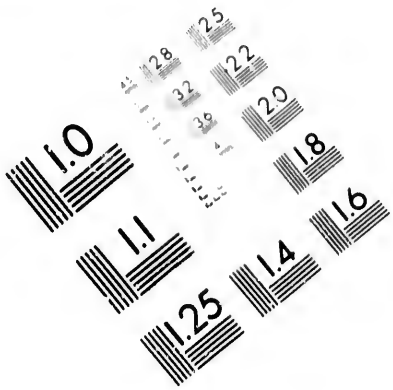

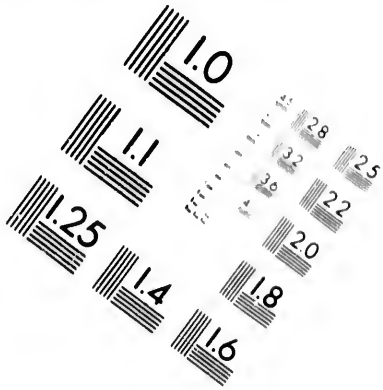

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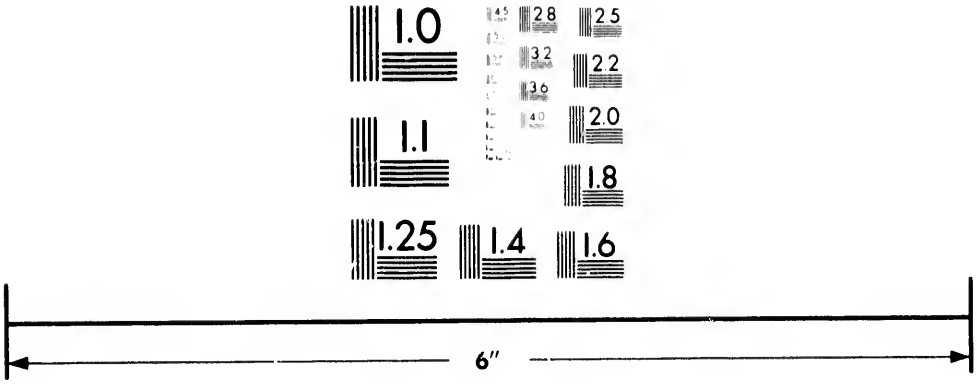

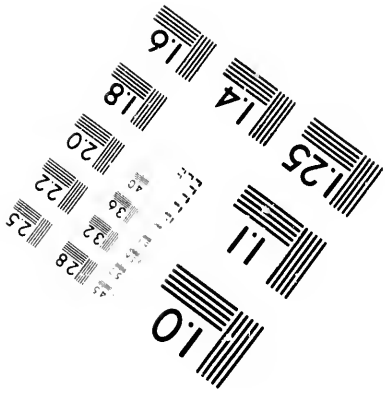

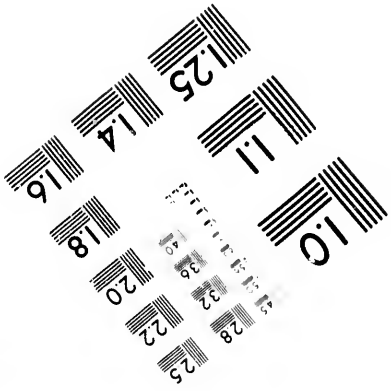

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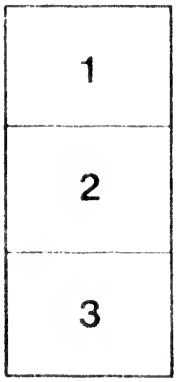

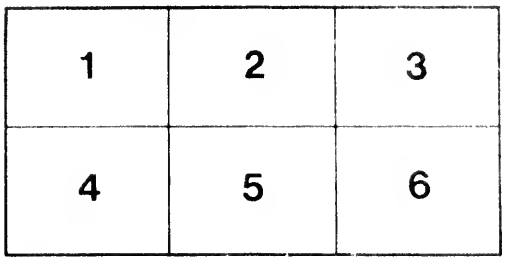

DEATH OF SIR HUGH WILLOUGHBY.

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MANY OF WHICH ARE NOW FIRST TRANSLATED INTO ENGLISH.

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1810.

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A GENERAL COLLECTION

OF

VOYAGES AND TRAVELS.

THE VOYAGES OF SIR HUGH WILLOUGHBY, RICHARD CHANCELOR, AND OTHERS, TO THE NORTHERN PARTS OF RUSSIA AND SIBERIA.

(FROM HAKLUYT'S COLLECTION, VOL. I. P. 294.)

THESE interesting Voyages are introduced with a genealogy of the dukes of Moscovy, which being extraneous to the subject, and often erroneous, shall be here omitted. But the instructions of Sebastian Cabot deserve preservation on account of their curiosity, and the celebrity of the author, not to mention that the first English voyage of discovery deserves to be detailed with all its circumstances; and in a plan of this extent, the Gothic building may sometimes form an agreeable variety amidst modern edifices.

Ordinances, instructions, and advertisements of and for the direction of the intended voyage for Cathay, compiled, made, and delivered by the right worshipful M. Sebastian Cabota, esquire, governor of the mystery and company of the merchants adventurers for the discovery of regions, dominions, islands, and places unknown, the 9th day of May, in the year of our Lord God 1553, and in the 7th year of the reign of our most dread sovereign lord, Edward the Sixth, by the grace of God, king of England, France, and Ireland, defender of the faith, and of the church of England and Ireland, in earth supreme head.

First, The captain-general, with the pilot-major, the masters, merchants, and other officers, to be so knit and accorded in unity, love, conformity, and obedience, in every degree on all sides, that no dissention, variance or contention, may rise or spring betwixt them and the mariners of this company, to the damage or hindrance of the voyage; for that dissention, by many experiences, hath overthrown many notable intended and likely enterprises and exploits.

2. Item, for as much as every person hath given an oath to be true, faithful, and loyal subjects and liegemen to the king's most excellent majesty, his heirs and successors, and for the observation of all laws and statutes made for the preservation of his most excellent majesty, and his crown imperial of his realms of England and Ireland,

and to serve his grace, the realm, and this present voyage, truly, and not to give up, intermit, or leave off the same voyage and enterprise until it shall be accomplished, so far forth as possibility and life of man may serve or extend: therefore it behoveth every person, in his degree, as well for conscience as for duty's sake, to remember his said charge, and the accomplishment thereof.

3. Item, where furthermore, every mariner or passenger in his ship hath given like oath to be obedient to the captain-general, and to every captain and master in his ship, for the observation of these present orders contained in this book, and all other which hereafter shall be made by the twelve counsellors in this present book named, or the most part of them, for the better conduction and preservation of the fleet, and achieving of the voyage, and to be prompt, ready, and obedient in all acts and feats of honesty, reason, and duty, to be ministered, shewed, and executed, in advancement and preferment of the voyage and exploit: therefore it is convenient that this present book shall once every week, by the discretion of the captain, be read to the said company, to the intent, that every man may the better remember his oath, conscience, duty, and charge.

4. Item, every person, by virtue of his oath, to do effectually, and with good will (as far forth as him shall comply) all and every such act and acts, deed and deeds, as shall be to him or them from time to time commanded, committed, and enjoined (during the voyage) by the captain-general, with the assent of the counsel and assistants, as well in and during the whole navigation and voyage, as also in discovering and landing, as cases and occasions shall require.

5. Item, all courses in navigation to be set and kept, by the advice of the captain, pilot-major, masters, and masters' mates, with the assents of the counsellors, and the most number of them, and in voices uniformly agreeing in one, to prevail, and take place, so that the captain-general shall in all counsels and assemblies have a double voice.

6. Item, that the fleet shall keep together, and not separate themselves asunder, as much as by wind and weather may be done or permitted, and that the captains, pilots, and masters, shall speedily come aboard the admiral, when, and as often, as he shall seem to have just cause to assemble them for counsel or consultation to be had, concerning the affairs of the fleet and voyage.

7. Item, that the merchants, and other skilful persons in writing, shall daily write, describe, and put in memory, the navigation of every day and night, with the points, and observation of the lands, tides, elements, altitude of the sun, course of the moon and stars, and the same so noted, by the order of the master and pilot of every ship, to be put in writing, the captain-general assembling the masters together once every week (if wind and weather shall serve) to confer all the observations and notes of the said ships, to the intent it may appear wherein the notes do agree, and wherein they dissent, and upon good debatement, deliberation, and conclusion determined, to put the same into a common ledger, to remain of record for the company: the like order to be kept in proportioning of the cards, astrolabes, and other instruments, prepared for the voyage at the charge of the company.

8. Item, that all enterprises and exploits of discovering or landing to search isles, regions, and such like, to be searched, attempted, and enterprised, by good deliberation, and common assent, determined advisedly. And that in all enterprises, notable ambassages, suits, requests, or presentment of gifts or presents to princes, to be done and executed by the captain-general in person, or by such other as he by common assent shall appoint or assign to do, or cause to be done, in the same.

9. Item, the steward and cook of every ship, and their associates, to give and render to the captain and other head officers of their ship weekly (or oftener if it shall seem requisite) a just or plain and perfect accompt of expences of the victuals, as well flesh, fish, biscuit, meat, or bread, as also of beer, wine, oil, or vinegar, and all other kind of victualling under their charge, and they, and every of them, so to order and dispend the same, that no waste or unprofitable excess be made otherwise than reason and necessity shall command.

10. Item, when any inferior or mean officer, of what degree or condition he shall be, shall be tried untrue, remiss, negligent, or unprofitable, in or about his office in the voyage, or not to use himself in his charge accordingly, then every such officer to be punished or removed, at the discretion of the captain and assistants, or the most part of them, and the person so removed not to be reputed, accepted, or taken, from the time of his remove, any more for an officer, but to remain in such condition and place as he shall be assigned unto, and none of the company to resist such chastisement or worthy punishment as shall be ministered to him moderately, according to the fault or desert of his offence, after the laws and common customs of the seas in such cases heretofore used and observed.

11. Item, if any mariner, or officer inferior, shall be found by his labour not meet nor worthy the place that he is presently shipped for, such person may be unshipped and put on land at any place within the king's majesty's realm and dominion, and one other person more able and worthy to be put in his place, at the discretion of the captain and masters, and order to be taken that the party dismissed shall be allowed proportionably the value of that he shall have deserved to the time of his dismission or discharge, and he to give order, with sureties, pawn, or other assurance, to repay the overplus of that he shall have received which he shall not have deserved, and such wages to be made with the party newly placed as shall be thought reasonable, and he to have the furniture of all such necessaries as were prepared for the party dismissed, according to right and conscience.

12. Item, that no blaspheming of God, or detestable swearing, be used in any ship, nor communication of ribaldry, filthy tales, or ungodly talk, to be suffered in the company of any ship, neither dicing, carding, tabling, nor other devilish games, to be frequented, whereby ensueth not only poverty to the players, but also strife, variance, brawling, fighting, and oftentimes murder, to the utter destruction of the parties, and provoking of God's most just wrath and sword of vengeance. These, and all such like pestilences and contagions of vices and sins, to be eschewed, and the offenders once monished, and not reforming, to be punished at the discretion of the captain and master, as appertaineth.

13. Item, that morning and evening prayer, with other common services appointed by the king's majesty and laws of this realm, to be read and said in every ship daily by the minister in the admiral, and the merchant or some other person learned in other ships, and the Bible or paraphrases to be read devoutly and christianly, to God's honour, and for his grace to be obtained and had, by humble and hearty prayer of the navigants accordingly.

14. Item, that every officer is to be charged by inventory with the particulars of his charge, and to render a perfect accompt of the defraying of the same, together with modest and temperate dispending of powder, shot, and use of all kind of artillery, which is not to be misused, but diligently to be preserved, for the necessary defence of the fleet and voyage, together with due keeping of all instruments of your navigation, and other requisites.

15. Item, no liquor to be spilt on the ballast, nor filthiness to be left within board; the cook-room and all other places to be kept clean, for the better health of the company; the gromals and pages to be brought up according to the laudable order and use of the sea, as well in learning of navigation, as in exercising of that which to them appertaineth.

16. Item, the liveries in apparel given to the mariners be to be kept by the merchants, and not to be worn but by the order of the captain, when he shall see cause to muster or shew them in good array, for the advancement and honour of the voyage, and the liveries to be re-delivered to the keeping of the merchants, until it shall be thought convenient for every person to have the full use of his garment.

17. Item, when any mariner or any other passenger shall have need of any necessary furniture of apparel for his body, and conservation of his health, the same shall be delivered him by the merchant, at the assignment of the captain and master of that ship wherein such needy person shall be, at such reasonable price as the same cost, without any gain to be exacted by the merchants, the value thereof to be entered by the merchant in his book, and the same to be discounted off the party's wages that so shall receive and wear the same.

18. Item, the sick, diseased, weak, and visited person within board, to be tendered, relieved, comforted, and helped, in the time of his infirmity; and every manner of person, without respect, to bear another's burthen, and no man to refuse such labour as shall be put to him, for the most benefit and public wealth of the voyage and enterprise to be achieved exactly.

19. Item, if any person shall fortune to die, or miscarry in the voyage, such apparel and other goods as he shall have, at the time of his death, is to be kept by the order of the captain and master of the ship, and an inventory to be made of it, and conserved to the use of his wife and children, or otherwise, according to his mind and will, and the day of his death to be entered in the merchant's and steward's books, to the intent it may be known what wages he shall have deserved to his death, and what shall rest due to him.

20. Item, that the merchants appointed for this present voyage shall not make any shew or sale of any kind of merchandises, or open their commodities, to any foreign princes, or any of their subjects, without the consent, privity, or agreement of the captains, the cape merchants, and the assistants, or four them, whereof the captain-general, the pilot-major, and cape merchant, to be three, and every of the petty merchants to shew his reckoning to the cape merchant, when they, or any of them, shall be required: and no commutation or truck to be made by any of the petty merchants, without the assent abovesaid: and all wares and commodities trucked, bought, or given to the company by way of merchandise, truck, or any other respect, to be booked by the merchants, and to be well ordered, packed, and conserved in one mass entirely, and not to be broken or altered until the ship shall return to the right discharges, and inventory of all goods, wares and merchandises, so trucked, bought, or otherwise dispended, to be presented to the governor, consuls, and assistants in London, in good order, to the intent the king's majesty may be truly answered of that which to his grace by his grant of corporations is limited, according to our most bound duties, and the whole company also to have that which by right unto them appertaineth, and no embezzlement shall be used, but the truth of the whole voyage to be opened, to the commonwealth and benefit of the whole company and mystery, as appertaineth, without guile, fraud, or mal engine.

21. Item, no particular person to hinder or prejudicate the common stock of the company, in sale or preferment of his own proper wares and things, and no particular

emergent or purchase to be employed to any several profit, until the common stock of the company shall be furnished, and no person to hinder the common benefit in such purchases or contingents as shall fortune to any one of them, by his own proper policy, industry, or chance, nor no contention to rise in that behalf, by any occasion of jewel, stones, pearls, precious metals, or other things of the region, where it shall chance the same to rise, or to be found, bought, trucked, permuted, or given: but every person to be bound in such case, and upon such occasion, by order and direction, as the general-captain and the council shall establish and determine, to whose order and discretion the same is left: for that of things uncertain, no certain rules may or can be given.

22. Item, not to disclose to any nation the state of our religion, but to pass it over in silence, without any declaration of it, seeming to bear with such laws and rites as the place hath, where you shall arrive.

23. Item, for as much as our people and ships may appear unto them strange and wonderous, and theirs also to ours, it is to be considered, how they may be used, learning much of their natures and dispositions by some one such person, as you may first either allure, or take, to be brought aboard your ships, and there to learn as you may, without violence or force; and no woman to be tempted or entreated to incontinence, or dishonesty.

24. Item, the person so taken to be well entertained, used, and apparelled, to be set on land, to the intent that he or she may allure others to draw nigh, to shew the commodities: and if the person taken may be made drunk with your beer, or wine, you shall know the secrets of his heart.

25. Item, our people may not pass farther into a land, than that they may be able to recover their pinnaces, or ships, and not to credit the fair words of the strange people, which be many times tried subtle, and false, nor to be drawn into peril of loss, for the desire of gold, silver, or riches, and esteem your own commodities above all other, and in countenance shew not much to desire the foreign commodities: nevertheless, take them as for friendship, or by way of permutation.

26. Item, every nation and region is to be considered advisedly, and not to provoke them by any disdain, laughing, contempt, or such like, but to use them with prudent circumspection, with all gentleness and courtesy, and not to tarry long in one place, until you shall have attained the most worthy place that may be found, in such sort as you may return, with victuals sufficient, prosperously.

27. Item, the names of the people of every island are to be taken in writing, with the commodities and incommodities of the same, their natures, qualities, and dispositions, the site of the same, and what things they are most desirous of, and what commodities they will most willingly depart with, and what metals they have in hills, mountains, streams, or rivers, in, or under the earth.

28. Item, if people shall appear gathering of stones, gold, metal, or other like, on the sand, your pinnaces may draw nigh, marking what things they gather, using or playing upon the drum, or such other instruments, as may allure them to hearkening, to fantasy or desire to see and hear your instruments and voices, but keep you out of danger, and shew to them no point or sign of rigour and hostility.

29. Item, if you shall be invited into any lord's or ruler's house, to dinner, or other parliance, go in such order of strength, that you may be stronger than they, and be wary of woods and ambushes, and that your weapons be not out of your possessions.

30. Item, if you shall see them wear lions' or bears' skins, having long bows and arrows, be not afraid of that sight: for such be worn oftentimes more to fear strangers, than for any other cause.

31. Item, there are people that can swim in the sea, havens, and rivers, naked, having bows and shafts, coveting to draw nigh your ships, which, if they shall find not well watched or warded, they will assault, desirous of the bodies of men, which they covet for meat: if you resist them, they dive, and so will flee, and therefore diligent watch is to be kept both day and night in some islands.

32. Item, if occasion shall serve, that you may give advertisements of your proceedings in such things as may correspond to the expectation of the company, and likelihood of success in the voyage, passing such dangers of the seas, perils of ice, intolerable colds, and other impediments, which, by sundry authors and writers, have ministered matter of suspicion in some heads that this voyage could not succeed, for the extremity of the north pole, lack of passage, and such like, which have caused wavering minds and doubtful heads not only to withdraw themselves from the adventure of this voyage, but also dissuaded others from the same, the certainty whereof, when you shall have tried by experience (most certain master of all worldly knowledge) then, for declaration of the truth which you shall have experted, you may, by common assent of counsel, send, either by land or otherwise, such two or one person, to bring the same by credit, as you shall think may pass in safety: which sending is not to be done but upon urgent causes, in likely success of the voyage, in finding of passage, in towardliness of beneficial traffic, or such other like, whereby the company, being advertised of your estates and proceedings, may further provide, foresee, and determine that which may seem most good and beneficial for the public wealth of the same; either providing before-hand such things as shall be requisite for the continuance of the voyage, or else otherwise to dispose as occasion shall serve: in which things your wisdoms and discretions are to be used, and shewed, and the contents of this capitule by you much to be pondered, for that you be not ignorant how many persons, as well as the king's majesty, the lords of his honourable counsel, this whole company, as also your wives, children, kinsfolks, allies, friends, and familiars, be replenished in their hearts with ardent desire to learn and know your estates, conditions, and welfares, and in what likelihood you be in to obtain this notable enterprize, which is hoped no less to succeed to you, than the Orient or Occident Indies have to the high benefit of the emperor and kings of Portugal, whose subjects, industries, and travels by sea, have enriched them, by those lands and islands, which were to all cosmographers and other writers both unknown, and also by appearances of reason void of experience thought and reputed unhabitable, for extremities of heats and colds, and yet indeed, tried, most rich, peopled, temperate, and so commodious, as all Europe hath not the like.

33. Item, no conspiracies, part-takings, factions, false tales, untrue reports, which be the very seeds and fruits of contention, discord, and confusion, by evil tongues, to be suffered, but the same, and all other ungodliness, be chastened charitably with brotherly love, and always obedience to be used and practised by all persons in their degrees, not only for duty and conscience sake towards God, under whose merciful hand navigants above all other creatures naturally be most nigh and vicine, but also for prudent and worldly policy, and public weal, considering and always having present in your minds, that you be all one most royal king's subjects and naturals, with daily remembrance of the great importance of the voyage, the honour, glory, praise, and

benefit, that depend of and upon the same, toward the common wealth of this noble realm, the advancement of you the travellers therein, your wives, and children, and so to endeavour yourselves as that you may satisfy the expectation of them, who at their great costs, charges, and expences, have so furnished you in good sort, and plenty of all necessaries, as the like was never in any realm seen, used, or known, requisite and needful for such an exploit, which is most likely to be achieved and brought to good effect, if every person in his vocation shall endeavour himself, according to his charge and most bounden duty: praying the living God to give you his grace to accomplish your charge to his glory, whose merciful hand shall prosper your voyage, and preserve you from all dangers.

In witness whereof I, Sebastian Cabota, governor aforesaid, to these present ordinances have subscribed my name, and put my seal, the day and year above written.

THE NAMES OF THE TWELVE COUNSELLORS APPOINTED IN THIS VOYAGE.

1. Sir Hugh Willoughby, knight, captain-general.
2. Richard Chancelor, captain of the Edward Bonaventure, and pilot-general of the fleet.
3. George Burton, cape merchant.
4. Master Richard Stafford, minister.
5. Thomas Langlie, merchant.
6. James Delahere, gentleman.
7. William Gefferson, master of the Bona Speranza admiral.
8. Stephen Burrough, master of the Edward Bonaventure.
9. Cornelius Durforth, master of the Confidentia.
10. Roger Wilson, } masters' mates.
11. John Buckland, } masters' mates.
12. Richard Ingram, } masters' mates.

The copy of the letters missive, which the right noble Prince Edward the Sixth sent to the kings, princes, and other potentates, inhabiting the north-east parts of the world, toward the mighty empire of Cathay; at such time as sir Hugh Willoughby, knight, and Richard Chancelor, with their company, attempted their voyage thither in the year of Christ 1553, *and the seventh and last year of his reign.*

Edward the Sixth, by the grace of God, king of England, France, and Ireland, &c. To all kings, princes, rulers, judges, and governors of the earth, and all other having any excellent dignity on the same, in all places under the universal heaven: peace, tranquillity and honour, be unto you, and your lands and regions, which are under your dominions, and to every of you, as is convenient.

For as much as the great and Almighty God hath given unto mankind, above all other living creatures, such a heart and desire, that every man desireth to join friendship with other, to love and be loved, also to give and receive mutual benefits: it is therefore the duty of all men, according to their power, to maintain and increase this desire in every man, with well deserving to all men and especially to shew this good affection to such as, being moved with this desire, come unto them from far countries. For how much the longer voyage they have attempted for this intent, so much the more do they thereby declare that this desire hath been ardent in them. Furthermore, also, the examples of our fathers and predecessors do invite us hereunto,

forasmuch as they have ever gently and lovingly intreated such as of friendly mind came to them, as well from countries near hand as far remote, commending themselves to their protection. And if it be right and equity to shew such humanity toward all men, doubtless the same ought chiefly to be shewn to merchants, who, wandering about the world, search both the land and the sea, to carry such good and profitable things, as are found in their countries, to remote regions and kingdoms, and again, to bring from the same such things as they find there, commodious for their own countries: both as well that the people, to whom they go, may not be destitute of such commodities as their countries bring not forth to them, as that also they may be partakers of such things whereof they abound. For the God of heaven and earth, greatly providing for mankind, would not that all things should be found in one region, to the end that one should have need of another, that by this means friendship might be established among all men, and every one seek to gratify all. For the establishing and furtherance of which universal amity, certain men of our realm, moved hereunto by the said desire, have instituted, and taken upon them a voyage by sea into far countries, to the intent, that between our people and them a way may be opened, to bring in and carry out merchandises, desiring us to further their enterprize. Who, assenting to their petition, have licensed the right valiant and worthy sir Hugh Willoughby, knight, and other our trusty and faithful servants, which are with him, according to their desire, to go to countries to them heretofore unknown, as well to seek such things as we lack, as also to carry unto them from our regions such things as they lack. So that hereby not only commodity may ensue both to them and us, but also an undissoluble and perpetual league of friendship be established between us both, while they permit us to take of their things such, whereof they have abundance in their regions, and we again grant them such things of ours, whereof they are destitute. We therefore desire you kings and princes, and all other to whom there is any power on the earth, to permit unto these our servants free passage by your regions and dominions: for they shall not touch any thing of yours unwilling unto you. Consider you that they also are men. If, therefore, they shall stand in need of any thing, we desire you of all humanity, and for the nobility which is in you, to aid and help them with such things as they lack, receiving again of them such things as they shall be able to give you in recompence. Shew yourselves so towards them, as you would that we and our subjects should shew ourselves towards your servants, if at any time they shall pass by our regions.

Thus doing, we promise you, by the God of all things that are contained in heaven, earth, and the sea, and by the life and tranquillity of our kingdoms, that we will with like humanity accept your servants, if at any time they shall come to our kingdoms, where they shall as friendly and gently be entertained, as if they were born in our dominions, that we may hereby recompence the favour and benignity which you have shewed to our men. Thus, after we have desired you kings and princes, &c. with all humanity and favour to entertain our well-beloved servants, we will pray our Almighty God to grant you long life and peace, which never shall have end. Written in London, which is the chief city of our kingdom, in the year from the creation of the world 5515, in the month of Jiar,* the fourteenth day of the month, and seventh year of our reign.

* Hakluyt supposes this to be the Saracen name of February. In the geography of these times, the savages of the north of Europe were supposed to be Saracens. This letter is translated by Hakluyt from the Latin, and he adds, that it was likewise written in Greek and other languages.

The true copy of a note found written in one of the two ships, to wit, the Speranza, which wintered in Lappia, where sir Hugh Willoughby and all his company died, being frozen to death, anno 1553.

The voyage intended for the discovery of Cathay, and divers other regions, dominions, islands and places unknown, set forth by the right worshipful master Sebastian Cabota, esquire, and governor of the mystery and company of the merchants adventurers of the city of London: which fleet, being furnished, did set forth the tenth day of May, 1553, and in the seventh year of our most dread sovereign lord and king, Edward the Sixth.

The names of the ships of the fleet, and of their burden, together with the names of the captains, and counsellors, pilot-major, masters of the ships, merchants, with other officers, and mariners, as hereafter followeth.

THE BONA ESPERANZA, ADMIRAL OF THE FLEET, OF ONE HUNDRED AND TWENTY TONS, HAVING WITH HER A PINNACE AND A BOAT.

Sir Hugh Willoughby, knight, captain-general of the fleet.
William Gefferson, master of the ship.
Roger Wilson, his mate.
William Gittons, Charles Barrett, Gabriel Willoughby, John Andrews, Alexander Woodfoord, Ralph Chatterton, merchants.

MARINERS AND OFFICERS, ACCORDING TO THE USE AND CUSTOM OF THE SEAS.

John Brooke, master gunner.
Nicholas Anthony, boatswain.
John Web, his mate.
Christopher Banbrucke, Thomas Davison, Robert Rosse, Thomas Simpson, quarter masters.
William White, James Smith, Thomas Painter, John Smith, their mates.
Richard Gwinne, George Goiswine, carpenters.
Robert Gwinne, purser.
Laurence Edwards, his mate and cooper.
Richard Morgan, cook.
Thomas Nashe, his mate.
William Light, John Brande, Cuthbert Chelsie, George Blage, Thomas Walker, Thomas Allen, Edward Smith, Edward Hunt, John Fawkner, Rowland Brooke.
Alexander Gardiner, Richard Molton, Surgeons, which two were taken in at Harwich.
Discharged at Harwich, by reason of sickness, George Blake, Nicholas Anthony.
For pickerie, ducked at the yard's arm, and so discharged, Thomas Nashe.

THE EDWARD BONAVENTURE, OF ONE HUNDRED AND SIXTY TONS, WITH HER A PINNACE AND A BOAT.

Richard Chancelor, captain and pilot-major of the fleet.
Stephen Burrough, master of the ship.
John Buckland, his mate.
George Burton, Arthur Edwards, merchants.
John Stafford, minister.
James Dallaber, Nicholas Newborrow, John Segswike, Thomas Francis, John Hasse, Richard Johnson, William Kempe.

MARINERS AND OFFICERS, ACCORDING TO THE USE AND CUSTOM OF THE SEAS.

Robert Stanton, master gunner.
John Walker, his mate.
James Long, John Cocks, gunners.
Thomas Walter, surgeon.
Peter Palmer, boatswain.
Richard Strowde, his mate.
John Robinson, John Carowe, Thomas Stone, Roger Lishbie, quarter masters.
John Austen, steward, Patrick Stevens, his mate.
Austen Jacks, cook.
William Every, cooper.
Griffin Wagham, carpenter.
Thomas Stelston, Thomas Townes, John Robinson, John White, William Laurence, Miles Butter, John Browne, William Morren, William Watson, Thomas Handcocks, Edward Pacie, Thomas Browne, Arthur Pet, George Phibarie, Edward Paterson, William Beare, John Potter, Nicholas Lawrence, William Burrough, Roger Welford, John Williams.

THE BONA CONFIDENTIA OF NINETY TONS, HAVING WITH HER A PINNACE AND A BOAT.

Cornelius Durfoorth, master of the ship.
Richard Ingram, his mate.
Thomas Langlie, Edward Kever, Henry Dorset, merchants.

MARINERS AND OFFICERS, ACCORDING TO THE USE AND CUSTOM OF THE SEAS.

Henry Tailer, master gunner.
George Thurland, his mate.
William Hamane, boatswain.
John Edwards, his mate.
Thomas Kirbie, Henry Dickenson, John Haye, William Shepwash, quarter masters.
John Reyne, steward.
Thomas Haute, cook, William Lassie, his mate.
Nicholas Knight, carpenter.
Peter Lewike, Nicholas Wiggleworth, John Moore, William Chapman, Brian Chester, William Barrie, Richard Wood, Clement Gibson, John Clarecke, Erasmus Bentley, John Duriforth.

THE JURAMENTUM, OR OATH, MINISTERED TO THE CAPTAIN.

You shall swear to be a faithful, true, and loyal subject, in all points and duties that to a subject appertaineth, to our sovereign lord the king's majesty, his heirs, and successors: and that you shall well and truly, to the uttermost of your capacity, wit, and knowledge, serve this present voyage, committed to your charge, and not to give up, nor sooner intermit the same, until you shall have achieved the same, so far forth as you may without danger of your life, and loss of the fleet: you shall give good, true, and faithful counsel to the said society, and to such as shall have the charge with or under you, and not to disclose the secrets, or privities, of the same to any person, by any manner of mean, to the prejudice, hurt, or damage of it. You shall minister justice to all men under your charge, without respect of person, or any affection, that might move you to decline from the true ministration of justice. And further, you shall observe, and cause to be observed, as much as in you lieth, all and singular rules, articles, provisions hitherto made, or hereafter to be made, for the pre-

servation or safe conduct of the fleet and voyage, and benefit of the company. You shall not permit nor suffer the stock or goods of the company to be wasted, embezzled, or consumed, but shall conserve the same whole and entire, without diminishment, until you shall have delivered or cause to be delivered the same, to the use of the company. And finally, you shall use yourself in all points, sorts, and conditions, as to a faithful captain and brother of this company shall belong and appertain: so help you God, &c.

THE OATH MINISTERED TO THE MASTER OF THE SHIP, &c.

You shall swear, by the holy contents in that book, that you, according and to the uttermost of your knowledge, and good understanding in mariner's science and craft, shall in your vocation do your best to conduct the good ship called the N. &c. whereof you now are master, under God, both unto and from the ports of your discovery, and so use your endeavour and faithful diligence, in charging, discharging, lading again, and roomaging of the same ship, as may be most for the benefit and profit of this right worshipful fellowship: and you shall not privately bargain, buy, sell, exchange, barter, or distribute any goods, wares, merchandise, or things whatsoever (necessary tackles and victuals for the ship only excepted) to or for your own lucre, gain, or profit, neither to nor for the private lucre, gain, or profit of any other person or persons whatsoever. And further, if you shall know any boatswain, mariner, or any other person or persons whatsoever, to buy, sell, barter, truck, or exchange any goods, wares, merchandises or things, for private account, reckoning, or behalf, you shall do your best to withstand and let the same: and if you cannot commodiously so do, that then, before the discharge of such goods bought for private account, you shall give knowledge thereof to the cape merchant of this said fellowship for the time being. And you shall not receive nor take, nor suffer to be received or taken into your said ship, during this voyage, any manner of person or persons whatsoever, going or returning, but only those mariners, which without fraud or guile shall be hired to be of your company, and to serve in mariners' craft and science only: So help you God, &c.

These foresaid ships being fully furnished with their pinnaces and boats, well appointed with all manner of artillery, and other things necessary for their defence, with all the men aforesaid, departed from Ratcliffe, and valed unto Deptford the tenth day of May, 1553.

The eleventh day, about two of the clock, we departed from Deptford, passing by Greenwich, saluting the king's majesty, then being there, shooting off our ordnance, and so valed unto Blackwall, and there remained until the seventeenth day, and that day in the morning we went from Blackwall, and came to Woolwich by nine of the clock, and there remained one tide, and so the same night unto Heyreth.

The eighteenth day from Heyreth unto Gravesend, and there remained until the twentieth day: that day being Saturday, from Gravesend unto Tilbury Hope, remaining there until the two and twentieth day.

The twenty-second day from Tilbury Hope to Hollie Haven.

The twenty-third day from Hollie Haven, till we came against Lee, and there remained that night, by reason that the wind was contrary to us.

The twenty-fourth day, the wind being in the S. W. in the morning, we sailed along the coast over the Spits, until we came against St. Osyth, about six of the clock at night, and there came to anchor, and abode there all that night.

The twenty-fifth day, about ten of the clock, we departed from St. Osyth, and so sailed forward unto the Nase, and there abode that night for wind and tide.

The twenty-sixth day, at five of the clock in the morning, we weighed our anchor, and sailed over the Nase, the wind being at the S. W. until we came to Orwell Wands, and there came to an anchor, and abode there until the twenty-eighth day.

The same day being Trinity Sunday, about seven of the clock before noon we weighed our anchors, and sailed till we came athwart Walsursye, and there came to an anchor.

The twenty-ninth day from thence to Holmehead, where we stayed that day, where we consulted which way and what courses were best to be holden, for the discovery of our voyage, and there agreed.

The thirtieth day of May, at five of the clock in the morning, we set sail, and came against Permouth, about three leagues into the sea, riding there at anchor all that night.

The last of May into the sea six leagues N. E. and there tarried that night, where the wind blew very sore.

The first of June, the wind being at north, contrary to us, we came back again to Orwell, and remained there until the fifteenth day, tarrying for the wind, for all this time the wind was contrary to our purpose.

The fifteenth day, being at Orwell, in the latitude of fifty-two degrees, in the morning we weighed our anchors, and went forth into the Wands, about two miles from the town, and lay there that night.

The sixteenth day, at eight of the clock, we set forward, and sailed until we came athwart Alburrough, and there stayed that night.

The seventeenth day, about five of the clock before noon, we went back unto Orfordnesse, and there remained until the nineteenth day.

The nineteenth day, at eight of the clock in the morning, we went back to Orwell, and abode there three days, tarrying for the wind.

The twenty-third day of June, the wind being fair in the S. W. we hailed into the seas to Orfordnesse, and from thence into the seas ten leagues N. E. then being past the sands, we changed our course six leagues N. N. E. about midnight we changed our course again, and went due N. continuing in the same unto the twenty-seventh day.

The twenty-seventh day, about seven of the clock, N. N. W. forty-two leagues, to the end to fall with Shotland: then the wind veered to the W. so that we could lie but N. and by W. continuing in the same course forty leagues, whereby we could not fetch Shotland: then we sailed N. sixteen leagues by estimation, after that N. and by W. and N. N. W. then S. E. with divers other courses, traversing and tracing the seas, by reason of sundry and manifold contrary winds, until the fourteenth day of July: and then the sun entering into Leo, we discovered land eastward of us, unto the which we sailed that night as much as we might: and after we went on shore with our pinnace, and found little houses to the number of thirty, where we knew that it was inhabited, but the people were fled away, as we judged, for fear of us.

The land was all full of little islands, and that innumerable, which were called (as we learned afterwards) Ægeland, and Halgeland, which lieth from Orfordnesse N. and by E. being in the latitude of sixty-six degrees.* The distance between Orfordnesse and Ægeland two hundred and fifty leagues. Then we sailed from thence twelve leagues N. W. and found many other islands, and there came to anchor the nineteenth day, and

* In fact between fifty-four and fifty-five degrees.

manned our pinnace, and went on shore to the islands, and found people mowing and making of hay, which came to the shore and welcomed us. In which place were an innumerable sort of islands, which were called the Isles of Rost, being under the dominion of the king of Denmark: which place was in latitude sixty-six degrees, and thirty minutes. The wind being contrary, we remained there three days, and there was an innumerable sort of fowls of divers kinds, of which we took very many.

The twenty-second day, the wind coming fair, we departed from Rost, sailing N. N. E. keeping the sea until the twenty-seventh day, and then we drew near unto the land, which was still E. of us; then went forth our pinnace to seek harbour, and found many good harbours, of the which we entered into one with our ships, which was called Stanfew, and the land being islands, were called Lewfoot, or Lofoot,* which were plentifully inhabited, and very gentle people, being also under the king of Denmark; but we could not learn how far it was from the main land: and we remained there until the thirtieth day, being in latitude sixty-eight degrees, and from the aforesaid Rost about thirty leagues N. N. E.

The thirtieth day of July about noon we weighed our anchors, and went into the seas, and sailed along these islands N. N. E. keeping the land still in sight until the second day of August: then hailing in close aboard the land, to the intent to know what land it was, there came a skiff of the island aboard of us, of whom we asked many questions, who shewed unto us that the island was called Seynam,† which is the latitude of seventy degrees, and from Stanfew thirty leagues, being also under the king of Denmark; and that there was no merchandise there, but only dried fish and train oil. Then we, being purposed to go unto Finmark, inquired of him if we might have a pilot to bring us unto Finmark: and he said, that if we could bear in, we should have a good harbour, and on the next day a pilot to bring us to Finmark, unto the Wardhouse, which is the strongest hold in Finmark, and most resorted to by report. But when we would have entered into an harbour, the land being very high on every side, there came such flaws of wind and terrible whirlwinds, that we were not able to bear in, but by violence were constrained to take the sea again, our pinnace being unshipped: we sailed N. and by E. the wind increasing so sore that we were not able to bear any sail, but took them in, and lay adrift, to the end to let the storm overpass. And that night, by violence of wind and thickness of mists, we were not able to keep together within sight, and then about midnight we lost our pinnace, which was a discomfort unto us. As soon as it was day, and the fog overpast, we looked about, and at the last we descried one of our ships to leeward of us; then we spread an hullock of our foresail, and bare room with her, which was the Confidence, but the Edward we could not see. Then the flaw something abating, we and the Confidence hoisted up our sails the fourth day, sailing N. E. and by N. to the end to fall with the Wardhouse, as we did consult to do before, in case we should part company. Thus running N. E. and by N. and N. E. fifty leagues, then we sounded, and had one hundred and [illegible]ty fathoms, whereby we thought to be far from land, and perceived that the land lay not as the globe made mention. Wherefore we changed our course the sixth day, and sailed S. E. and by S. eight-and-forty leagues, thinking thereby to find the Wardhouse.

The eighth day, much wind rising at the W. N. W. we, not knowing how the coast lay, struck our sails, and lay adrift, where we sounded, and found one hundred and sixty fathoms as afore.

The ninth day, the wind veering to the S. S. E. we sailed N. E. twenty-five leagues.

* Loffoden. † Senjan.

The tenth day we sounded, and could get no ground, neither yet could see any land, whereat we wondered; then the wind coming at the N. E. we ran S. E. about forty-eight leagues.

The eleventh day, the wind being at S. we sounded, and found forty fathoms and fair sand.

The twelfth day, the wind being at S. and by E. we lay with our sail E. and E. and by N. thirty leagues.

The fourteenth day, early in the morning, we descried land, which land we bare with all, hoisting out our boat to discover what land it might be: but the boat could not come to land the water was so shoal, where was very much ice also, but there was no similitude of habitation, and t 's land lieth from Seynam E. and by N. one hundred and sixty leagues, being in latitude seventy-two degrees. Then we plied to the northward the fifteenth, sixteenth, and seventeenth day.

The eighteenth day, the wind coming at the N. E. and the Confidence being troubled with bilge water, and stocked, we thought it good to seek harbour for her redress: then we bare room the eighteenth day S. S. E. about seventy leagues.

The twenty-first day we sounded, and found ten fathom, after that we sounded again, and found but seven fathom, so shallower and shallower water, and yet could see no land, where we marvelled greatly: to avoid this danger, we bare roomer into the sea all that night N. W. and by W.

The next day we sounded, and had twenty fathoms, then shaped our course, and ran W. S. W. until the twenty-third day: then we descried low land, unto which we bare as nigh as we could, and it appeared unto us unhabitable. Then we plied westward along by that land, which lieth W. S. W. and E. N. E. and much wind blowing at the W. we haled into the sea N. and by E. thirty leagues. Then the wind coming about at the N. E. we sailed W. N. W. after that, the wind bearing to the N. W. we lay with our sails W. S. W. about fourteen leagues, and then descried land, and bare in with it, being the twenty-eighth day, finding shoal water, and bare in till we came to three fathom, then perceiving it to be shoal water, and also seeing dry sands, we haled out again N. E. along that land, until we came to the point thereof. That land turning to the westward, we ran along sixteen leagues N. W. then coming into a fair bay, we went on land with our boat, which place was unhabited, but yet it appeared unto us that the people had been there, by crosses and other signs: from thence we went all along the coast westward.

The fourth day of September we lost sight of land, by reason of contrary winds, and the eighth day we descried land again. Within two days after we lost the sight of it: then running W. and by S. about thirty leagues, we got the sight of land again, and bare in with it until night: then perceiving it to be a lee shore, we got us into the sea, to the end to have sea room.

The twelfth of September we haled to shoreward again, having then indifferent wind and weather: then being near unto the shore, and the tide almost spent, we came to an anchor in thirty fathoms water.

The thirteenth day, we came along the coast which lay N. W. and by W. and S. E. and by E.

The fourteenth day we came to an anchor within two leagues of the shore, having sixty fathoms.

There we went ashore with our boat, and found two or three good harbours, the land being rocky and high, but as for people we could see none. The fifteenth day we ran still along the coast, until the seventeenth day: then the wind being contrary unto us,

we thought it best to return unto the harbour which we had found before, and so we bare roomer with the same, howbeit we could not accomplish our desire that day. The next day, being the eighteenth of September, we entered into the haven, and there came to an anchor at six fathoms. This haven runneth into the main, about two leagues, and is in breadth half a league, wherein were very many seal fishes, and other great fishes, and upon the main we saw bears, great deer, foxes, with divers strange beasts, as guloines,* and such other which were to us unknown, and also wonderful. Thus remaining in this haven the space of a week, seeing the year far spent, and also very evil weather, as frost, snow, and hail, as though it had been the deep of winter, we thought best to winter there. Wherefore we sent out three men S. S. W. to search if they could find people, who went three days journey, but could find none: after that we sent other three westward, four days journey, which also returned without finding any people. Then sent we three men S. E. three days journey, who in like sort returned without finding of people, or any similitude of habitation.

These two notes following were written upon the outside of this pamphlet or book.

"1. The proceedings of sir Hugh Willoughby, after he was separated from the Edward Bonaventure.

"2. Our ship being at an anchor in the harbour called Sterfier, in the island Lofoote."

The river or haven, wherein sir Hugh Willoughby with the company of his two ships perished for cold, is called Arzina, in Lapland, near unto Kegor. But it appeareth by a will found in the ship, that sir Hugh Willoughby and most of the company were alive in January 1554.

* Hakluyt adds upon the margin, *or ellone:* and adds, that in this harbour they died.

The Book of the great and mighty Emperor of Russia, and duke of Moscovia, and of the dominions, orders and commodities thereunto belonging: drawn by Richard Chancelor.

FOR as much as it is meet and necessary for all those that mind to take in hand the travel into far or strange countries, to endeavour themselves not only to understand the orders, commodities, and fruitfulness thereof, but also to apply them to the setting forth of the same, whereby it may encourage others to the like travail: therefore have I now thought good to make a brief rehearsal of the orders of this my travail in Russia and Moscovia, and other countries thereunto adjoining; because it was my chance to fall with the north parts of Russia before I came towards Moscovia, I will partly declare my knowledge therein. Russia is very plentiful both of land and people, and also wealthy for such commodities as they have. They be very great fishers for salmons and small cods: they have much oil, which we call train oil, the most whereof is made by a river called Duina. They make it in other places, but not so much as there. They have also a great trade in seething of salt water. To the north part of that country are the places where they have their furs; as sables, marterns, greesse beavers, foxes white, black, and red; minks, ermines, miniver, and harts. There are also a fish's teeth, which fish is called a morsse. The takers thereof dwell in a place called Postesora, which bring them upon harts to Lampas to sell, and from Lampas carry them to a place called Colmogro, where the high market is holden on St. Nicholas day. To the west of Colmogro there is a place called Gratanove, in our language Novogorode, where much fine flax and hemp groweth, and also much wax and honey. The Dutch merchants have a staple house there. There is also great store of hides, and at a place called Plesco: and thereabouts is great store of flax, hemp, wax, honey; and that town is from Colmogro one hundred and twenty miles.

There is a place called Vologda, the commodities whereof are tallow, wax, and flax but not so great plenty as is in Gratanove. From Vologda to Colmogro there runneth a river called Duina, and from thence it falleth into the sea. Colmogro serveth Gratanove, Vologda, and the Mosco, with all the country thereabout, with salt and salt fish. From Vologda to Jeraslave is two hundred miles; which town is very great: the commodities thereof are hides, and tallow, and corn in great plenty, and some wax, but not so plentiful as in other places.

The Mosco is from Jeraslave two hundred miles. The country betwixt them is very well replenished with small villages, which are so well filled with people, that it is wonder to see them: the ground is well stored with corn, which they carry to the city of Mosco in such abundance, that it is wonder to see it. You shall meet in a morning seven or eight hundred sledges coming or going thither, that carry corn, and some carry fish. You shall have some that carry corn to the Mosco, and some that fetch corn from thence, that at the least dwell a thousand miles off; and all their carriage is on sledges. Those which come so far dwell in the north parts of the duke's dominions, where the cold will suffer no corn to grow, it is so extreme. They bring thither fishes, furs, and beasts' skins. In those parts they have but small store of cattle.

The Mosco itself is great: I take the whole town to be greater than London with the suburbs; but it is very rude, and standeth without all order. Their houses are all of timber, very dangerous for fire. There is a fair castle, the walls whereof are of brick,

and very high; they say they are eighteen feet thick, but I do not believe it, it doth not so seem, notwithstanding I do not certainly know it; for no stranger may come to view it. The one side is ditched, and on the other side runneth a river called Moscua, which runneth into Tartary, and so into the sea called Mare Caspium: and on the north side there is a base town, the which hath also a brick wall about it, and so it joineth with the castle wall. The emperor lieth in the castle, wherein are nine fair churches, and therein are religious men. Also there is a metropolitan, with divers bishops. I will not stand in description of their buildings, nor of the strength thereof, because we have better in all points in England. They be well furnished with ordinance of all sorts.

The emperor's or duke's house, neither in building, nor in the outward shew, nor yet within the house, is so sumptuous as I have seen. It is very low built in eight square, much like the old building of England, with small windows, and so in other points.

Now to declare my coming before his majesty: after I had remained twelve days, the secretary which hath the hearing of strangers did send for me, advertising me that the duke's pleasure was to have me to come before his majesty with the king's my master's letters; whereof I was right glad, and so I gave mine attendance. And when the duke was in his place appointed, the interpreter came for me into the outer chamber, where sat one hundred or more gentlemen, all in cloth of gold, very sumptuous, and from thence I came into the council chamber, where sat the duke himself with his nobles, which were a fair company: they sat round about the chamber on high, yet so that he himself sat much higher than any of his nobles, in a chair gilt, and in a long garment of beaten gold, with an imperial crown upon his head, and a staff of crystal and gold in his right hand, and his other hand half leaning on his chair. The chancellor stood up with the secretary before the duke. After my duty done, and my letter delivered, he bade me welcome, and inquired of me the health of the king my master; and I answered that he was in good health at my departure from his court, and that my trust was, that he was now in the same. Upon the which he bade me to dinner. The chancellor presented my present unto his grace bareheaded (for before they were all covered) and when his grace had received my letter, I was required to depart: for I had charge not to speak to the duke, but when he spake to me. So I departed unto the secretary's chamber, where I remained two hours, and then I was sent for again unto another palace, which is called the golden palace, but I saw no cause why it should be so called; for I have seen many fairer than it in all points: and so I came into the hall, which was small and not great, as is the king's majesty's of England, and the table was covered with a table-cloth; and the marshall sat at the end of the table with a little white rod in his hand, which board was full of vessels of gold: and on the other side of the hall did stand a fair cupboard of plate. From thence I came into the dining chamber, where the duke himself sat at his table without cloth of estate, in a gown of silver, with a crown imperial on his head; he sat in a chair somewhat high: there sat none near him by a great way. There were long tables set round about the chamber, which were full set with such as the duke had at dinner: they were all in white. Also the places where the tables stood were higher by two steps than the rest of the house. In the midst of the chamber stood a table or cupboard to set plate on; which stood full of cups of gold: and amongst all the rest there stood four marvellous great pots or crudences, as they call them, of gold and silver: I think they were a good yard and a half high. By the cupboard stood two gentlemen with napkins on their shoulders, and in their hands each of them had a cup of gold set with pearls and precious stones, which were the duke's own drinking-cups: when he was disposed, he drank them off at a draught. And for

his service at meat it came in without order, yet it was very rich service: for all were served in gold, not only he himself, but also all the rest of us, and it was very massy: the cups also were of gold, and very massy. The number that dined there that day was two hundred persons, and all were served in golden vessels. The gentlemen that waited were all in cloth of gold, and they served him with their caps on their heads. Before the service came in the duke sent to every man a great shiver of bread, and the bearer called the party so sent to by his name aloud, and said, John Basiliuich, emperor of Russia, and great duke of Moscovia, doth reward thee with bread: then must all men stand up, and do at all times when these words are spoken. And then last of all he giveth the marshall bread, whereof he eateth before the duke's grace, and so doth reverence and departeth. Then cometh the duke's service of the swans, all in pieces, and every one in a several dish: the which the duke sendeth as he did the bread, and the bearer saith the same words as he said before. And as I said before, the service of his meat is in no order, but cometh in dish by dish: and then after that the duke sendeth drink, with the like saying as before is told. Also before dinner he changed his crown, and in dinner time two crowns; so that I saw three several crowns upon his head in one day. And thus, when his service was all come in, he gave to every one of his gentlemen waiters meat with his own hand, and so likewise drink. His intent thereby is, as I have heard, that every man shall know perfectly his servants. Thus, when dinner is done, he calleth his nobles before him name by name, that it is wonder to hear how he could name them, having so many as he hath. Thus, when dinner was done, I departed to my lodging, which was an hour within night. I will leave this, and speak no more of him nor his household: but I will somewhat declare of his land and people, with their nature and power in the wars. This duke is lord and emperor of many countries, and his power is marvellous great; for he is able to bring into the field two or three hundred thousand men: he never goeth into the field himself with under two hundred thousand men: and when he goeth himself he furnisheth his borders all with men of war, which are no small number. He leaveth on the borders of Liefland forty thousand men, and upon the borders of Letto sixty thousand men, and toward the Nagayan Tartars sixty thousand, which is wonder to hear of: yet doth he never take to his wars neither husbandmen nor merchant. All his men are horsemen: he useth no footmen, but such as go with the ordinance and labourers, which are thirty thousand. The horsemen are all archers, with such bows as the Turks have, and they ride short as do the Turks. Their armour is a coat of plate, with a skull on their heads. Some of their coats are covered with velvet or cloth of gold; their desire is to be sumptuous in the field, and especially the nobles and gentlemen: as I have heard, their trimming is very costly, and partly I have seen it, or else I would scarcely have believed it: but the duke himself is richly attired above all measure; his pavilion is covered either with cloth of gold or silver, and so set with stones, that it is wonderful to see it. I have seen the king's majesty's of England, and the French king's pavilions, which are fair, yet not like unto his. And when they be sent into far or strange countries, or that strangers come to them, they be very gorgeous: else the duke himself goeth but meanly in apparel; and when he goeth betwixt one place and another, he is but reasonably apparelled over other times. In the while that I was in Mosco the duke sent two ambassadors to the king of Poland, which had at the least five hundred horses; their sumptuousness was above measure, not only in themselves, but also in their horses, as velvet, cloth of gold, and cloth of silver, set with pearls, and not scant. What shall I farther say? I never heard of nor saw men so sumptuous; but it is no daily guise, for when they have

not occasion, as I said before, all their doing is but mean. And now to the effect of their wars: they are men without all order in the field; for they run hurling on heaps, and for the most part they never give battle to their enemies; but that which they do, they do it all by stealth. But I believe they be such men for hard living as are not under the sun, for no cold will hurt them: yea, and though they lie in the field two months, at such time as it shall freeze more than a yard thick, the common soldier hath neither tent nor any thing else over his head; the most defence they have against the weather is a felt, which is set against the wind and weather, and when snow cometh he doth cast it off, and maketh him a fire, and layeth him down thereby. Thus do the most of all his men, except they be gentlemen, which have other provision of their own. Their lying in the field is not so strange as is their hardiness; for every man must carry and make provision for himself and his horse for a month or two, which is very wonderful. For he himself shall live upon water and oatmeal mingled together cold, and drink water thereto: his horse shall eat green wood, and such like baggage, and shall stand open in the cold field without covert, and yet will he labour and serve him right well. I pray you, among all our boasting warriors, how many should we find to endure the field with them but one month. I know no such region about us that beareth that name for man and beast. Now what might be made of these men, if they were trained and broken to order and knowledge of civil wars? If this prince had within his countries such men as could make them to understand the things aforesaid, I do believe that two of the best or greatest princes in Christendom were not well able to match with him, considering the greatness of his power and the hardiness of his people, and strait living both of people and horse, and the small charges which his wars stand him in; for he giveth no wages except to strangers. They have a yearly stipend, and not much. As for his own countrymen, every one serveth of his own proper costs and charges, saving that he giveth to his arcubussiers certain allowance for powder and shot, or else no man in all his country hath one penny wages. But if any man hath done very good service, he giveth him a farm or a piece of land; for the which he is bound at all times to be ready with so many men as the duke shall appoint; who considereth in his mind what that land or farm is well able to find: and so many shall he be bound to furnish at all and every such time as wars are holden in any of the duke's dominions. For there is no man of living but he is bound likewise, whether the duke call for either soldier or labourer, to furnish them, with all such necessaries as to them belong.

Also, if any gentleman or man of living do die without issue male, immediately after his death the duke entereth his land, notwithstanding he have never so many daughters, and peradventure giveth it forthwith to another man, except a small portion that he spareth to marry the daughters withal. Also, if there be a rich man, a fermour, or man of living, which is stricken in age, or by chance is maimed, and be not able to do the duke's service, some other gentleman that is not able to live, and more able to do service, will come to the duke and complain, saying, your grace hath such an one, which is unmeet to do service to your highness, who hath great abundance of wealth, and likewise your grace hath many gentlemen which are poor, and lack living, and we that lack are well able to do good service, your grace might do well to look upon him, and make him to help those that want. Immediately the duke sendeth forth to inquire of his wealth; and if it be so proved, he shall be called before the duke, and it shall be said unto him, friend, you have too much living, and are unserviceable to your prince; less will serve you, and the rest will serve other men that are more able to serve; whereupon immediately his living shall be taken away from him, saving a little

to find himself and his wife on, and he may not once repine thereat: but for answer he will say, that he hath nothing, but it is God's and the duke's grace's, and cannot say, as we the common people in England say, if we have any thing, that it is God's and our own. Men may say that these men are in wonderful great awe, and obedience, that thus one must give and grant his goods, which he hath been scraping and scratching for all his life, to be at his prince's pleasure and commandment. Oh that our sturdy rebels were had in the like subjection to know their duty towards their princes. They may not say, as some knaves in England say, I would find the queen a man to serve in my place, or make his friends tarry at home, if money have the upper hand. No, no, it is not so in this country: for he shall make humble suit to serve the duke. And whom he sendeth most to the wars, he thinketh he is most in his favour: and yet, as I before have said, he giveth no wages. If they knew their strength, no man were able to make match with them: nor they that dwell near them should have any rest of them. But I think it is not God's will: for I may compare them to a young horse that knoweth not his strength, whom a little child ruleth and guideth with a bridle, for all his great strength: for if he did, neither child nor man could rule him. Their wars are holden against the Crimme Tartarians and the Nagaians.

I will stand no longer in the rehearsal of their power and wars. For it were too tedious to the reader. But I will in part declare their laws and punishments, and the execution of justice. And first, I will begin with the commons of the country, which the gentlemen have rule on: and that is, that every gentleman hath rule and justice upon his own tenants. And if it so fall out that two gentlemen's servants or tenants do disagree, the two gentlemen examine the matter, and have the parties before them, and so give the sentence. And yet cannot they make the end betwixt them of the controversy, but either of the gentlemen must bring his servant or tenant before the high judge or justice of that country, and there present them, and declare the matter and case. The plaintiff saith, I require the law; which is granted: then cometh an officer and arresteth the party defendant, and useth him contrary to the laws of England. For when they attach any man, they beat him about the legs, until such time as he findeth sureties to answer the matter: and if not, his hands and neck are bound together, and he is led about the town, and beaten about the legs, with other extreme punishments, till he come to his answer: and the justice demandeth, if it be for debt, and saith: owest thou this man any such debt? He will, perhaps, say nay. Then saith the judge: art thou able to deny it? Let us hear how. By oath, saith the defendant. Then he commandeth to leave beating him, till further trial be had.

Their order in one point is commendable. They have no man of law to plead their causes in any court; but every man pleadeth his own cause, and giveth bill and answer in writing, contrary to the order in England. The complaint is in manner of a supplication, and made to the duke's grace; and delivered him into his own hand, requiring to have justice, as in his complaint is alleged.

The duke giveth sentence himself upon all matters in the law: which is very commendable, that such a prince will take pains to see ministration of justice. Yet notwithstanding it is wonderfully abused; and thereby the duke is much deceived. But if it fall out that the officers be espied in cloaking the truth, they have most condign punishment. And if the plaintiff can nothing prove, then the defendant must take his oath upon the crucifix whether he be in the right or no. Then is demanded if the plaintiff be any thing able farther to make proof: if he be not, then sometimes he will say, I am able to prove it by my body and hands, or by my champions's body, so re-

quiring the camp. After the other hath his oath, it is granted as well to the one as to the other. So when they go to the field they swear upon the crucifix, that they be both in the right, and that the one shall make the other to confess the truth before they depart forth of the field: and so they go both to the battle, armed with such weapons as they use in that country: they fight all on foot, and seldom the parties themselves do fight, except they be gentlemen. For they stand much upon their reputation, for they will not fight, but with such as are come of as good an house as themselves. So that if either party require the combat, it is granted unto them, and no champion is to serve in their room: wherein is no deceit: but otherwise by champions there is. For although they take great oaths upon them to do the battle truly, yet is the contrary often seen: because the common champions have none other living. And as soon as the one party hath gotten the victory, he demandeth the debt, and the other is carried to prison, and there is shamefully used till he take order. There is also another order in the law, that the plaintiff may swear in some causes of debt. And if the party defendant be poor, he shall be set under the crucifix. and the party plaintiff must swear over his head; and when he hath taken his oath, the duke taketh the party defendant home to his house, and useth him as his bondman, and putteth him to labour, or letteth him for hire to any such as need him, until such time as his friends make provision for his redemption: or else he remaineth in bondage all the days of his life. Again, there are many that will sell themselves to gentlemen or merchants, to be their bondmen, to have, during their life, meat, drink, and cloth, and at their coming to have a piece of money. Yea, and some will sell their wives and children to be bawds and drudges to the buyer. Also they have a law for felons and pickers, contrary to the laws of England. For by their law they can hang no man for his first offence; but may keep him long in prison, and oftentimes beat him with whips and other punishment: and there he shall remain until his friends be able to bail him. If he be a picker, or a cut-purse, as there be very many, the second time he is taken he hath a piece of his nose cut off, and is burned in the forehead, and kept in prison till he find sureties for his good behaviour. And if he be taken the third time, he is hanged. And at the first time he is extremely punished, and not released except he have very good friends, or that some gentleman require to have him to the wars: and in so doing he shall enter into great bonds for him: by which means the country is brought into good quietness. But they be naturally given to great deceit, except extreme beating did bridle them. They be naturally given to hard living, as well in fare as in lodging. I heard a Russian say, that it was a great deal merrier living in prison than forth, but for the great beating. For they have meat and drink without any labour, and get the charity of well-disposed people: but being at liberty they get nothing. The poor is very innumerable, and live most miserably: for I have seen them eat the pickle of herring and other stinking fish; nor the fish cannot be so stinking nor rotten, but they will eat it, and praise it to be more wholesome than other fish or fresh meat. In mine opinion there be no such people under the sun for their hardness of living. Well, I will leave them in this point, and will in part declare their religion. They do observe the law of the Greeks with such excess of superstition, as the like hath not been heard of. They have no graven images in their churches, but all painted, to the intent they will not break the commandment: but to their painted images they use such idolatry, that the like was never heard of in England. They will neither worship nor honour any image that is made forth of their own country. For their own images (say they) have pictures to declare what they be, and how they be of God, and so be not ours. They

say, look how the painter or carver hath made them, so we do worship them; and they worship none before they be christened. They say we be but half christians: because we observe not part of the old law with the Turks. Therefore they call themselves more holy than us. They have none other learning but their mother tongue, nor will suffer no other in their country among them. All their service in churches is in their mother tongue. They have the Old and New Testament, which are daily read among them: and yet their superstition is no less. For when the priests do read, they have such tricks in their reading, that no man can understand them, nor no man giveth ear to them. For all the while the priest readeth, the people sit down, and talk one with another. But when the priest is at service no man sitteth, but gaggle and duck like so many geese. And as for their prayers, they have but little skill, but use to say *As bodi pomele:* as much to say, Lord have mercy upon me. For the tenth man within the land cannot say the Pater Noster. And as for the creed, no man may be so bold as to meddle therewith but in the church: for they say it should not be spoken of but in the churches. Speak to them of the commandments, and they will say they were given to Moses in the law which Christ hath now abrogated by his precious death and passion; therefore (say they) we observe little or none thereof. And I do believe them. For if they were examined of their law and commandments together, they should agree but in few points. They have the sacrament of the Lord's Supper, in both kinds, and more ceremonies than we have. They present them in a dish in both kinds together, and carry them round about the church upon the priest's head, and so do minister at all such times as any shall require. They be great offerers of candles, and sometimes of money, which we call in England, Soul-pence, with more ceremonies than I am able to declare. They have four Lents in the year, whereof our Lent is the greatest. Look, as we do begin on the Wednesday, so they do on the Monday before, and the week before that they call the Butter-week; and in that week they eat nothing but butter and milk. Howbeit, I believe there be in no other country the like people for drunkenness. The next Lent is called Saint Peter's Lent, and beginneth always the Monday next after Trinity Sunday, and endeth on Saint Peter's even. If they should break that fast, their belief is, that they should not come in at Heaven gates. And when any of them die, they have a testimonial with them in the coffin, that when the soul cometh to Heaven gates it may deliver the same to Saint Peter, which declareth that the party is a true and holy Russian. The third Lent beginneth fifteen days before the later Lady-day, and endeth on our Lady-even. The fourth Lent beginneth on Saint Martin's-day, and endeth on Christmas-even: which Lent is fasted for Saint Philip, Saint Peter, Saint Nicholas, and Saint Clement. For they four be the principal and greatest saints in that country. In these Lents they eat neither butter, eggs, milk, nor cheese; but they are very straitly kept with fish, cabbages, and roots. And out of their Lents they observe truly the Wednesdays and Fridays throughout the year; and on the Saturday they do eat flesh. Furthermore, they have a great number of religious men; which are black monks, and they eat no flesh throughout the year, but fish, milk, and butter. By their order they should eat no fresh fish, and in their Lents they eat nothing but coleworts, cabbages, salt cucumbers, with other roots, as radish and such like. Their drink is like our penny ale, and is called *quass.* They have service daily in their churches, and use to go to service two hours before day, and that is ended by daylight. At nine of the clock they go to mass: that ended, to dinner; and after that to service again; and then to supper: you shall understand that at every dinner and

supper they have declared the exposition of the Gospel that day: but how they wrest and twine the Scripture and that together by report it is wonderful. As for whoredom and drunkenness there be none such living; and for extortion they be the most abominable under the sun. Now judge of their holiness. They have twice as much land as the duke himself hath: but yet he is reasonable even with them, as thus: when they take bribes of any of the poor and simple, he hath it by an order; when the abbot of any of their houses dieth, then the duke hath all his goods, moveable and immoveable; so that the successor buyeth all at the duke's hands: and by this mean they be the best fermours the duke hath. Thus with their religion I make an end, trusting hereafter to know it better.

To the right worshipful and my singular good uncle, Master Christopher Frothingham, give these.

Sir, read and correct;
For great is the defect.

THE TESTIMONY OF M. RICHARD EDEN, IN HIS DECADES, CONCERNING THE BOOK FOLLOWING.

And whereas (saith he) I have before made mention how Moscovy was in our time discovered by Richard Chancelor, in his voyage toward Cathay, by the direction and information of M. Sebastian Cabota, who long before had this secret in his mind; I shall not need here to describe that voyage, forasmuch as the same is largely and faithfully written in the Latin tongue, by that learned young man Clement Adams, schoolmaster to the queen's henshmen, as he received it at the mouth of the said Richard Chancelor.

The new navigation and discovery of the kingdom of Moscovia, by the north-east, in the year 1553*: enterprised by sir Hugh Willoughby, knight, and performed by Richard Chancelor, pilot-major of the voyage: written in Latin by Clement Adams.*

At what time our merchants perceived the commodities and wares of England to be in small request with the countries and people about us, and near unto us, and that those merchandises which strangers in the time and memory of our ancestors did earnestly seek and desire were now neglected, and the price thereof abated, although by us carried to their own ports, and all foreign merchandises in great account, and their prices wonderfully raised; certain grave citizens of London, and men of great wisdom, and careful for the good of their country, began to think with themselves, how this mischief might be remedied. Neither was a remedy (as it then appeared) wanting to their desires, for the avoiding of so great an inconvenience: for seeing that the wealth of the Spaniards and Portingales, by the discovery and search of new trades and countries, was marvellously increased, supposing the same to be a course and mean for them also to obtain the like, they thereupon resolved upon a new and strange navigation. And whereas at the same time one Sebastian Cabota, a man in those days very renowned, happened to be in London, they began first of all to deal and consult diligently with him, and after much speech and conference together, it was at last concluded that three ships should be prepared and furnished out, for the search and discovery of the northern part of the world, to open a way and passage to our men for travel to new and unknown kingdoms.

And whereas many things seemed necessary to be regarded in this so hard and difficult a matter, they first made choice of certain grave and wise persons in manner of a senate or company, which should lay their heads together and give their judgments, and provide things requisite and profitable for all occasions: by this company it was thought expedient, that a certain sum of money should publicly be collected, to serve for the furnishing of so many ships. And lest any private man should be too much oppressed and charged, a course was taken, that every man willing to be of the society should disburse the portion of twenty and five pounds a-piece: so that in short time, by this means, the sum of six thousand pounds being gathered, the three ships were bought, the most part whereof they provided to be newly built and trimmed. But in this action, I know not whether I may more admire the care of the merchants, or the diligence of the shipwrights: for the merchants, they get very strong and well-seasoned planks for the building; the shipwrights, they with daily travail, and their greatest skill, do fit them for the dispatch of the ships: they calk them, pitch them, and among the rest they make one most staunch and firm, by an excellent and ingenious invention. For they had heard that in certain parts of the ocean a kind of worms is bred, which many times pierceth and eateth through the strongest oak that is: and therefore, that the mariners and the rest to be employed in this voyage might be free and safe from this danger, they cover a piece of the keel of the ship with thin sheets of lead: and having thus built the ships, and furnished them with armour and artillery, then followed a second care no less troublesome and necessary than the former, namely, the provision of victuals, which was to be made according to the time and length of the voyage. And whereas they afore determined to have the east part of the world sailed unto, and yet that the sea towards the same was not open, except they kept the northern tract, whereas yet it was doubtful whether there were any passage yea or no, they resolved to victual the ships for eighteen months; which they did for this reason. For our men being to pass that huge and cold part of the world, they wisely foreseeing it, allow them six months victual to sail to the place, so much more to remain there if the extremity of the winter hindered their return, and so much more also for the time of their coming home.

Now this provision being made and carried aboard, with armour and munition of all sorts, sufficient captains and governors of so great an enterprise were as yet wanting; to which office and place, although many men (and some void of experience) offered themselves, yet one sir Hugh Willoughby, a most valiant gentleman, and well born, very earnestly requested to have that care and charge committed unto him: of whom before all others, both by reason of his goodly personage (for he was of a tall stature) as also for his singular skill in the services of war, the company of the merchants made greatest accompt: so that at the last they concluded, and made choice of him for the general of this voyage, and appointed to him the admiral, with authority and command over all the rest. And for the government of other ships, although divers men seemed willing, and made offers of themselves thereunto, yet by a common consent one Richard Chancelor, a man of great estimation for many good parts of wit in him, was elected, in whom alone great hope for the performance of this business rested. This man was brought up by one Master Henry Sydney, a noble young gentleman, and very much beloved of king Edward, who at this time coming to the place where the merchants were gathered together, began a very eloquent speech or oration, and spake to them after this manner following:

"My very worshipful friends, I cannot but greatly commend your present godly and virtuous intention, in the serious enterprising (for the singular love you bear to your country) a matter, which (I hope) will prove profitable for this nation, and honourable to this our land. Which intention of yours we also of the nobility are ready to our power to help and further; neither do we hold any thing so dear and precious unto us, which we will not willingly forego, and lay out in so commendable a cause. But principally I rejoice in myself, that I have nourished and maintained that wit, which is like by some means and in some measure to profit and steed you in this worthy action. But yet I would not have you ignorant of this one thing, that I do now part with Chancelor, not because I make little reckoning of the man, or that his maintenance is burdenous and chargeable unto me, but that you might conceive and understand my good will and promptitude for the furtherance of this business, and that the authority and estimation which he deserveth may be given him. You know the man by report, I by experience; you by words, I by deeds; you by speech and company, but I, by the daily trial of his life, have a full and perfect knowledge of him. And you are also to remember, into how many perils for your sakes, and his country's love, he is now to run: whereof it is requisite that we be not unmindful, if it please God to send him good success. We commit a little money to the chance and hazard of fortune: he commits his life (a thing to a man of all things the most dear) to the raging sea, and the uncertainties of many dangers. We shall here live and rest at home quietly with our friends, and acquaintance: but he in the mean time labouring to keep the ignorant and unruly mariners in good order and obedience, with how many cares shall he trouble and vex himself? with how many troubles shall he break himself? and how many disquietings shall he be forced to sustain? We shall keep our own coasts and country: he shall seek strange and unknown kingdoms. He shall commit his safety to barbarous and cruel people, and shall hazard his life amongst the monstrous and terrible beasts of the sea. Wherefore, in respect of the greatness of the dangers, and the excellency of his charge, you are to favour and love the man thus departing from us: and if it fall so happily out that he return again, it is your part and duty also liberally to reward him."

After that this noble young gentleman had delivered this, or some such like speech, much more eloquently than I can possibly report it, the company then present began one to look upon another, one to question and confer with another: and some (to whom the virtue and sufficiency of the man was known) began secretly to rejoice with themselves; and to conceive a special hope, that the man would prove in time very rare and excellent, and that his virtues, already appearing and shining to the world, would grow, to the great honour and advancement of this kingdom.

After all this, the company growing to some silence, it seemed good to them that were of greatest gravity amongst them, to inquire, search, and seek what might be learned and known concerning the easterly part or tract of the world. For which cause two Tartarians, which were then of the king's stable, were sent for, and an interpreter was gotten to be present, by whom they were demanded touching their country, and the manners of their nation. But they were able to answer nothing to the purpose; being indeed more acquainted (as one there merrily and openly said) to toss pots, than to learn the states and dispositions of people. But after much ado, and many things passed about this matter, they grew at last to this issue, to set down and appoint a time for the departure of the ships: because divers were of opinion, that a great part of the best time of the year was already spent, and if the delay grew longer, the way

would be stopped and barred by the force of the ice, and the cold climate: and therefore it was thought best by the opinion of them all, that by the tenth day of May, the captains and mariners should take shipping, and depart from Ratcliffe upon the ebbe, if it pleased God. They having saluted their acquaintance, one his wife, another his children, another his kinsfolks, and another his friends dearer than his kinsfolks, were present, and ready at the day appointed: and having weighed anchor, they departed with the turning of the water, and sailing easily, came first to Greenwich. The greater ships are towed down with boats, and oars, and the mariners being all apparelled in watchet or sky-coloured cloth, rowed amain, and made away with diligence. And being come near to Greenwich (where the court then lay) presently, on the news thereof, the courtiers came running out, and the common people flocked together, standing very thick upon the shore; the privy council they looked out at the windows of the court, and the rest ran up to the tops of the towers: the ships hereupon discharge their ordnance, and shoot off their pieces after the manner of war, and of the sea, insomuch that the tops of the hills sounded therewith, the vallies and the waters gave an echo, and the mariners they shouted in such sort that the sky rang again with the noise thereof. One stood in the poop of the ship, and by his gesture bids farewell to his friends in the best manner he could. Another walks upon the hatches, another climbs the shrouds, another stands upon the main yard, and another in the top of the ship. To be short, it was a very triumph (after a sort) in all respects to the beholders. But (alas!) the good king Edward (in respect of whom, principally, all this was prepared) he only by reason of his sickness was absent from this shew, and not long after the departure of these ships, the lamentable and most sorrowful accident of his death followed.

But to proceed in the matter.

The ships going down with the tide, came at last to Woolwich, where they stayed and cast anchor, with purpose to depart therehence again as soon as the turning of the water and a better wind should draw them to set sail. After this they departed and came to Harwich, in which port they staid long, not without great loss and consuming of time: yet at the last with a good wind they hoisted up sail, and committed themselves to the sea, giving their last adieu to their native country, which they knew not whether they should ever return to see again or not. Many of them looked oftentimes back, and could not refrain from tears, considering into what hazards they were to fall, and what uncertainties of the sea they were to make trial of.

Amongst the rest, Richard Chancelor, the captain of the Edward Bonaventure, was not a little grieved with the fear of wanting victuals, part whereof was found to be corrupt and putrified at Harwich, and the hogsheads of wine also leaked, and were not staunch: his natural and fatherly affection also somewhat troubled him; for he left behind him his two little sons, which were in the case of orphans if he sped not well; the estate also of his company moved him to care, being in the former respects after a sort unhappy, and were to abide with himself every good or bad accident: but in the mean time, while his mind was thus tormented with the multiplicity of sorrows and cares, after many days sailing, they kenned land afar off, whereunto the pilot directed the ships; and being come to it, they land, and find it to be Rost Island, where they stayed certain days, and afterwards set sail again, and proceeding towards the north, they espied certain other islands, which were called the Cross-of-Islands. From which places when they were a little departed, sir Hugh Willoughby the general, a man of good foresight and providence in all his actions, erected and

set out his flag, by which he called together the chiefest men of the other ships, that by the help and assistance of their counsels, the order of the government and the conduction of the ships in the whole voyage might be the better: who being come together accordingly, they conclude and agree, that if any great tempest should arise at any time, and happen to disperse and scatter them, every ship should endeavour his best to go to Wardhouse, a haven or castle of some name in the kingdom of Norway, and that they that arrived there first in safety should stay, and expect the coming of the rest.

The very same day in the afternoon, about four of the clock, so great a tempest suddenly arose, and the seas were so outrageous, that the ships could not keep their intended course, but some were per force driven one way, and some another way, to their great peril and hazard: the general with his loudest voice cried out to Richard Chancelor, and earnestly requested him not to go far from him; but he neither would nor could keep company with him, if he sailed still so fast: for the admiral was of better sail than his ship. But the said admiral (I know not by what means) bearing all his sails, was carried away with so great force and swiftness, that not long after he was quite out of sight, and the third ship also with the same storm and like rage was dispersed and lost us.

The ship boat of the admiral (striking against the ship) was overwhelmed in the sight and view of the mariners of the Bonaventure: and as for them that are already returned and arrived, they know nothing of the rest of the ships what was become of them.

But if it be so, that any miserable mishap have overtaken them, if the rage and fury of the sea have devoured those good men, or if as yet they live, and wander up and down in strange countries, I must needs say they were men worthy of better fortune, and if they be living, let us wish them safety and a good return: but if the cruelty of death hath taken hold of them, God send them a christian grave and sepulchre.

Now Richard Chancelor, with his ship and company, being thus left alone, and become very pensive, heavy, and sorrowful, by this dispersion of the fleet, he (according to the order before taken) shapeth his course for Wardhouse in Norway, there to expect and abide the arrival of the rest of the ships. And being come thither, and having staid there the space of seven days, and looked in vain for their coming, he determined at length to proceed alone in the purposed voyage. And as he was preparing himself to depart, it happened that he fell in company and speech with certain Scottishmen; who having understanding of his intention, and wishing well to his actions, began earnestly to dissuade him from the further prosecution of the discovery, by amplifying the dangers which he was to fall into, and omitted no reason that might serve to that purpose. But he holding nothing so ignominious and reproachful, as inconstancy and levity of mind, and persuading himself that a man of valour could not commit a more dishonourable part, than for fear of danger to avoid and shun great attempts, was nothing at all changed or discouraged with the speeches and words of the Scots, remaining stedfast and immutable in his first resolution; determining either to bring that to pass which was intended, or else to die the death.

And as for them which were with Master Chancelor in his ship, although they had great cause of discomfort by the loss of their company (whom the foresaid tempest had separated from them) and were not a little troubled with cogitations and perturbations of mind, in respect of their doubtful course; yet notwithstanding they were of such

consent and agreement of mind with Master Chancelor, that they were resolute, and prepared, under his direction and government, to make proof and trial of all adventures, without all fear or mistrust of future dangers. Which constancy of mind in all the company did exceedingly increase their captain's carefulness; for he being swallowed up with like good will and love towards them, feared, lest through any error of his, the safety of the company should be endangered. To conclude, when they saw their desire and hope of the arrival of the rest of the ships to be every day more and more frustrated, they provided to sea again, and Master Chancelor held on his course towards that unknown part of the world, and sailed so far, that he came at last to the place where he found no night at all, but a continual light and brightness of the sun shining clearly upon the huge and mighty sea. And having the benefit of this perpetual light for certain days, at the length it pleased God to bring them into a certain great bay, which was of one hundred miles or thereabouts over. Whereinto they entered, and somewhat far within it cast anchor, and looking every way about them, it happened that they espied afar off a certain fisher boat, which Master Chancelor, accompanied with a few of his men, went towards, to commune with the fishermen that were in it, and to know of them what country it was, and what people, and of what manner of living they were: but they being amazed with the strange greatness of his ship (for in those parts before that time they had never seen the like) began presently to avoid and to flee: but he still following them, at last overtook them, and being come to them, they (being in great fear, as men half-dead) prostrated themselves before him, offering to kiss his feet: but he (according to his great and singular courtesy) looked pleasantly upon them, comforting them by signs and gestures, refusing those duties and reverences of theirs, and taking them up in all loving sort from the ground. And it is strange to consider how much favour afterwards in that place this humanity of his did purchase to himself. For they being dismissed, spread by and by a report abroad of the arrival of a strange nation, of a singular gentleness and courtesy: whereupon the common people came together, offering to these new come guests victuals freely, and not refusing to traffic with them; except they had been bound by a certain religious use and custom not to buy any foreign commodities, without the knowledge and consent of the king.

By this time our men had learned that this country was called Russia or Moscovy, and that Juan Vasiliwich (which was at that time their king's name) ruled and governed far and wide in those places. And the barbarous Russes asked likewise of our men, whence they were, and what they came for: whereunto answer was made, that they were Englishmen sent into those coasts, from the most excellent king Edward the Sixth, having from him in commandment, certain things to deliver to their king, and seeking nothing else but his amity and friendship, and traffic with his people, whereby they doubted not, but that great commodity and profit would grow to the subjects of both kingdoms.

The barbarians heard these things very gladly, and promised their aid and furtherance to acquaint their king out of hand with so honest and a reasonable request.

In the mean time Master Chancelor entreated victuals for his money of the governor of that place (who together with others came aboard him) and required hostages of them likewise for the more assurance of safety to himself and his company. To whom the governors answered, that they knew not in that case the will of their king, but yet were willing in such things as they might lawfully do to pleasure him: which was as then to afford him the benefit of victuals.

Now while these things were a doing, they secretly sent a messenger unto the emperor, to certify him of the arrival of a strange nation, and withal to know his pleasure concerning them. Which message was very welcome unto him, insomuch that voluntarily he invited them to come to his court. But if by reason of the tediousness of so long a journey, they thought it not best so to do, then he granted liberty to his subjects to bargain, and to traffic with them: and further promised, that if it would please them to come to him, he himself would bear the whole charges of post horses. In the meantime the governors of the place deferred the matter from day to day, pretending divers excuses, and saying one while, that the consent of all the governors, and another while, that the great and weighty affairs of the kingdom compelled them to defer their answer: and this they did of purpose, so long to protract the time, until the messenger (sent before to the king) did return with relation of his will and pleasure.

But Master Chancelor (seeing himself held in this suspense with long and vain expectation, and thinking that of intention to delude him they posted the matter off so often) was very instant with them to perform their promise; which if they would not do, he told them that he would depart, and proceed in his voyage. So that the Moscovites (although as yet they knew not the mind of their king) yet fearing the departure indeed of our men, who had such wares and commodities as they greatly desired, they at last resolved to furnish our people with all things necessary, and conduct them by land to the presence of their king. And so Master Chancelor began his journey, which was very long, and most troublesome, wherein he had the use of certain sleds, which in that country are very common, for they are carried themselves upon sleds, and all their carriages are in the same sort, the people almost not knowing any other manner of carriage, the cause whereof is the exceeding hardness of the ground congealed in the winter time by the force of the cold, which in those places is very extreme and horrible, whereof hereafter we will say something.

But now they having passed the greater part of their journey, met at last with the sleddeman (of whom I spake before) sent to the king secretly from the justices or governors, who by some ill hap had lost his way, and had gone to the sea side, which is near to the country of the Tartars, thinking there to have found our ship. But having long erred and wandered out of his way, at the last, in his direct return, he met (as he was coming) our captain on the way. To whom he by and by delivered the emperor's letters, which were written to him with all courtesy and in the most loving manner that could be: wherein express commandment was given, that post horses should be gotten for him and the rest of his company without any money. Which thing was of all the Russes in the rest of their journey so willingly done, that they began to quarrel, yea, and to fight also, in striving and contending which of them should put their post horses to the sledde: so that after much ado and great pains taken in this long and weary journey, (for they had travelled very near fifteen hundred miles) Master Chancelor came at last to Mosco, the chief city of the kingdom, and the seat of the king: of which city, and of the emperor himself, and of the principal cities of Moscovy, we will speak immediately more at large in this discourse.

OF MOSCOVY, WHICH IS ALSO CALLED RUSSIA.

Moscovy, which hath the name also of Russia the White, is a very large and spacious country, every way bounded with divers nations. Towards the south and the east, it is compassed with Tartaria: the northern side of it stretcheth to the Scythian ocean:

upon the west part border the Lappians, a rude and savage nation, living in woods, whose language is not known to any other people: next unto these, more towards the south, is Swecia, then Finlandia, then Livonia, and last of all Lituania. This country of Moscovy hath also very many and great rivers in it, and is marish ground in many places: and as for the rivers, the greatest and most famous amongst all the rest, is that, which the Russes in their own tongue call Volga; but others know it by the name of Rha. Next unto it in fame is Tanais, which they call Don, and the third Boristhenes, which at this day they call Neper. Two of these, to wit, Rha and Boristhenes, issuing both out of one fountain, run very far through the land: Rha receiving many other pleasant rivers into it, and running from the very head or spring of it towards the east, after many crooked turnings and windings, dischargeth itself, and all the other waters and rivers that fall into it by divers passages, into the Caspian Sea. Tanais, springing from a fountain of great name in those parts, and growing great near to his head, spreads itself at length very largely, and makes a great lake: and then growing narrow again, doth so run for certain miles, until it falleth into another lake, which they call Juan: and therehence fetching a very crooked course, comes very near to the river Volga: but disdaining as it were the company of any other river, doth there turn itself again from Volga, and runs towards the south, and falls at last into the lake of Mæotis. Boristhenes, which comes from the same head that Rha doth (as we said before) carrieth both itself, and other waters that are near unto it, towards the South, not refusing the mixture of other small rivers; and running by many great and large countries falls at last into Pontus Euxinus. Besides these rivers, are also in Moscovy certain lakes and pools, the lakes breed fish by the celestial influence: and amongst them all, the chiefest and most principal is called Bealozera, which is very famous by reason of a very strong town built in it, wherein the kings of Moscovy reserve and repose their treasure in all time of war and danger.

Touching the Rhiphean mountains, whereupon the snow lieth continually, and where hence in times past it was thought that Tanais the river did spring, and that the rest of the wonders of nature, which the Grecians feigned and invented of old, were there to be seen: our men which lately came from thence, neither saw them nor yet have brought home any perfect relation of them, although they remained there for the space of three months, and had gotten in that time some intelligence of the language of Moscovy. The whole country is plain and champion, and few hills in it: and towards the north hath very large and spacious woods, wherein is great store of fir trees, a wood very necessary, and fit for the building of houses: there are also wild beasts bred in those woods, as buffes, bears, and black wolves, and another kind of beast unknown to us, but called by them Rossomakka; and the nature of the same is very rare and wonderful: for when it is great with young, and ready to bring forth, it seeketh out some narrow place between two stakes, and so going through them, presseth itself, and by that means is eased of her burden, which otherwise could not be done. They hunt their buffes for the most part a horseback, but their bears afoot, with wooden forks. The north parts of the country are reported to be so cold, that the very ice or water which distilleth out of the moist wood which they lay upon the fire is presently congealed and frozen: the diversity groweth suddenly to be so great, that in one and the self same firebrand a man shall see both fire and ice. When the winter doth once begin there, it doth still more and more increase by a perpetuity of cold: neither doth that cold slack, until the force of the sun beams doth dissolve the cold, and make glad the earth, returning to it again. Our mariners which we left in the ship in

the mean time to keep it, in their going up only from their cabins to the hatches, had their breath oftentimes so suddenly taken away, that they often fell down as men very near dead, so great is the sharpness of that cold climate: but as for the south parts of the country, they are somewhat more temperate.

OF MOSCO, THE CHIEF CITY OF THE KINGDOM, AND OF THE EMPEROR THEREOF.

It remaineth that a larger discourse be made of Mosco, the principal city of that country, and of the prince also, as before we have promised. The empire and government of the king is very large, and his wealth at this time exceeding great. And because the city of Mosco is the chiefest of all the rest, it seemeth of itself to challenge the first place in this discourse. Our men say, that in bigness it is as great as the city of London with the suburbs thereof. There are many and great buildings in it, but for beauty and fairness nothing comparable to ours. There are many towns and villages also, but built out of order, and with no handsomeness: their streets and ways are not paved with stone as ours are: the walls of their houses are of wood: the roofs for the most part are covered with shingle boards. There is hard by the city a very fair castle, strong, and furnished with artillery, whereunto the city is joined directly towards the north with a brick wall: the walls also of the castle are built with brick, and are in breadth or thickness eighteen feet. This castle hath on the one side a dry ditch, on the other side the river Moscua, whereby it is made almost inexpugnable. The same Moscua trending towards the east doth admit into it the company of the river Occa.

In the castle aforesaid, there are in number nine churches, or chaples, not altogether unhandsome, which are used and kept by certain religious men, over whom there is, after a sort, a patriarch or governor, and with him other reverend fathers, all which for the greater part dwell within the castle. As for the king's court and palace, it is not of the neatest, only in form it is four square, and of low building, much surpassed and excelled by the beauty and elegance of the houses of the kings of England. The windows are very narrowly built, and some of them by glass, some other by lattices, admit the light: and whereas the palaces of our princes are decked and adorned with hangings of cloth of gold, there is none such there: they build and join to all their walls benches, and that not only in the court of the emperor, but in all private men's houses.

Now after that they had remained about twelve days in the city, there was then a messenger sent unto them, to bring them to the king's house: and they being after a sort wearied with their long stay, were very ready and willing so to do: and being entered within the gates of the court, there sat a very honourable company of courtiers, to the number of one hundred, all apparelled in cloth of gold, down to their ancles: and there hence being conducted into the chamber of presence, our men began to wonder at the majesty of the emperor: his seat was aloft, in a very royal throne, having on his head a diadem, or crown of gold, apparelled with a robe all of goldsmith's work, and in his hand he held a sceptre garnished and beset with precious stones: and besides all other notes and appearances of honour, there was a majesty in his countenance proportionable with the excellency of his estate: on the one side of him stood his chief secretary, on the other side the great commander of silence, both of them arrayed also in cloth of gold; and then there sat the council of one hundred and fifty in number, all in like sort arrayed, and of great state. This so honourable an assembly, so great a majesty of the emperor, and of the place, might very well have amazed our men, and

have dashed them out of countenance: but notwithstanding Master Chancelor, being therewithal nothing dismayed, saluted, and did his duty to the emperor, after the manner of England, and withal delivered unto him the letters of our king, Edward the Sixth. The emperor having taken, and read the letters, began a little to question with them, and to ask them of the welfare of our king: whereunto our men answered him directly, and in few words: hereupon our men presented something to the emperor, by the chief secretary, which, at the delivery of it, put off his hat, being afore all the time covered: and so the emperor having invited them to dinner, dismissed them from his presence: and going into the chamber of him that was master of the requests to the emperor, and having staid there the space of two hours, at the last the messenger cometh, and calleth them to dinner: they go, and being conducted into the golden court (for so they call it, although not very fair) they find the emperor sitting upon an high and stately seat, apparelled with a robe of silver, and with another diadem on his head: our men being placed over against him, sit down: in the midst of the room stood a mighty cupboard upon a square foot, whereupon stood also a round board, in manner of a diamond, broad beneath, and towards the top narrow, and every step rose up more narrow than another. Upon this cupboard was placed the emperor's plate, which was so much, that the very cupboard itself was scant able to sustain the weight of it: the better part of all the vessels, and goblets, was made of very fine gold: and among the rest, there were four pots of very large bigness, which did adorn the rest of the plate in great measure: for they were so high, that they thought them at the least five feet long. There were also upon this cupboard certain silver casks, not much differing from the quantity of our firkins, wherein was reserved the emperor's drink: on each side of the hall stood four tables, each of them laid and covered with very clean table cloths, whereunto the company ascended by three steps or degrees: all which were filled with the assembly present: the guests were all apparelled with linen without, and with rich skins within, and so did notably set out this royal feast. The emperor, when he takes any bread or knife in his hand, doth first of all cross himself upon his forehead: they that are in special favour with the emperor sit upon the same bench with him, but somewhat far from him: and before the coming in of the meat, the emperor himself, according to an ancient custom of the kings of Moscovy, doth first bestow a piece of bread upon every one of his guests, with a loud pronunciation of his title, and honour, in this manner; the great duke of Moscovy, and chief emperor of Russia, John Basiliwich (and then the officer nameth the guest) doth give thee bread. Whereupon all the guests rise up, and by and by sit down again. This done, the gentleman usher of the hall comes in with a notable company of servants, carrying the dishes, and having done his reverence to the emperor, puts a young swan in a golden platter upon the table, and immediately takes it thence again, delivering it to the carver, and seven other of his fellows, to be cut up: which being performed, the meat is then distributed to the guests, with the like pomp and ceremonies. In the mean time, the gentleman usher receives his bread, and tasteth to the emperor, and afterward, having done his reverence, he departeth. Touching the rest of the dishes, because they were brought in out of order, our men can report no certainty: but this is true, that all the furniture of dishes, and drinking vessels, which were then for the use of a hundred guests, was all of pure gold, and the tables were so laden with vessels of gold, that there was no room for some to stand upon them.

We may not forget that there were one hundred and forty servitors arrayed in cloth of gold, that in the dinner time changed thrice their habit and apparel, which servitors

are in like sort served with bread from the emperor, as the rest of the guests. Last of all, dinner being ended, and candles brought in (for by this time night was come) the emperor calleth all his guests and noblemen by their names, in such sort, that it seems miraculous that a prince, otherwise occupied in great matters of estate, should so well remember so many and sundry particular names. The Russes told our men, that the reason thereof, as also of the bestowing of bread in that manner, was to the end that the emperor might keep the knowledge of his own household: and withal, that such as are under his displeasure might by this means be known.

OF THE DISCIPLINE OF WAR AMONG THE RUSSES.

Whensoever the injuries of their neighbours do call the king forth to battle, he never armeth a less number against the enemy than three hundred thousand soldiers, one hundred thousand whereof he carrieth out into the field with him, and leaveth the rest in garrison in some fit places, for the better safety of his empire. He presseth no husbandman nor merchant; for the country is so populous, that these being left at home, the youth of the realm is sufficient for all his wars. As many as go out to warfare do provide all things of their own cost: they fight not on foot, but altogether on horseback: their armour is a coat of mail and a helmet: the coat of mail is gilded, or else adorned with silk, although it pertain to a common soldier: they have a great pride in shewing their wealth: they use bows and arrows, as the Turks do: they carry lances also into the field. They ride with a short stirrup, after the manner of the Turks. They are a kind of people most sparing in diet, and most patient in extremity of cold, above all others; for when the ground is covered with snow, and is grown terrible and hard with the frost, this Russe hangs up his mantle, or soldier's coat, against that part from whence the wind and snow drives, and so making a little fire, lieth down with his back towards the weather: this mantle of his serves him for his bed, wall, house and all: his drink is cold water of the river, mingled with oatmeal, and this is all his good cheer, and he thinketh himself well and daintily fed therewith, and so sitteth down by his fire, and upon the hard ground roasteth as it were his weary sides thus daintily stuffed; the hard ground is his feather-bed, and some block or stone his pillow: and as for his horse, he is as it were a chamber fellow with his master, faring both alike. How justly may this barbarous and rude Russe condemn the daintiness and niceness of our captains, who, living in a soil and air much more temperate, yet commonly use furred boots and cloaks! But thus much of the furniture of their common soldiers. But those that are of higher degrees come into the field a little better provided. As for the furniture of the emperor himself, it is then above all other times most notable. The coverings of his tent, for the most part, are all of gold, adorned with stones of great price, and with the curious workmanship of plumasiers. As often as they are to skirmish with the enemy, they go forth without any order at all: they make no wings, nor military divisions of their men, as we do, but lying for the most part in ambush, do suddenly set upon the enemy. Their horses can well abstain two whole days from any meat: they feed upon the barks of trees, and the most tender branches, in all the time of war. And this scant and miserable manner of living both the horse and his master can well endure, sometimes for the space of two months, lusty and in good state of body. If any man behave himself valiantly in the field, to the contentation of the emperor, he bestoweth upon him in recompense of his service some farm, or so much ground as he and his may live upon, which notwithstanding after his death returneth again to the emperor, if he die without

a male issue. For although his daughters be never so many, yet no part of that inheritance comes to them, except peradventure the emperor of his goodness give some portion of the land amongst them, to bestow them withal. As for the man, whosoever he be, that is in this sort rewarded by the emperor's liberality, he is bound in a great sum to maintain so many soldiers for the war when need shall require, as that land, in the opinion of the emperor, is able to maintain. And all those to whom any land falls by inheritance are in no better condition, for if they die without any male issue, all their lands fall into the hands of the emperor. And moreover, if there be any rich man amongst them, who in his own person is unfit for the wars, and yet hath such wealth, that thereby many noblemen and warriors might be maintained, if any of the courtiers present his name to the emperor, the unhappy man is by and by sent for, and in that instant deprived of all his riches, which with great pains and travail all his lifetime he hath gotten together; except perhaps some small portion thereof be left him, to maintain his wife, children, and family. But all this is done of all the people so willingly at the emperor's commandment, that a man would think they rather make restitution of other men's goods, than give that which is their own to other men. Now the emperor having taken these goods into his hands, bestoweth them among his courtiers according to their deserts; and the oftener that a man is sent to the wars, the more favour he thinketh is borne to him by the emperor, although he go upon his own charge, as I said before; so great is the obedience of all men generally to their prince.

OF THE AMBASSADORS OF THE EMPEROR OF MOSCOVY.

The Moscovite, with no less pomp and magnificence than that which we have spoken of, sends his ambassadors to foreign princes in the affairs of estate. For while our men were abiding in the city of Mosco, there were two ambassadors sent to the king of Poland, accompanied with five hundred notable horses, and the greater part of the men were arrayed in cloth of gold, and of silk, and the worst apparel was of garments of blue colour, to speak nothing of the trappings of the horses, which were adorned with gold and silver, and very curiously embroidered: they had also with them one hundred white and fair spare horses, to use them at such times as any weariness came upon them. But now the time requireth me to speak briefly of other cities of the Moscovites, and of the wares and commodities that the country yieldeth.

NOVOGORODE.

Next unto Mosco, the city of Novogorode is reputed the chiefest of Russia; for although it be in majesty inferior to it, yet in greatness it goeth beyond it. It is the chiefest and greatest mart town of all Moscovy: and albeit the emperor's seat is not there, but at Mosco, yet the commodiousness of the river, falling into that gulf which is called Sinus Finnicus, whereby it is well frequented by merchants, makes it more famous than Mosco itself. This town excels all the rest in the commodities of flax and hemp: it yields also hides, honey, and wax. The Flemings there sometimes had a house of merchandise, but by reason that they used the like ill-dealing there, which they did with us, they lost their privileges, a restitution whereof they earnestly sued for at the time that our men were there. But those Flemings hearing of the arrival of our men in those parts, wrote their letters to the emperor against them, accusing them for pirates and rovers, wishing him to detain and imprison them. Which things when they were known of our men, they conceived fear that they should never have returned home. But the emperor

believing rather the king's letters, which our men brought, than the lying and false suggestions of the Flemings, used no ill intreaty towards them.

YERASLAVE.

Yeraslave also is a town of some good fame, for the commodities of hides, tallow, and corn, which it yields in great abundance. Cakes of wax are there also to be sold, although other places have greater store. This Yeraslave is distant from Mosco about two hundred miles; and betwixt them are many populous villages. Their fields yield such store of corn, that in conveying it towards Mosco, sometimes in a forenoon a man shall see seven hundred or eight hundred sleds going and coming, laden with corn and salt fish: the people come a thousand miles to Mosco to buy that corn, and then carry it away upon sleds; and these are those people that dwell in the north parts, where the cold is so terrible, that no corn doth grow there, or if it spring up, it never comes to ripeness. The commodities that they bring with them are salt fish, skins, and hides.

VOLOGDA.

Vologda, being from Mosco five hundred and fifty miles, yields the commodities of hemp and flax also; although the greatest store of flax is sold at Novogorode.

PLESCO.

The town of Plesco is frequented of merchants for the good store of honey and wax that it yieldeth.

COLMAGRO.

The north parts of Russia yield very rare and precious skins; and amongst the rest those principally which we call sables, worn about the necks of our noble women and ladies: it hath also martin's skins, white, black, and red fox skins, skins of hares, and ermines, and others, which they call and term barbarously, as beavers, minxes, and minivers. The sea adjoining breeds a certain beast which they call the mors, which seeketh his food upon the rocks, climbing up with the help of his teeth. The Russes use to take them for the great virtue that is in their teeth, whereof they make as great accompt as we do of the elephant's tooth. These commodities they carry upon deers' backs to the town of Lampas, and from thence to Colmagro, and there in the winter time are kept great fairs for the sale of them. This city of Colmagro serves all the country about it with salt and salt fish. The Russians also of the north parts send thither oil, which they call trane, which they make in a river called Una, although it be also made elsewhere: and here they use to boil the water of the sea, whereof they make very great store of salt.

OF CONTROVERSIES IN LAW, AND HOW THEY ARE ENDED.

Having hitherto spoken so much of the chiefest cities of Russia as the matter required, it remaineth that we speak somewhat of the laws that the Moscovites do use, as far forth as the same are come to our knowledge. If any controversy arise among them, they first make their landlords judges in the matter; and if they cannot end it, then they prefer it to the magistrate. The plaintiff craveth of the said magistrate that

he may have leave to enter law against his adversary; and having obtained it, the officer fetcheth the defendant, and beateth him on the legs till he bring forth a surety for him; but if he be not of such credit as to procure a surety, then are his hands by an officer tied to his neck, and he is beaten all the way till he come before the judge. The judge then asketh him (as for example in the matter of debt) whether he oweth any thing to the plaintiff. If he denies it, then saith the judge, how canst thou deny it? the defendant answereth, by an oath: thereupon the officer is commanded to cease from beating of him, until the matter be further tried. They have no lawyers, but every man is his own advocate, and both the complaint of the accuser, and the answer of the defendant, are in manner of petition delivered to the emperor, intreating justice at his hands. The emperor himself heareth every great controversy, and upon the hearing of it giveth judgment, and that with great equity, which I take to be a thing worthy of special commendation in the majesty of a prince. But although he do this with a good purpose of mind, yet the corrupt magistrates do wonderfully pervert the same; but if the emperor take them in any fault, he doth punish them most severely. Now at the last, when each party hath defended his cause with his best reasons, the judge demandeth of the answer whether he hath any more to say for himself; he answereth, that he will try the matter in fight by his champion, or else intreateth that in fight betwixt themselves the matter may be ended; which being granted, they both fight it out: or if both of them, or either of them, seem unfit for that kind of trial, then they have public champions to be hired, which live by ending of quarrels. These champions are armed with iron axes and spears, and fight on foot, and he whose champion is overcome is by and by taken and imprisoned, and terribly handled, until he agreeth with his adversary. But if either of them be of any good calling and degree, and do challenge one another to fight, the judge granteth it; in which case they may not use public champions: and he that is of any good birth doth contemn the other, if he be basely born, and will not fight with him. If a poor man happen to grow in debt, his creditor takes him and maketh him pay the debt, in working either to himself, or to some other man, whose wages he taketh up. And there are some among them that use willingly to make themselves, their wives, and children, bond-slaves unto rich men, to have a little money at the first into their hands, and so for ever after content themselves with meat and drink; so little account do they make of liberty.

OF PUNISHMENTS UPON THIEVES.

If any man be taken upon committing of theft, he is imprisoned and often beaten, but not hanged for the first offence, as the manner is with us; and this they call the law of mercy. He that offendeth the second time hath his nose cut off, and is burned in the forehead with a hot iron. The third time he is hanged. There are many cut-purses among them; and if the rigour of the prince did not cut them off, they could not be avoided.

OF THEIR RELIGION.

They maintain the opinions of the Greek church: they suffer no graven images of saints in their churches, but their pictures painted in tables they have in great abundance, which they do adore and offer unto, and burn wax candles before them, and cast holy water upon them without other honour. They say that our images which are set up in churches and carved have no divinity in them. In their private houses they have

images for their household saints, and for the most part they are put in the darkest place of the house: he that comes into his neighbour's house doth first salute his saints, although he see them not. If any form or stool stand in his way, he oftentimes beateth his brow upon the same, and often ducking down with his head and body, worshippeth the chief image. The habit and attire of the priests and of the laymen doth nothing at all differ. As for marriage, it is forbidden to no man, only this is received and held amongst them for a rule and custom, that if a priest's wife doth die, he may not marry again, nor take a second wife; and therefore they of secular priests, as they call them, are made monks, to whom then chastity for ever is commanded. Their divine service is all done and said in their own language, that every man may understand it: they receive the Lord's supper with leavened bread, and after the consecration they carry it about the church in a saucer, and prohibit no man from receiving and taking of it that is willing so to do. They use both the Old and the New Testament, and read both in their own language, but so confusedly, that they themselves that do read understand not what themselves do say; and while any part of either Testament is read, there is liberty given by custom to prattle, talk, and make a noise: but in the time of the rest of the service they use very great silence and reverence, and behave themselves very modestly, and in good sort. As touching the Lord's Prayer, the tenth man amongst them knows it not; and for the articles of our faith, and the ten commandments, no man, or at the least very few of them, do either know them or can say them; their opinion is, that such secret and holy things as they are should not rashly and imprudently be communicated with the common people. They hold for a maxim amongst them, that the old law and the commandments also are abolished by the death and blood of Christ: all studies and letters of humanity they utterly refuse: concerning the Latin, Greek, and Hebrew tongues, they are altogether ignorant in them.

Every year they celebrate four several fasts, which they call according to the names of the saints. The first begins with them at the time that our Lent begins; the second is called amongst them the fast of St. Peter; the third is taken from the day of the Virgin Mary; and the fourth and last begins upon St. Philip's day. But as we begin our Lent upon Wednesday, so they begin theirs upon the Sunday. Upon the Saturday they eat flesh. Whensoever any of those fasting feasts do draw near, look what week doth immediately go before them, the same week they live altogether upon white meats; and in their common language they call those weeks the fast of butter.

In the time of their fasts, the neighbours everywhere go from one to another, and visit one another, and kiss one another with kisses of peace, in token of their mutual love and christian concord; and then also they do more often than at any other time go to the holy communion. When seven days are past from the beginning of the fast, then they do often either go to their churches, or keep themselves at home and use often prayer; and for that sevennight they eat nothing but herbs: but after that sevennight's fast is once past, then they return to their old intemperance of drinking, for they are notable tosspots. As for the keeping of their fasting days, they do it very straightly; neither do they eat any thing besides herbs and salt fish as long as those fasting days do endure; but upon every Wednesday and Friday in every week throughout the year they fast.

There are very many monasteries of the order of St. Benedict amongst them, to which many great livings for their maintenance do belong; for the friars and the monks do at the least possess the third part of the livings throughout the whole Moscovite empire. To those monks that are of this order there is amongst them a perpetual prohi-

bition that they may eat no flesh, and therefore their meat is only salt fish, milk, and butter; neither is it permitted them by the laws and customs of their religion to eat any fresh fish at all; and at those four fasting times whereof we spake before, they eat no fish at all, only they live with herbs and cucumbers, which they do continually for that purpose cause and take order to grow and spring, for their use and diet.

As for their drink, it is very weak and small. For the discharge of their office, they do every day say service, and that early in the morning before day; and they do in such sort, and with such observation, begin their service, that they will be sure to make an end of it before day; and about nine of the clock in the morning they celebrate the communion. When they have so done, they go to dinner, and after dinner they go again to service, and the like also after supper; and in the mean time, while they are at dinner, there is some exposition or interpretation of the gospel used.

Whensoever any abbot of a monastery dieth, the emperor taketh all his household stuff, beasts, flocks of sheep, gold, silver, and all that he hath; or else he that is to succeed him in his place and dignity doth redeem all those things, and buyeth them of the emperor for money.

Their churches are built of timber, and the towers of their churches, for the most part, are covered with shingle boards. At the doors of their churches they usually build some entrance or porch, as we do; and in their church yards they erect a certain house of wood, wherein they set up their bells, wherein sometimes they have but one, in some two, and in some also three.

There is one use and custom amongst them which is strange and rare, but yet it is very ridiculous, and that is this: when any man dieth amongst them, they take the dead body and put it in a coffin or chest, and in the hand of the corpse they put a little scrawl, and in the same there are these words written, that the same man died a Russe of Russes, having received the faith, and died in the same. This writing or letter, they say, they send to St. Peter, who receiving it (as they affirm) reads it, and by and by admits him into heaven, and that his glory and place is higher and greater than the glory of the christians of the Latin church, reputing themselves to be followers of a more sincere faith and religion than they: they hold opinion that we are but half christians, and themselves only to be the true and perfect church. These are the foolish and childish dotages of such ignorant barbarians.

OF THE MOSCOVITES THAT ARE IDOLATERS, DWELLING NEAR TO TARTARIA.

There is a certain part of Moscovy, bordering upon the countries of the Tartars, wherein those Moscovites that dwell are very great idolaters. They have one famous idol amongst them, which they call the golden old wife; and they have a custom that whensoever any plague or any calamity doth afflict the country, as hunger, war, or such like, then they go to consult with their idol, which they do after this manner: they fall down prostrate before the idol, and pray unto it, and put in the presence of the same a cymbal; and about the same certain persons stand, which are chosen amongst them by lot; upon their cymbal they place a silver toad, and sound the cymbal, and to whomsoever of those lotted persons that toad goeth, he is taken, and by and by slain; and immediately, I know not by what illusions of the devil or idol, he is again restored to life, and then doth reveal and deliver the causes of the present calamity. And by this means knowing how to pacify the idol, they are delivered from the imminent danger.

OF THE FORM OF THEIR PRIVATE HOUSES, AND OF THE APPAREL OF THE PEOPLE.

The common houses of the country are everywhere built of beams of fir-tree; the lower beams do so receive the round hollowness of the uppermost, that by the means of the building thereupon, they resist and expel all winds that blow; and where the timber is joined together, there they stop the chinks with moss. The form and fashion of their houses in all places is four square, with strait and narrow windows, whereby with a transparent casement, made or covered with skin like to parchment, they receive the light. The roofs of their houses are made of boards covered without with the bark of trees; within their houses they have benches or griezes hard by their walls, which commonly they sleep on, for the common people know not the use of beds; they have stoves wherein in the morning they make a fire, and the same fire doth either moderately warm, or make very hot the whole house.

The apparel of the people for the most part is made of wool; their caps are peaked like unto a tike or diamond, broad beneath, and sharp upward. In the manner of making whereof there is a sign and representation of nobility; for the loftier or higher their caps are, the greater is their birth supposed to be, and the greater reverence is given them by the common people.

THE CONCLUSION, TO QUEEN MARY.

These are the things, most excellent queen, which your subjects newly returned from Russia have brought home concerning the state of that country; wherefore, if your majesty shall be favourable, and grant a continuance of the travel, there is no doubt but that the honour and renown of your name will be spread amongst those nations, whereunto three only noble personages from the very creation have had access, to whom no man hath been comparable.

THE COPY OF THE DUKE OF MOSCOVY AND EMPEROR OF RUSSIA HIS LETTERS SENT TO KING EDWARD THE SIXTH, BY THE HANDS OF RICHARD CHANCELOR.

THE almighty power of God, and the incomprehensible Holy Trinity, rightful Christian belief, &c. We, great duke Juan Vasilivich, by the grace of God, great lord and emperor of all Russia, great duke of Volodemer, Mosco, and Novograd, king of Kazan, king of Astracan, lord of Plesco, and great duke of Smolensko, of Twerria, Joughoria, Permia, Vadska, Bulghoria, and others, lord and great duke of Novograd in the low country, of Chernigo, Rezan, Polotskoy, Rostove, Yaruslaveley, Bealozera, Liefland, Oudoria, Obdoria, and Condenza, commander of all Siberia, and of the north parts, and lord of many other countries, greeting. Before all, right, great, and worthy of honour, Edward king of England, &c. according to our most hearty and good zeal, with good intent and friendly desire, and according to our holy christian faith, and great governance, and being in the light of great understanding, our answer by this our honourable writing unto your kingly governance, at the request of your faithful servant, Richard Chancelor, with his company, as they shall let you wisely know, is this. In the strength of the twentieth year of our governance, be it known, that at our sea coasts arrived a ship with one Richard and his company, and said that he was desirous to come

into our dominions, and according to his request hath seen our majesty and our eyes; and hath declared unto us your majesty's desire, as that we should grant unto your subjects to go and come, and in our dominions, and among our subjects, to frequent free marts with all sorts of merchandises, and upon the same to have wares for their return; and they have also delivered us your letters, which declare the same request. And hereupon we have given order, that wheresoever your faithful servant Hugh Willoughby land or touch in our dominions, to be well entertained, who as yet is not arrived, as your servant Richard can declare.

And we, with christian belief and faithfulness, and according to your honourable request, and my honourable commandment, will not leave it undone; and are furthermore willing that you send unto us your ships and vessels, when and as often as they may have passage, with good assurances on our part to see them harmless. And if you send one of your majesty's counsel to treat with us, whereby your country merchants may, with all kind of wares, and where they will, make their market in our dominions, they shall have their free mart, with all free liberties through my whole dominions, with all kinds of wares, to come and go at their pleasure, without any let, damage, or impediment, according to this our letter, our word, and our seal, which we have commanded to be undersealed. Written in our dominion, in our city, and our palace in the castle of Mosco, in the year 7060, the second month of February.

This letter was written in the Moscovian tongue, in letters much like to the Greek letters, very fair written in paper, with a broad seal hanging at the same, sealed in paper upon wax. This seal was much like the broad seal of England, having on the one side the image of a man on horseback, in complete harness, fighting with a dragon. Under this letter was another paper, written in the Dutch tongue, which was the interpretation of the other, written in the Moscovian letters. These letters were sent the next year after the date of king Edward's letters, 1554.

THE COINS, WEIGHTS, AND MEASURES USED IN RUSSIA; WRITTEN BY JOHN HASSE, IN THE YEAR 1554.

FORASMUCH as it is most necessary for all merchants who seek to have traffic in any strange regions, first to acquaint themselves with the coins of those lands with which they do intend to join in traffic, and how they are called from the valuation of the highest piece to the lowest, and in what sort they make their payments, as also what their common weights and measures be; for these causes I have thought good to write something thereof, according to mine own knowledge and experience, to the end that the merchants of that new adventure may the better understand how the wealth of that new frequented trade will arise.

First, it is to be noted, that the emperor of Russia hath no other coins than silver in all his land, which goeth for payment amongst merchants; yet notwithstanding there is a coin of copper which serveth for the relief of the poor in Mosco, and no where else, and that is but only for quasse, water, and fruit, as nuts, apples, and such other like. The name of which money is called pole or poles, of which poles there go to the least of the silver coins eighteen. But I will not stand upon this, because it is no current money among merchants.

Of silver coins there be three sorts of pieces: the least is a poledenga; the second a denga; the third, nowgrote, which is as much to say in English, as halfpenny, penny, and two-pence; and for other valued money than this, there is none: there are often-

times there coins of gold, but they come out of foreign countries, whereof there is no ordinary valuation, but they pass according to the agreement of merchants.

Their order in summing of money is this: as we say in England halfpenny, penny, shilling, and pound, so say they poledenga, denga, altine, and rubble: there goeth two poledengas to a denga, six dengas to an altine, and twenty-three altines and two dengas to a rubble.

Concerning the weights of Russia they are these: there are two sorts of pounds in use amongst them; the one great, the other small: the great pound is just two small pounds: they call the great weight by the name of beasemar, and the small they call the skalla weight: with this small weight they weigh their silver coins, of the which the emperor hath commanded to put to every small pound three rubbles of silver; and with the same weight they weigh all grocery wares, and almost all other wares which come into the land, except those which they weigh by the pode, as hops, salt, iron, lead, tin, and batrie, with divers others, notwithstanding they use to weigh batrie more often by the small weight than by the great.

Whensoever you find the prices of your wares rated by the pode, consider that to be the great weight, and the pound to be the small. Also they divide the small pound into forty-eight parts, and they call the eight-and-fortieth part a slotnike, by the which slotnike, the retailers sell their wares out of their shops, as goldsmiths, grocers, silk-sellers, and such other, like as we do use to retail by the ounce: and as for their great weight which they call the beasemar, they sell by pode, or shippond. The pode doth contain of the great weight forty pounds, and of the small eighty: there go ten podes to a shippond.

Yet you must consider that their great weight is not full with ours: for I take not their great pound to be full thirteen ounces, but above twelve I think it be. But for your just proof, weigh six rubbles of Russia money with our pound weight, and then you shall see what it lacketh: for six rubbles of Russia is by the emperor's standard the great pound: so that I think it be the next way to know the just weight, as well of the great pound as of the small.

There is another weight needful to be known, which is the weight of Wardhouse, for so much as they weigh all their dry fish by weight, which weight is the beasemar, as they of Russia do use, notwithstanding there is another sort in it: the names of those weights are these: the mark pound, the great pound, the weie, and the shippond. The mark pound is to be understood as our pound, and their great pound is twenty-four of their mark pound: the weie is three great pound, and eight weie is a shippond.

Now concerning their measures, as they have two sorts of weights, so they have also two sorts of measures, wherewith they measure cloth, both linen and woollen: they call the one an areshine, and the other a locut: the areshine I take to be as much as the Flanders ell, and their locut half an English yard: with their areshine they may mete all such sorts of cloths as come into the land, and with the locut all such cloth, both linen and woollen, as they make themselves. And whereas we use to give yard and inch, or yard and handful, they do give nothing but bare measure.

They have also a measure wherewith they do meet their corn which they call a setforth, and the half of that an osmine: this setforth I take to be three bushels of London measure. And as for their drink measure, they call it a span, which is much like a bucket, and of that I never saw any true rate, but that some was greater than other some. And as for the measures of Wardhouse, wherewith they mete their cloth,

there is no difference between that and the measure of Dansk, which is half an English ell.

Concerning the tolls and customs of Russia, it was reported to me in Moscovia, that the Turks and Armenians pay the tenth penny custom of all the wares they bring into the emperor's land, and above that they pay for all such goods as they weigh at the emperor's beam, two pence of the rubble, which the buyer or seller must make report of to the master of the beam they: also pay a certain horse toll, which is in divers places of his realm four pence of a horse.

The Dutch nation are free of this: notwithstanding, for certain offences, they had lost their privileges, which they have recovered this summer, to their great charge. It was reported to me by a justice of that country, that they paid for it thirty thousand rubbles, and also that Rye, Dorpte, and Revel have yielded themselves under the government of the emperor of Russia: whether this was a brag of the Russes or not, I know not, but thus he said, and indeed while we were there, there came a great ambassador out of Liefland, for the assurance of their privileges.

To speak somewhat of the commodities of this country, it is to be understood, that there is a certain place four score miles from the sea called Colmogro: to which place there resort all the sorts of wares that are in the north parts, as oils, salt, stockfish, salmon, feathers, and furs: their salt they make of salt water by the sea side: their oils they make of seals, whereof they have great store, which is brought out of the bay where our ships came in: they make it in the spring of the year, and bring it to Colmogro to sell, and the merchants there carry it to Novogrode, and so sell it to the Dutch nation. Their stockfish and salmon cometh from a place called Mallums, not far from Wardhouse: their salmon and their salt they carry to Mosco, and their dry fish they carry to Novogrode, and sell it there to the Lieflanders.

The furs and feathers which come to Colmogro, as sables, beavers, minks, armine, lettis, graies, woolverings, and white foxes, with deer skins, they are brought thither, by the men of Penning, Lampas, and Powstezer, which fetch them from the Samoedes that are counted savage people: and the merchants that bring these furs do use to truck with the merchants of Colmogro for cloth, tin, batrie, and such other like, and the merchants of Colmogro carry them to Novogrode, Vologda, or Mosco, and sell them there. The feathers which come from Penning they do little esteem.

If our merchants do desire to know the meetest place of Russia for the standing house, in mine opinion I take it to be Vologda, which is a great town standing in the heart of Russia, with many great and good towns about it. There is great plenty of corn, victuals, and of all such wares as are raised in Rusland, but specially flax, hemp, tallow, and bacon: there is also great store of wax, but it cometh from the Mosco.

The town of Vologda is meetest for our merchants, because it lieth amongst all the best towns of Russia, and there is no town in Russia but trades with it: also the water is a great commodity to it. If they plant themselves in Mosco or Novogrode, their charge will be great and wonderful, but not so in Vologda: for all things will there be had better cheap by the one half. And for their vent I know no place so meet. It is likely that some will think the Mosco to be the meetest by the reason of the court, but by that reason I take it to be worse: for the charge there would be so great by cravers and expences, that the moiety of the profit would be wholly consumed, which in the other place will be saved. And yet notwithstanding our merchants may be there in the winter to serve the emperor and his court. The emperor is a great merchant

himself of wax and sables, which with good foresight may be procured to their hands: as for other commodities there are little or none in Moscovia, besides those above rehearsed: if there be other it is brought thither by the Turks, who will be dainty to buy our clothes, considering the charges of carriage over land.

Our merchants may do well to provide for the Russes such wares as the Dutch nation doth serve them of, as Flanders and Holland cloths, which, I believe, they shall serve better and with less charge than they of Rye, or Dorpte, or Revel: for it is no small adventure to bring their clothes out of Flanders to either of these places, and their charge not little to carry them over land to Novogrode, which is from Rye nine hundred Russian miles.

This Novogrode is a place well furnished with flax, wax, hides, tallow, and many other things: the best flax in Russia is brought thither, and there sold by the hundred bundles, which is done also at Vologda, and they that bring the flax to Novogrode, dwell as near Vologda, as Novogrode, and when they hear of the utterance which they may have with our nation, they will as willingly come to them as go to other.

They have in Russia two sorts of flax, the one is called great flax, and the other small: that which they call great flax is better by four rubbles in one hundred bundles than the small: it is much longer than the other, and cleaner without wood: and whereas of the small flax there go twenty-seven or twenty-eight bundles to a shippond, there goeth not of the greater sort above twenty-two or twenty-four at the most. There are many other trifles in Russia, as soap, mats, &c. but I think there will be no great account made of them.

The letter of M. George Killingworth, the company's first agent in Moscovy, touching their entertainment in their second voyage. Anno 1555, *the twenty-seventh of November in Mosco.*

RIGHT worshipful, my duty considered, &c. It may please your worship to understand, that at the making hereof we all be in good health, thanks be to God, save only William our cook as we came from Colmogro fell into the river out of the boat, and was drowned. And the eleventh day of September we came to Vologda, and there we laid all our wares up, and sold very little: but one merchant would have given us twelve rubbles for a broad cloth, and he said he would have had them all, and four altines for a pound of sugar, but we did refuse it because he was the first, and the merchants were not come thither, nor would not come before winter, trusting to have more: but I fear it will not be much better. Yet notwithstanding we did for the best. And the house that our wares lie in costs from that day until Easter ten rubbles. And the twenty-eighth day of September we did determine with ourselves that it was good for M. Gray, Arthur Edwards, Thomas Hautory, Christopher Hudson, John Segewick, Richard Johnson, and Richard Judd, to tarry at Vologda, and M. Chancelor, Henry Lane, Edward Prise, Robert Best, and I, should go to Mosco. And we did lade the emperor's sugar, with part of all sorts of wares, to have had to the Mosco with us, but the way was so deep, that we were fain to turn back, and leave it still at Vologda till the frost. And we went forth with post horse, and the charge of every horse being still ten in number comes to ten shillings and seven pence half-penny, besides the guides. And we came to the Mosco the fourth day of October, and were lodged that night in a simple house: but the next day we were sent for to the emperor his secretary, and he bade us welcome with a cheerful countenance and cheerful words, and we shewed him that we had a letter from our queen's grace to the emperor his grace, and then he desired to see them all, and that they might remain with him, to have them perfect, that the true meaning might be declared to the emperor, and so we did: and then we were appointed to a better house: and the seventh day the secretary sent for us again, and then he shewed us that we should have a better house, for it was the emperor his will that we should have all things that we did lack, and did send us meat of two sorts, and two hens, our house free, and every two days to receive eight hens, seven altines, and two-pence in money, and meat a certain portion, and a poor fellow to make clean our house, and to do that whereunto we would set him. And we had given many rewards before, which you shall perceive by other, and so we gave the messengers a reward with thanks: and the ninth day we were sent to make us ready to speak with the emperor on the morrow. And the letters were sent us, that we might deliver them ourselves, and we came before him the tenth day: and before we came to his presence we went through a great chamber, where stood many small tuns, pails, bowls, and pots of silver, I mean, like washing bowls, all parsel gilt: and within that another chamber, wherein sat (I think) near a hundred in cloth of gold, and then into the chamber where his grace sat, and there I think were more than in the other chamber also in cloth of gold, and we did our duty, and shewed his grace our queen's grace's letters, with a note of your present which was left in Vologda: and then his grace did ask how our queen's grace did, calling her cousin, saying that he was glad that we were come in health into his realm, and we went one by one unto him, and took him by the hand, and then his

grace did bid us go in health, and come to dinner again, and we dined in his presence, and were set with our faces towards his grace, and none in the chamber sat with their backs towards him, being I think near a hundred at dinner then, and all served with gold, as platters, chargers, pots, cups, and all not slender but very massy, and yet a great number of platters of gold standing still on the cupboard not moved: and divers times in the dinner time his grace sent us meat and drink from his own table, and when we had dined, we went up to his grace, and received a cup with drink at his own hand, and the same night his grace sent certain gentlemen to us with divers sorts of wine and meat, to whom we gave a reward, and afterward we were by divers Italians counselled to take heed whom we did trust to make the copy of the privileges that we would desire to have, for fear it should not be written in the Russian tongue, as we did mean. So first a Russian did write for us a breviat to the emperor, the tenor whereof was, that we did desire a stronger privilege: and when the secretary saw it, he did deliver it to his grace, and when we came again, his grace willed us to write our minds, and he would see it, and so we did. And his grace is so troubled with preparations to wars, that as yet we have had no answer: but we have been required of his secretary, and of the under chancellor, to know what wares we had brought into the realm, and what wares we do intend to have, that are, or may be had in this realm: and we shewed them, and they shewed the emperor thereof. And then they said his grace's pleasure was, that his best merchants of the Mosco should be spoken to, to meet and talk with us. And so a day was appointed, and we met in the secretary his office, and there was the under chancellor, who was not past two years since the emperor's merchant, and not his chancellor: and then the conclusion of our talk was, that the chancellor willed us to bethink us, where we would desire to have a house or houses, that we might come to them as to our own house, and for merchandise to be made preparation for us, and they would know our prices of our wares and frise: and we answered that for our prices they must see the wares before we could make any price thereof, for the like in goodness hath not been brought into the realm, and we did look for an example of all sorts of our wares to come from Vologda, with the first sled way, and then they should see them, and then we would shew them the prices of them: and likewise we could not tell them what we would give them justly, till we did know as well their just weights as their measures: for in all places where we did come, all weights and measures did vary. Then the secretary (who had made promise unto us before) said, that we should have all the just measures under seal, and he that was found faulty in the contrary, to buy or sell with any other measure than that, the law was, that he should be punished: he said moreover, that if it so happen that any of our merchants do promise by covenant at any time to deliver you any certain sum of wares in such a place, and of such like goodness, at such a day, for such a certain price, that then because of variance, we should cause it to be written, according as the bargain is, before a justice or the next ruler to the place: if he did not keep covenant and promise in all points, according to his covenant, that then look what loss or hindrance we could justly prove that we have thereby, he should make it good if he be worth so much: and in like case we must do to them: and to that we did agree, save only if it were to come over the sea, then if any such fortune should be (as God forbid) that the ship should mischance or be robbed, and the proof to be made that such kind of wares were laden, the English merchants to bear no loss to the other merchant. Then the chancellor said, methinks you shall do best to have your house at Colmogro, which is but one hundred miles from the right discharge of the ships, and yet I trust the ships shall come

nearer hereafter, because the ships may not tarry long for their lading, which is one thousand miles from Vologda by water, and all our merchants shall bring all our merchandise to Colmogro to you, and so shall our merchants neither go empty nor come empty: for if they lack lading homeward, there is salt, which is good ware here, that they may come loaden again. So we were very glad to hear that, and did agree to his saying: for we shall nevertheless, if we list, have a house at Vologda, and at the Mosco, yea, and at Novogrode, or where we will in Rusland: but the three-and-twentieth of this present we were with the secretary, and then, among other talk, we moved, that if we should tarry at Colmogro with our wares, and should not come to Vologda, or further to seek our market, but tarry still at Colmogro, and then the merchants of the Mosco and others should not come and bring their wares, and so the ships should come, and not have their lading ready, that then it were a great loss and hindrance for us: then said he again to us, that the merchants had been again together with him, and had put the like doubt, that if they should come and bring their wares to Colmogro, and that they should not find wares there sufficient to serve them, that then they should be at a great loss and hindrance, they leaving their other trade to fall to that: and to that we did answer, that after the time that we do appoint them to bring their wares to Colmogro, God willing, they should never come thither, but at the beginning of the year, they should find that our merchants would have at the least for a thousand rubbles, although the ships were not come: so that he said, that then we must talk further with the merchants: so that as yet I know not but that we shall have need of one house at Colmogro, and another at Vologda, and if that they bring not their wares to Colmogro, then we shall be sure to buy some at Vologda, and to be out of bondage.

And thus may we continue three or four years, and in this space we shall know the country and the merchants, and which way to save ourselves best, and where to plant our houses, and where to seek for wares: for the Mosco is not best for any kind of wares for us to buy, save only wax, which we cannot have under seven pence the Russe pound, and it lacks two ounces of our pound, neither will it be much better cheap, for I have bidden six pence for a pound. And I have bought more, five hundred weight of yarn, which stands me in eight pence farthing the Russe pound, one with another. And if we had received any store of money, and were dispatched here, of that we tarry for, as I doubt not but we shall be shortly (you know what I mean) then as soon as we have made sale, I do intend to go to Novogrode, and to Plesco, whence all the great number of the best tow flax cometh, and such wares as are there I trust to buy part. And fear you not but we will do that may be done, if God sends us health, desiring you to prepare fully for one ship to be ready in the beginning of April to depart off the coast of England.

Concerning all those things which we have done in the wares, you shall receive a perfect note by the next bearer (God willing) for he that carrieth these from us is a merchant of Terwill, and he was caused to carry these by the commandment of the emperor his secretary, whose name is Juan Mecallawich Weskawate, whom we take to be our very friend. And if it please you to send any letters to Dantiske to Robert Elson, or to William Watson's servant Dunstan Walton, to be conveyed to us, it may please you to enclose ours in a letter sent from you to him, written in Polish, Dutch, Latin, or Italian: so enclosed coming to the Mosco to his hands, he will convey our letters to us wheresoever we be. And I have written to Dantiske already to them for the conveyance of letters from thence.

And to certify you of the weather here, men say that these hundred years was never so warm weather in this country at this time of the year. But as yesternight we received a letter from Christopher Hudson from a city called Yeraslave, who is coming hither with certain of our wares, but the winter did deceive him, so that he was fain to tarry by the way: and he wrote that the emperor's present was delivered to a gentleman at Vologda, and the sled did overthrow, and the butt of hollock was lost, which made us all very sorry.

I pray you be not offended with these my rude letters for lack of time: but as soon as sales be made, I will find the means to convey you a letter with speed: for the way is made so doubtful, that the right messenger is so much in doubt, that he would not have any letters of any effect sent by any man, if he might, for he knows not of these: and to say the truth, the way is not for him to travel in. But I will make another shift beside, which I trust shall serve the turn till he come, if sales be made before he be ready, which is, and shall be as pleaseth God: who ever preserve your worship, and send us good sales. Written in haste.

By your's to command
GEORGE KILLINGWORTH, Draper.

A COPY OF THE FIRST PRIVILEGES GRANTED BY THE EMPEROR OF RUSSIA TO THE ENGLISH MERCHANTS IN THE YEAR 1555.

John Vasilivich, by the grace of God emperor of Russia, great duke of Novogrode, Moscovia, &c. To all people that shall see, read, hear, or understand these presents, greeting. Forasmuch as God hath planted all realms and dominions in the whole world with sundry commodities, so as the one hath need of the amity and commodities of the other, and by means thereof traffic is used from one to another, and amity thereby increased: and for that as amongst men nothing is more to be desired than amity, without the which no creature being of a natural good disposition can live in quietness, so that it is as troublesome to be utterly wanting, as it is perceived to be grievous to the body to lack air, fire, or any other necessaries most requisite for the conservation and maintenance thereof in health: considering also how needful merchandise is, which furnisheth men of all that which is convenient for their living and nouriture, for their clothing, trimming, the satisfying of their delights, and all other things convenient and profitable for them, and that merchandise bringeth the same commodities from divers quarters in so great abundance, as by means thereof nothing is lacking in any part, and that all things be in every place (where intercourse of merchandises is received and embraced) generally in such sort, as amity thereby is entered into, and planted to continue, and the enjoyers thereof be as men living in a golden world: Upon these respects and other weighty and good considerations, us hereunto moving, and chiefly upon the contemplation of the gracious letters, directed from the right high, right excellent, and right mighty queen Mary, by the grace of God queen of England, France, &c. in the favour of her subjects, merchants, the governor, consuls, assistants, and commonalty of merchants adventurers for discovery of lands, &c.

Know ye therefore, that we of our grace special, mere motion, and certain knowledge, have given and granted, and by these presents, for us, our heirs and successors, do give and grant as much as in us is and lieth, unto Sebastian Cabota governor, sir George Barnes knight, &c. consuls: sir John Gresham, &c. assistants, and to the commonalty of the afore-named fellowship, and to their successors for ever, and

to the successors of every of them, these articles, grants, immunities, franchises, liberties and privileges, and every of them hereafter following expressed and declared, videlicet:

1. We for us, our heirs, and successors, do by these presents give and grant free licence, faculty, authority and power unto the said governor, consuls, assistants and commonalty of the said fellowship, and to their successors for ever, that all and singular the merchants of the same company, their agents, factors, doers of their business, attornies, servants, and ministers, and every of them, may at all times hereafter for evermore, surely, freely, and safely, with their ships, merchandises, goods, and things whatsoever, sail, come and enter into all and singular our lands, countries, dominions, cities, towns, villages, castles, ports, jurisdictions, and districts by sea, land, or fresh waters, and there tarry, abide, or sojourn, and buy, sell, barter and change all kind of merchandises, with all manner of merchants, and people, of whatsoever nation, rite, condition, state or degrees they be, and with the same or other ships, wares, merchandises, goods, and things, whatsoever they be, unto other empires, kingdoms, dukedoms, parts, and to any other place or places at their pleasure and liberty by sea, land, or fresh waters may depart, and exercise all kind of merchandises in our empire and dominions, and every part thereof freely and quietly, without any restraint, impeachment, price, exaction, prest, strait, custom, toll, imposition, or subsidy, to be demanded, taxed, paid, or at any time hereafter to be demanded, taxed, set, levied, or inferred upon them, or any of them, or upon their goods, ships, wares, merchandises, and things of, for, or upon any part or parcel thereof, or upon the goods, ships, wares, merchandises, and things of any of them, so that they shall not need any other safe conduct or licence-general nor special of us, our heirs, or successors; neither shall be bound to ask any safe conduct or licence in any of the aforesaid places subject unto us.

2. Item, we give and grant to the said merchants this power and liberty, that they, nor any of them, nor their goods, wares, merchandises, or things, nor any part thereof, shall be by any means within our dominions, lands, countries, castles, towns, villages, or other place or places of our jurisdiction, at any time hereafter attached, stayed, arrested, nor disturbed for any debt, duty, or other thing, for the which they be not principal debtors or sureties, nor also for any offence or trespass committed, or that shall be committed, but only for such as they, or any of them, shall actually commit; and the same offences (if any such happen) shall be by us only heard and determined.

3. Item, we give and grant that the said merchants shall and may have free liberty, power, and authority to name, choose, and assign brokers, shippers, packers, weighers, measurers, waggoners, and all other meet and necessary labourers, for to serve them in their feat of merchandises, and minister and give unto them, and every of them, a corporal oath, to serve them well and truly in their offices, and finding them, or any of them, doing contrary to his or their oath, may punish and dismiss them, and from time to time choose, swear, and admit other in their place or places, without contradiction, let, vexation, or disturbance, either of us, our heirs, or successors, or of any other our justices, officers, ministers, or subjects whatsoever.

4. Item, we give and grant unto the said merchants, and their successors, that such person as is or shall be commended unto us, our heirs, or successors, by the governor, consuls, and assistants of the said fellowship resiant within the city of London, within the realm of England, to be their chief factor within this our empire and dominions, may and shall have full power and authority to govern and rule all Englishmen that have had, or shall have access, or repair in or to this said empire and jurisdictions, or any part

thereof; and shall and may minister unto them, and every of them, good justice in all their causes, plaints, quarrels, and disorders between them, moved and to be moved, and assemble, deliberate, consult, conclude, define, determine, and make such acts and ordinances as he so commended with his assistants shall think good and meet for the good order, government, and rule of the said merchants, and all other Englishmen repairing to this our said empire and dominions, or any part thereof, and to set and levy upon all and every Englishman, offender or offenders, of such their acts and ordinances made and to be made, penalties and mulcts by fine or imprisonment.

5. Item, if it happen that any of the said merchants, or other Englishman, as one or more do rebel against such chief factor or factors, or his or their deputies, and will not dispose him or themselves to obey them, and every of them, as shall appertain; if the said rebels or disobedients do come, and be found in our said empire and jurisdictions, or any part and place thereof, then we promise and grant that all and every our officers, ministers and subjects, shall effectually aid and assist the said chief factor or factors, and their deputies, and for their power shall really work to bring such rebel, or disobedient rebels, or disobedients, to due obedience; and to that intent shall lend unto the same factor or factors, and their deputies, upon request therefore to be made, prisons and instruments for punishments from time to time.

6. Item, we promise unto the said merchants, and their successors, upon their request, to exhibit and do unto them good, exact, and favourable justice, with expedition in all their causes; and that then they, or any of them, shall have access, or come to or before any of our justices, for any their plaints moved, and to be moved, between any our subjects or other stranger and them, or any of them, that then they shall be first and forthwith heard, as soon as the party which they shall find before our justices shall be depeached, which party being heard forthwith, and as soon as may be, the said English merchants shall be rid and dispatched; and if any action shall be moved by or against any of the said merchants, being absent out of our said empire and dominions, then such merchants may substitute an attorney in all and singular his causes, to be followed as need shall require, and as shall seem to him expedient.

7. Item, we grant and promise to the said merchants, and to their successors, that if the same merchants, or any of them, shall be wounded, or (which God forbid) slain in any part or place of our empire or dominions, then good information thereof given, we and our justices and other officers shall execute due correction and punishment without delay, according to the exigence of the case; so that it shall be an example to all others not to commit the like. And if it shall chance the factors, servants, or ministers of the said merchants, or any of them, to trespass or offend, whereby they, or any of them, shall incur the danger of death or punishment, the goods, wares, merchandises, and things of their masters shall not therefore be forfeited, confiscated, spoiled, nor seized by any means by us, our heirs, or successors, or by any our officers, ministers, or subjects, but shall remain to their use, frank, free, and discharged from all punishment and loss.

8. Item, we grant that if any of the English nation be arrested for any debt, he shall not be laid in prison, so far as he can put in sufficient surety and pawn; neither shall any sergeant or officer lead them, or any of them, to prison, before he shall have known whether the chief factor or factors, or their deputies, shall be sureties, or bring in pawn for such arrested; then the officers shall release the party, and shall set him or them at liberty.

9. Moreover, we give, grant, and promise, to the said merchants, that if any of their ships, or other vessels, shall be spoiled, robbed, or damnified in sailing, anchoring, or returning, to or from our said empires and dominions, or any part thereof, by any pirates, merchants, or other person, whatsoever he or they be, that then, and in such case, we will do all that in us is to cause restitution, reparation and satisfaction, to be duly made to the said English merchants, by our letters, and otherwise, as shall stand with our honour, and be consonant to equity and justice.

10. Item, for us, our heirs, and successors, we do promise, and grant, to perform, maintain, corroborate, authenticate, and observe, all and singular the aforesaid liberties, franchises, and privileges, like as presently we firmly do intend, and will corroborate, authenticate, and perform the same, by all mean and way that we can, as much as may be, to the commodity and profit of the said English merchants, and their successors, for ever.

And to the intent that all and singular the said gifts, grants, and promises, may be inviolably observed, and performed, we, the said John Vasilivich, by the grace of God, emperor of Russia, great duke of Novogrode, Mosco, &c. for us, our heirs, and successors, by our imperial and lordly word, instead of an oath, have, and do promise, by these presents, inviolably to maintain and observe, and cause to be inviolably observed and maintained, all and singular the aforesaid gifts, grants, and promises, from time to time, and at all and every time and times hereafter; and for the more corroboration hereof, have caused our signet hereunto to be put.* Dated in our castle of Mosco, the twentieth day of , in the year

* The charter granted by Philip and Mary to the Russia merchants does not deserve insertion; but it is singular, that the right of conquest is permitted over any part possessed by infidels.

The navigation and discovery toward the river of Ob, made by master Stephen Burrough. master of the pinnace called the Serchthrift, with divers things worth the noting, passed in the year 1556.

(HACKLUYT, VOL. I. P. 274.)

WE departed from Ratcliffe, to Blackwall, the twenty-third of April. Saturday, being St. Mark's day, we departed from Blackwall to Grays.

The twenty-seventh, being Monday, the right worshipful Sebastian Cabota came aboard our pinnace, at Gravesend, accompanied with divers gentlemen and gentlewomen, who, after that they had viewed our pinnace, and tasted of such cheer as we could make them aboard, they went on shore, giving to our mariners right liberal rewards; and the good old gentleman, master Cabota, gave to the poor most liberal alms, wishing them to pray for the good fortune and prosperous success of the Serchthrift, our pinnace; and then, at the sign of the Christopher, he and his friends banquetted, and made me, and them that were in the company, great cheer; and for very joy that he had to see the towardness of our intended discovery, he entered into the dance himself, among the rest of the young and lusty company; which being ended, he and his friends departed most gently, commending us to the governance of Almighty God.

Tuesday we rode still at Gravesend, making provision for such things as we wanted.

Wednesday, in the morning, we departed from Gravesend, the wind being at S. W. that night we came to an anchor thwart our Lady of Holland's.

Thursday, at three of the clock in the morning, we weighed, and by eight of the clock we were at an anchor in Orwel Wanns, and then, incontinent, I went aboard the Edward Bonaventure, where the worshipful company of merchants appointed me to be, until the said good ship arrived at Wardhouse; then I returned again into the pinnace.

Friday, the fifteenth of May, we were within seven leagues of the shore, on the coast of Norway, the latitude, at a south sun, 58° 30′, where we saw three sails, beside our own company; and thus we followed the shore or land, which lieth N. N. W. N. and by W. and N. W. and N. as it doth appear by the plat.

Saturday, at an east sun, we came to St. Dunstan's island, which island I so named; it was off us east, two leagues and a half, the wind being at S. E. the latitude this day, at a south sun, 59° 42′. Also the high round mountain bare east of us, at a south sun; and when this hill is east of you, and being bound to the northward, the land lieth north, and half a point westerly, from this said south sun, unto a north sun, twenty leagues N. W. along the shore.

Upon Sunday, at six of the clock in the morning, the farthest land that we could see, that lay N. N. W. was east of us three leagues, and then it trended to the northwards, and to the eastwards of the north; which headland I judged to be Scoutsness. At seven of the clock we changed our course, and went N. the wind being at S. S. E. and it waxed very thick and misty, and when it cleared, we went N. N. E. At a south sun we lost sight of the Serchthrift, because of the mist, making our way N. and when we lost sight of the shore and pinnace, we were within two leagues and a half of the shore. The last land that we saw, when this mist came upon us, which is to the northwards of Scoutsness, lay N. N. E. and S. S. W. and we made our way N. until a west sun five leagues.

From that until Monday, three a-clock in the morning, ten leagues N. N. E. and then we went N. and by E. because the wind came at the W. S. W. with thick

mist; the latitude this day at a south sun 63° 30′ truly taken: at this season we had sight of our pinnace again.

From that until Tuesday a south sun N. N. E. forty-four leagues, and then N. E. from a south sun until eight of the clock, fifteen leagues N. E.

From that until Wednesday a south sun N. N. E. except the first watch N. E. then had we the latitude in 67° 39′. From that unto a N. W. sun eighteen leagues N. E. and then we were within two leagues of the shore, and saw the high land to the southwards of Lowfoot break out through the mist, and then we went N. and by E.

From the said N. W. sun until four of the clock in the morning, N. and by E. ten leagues and a half, and then N. N. E. until a south sun, the latitude being 69° 30′. From that until half an hour past seven of the clock, N. N. E. eleven leagues and a half, and then we went N. E. ten leagues. From that three leagues and a half E. N. E. and then we saw the land through the clouds and hazy thwart on the broadside of us, the wind being then at S. S. W.

From that until Saturday, at eight of the clock in the morning, E. N. E. and to the northwards forty-eight leagues, and then the wind came up at N. we being aboard the shore, and thwart of the chapel which I suppose is called Kedilwike; then we cast the ship's head to the seawards, because the wind was very scant; and then I caused the pinnace to bear in with the shore, to see whether she might find an harbour for the ships or not, and that she found and saw two roaders ride in the sound; and also they saw houses. But notwithstanding, God be praised, the wind enlarged upon us, that we had not occasion to go into the harbour; and then the pinnace bare her mizen mast overboard with flag and all, and lost the flag: with the mast there fell two men overboard, but God be praised they were saved; the flag was a token, whereby we might understand whether there were a good harbour there or not.

At a north sun the North Cape (which I so named the first voyage) was thwart of us, which is nine leagues to the eastwards of the aforesaid chapel from the easternmost point of it.

June 7. The Sunday we weighed in Corpus Christi bay, at a N. E. and by E. sun; the bay is almost half a league deep; the headland, which is Corpus Christi point, lieth S. E. and by E. one league from the head of the bay, where we had a great tide, like a race over the flood: the bay is at the least two leagues over; so do I imagine from the Fair foreland to Corpus Christi point ten leagues S. E. and by E. it floweth in this bay at a S. and by W. moon, full sea. From that we went until seven o'clock at afternoon twenty leagues S. E. and by S. and then we took in all our sails, because it was then very misty, and also we met with much ice that ran out of the bay; and then we went S. S. E. with our foresail. At eight of the clock we heard a piece of ordnance, which was out of the Edward, which bade us farewell, and then we shot off another piece, and bade her farewell; we could not one see the other because of the thick mist: at a N. W. sun it began somewhat to clear and then we saw a headland, and the shore trended to the southwestward, which I judged to be about Cross Island; it was off us at a N. N. W. sun, W. S. W.

8. From this N. N. W. sun until Monday we went S. E. and this morning we came at anchor among the shoals that lie off Point Lookout, at a N. E. and by E. sun, the wind being at E. S. E. At this point Lookout, a south moon maketh a full sea. Cape Good Fortune lieth from the Isle of Crosses S. E. and between them is ten leagues. Point Lookout lieth from Cape Good Fortune E. S. E. and between them are six leagues. St. Edmond's point lieth from Point Lookout E. S. E. and half a point to

the southwards, and between them are six leagues. There is between these two points a bay that is half a league deep, and is full of shoals and dangers. At a S. E. sun we weighed, and turned to the windwards, the wind being at E. S. E. and at a S. E. sun we came to an anchor, being then a full sea, in five fathoms and a half water. It lieth at this place where we rode, and also at point Lookout, four fathom water. At a W. N. W. sun we weighed, and drived to the windwards until Tuesday, a N. N. E. sun, and then being a high water, we came to an anchor open of the river Cola, in eight fathom water. Cape St. Bernard lieth from St. Edmond's point S. E. and by S. and betwixt them are six leagues; and also betwixt them is the river Cola, into which river we went this evening.

10. Wednesday we rode still in the said river, the wind being at the N. we sent our skiff a-land to be dressed; the latitude of the mouth of the river Cola is 65° 48′.

11. Thursday, at six of the clock in the morning, there came aboard of us one of the Russe lodias, rowing with twenty oars, and there were four-and-twenty men in her. The master of the boat presented me with a great loaf of bread, and six rings of bread, which they call colaches, and four dried pikes, and a peck of fine oatmeal; and I gave unto the master of the boat a comb and a small glass: and he declared unto me that he was bound to Pechora; and after that I made them to drink, the tide being somewhat broken, they gently departed. The master's name was Pheodor.

Whereas the tenth day I sent our pinnace on shore to be mended, because she was leaky and weak, with the carpenter and three men more to help him, the weather chanced so, that it was Sunday before they could get aboard our ship. All that time they were without provision of victuals, but only a little bread, which they spent by Thursday at night, thinking to have come aboard when they had listed, but wind and weather denied them; insomuch that they were fain to eat grass and such weeds as they could find then above ground, but fresh water they had plenty; but the meat with some of them could scant frame, by reason of their queazy stomachs.

14. From Thursday at afternoon, until Sunday in the morning, our bark did ride such a roadsted, that it was to be marvelled, without the help of God, how she was able to abide it.

In the bight of the S. E. shore of the river Cola, there is a good road in five fathom, or four fathom and a half, at a low water; but you shall have no land N. N. E. of you then. I proved with our pinnace that the depth goeth on the S. E. shore.

18. Thursday we weighed our anchors in the river Cola, and went into the sea seven or eight leagues, where we met with the wind far northerly, that of force it constrained us to go again back into the said river, where came aboard of us sundry of their boats, which declared unto me that they were also bound to the northwards, a fishing for morse and salmon, and gave me liberally of their white and wheaten bread.

As we rode in this river, we saw daily coming down the river many of their lodias, and they that had least had four-and-twenty men in them, and at the last they grew to thirty sail of them; and among the rest there was one of them whose name was Gabriel, who shewed me very much friendship, and he declared unto me that all they were bound to Pechora, a fishing for salmons and morses; insomuch that he shewed me by demonstrations, that with a fair wind we had seven or eight days sailing to the river Pechora, so that I was glad of their company. This Gabriel promised to give me warning of shoals, as he did indeed.

21. Sunday being the one-and-twentieth day, Gabriel gave me a barrel of mead, and one of his special friends gave me a barrel of beer, which was carried upon men's backs at least two miles.

22. Monday we departed from the river Cola, with all the rest of the said lodias, but sailing before the wind they were all too good for us; but according to promise, this Gabriel and his friend did often strike their sails and tarried for us, forsaking their own company.

23. Tuesday, at an E. N. E. sun, we were thwart of cape St. John. It is to be understood that from the Cape St. John unto the river or bay that goeth to Mezen, it is all sunk land, and full of shoals and dangers, you shall have scant two fathom water, and see no land. And this present day we came to an anchor thwart of a creek, which is four or five leagues to the northwards of the said cape, into which creek Gabriel and his fellow rowed, but we could not get in; and before night there were above twenty sail that went into the said creek, the wind being at the N. E. We had indifferent good landfang.

This afternoon Gabriel came aboard with his skiff, and then I rewarded him for the good company that he kept with us over the shoals with two small ivory combs, and a steel glass, with two or three trifles more, for which he was not ungrateful; but notwithstanding his first company had gotten further to the northwards.

24. Wednesday being Midsummer-day, we sent our skiff aland to sound the creek, where they found it almost dry at a low water; and all the lodias within were on ground.

Although the harbour were evil, yet the stormy similitude of northerly winds tempted us to set our sails, and we let slip a cable and an anchor, and bare with the harbour, for it was then near a high water: and as always in such journies varieties do chance, when we came upon the bar in the entrance of the creek, the wind did shrink so suddenly upon us, that we were not able to lead it in, and before we could have flatted the ship before the wind, we should have been on ground on the lee shore; so that we were constrained to let fall an anchor under our sails, and rode in a very breach, thinking to have warped in. Gabriel came out with his skiff, and so did sundry others also, shewing their good will to help us, but all to no purpose, for they were likely to have been drowned for their labour; insomuch that I desired Gabriel to lend me his anchor, because our own anchors were too big for our skiff to lay out, who sent me his own, and borrowed another also and sent it us. Then we laid out one of those anchors, with a hawser which he had of one hundred and forty fathom long, thinking to have warped in, but it would not be, for as we shorted upon the said warp the anchor came home, so that we were fain to bear the end of the warp, that we rushed in upon the other small anchor that Gabriel sent aboard, and laid that anchor to seawards; and then between these two anchors we traversed the ship's head to seawards, and set our foresail and mainsail, and when the bark had way we cut the hawser, and so gat the sea to our friend, and tried out all that day with our main course.

25. The Thursday we went room with Cape St. John, where we found indifferent good road for a N. N. E. wind, and for a need, for a N. and by W. wind.

26. Friday at afternoon we weighed and departed from thence, the weather being meetly fair, and the wind at E. S. E. and plied for the place where we left our cable and anchor, and our hawser; and as soon as we were at an anchor, the foresaid Gabriel came aboard of us, with three or four more of their small boats, and brought with them of their aquavitæ and mead, professing unto me very much friendship, and rejoiced to see us again, declaring that they earnestly thought that we had been lost. This Gabriel declared unto me that they had saved both the anchors and our hawser; and after we had thus communed, I caused four or five of them to go into my cabin, where I gave

them figs, and made them such cheer as I could. While I was thus banquetting of them there came another of their skiffs aboard with one who was a Keril, whose name afterwards I learned, and that he dwelt in Colmogro, and Gabriel dwelt in the town of Cola, which is not far from the river's mouth. This foresaid Keril said unto me that one of the anchors which I borrowed was his; I gave him thanks for the loan of it, thinking it had been sufficient. And as I continued in one accustomed manner, that if the present which they brought were worth entertainment, they had it accordingly; he brought nothing with him, and therefore I regarded him but little. And thus we ended, and they took their leave and went ashore. At their coming ashore Gabriel and Keril were at inconvenient words, and by the ears as I understand; the cause was because the one had better entertainment than the other: but you shall understand that Gabriel was not able to make his party good, because there were seventeen lodias of the Keril's company who took his part, and but two of Gabriel's company.

The next high water Gabriel and his company departed from thence, and rowed to their former company and neighbours, which were in number twenty-eight at the least, and all of them belonging to the river Cola.

27. And as I understood Keril made reckoning that the hawser which was fast in his anchor should have been his own, and at first would not deliver it to our boat, insomuch that I sent him word that I would complain upon him, whereupon he delivered the hawser to my company.

The next day being Saturday, I sent our boat on shore to fetch fresh water and wood, and at their coming on shore this Keril welcomed our men most gently, and also banquetted them; and in the mean time caused some of his men to fill our barricoes with water, and to help our men to bear wood into their boat; and then he put on his best silk coat, and his collar of pearls, and came aboard again, and brought his present with him; and thus having more respect unto his present than to his person, because I perceived him to be vain glorious, I bade him welcome, and gave him a dish of figs; and then he declared unto me that his father was a gentleman, and that he was able to shew me pleasure, and not Gabriel, who was but a priest's son.

28. After their departure from us we weighed, and plyed all the ebb to the windwards, the wind being northerly, and towards night it waxed very stormy, so that of force we were constrained to go room with Cape St. John again, in which storm we lost our skiff at our stern that we bought at Wardhouse, and there we rode until the fourth of July. The latitude of Cape St. John is 66° 50′. And it is to be noted, that the land of Cape St. John is of height from the full sea mark, as I judge, ten fathoms, being clean without any trees growing, and also without stones or rocks, and consists only of black earth, which is so rotten, that if any of it fall into the sea, it will swim as though it were a piece of wood. In which place, about three leagues from the shore, you shall not have above nine fathom water and clay ground.

July 4. Saturday at a N. N. W. sun, the wind came at E. N. E. and then we weighed and plyed to the northwards; and as we were two leagues shot past the cape, we saw a house standing in a valley, which is dainty to be seen in those parts, and by and by I saw three men on the top of the hill: then I judged them, as it afterwards proved, that they were men which came from some other place to set traps to take vermin for their furs; which traps we did perceive very thick along the shore as we went.

5. Sunday at an E. sun, we were thwart of the creek where the Russes lay, and there came to an anchor, and perceiving the most part of the lodias to be gone, we thought it not good to tarry any longer there, but weighed and spent all the ebb plying to the windwards,

6. Monday at a south sun it was high water. All along the coast it floweth little, only a south moon makes a full sea; and as we were a weighing we espied the Russe lodias which we first lost; they came out of a creek amongst the sandy hills; which hills begin fifteen leagues N. N. E. from Cape St. John.

7. Plying this ebb to an end, we came to an anchor six leagues N. N. E. from the place where we saw the Russes come out; and there the Russes harboured themselves within a sunk bank, but there was not water enough for us.

At a north sun we weighed and plyed to the northwards, the land lying N. N. E. and S. S. W. until a south sun, and then we were in the latitude of 68° 30′; and in this latitude end those sandy hills, and the land beginneth to lie N. and by W., S. and E. and N. N. W. and to the westwards, and there the water beginneth to wax deep.

At a N. W. sun we came to an anchor within half a league of the shore, where we had good plenty of fish, both haddocks and cods, riding in ten fathom water.

8. Wednesday we weighed and plyed nearer to the headland, which is called Caninoz, the wind being at E. and by N.

9. Thursday, the wind being scant, we turned to windwards the ebb, to get about Caninoz: the latitude this day at noon was 68° 40′.

10. Friday we turned to the windwards of the ebb, but to no purpose; and as we rode at an anchor, we saw the similitude of a storm rising at N. N. W. and could not tell where to get rode nor succour for that wind, and harbour we knew none; and that land which we rode under with that wind was a lee shore. And as I was musing what was best to be done, I saw a sail come out of a creek under the foresaid Caninoz, which was my friend Gabriel, who forsook his harbour and company, and came as near us as he might, and pointed us to the eastwards, and then we weighed and followed him, and went E. and by S. the wind being at W. N. W. and very misty.

11. Saturday we went E. S. E. and followed Gabriel, and he brought us into an harbour called Margoivets, which is thirty leagues from Caninoz, and we had upon the bar going in two fathom and a fourth part; and after we were past in over the bar it waxed deeper, for we had five fathoms, four and a half, and three fathom, &c. Our bark being moored, I sent some of our men to shore to provide wood, where they had plenty of drift wood, but none growing; and in this place we found plenty of young fowl, as gulls, seapies, and others, whereof the Russes would eat none, whereof we were nothing sorry, for there came the more to our part.

12. Sunday our men cut wood on shore and brought it aboard, and we ballasted our ship with stones.

This morning Gabriel saw a smoke on the way, who rowed into it with his skiff, which smoke was two leagues from the place where we rode; and at a N. W. sun he came aboard again, and brought with him a Samoed, which was but a young man; his apparel was then strange unto us, and he presented me with three young wild geese, and one young barnacle.

13. Monday I sent a man to the main in Gabriel's boat, and he brought us aboard eight barricoes of fresh water: the latitude of the said Margiovets is 68° 20′. It floweth there at a S. S. W. moon full sea, and hieth two fathom and a half water.

14. At a W. N. W. sun we departed from this place, and went E. twenty-five leagues, and then saw an island N. and by W. of us eight leagues, which island is called Dolgoieve; and from the easternmost part of this island there lieth a sand E. and by S. seven leagues long.

15. Wednesday at a N. and by E. sun, Swetinoz was S. of us five leagues. This day at afternoon we went in over the dangerous bar of Pechora, and had upon the bar but one fathom water.

16. Thursday we rode still.

17. Friday I went on shore and observed the variation of the compass, which was 3° 30′ from the N. to the W. the latitude this day was 69° 10′.

From two or three leagues to the eastward of Swetinoz, until the entering of the river Pechora, it is all sandy hills, and towards Pechora the sandy hills are very low.

It hieth on the bar of Pechora four feet water, and it floweth there at a S. W. moon a full sea.

20. Monday at a N. and by E. sun we weighed, and came out over the said dangerous bar, where we had but five feet water, insomuch that we found a foot less water coming out than we did going in. I think the reason was because when we went in the wind was off the sea, which caused the sands to break on either side of us, and we kept in the smoothest between the breaches, which we durst not have done, except we had seen the Russes to have gone in before us; and at our coming out the wind was off the shore, and fair weather, and then the sands did not appear with breaches as at our going in: we thank God that our ship did draw so little water.

When we were a sea board the bar the wind scanted upon us, and was at E. S. E. insomuch that we stopped the ebbs, and plied all the floods to the windwards, and made our way E. N. E.

21. Tuesday at a N. W. sun, we thought that we had seen land at E. or E. and by N. of us, which afterwards proved to be a monstrous heap of ice.

Within a little more than half an hour after we first saw this ice, we were enclosed within it before we were aware of it, which was a fearful sight to see; for, for the space of six hours, it was as much as we could do to keep our ship aloof from one heap of ice, and bear roomer from another, with as much wind as we might bear acourse; and when we had passed from the danger of this ice, we lay to the eastwards close by the wind.

22. The next day we were again troubled with the ice.

23. Thursday being calm, we plied to the windwards, the wind being northerly: we had the latitude this day at noon in 70° 11′.

We had not run past two hours N. W. the wind being at N. N. E. and N. E. and by N. a good gale, but we met again with another heap of ice: we weathered the head of it, and lay a time to the seawards, and made way W. six leagues.

24. Friday at a S. E. sun we cast about to the eastwards, the wind being at N. N. E. the latitude this day at noon was 70° 15′.

25. On St. James his day, bolting to the windwards, we had the latitude at noon in 70° 20′. The same day at a S. W. sun, there was a monstrous whale aboard of us, so near to our side that we might have thrust a sword or any other weapon in him, which we durst not do for fear he should have overthrown our ship; and then I called my company together, and all of us shouted, and with the cry that we made he departed from us: there was as much above water of his back as the breadth of our pinnace, and at his falling down he made such a terrible noise in the water, that a man would greatly have marvelled, except he had known the cause of it; but God be thanked we were quietly delivered of him. And a little after we spied certain islands, with which we bare, and found good harbour in fifteen or eighteen fathom, and black oze: we came to an anchor at a N. E. sun, and named the island St. James his island, where we found fresh water.

26. Sunday much wind blowing, we rode still.

27. Monday I went on shore and took the latitude, which was 70° 42′. The variation of the compass was 7° 30′ from the N. to the W.

28. Tuesday we plied to the westwards along the shore, the wind being at N. W. and as I was about to come to anchor, we saw a sail coming about the point, whereunder we thought to have anchored; then I sent a skiff aboard of him, and at their coming aboard they took acquaintance of them, and the chief man said he had been in our company in the river Cola, and also declared unto them that we were past the way which should bring us to the Ob. This land, said he, is called Nova Zembla, that is to say, the New Land; and then he came aboard himself with his skiff, and at his coming aboard he told me the like; and said further, that in this Nova Zembla is the highest mountain in the world, as he thought, and that Camen Bolshay, which is on the main of Pechora, is not to be compared to this mountain, but I saw it not; he made me also certain demonstrations of the way to the Ob, and seemed to make haste on his own way, being very loth to tarry, because the year was far past, and his neighbour had fet Pechora, and not he; so I gave him a steel glass, two pewter spoons, and a pair of velvet sheathed knives, and then he seemed somewhat the more willing to tarry, and shewed me as much as he knew for our purpose; he also gave me seventeen wild geese, and shewed me that four of their lodias were driven per force from Caninoze to this Nova Zembla. This man's name was Loshak.

29. Wednesday, as we plied to the eastwards, we espied another sail, which was one of this Loshak's company, and we bare room and spake with him who in like sort told us of the Ob, as the other had done.

30. Thursday we plied to the eastwards, the wind being at E. N. E.

31. Friday the gale of wind began to increase, and came westerly withal, so that by a N. W. sun we were at an anchor among the islands of Vaigats, where we saw two small lodias, the one of them came aboard of us, and presented me with a great loaf of bread; and they told me that they were all of Colmogro, except one man that dwelt at Pechora, who seemed to be the chiefest among them in killing of the morse.

There were some of their company on shore which did chase a white bear over the high cliffs into the water, which bear the lodia that was aboard of us killed in our sight.

This day there was a great gale of wind at N. and we saw so much ice driving a seaboard, that it was then no going to sea.

August 1. Saturday I went ashore, and there I saw three morses that they had killed: they held one tooth of a morse, which was not great, at a roble, and one white bear skin at three robles and two robles: they further told me that there were people called Samoeds on the great island, and that they would not abide them nor us, who have no houses, but only coverings made of deers' skins, set over them with stakes: they are men expert in shooting, and have great plenty of deer.

This night there fell a cruel storm, the wind being at W.

2. Sunday we had very much wind, with plenty of snow, and we rode with two anchors a-head.

3. Monday we weighed and went room with another island, which was five leagues E. N. E. from us; and there I met again with Loshak, and went on shore with him, and he brought me to a heap of the Samoeds' idols, which were in number about three hundred, the worst and the most unartificial work that ever I saw: the eyes and mouths of sundry of them were bloody; they had the shape of men, women, and children, very grossly wrought; and that which they had made for other parts was also sprinkled with blood. Some of their idols were an old stick, with two or three notches made with a knife in it. I saw much of the footing of the said Samoeds, and of the sleds that they ride in. There was one of their sleds broken, and lay by the heap of idols;

and there I saw a deer's skin which the fowls had spoiled; and before certain of their idols blocks were made as high as their mouths, being all bloody, I thought that to be the table whereon they offered their sacrifice: I saw also the instruments whereupon they had roasted flesh, and as far as I could perceive they make their fire directly under the spit.

Loshak being there present told me that these Samoeds were not so hurtful as they of Ob are, and that they have no houses, as indeed I saw none, but only tents made of deers' skins, which they under-prop with stakes and poles: their boats are made of deers' skins, and when they come on shore they carry their boats with them upon their backs; for their carriages they have no other beasts to serve them but deer only. As for bread and corn they have none, except the Russes bring it to them: their knowledge is very base, for they know no letter.

4. Tuesday we turned for the harbour where Loshak's bark lay, whereas before we rode under an island; and there he came aboard of us, and said unto me, if God send wind and weather to serve, I will go to the Ob with you, because the morses were scant at these islands of Vaigats; but if he could not get to the river of Ob, then he said he would go to the river of Naramzay, where the people were not altogether so savage as the Samoeds of the Ob are: he shewed me that they will shoot at all men to the uttermost of their power, that cannot speak their speech.

5. Wednesday we saw a terrible heap of ice approach near unto us, and therefore we thought good with all speed possible to depart from thence, and so I returned to the westwards again, to the island where we were the thirty-first of July.

6. Thursday I went ashore and took the latitude, which was 70° 25′; and the variation of the compass was 8° from the N. to the W.

Loshak and the two small lodias of Pechora departed from this island, while I was on shore taking the latitude, and went to the southwards: I marvelled why he departed so suddenly, and went over the shoals amongst the islands, where it was impossible for us to follow them; but after I perceived them to be weatherwise.

7. Friday we rode still, the wind being at N. N. E. with a cruel storm: the ice came in so abundantly about us at both ends of the island that we rode under, that it was a fearful sight to behold: the storm continued with snow, rain, and hail plenty.

8. Saturday we rode still also, the storm being somewhat abated, but it was altogether misty, that we were not able to see a cable's length about us, the wind being at N. E. and by E.

9. Sunday, at four of the clock in the morning, we departed from this island, the wind being at S. E. and as we were clear a seaboard the small islands and shoals, it came so thick with mists that we could not see a base shot from us; then we took in all our sails to make little way.

At a S. E. sun it waxed clear, and then we set our sails, and lay close by the wind to the southwards along the islands of Vaigats. At a W. sun we took in our sail again, because of the great mist and rain. We sounded at this place, and had five-and-twenty fathoms water, and soft black oze, being three leagues from the shore, the wind being at S. and by E. but still misty.

10. Monday at an E. sun we sounded, and had forty fathoms, and oze, still misty. At noon we sounded again, and had thirty-six fathom, still misty.

11. Tuesday at an E. N. E. sun we let fall our anchor in three-and-twenty fathom, the mist still continuing.

12. Wednesday, at three of the clock in the morning, the mist brake up, the wind being at N. E. and by E. and then we saw part of the islands of Vaigats, which we bare withal, and went E. S. E. close by the wind: at a W. sun we were at an anchor under

the S. W. part of the said Vaigats, and then I sent our skiff to shore with three men in her, to see if they might speak with any of the Samoeds, but could not: all that day was rainy but not windy.

13. Thursday the wind came westerly, so that we were fain to seek us another place to ride in, because the wind came a sea board land, and although it were misty, yet we followed the shore by our lead: and as we brought land in the wind of us, we let fall our anchor. At a W. sun the mist brake up so that we might see about us, and then we might perceive that we were entered into a sound.

This afternoon we took in two or three skiffs' lading of stones to ballast our ship withal. It hieth here four feet water, and floweth by fits uncertain to be judged.

14. Friday we rode still in the sound, the wind at S. W. with very much rain, and at the end of the rain it waxed again misty.

15. Saturday there was much wind at W. and much rain, and then again misty.

16. Sunday was very misty, and much wind.

17. Monday very misty, the wind at W. N. W.

18. Tuesday was also misty, except at noon: then the sun brake out through the mist, so that we had the latitude in 70° 10′: the afternoon was misty again, the wind being at W. N. W.

19. Wednesday at three of the clock afternoon the mist brake up, and the wind came at E. N. E. and then we weighed, and went S. and by E. until seven of the clock eight leagues, thinking to have had sight of the sandy hills that are to the eastwards of the river Pechora. At a N. W. sun we took in our mainsail, because the wind increased, and went with a foresail W. N. W. the wind being at E. N. E. at night there grew so terrible a storm, that we saw not the like, although we had endured many storms since we came out of England. It was wonderful that our bark was able to brook such monstrous and terrible seas, without the great help of God, who never faileth them at need, that put their sure trust in him.

20. Thursday at a S. S. W. sun, thanks be to God, the storm was at the highest, and then the wind began to slack, and came northerly withal, and then I reckoned the westermost point of the river Pechora to be S. of us fifteen leagues. At a W. S. W. sun we set our mainsail, and lay close by the wind, the wind being at N. W. and by N. making but little way, because the billow went so high: at midnight we cast about, and the ship caped N. N. E. making little way.

21. Friday at noon we had the latitude in 70° 8′, and we sounded and had twenty-nine fathoms sand, and in manner streamy ground. At a W. sun we cast about to the westwards, and a little after the wind came up at W.

22. Saturday was calm: the latitude this day at noon was 70° 20′, we sounded here, and had nine-and-forty fathom and oze, which oze signified that we drew towards Nova Zembla.

And thus we being out of all hope to discover any more to the eastward this year, we thought it best to return, and that for three causes.

The first the continual N. E. and northerly winds, which have more power after a man is past to the eastwards of Caninoze, than in any place that I do know in these northerly regions.

Second, because of great and terrible abundance of ice which we saw with our eyes, and we doubt greater store abideth in those parts: I adventured already somewhat too far in it, but I thank God for my safe deliverance from it.

Third, because the nights waxed dark, and the winter began to draw on with his storms: and therefore I resolved to take the first best wind that God should send, and

ply towards the bay of St. Nicholas, and to see if we might do any good there, if God would permit it.

This present Saturday we saw very much ice, and were within two or three leagues of it: it shewed unto us as though it had been a firm land as far as we might see from N. W. off us to the eastwards: and this afternoon the Lord sent us a little gale of wind at S. so that we bare clear of the westermost part of it, thanks be to God. And then against night, it waxed calm again, and the wind was at S. W. we made our way until Sunday noon N. W. and by W. and then we had the latitude in 70° 30′, the wind at S. W. there was a billow so that we could not discern to take the latitude exactly, but by a reasonable guess.

24. Monday there was a pretty gale of wind at S. so that we went W. and by S. the latitude this day at noon was 70° 10′: we had little wind all day: at a W. N. W. sun we sounded, and had twenty-nine fathoms black sandy oze, and then we were N. E. five leagues from the N. E. part of the island Colgoieve.

25. Tuesday the wind all westerly we plied to the windwards.

26. Wednesday the wind was all westerly, and calm: we had the latitude this day in 70° 10′, we being within three leagues of the north part of the island Colgoieve.

27. Thursday we went room about the westermost part of the island, seeking where we might find a place to ride in for a N. W. wind, but could find none, and then we cast about again to the seawards, and the wind came at W. S. W. and this morning we had plenty of snow.

28. Friday, the wind being at S. W. and by W. we plied to the windwards.

29. Saturday, the wind being at S. we plied to the westwards, and at afternoon the mist brake up and then we might see the land seven or eight leagues to the eastward of Caninoze: we sounded a little before, and had thirty-five fathoms and oze. And a while after we sounded again, and had nineteen fathom and sand: then we were within three leagues and a half of the shore, and towards night there came down so much wind, that we were fain to bring our ship atrie, and laid her head to the westwards.

30. Sunday, the wind became more calm, and then it waxed very misty: at noon we cast about to the eastwards, the wind being at S. and ran eight hours on that board, and then we cast about and caped W. S. W. we sounded and had thirty-two fathoms, and tough oze like clay.

31. Monday, we doubled about Caninoze, and came at an anchor there, to the intent we might kill some fish, if God would permit it, and there we gat a great nuse, which nuses were there so plenty, that they would scarcely suffer any other fish to come near the hooks: the said nuses carried away sundry of our hooks and leads.

A little after at a W. sun, the wind began to blow stormy at W. S. W. so that we were fain to weigh and forsake our fishing ground, and went close by the wind S. W. and S. W. and by W. making our way S. S. W.

September 1. Tuesday at a W. sun, we sounded and had twenty fathoms, and broken wilkeshells: I reckoned Caninoze to be twenty-four leagues N. N. E. from us.

11. The eleventh day we arrived at Colmogro, and there we wintered, expecting the approach of next summer to proceed farther in our intended discovery for the Ob: which (by reason of our employments to Wardhouse the next spring for the search of some English ships) was not accordingly performed.

Certain notes unperfectly written by Richard Johnson, servant to master Richard Chancelor, which was in the discovery of Vaigatz and Nova Zembla, with Stephen Burrough in the Serchthrift, 1556, *and afterward among the Samoeds, whose devilish rites he describeth.*

FIRST, after we departed out of England we fell with Norway, and on that coast lieth Northbern or Northbergin, and this people are under the king of Denmark: but they differ in their speech from the Danes, for they speak Norsh. And north of Northbern lie the isles of Rost and Lofoot, and these islands pertain unto Finmark, and they keep the laws and speak the language of the islanders. And at the eastermost part of that land is a castle which is called the Wardhouse, and the king of Denmark doth fortify it with men of war: and the Russes may not go to the westward of that castle. And E. S. E. from that castle is a land called Lappia: in which land be two manner of people, that is to say, the Lappians, and the Scrickfinns, which Scrickfinns are a wild people, which neither know God, nor yet good order: and these people live in tents made of deer skins: and they have no certain habitations, but continue in herds and companies by one hundred and two hundreds. And they are a people of small stature, and are clothed in deers' skins, and drink nothing but water, and eat no bread but flesh all raw. And the Lappians be a people adjoining to them, and be much like to them in all conditions, but the emperor of Russia hath of late overcome many of them, and they are in subjection to him. And this people will say that they believe in the Russes' God. And they live in tents as the other do. And S. E. and by S. from Lappia, lieth a province called Corelia, and these people are called Kerilli. And S. S. E. from Corelia lieth a country called Novogardia. And these three nations are under the emperor of Russia, and the Russes keep the law of the Greeks in their churches, and write somewhat like as the Greeks write, and they speak their own language, and they abhor the Latin tongue, neither have they to do with the pope of Rome, and they hold it not good to worship any carved image, yet they will worship painted images on tables or boards. And in Russia their churches, steeples and houses are all of wood: and their ships that they have are sowed with withes and have no nails. The Kerilles, Russians and Moscovians be much alike in all conditions. And S. from the Moscovians lie the Tartarians, which be Mahometans, and live in tents and waggons, and keep in herds and companies: and they hold it not good to abide long in one place, for they will say, when they will curse any of their children, I would thou mightest tarry so long in a place that thou mightest smell thine own dung, as the christians do: and this is the greatest curse that they have. And E. N. E. of Russia lieth Lampas, which is a place where the Russes, Tartars and Samoeds meet twice a year, and make the fair to barter wares for wares. And N. E. from Lampas lieth the country of the Somoeds, which be about the river of Pechere, and these Samoeds be in subjection to the emperor of Russia, and they lie in tents made of deer skins, and they use much witchcraft, and shoot well in bows. And N. E. from the river Pechere lieth Vaigatz, and there are the wild Samoeds, which will not suffer the Russes to land out of the sea, but they will kill them and eat them, as we are told by the Russes: and they live in herds, and have all their carriages with deer, for they have no horses. Beyond Vaigatz lieth a land called Nova Zembla, which is a great land, but we saw no people, and there we had fowl enough, and there we saw white foxes and white bears. And the said Samoeds which are about the banks of Pechere, which are in subjection to the empe-

ror of Russia, when they will remove from one place to another, then they will make sacrifices in manner following. Every kindred doth sacrifice in their own tent, and he that is most ancient is their priest. And first the priest doth begin to play upon a thing like to a great sieve, with a skin on the one end like a drum: and the stick that he playeth with is about a span long, and one end is round like a ball, covered with the skin of an hart. Also the priest hath upon his head a thing of white like a garland, and his face is covered with a piece of a shirt of mail, with many small ribs, and teeth of fishes and wild beasts hanging on the same mail. Then he singeth, as we use here in England to hallow, whope, or shout at hounds, and the rest of the company answer him with this owtis, *igha*, *igha*, *igha*, and then the priest replieth again with his voices. And they answer him with the self-same words so many times, that in the end he becometh as it were mad, and falling down as he were dead, having nothing on him but a shirt, lying upon his back I might perceive him to breathe. I asked them why he lay so, and they answered me, now doth our God tell him what we shall do, and whither we shall go. And when he had lain still a little while, they cried thus three times together, *oghao*, *oghao*, *oghao*, and as they use these three calls he riseth with his head and lieth down again, and then he rose up and sang with like voices as he did before: and his audience answered him *igha*, *igha*, *igha*. Then he commanded them to kill five olens, or great deer, and continued singing still, both he and they, as before. Then he took a sword, of a cubit and a span long (I did mete it myself) and put it into his belly halfway, and sometime less, but no wound was to be seen (they continuing in their sweet song still.) Then he put the sword into the fire till it was warm, and so thrust it into the slit of his shirt, and thrust it through his body, as I thought, in at his navel, and out at his fundament: the point being out of his shirt behind, I laid my finger upon it, then he pulled out the sword and sat down. This being done, they set a kettle of water over the fire to heat, and when the water doth seeth, the priest beginneth to sing again, they answering him, for so long as the water was in heating they sat and sang not. Then they made a thing, being four square, and in height and squareness of a chair, and covered with a gown, very close, the forepart thereof, for the hinder part stood to the tent's side. Their tents are round, and are called *chome* in their language. The water still seething on the fire, and this square seat being ready, the priest put off his shirt, and the thing like a garland which was on his head, with those things which covered his face, and he had on yet all this while a pair of hosen of deers' skins with the hair on, which came up to his buttocks. So he went into the square seat, and sat down like a taylor, and sang with a strong voice or hallowing. Then they took a small line made of deers' skins, of four fathoms long, and with a small knot the priest made it fast about his neck, and under his left arm, and gave it unto two men standing on both sides of him, which held the ends together. Then the kettle of hot water was set before him in the square seat, all this time the square seat was not covered, and then it was covered with a gown of broadcloth, without lining, such as the Russes do wear. Then the two men which did hold the ends of the line, still standing there, began to draw, and drew till they had drawn the ends of the line stiff and together, and then I heard a thing fall into the kettle of water, which was before him in the tent. Thereupon I asked them that sat by me what it was that fell into the water that stood before him. And they answered me that it was his head, his shoulder, and left arm, which the line had cut off, I mean the knot which I saw afterward drawn hard together. Then I rose up, and would have looked whether it were so or not, but they laid hold on me, and said, that if they should see him with their bodily eyes, they should live no longer. And the most part of them can speak the Russe tongue to be understood;

and they took me to be a Russian. Then they began to hallow with these words, *oghaoo oghaoo*, *oghaoo*, many times together. And as they were thus singing and out-calling, I saw a thing like a finger of a man two times together thrust through the gown from the priest. I asked them that sat next to me what it was that I saw, and they said not his finger; for he was yet dead: and that which I saw appear through the gown was a beast, but what beast they knew not nor would not tell. And I looked upon the gown, and there was no hole to be seen: and then at the last the priest lifted up his head with his shoulder and arm, and all his body, and came forth to the fire. Thus far of their service which I saw during the space of certain hours: but how they do worship their idols that I saw not: for they put up their stuff for to remove from that place where they lay. And I went to him that served the priest, and asked him what their God said to him when he lay as dead. He answered that his own people doth not know, neither is it for them to know: for they must do as he commanded. This I saw the fifth day of January in the year of our Lord 1556, after the English account.

OF THE PERMIANS, SAMOITES, AND LAPPES.

(HAKLUYT I. 491.)

THE Permians and Samoietes that lye from Russia, N. and N. E. are thought likewise to have taken their beginning from the Tartar kind. And it may partly be guessed by the fashion of their countenance, as having all broad and flat faces, as the Tartars have, except the Chircasses. The Permians are accounted for a very ancient people. They are now subject to the Russe. They live by hunting and trading with their furs, as also doth the Samoit, that dwelleth more towards the North Sea. The Samoit hath his name (as the Russe saith) of eating himself: as if in times past they lived as the cannibals, eating one another. Which they make more probable, because at this time they eat all kind of raw flesh, whatsoever it be, even the very carrion that lieth in the ditch. But as the Samoits themselves will say, they were called Samoie, that is, of themselves, as though they were indigene, or people bred upon that very soil, that never changed their seat from one place to another, as most nations have done. They are subject at this time to the emperor of Russia.

I talked with certain of them, and find that they acknowledge one God: but represent him by such things as they have most use and good by. And therefore they worship the sun, the ollen, the losh, and such like. As for the story of Slata Baba, or the golden hag (which I have read in some maps, and descriptions of these countries, to be an idol after the form of an old woman) that being demanded by the priest, giveth them certain oracles, concerning the success and event of things, I found to be a very fable. Only in the province of Obdoria upon the sea side, near to the mouth of the great river Obba, there is a rock, which naturally (being somewhat helped by imagination) may seem to bear the shape of a ragged woman, with a child in her arms (as the rock by the North Cape the shape of a friar) where the Obdorian Samoites use much to resort, by reason of the commodity of the place for fishing: and there sometime (as their manner is) conceive and practise their sorceries, and ominous conjecturings about the good or bad speed of their journies, fishings, huntings, and such like.

They are clad in seal skins, with the hair side outwards, down as low as the knees, with their breeches and netherstocks of the same, both men and women. They are all black haired, naturally beardless. And therefore the men are hardly discerned from the women by their looks: save that the women wear a lock of hair down along both

their ears. They live in a manner a wild and savage life, roving still from one place of the country to another, without any property of house or land more to one than to another. Their leader or director in every company is their papa, or priest.

On the north side of Russia, next to Corelia, lieth the country of Lappia, which reacheth in length from the farthest point northward (towards the North Cape) to the farthest part S. E. (which the Russe calleth Sweetnesse, or Holy Nose, the Englishmen Cape Grace) about three hundred and forty-five verst, or miles. From Sweetnesse to Candelox, by the way of Versega (which measureth the breadth of that country) is ninety miles or thereabouts. The whole country in a manner is either lakes or mountains, which, towards the sea side, are called Tondro, because they are all of hard and craggy rock, but the inland parts are well furnished with woods, that grow on the hills' sides, the lakes lying between. Their diet is very bare and simple. Bread they have none, but feed only upon fish and fowl. They are subject to the emperor of Russia, and the two kings of Sweden and Denmark: which all exact tribute and custom of them (as was said before) but the emperor of Russia beareth the greatest hand over them, and exacteth of them far more than the rest. The opinion is that they were first termed Lappes of their brief and short speech. The Russe divideth the whole nation of the Lappes into two sorts. The one they call Nowremanskoy Lapary, that is the Norwegian Lappes, because they be of the Danish religion. For the Danes and Norwegians they account for one people. The other, that have no religion at all, but live as brute and heathenish people, without God in the world, they call Dikoy Lapary, or the wild Lappes.

The whole nation is utterly unlearned, having not so much as the use of any alphabet, or letter among them. For practice of witchcraft and sorcery they pass all nations in the world. Though for enchanting of ships that sail along their coast (as I have heard it reported) and their giving of winds good to their friends, and contrary to other, whom they mean to hurt, by tying of certain knots upon a rope (somewhat like to the tale of Eolus his windbag) is a very fable, devised (as may seem) by themselves, to terrify sailors for coming near their coast. Their weapons are the long bow, and hand gun, wherein they excel, as well for quickness to charge and discharge, as for nearness at the mark, by reason of their continual practice (whereto they are forced) of shooting at wild fowl. Their manner is in summer time to come down in great companies to the sea side, to Wardhuyse, Cola, Kegor, and the bay of Vedagoba, and there to fish for cod, salmon, and but-fish, which they sell to the Russes, Danes, and Norwegians, and now of late to the Englishmen that trade thither with cloth, which they exchange with the Laps and Corelians for their fish, oil, and furs, whereof also they have some store. They hold their mart at Cola, on St. Peter's day: what time the captain of Wardhuyse (that is resiant there for the king of Denmark) must be present, or at least send his deputy, to set prices upon their stock fish, train oil, furs, and other commodities: as also the Russe emperor's customer, or tribute taker, to receive his custom, which is ever paid before any thing can be bought or sold. When their fishing is done, their manner is to draw their carbasses or boats on shore, and there to leave them, with the keel turned upwards, till the next spring tide. Their travel to and fro is upon sleds, drawn by the olen deer: which they use to turn a grazing all the summer time, in an island called Kildyn (of a very good soil compared with other parts of that country) and towards the winter time, when the snow beginneth to fall, they fetch them home again for the use of their sled.

A learned epistle, written in 1581, *unto the famous cosmographer, M. Gerard Mercator, concerning the river Pechora, Naramsay, Carareca, the mighty river of Ob, the place of Yaks Olgush, in Siberia, the great river Ardoh, the lake of Kittay, called of the borderers Paraha, the country of Carrah Colmak, giving good light to the discovery of the north east passage to Cathay, China, and the Malucaes.*

(HAKLUYT I. 309.)

To the famous and renowned Gerard Mercator, his reverend and singular friend at Duisburgh in Cliveland, these be delivered.

CALLING to remembrance (most dear friend) what exceeding delight you took at our being together, in reading the geographical writings of Homer, Strabo, Aristotle, Pliny, Dion, and the rest, I rejoiced not a little that I happened upon such a messenger as the bearer of these presents (whom I do especially recommend unto you) who arrived lately here at Arusburg, upon the river of Osella. This man's experience (as I am of opinion) will greatly avail you to the knowledge of a certain matter which hath been by you so vehemently desired, and so curiously laboured for, and concerning the which the late cosmographers do hold such variety of opinions: namely, of the discovery of the huge promontory of Tabin, and of the famous and rich countries subject to the emperor of Cathay, and that by the N. E. ocean sea. The man is called Alferius, being by birth a Netherlander, who for certain years lived captive in the dominions of Russia, under two famous men, Yacovius and Unekius, by whom he was sent to Antwerp to procure skilful pilots and mariners (by propounding liberal rewards) to go unto the two famous personages aforesaid, which two had set a Sweden shipwright on work to build two ships for the same discovery, upon the river of Dwina. The passage unto Cathay by the N. E. (as he declareth the matter, albeit without art, yet very aptly, as you may well perceive, which I request you diligently to consider) is without doubt very short and easy. This very man himself hath travelled to the river of Ob, both by land, through the countries of the Samoeds, and of Sibier, and also by sea, along the coast of the river Pechora eastward. Being encouraged by this his experience, he is fully resolved with himself to conduct a bark laden with merchandise (the keel whereof he will not have to draw over much water) to the bay of St. Nicholas, in Russia, being furnished with all things expedient for such a discovery, and with a new supply of victuals at his arrival there, and also to hire into his company certain Russes best known unto himself, who can perfectly speak the Samoeds' language, and are acquainted with the river of Ob, as having frequented those places year by year.

Whereupon, about the end of May, he is determined to sail from the bay of St. Nicholas eastward, by the main of Joughoria, and so to the easterly parts of Pechora, and to the island which is called Dolgoia. And here also he is purposed to observe the latitudes, to survey and describe the country, to sound the depth of the sea, and to note the distances of places, where, and so oft, as occasion shall be offered. And forasmuch as the bay of Pechora is a most convenient place both for harbour and victual, as well in their going forth as in their return home, in regard of ice and tempest, he is determined to bestow a day in sounding the flats, and in searching out the best entrance for ships: in which place heretofore he found the water to be but five feet deep, howbeit he doubteth not but that there are deeper channels: and then he intendeth to proceed on

along those coasts for the space of three or four leagues, leaving the island called Vaigats almost in the middle way between Ugoria and Nova Zembla, then also to pass by a certain bay between Vaigats and Ob, trending southerly into the land of Ugoria, whereinto fall two small rivers, called Marmesia and Carah, upon the which rivers do inhabit another barbarous and savage nation of the Samoeds. He found many flats in that tract of land, and many cataracts or overfalls of water, yet such as he was able to sail by. When he shall come to the river of Ob, which river (as the Samoeds report) hath seventy mouths, which by reason of the huge breadth thereof, containing many and great islands, which are inhabited with sundry sorts of people, no man scarcely can well discover, because he will not spend too much time, he purposeth to search three or four at the most of the mouths thereof, those chiefly which shall be thought most commodious by the advice of the inhabitants, of whom he meaneth to have certain with him in his voyage, and meaneth to employ three or four boats of that country in search of these mouths, as near as possibly he can to the shore, which within three days' journey of the sea is inhabited, that he may learn where the river is best navigable. If it so fall out that he may sail up the river Ob against the stream, and mount up to that place which heretofore, accompanied with certain of his friends, he passed unto by land, through the country of Siberia, which is about twelve days' journey from the sea, where the river Ob falleth into the sea, which place is in the continent, near the river Ob, and is called Yaks Olgush, borrowing his name from that mighty river which falleth into the river Ob, then doubtless he would conceive full hope that he had passed the greatest difficulties: for the people dwelling thereabout report, which were three days sailing only from that place beyond the river Ob, whereby the breadth thereof may be gathered (which is a rare matter there, because that many rowing with their boats of leather one day's journey only from the shore have been cast away in tempest, having no skill to guide themselves neither by sun nor star) that they have seen great vessels laden with rich and precious merchandise brought down that great river by black or swart people. They call that river Ardoh, which falleth into the lake of Kittay, which they call Paraha, whereupon bordereth that mighty and large nation which they call Carrah Colmak, which is none other than the nation of Cathay. There, if need require, he may fitly winter and refresh himself and his, and seek all things which he shall stand in need of: which if it so fall out, he doubteth not but in the mean while he shall be much furthered in searching and learning out many things in that place. Howbeit, he hopeth that he shall reach to Cathay that very summer, unless he be hindered by great abundance of ice at the mouth of the river of Ob, which is sometimes more and sometimes less. If it so fall out, he then purposeth to return to Pechora, and there to winter: or if he cannot do so neither, then he meaneth to return to the river of Dwina, whither he will reach in good time enough, and so the next spring following to proceed on his voyage. One thing in due place I forgat before.

The people which dwell at that place called Yaks Olgush affirm that they have heard their forefathers say, that they have heard most sweet harmony of bells in the lake of Kittay, and that they have seen therein stately and large buildings: and when they make mention of the people named Carrah Colmak (this country is Cathay) they fetch deep sighs, and holding up their hands, they look up to Heaven, signifying, as it were, and declaring the notable glory and magnificence of that nation. I would this Oliver were better seen in cosmography, it would greatly further his experience, which doubtless is very great. Most dear friend, I omit many things, and I wish you should hear the man himself, which promised me faithfully that he would visit you in his

way at Duisburg, for he desireth to confer with you, and doubtless you shall very much further the man. He seemeth sufficiently furnished with money and friends, wherein, and in other offices of courtesy, I offered him my furtherance, if it had pleased him to have used me. The Lord prosper the man's desires and forwardness, bless his good beginnings, further his proceedings, and grant unto him most happy issue. Fare you well, good sir, and my singular friend. From Arusburg, upon the river of Osella, the twentieth of February, 1581.

Your's wholly at commandment,

JOHN BALAK.

The letter of Gerard Mercator, written to M. Richard Hakluyt, of Oxford, touching the intended discovery of the north east passage. Anno 1580.*

(HACKLUYT, VOL. I. P. 444.)

[Translated from the Latin.]

SIR, I received your letters the nineteenth of June: it grieved me much that upon the sight of them, the time being spent, I could not give any convenient instructions: I wish Arthur Pet had been informed before his departure of some special points. The voyage to Cathaio by the east is doubtless very easy and short, and I have oftentimes marvelled, that being so happily begun, it hath been left off, and the course changed into the west, after that more than half of your voyage was discovered. For beyond the island of Vaigats and Nova Zembla, there followeth presently a great bay, which on the left side is enclosed with the mighty promontory Tabin.† Into the midst hereof there fall great rivers, which passing through the whole country of Serica, and being, as I think, navigable with great vessels into the heart of the continent, may be an easy means whereby to traffic for all manner of merchandise, and transport them out of Cathaio, Mangi, Mien, and other kingdoms thereabout, into England. But considering with myself that that navigation was not intermitted, but upon great occasion, I thought that the emperor of Russia and Moscovy had hindered the proceeding thereof. If so be that with his grace and favour a further navigation may be made, I would counsel them certainly not first to seek out the promontory Tabin, but to search this bay and rivers aforesaid, and in them to pick and choose out some convenient port and harbour for the English merchants, from whence afterward, with more opportunity and less peril, the promontory Tabin and all the coast of Cathaio may be discovered. And that there is such a huge promontory called Tabin, I am certainly persuaded, not only out of Pliny, but also other writers, and some maps (though somewhat rudely drawn:) and that the pole of the loadstone is not far beyond Tabin, I have learned by the certain observations of the loadstone; about which pole and Tabin I think there are very many rocks, and very hard and dangerous sailing: and yet a more hard and difficile passage I think it to be this way which is now attempted by the west, for it is nearer to the pole of the loadstone, to the which I think it not safe to approach. And because the loadstone hath another pole than that of the world, to the which from all parts it

* In the original, this letter follows some instructions for navigators, by M. Richard Hakluyt, of Eiton, in the county of Hereford, esquire, anno 1580. Was this gentleman the father of our editor?

† This absurd theory is founded upon a misapprehension of the ancient geography.

hath a respect, the nearer you come unto it, the more the needle of the compass doth vary from the north, sometimes to the west, and sometimes to the east, according as a man is to the eastward or to the westward of that meridian that passeth by both the poles of the magnet and the world.

This is a strange alteration, and very apt to deceive the sailor, unless he know the unconstancy and variation of the compass, and take the elevation of the pole sometimes with his instruments. If Master Arthur be not well provided in this behalf, or of such dexterity, that perceiving the errors he be not able to correct the same, I fear lest in wandering up and down he lose his time, and be overtaken with the ice in the midst of the enterprise. For that gulf, as they say, is frozen every year very hard. Which if it be so, the best counsel I could give for their best safety were to seek some harbour in that bay, and those rivers whereof I have spoken, and by some ambassador to make friendship and acquaintance with the great Can, in the name of the queen's majesty, which I believe will be grateful to the mightiest emperor in the world, yea most excellent for the length of the traffic, and great distance of the places. I think from the mouths of the mighty rivers Bautisus and Oechardus to Cambalu, the chiefest seat of the prince the Can, there are not past three hundred German miles, and to pass by Ezina, a city of the kingdom of Tangut, which seemeth to be but one hundred German miles from the mouths of the said rivers, and is subject to the great Can.

I would gladly know how high the sea doth flow commonly in the port of Moscovia, where your men do harbour, and in other easterly places unto Tabin; and also whether the sea in this strait do flow always one way to the E. or to the W. or whether it do ebb and flow according to the manner of the tides in the middle of the channel, that is to say, whether it flow there six hours into the W. and as many back again to the E. for hereupon depend other speculations of importance. I would wish M. Frobisher to observe the same westwards. Concerning the gulf of Merosro and Canada, and New France, which are in my maps, they were taken out of a certain sea card drawn by a certain priest out of the description of a Frenchman, a pilot very skilful in those parts, and presented to the worthy prince George of Austria, bishop of Liege: for the trending of the coast, and the elevation of the pole, I doubt not but they are very near the truth: for the chart had, beside a scale of degrees of latitude passing through the midst of it, another particularly annexed to the coast of New France, wherewith the error of the latitudes committed by reason of the variation of the compass might be corrected. The history of the voyage of Jacobus Onoyen Buschedu-censis* throughout all Asia, Africa, and the north, was lent me in time past by a friend of mine at Antwerp. After I had used it, I restored it again: after many years I required it again of my friend, but he had forgotten of whom he had borrowed it. The writings of Gulielmus Tripolitanus, and Joanes de Plano Carpini, I never saw: only I found certain pieces of them in other written hand books. I am glad the epitome of Abilfada is translated, I would we might nave it shortly.

Thus much, sir, I thought good to answer your letters: if there be any thing else that you would require of me, I will most willingly communicate it with you, craving this likewise of your courtesy, that whatsoever observations of both these voyages shall come to your hands, you would impart them to me, they shall all remain with me according to your discretion and pleasure, and whatsoever I gather of them, I will faithfully signify unto you by letters, if happily they may yield any help or light unto this most excellent enterprise of navigation, and most profitable to our christian common-

* Of Bois le Duc.

wealth. Fare you well, most learned friend. At Duisburg in Cliveland, twenty-eighth of July, the year 1580.

At Arthur his return, I pray you learn of him the things I have requested, and whether any where in his voyage he found the sea fresh, or not very salt; for I suppose the sea between Nova Zembla and Tabin to be fresh.

Yours wholly to my power to be commanded,

GERARD MERCATOR.

The discovery made by M. Arthur Pet and M. Charles Jackman of the north-east parts, beyond the Island of Vaigatz, with two barks; the one called the George, the other the William, in the year 1580.* *Written by Hugh Smith.*

(FROM HAKLUYT, VOL. I. P. 445.)

UPON Monday the thirtieth of May we departed from Harwich in the afternoon, the wind being at S. and to the eastward. The ebb being spent we could not double the pole, and therefore were constrained to put in again until the next day in the morning, being the last of May; which day we weighed our anchors about three o'clock in the morning, the wind being W. S. W. The same day we passed Orfordnesse at an east sun, and Stamford at a west sun, and Yarmouth at a W. N. W. sun, and so to Winterton, where we did anchor all night; it was then calm, and the flood was come.

The next day, being the first of June, we set sail at three o'clock in the morning, and set our course north, the wind at the S. W. and at S. S. W.

The tenth day, about one of the clock in the afternoon, we put into Norway, to a place where one of the headlands of the sound is called Bottel; the other headland is called Moile. There is also an island called Kene. Here I did find the pole to be elevated 62°: it doth flow there S. and it hieth seven or eight feet, not above.

The eleventh day in the morning the wind came to the S. and to the S. E. the same day at six in the afternoon we set sail and bare along the coast; it was very foul weather, with rain and fog.

The twenty-second day, the wind being at W. we did hall the coast E. N. E. and E. The same day, at six in the morning, we did double the North Cape. About three in the afternoon we passed Skitesbeareness, and hald along the coast E. and E. S. E. and all the same night we hald S. E. and S. E. by E.

The twenty-third day, about three in the morning, we came to Wardhouse, the wind at the N. W. The cause of our coming in was to seek the William, whose company we lost the sixth day of this month, and to send letters into England. About one of the clock in the afternoon the William also came into Wardhouse to us in good safety, and all her company in good health.

The twenty-fourth the wind came to the E. N. E. This day the William was hald aground, because she was somewhat leaky, and to mend her steerage. This night, about twelve of the clock, she did hale afloat again.

The twenty-fifth day the wind was at E. N. E.

* This narrative is inserted, though somewhat prolix, as the voyage was of great expectation, and the navigators had the merit of making a most obstinate and persevering attempt for a north-east passage to China.

The twenty-sixth day the Toby of Harwich departed from Wardhouse for London, Thomas Green being master, to whom we delivered our letters.

The twenty-seventh day the wind was at S. S. E. and the twenty-eighth also.

The twenty-ninth day, about six in the afternoon, the wind came to the W. N. W. for the space of one hour, and presently to the E. again, and so was variable all the same night.

The thirtieth, about six in the morning, the wind came to E. S. E. and continued so all the same day.

The first of July, about five in the afternoon, the wind was at N. N. W. and about seven of the clock we set sail from Wardhouse E. and by S.

The second day, about five in the morning, the wind was E. and E. S. E. and we did lie to the shorewards; and about ten in the morning the wind came to S. S. E. and we laid it to the eastwards; sometimes we lay E. by S. sometimes E. S. E. and sometimes E. by N. About five in the afternoon we bare with the William, who was willing to go with Kegor, because we thought her to be out of trie, and sailed very ill, where we might mend her steerage; whereupon Master Pet, not willing to go into harbour, said to Master Jackman, that if he thought himself not able to keep the sea, he should do as he thought best, and that he in the mean time would bear with Willoughby's land, for that it was a parcel of our direction, and would meet him at Verove Ostrove, or Vaigats, and so we set our course E. N. E. the wind being at S. E.

The third day the wind at S. E. we found the pole to be elevated 70° 46′. The same night at twelve of the clock we sounded, but had no ground, in one hundred and twenty fathoms, being fifty leagues from the one side by our reckoning E. N. E. from Kegor.

The fourth day all the morning was calm. This day we found the pole to be elevated 71° 38′. This day, at nine in the afternoon, the wind at N. E. with a gentle gale, we hald along S. E. by E.

The fifth day, the wind at N. W. we hald E. and E. by S. This day we saw land, but we could not make it, the wind being northerly, so that we could not come near to it.

The sixth day, about two in the afternoon, the wind at N. N. W. we hald E. S. E. with a fair and gentle gale. This day we met with ice. About six in the afternoon it became calm; we with sail and oars laid it to the N. E. part, hoping that way to clear us of it: for that way we did see the head part of it, as we thought; which done, about twelve of the clock at night we gat clear of it: we did think it to be ice of the bay of St. Nicholas, but it was not, as we found afterwards.

The seventh day we met with more ice, at the east part of the other ice: we hald along a-weather the ice to find some end thereof by E. N. E. This day there appeared more land north from us, being perfect land: the ice was between us and it, so that we could not come nearer to it.

The same morning, at six of the clock, we put into the ice to find some way through it; we continued in it all the same day, and all the night following, the wind by the N. N. W. we were constrained to go many points of our compass, but we went most an easterly course.

The eighth day, the wind at N. N. W. we continued our course, and at five in the morning we sounded, and had ninety fathoms red oze. This day, at four in the afternoon, we sounded again, and had eighty-four fathoms oze, as before. At six in the afternoon we cleared ourselves of the ice, and hald along S. E. by S. we sounded again at ten o'clock at night, and had forty-three fathom sandy oze.

The ninth day, at two in the morning, we sounded again, and had forty-five fathoms,

then there appeared a shadow of land to us E. N. E. and so we ran with it the space of two hours, and then perceiving that it was but fog, we hald along S. E.

This day, at two in the afternoon, we sounded, and had fifty fathoms black oze; our latitude was 70° 3′. At ten o'clock at night we sounded again, and had fifty fathoms black oze.

The tenth day, the wind being at N. N. W. we hald E. and by N. which course we set, because at ten of the clock aforenoon we did see land, and then we sounded, having thirty-five fathoms black oze. All this day there was a great fog, so that we durst not bear with the land to make it, and so we kept an outwardly course. This day, at six in the afternoon, we espied land, wherewith we hald, and then it grew calm; we sounded, and had one hundred and twenty fathoms black oze; and then we sent our boat a-land to sound and prove the land. The same night we came with our ship within an island, where we rode all the same night. The same night we went into a bay to ride near the land for wood and water.

The eleventh day the wind came to the E. S. E. This day, about a league from us to the eastwards, we saw a very fair sound or river that past very far into the country, with two or three branches, with an island in the midst.

The twelfth of July the wind was E. S. E. This day, about eleven o'clock in the morning, there came a great white bear down to the water side, and took the water of his own accord; we chased him with our boat, but for all that we could do he got to land and escaped from us, where we named the bay Bearbay. This day, at seven in the afternoon, we set sail, for we had good hope that the wind would come westerly, and with sail and oars we gat the sea. All the night it was calm with fog.

The thirteenth day in the morning the wind was very variable with fog, and as it cleared up we met with great store of ice, which at the first shewed like land: this ice did us much trouble, and the more because of the fog, which continued until the fourteenth day twelve of the clock.

The fourteenth day in the morning we were so imbayed with ice, that we were constrained to come out as we went in, which was by great good fortune, or rather by the goodness of God, otherwise it had been impossible; and at twelve of the clock we were clear of it, the wind being at S. and S. by W. The same day we found the pole to be elevated 70° 26′: we lay along the coast N. W. thinking it to be an island; but finding no end in rowing so long, we supposed it to be the main of Nova Zembla. About two in the afternoon we laid it to the southward to double the ice, which we could not do upon that board, so that we cast about again and lay W. along under the ice. About seven in the afternoon we got about the greatest part thereof. About eleven o'clock at night we brought the ice S. E. of us, and thus we were rid of this trouble at this time.

The fifteenth day, about three in the morning, the wind was at S. S. W. we cast about and lay to the eastwards; the wind did wester, so that we lay S. S. W. with a flawn sheet, and so we ran all the same day. About eight in the afternoon we sounded, and had twenty-three fathoms small gray sand. This night, at twelve of the clock, we sounded again, and had twenty-nine fathoms sand, as afore.

The sixteenth day unto three in the morning we hald along E. S. E. where we found eighteen fathoms red sand, then we hald along N. E. In these soundings we had many overfals. This day, at ten of the clock, we met with more ice, which was very great, so that we could not tell which way to get clear of it: then the wind came to the S. S. E. so that we lay to the northwards: we thought that way to clear ourselves of it, but that way we had more ice. About six in the afternoon the wind came to the E. then we lay to the southwards, that we had thirty fathoms black oze. This day we found the

pole to be elevated 69° 40′; and this night at twelve o'clock we had forty-one fathoms red sand.

The seventeenth day, at three in the morning, we had twelve fathoms. At nine we had eight and seven. All this day we ran S. and S. by W. at the depth aforesaid, red sand, being but shallow water. At eight in the afternoon, the wind with a shower and thunder came to the S. W. and then we ran E. N. E. At twelve at night it came to the S. and by E. and all this was in the bay of Pechora.

The eighteenth day, at seven in the morning, we bare with the headland of the bay, where we found two islands; there were also overfalls of water or tides. We went between the main and the island, next to the head, where we had about two fathoms and a half; we found the pole elevated 69° 13′. This day we had sight of Vaigatz: the land of the main of Pechora did trend S. E. we hald E. S. E. and had ten fathoms oze all the same day until four in the afternoon, then being calm we anchored in ten fathoms all the same night.

The nineteenth day, at two in the morning, we set sail, and ran S. and S. S. W. all the same day, at eight, seven, and six fathoms; this was off the S. part of Vaigatz; this part of the land lieth N. and S. This day, at four in the afternoon, we found shallow water, sometimes four fathoms, sometimes three, and two and a half, and one fathom and a half; there we anchored, and sent our boat away to sound, and all to leeward we had four feet, and three feet, and two feet; there was not water for the boat between Vaigatz and the other side: finding no more water, there was no other way but to go back as we came in, having the wind N. W. so at twelve at night we set sail.

The twentieth day we plied to the northwards, and got deep water again six and seven fathoms.

The twenty-first day, the wind by the N. W. we hald along the coast N. and N. N. W. we had eight, and nine, and ten fathoms.

The twenty-second day the wind came to the S. W. we bare along the coast of Vaigatz, as we found it to lie N. and by W. and N. N. W. and N. the wind blew very much with great fog: we lacking water and wood bare within an island, where we found great store of wood and water; there were three or four goodly rounds. Under two points there was a cross set up, and a man buried at the foot of it. Upon the said cross Master Pet did grave his name, with the date of our Lord, and likewise upon a stone at the foot of the cross, and so did I also; to the end that if the William did chance to come thither, they might have knowledge that we had been there. At eight in the afternoon the wind came to the N. N. W. we set sail and turned out of the bay. The same night the wind came to the W. so that we lay N. along the land.

The twenty-third day, at five in the morning, the wind came to the S. W. a sea board we saw a great number of fair islands, to the number of six; a sea board of these islands there are many great overfalls, as great streams or tides; we hald N. E and E. N. E. as the land did trend. At eight aforenoon the wind came to the S. E. with very much wind, rain, and fog, and very great store of ice a sea board; so we lay to the S. W. to attain to one of the islands to harbour us if the weather did so extremely continue, and to take in our boat, thinking it meet so to do, and not to tow her in such weather. About twelve of the clock it became very calm upon the sudden, and came up to the W. N. W. and N. W. by W. and then we took in our boat; and this done, there came down so much wind as we were not able to steer afore it, with corse and bonnets of each, we hald S. with the land, for so the land did trend. This day all the afternoon we sailed under a great land of ice, we sailed between the land and it, being not able to cross it. About twelve at night we found the ice to stretch into the land, that we could

not get clear to the eastward, so we laid it to the shore, and there we found it clear hard aboard the shore; and we found also a very fair island, which makes a very good harbour, and within are twelve fathoms.

This island is to the eastwards of Vaigatz four or five leagues. This land of the main doth trend S. E. and S. E. by E. it is a very fair coast, and even and plain, and not full of mountains nor rocks: you have but shallow water of six or seven fathoms about a league from the shore. All this morning we hald E. S. E. This day we found the pole to be elevated 69° 14′. About twelve o'clock we were constrained to put into the ice, to seek some way to get to the northwards of it, hoping to have some clear passage that way, but there was nothing but whole ice. About nine in the afternoon we had sight of the William, and when we saw her there was a great land of ice between her and us, so that we could not come one to the other; but as we came near to her, we sounded our trumpet and shot off two muskets, and she put out her flag upon her foretopmast in token that she did see us. All this time we did shorten our sails, and went with our foresail and maintopsail, seeking the best way through the broken ice, she making away the best that she could to follow us, we put our flag to answer her again with the like; thus we continued all the afternooon till about twelve o'clock at night, and then we moored our ship to a piece of ice to tarry, for the William.

The twenty-fifth day, about five in the morning, the William came to us, being both glad of our meeting. The William had her sternpost broken, that the rudder did hang clean besides the stern, so that she could in no wise port her helm with all hands; she did lighten her stern, and trim her head, and when we had brought her forward all that we could, we brought a cable under her stern, and with our capstain did wind up her stern, and so we made it as well as the place would give us leave, and in the end we brought her to steer again. We acknowledge this our meeting to be a great benefit of God for our mutual comfort, and so gave his majesty thanks for it. All the night after we took our rest, being made fast upon a piece of ice: the wind was at W. N. W. but we were so enclosed with ice that we could not tell which way to pass. Winds we have had at will, but ice and fogs too much against our wills, if it had pleased the Lord God otherwise.

The twenty-sixth day the wind was at W. N. W. we set sail to the northwards, to seek if we could find any way clear to pass to the eastward; but the further we went that way, the more and thicker was the ice, so that we could go no further; so about four in the afternoon we were constrained to moor upon another piece of ice. I think we sailed in all a league this day; here we had fifteen fathoms oze, and this oze is all the channel over. All the same day after four of the clock, and all the night, we tarried there, being without all good hope, but rather in despair. This day Master Jugman did see land E. N. E. from us, as he did think; whether it were land or no I cannot tell well, but it was very like land, but the fogs have many times deceived us.

The twenty-seventh day the wind was at N. W. This day, at nine in the morning, we set sail to seek the shore. Further into the ice we could not go, and at seven in the afternoon we moored to a piece of ice, and the William with us; here we had fourteen fathoms oze. At three in the afternoon we warped from one ice to another. At nine in the afternoon we moored again to a piece of ice until the next day. All this night it did snow, with much wind, being at W. N. W. and at N. W. and by W.

The twenty-eighth day the wind came to the S. W. and S. S. W. This day was a very fair day. At one in the afternoon Master Pet and Master Jackman did confer together what was best to be done, considering that the winds were good for us, and we

not able to pass for ice, they did agree to seek to the land again, and so to Vaigatz, and there to confer further. At three in the afternoon we did warp from one piece of ice to another, to get from them if it were possible: here were pieces of ice so great, that we could not see beyond them out of the top. Thus we warped until nine in the afternoon, and then we moored both our ships to a great and high piece of ice until the next morning.

The nine and-twentieth day the wind came to the S. W. we set sail at five in the morning, to ply into the shore if it were possible: we made many turns among the ice to small purpose, for with the wind doth the current run. This day by misfortune a piece of ice struck off our greep afore at two aforenoon, yet for all this we turned to do our best. The William being incumbered with ice, and perceiving that she did little good, took in all her sails and made herself fast to a piece of ice, and about four in the afternoon she set sail to follow us: we were afraid that she had taken some hurt, but she was well. At seven aforenoon we took in all our sails to tarry for the William, and made our ship fast to a piece of ice: the William before she came to us took in all her sails, and moored to another piece of ice; and thus we continued until the next morning.

The thirtieth day, the wind at S. E. and by S. and at nine in the morning we set sail, and sooner would have done if the William had been by us; but we did tarry for her, to know whether all was well with her; but as soon as we made sail she did the like. All this day we did our best to seek our way as the ice would give us leave; sometimes we lay S. sometimes W. and sometimes E. and thus we continued until eight at night, and then being calm, we made our ship fast to a piece of ice, and went to supper. In the mean time the wind with a fair gentle gale came up to the E. and E. and by S. but there came down a shower of rain with it, which continued the space of one hour; which being done it became calm again, so that we could do no good all that night, but took our rest until the next day.

The thirty-first, the wind being at S. W. we set sail to turn to windward at three o'clock in the morning. In this turning we did little good, for the current would not give us leave; for as the wind is, so is the current. We did our best until ten of the clock, and then perceiving that we did no good, and being enclosed with ice, we made our ships fast to a piece of ice. All this day the William lay still, and did as much good as we that did labour all the forenoon; thus we took our rest all the same day.

In the afternoon we set sail, the wind being at S. and by E. we lay to the westwards, as S. W. and S. W. and by S. and sometime to the westward, as we might: thus we continued until nine at night, and then we could go no further for ice; so we with the William were constrained to make our ship fast to a piece of ice all the same night. This day we found the pole elevated 69° 20′, and here we had seventeen fathoms oze.

The first day of August was very calm in the morning, the wind being at W. N. W. About twelve the wind came to the W. and continued so all the same night, with great fog.

The second day the wind was at S. W. all day, with rain and fog. All this day we were inclosed with ice, so that we were forced to lie still: here we had one-and-twenty fathoms oze. At six in the afternoon the wind was at W. with very much foul weather, and so continued all the same night.

The third day the wind was at W. and W. by N. and W. N. W. This day we lay still enclosed with ice, the weather being dark with fog; thus abiding the Lord's leisure, we continued with patience; and sounding we found twenty-one fathoms.

The fourth day we lay still enclosed with ice, the wind being at W. N. W. This ice

did every day increase upon us, yet putting our trust in God, we hoped to be delivered out of it in good time.

The fifth day all the morning it rained, with very much wind, being at S. S. E. About three in the afternoon we set sail, and presently it became calm for the space of one hour, then the wind came to the N. N. E. and here we had thirty-three fathoms; thus we made way among the ice S. W. and S. S. W. and W. as we might find our way, for the space of three hours: then we met with a whole land of ice, so that we could go no further; here we moored our ship, to tarry for a further opening: here we found forty-five fathoms oze, and all the night was very dark with fog.

The sixth day having no opening of the ice we lay still, the wind being at W. and W. by S. here we had sixty-three fathoms oze: all the same night the wind was at the W. N. W.

The seventh day the wind was at W. and W. and by N. all day. All this day we lay still, being enclosed with ice that we could not stir, labouring only to defend the ice as it came upon us: here we had sixty-eight fathoms oze.

The eighth day was very fair and calm, but foggy. This day towards night there was little wind by the S. S. W. then the ice began a little to open, and here we had seventy fathoms oze: all the night was foggy.

The ninth day the wind was at N. W. and by W. all the afternoon we lay still because of the ice, which did still inclose us. This day we found the pole elevated 70° 4′, we had sixty-three fathoms oze. This night was a very fair night, but it freezed: in the morning we had much ado to go through the same; and we were in doubt that if it should have freezed so much the night following, we should hardly have passed out of it. This night there was one star that appeared unto us.

The tenth day the wind was at E. N. E. with a very small gale: we with sail and oars made way through the ice. About five in the morning we set sail; sometime we lay S. W. and sometime S. and sometime W. as we might best find the way. About three in the afternoon the gale began to fresh. About six in the afternoon the wind was at N. E. with fog: here we had eighty-eight fathoms: we bare sail all the same night, and it snowed very much.

The eleventh day we were much troubled with ice, and by great force we made our way through it, which we thought a thing impossible; but extremity doth cause men to do much, and in the weakness of man God's strength most appeareth: this day we had ninety-five fathoms. At three in the afternoon the wind came to the S. W. we were forced to make our ship fast to a piece of ice, for we were enclosed with it, and tarried the Lord's leisure: this night we had ninety-seven fathoms.

The twelfth day the wind was at the S. E. not very much, but in a manner calm. At eleven of the clock the wind came to the W. S. W. all the day was very dark, with snow and fog. At six in the afternoon we set sail, the wind being at the N. N. E. All this night we bare away S. W. and S. S. W. as well and as near as the ice would give us leave. All this night we found the ice somewhat favourable to us more than it was before, whereupon we stood in good hope to get out of it.

The thirteenth day, at seven in the morning, the wind was at the N. E. and N. E. and by E. All this day we were much troubled with the ice, for with a blow against a piece of ice we brake the stock of our anchor, and many other great blows we had against the ice, that it was marvellous that the ship was able to abide them: the side of our boat was broken with our ship which did recoil back, the boat being betwixt a great piece of ice and the ship, and it perished the head of our rudder. This day was a very hard day with us: at night we found much broken ice; and all this night it blew very

much wind, so that we lay in drift with the ice, and our drift was S. for the wind was at N. all this night, and we had great store of snow.

The fourteenth day in the morning we made our ship fast to a piece of ice, and let her drive with it. In the mean time we mended our boat and our steerage. All this day the wind continued northerly, and here we had threescore and two fathoms: thus we lay adrift all the same night.

The fifteenth day we set sail at six in the morning, the wind being at N. E. At nine aforenoon we entered into a clear sea without ice, whereof we were most glad, and not without great cause, and gave God the praise. We had nineteen fathoms water, and ran in S. W. all the morning until we came to fourteen fathoms, and thence we hald W. till we came to ten fathoms, and then we went N. W. for so the land doth trend. At twelve of the clock we had sight of the land, which we might have had sooner, but it was dark and foggy all the same day; for when we had sight of the land, we were not passing three leagues from it. This day we had the pole elevated 69° 49′. All day we ran along the coast in ten and nine fathoms pepered sand. It is a very goodly coast and a bold, and fair soundings off it, without sands or rocks.

The sixteenth day the wind was at E. This day we were troubled again with ice, but we made great shift with it, for we got between the shore and it. This day, at twelve of the clock, we were thwart of the S. E. part of Vaigatz, all along which part there was great store of ice, so that we stood in doubt of passage, yet by much ado we got betwixt the shore and it. About six in the afternoon was found a great white bear upon a piece of ice. All this day in the afternoon it was dark with fog; and all the night we hald N. and N. by W. and sometime N. and by E. for so doth the land trend.

The seventeenth day in the morning we hald W. for so doth the land lie: the wind was at S. E. and it was very dark with fog, and in running along the shore we fell aground, but God be praised without hurt, for we came presently off again. The William came to an anchor to stay for us, and sent some of their men to help us, but before they came we were under sail; and as we came to the William we did stow our boats and made sail, we went within some of the islands, and hald W. S. W.

About two of the clock in the afternoon we set our course S. W. and by S. so we ran S. W. until twelve at night, the wind came to the N. N. E. and then we hald W.

The eighteenth day, at six in the morning, we had sixteen fathoms red sand; at six in the morning, thirteen fathoms; at ten, fourteen fathoms, and we hald W. N. W. At twelve a clock the wind came to the E. and E. by S. we hald W. and by N. all the same day and night. At six in the afternoon we had seventeen fathoms red sand.

The nineteenth day the wind was at E. N. E. at six in the morning we had nineteen fathoms red sand: at twelve of the clock the wind blew N. and N. by E. we had seventeen fathoms of water, at three in the afternoon fifteen.

The twentieth day the wind was at N. E. and N. N. E. at seven in the morning we had thirty fathoms black oze: at twelve of the clock we were upon the sudden in shoal water, among great sands, and could find no way out: by sounding and seeking about we came aground, and so did the William, but we had no hurt, for the wind was off the shore, and the same night it was calm: all night we did our best, but we could not have her afloat. These shoals do lie off Colgoyeve; it is very flat a great way off, and it doth not high above two or three feet water: it floweth N. E. and S. W.

The twenty-first day the wind was at S. W. and being very fair weather we did lighten our ships as much as was possible for us to do, by reason of the place. The same high water, by the help of God, we got both afloat, and the wind being at the S. W. did help us, for it caused it to flow the more water.

This day we found the pole to be elevated 68° 40′. In the afternoon we both set sail to seek way to get out of these sands, our boat a-head sounding, having six, seven, and eight fathoms, all within the sand which was without us. We bare to the southward, and the William bare more to the eastwards, and night being at hand the wind came to the S. E. whereupon we laid it to the southwards, lying S. W. and S. and by W. and ran to nineteen, and twelve, and fourteen fathoms, and presently we had but six fathoms, which was off the sands' head, which we were aground upon the day before. Then we cast about to the eastwards for deep water, which we presently had, as ten, fifteen, and twenty, and so to twenty-three fathoms.

The twenty-second day, at eight in the morning, we cast about to the southward, and this day in the morning we saw the William under our lee as far as we could see her, and with a great fog we lost the sight of her, and since we have not seen her. Thus we ran till we came to thirty fathoms black oze, which we had at twelve of the clock, and at three in the afternoon we had twenty and three fathoms, and then we ran W. N. W. and W. by N. all the same night following.

The twenty-third day we had at six in the morning twenty-seven fathoms, at eight o'clock twenty-eight fathoms: at nine the wind being at E. S. E. we hald W. N. W. this day we had sight of the land of Hugri side. At twelve of the clock we had thirty-two fathoms sand. This day we ran W. and by N. and came to five fathoms off the bay of Morzovets. Then we laid it to the northwards, so that we lay N. N. E. off. The wind after came to the N. and N. by E. and we lay E. and E. by N. then we laid it to the westward again: and thus we lay till we came to forty fathoms, and then we went N. W. till we came to fourteen fathoms, and so to ten fathoms. Then we cast about to the eastwards, and lay E. and E. by N. all the same night.

The twenty-fourth day, at eight in the morning, we had thirty-two fathoms. We ran N. W. till we came to eleven fathoms, then we lay to the northwards till twelve at night, and then we came to forty fathoms, then the wind at N. E. we lay to the westwards, and hald N. W. along.

The twenty-fifth, at four in the morning, we had thirty-seven fathoms, we ran N. W. the wind at N. N. E. very much.

The twenty-sixth day we ran with the same wind, and found the pole to be elevated 70° 40′.

The twenty-seventh, at seven in the morning, we saw land, which we made to be Kegor, then we hald N. W. and N. by W. to double the North Cape.

The twenty-eighth day, at three in the morning, we ran N. W. and so all day. At night the wind came to the S. W. and we ran N. W. all that night.

The twenty-ninth day we put into a sound called Tane, and the town is called Hungon: we came to an anchor at five in the afternoon, at twenty-five fathoms very fair sand. This sound is very large and good, and the same night we got water aboard.

The thirtieth day in the morning the wind at N. E. and but little, we set sail, and with our boat on head we got the sea about twelve of the clock: the wind with a fair gale came to the E. S. E. and all this day and night we ran W. N. W.

The thirty-first day at twelve of the clock we doubled the North Cape, the wind being at E. S. E. we hald W. all the same day, and at night we ran W. S. W.

The first day of September the wind was at N. E. with very much fog: all this day we ran W. S. W. at two in the afternoon the wind came N.

The second day at three in the morning we doubled Foulenesse, and the wind was this day variable at all parts of the compass. In the afternoon we made but little way:

at six o'clock the wind came to the S. W. and we went N. W. At nine in the night there came down so much wind by the W. S. W. that we were fain to lay it a hull, we hald it to northwards for the space of two hours, and then we laid her head to the southwards, and at the break of day we saw land, which is very high, and is called by the men of the country Foulenesse. It is within full of small islands, and without full of rocks very far out, and within the rocks you have fair sand at twenty fathoms.

The third day, in the morning, we bare with the sound aforesaid: within it is but shoal water, four, five, and three fathoms, sandy ground, the land is very high, and the church that is seen is called Helike Kirke. It doth high here not above eight or nine feet.

The twelfth day, at three in the afternoon, we put into a sound by Lowfoot, where it doth flow S. W. and by S. and doth high seven or eight feet water.

The thirteenth day much wind at W. we had a ledge of rocks in the wind of us, but the road was reasonable good for all southerly and westerly winds. We had the main land in the wind of us: this day was stormy, with rain.

The twenty-third day, at four of the clock in the afternoon, we put into Norway, into a sound called Romesal, where it floweth S. S. E. and doth high eight feet water. This place is full of low islands, and many good sounds without the high mountain land. Here is great store of wood growing, as fir, birch, oak, and hazel: all this night the wind was at the S. very much wind, with rain and fog.

The twenty-eighth day in the morning, the wind being at E. N. E. we set sail at eight of the clock, and hald out of the bay W. S. W. and S. W. having a goodly gale until one of the clock, and then the wind came to S. E. and to the S. with rain and fog, and very much wind: at six of the clock we came into a very good road, where we did ride all the same night in good safety.

The twenty-ninth day we put into a good sound, the wind being by the S. W. at three in the afternoon there came down very much wind by the S. and all night with vehement blasts and rain.

The thirtieth day, all day the wind was at W. S. W. And in this sound the pole is elevated 63° 10′.

The first day of October the wind was at S. with very much wind and vehement blasts.

The seventh day we set sail: for from the first of this month until this seventh day we had very foul weather, but specially the fourth day, when the wind was so great, that our cables brake with the very storm, and I do not think that it is possible that any more wind than that was should blow: for, after the breaking of our cable, we did drive a league before our anchors would take any hold: but, God be thanked, the storm began to slack, otherwise we had been in ill case.

The seventh day, at night, we came to an anchor until the next day, which was the eighth day of the month, when, as the wind grew great again with rain, whereupon we set sail and returned into the sound again: and at our first coming to an anchor, presently there blew so much wind, that although our best anchor was out, yet the extremity of the storm drove us upon a ledge of rocks, and did bruise our ship in such sort, that we were constrained to lighten her to save her, and by this means (by the help of God) we got off our ship and stopped our leaks, and moored her in good safety, abiding for a wind. We rid from this day by reason of contrary winds, with fog and rain, until the twenty-fourth day, which day, in the morning, the wind came to the N. E. and at eight of the clock we set sail. This sound is called Moore Sound, where it hieth about five feet water, and floweth S. S. E. The next day, being the twenty-fifth day, we put

into a sound which is called Ultar Sound, where was a ship of the king of Denmark put into another sound thereby, being two leagues to the southwards of us, that came out of Iceland: the wind was contrary for us at S. S. W.

The twelfth day of November we set sail, the wind being at the E. S. E. and passed through the sound where the king's ship did lie: which sound is called Sloure Sound. But as we did open the sound, we found the wind at the S. W. so that we could do no good, so that we moored our ship between two islands, until the eighteenth day, and then the weather being fair and calm, we set sail, and went to sea, hoping to find a fair wind, but in the sea we found the wind at the S. W. and S. S. W. so that we were constrained to return into the same sound.

The next day, being the nineteenth, the king's ship came out also, because she saw us put to sea, and came as far out as we, and moored where we did moor afore: and at our return back again, we moored our ship in an outer sound, called Scorpe Sound, because the king's ship was without victuals, and we did not greatly desire her company, although they desired ours. In this sound the pole is elevated 62° 47′. Thus we lay still for a wind until the first of December, which day we set sail at six o'clock in the morning, and at four in the afternoon we laid it to the inwards.

The ninth day we had sight of the coast of Scotland, which was Buchanness.

The tenth day we were open off the Frith.

The eleventh day, at four in the morning, we were thwart of Barwike: at six we were thwart of Bamburch: the same day, at ten at night, we were shot as far as Hollyfoote. Then the wind came to the S. and S. E. so that we lay still until the next day in the morning, and then we were constrained to put with Tinmouth. The same day, at night, we hald aground to stop a leak, which we found to be in the skarf afore. The wind continued by the S. E. and S. S. E. until the twentieth day, and then we set sail about twelve at night, bearing along the coast.

The twenty-second day, by reason of a S. E. wind, we thought we should have been put into Humber, but the wind came to the W. so that we hald S. E. and at three in the afternoon we hald a sea board the sands, and had shoal water off Lymery and Owry, and were in four fathoms off them. The next day we hald as we might to sease Orfordnesse.

The twenty-fourth day we came thwart of the Naze, about eight in the morning.

The twenty-fifth day, being the nativity of Christ, we came to an anchor between Oldhaven and Tilbury Hope. The same day we turned as high as Porshet.

The twenty-sixth day we turned as high as Ratcliffe, and praised God for our safe return. And thus I end, 1580.

The William, with Charles Jackman, arrived at a port in Norway, between Trondem and Rostock, in October, 1580, and there did winter: and from thence departed again in February following, and went in company of a ship of the king of Denmark toward Iceland: and since that time he was never heard of.

THE FIRST VOYAGE OF THE DUTCH AND ZEALANDERS, BY THE NORTH, ALONG THE COASTS OF NORWAY, MOSCOVY, AND TARTARY, IN ORDER TO SEEK A PASSAGE TO THE KINGDOMS OF CATHAY AND CHINA.

[Newly translated from the Receuil des Voyages, qui ont servi a l'etablissement et aux progrez de la Compagnie des Indes Orientales. Tom. i. p. 55.]

THE ancients, who possessed a great taste for the wonderful, have not failed to intermix it with the foundations of empires, and the establishments of states, and of almost all societies. At present, that the world is become more rational, nothing on these occasions is recited but of the most ordinary description. We even sometimes find ourselves surprised, and in some measure displeased, at reading the feeble commencement of a great intrigue so little corresponding with the conclusion, and the ideas it has inspired. We feel inclined to call in question the veracity of those, who disclose to us the motives and the simple means by which the greatest events have been produced.

The empire founded by the Dutch in the East Indies is not one of the least brilliant ornaments which adorn the history of the seventeenth century. It is at the same time one of those astonishing events, which have not been in the least foreseen when the first steps were made which gave them birth, and as nothing was farther from the views of those who were the cause in producing this great effect, perhaps there also has never been so illustrious a foundation, produced almost by accident, and with so little design and power.

Although this first relation, which is placed at the head of this volume, only presents the failure of a design, it is nevertheless certain that the navigation it describes was the first instigation given to the United Provinces to go in quest of those rich regions, of which they have since acquired the possession. Some merchants, animated with a desire of making trade flourish, submitted propositions to the States, and obtained a permission, the consequences of which have been the sources of all the glory and prosperity of their native country.

At the head of the society which undertook this enterprise was Balthasar Moucheron, of Zealand. He requested of the States General and prince Maurice, high admiral, the liberty of seeking a northern passage to the kingdoms of Cathay and China: which was granted.

Three vessels were immediately equipped by the society, one at Amsterdam, another at Zealand, and the third at Enchuisen. These vessels set sail in the year 1594, to pass around, if possible, by Norway, Moscovy, and Tartary, and proceed to China.

The vessel equipped at Amsterdam had for chief pilot William Barentsz, of the town of Schelling, a very skilful mariner. He took with him a fisherman of the same town, with his bark, to keep him company, in case the other two vessels should be separated from him.

These vessels having departed from the Texel on the fifth of June, arrived on the twenty-third of the same month at the island of Kilduin, in Moscovy.

During the night of the fourth of July, Barentsz observed the altitude, the sun being at the lowest point, that is to say, N. E. half E. and he found he was in the latitude of 73° 25'.* They then sailed five or six leagues from the land, under Novaya Zemlia, and having again observed the altitude, they bore to the east.

* It appears, at the conclusion of this journal, that Barentsz was separated from the other two vessels, and as they all joined in latitude 69°, it is very probable they were separated at leaving Kilduin; so that hereafter the navigation alone of the vessel of Barentsz, with the bark of the fisherman, is inquired into.

When they had run five or six leagues in the same course, they found themselves near a point of land sufficiently low, but extending a considerable distance into the sea, which they called Langenes. To the east of this point there was a great bay, by which they sent the shallop to shore, where no person was observed. They afterwards remarked two creeks between the cape of Baxo, which is four leagues from Langenes, and the western point of the bay of Loms, which is capacious and extensive. To the west they found a good haven, where are six, seven, and eight fathoms of water. Here the shallop approached the land, and they formed a buoy of an old mast which they found.

This bay they called the bay of Loms, on account of a species of birds seen in great quantity, which were very heavy, *Lom* in the Dutch language signifying heavy. In effect the bodies of these birds appeared so large in proportion to their wings, which were very small, that they were surprised at their being able to lift such heavy masses. They make their nests on steep mountains, in order to be secure from the beasts, and they only lay one egg at a time. They are not scared at the sight of men: one may even be taken in its nest, without occasioning the others near it to fly away or quit their stations.

From the bay of Loms, they sailed towards Admiralty Isle, the western side of which is not clear, having little depth even at a considerable distance from the shore; so that it is necessary to keep off the coast, and not to approach but with great precaution. The depth is even very unequal, and when at one sounding ten fathoms have been found, sometimes but six are found at another, and immediately afterwards they again find, ten, eleven, and twelve.

The sixth of July, at midnight, they arrived at the *Swarthock*, or the Black Cape, lying in latitude 75° 29′, and afterwards at William's Isle at the distance of eight leagues, in the latitude of 75° 55′.

They found at this place a great quantity of wood which had been brought by the sea, and Walrusses, or sea-cows, marine monsters of wonderful strength, larger than oxen, and having a rougher hide than the marine dog, with very short hair. Their muzzle resembles that of the lion. They almost constantly abide on the ice, and are difficult to kill, unless the blow be given exactly on the side of the head. They have four feet and no ears.

They only bring forth one or two young ones at a time, and when met by the fishermen on the ice, they throw their young ones before them into the water, and taking them between their fore legs as between the arms, they plunge with them and re-appear at different times, and when they would revenge themselves and attack the barks, or defend themselves, they again cast away their young, and approach the bark with extreme fury. They have two teeth on each side of the mouth, nearly fourteen inches long, which are as much esteemed as the teeth of the elephant, especially in Moscovy, Tartary, and the other parts where they are used, because they are neither less white, less hard, nor less smooth than ivory. The hair of the beard resembles little horns, and is almost similar to those of the porcupine. Two were seen in 1612, at Amsterdam and other cities of Holland: one of them was old and dead, the other was young and still alive. The English call them sea-horses, and the French sea-cows: but among the Russians, who have been acquainted with these animals from time immemorial, they have the name of Morses.

On the ninth of July they anchored in Berenfort road, under William's Isle, where having seen a white bear, they got into the shallop and wounded it with bullets. But the bear finding itself wounded, redoubled its fury, and exhibited marks of the greatest

vigour we have ever heard of, rising and appearing again from the bottom, where he had plunged, to swim anew. The persons in the shallop directed it towards the animal, and passed a cord round its neck with a running knot, thinking to take it alive and carry it to Holland; nevertheless they were very content at seeing it die, and having only the skin; for it cried so horribly, struggled in such a manner, and made such prodigious efforts, that those who have never seen it would not be able to imagine any thing similar.

After having thus tormented it, they gave it a little relaxation, by not drawing the nooze tight; but they always dragged it after them, in order to fatigue it the more. Barentsz having caused it to be brought near, and touched it with his hand, the bear darted with vigour towards the shallop, put its two paws on the stern, and exerted itself in such a manner that it entered with half its body. The crew were so alarmed, that they all fled to the poop, and no one expected to escape alive.

The adventure which delivered them from this peril was very singular. The nooze got entangled with the iron work of the rudder, and stopped the bear. When they saw it thus checked, the most courageous of the sailors advanced with a demi-lance, and gave it so violent a blow that the animal fell into the water. The shallop, which then approached the vessel with all possible speed, dragged the bear after it, and so exhausted its strength, that seeing it less agitated than before, they were enabled to kill it, and its skin was brought to Amsterdam.

On the tenth of July they observed the Isle of Crosses, which they thus named on account of two great crosses which they saw there. They anchored at the distance of two long leagues from the shore, and having landed in the island they found it barren and full of rocks, being half a league in extent from East to West, and having at each extremity a chain of rocks under water.

Eight leagues thence is Cape Nassau, in the latitude of 76° 30′. It is a low and level point which must be carefully avoided, because there is a bank of seven fathoms at a great distance from the shore. From this cape they sailed five leagues to the E. and by S. and to the E. S. E. and then thought they saw land to the N. E. and by E. They immediately steered in that direction, conceiving this to be a new land, to the North of Novaya Zemlia. But the wind increasing they were obliged to furl all the sails; and the sea afterwards became so troubled, that they sailed for more than sixteen hours under bare poles.

The day following they lost their little bark by a wave which sunk it, and after being thus driven about for a considerable time under bare poles, they found themselves at three in the afternoon under Novaya Zemlia, close to the land.

On the thirteenth of July a great quantity of ice was observed from the top-mast. On the fourteenth they found themselves in the latitude of 77° 45′, near a surface of ice perfectly smooth, extending as far as the eye could reach. On the morning of the nineteenth they returned to the coast of Novaya Zemlia, near Cape Nassau, and on the twenty-sixth they were at Cape Troost.

On the twentieth they arrived in latitude 77°, and the most northern point of Novaya Zemlia, called *Ys-hoek*, or Icy Cape, bore due E. Here they found some little stones shining like gold; for which reason they called them golden stones.

On the thirty-first of July, having tacked between the ice and the land, during fine weather, they arrived at the Orange Isles, near one of which they met with upwards of two hundred sea-cows on the sand, basking in the sun. The crew thinking these amphibious animals were not able to defend themselves on shore, went to attack them to obtain their teeth: but their fury broke the hatchets, sabres, and pikes, without

their being able to kill a single one, or to obtain any other advantage than that of seizing one of their teeth which was broken.

This ill succe did not discourage the sailors. They resolved to return on board and to bring guns; v hey were not able to accomplish on account of the violence of the wind, which very impetuous, separating the ice in large flakes.

At the same time they found a large white bear asleep, and firing upon him they wounded him. Notwithstanding this he ran away, and threw himself into the water, where they followed him, steering the shallop after him. He was killed, and dragged on the ice, upon which he was stabbed with a demi-lance, in order to return and take him, if the wind, which continued strengthening, and the ice which was still breaking into flakes, had not presented an insurmountable obstacle.

After these adventures, and this navigation to the Orange Isles, William Barentsz perceived that it was not in his power to advance further, nor to discover more distant countries. The crew themselves began to appear fatigued, and little disposed to continue the voyage. He resolved therefore to return, in order to rejoin the other two vessels, which had directed their course towards the Weygats or strait of Nassau, in order to learn what discoveries they had made.

On the first of August they resumed the same route by which they had come, and having doubled the Capes of Troost and Nassau, and several others, they arrived on the eighth at a very low and small isle, lying at the distance of half a league from the main land, and which they called Black Island, on account of its surface having a black appearance. Barentsz having observed the altitude here, found the island to lie in latitude 71° 45′. There was a large creek, and the pilot was of opinion that it was in that place Oliver Beunel had formerly been: and that consequently the island should be called Constintsarch.

At the distance of three leagues from this isle, they discovered besides another little point, upon which there was a cross. They afterwards ranged the coast for four leagues, and doubled another little point, behind which was a great creek, and they named it the Fifth Cape, or the Cape of St. Laurence.

Bastion Cape is also three leagues distant from this latter. There is a black rock quite close to the shore, upon which was seen a cross. Some sailors having landed were certain there had been men who had fled at their coming: for they found six sacks of rye flour buried, and a heap of stones about the cross.

Within gunshot of this latter place, there was another cross, with three houses constructed of wood, after the northern fashion, where they saw several barrel staves; which induced them to think it probable there might be a salmon fishery at that place. There were also five or six coffins on the ground, near as many ditches, and they were all filled with stones.

The haven is very good, and sheltered from every wind. They named it Flour Port, on account of the flour which they had found. Betwixt this port and Cape Bastion is the bay of St. Laurence, also very good, and sheltered from the N. E. and N. W. winds. They observed the altitude in Flour Port, and found themselves in latitude 70° 45′.

On the twelfth of August two small islands were discovered, the latter of which was only a league from the land, which they named St. Clara. On the fifteenth, at three in the afternoon, Barentsz having observed the altitude found himself in latitude 69° 15′. They sailed two leagues more to the east and observed the isles of Matfloe and Delgoi, where the vessel in the morning rejoined those of Zealand and Enchuisen, which had also arrived the same day from the strait of Nassau.

They imagined at first that Barentsz had sailed round Novaya Zemlia, and had also returned by the same strait. At their junction the ordinary salutations passed, and they afterwards recounted to each other their navigation and the discoveries they had made.

After this they sailed together to Holland. Barentsz arrived at Amsterdam on the sixteenth of September with the yacht he had conducted, and a sea-cow of prodigious size, which had been killed on a bank of ice.

SECOND VOYAGE OF THE DUTCH AND ZEALANDERS, BY THE NORTH, ALONG THE COASTS OF NORWAY, MOSCOVY, AND TARTARY, IN ORDER TO REACH CATHAY AND CHINA.

THESE vessels having returned in the autumn, reported that there were hopes of finding a passage by the strait of Nassau. The crews of the vessels of Zealand and Enchuisen were of this opinion, which was strongly supported by John Hugues of Linschooten, who had performed the voyage in quality of steward.

This opinion induced the states general and the prince of Orange again to equip some vessels for the following spring, not only in order to make discoveries, and as it were sound the passage, as they had already done, but they were also to carry merchandise. The merchants had the liberty of sending what goods they pleased, with persons to negociate for them in the places they should land; and they were exempted from the taxes on exports, and all custom-house duties.

Peter Plancius, the celebrated cosmographer, was one of those entrusted with the care and conduct of this second voyage. It was he who prescribed the route, and who indicated the situations of Tartary, Cathay, and China. But to the present day we have not been enabled to judge whether he was accurate or not, since the three voyages which have been undertaken to proceed by the north to those countries have failed of success, and the routes prescribed by him were not followed. Many accidents occurred, and there were inconveniences which the shortness of the time would not permit to remedy.

Seven vessels were therefore equipped in 1595, by order of the states general and the prince of Orange, in order to pass by the Weigatts, and sail towards Cathay and China. There were two from Amsterdam, two from Zealand, two from Enchuisen, and one from Rotterdam: six were laden with all sorts of merchandise, and with money, and merchants were appointed to negociate them.

The seventh, which was a yacht, received orders to return with tidings of the six others, when they should have doubled Cape Tabin, which they conceived to be the farthest point of Tartary, or at least when they should be so far advanced that they might direct their course toward the south, and have nothing more to dread from the ice.

The same William Barentsz was again commander and pilot of the largest of the two vessels from Amsterdam; and James Heemskerk, who was appointed steward, is that Heemskerk who twelve years after, that is to say, in 1607, acquired so great a reputation in a celebrated naval combat which took place in the bay, and under the cannon of the fortress of Gibraltar. Gerard de Veer also embarked in the same vessel; and it is from his journal that the present relation is published.

They left the Texel on the second of June 1595, at sun-rise, and on the fourteenth were in sight of Norway. On the twenty-second, at three in the afternoon, they saw by the head of the ship a large whale asleep: it awoke at the noise of the ship's way and the

shouts of the crew, and thus escaped, otherwise the vessel would inevitably have passed over it.

On the fourth of August the vice-admiral, who was a little way before, struck on a rock; but the weather was so favourable that he relieved himself without difficulty. The accident of this vessel was a warning to the others to avoid the same rock. On the sixth the same vessel of the vice-admiral and that of Barentsz ran foul of each other, and were much damaged. On the seventh they fell in with a vessel from Enchuisen, coming from the White Sea.

On the fourteenth the altitude was taken, and they found themselves in latitude 70° 47′. On the eighteenth they observed two islands, to which the vessels from Enchuisen gave the names of Prince Maurice, and Count Frederic his brother. On the same day, at six in the evening, they discovered Nassau Strait, which bore five leagues E. N. E.

From the latitude of 70° to the strait, they constantly sailed through fragments of ice; but the channel, which is situated exactly between the cape of Idols and the land of the Samoiedes, was so full, that it seemed impossible to penetrate there: they therefore determined to enter the bay, which they named Train Bay, because they there found a great quantity of train-oil. This bay is safe; a ship is there protected from the banks of ice, and from almost every wind, and it may be entered to any distance in five, four, and three fathoms of water, on a sound bottom; but it is deeper on the eastern side.

On the twenty-first of August fifty persons landed in order to reconnoitre the country. When they had proceeded two leagues, they found several sledges laden with furs, train-oil, and other such merchandise: they also found traces of men and rein-deer, and they were of opinion that there were men dwelling at no great distance, or at least that they frequented the place; besides, the idols which they observed on the cape farther confirmed them in this idea.

Penetrating afterwards farther into the country, they were in hopes of meeting at last with houses and men, who might inform them of the state of the sea, and the navigation in those parts; but notwithstanding their pains and care they discovered neither the one nor the other.

In the mean time some of them advancing to the S. E. towards the shore, discovered a practicable path in the marshes; for on entering into the water up to the middle of the leg they found a sound bottom, and in other places less deep, the water was only above the shoe.

When they had arrived at the sea shore they began to rejoice, imagining they had discovered a passage, for they saw so little ice that they were in hopes of being able to pierce through; they therefore returned in the evening on board, and communicated this intelligence: the master had also sent a yacht with oars to observe if the sea of Tartary was open. The vessel not being able to enter that sea on account of the ice, repaired to Cape Cross, where the crew left it, and proceeded by land to Twist-hoek, or Cape Dispute; there they perceived that the ice of the sea of Tartary was in great quantities along the coast of Russia, and the point of Weigats.

On the twenty-third day of the same month of August they fell in with a bark from Pitzora, constructed of the barks of trees sewed together, and which was dispatched to the north to seek for the teeth of sea-cows, train-oil, and geese, in order to lade some Russian vessels which were to come by the Weigats.

On being spoken to, they answered, that those vessels were to come round by the sea of Tartary, and pass beyond the river Obi, to go to winter at Ugolita, a place in Tartary, as they were accustomed to do every year: they also said that the outlet from the strait would not be completely closed up before two months or two months and a half;

but that then it would be possible to proceed to Tartary on the ice, by the sea which they named the sea of Marmora.

On the twenty-fifth of August the Dutch returned to the bark, where they were received by the Russians with marks of friendship, which they did not fail to return. The Russians, who had a great many fat geese, made them a present of eight; and the Dutch having entreated that some of their company would go to their ship, seven followed them.

When they were arrived, they testified their surprise and admiration at the sight of so large a vessel, and considering the manner and order with which it was equipped, they examined it with curiosity on all sides: they were afterwards presented with meat, butter, and cheese, which they would not taste, because it was a fast day with them; but they ate voraciously of pickled herring, swallowing it whole with the head and tail. They also made them a present of a trough full, for which they shewed much gratitude; they then carried them back with the yacht to Trane Bay.

On the thirty-first of August Barentsz sailed along the northern coast of Weigats, where they found some of those men called Samoiedes, and which are regarded as savages, though they are not absolutely so; for the Dutch having penetrated a league into the country, and having met with twenty of them, had some communication. It is true there was so great a mist that they did not perceive the Dutch; and when the latter discovered them they were already very near, and beheld them in two companies.

The interpreter being detached, and having advanced in order to speak to them, one of the Samoiedes also advanced, and approaching he drew an arrow from his quiver, threatening to kill the interpreter. The latter having no arms was much alarmed, and cried out in the Russian language, *Do not shoot, we are friends.* The Samoiede immediately laid down his bow and arrow, and signified that he was willing to discourse. The interpreter having said a second time, *We are friends: Well,* said he, *then you are welcome:* and afterwards they saluted each other, by inclining the head to the ground, after the Russian manner.

The interpreter having asked some questions concerning the state and situation of the country and sea which they observed on the east, after sailing through the straits of the Weigats; he answered, that when they should have passed a point which was at the distance of about five days journey, and which he indicated to lie to the N. E. they would meet with a great sea to the S. E. adding that he was particularly acquainted with that, one of his companions having been sent there from their king with troops under his command.

The Samoiedes are clothed in the manner in which savages are represented; and in this particular they may be called savages: but on no other account do they merit the appellation, for they exhibit a considerable portion of good sense in their behaviour.

Their clothing consists of skins of rein-deer, covering them from head to foot, the chiefs excepted, who cover the head with some coloured pieces lined with fur; the others have caps of rein-deer skin, the hair being on the outside, sitting very close about the head. They wear the hair long, tied in a single tress, and hanging down their backs over their garments.

They are of small stature, with broad and flat faces, small eyes, short legs, with the knees bending out; they run swiftly, and leap very well: they place little confidence in other nations, of which the following are proofs.

Though the Dutch had testified much confidence and friendship in this first interview, yet having returned, on the first of September, a second time to land, and requested to examine one of their bows, they refused, and appeared displeased.

The king had guards who went everywhere, and carefully watched what happened, particularly observing the sales and the purchasers. One of the Dutch having approached a little nearer to him than the others, and having saluted him after the manner of the country, presented him with some biscuit, which the king took with much civility, and immediately began to eat it; but while eating, he looked around, and attentively observed what they were doing.

Their sledges are always ready, and are drawn by a rein-deer or two, which run so swiftly, that they carry a man or two with greater celerity than horses could do.

One of the Dutch having fired his gun towards the sea, they were so terrified that they ran and jumped like madmen: they were pacified, however, when they understood no harm was intended to them. The Dutch gave them to understand that those were the arms they used instead of bows.

But in order to make them understand the power and use of this kind of arms, one of the Dutch took a flat stone, as large as the half of the palm of the hand, and placed it at a distance on an eminence. The Samoiedes, who comprehended by the signs which were made that he was about to perform something singular, assembled to the number of about fifty or sixty, and placed themselves near the stone: the Hollander fired, and having hit the mark, the stone was broken to pieces, at which the spectators evinced a great astonishment.

At length they parted with signs of amity on both sides, and when the Dutch were in their yacht, they once more took off their caps and sounded the trumpets; to which the Samoiedes having answered in their manner, they returned to their sledges and seated themselves.

A little time afterwards they saw one of them return to the shore to reclaim a statue, of very rude carving, which one of the Dutch had carried away. He came on board the yacht, and having seen the statue, signified to them that they had been guilty of a very bad action in taking it away. They returned it to him, and it was first placed on an eminence near the shore, from which it was afterwards carried away in a sledge.

It would appear from this and many other occasions that these statues are the gods of the Samoiedes. Near a hundred were also found on the point of Weigats, which had been named the Cape of Idols, not better finished than the other: they were a little rounded at the top, and in the middle was a small elevation serving for a nose, with two little holes above for the eyes, and another under the nose for the mouth. A quantity of ashes and bones of rein-deer were observed before them, which shewed that the Samoiedes had offered sacrifices to them.

The Dutch having set sail on the second of September, two hours before sunrise, found themselves at sunset at the distance of a league from Twist-hoek, to the east of that cape; and sailing north till noon, performed about six leagues of their course. They afterwards met with so much ice, the wind was so changeable, and there arose so thick a fog, that they were under the necessity of making short tacks; and at length they drifted to the east of the Isle of the States, within musket shot of the land.

They landed on the island, where they met with a great quantity of hares, many of which they killed. On the sixth of September some sailors again landed to seek for a certain sort of stone, a species of diamond, of which a sufficient quantity is also found in the Isle of the States. During this search two of the sailors sleeping by one another, a white bear, very lean, approached them softly, and seized one by the nape of the neck. The sailor, not knowing what it was, cried out, who has seized me thus behind? His companion having raised his head said, Holloa! my dear friend, it is a bear; and immediately rising ran away. The bear bit the unfortunate man in several parts of the head,

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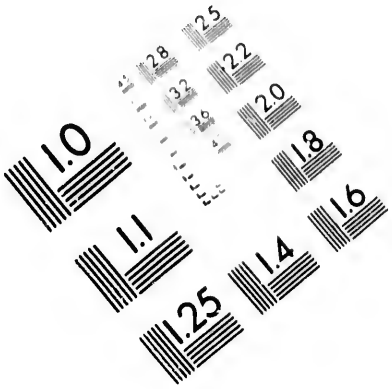

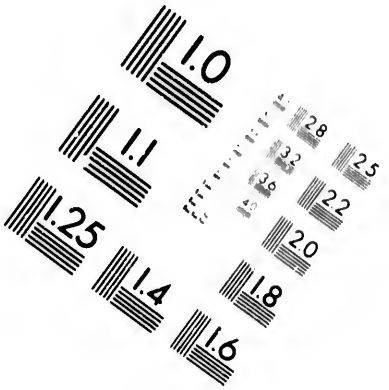

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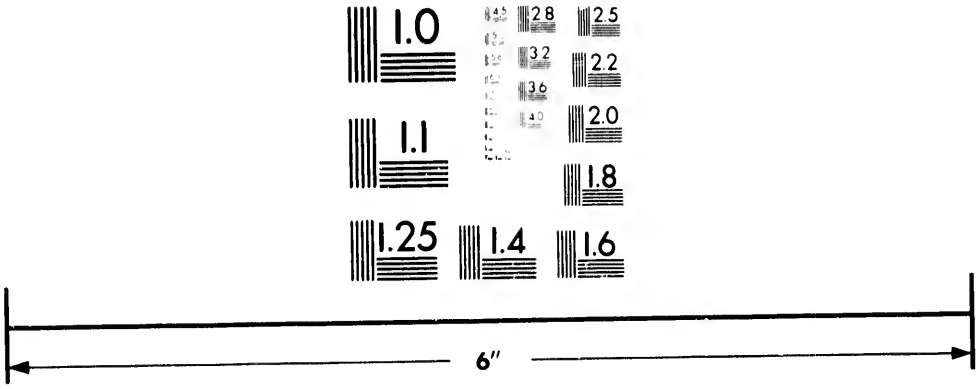

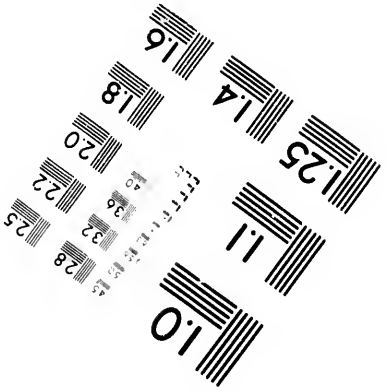

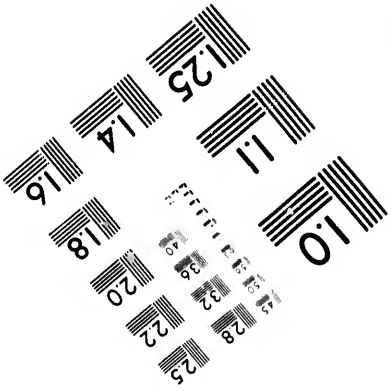

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and having quite mangled it, sucked the blood. The rest of the persons who were on shore, to the number of twenty, immediately ran with their firelocks and pikes, and found the bear devouring the body, which, on seeing them, ran towards them with incredible fury, threw himself upon one of them, carried him away, and tore him to pieces, which so terrified them that they all fled.

Those who remained in the vessel and the yacht, seeing them thus flee and return towards the shore, jumped into the boats and rowed with all their force to receive them. When they had landed and beheld this lamentable spectacle, they encouraged the others to return with them to the combat, that all together might attack this ferocious animal; but there were some who could not be induced to it. Our companions are dead, said they, we cannot preserve their lives; if we could still have this hope, we would go with as much ardour as you to deliver them: but there is nothing to be aspired at, but a victory from which will accrue neither honour nor advantage, and for which we must expose ourselves to a frightful danger. We can either kill or take the bear, and probably this will happen, but it will cost the life of one of us; and the glory of the capture or death of this animal ought not to be sought at this price.

Notwithstanding these reasons three of them advanced a little, while the bear continued to devour his prey, without disturbing himself at the sight of thirty men together, so near him. These three were Cornelius Jacobs, pilot, and Hans Van Uffelen, purser of the vessel of Barentsz, and William Gysen, pilot of the yacht.

The two pilots having fired three times without hitting the animal, the purser advanced a little farther and shot the bear in the head close by the eye, which did not cause him to quit his prey; but holding the body always by the neck which he was devouring, carried it away as yet quite entire. Nevertheless they then perceived that he began himself to totter, and the purser going towards him with a Scotchman, they gave him several sabre wounds, and cut him to pieces, without his abandoning his prey. At length the pilot Gysen having given him a violent blow with the butt end of his firelock on the muzzle, which brought him to the ground, the purser leaped upon him and cut his throat. The two bodies half devoured were interred in the isle of the States, and the skin of the bear was carried to Amsterdam.

On the ninth of September they again set sail, but they met with so great a quantity of ice banks, which struck against the vessel, that they were not able to pass, and were under the necessity of returning in the evening, and anchoring in the same place from which they had set sail. The admiral and the yacht of Rotterdam touched on the rocks, which however did them no damage.

On the eleventh of the same month all the vessels again sailed towards the sea of Tartary, without being able to advance farther than before, on account of the ice: thus they returned to the Weigats, and steered towards the cape of the Crosses. On the fourteenth the weather became a little finer, the wind veered to the N. W. and the currents set in with rapidity from the sea of Tartary.

On the same day they crossed over from the other side of the Weigats to the main land, in order to sound the channel, and pierced through the extremity of the gulf behind the Isle of the Tail, where they found a little wooden house and a large channel. On the following morning they hauled their anchors on board, and raised their topmasts, under the idea of endeavouring a second time to continue their voyage; but the admiral, not being of this opinion, remained at anchor.

On the morning of the twenty-fifth they saw the ice enter into the Weigats, on the eastern side, so that they were constrained to weigh anchor, and to depart from the strait by the west, in order to direct their course homewards. On the thirtieth the fleet was

at the island named Wardhuys, and it remained there at anchor until the tenth of October, when it continued its course; and on the eighteenth of November entered the Meuse, after a voyage of four months and sixteen days.

THIRD VOYAGE OF THE DUTCH AND ZEALANDERS, BY THE NORTH, ALONG NORWAY, MOSCOVY, AND TARTARY, TO PASS TO THE KINGDOMS OF CATHAY AND CHINA, BY PERMISSION OF THE COUNCIL OF THE CITY OF AMSTERDAM, 1596.

AFTER these two voyages, which had failed of the desired success, the idea of undertaking a third was not relinquished; but their high mightinesses were unwilling to countenance the attempt. Nevertheless it was decreed, that if there were individuals, cities, or corporations, willing to bear the expences of the voyage, they would not be prevented; and that if they could furnish sufficient proofs of having succeeded, and passed, the state would make a considerable recompense in money, and the sum was stipulated.

The council of the city of Amsterdam, which was not discouraged, ordered two vessels to be equipped, at the commencement of the year 1596, and the crews engaged under two conditions, which were, that they should be paid according to a certain rate, if they returned without having succeeded; or according to another certain rate, if they accomplished their design. The recompense to be made in the latter case was considerable. They took as few married persons as possible, lest their affection for their families should occasion them to think too much of return.

The two vessels were ready to sail at the beginning of May. James Heemskerk was appointed master and steward, as before, and William Barentsz first pilot of one, and John Cornelisz Ryp was appointed steward of the other.

On the eighteenth of May they departed from Vlie, and on the twenty-second were in sight of Hitlandt of Faverhill.* On the thirtieth they found themselves in latitude 69° 24′, and on the first of June they experienced no night.

On the second of June, at half past ten in the morning, they saw a surprising phenomenon in the heavens. On each side of the sun appeared a mock sun, with a rainbow passing through these three suns. There were besides two other rainbows, one surrounding the suns, the other crossing the true sun, the lowest part of which was elevated 28° above the horizon. At noon they observed the altitude with the astrolabe, and found themselves in latitude 71°.

The vessel of John Cornelisz being always to windward of that of William Barentsz, without coming up to him, induced Barentsz to stand to the N. E. in order to come to the wind and join him, thinking that he lay too much to the west; and indeed this appeared in the end. In the evening, when they had joined, Barentsz told him they lay too much to westward, and that he must bear to the east. Cornelisz answered, that he did not wish to enter the straits of Weigats.

They then sailed N. E. and by N. and were nearly sixty leagues in the main sea. Barentsz was of opinion that they should rather bear to the E. N. E. than to the N. N. E. on account of their having drifted so much to the west. He even thought that they should steer to the east, at least for some time, and until they had recovered what they had

* Probably Faverhill in Shetland.

lost. But Cornelisz would not yield to these reasons; on the contrary, he persisted in the design of always running in a N. N. E. direction, convinced that if they bore to the east they would enter the Weigats. Barentsz was finally compelled to join him, and steer N. E. and by N. whereas they should have stood to the N. E. and even have steered more to the E.

On the fifth of June they began to see ice, which so surprised them that they imagined at first they saw swans, and those on deck cried out they beheld a quantity swimming. The others who were below having ascended to the quarter deck, and considered the thing with a calmer eye, told them that the swans were just converted into flakes of ice: in fact, they were floating banks of ice which had been detached. At midnight they came up with this ice, the sun then being elevated about a degree above the horizon to the north.

On the seventh they were in latitude 74°, sailing along the ice, as if running between two shores: the water was as green as grass, and they presumed they were near Greenland. In the mean time the ice thickened as they advanced.

On the ninth they discovered an island, lying in latitude 74° 30′, which appeared to them to be about five leagues in length. On the eleventh they landed, and found a quantity of sea-gulls' eggs. They afterwards ascended a mountain, so steep that the sides seemed almost perpendicular, from which they descended with the greatest difficulty and danger, not being able to look down without dismay, and beholding nothing but rugged points of rocks, where they would have been dashed to pieces if they had fallen or slipped. They therefore descended gently, some on their knees, some sliding, without meeting any accident, although Barentsz, who remained in the shallop, observing them, was in doubt if he should ever behold them again alive.

On the morning of the twelfth they saw a white bear, and directed the shallop after him, to endeavour to throw a strong noose about his neck; but they found him so furious, that they dared not attempt it. John Cornelisz having sent a reinforcement of men and arms, they all attacked him together: the combat lasted four glasses, or two hours, and in the end they cut off his head with a hatchet. He was carried on board the vessel of Cornelisz, where he was flayed: the skin was twelve feet long: part of his flesh was eaten, but was not found good. This incident induced them to name the island *Beeren-eilandt*, or the isle of Bears.

On the thirteenth they weighed anchor, and while sailing perceived towards the evening something very large floating on the water: they imagined at first it was a vessel, but approaching they found it to be a dead whale, upon which were a great number of sea-gulls.

On the seventeenth and eighteenth they met with much ice, through which having passed, they came to the southern point of the island, and exerted every effort to double it, without being able to succeed.

On the nineteenth they again discovered land, and having observed the altitude, found themselves in latitude 80° 11′. The country in sight was of great extent, which they coasted, running westward to latitude 79° 30′, where they met with a good road; but they could not approach nearer on account of a N. E. wind, which came directly from the land, the bay stretching into the sea N. and S.

On the twenty-first they cast anchor in sight of land, in eighteen fathoms of water, and the crew of Barentsz went with that of Cornelisz to seek for ballast on the western coast. As they were returning on board a white bear entered into the water, and swam towards their vessel. Leaving the labour of the ballast, they threw themselves into the shallop and directed it towards the bear, who swam more than a league into the sea.

They followed him with three shallops and small boats: most of the arms with which they struck him broke on his body. Once also, on his side, he darted his paws with so great a force against the stem of one of the boats, that if he had darted against the middle of the vessel in the same manner, there is every appearance he would have overset it. At last they killed him and carried him on board: his skin was thirteen feet in length.

After this affair they sailed in a shallop for more than a league towards the land, where they met with a good port, sixteen, twelve, and ten feet in depth; and entering farther towards the east, they saw two islands extending eastward into the sea. On the western side was a very large gulf, and another isle in the centre, having sailed towards which they landed, and found plenty of wild geese, and the geese themselves in their nests, which flew away on seeing them: they killed one, which they dressed with some eggs.

They were of the same species which come every year in such great flocks into Holland, and especially to Wieringen, in the Zuiderzee, between North Holland and Friesland, it not having been known before where they went to lay. Some authors had asserted that those eggs were the fruit of certain trees in Scotland, planted on the sea shore, and that those which fell to the ground broke to pieces, while those which fell into the sea were immediately hatched; and that the little goslings swam as soon as they wer born. It is not to be wondered at that the place of the nests of these geese should be unknown, since it does not appear that any person till then had ever sailed as far as latitude 80°, nor that this country had ever been discovered.

It should be remarked, that although this island, which these navigators conceived to be Greenland, lies in latitude 80°, and even still higher, there is nevertheless verdure and grass, and beasts of pasture, as rein-deer and other animals; and that neither herbs nor verdure exist in Novaya Zemlia, which is farther distant from the arctic pole by four degrees, and where are only seen carnivorous animals, as bears and foxes.

"This country, which the author of the journal here followed believed to be Greenland, is the most northern country which has been discovered to the present time. It is situated between Greenland, which depends upon Norway, and Novaya Zemlia, which belongs to Moscovy, directly by the side of Finmarch, or the northern part of Norway. This island extends, at least according to the knowledge possessed when this journal was published, from the seventy-sixth to beyond the eightieth degree, and consequently is more than sixty German leagues in length.

"It was the difference of opinion between William Barentsz and John Cornelisz, which has been mentioned above, that occasioned the discovery of the western coast of the island. Since that time Henry Hudson, an Englishman, has also sailed there, of whom Hondius relates in his great planisphere that he met with a coast quite covered with ice to the N. W. of the isle, by the latitude of between eighty-one and eighty-two degrees.

"Since that time the English have sailed there every summer, to fetch the teeth of the sea-cow, whale fins, and the blubber of the same fish. This fishery was first undertaken by the Russian company at London; but the Dutch, French, and Biscayans have since also sailed there. From the knowledge we have of that country, which the English call Greenland, and the Dutch Spilberg, Spitsberg, or Spisberg, we have designed a map,* which is here annexed, principally founded on the map of John Daniel, of London.

"This island, as before mentioned, lies between latitude 76°, and latitude 80° N. N. W.

* This map is now very antiquated and erroneous.

from the Isle of Bears, which is beyond Norway. It is under a climate which the ancients had reason to believe uninhabitable on account of its cold. There is no country in the world in which the nights are shorter. During the six months of summer the light never wholly fails; and during two months of the six months of winter, when the sun is beyond the line, and in proportion as it recedes, the days are only of twelve, ten, eight, and finally of one hour; it does not cease when it is at the lowest, and in the middle of this long night, to rise twelve degrees and a half above the horizon, that is, in latitude 80°, and during the twenty-four hours is seen the light of day-break; thus, according to Ptolemy and others, the dawn may appear, when the sun is only eighteen degrees under the horizon.

"But although the day is of such length, and the sun shines for so long a time, without intermission in this rigorous climate, it does not prevent the summer from being the shortest and the least warm of all the countries north of the line. The ice has sometimes been seen so thick and strong on the thirteenth of June along the coasts, and at the mouth of the harbours, that the vessels could not enter. The snow itself, which always remains in certain places, had melted so little in others, that the rein-deer could find nothing to graze on, and were become perfectly meagre.

"The cause of this excessive cold and these long winters is, that the sun never rises higher on the horizon than 32° 20′: thus its rays strike the earth obliquely; so that only gliding over it, instead of penetrating, they cannot sufficiently warm it. By the same reason, the rays of the sun are not of sufficient strength to dissipate the vapours and fogs which rise from the earth, and which remain on the mountains and the sea, often preventing the crews of the vessels from seeing farther than the length of a ship.

"It is, besides, by the same principle that this land, of which to the present time, that is to say, when this relation was published, only the coasts are known, appears overspread with high mountains, whose summits are perpetually covered with snow; and that in the plains which intersect them, neither trees, bushes, nor fruits, are seen; of verdure there is nothing but a short and thick moss, of a yellowish colour, through which shoot little blue flowers. Nevertheless some mariners assert that they have observed a green plant like hay.

"The animals which are seen there are white bears, larger than oxen, and stags, or rein-deer: the latter feed on the moss, and during the space of a month which some vessels remained off these shores they were observed to become so fat, that the flesh was excellent.

"They have very crooked horns, and are rather smaller than stags: they are unaccustomed to the sight of men, as may be concluded from what has been said, yet are not startled at seeing them. Sometimes they have been wounded with musquets, and have run towards those who fired, as if to seek succour or refuge in their arms, and struck them so violently as to occasion their falling to the ground.

"On these coasts are also seen white and gray foxes, and even black. The English have found horns, which the connoisseurs pretend to belong to the unicorn. Nevertheless those which have been brought to Holland have not disclosed to what species they belong.

"A great quantity of whales, of different species, resort to the mouths of the harbours, many of which are eighty feet long, and have so much fat, that from it much oil is derived. Some have no fins on the back; but at the mouth have pendants, resembling great beards, sometimes a fathom and more long. Six hundred pieces are drawn from the same mouth: they are situated above, and ranged like the teeth of a comb, in the place where other fish have their teeth, and there are only those above. The front and

back ones are very small, so that in general they do not reckon on a greater number than four hundred. It is the only considerable profit which can be derived from this coast.

"On each side of the back part of the head the whales have large fins, where they are more easily struck with the harpoon, and more dangerously wounded. When they are wounded, and the blood runs from the head, they force the water and blood through the vent which they have above the head as high as the mast: when they have exhausted their strength by struggling, the boats approach, and throw darts on their head, and in the aperture.

"The whales have a thick black skin, covered with a black cuticle, and smooth as satin: their food is a small fish, called by the French a sea-flea, and which is not so large as the samphire plant: they swim with the mouth open, and swallow this little fish while swimming, shutting their mouth as soon as it enters.

"There are also white whales, which are of little value. Whitings are also found, but in small quantity. There are many aquatic birds, and particularly sea-gulls, which gather on dead whales; two kinds of divers; loms, which properly are a species of parrot, geese, mallards, ducks which lay very large eggs, and a great quantity of wild geese.

"A little farther north are found sea-cows, which may be named sea-elephants, for they much resemble the elephant by the size of the body, and by their teeth: as to their skin, though it be very thick, and that some have been seen at Amsterdam weighing four hundred pounds, it is, however, not esteemed, because it is unequal and foul. They have much lard, which may be clarified so as to afford oil. When they see another cow of their species which is dead, they assemble in great numbers, and placing themselves upon it, they heat it, and occasion it to corrupt.

"At five leagues still farther north, where are channels of fresh water, there are seen marine dogs, of the same nature as those which are seen in these provinces, that is to say, the United Provinces.

"This is all the knowledge relative to the state of this country, which was possessed at the time of the publication of the present relation."

On the twenty-third of June a part of the crew landed, with the intention of observing the variation of the compass: while they were thus occupied a white bear swam towards the vessel, and would have entered, if he had not been perceived. They fired some shot, when the bear returned to the island in which were the other part of the sailors. Those who remained on board seeing him return, sailed immediately towards land, and shouted with all their strength to warn their companions, who hearing these cries, imagined the vessel had struck on some rock. The bear itself was so frightened, that it took another route leading from the island, at which those on board were much rejoiced, for their companions had no arms.

With respect to the variation of the compass, they found it to differ 16°. On the twenty-fourth they sailed, and approached very near to shore, where having landed, they found two teeth of the sea-cow, each weighing six pounds, and also another small one. On the twenty-fifth they sailed along the coast, in 79° latitude, and having discovered a large gulf, they entered it, and advanced about ten leagues; but were obliged to tack about quickly, in order to depart, on account of contrary winds.

On the twenty-eighth they doubled a cape lying on the western coast, where was so great a quantity of birds, that they cast themselves in great flights against the sails of the vessel.

On the twenty-ninth they were obliged to bear off from the land on account of the ice, and they arrived in latitude 76° 50′.

On the first of July, they were again in sight of the Island of Bears, when John Cornelisz, with the other officers of his vessel, went on board that of William Barentsz, where not being able to agree as to the route they should take, it was finally settled that each should steer the course he judged proper. In consequence Cornelisz, following his idea, returned again to latitude 80°, thinking he should be able to pass by the east of the lands which are there, and he then steered towards the north.

Barentsz, on the contrary, pursued a southern direction, on account of the ice. On the eleventh he imagined himself, by calculation, to lie N. and S. with Candinous, or Candnoes, the eastern point of the White Sea, which remained to the S. and he bore to the S. and S. and by E. in latitude 72°, and conceived himself to be near the land of sir Hugh Willoughby. On the seventeenth he arrived in latitude 74° 40′. At noon he observed Novaya Zemlia, towards the bay of Loms. On the eighteenth he doubled the cape of Admiralty Isle, and on the nineteenth saw the Isle of Crosses, under which he anchored on the twentieth, the ice preventing him from advancing farther.

Eight of the seamen sailed towards land in the shallop, where they went to visit one of the crosses, and placed themselves at the foot in order to repose, before visiting the other. These two crosses have given name to the island. Proceeding to visit the other cross, they perceived two bears at the foot, at which they were very much alarmed, not having any arms. The bears raised themselves quite upright against the cross, in order that they might the better see the persons coming towards them, for they can smell at a far greater distance than they can see, and afterwards ran to meet them.

The sailors fled towards their boat, looking behind from time to time, to see if they were followed by these ferocious beasts. But the master stopped them, and threatened to plunge the boat hook he held in his hand into the body of the first man who fled; because, he said, it would be better to keep all together than to separate, in order to frighten the bears by their shouts. They therefore walked an ordinary pace towards the boat, where they escaped with much joy.

On the twenty-first of July they were in latitude 76° 15′, and the variation of the compass was 26° or a little more. On the sixth of August they passed by Cape Nassau, and on the seventh were under Cape Troost, where Barentsz had long wished to be. In the evening the weather became so hazy that it was necessary to moor the ship to a bank of ice, of thirty-six fathoms depth in the water, and about sixteen fathoms above, so that it was altogether fifty-two fathoms in thickness.

On the ninth of August, the vessel being still moored to the bank of ice, the master, who was walking on deck, heard the breathing of an animal, and immediately beheld a bear attempting to mount the ship.

He immediately cried out, all hands on deck! and all the crew having ascended, they saw the bear with his claws against the side of the vessel, and endeavouring to enter. They began shouting all together as loud as they could, at which the beast, frightened, retired a little farther off. But returning immediately from behind the bank of ice to which the vessel was moored, and walking fiercely towards them, still endeavoured to throw himself within. They had had time to stretch the sail of the shallop over the upper works of the vessel, and a part of the crew was near the windlass with four firelocks. The bear was wounded and fled, without their being able to see on which side, on account of the snow, which fell very thick. It is very probable he went behind one of the mountains of ice which had gathered on the banks.

On the tenth of August, the ice having separated, the flakes began to float, and it was then observed that the large bank of ice to which the vessel had been moored,

reached to the bottom, because all the others, passing along, struck against this bank without moving it. They were therefore afraid of being enclosed by the ice, and endeavoured to leave that part of the sea; although in passing they found the water already frozen, the vessel occasioning the ice to crack for a considerable distance around it. They finally arrived at another bank, where they presently cast a stream anchor, and remained moored there till night.

After supper, during the first watch, the ice began to break with so dreadful a noise as not to be described. The head of the vessel lay in the current which broke up the ice, so that they were obliged to let out more cable in order to be clear of it. More than four hundred large banks of ice were counted, lying ten fathoms under the water, and apparently of the height of two fathoms above.

They afterwards made the vessel fast to another bank, six long fathoms under water, and they moored it by the stern. When they were settled there, they perceived at a little distance another bank, the top of which ended in a point like the point of a steeple, and it reached to the bottom of the sea. They advanced towards it, and found it to be twenty fathoms under water and nearly twelve above.

On the eleventh of August they sailed again towards another bank, being eighteen fathoms deep, and ten fathoms above the water.

On the twelfth they advanced towards the coast, that the vessel might not be carried away by the ice, and that at all events it might be in greater security; for the larger banks of ice could not approach it, being only in four or five fathoms of water. In that place was also a great fall of water, which descended from the mountains. The vessel was again moored to a bank of ice, and this place they named the Little Cape of the Ice.

On the thirteenth of the same month of August, in the morning, they saw a bear coming from the eastern point towards the vessel. A sailor broke one of his legs by a musket ball. Notwithstanding which he went back and climbed up a mountain. Several of the crew left the ship, and having pursued him, killed and flayed him.

On the fifteenth Barentsz steered along the coast of Orange Isle, where his vessel was entangled in the ice, near a great bank, in danger of shipwreck. But he extricated himself by approaching the land, though with extreme difficulty; and when he had moored himself, the wind veered to the S. E. which occasioned him to change his anchorage.

While the crew were all engaged in performing this change, the great noise they made awoke a bear, who was sleeping quite close. He immediately ran towards the vessel, and obliged all the labourers to quit their work in order to defend themselves. The bear received a musket ball in his body, and fled thus wounded to the other side of the island, where he placed himself on a bank of ice. They followed him, and seeing the shallop sailing towards him, he threw himself again into the water and endeavoured to get back to the island. They intercepted his passage, and wounded him on the head with a hatchet. They endeavoured to follow up the blow, but every time the hatchet was raised, he plunged into the water and avoided the blows with such dexterity, that it was with great difficulty he was killed.

On the sixteenth ten men in the yacht sailed towards Novaya Zemlia. They drew the schuyt on the highest part of the ice, which resembled a little mountain, and observed the altitude, in order to know in which direction the main land lay. They found it to lie S. S. E. and afterwards still more to the S. This led them to think, though very unseasonably, that the continent extended towards the south. At the same time they observed the water to the S. E. to be free, and imagined the success of their voyage was

insured; so that they were extremely impatient to carry this pleasing intelligence to Barentsz.

On the eighteenth they got ready and wished to sail, but in vain, for having navigated with great difficulty, they were obliged to return to the place from which they departed.

On the nineteenth they doubled Cape Desire, and conceived fresh hopes of being able to sail. Nevertheless they got entangled again in the ice, and were obliged to put back. On the twenty-first they entered Icy Harbour, and remained at anchor there during the night. On the following morning they left it, and moored their vessel to a bank of ice on which they mounted, and admired its figure, as being of very singular form.

This bank was covered with earth at the top, and nearly forty eggs were found. The colour was not that of ice, but of a sky blue. Those who were there, reasoned much concerning this object. Some said it was in fact ice, while the others maintained that it was a frozen land. However this might be, the bank was of very great height, being about eighteen fathoms under water, and ten above.

On the twenty-fifth of August, at three in the afternoon, the tide again began to force the ice along; and they imagined they could sail by the south of Novaya Zemlia towards the west of the Weigats. For as they had passed Novaya Zemlia, and not having found any passage open, they had no more hopes of being able to proceed farther, and prepared to return to Holland, when being arrived in the Bay of the Currents they were impeded by the ice, which was so thick that they were obliged to put back.

On the twenty-sixth, having entered Icy Harbour, they remained there enclosed by the ice which floated from all parts, and rolled along with great force; so that they were not able to extricate themselves. They even had nearly lost three men, who were on the ice endeavouring to make an opening. But happily for these three men, as the vessel fell back, and the ice was carried along by the same side the vessel was forced from, and that they were active and strong, each of them took so well his opportunity, that one caught hold of the tacks, the other the sheet, and the third the bight of the main brace, which hung out of the back part of the ship; and thus they were all three most miraculously saved, so nearly had they been carried away by the ice.

In the evening of the same day they came to the west of Icy Harbour, where they were obliged to winter, and suffered a great deal, as much by cold, as the want of necessary articles, not to mention their vexation. On the twenty-seventh the ice floated about the vessel, and as the weather was fine, part of the crew landed, and had penetrated a considerable distance, whilst the wind, which veered to the S. E. and was sufficiently strong, detaching yet more ice, forced it towards the prow of the vessel, and occasioned it to pitch in such a manner, and at the same time to fall astern, that it seemed to touch the bottom with both its extremities.

In this imminent danger, the shallop was let down, in order to save themselves in case of necessity. They also hoisted a flag, as a signal to those on shore to return on board; at the sight of which they made all haste to repair there, though they thought that the vessel had already started.

On the twenty-eighth, the ice being separated a little, the ship was recovered in its station: but before this was quite accomplished, Barentsz went with the other pilot to visit the prow. While they were there engaged, and on their knees and elbows in order to measure, the upper works of the vessel started, and in opening made so dreadful a cracking that they believed themselves lost. On the twenty-ninth, when it was completely in its station, they endeavoured by means of iron crows and other instruments to break and separate the ice, which lay in heaps, but without success; so

that they had no longer hopes of being able to disengage themselves and to have a free navigation.

On the thirtieth the flakes of ice began again to gather in heaps more and more, around the vessel, to which a strong wind contributed much, and the snow which fell in thick flakes, and increased the height of these dangerous ramparts which surrounded it. There was a dreadful cracking everywhere both within and around the ship, and they were in dread of seeing it burst and break to pieces.

As the ice was much more heaped up under the vessel on the side whence the current proceeded, than the other, it first lay very much inclined; but finally it gathered in heaps in the same manner on the other side, and by this means the vessel was set upright again, and lifted on these banks of ice, as if it had been intentionally raised with screws or other machines.

On the thirty-first more flakes of ice floated towards those at the head, and entirely raised up the prow; so that the stem was elevated four or five feet higher than the rest of the vessel, and the stern was sunk between the ice, as in a pit. They were in hopes this incident would preserve the rudder, and that the flakes of ice would no more strike against it: but this did not prevent its breaking, as well as the tiller. Nevertheless, if it was not able to save the rudder, there is every appearance that it contributed the most to preserve the body of the vessel. For if the stern frame had been exposed to the flakes of ice which incessantly floated, like the prow, they would have lifted up the whole vessel, and finally overset it, or even it might have filled the lower part with water, which was much feared.

Under this apprehension they had already got the shallop and yawl on the ice to retire to, and after having waited for four hours in anxious expectation of what might happen, the ice began to separate, and was carried away by the current. They all regarded this new incident as a deliverance sent by God, and laboured with all their might to refit the rudder and tiller. It was afterwards judged proper to unhang it, in order that if they were again beset with the ice it might run no more hazard.

On the first of September the flakes of ice began again to heap together, so that the whole body of the vessel was raised two feet, and nevertheless remained entire. In the afternoon they made the necessary preparations to draw the yawl and shallop to shore. On the second the vessel was still more raised by new flakes, which occasioned it to crack so dreadfully, and even to start in several places, that notwithstanding the bad weather they resolved to drag the yawl to land, with thirteen casks of biscuits, and two small casks of wine.

On the third the vessel was beset with fresh flakes of ice, which united with those which already surrounded it, and held it so fast. Then the after-piece which was at the stern post separated, but the sheathing still remained. The cable which was anchored to the wind also broke, as well as a new cable which they had fastened to the ice: so that it was to be wondered at that the body of the vessel should remain entire, considering the violence, the quantity, and the size of the flakes of ice, some of which were seen floating as high as the salt mountains seen in Spain, and were only at musket shot distance from the vessel.

On the fifth, after supper, the banks of ice pressed so against the vessel, that it remained quite inclined on one side, and was greatly injured, though always without separating. Nevertheless, as they imagined it could not resist much longer, they carried to shore an old fore-sail, powder, lead, firelocks, muskets, and other arms, in order to make a tent near the place where was the yawl. They also carried more biscuit, and wine, with carpenters' instruments, to refit the shallop, if necessary. Besides there was

so little water about the vessel, that they were not able at one time to draw up a full bucket.

On the seventh, five sailors having landed, two of them returned on board, and the three others walked for two leagues into the country, where they saw a river of fresh water, and a quantity of wood which had floated on its banks. They also saw traces of rein deer and elks, at least as well as they could judge from the marks of the feet, and the different size of these vestiges, such as they appeared imprinted on the ground.

On the night of the ninth two bears came close to the vessel, which they put to flight by the noise of trumpets and guns which they fired, although none of them took effect on account of the fog. On the eleventh, being calm weather, eight sailors well armed went on shore, in order to see if the three others who had already been there had well observed every thing, and if they were not mistaken in the report they had made concerning the wood on the banks of the river. For after having been locked in the ice at different times, and extricated themselves from it, they found themselves this time enclosed in such a manner, that they well perceived, it being the season of autumn and winter approaching, there was no more room to hope they should be able to disengage themselves. Thus preparing to pass the winter, they had held counsel all together as to what was to be done, in waiting what it should please God to order concerning them.

It was therefore resolved to fortify themselves against the cold, and the attacks of wild beasts, and to build a hut for this purpose. They had a favourable opportunity for executing their design. On the shore were found even whole trees with the roots, which had been brought either from Tartary, or Moscovy, for there were none on the spot; so that they found the three first sailors had made a faithful report. This beginning of good fortune induced them to hope that Heaven would grant them hereafter greater favours, and that since it furnished them with the means of building a retreat to warm themselves, and to prevent their perishing by cold, which would have been inevitable without this assistance, it would also facilitate to them the means of returning to their native country.

On the fifteenth of the same month of September, in the morning, the man who stood centinel perceived three bears, one of which remained behind a bank of ice, while the others advanced towards the vessel. As the crew were preparing to fire, one of the bears was about to put his head into a tub where some meat lay in soak, at a considerable distance from the vessel, because there was no water in the part where it lay. At the same instant the bear received a musket ball in his head, which laid him dead. The other bear remained as if thunderstruck: he attentively regarded his companion stretched on the place, and seeing him make no motion, he smelt to him, and at length went away. They followed him with their eyes, and as they perceived him return, and raise himself on his hind legs in order to cast himself on the sailors, they fired and shot him in the belly, which caused him to fall again on his feet, and then he fled, making a great howling. They opened the dead bear, and having taken out the entrails, they placed him on his four legs, in order to see if he would be sufficiently frozen to carry him to Holland, if they had the good fortune to extricate the vessel.

The work of the building of a hut was at length begun, by preparing a sledge to convey the wood. At this time the sea was all frozen to the thickness of two fingers. On the sixteenth they brought four rafters from a league distant, by walking always on the ice or the snow. During that night it still froze of the thickness of two fingers. On the seventeenth thirteen men departed to seek for wood, ten of which conveyed it, while the other three cut it. On the twenty-first the frost increased to such a degree,

that it was necessary to transport the kitchen articles to the lower part of the hold, every thing freezing in the cook room.

On the twenty-third the carpenter died, and on the twenty-fourth was buried in a cleft of a mountain, near a water-fall, for the earth was so frozen that it was impossible to dig a grave. On the twenty-fifth the rafters were fixed, and the building began to assume its form. On the twenty-sixth the wind blew from the west and the sea was free, but the vessel not being disengaged, the crew only beheld this mitigation of the weather with vexation.

The whole of the crew did not consist at that time of more than sixteen men, of whom some one was frequently sick. On the twenty-seventh it froze so hard, that one of the crew, being at work, putting a nail into his mouth, as is the custom of workmen, the skin came away when he drew it out, and the blood followed. The cold latterly became so intense, that it was only an extreme desire of preserving life, which could have enabled them to support the hardship of their labour.

On the thirtieth the wind was E. and E. S. E. and it snowed so hard on the preceding night, and all this day, that the height of the snow prevented their going in quest of wood. They made a great fire along the building to thaw the earth, and raise it around like a rampart, in order to form a better inclosure, but in vain, for the earth was frozen so hard and to such a depth, that it was impossible to soften it, and if they had been determined to accomplish it in all events, it would have consumed too great a quantity of wood.

On the second of October the hut was in an advanced state, and near it was raised a May-pole of frozen snow. On the fifth the sea was observed to be open as far as the eye could extend, notwithstanding which the ice about the vessel did not melt; so that it seemed as if they had built a wall on purpose to raise it two or three feet, and it was found that the water in this part was frozen to the bottom, that is to say, to the depth of three fathoms and a half. On the same day the front cabin was cut up, and the planks were used to cover the hut, in form of a roof, with two slopings; which was nearly completed on the same day. On the seventh the aftermost cabin was cut up, to make a fence around the hut.

The wind, which was violent during the night of the seventh, continued all the following day, and brought so much snow, that it seemed very probable that those who should be exposed to the air would have been suffocated. Besides, it would have been totally impossible to walk as far as the length of a ship, and to suffer the rigour of the cold, and the inconvenience of the air, during that time.

On the fifteenth the air became a little milder, so that they were enabled to leave the ship. One of the crew being on shore met with a bear, which he did not perceive till he was near to him. He turned back, and fled with all haste towards the vessel. The bear pursued him, and arriving at the spot where they had placed the other bear which had been killed a short time before to freeze, and was completely covered with snow, excepting one of his paws that was raised in the air, he stopped there; which gave the sailor an opportunity of reaching the vessel, and saving his life.

As he was very much frightened on entering the ship, he could utter nothing but *a bear, a bear*. The other sailors having ascended above, in order to fire on the bear, could scarcely perceive any thing, on account of the smoke in the vessel, while they were shut up in it; and which they could never have believed possible to support, if it had been to gain all the wealth of the world, if they had not been influenced to preserve their lives, which they would soon have lost, by the incredible severity of the cold, and the inconvenience of the snow. The bear did not wait till their eyes were free, and retired without being seen.

On the eleventh the wine and the other provisions were brought to land, and on the twelfth half of the crew slept in the hut they had built, where they suffered extreme cold, because as yet they had no beds and little covering. Nor could they make any fire, the chimney not being yet built, and the smoke on this account insupportable.

On the thirteenth three sailors went to the ship, and placed some beer on a sledge, in order to carry it away; but as they were setting off, there arose so violent a wind, there was so great a storm, and the cold so intense, that they were not only obliged to re-enter the vessel, but even to leave their beer without on the sledge. The following day they found the bottom of a cask of strong beer of Dantzic* completely cracked by the strength of the frost; and the beer, instead of running out, was frozen, and stuck to the bottom as if it had been strong glue. The cask was carried into the hut, and placed upright. They thawed the beer, for there was very little in the middle of the cask which was not frozen; but what was not congealed, having lost the taste of beer, because the strength had been drawn away, was no longer fit to drink; and that which they thawed had only the taste of water. They thought of mixing them together again, which however did not restore the original taste or virtue.

On the night of the sixteenth a bear attempted to enter the vessel; but hearing the voices of the sailors towards break of day, he retired. On the eighteenth, after taking the biscuit from the yawl, which they had dragged to land, they also took out the wine, which was not yet frozen, though the frost had already continued with great severity for six weeks.

On the nineteenth another bear attempted to get into the vessel, where only two men and a boy remained, who were very much alarmed. The two men ran to the bottom of the hold, and the boy climbed to the top of the fore shrouds. In the mean time some sailors advancing from the hut, the bear went directly up to them as soon as he perceived them, but fled at the first shot they fired at him.

On the twentieth they returned to the vessel to carry away all the beer: they found some casks which the frost had split, and several iron hoops broken on those in which was the strong beer. On the twenty-fourth all the remainder of the crew, to the number of eight, retired to the house, and they were obliged to convey on a sledge a ninth, who was sick. They also dragged, with incredible labour, the shallop of their vessel, and they placed it with the keel upwards, in order to make use of it when opportunity should offer.

In fine, seeing that the vessel was frozen in such a manner that they could have no hopes of seeing it soon disengaged, they carried back the stream anchor on board, lest it should be lost under the snow, and that they might use it in the following summer, hoping to find then some favourable occasion for returning to their country.

In the mean time the sun, the sight of which was the only benefit and pleasure which remained, beginning to abandon them, they made all possible diligence to convey on their sledges the remainder of the victuals in the vessel, and the rigging necessary to equip the shallop, in order to carry them to their hut. On the twenty-fifth of the same month of October, while occupied in this work, the master, who happened to raise his eyes, saw three bears behind the vessel, who were advancing towards the sailors. He cried out loudly, in order to frighten them. On their side, the sailors threw their straps on the ground, to put themselves in a state of defence. Luckily two halberts were found on the sledge: the master took one, and Gerard de Veer the other. The others ran towards the vessel, but one of them fell into a chasm

* A strong and medicinal beer, made with the berries of sweet briar.

in the ice; an accident which made all the rest shudder, thinking the bears would inevitably devour him. Instead of which these ferocious beasts pursued those who fled towards the vessel; during which time the master, with De Veer and the man who had fallen into the chasm, went round the vessel, and entered on the opposite side to the bears.

These savage animals, seeing that they had entered, advanced furiously towards the vessel, where the crew, having no other arms but the two halberts, on which they could not depend, endeavoured to divert their attention by throwing pieces of wood at their heads, and other things, after which they ran each time a piece was thrown, in the same manner as a dog runs after a stone. One of the sailors was sent into the cook room to strike a fire, and another to seek for some pikes. The more the sailor hastened, the less was he able to kindle any fire, so that there was no opportunity of using their firelocks. In the mean time the bears always returned to the assault with equal fury. A halbert was thrown, which having struck the largest directly on the mouth, he began to retreat, and the others, who were considerably smaller, followed him slowly at a distance, and left the crew to the liberty of dragging their sledge to the hut.

On the twenty-sixth the greater part of the water was free close to the land, but the ice always continued about the vessel. On the twenty-seventh a white fox was killed, which they roasted; it very much resembled the rabbit in taste. The same day they were employed in mending and fixing the clock. They also prepared a lamp to burn in the night time, and for this purpose they used the fat of a bear, which they melted. On the twenty-ninth they carried on sledges a quantity of the herbs and other things left by the sea on the shore, which they placed about the sail that enclosed the hut, that the cold might penetrate less through the planks, which were not let into each other, the bad weather not having permitted them to do otherwise.

On the first of November, in the dusk of the evening, they saw the moon rise in the east, and the sun yet rose sufficiently high on the horizon to be perceived. On the second they saw the sun rise in the S. S. E. and set near the S. S. W. but the whole of his disk did not appear above the horizon: he was only seen on the horizon itself, and a part of it remained concealed. On the same day they killed a fox with a blow of a hatchet, which they roasted.

On the third the sun rose in the S. and by E. a little nearer the S. than the S. E. and set in the S. and by W. also a little nearer the S. and the top alone of its disk appeared above the horizon, although the situation where they took altitude was as high as the top of the vessel, which lay close. On the fourth it was no longer observed, although the weather was very serene.

At this time the surgeon took a cask, or an empty pipe, and made a bath of it, where they bathed one after another: from which they experienced much benefit. On the same day they took a fox, this animal appearing at that time while the bears were retired as well as the sun, and did not again appear till the return of that star.

As the sun had quitted the horizon, the moon had come to take its place, appearing all day and night without setting, when it was in its highest quarter. The sixth was so dull a day, that it could not be distinguished from the night, the more as the clock, which would have assisted them, had stopped; so that not conceiving it to be day, all the people remained for a long time a-bed, without rising but on necessary occasions, and when they rose, they were not able to discern if the light they saw was that of the day or the moon. They even had much dispute concerning it, but finally found that it was day, and even the middle of the day.

On the eighth they distributed the remainder of the bread, and the portions were fixed at four pounds and five ounces for eight days, instead, as formerly, of the same

portion only lasting for five or six days. As to the fish and meat, they imagined there was no necessity of distributing them; but for the drink, they were in want of it, and what beer remained possessed no strength nor taste. On the eleventh they fixed a net made of rope yarn on a hoop, to catch foxes: so that when a fox was underneath, he remained there caught as in a trap, and they could draw the trap and the fox into the hut. The same day they took a fox.

On the twelfth the distribution of the wine was fixed at two small cups each day, and they had nothing besides to drink but water from melted snow, which they took from without. On the eighteenth the master distributed to each person a piece of thick cloth, to cover themselves, or to use in any manner they should choose against the cold. On the twenty-ninth the chest of sheets was opened, which were also distributed to make shirts, for the pressing necessity obliged them to seek every method to relieve their persons.

On the twentieth, the weather being tolerably fine, they washed their linen, but it was not perfectly washed: for as soon as they drew it from the boiling water, in order to wring it, it froze. It even continued frozen near the fire on the outer side, and only the side facing the fire thawed; so that it was necessary to plunge the other side again into the boiling water, in order to thaw it.

On the twenty-second they ate together a large Dutch cheese, one of seventeen which they still possessed, and the remainder was divided, that each man might manage his portion at discretion. On the twenty-third, as they saw foxes, they constructed traps of thick planks, which they furnished with stones in order to render them the heavier, and fixed short stakes in the ground about the place where the planks fell, in order to prevent the foxes from digging, and escaping; and they took some by this method.

On the twenty-fourth two men who were indisposed bathed, and on leaving the bath the surgeon made them take a purgative medicine, from which they derived much benefit. On the twenty-sixth, twenty-seventh, and twenty-eighth, there fell such a prodigious quantity of snow, that they remained buried in their hut, without being able to leave it on any occasion whatever. But the weather clearing up on the twenty-ninth, they began to dig the snow with shovels, made an opening, and finally got out, by crawling through the hole they had dug. They found their traps covered with snow, but disengaged them, and on the same day took a fox; an aliment which became necessary, there being no other to be found in the snow, even when it was possible to remove it. By this they were also furnished with skins, to make caps proper to secure their heads from the severity of the cold.

On the first of December the snow still environed their hut on all sides; which occasioned so great a smoke when they wished to make a fire, that they were obliged to lay in bed almost all day, except the cook, who at length arose to prepare some victuals. On the second day they made use of stones, which they heated and placed around them in their beds, because the cold and smoke being equally insupportable, they could scarcely find means to protect themselves at the same time from both of those evils.

On the third, while in their beds, they heard the ice of the sea crack with so horrible a noise, that they imagined the mountains of ice which they had seen during the summer, and which had appeared of so many fathoms in height, were detached, and heaping upon one another.

In the mean time, as during two or three days that they had not so much fire as usual, it froze so hard within the hut, that on the floor and walls was ice of the thickness of two fingers, and there was some even in their beds where they lay. They then prepared the sand-glass of twelve hours, and took care to keep it in good order, that they might

know the time, for the frost had suspended the motion of the dials, though they had increased the counterpoises.

On the sixth the cold was so great, that not being able to support it any longer, they regarded each other with languishing looks and pity, believing the cold would still increase, and extinguish their lives: in fact, however great they made the fire, they could no more warm themselves. The dry wine of Serez, which is of a very hot nature, also froze then, and they were obliged to thaw it on the days of distribution, which was performed every other day, when each man had half a pint, and after that they had only water, a drink very little fit for their condition, and the cold which overwhelmed them, and besides it was snow water.

The seventh was as sad a day as the preceding. This day they consulted together as to the best means of resisting the cold: it was resolved to fetch from the vessel the pit-coal which was there, because it affords great heat, and burns for a long time. In the evening they made a large fire of this coal, which warmed them surprisingly; but they thought not of the return and the sad effects this pleasure might possess. This warmth, which had done them so much good, they were willing to preserve as much as possible, and for this purpose they entirely closed the windows, and went to bed, very contented to lie so warmly, which rendered them gayer than ordinary, and occasioned them to talk together for a long time after being in bed.

In the end they found themselves all attacked with vertigos and swimmings in the head, some more than others, which they perceived by the means of one of them, who, being sick, could less support them, and made lamentations. They all found themselves in excessive pain, not being able to stand up: some however crawled to the chimney and door, and opened them; but the man who opened the door fainted, and fell down on the snow. De Veer, whose head was near to the door, having heard the fall, threw some vinegar in the face of the man who had fallen, and brought him to himself.

When the door was opened, the cold, which had done them so much harm, was of service, and recovered them; without it they must all have inevitably expired during the fainting which seized them. The master distributed to each a glass of wine to strengthen their spirits.

On the ninth, tenth, and eleventh, the weather was fine and clear, and the sky starry; yet the cold increased to so great a degree, that those who have not felt it are unable to conceive: the leather of their shoes froze on the feet as hard as if it had been horn, so that they were of no more service. They made a kind of covering, resembling large slippers, of the upper part of sheep skins, which they might wear with three or four pair of socks over one another, in order to warm their feet: their garments were even quite white with snow and frost: when they remained without sufficiently long, the pustules and pimples on their body, face, and ears also, were frozen.

On the fourteenth of the same month of December they observed the altitude, and found themselves in latitude 76°. On the eighteenth seven of them went to observe the state of the vessel. The water had risen an inch in eighteen days, during which time they had not visited the vessel, though it was not properly water, but ice, because the water froze immediately it appeared above the ice. The water brought from Holland in casks was also completely frozen.

The twenty-fourth, which was Christmas-eve, they disengaged their hut from the snow, in order that they might go out; a labour they were at that time obliged to perform every day. Although there was no day-light, they were enabled to see to a tolerable distance, and they perceived there were several places in the sea perfectly free, which was occasioned, no doubt, when the violent cracking of the ice was heard. Christmas-day

was dreary, yet they heard foxes around the hut, which they would have been well pleased to have caught, to use in the pressing want. The fire no longer appeared to cast its accustomed heat, or at least it could not pass to near objects; for their stockings were burned before their feet received any warmth, and the burning of the stockings would not have been perceived, if the smell had not been affected.

In this manner passed the close of the year, and in the midst of these sufferings the remainder of the crew of the vessel entered on the year 1597. The commencement was not less severe than the preceding year had been: they began it by again diminishing the portions of wine distributed every other day; and as some of them feared it would be a considerable length of time before they left the place, though they always flattered themselves with this hope, they spared that very necessary aliment, in order to make it last the longer, and to retain some in case of a more pressing occasion.

On the fourth of January they put on their chimney a lance with a small piece of cloth, in order to know the quarter of the wind; but to learn it, they did well to observe it in placing the linen, for it was frozen in a moment after, and became as stiff as a stick, without being able to play or turn.

On the fifth, the air being a little milder, they cleared their door, which had been shut for some days, and opened it: they made use of this opportunity for regulating the most necessary matters; among others, they cut some wood and carried it into the hut, that they might not be in want of it, if possible.

The whole of the day being thus passed in laborious occupation, they recollected at night that it was twelfth-day, and entreated the master to permit them to take at least some hours of recreation, among so many hardships and causes of grief. They were unwilling to use any thing but the wine they had voluntarily spared, and perhaps two pounds of flour, of which they made a kind of fritters cooked with oil; a mess which was eaten with as good an appetite as they would have eaten the greatest delicacies, if they had been at their own dwellings. They even celebrated the feast in all its ceremonies, drawing tickets, and the gunner was king of Novaya Zemlia; a country perhaps more than two hundred leagues long, situated between two seas.

On the tenth of January they found the water had risen nearly a foot in the vessel. On the twelfth they observed the altitude of the star called the Bull's Eye; and it appeared to them that the altitude of this star, and some others besides, which they had observed, and that of the sun, accorded very well, and that they were in latitude 76°, but rather higher than lower.

On the thirteenth the weather was clear and serene, and they perceived the light of day began to increase; for on throwing a ball they perceived it roll, which they could not before. From this time they went out every day, and exercised themselves at walking, running, throwing, in order to revive their limbs: they also remarked at the same time a redness in the sky, which was to them an aurora, the harbinger of the sun. The air was also found less cold during the day; so that when they had a good fire in the hut, there fell from the boards and partitions large pieces of ice, which thawed in the beds, a circumstance which never happened before, however great they made their fire; but at night it always froze equally strong.

On the eighteenth, as the wood-fuel diminished greatly, they again used pit-coal, with the precaution of not closing the chimney, which prevented the former bad effects: nevertheless they judged it proper to be careful of it, as well as the wood, and still more so, for they expected to reimbark in their little vessel without any covering, where they would have great occasion for coal. It was also necessary in the same manner to diminish the portions of biscuit, as well on account of the quantity already consumed, as

because the casks were not exactly of the proper weight. Again, the capture of foxes was not so abundant as formerly; and this retreat of the fox was still more grievous, as it was an indication of the speedy return of the bears, who in fact appeared very soon after.

The twenty-fourth of January was a clear and fine day. James Heemskerk, Gerard de Veer, and another, took the opportunity of walking towards the southern shore of Novaya Zemlia. De Veer, when they least thought of it, perceived a side of the sun's disk; full of joy, they all three returned quickly to carry this agreeable news to Barentsz and the others. Barentsz, an experienced mariner, would not believe it, because, according to all the computations, it would be fifteeen days before the sun could be seen in that altitude. The others maintained that they had seen it; and this dispute gave rise to wagers.

The twenty-fifth and twenty-sixth were so very misty that they could not see one another, so that those who had wagered that the sun had not yet appeared imagined they had already won: but the weather clearing up on the twenty-seventh, all the company together beheld the full disk of the star of day above the horizon; whence it was easy to conclude that a part had been seen on the twenty-fourth.

Nevertheless, as this discovery is contrary to the opinions of all writers, both ancient and modern, and that some may pretend that it is against the course of nature, and that it destroys the rotundity ascribed to the heavens and earth, they conceived there would be persons inclined to believe they were mistaken; that they would say it was so long since they had beheld the day, that it was impossible to keep an exact account of the number of the days; that probably they had passed some days in bed and sleep, without being conscious of it; and that, in fine, from whatever accident it might arise, they must necessarily have made some error in their calculation.

But as for them, who did not doubt of what they had seen, and who were unwilling to give occasion to think that they might have some doubts, as they might have done if they had spoken less positively, and had not related the circumstances and the reasons, they have minutely written all these things, in order to show that their computation was exact: they then saw, for the first time, the sun in the sign of Aquarius, in 5° 25′; and according to their former calculation, he should have been in 16° 27′, before he could appear in the latitude of 76°, where they found themselves to be.

These circumstances, so contrary to one another, occasioned much astonishment, the more as they did not think it possible to be mistaken in their computation of the time: they had marked day by day, without omitting any one, whatever happened: they had continually paid attention to their watches, and when they were frozen, they had recourse to the twelve-hour-glass.

Their occupation at that time was to make different reflections, in order to conciliate what appeared so opposite, and to discover the truth with respect to the time. They consulted the Ephemerides of Joseph Scala, printed at Venice, which reached from 1589 to 1600; and they thereby found that on the twenty-fourth of January, which was the same day the sun had appeared to them, the Moon and Jupiter were in conjunction, at one hour after midnight with respect to Venice.

On this remark they were attentive to observe that same night at what hour those two planets should be in conjunction, with regard to the place they were in, and they were five hours later than at Venice, that is to say, about six in the morning. During this observation they saw that they approached each other at times till six in the morning, when they were exactly the one above the other, both in the sign of Taurus. Their conjunction took place by the compass exactly at N. and by E. and the south of the

compass, or of the needle, was S. S. W. where was the true south, the moon being eight days old; whence it appeared that the moon and sun were at the distance of eight rumbs from each other.

This difference therefore between the place where they were and Venice was five hours in longitude, and that being supposed, we may compute how much farther they were to the east than the city of Venice, that is to say, five hours, each hour being of fifteen degrees, which makes seventy-five degrees; from which it is easy to conclude that they were not mistaken in their computation, but that by the means of these two planets they had found the true longitude; for the city of Venice is in longitude 37° 25′, and the declination being 46° 5′: it follows that the hut which was in Novaya Zemlia was in longitude 112° 25′, and latitude 76°. All which circumstances are here related to shew that there was no error in their computation of time.

As to what regards the difference of time, which was about fifteen days, that they had seen the sun at Novaya Zemlia sooner than it should have appeared, it is left to the learned to argue, and to determine as well as they can.

On the same day, the twenty-sixth of January, the sick man of the company fell into a great swoon, and continued very bad till past midnight, when he died. On the twenty-seventh they dug a grave in the snow near the hut in order to bury him, though with no small difficulty on account of the cold, which obliged them to work by turns. In fine, the pit being seven feet deep, they buried the dead man. The thirty-first was a very fine day, and they were able to enjoy the brightness of the sun with pleasure.

The first seven days of February were bad and stormy, which nearly occasioned them to despair; for in the hopes of finer weather they had not taken the usual precaution of providing themselves with wood. The hut was again surrounded with high ramparts of snow: the fog was greater than it had been in the midst of winter, and the snow fell as thick as ever. But they did not as before give themselves the trouble of disengaging their door each time; and when any thing occurred which obliged them to go out, they passed through the chimney, and those who were not able, were constrained to perform their necessities within.

On the eighth, the weather became finer: they saw the sun rise in the S. S. E. and set in the S. S. W. that is to say, with respect to the dial of lead they had constructed near their hut, and fixed exactly south of that place; for otherwise there was a difference at least of two rumbs from their other ordinary compasses.

On the thirteenth they cleaned their traps: while they were thus occupied, they saw a large bear coming directly towards the hut, to which they all retired in great haste. One of them having taken aim, the ball struck the bear on the breast, passed quite through the body, and went out by the tail, so that it became as flat as a halfpenny. The bear being wounded, made a great leap, and retired for twenty or thirty feet from the hut, where he fell. Those who pursued him found him still living, and he raised his head, as if to see who had wounded him.

As they had already too fatally experienced the strength of these animals, they did not stop there, but fired two other musket-shots at him and killed him: they ripped up his belly, and having taken away more than a hundred pounds of fat and lard, they melted it; and by this means they had wherewithal to feed their lamp every night, which they had not done for some time, being in want of material; but now they had the pleasure of having each a lighted lamp by his bedside when they chose. The skin of the bear was nine feet long and seven wide.

On the twenty-first they had no more wood remaining to warm themselves, and the weather was very severe, as well on account of the wind and snow as of the cold. It was

necessary therefore to collect together what wood they could, both from without and within, and use even the small sticks under their feet. The weather was finer on the twenty-second: they prepared a sledge to fetch some wood, but found it so covered with snow that it was impossible to disengage it; thus they were obliged to proceed much farther, whence, nevertheless, they brought but little, and with such great labour, that returning they all lost their spirits, as the severity of the cold was great, the labour of dragging the wood fatiguing, and the strength of the labourers exhausted by their exertions, and the inconveniences they then experienced; but, in short, it was however indispensable either to bring wood or perish with cold.

When they approached the hut, they perceived the waters open in different places of the sea, which afforded them some consolation, and awakened the hopes of a speedy departure.

On the twenty-eighth they again went, to the number of ten, to fetch a sledge full of wood, the eleventh of their company not being able to assist them, because he had lost his great toe by the severity of the cold; and this labour was not less painful than the other.

On the eighth of March they saw no more ice on the N. E. side in the sea, from which they concluded that there was a great sea to the N. E. of them.

On the ninth they were able to see still farther, and perceived all the sea to the N. E. open; but on the side of Tartary there yet remained ice, whence they concluded that the sea was of no great breadth on that side, even when the weather was perfectly serene: they imagined they discovered lands, and they shewed to one another, to the S. and S. E. of their hut, a land, which appeared to them like little mountains, and in the same manner as prospects do when they first present themselves.

On the fourteenth there arose a wind from the E. N. E. so violent and cold, that the sea was again frozen as hard as ever. This severe weather occasioned those to relapse, who, having been ill, and growing better, had been a little too much exposed during the milder weather. From this day the cold continually increased, and was even still greater and more insupportable than ever. This contrary weather, so little expected, dispirited the whole crew in such a manner, that they could scarcely console themselves with the hopes of a speedy thaw, which the season seemed to promise.

During the night of the sixth of April, a bear approached the hut: notwithstanding their endeavours to kill him with musket and firelock shots, they were not able to take aim on account of the fog; and besides the powder was so damp that it would not take fire, and their guns almost always failed to fire. The bear descended by the steps in the snow to the door, and attempted to enter; but the master, placing himself behind it, kept it so well closed that the bear retired.

Nevertheless he returned two hours after, and climbed to the top of the hut, where he made so dreadful a roaring that they were all alarmed: he advanced towards the chimney, and made such great exertions to overturn it, that they feared he would accomplish it: he tore the sail with which it was surrounded, and having made an extraordinary ravage, he at length departed.

On the eighth and ninth the wind blew from the S. W. and the ice disappeared; but on the tenth a violent wind from the N. E. brought it back again, and filled the sea, heaping the flakes upon one another, so that about the coast there were yet more and higher heaps than before.

This severe weather continued till the fifteenth, when they visited their vessel: they found it in the same condition they had left it. Returning, they saw a bear who approached them: they immediately placed themselves in a state of defence, and the bear

as if conscious of his danger retired. They advanced to the place from which they had seen him proceed, in order to discover if he had no lurking hole: they found a large cavity in the snow, nearly as deep as the height of a man, narrow at the entrance, and very wide within: they thrust their pikes into it, and not meeting with any thing, one of the company even entered it.

After this they went together to the sea shore, from which they viewed the mountains of ice which covered the sea, and which were nearly disposed like the houses of a great city, intersected with towers, steeples, bastions, and ramparts. On the seventeenth seven of them returned to their vessel: they there perceived that the water was free, which induced them to mount those heaps of ice, and pass as well as they could from one to the other, till they reached the water, which they had not approached for six or seven months. Arriving there they beheld a little bird, which dived into the water and concealed itself; and this induced them to think that the water was more open than it had been to that time.

On the eighteenth they observed the altitude, and found themselves in latitude 75° 58′. On the first of May they cooked the remainder of their meat, which was as good as ever, at least they thought so, and it appeared such in eating: it possessed however this defect, that being dressed it would no longer keep.

On the second of May there arose a violent wind from the S. W. which cleared the main sea, and left no more ice. They each began then to talk of embarking and returning to Holland, being very weary at the stay they had made in so disagreeable and incommodious a place. On the third all the remainder of the ice was carried away, except that which surrounded the vessel.

Nevertheless, the best provisions, and which were the most fit to give them strength, as meat, oatmeal, and others, failed them at a time when they had occasion to strengthen themselves, in order to support the labour they had to perform. With this view the master distributed the remainder of the bacon, and he found enough for three weeks, at two ounces a day for each man.

On the fourth five of them went to the vessel, which was more enclosed in the ice than ever, since in the middle of March it was only seventy-five paces from the open water, and at that time five hundred: this was a great subject of affliction, for they were not aware that they could drag the schuyt or shallop to the sea. In the night a bear having come to the door of the hut, retired when he heard the voices and noise, as one of the sailors observed, who had ascended the chimney; so that it seemed the bears began to be afraid, and dared not attack the men with their usual boldness.

On the fifth, when the sun was at the lowest, they beheld it at a considerable height above the horizon. On the seventh and eighth the snow again fell in such quantities, that they were obliged to remain in their hut, where some of the sailors proposed to speak to the master, and represent to him that it was time to leave that fatal place. Nevertheless no one dared to undertake it, because he had signified and had deferred their departure to the end of June, when they might hope the vessel would be disengaged from the ice, being the finest weather of the summer. On the ninth all the crew, still more urged with desire of returning, entreated Barentsz to speak to the master, and to persuade him to embark: but Barentsz stopped them by his remonstrances, and made them again defer their purpose.

On the fifteenth Barentsz, having again been solicited, spoke to the master, who told him that they should only wait till the end of the present month, and that if the vessel was not disengaged in that time, they should prepare to fit up the schuyt and shallop, and depart. This answer revived the crew; but the period appeared very remote, because it would require a considerable time to refit these little vessels and equip them.

On the twentieth and twenty-first the wind blew from the N. E. and brought back the ice: nevertheless, with the consent of the master, each began to prepare his clothes, and what he imagined he should particularly want for the voyage. On the twenty-fifth they observed the altitude in the afternoon, and found themselves in latitude 76°, as they had done before. On the twenty-sixth and twenty-seventh the same N. E. wind blowing violently, again brought more ice. The crew having taken occasion from this to urge the master, he permitted them to commence the work of equipment; and on the following day seven of them went to the vessel, and brought every thing that was necessary. among others the old foremast sail, to make sails, some running rigging from the packets of ropes, and other articles.

On the twenty-ninth ten men went to the schuyt, to draw it to the hut and refit it. It was so buried in the snow that they had great difficulty to disengage it; but they were not able to draw it after them, on account of their weak state, which occasioned the most poignant grief, because they then feared they should end their days there. The master exhorted them briskly to exert all their efforts, telling them, that in fact, unless they were willing to become citizens of Novaya Zemlia, and very soon to prepare their graves there, they must recover the schuyt, and that the hopes of return depended on it; the strongest and most affecting remonstrance that could have been made.

But of what little avail are words and reasons against a physical impossibility! Weakened by long exertions, and already fatigued with the labour, they were not able to proceed: they reposed themselves, and having dined, they returned again to try their strength. The shallop, which lay with the keel upwards, was again overturned near the hut, and they began to repair it.

While they were labouring with ardour, they perceived a frightful bear coming towards them: they immediately re-entered the hut, where they waited at all the three doors with firelocks, and a fourth mounted the chimney with a musket. The bear walked towards them with as much fierceness as any before, and approached to the declivity of the steps of one of the doors, where he was not perceived by the man on guard there, who was then looking towards the other door. Those who were within, seeing the bear, cried out for him to take care of himself: he turned his head, and notwithstanding the fright he was in, he fired his gun, which having wounded the bear in the body, he fled.

This spectacle was distressing to those who beheld it, for when the man perceived the bear, that ferocious beast was close to him, ready to tear him to pieces; and if the prime of the gun had not taken fire, as sometimes happens, there is no doubt he would have been devoured. Perhaps the animal would even have entered the hut, where he would have made a dreadful carnage.

In the mean time the wound he had received prevented him from fleeing very far. When they perceived him stop, they ran to him with their arms, and having killed him, they ripped up his belly, where they found pieces of sea dogs yet entire, with the skin and hair, which indicated that they had only just been devoured.

On the thirtieth all those who were in a condition to work at the refitting of the bark employed themselves, and the others mended the sails, or made in the hut other necessary things for their departure. Another bear came again to present himself to the workmen without, who killed him. On the last day of the month, while they were engaged in their most laborious work, there came again a fresh one, who walked fiercely towards them. It seemed as if these animals perceived that their prey was about to escape, and which they wished to prevent, by returning three successive days.

It was therefore necessary to quit their work, and retire to their hut; the bear followed

them: he was received with a volley of three firelocks, which all took effect, the one from the chimney, and the other two from two of the doors. This death cost them dear, for having cut the beast in pieces, and dressed the liver, and eaten it with pleasure, they were all indisposed: three of them were so very ill, that they thought they would die; nevertheless they recovered, having a new skin from the head to the foot. Their re-establishment scarcely gave less pleasure to the remainder of the company than to themselves; for the loss of three men would perhaps have put them out of condition to work with any effect for their return.

On the third of June, their strength having returned, they resumed the refitting of the bark, which was completed after six days' labour. At night there arose so violent a wind from the west, that the water again became free, and they prepared to embark. On the fourth they went to the number of eleven to the schuyt, which was on the sea shore, and dragged it to the vessel; this labour being then more easy than it had been when they were obliged to quit it, either because the snow was not so hard, and that the schuyt glided more freely over it, or that they possessed more courage by seeing the water free, and being on the eve of embarking.

They left three men there to refit the schuyt, which was properly a little herring-bark or herring-buss, and was sharpened behind. They cut off a part from the poop, made a little stern frame, and added some planks to the sides, that the vessel might have more depth, and be better able to stand the sea.

The other part of the crew, which was in the hut, did not work with less ardour for the other preparations of the voyage. On this same day they conveyed two sledges laden with provisions and other articles from the hut to the vessel, which was nearly half way between the hut and the place where the water was free, that they might not have so long a carriage when it was necessary to embark. On the sixth they dragged two more sledges laden with some provisions and merchandise.

After this there happened a violent storm from the S. W. accompanied with snow and hail, and particularly rain, which they had not beheld for a long time. The carpenters were obliged to quit their work, and retire with the others into the hut, where nothing then remained dry; for the planks had been taken away to refit the little vessels, and there only remained the sail, which was not fit to keep out the rain. The path which was covered with snow began also to thaw, so that it was necessary to leave off the shoes they had made of hats, to resume their leathern shoes, in whatever state they might be, and to make the best use they could of them.

On the seventh they packed up the best merchandise, and that which they chose to carry back, and wrapped them round with tarpawling, in order to protect them from the water, which could not fail frequently to splash in a little vessel without cover. On the eighth they dragged their packages to the vessel, and the same day the carpenters completed the repairs of the schuyt. On the same day also they dragged the shallop to the vessel; and on the tenth they made four journies with the sledge laden each time. They put what little remained of the wine in small vessels, in order to distribute it between the two boats; and also that in case one should remain enclosed in the ice, as they well foresaw what might happen, they could easily remove all the things from one boat to the other, or unload them on the ice, in order to transport them.

On the eleventh they experienced a fresh subject of apprehension. A great tempest arose from the N. N. W. and they thought it might break the remainder of the ice on the sea shore, and occasion the vessel to float, or perhaps split it, in which was then every thing of the best they possessed, both as to provisions and merchandise; a misfortune which would have far exceeded all the others they had experienced, and against which

they would not have been able to bear. But God did not permit so great a misery to overwhelm them.

On the twelfth they all proceeded together, with hatchets, spades, and all other necessary implements, to smooth a passage by which they might drag the boats to the sea. The labour was severe: it was necessary to break the ice, dig, throw it aside, transport it, and undergo a fatigue not to be expressed. Yet they would have consoled themselves if they could have done it in peace; but they were interrupted by a large ugly bear, lean and scraggy, coming from the main sea on a piece of ice, and which they conjectured to come from Tartary, because they had already met with it formerly at twenty or thirty leagues at sea. As they did not expect such an adventure, only the surgeon had a musket, and De Veer was obliged to quit the others and run to the vessel, to fetch two or three more.

The bear perceiving De Veer detached from the company ran after him, and would have reached him, if they had not immediately fired to prevent it. The report made the bear turn his head: he turned round, and the surgeon fired a second time, which wounded him; he immediately fled; but being impeded in his flight by the inequalities and height of the ice, several other shots struck him, which knocked out his teeth, and he expired.

The fourteenth was fine weather. The master and the carpenters went to the vessel, where they completed the equipment of the schuyt and shallop, so that it only required to launch them. After this, perceiving the waters were open, and that it blew fresh from the S. W. the master told Barentsz, who had been sick for a considerable time, that he was of opinion they should embark. This proposition was no sooner communicated to the crew than it was accepted, and they prepared to launch the vessels.

Barentsz then wrote a memoir, containing the circumstances of their departure from Holland, their voyage, their arrival at Novaya Zemlia, the stay they made there, and their retreat, and put it in a musket charge, which he hung in the chimney, in order that if any one should land in the same place, they might be informed of what had happened to them, so as to profit by it, and to know by what adventure they found the remains of a little house, which had been inhabited for ten months.

Besides this, as the voyage they were about to undertake with two small vessels, without any cover, must expose them to imminent dangers, the master thought proper to write two letters, which were signed by the whole crew, and one placed in each of the vessels. In these was contained a recital of all they had suffered while waiting for the opening of the waters, and in the expectation that their vessel would be then disengaged from the ice; that having been deceived in this hope, and the ship always remaining fixed, as they saw the season would soon pass away, they had been obliged to abandon it, and expose themselves to the dangers of a voyage, which delivered them to the mercy of the winds and waves; that they had judged proper to make a double memoir, in case the two vessels should be separated, either by a storm, or any other fortune of the sea, or if one of the two should perish, that it might be learned from the other how the circumstances had come to pass, and in it be found that testimony for the confirmation of what should be related by those who might chance to remain.

Thus, after having agreed in all arrangements, they drew to the sea the two vessels, and eleven sledges laden with provisions, wine, and merchandise, which they were careful to place in the best manner possible for their preservation: that is to say, six packets of fine woollen cloth; a chest full of linen cloth; two packets of velvet; two small boxes full of money; two casks of articles necessary for refitting, and clothes for the ship's company; thirteen casks of bread; one of cheese; a small cask of bacon; two

of oil, six of wine, two of vinegar, and the clothes of the crews. All this appeared so much when taken out of the vessel, that it might have been said to be impossible to accommodate it in the little space of two such small vessels.

When the embarkment had taken place, they also carried on board two sick men. Barentsz and another, who were disposed in the two vessels, which the master caused to be moored close to one another. At this time also he had the two memoirs signed, of which mention has been made.

In fine, on the fourteenth of June 1597, at six in the morning, they weighed anchor, and set sail from Novaya Zemlia with a westerly wind: they arrived that day at the Cape of the Isles, where they still met with much ice, and they remained there enclosed; which afflicted them in no small degree, under the apprehension they might continue there: four of them landed to reconnoitre the country, and they knocked down four birds from the rocks with stones.

On the fifteenth, the ice being a little separated, they doubled the Cape Flessingen, and came to Cape Desire. On the sixteenth they were at Orange Isle, where they also landed, and having made a fire of the wood they found there, they melted the snow and put the water into small casks for drink. Three of them passed on the ice to another island, where they took three birds; but returning, the master, who was one of the three, fell into a hole in the ice, where he was in danger of perishing, for there was at that part a very rapid current. They dressed the birds for the sick.

After they had again set sail, and were arrived at Icy Cape, the two vessels joined, and the master, who was not in the same with Barentsz, asked him how he found himself. Barentsz replied that he was better, and hoped he would still be able to travel before they arrived at their inn. He asked if they were at Icy Cape, and De Veer having answered him in the affirmative, he wished to be raised up, in order that he might behold that cape once more, for which there was leisure enough, being again enclosed in the ice, and the vessels completely surrounded.

On the morning of the seventeenth, the flakes of ice struck against these two little vessels in so dreadful a manner, that the hair of the crew stood on end: they believed themselves at their last hour, neither being able to stop the course of these floating masses, nor to prevent their being carried to leeward: they even found themselves all together so pressed between two banks of ice, that they took their last farewell of each other.

At length, resuming courage, they endeavoured to come nearer to the firm ice, to fasten a cord and tow the vessels there, that they might be less exposed to the floating flakes. When they had approached a little, there was no person who would go to moor the cord; the danger was too great; yet a virtue must be made of necessity, and the strength of the balance prevail over the weak side. In this dilemma De Veer, who was the most nimble among them, undertook to carry the cord, and leaped from one flake of ice to the other, until, with the assistance of God, he happily arrived on the firm ice, and fastened the cord about an eminence of ice.

All the others then also left the vessels, and carried the sick in sheets on the ice, where they placed some other things under them, in order that they might repose. They afterwards disembarked whatever remained on board, and dragging the vessels on the ice, they saw themselves delivered from the fear of a death which had appeared almost inevitable.

On the eighteenth they refitted their vessels, which had been damaged from what they had suffered. They caulked the seams and covered them with tar-pawling, having happily found some wood to make pitch. They afterwards landed to seek for eggs, to

give to the sick, who most earnestly asked for some: but they were not able to find any, and only brought back four birds.

On the nineteenth they were more enclosed in the ice than before, and no more beheld any part open, so that they thought they had only prolonged their lives for some days, unless God should deliver them by some fresh miracle. On the twentieth, at nine in the morning, the mate came on board the shallop, and said that one of the crew, called Nicolas Andrisz, appeared to be drawing near to his end. Barentsz told him that he firmly believed his was not far off. The crew who perceived at the same time that Barentsz was looking over a chart, which De Veer had drawn of the places they had seen during the voyage, had not the least idea of his being in that state. They remained seated and conversed together of many other matters, until Barentsz, putting aside the chart, said to De Veer, give me some drink. When he had drank, he found himself very bad, his eyes rolled in his head, and he expired so suddenly, that they had not time to call the master, who was in the schuyt. Nicolas Andrisz also expired immediately after. But the death of Barentsz extremely afflicted the whole crew, for they possessed great confidence in him, and he was very experienced in the art of pilotage and navigation.

On the twenty-second, the wind blowing fresh from the S. E. the sea began to open. Yet it was necessary to drag the vessels more than fifty paces on the ice, and after having launched them, to draw them again on other ice, and to drag them for more than thirty paces before arriving at a free and navigable part. Having performed this labour, they set sail between four and five in the morning, and at noon got again entangled in the ice: but a little time after it separated, in a manner that it had the appearance of the opening of a sluice. They then navigated a little along the coast, and afterwards suddenly found themselves again completely enclosed, and notwithstanding all their efforts to separate the ice, they could not accomplish it. At length the waters having again opened of themselves, they continued to sail along the coast.

On the twenty-third, at nine in the morning, they came to Cape Troost, from which they could not depart on account of the fresh ice which surrounded them. On the same day they observed the altitude, and found themselves in latitude 76° 39′. Here the sun shone clear; but it was not of sufficient strength to melt the snow, for which they would have had great occasion in order to have water to drink, all of them suffering a great thirst.

On the twenty-fourth, at noon, they disengaged themselves from the ice by means of their oars, and having gained the sea, they sailed onward well till they came to Cape Nassau, which they discovered, and from which they were according to their computation at the distance of three leagues. Three sailors landed, and brought a little wood, which served them to boil some meat, in order to have some warm aliment for their stomachs, of which they stood in very great need.

On the twenty-fifth and twenty-sixth there arose a heavy tempest from the south, during which the part of the ice to which the vessels were moored broke and separated. The vessels being unmoored, drifted out to sea, without their being able to row towards the firm ice, and they were a hundred times in danger of perishing. As they found they could not regain the land by means of the oars, they hoisted up the foresail, and stood towards the coast. But the foremast of the schuyt broke twice; so that they were constrained, notwithstanding the violence of the wind, to make use of the main sail. Scarcely was it hoisted up, when the wind took it in such a manner, that if it had not been immediately lowered, the vessel would have been sunk; for it already admitted the water everywhere by the side, and this accident, with the violence of the tempest, occasioned those exposed to them to regard death as certain. But the time appointed by Heaven

for their last hour was not yet arrived. There suddenly arose a N. W. wind, which calmed every thing, and favoured their passage to the firm ice, though they did not reach it without danger.

When they had arrived there, they looked about to endeavour to discover the shallop, and not seeing any thing of it, they navigated about a league along the ice without the least sign of it: so that they began to apprehend the vessel was lost. In the mean time there happened a great fog, which obliged the crew of De Veer to fire a musket, in order that they might answer, if they heard it. In fact, the others answered, and this signal enabled them to rejoin.

On the twenty-seventh they arrived at a place on the western coast of Cape Nassau, where, while they sailed along the land, they beheld on the ice more sea-cows than they had ever seen, or rather they saw an innumerable multitude. They also observed a flock of birds, at which having fired two muskets together, they killed twelve. On the twenty-eighth they disembarked all their cargo, and placed it on the firm ice, where they also dragged their vessels, because the wind which came from the sea might force the ice towards them with too much violence.

As soon as they had descended on the ice they made tents of their sails, and placed themselves underneath, in order to take some repose, leaving one man as centinel. About midnight there came three bears towards the vessels. The centinel discovering them, called out three bears, three bears. At this noise they all awoke, and proceeded from the tents with muskets charged only with small shot to kill birds. Although these shots might give no great wounds to the bears, they did not fail to turn back, and by this means gave an opportunity of loading the muskets again. One was killed, and the other two fled.

They returned on the following day, at three in the afternoon, to the place where the dead bear was lying, and one of them having taken him by the throat, carried him to a considerable distance on the most rugged ice, where both began to eat him. The crew seeing this fired a musket, which occasioned them to quit their prey and flee. Four men going to the place, found that in the little time they were about it they had already devoured half of the body of their comrade, of which seeing the size, they were astonished at the strength of the bear who had carried him away by so difficult a path, since these four men had great difficulty to lift the remaining half.

On the thirtieth the westerly wind again forced the ice with the same violence towards the east; they beheld afresh two bears coming on a bank of floating ice; which they believed to be the same they had seen the preceding day. They shewed a disposition to attack the crews, but took another route. About half past ten in the morning another presented himself on the firm ice, who retired as soon as he heard a noise.

On the first of July, at six in the morning, which was the break of day, there came again a bear on the flakes of ice who plunged into the water in order to swim to the firm ice where the crews were, but retired at the sound of their voices. About nine, the banks of ice coming from the sea struck with so much violence against the firm ice, that it split into several pieces that to which the crew had retired with their little vessels, and occasioned it to float. This was a dreadful accident, for all their packages were on the ice, and the greater part fell into the water.

It became necessary therefore to exert fresh strength in order to drag the shallop on the ice near the shore, where they hoped to be less incommoded by the flakes of ice. But having drawn the vessel, when they would go to fetch the packets, they found themselves in as great danger as ever they had been; for while they endeavoured to lay hold of a packet, the ice split between both, or under another packet, and carried it

away. It even split under the feet of the people while they were walking; so that they were at a loss to know how to act, or how to save themselves.

The same happened when they endeavoured to move the schuyt, the ice split under their feet, and the schuyt was carried away with the crew. It was even broken in some parts, especially in those which had been altered or repaired. The mast was broken; the cross-piece of the mast, and almost the whole schuyt, was split to pieces. There was also a sick man within, who was not taken out but with extreme danger to the persons employed in this charitable office; for the pieces of ice on which they were obliged to place themselves floated, and struck against other ice, and the least blow which might have been given to an arm or a leg would have broken it.

At length, after a considerable time of hardships and labour, the ice dispersed a little, and the violence of their course diminished. They then returned to their schuyt, and drew it again on the firm ice near the shallop, where it was in a little more security. This fatigue lasted from six in the morning till six in the evening, so that all the crew were quite exhausted. They lost that day two casks of biscuit, a chest full of linen cloth, a chest full of clothes, and necessary articles for the equipment of the vessels, the astronomical circle, a packet of scarlet cloth, a little cask of oil, one of wine, and some cheeses.

On the second of July, at half past four in the afternoon, the weather was finer, and six men were employed at the refitting of the schuyt, while six others went on shore to seek for wood. They also brought some stones, which they arranged on the ice to serve as a hearth, and to make a fire, in order to melt some pitch to caulk the schuyt. They looked at the same time for a piece of wood to make a mast, which they found. There was even some wood cut down, and tools to cleave it, which they carried away, and which indicated that the place had been frequented by men. The schuyt was repaired at two in the morning, and they afterwards roasted some birds which they had killed, in order to eat, and recruit their strength.

On the third two men were sent to procure some water. They found at the watering place, two of their oars, the tiller of the rudder, the chest of linen cloth, and a hat out of the chest of goods. They carried away their load, and when they were returned, they sent four others, who drew all the remainder of the water, and placed it on the ice, whence they again took it when they set sail.

On the fourth the weather was finer than they had experienced since their stay on the coasts of Novaya Zemlia. They availed themselves of this opportunity to wash in snow water the pieces of velvet which had been wetted by the salt water, and packed them up afresh. On the fifth, John Jansz of Haerlem, a relation of the deceased Nicolas Andrisz, also died. On the same day the flakes began again to float with violence. On the seventh they killed thirteen birds, on which they feasted the following day.

On the ninth the ice continued to float, and the water became free towards the land. The firm ice, on which were the vessels and crews, also began to separate and float, which obliged them to draw their vessels to the water more than three hundred and forty paces, a prodigious labour, and which they could never have performed, if they had not been actuated to preserve their lives. They set sail between seven and eight in the morning; but at six in the evening were obliged to return to land, and replace themselves on the firm ice, which was not yet separated in that part.

On the tenth they exerted all their efforts to pass through the ice, and sailed till they found themselves between two large surfaces of ice, very much resembling fields, but which joined together in a part. It was necessary therefore to unload the vessels again, transport their cargoes, and drag themselves on the ice till they should again

meet with open water, which they did not for more than a hundred paces. Afterwards they again set sail, but this did not continue long, and they were constrained to proceed more gently, in order to pass to a small space lying between two other fields of ice, which however were only two prodigious floating flakes, between which they passed, before they were completely joined.

When they were without this strait, the wind began to blow fresh from the west, and took them by the prow; so that they sailed with all their efforts to regain the firm ice, which with great difficulty they approached. They there again dragged their vessels, and remained half dead with fatigue, and almost in despair at beholding the prodigious assemblage of difficulties.

On the eleventh a large and very fat bear advanced towards them from the water. He was received with three muskets, which were aimed at him together, and being fired when he was no farther off than about thirty paces, killed him at once. The fat, quite warm, which issued from his wounds, resembled oil on the water where it flowed. Some of the crew placed themselves on an ice bank, which they directed towards the body, and having fixed a cord about his neck, dragged him on the ice, where they drew his teeth; and having measured the body, found it to be eight feet thick.

After this, three of the crew went to an island lying before them, from which they discovered the Isle of Crosses to the west. They advanced by that side and entered this latter island, in order to see if there were no signs of the Russians being arrived there; but they saw nothing that could in the least induce them to imagine that any one had landed there since their departure. They took nearly seventy eggs of mountain mallards, and returned to join their companions, after an absence of twelve hours, which had appeared to the remainder of the crew, who waited for them, a great time, and had occasioned them great uneasiness.

They related, that in order to pass the Isle of Crosses, they had sometimes been up to their knees in the water on the ice between the two islands, and that they had walked nearly six leagues going and coming. The others were astonished at their boldness, and especially being so weak as they all were, that they had undertaken so fatiguing a journey. The eggs they brought were a very necessary and agreeable mess for them all: and though amidst so many difficulties, they did not fail to make a very delicious repast. They also then distributed the remainder of the wine, of which each had three *mingles*, or six French pints.

On the sixteenth a bear came towards them from the land. At first they could not discern if it was a bear, so much did his white skin glitter, and resemble the snow. When he had approached they fired at him, and the shot taking effect, he fled. On the following day, some of them wishing to go to the neighbouring island, to observe if there were any opening in the water, met about half way with the wounded bear, lying on a bank of ice. As soon as he heard them he fled, but one of them having given him a violent blow with a boat hook, the hook of which entered his skin, he fell back on his two hinder paws. The man would have followed up the blow, but the bear broke the hook to pieces, so that he who had given the blow fell backwards in his turn. The others immediately fired on the bear, which occasioning him to flee, the sailor who had fallen down, rose up, ran after him with the stump of his boat hook, and discharged several heavy blows on his body. The bear turned back each time, and leaped three times against the man who struck him. In the mean time his two companions having approached, they fired again at the bear, and pierced him through the body, so that he fell back again, and could no longer walk but with difficulty. In fine, they fired once more, and having killed him, they drew his teeth.

On the eighteenth they unloaded the vessels, and having drawn them on the ice, they dragged them over it to a place where water was open. Afterwards they carried the cargo there, that is to say, for more than a thousand paces; a fatigue under which they had nearly sunk. They then again set sail, and navigated till half past four in the afternoon, when they were again entangled in the ice: and it was necessary to draw their vessels over, as they had already so many times. They there had a distinct view of the Isle of Crosses, from which they computed they were at the distance of a league.

On the nineteenth, while the vessels and the crew were on the ice, seven men passed at six in the morning into the Island of Crosses, whence they beheld a considerable space of water open to the west, which gave them great joy, and occasioned them to hasten to bear this good intelligence to their companions. Nevertheless they took time to collect a hundred eggs, which were cooked as soon as they arrived, and distributed.

At two in the afternoon they laboured to put the vessels into the water. It was necessary to drag them for more than two hundred and seventy paces, but this was performed with a cheerfulness which much alleviated the pain, in the hopes that it would be the last of that kind of fatigue they should undergo. As soon as the vessels were in the water, they set sail, and made such good way, that at six in the evening they were beyond the Isle of Crosses, and immediately afterwards they saw no more ice, or at least the little they beheld gave them no uneasiness. They bore to the W. and by S. with a good steady wind blowing from the E. and E. N. E. so that, according to their computation, they sailed at the rate of eighteen leagues in twenty-four hours: which inspired them with fresh courage, and with the hopes, by the blessing of God, of a happy return.

On the twentieth, at nine in the morning, they doubled the Black Cape, and at six in the evening observed Admiralty Isle, which they passed at midnight. They there beheld nearly two hundred sea-cows on a bank of ice, about which they were feeding, and they attacked them, of which they had occasion to repent; for this species of marine monsters possessing an extraordinary strength, they all swam towards the vessels, as if with a design to attack them, and to revenge the injury they had sustained; and they made all round a dreadful noise, as if they had threatened to destroy every thing. The freshness of the wind, which forced the vessels along, relieved them from a peril which they could well have avoided, if they had been willing, and into which a want of prudence alone had drawn them.

On the twenty-first they doubled the capes of Plancio and Laugenes. On the twenty-second, as they were close to Cape Cant, the crew of Gerard De Veer landed to seek for eggs and birds. They did not find any; but afterwards, about noon, seeing a rock covered with birds, they steered towards it, and throwing stones, they knocked down and took twenty-two birds, and one of the crew having landed on the rock, brought away twenty-three eggs.

About three in the afternoon they came to another cape, where they took nearly a hundred and twenty-five birds, taking the greater number by the hand in their nests: for they were not alarmed at the sight of the men, and no doubt were only afraid of the foxes and other wild beasts, to secure themselves from which they built their nests on those high and steep rocks, where they could not ascend. As for the men, if the sight of them had frightened the birds, they might easily have escaped from their hands, for they could not go to take them in their own nests, where they seemed to await being taken, without danger of breaking their legs or arms, or of perishing, and still more in descending than in mounting. Besides, there was only one egg in each nest; and it lay on the bare rock, without straw or feathers, or any thing which could give it

warmth; so that there was room for wonder how these eggs could be brooded and hatched, on account of the great cold which reigned there.

When they had again set sail in order to depart from the coast, the wind became perfectly contrary. Besides, the sea was so covered with ice, that after much difficulty, and making different tacks, they found themselves again entangled. The master, who was in the schuyt, farther into the sea, seeing the others in the midst of the ice, and that they continually advanced, imagined they perceived open water farther off, in which he was not deceived; and that they were willing to reach it. Under this idea he tacked about, and steered in the same direction, and both together bore towards the coast, where they met with a good harbour, sheltered almost from every wind. They landed there and brought wood, in order to cook the birds.

On the twenty-third, the weather being cloudy and foggy, and the wind blowing from the north, they were constrained to remain in that creek. In the mean time some of the crew advancing farther into the island, they found some small stones of good gold. On the twenty-fourth they observed the altitude, and found themselves in latitude 73° 10′. The weather continuing unfavourable, they were obliged to remain longer in that place, where they went to seek for small golden stones, and they brought away handsomer than they had observed before.

On the twenty-sixth, at noon, they again set sail, and as the creek in which they were was of great extent, it was already full midnight by the time they were without. On the twenty-seventh they sailed along the coast through the broken ice, and at six in the evening they arrived at a place where was a very rapid current, which induced them to think they were near Costinsarch: for they saw a great gulf, as they imagined, extending to the sea of Tartary. About midnight they doubled the Cape of the Crosses, and entered the channel between the main land and an island.

On the twenty-eighth of July they sailed along the coast, and came at three in the afternoon to the Abbey of St. Laurence, or under Bastion Cape, where they found beyond the point two Russian barks, which were at anchor. It would be difficult to describe the joy of the whole crew at having arrived at a place where they had the sight of men. Nevertheless this joy was damped by the reflection that these men, who were to the number of thirty, were not Hollanders, but perhaps savages, or at least other people, with whom they were unacquainted, and who might treat them as enemies.

In the mean time they approached the shore with much difficulty, and the Russians perceiving them, quitted their work, and advanced towards them unarmed. Approaching one another, they made salutations, each according to his manner. Some of the Russians recollected the Hollanders, and beheld them with compassion; and some of the Hollanders also remembered them to be the same they had seen in the preceding voyage, when they had passed the Weigats, and who had entered their vessel. It was easy to observe on the countenances of the Russians the astonishment they were in, at beholding the others, and seeing them so meagre and cast down, wandering in small vessels without decks, and quite exposed; while before they had seen them in so beautiful a ship, and so well equipped.

Two of them laid their hands in a friendly manner on the shoulders of the master and De Veer, in order to let them know they remembered them; for of all the Dutch crew which was there, only these two had been in the preceding voyage, in which they had seen the Russians. They asked, as well as could be comprehended, where their *crabble* was, that is to say, their vessel. As they had no interpreter, they made them understand in the best manner they could, that they had lost it in the ice; upon which

they replied, *Crabble propal;* the Dutch, conceiving they said the vessel is lost, replied also *Crabble propal,* thinking to say, yes, we have lost it.

Afterwards the Russians made them understand that in the other voyage they had drunk wine in the ship. One of the sailors comprehending that they spoke of drinking, went to draw some water, and having presented it to them, they shook their heads, and said, *Nodobre,* by which they thought they would say, that is not good. The master having approached them, and having opened his mouth, and shewn the inside, in order to make them understand that he was tormented with the scurvy, and to ask if they had no remedies for this disorder, they conceived the master would say he was hungry, and having returned to their lodia, they brought a loaf of rye flour, of about eight pounds weight, and some dried birds. The master thanked them, and also made them a present of half a dozen biscuits. He invited two of the principal to come into the schuyt with him, where they presented each with a glass of wine of what they had remaining. The other sailors went to the place where were the other Russians, and there boiled some biscuits in water, in order to take something warm. In fine, it was a great consolation to have commerce with men, after being deprived of that pleasure for thirteen months.

On the twenty-third, in the morning, the Russians prepared to sail, and drew from beneath the grass, on the brink of the sea, some tons of whale oil, which they had buried, in order to carry on board. The Dutch, who had not been able to learn their route, perceived they took that of the Weigats. They steered the same course, and followed them. But the weather was so dark and misty, that they lost sight of one another.

In the mean time the Dutch entered a channel between two islands, and passed them till they were again entangled in the ice, without seeing any opening by which they might leave it; which made them presume that they were near the Weigats, and that the N. W. wind had thus forced the ice into the gulf. It was therefore necessary to put back, and return to the two islands, to one of which they moored their vessels.

On the thirty-first they sailed from this island towards another, in which were two crosses. Perceiving these, they persuaded themselves that they should meet with some people there: but they saw no one. Nevertheless their trouble was not lost; if they found no men, they found some *cochlearia,* a herb of which they were nearly all in want, because they were attacked with the scurvy, and so affected, that the greater part was ready to sink under it. They ate the *cochlearia* in great quantities, because in Holland they had heard much said of its virtue, and they experienced it to be yet greater than they had imagined. It had so great and sudden an effect, that they were surprised; so that those who were no longer able to eat biscuit began to eat it directly.

On the third of August, 1597, they determined to cross from Novaya Zemlia to Russia. With this intention they steered to the S. S. W. and sailed till six in the morning, when they again got entangled in the ice. This new misfortune sensibly affected them, for they did not expect to be any more exposed to it, and thought they had been completely clear of it.

A calm coming on at the same time, they endeavoured to extricate themselves by their oars; and in fact, by three in the afternoon they were in the main sea, where no more ice was seen. As they proceeded at a good rate, they imagined they should soon be off the coast of Russia; but at nine at night they saw themselves afresh surrounded with ice; an accident which had nearly ruined them, and occasioned them to fear they should never be out of these dangerous parts.

Not being able therefore to sail with the shallop, nor to double Icy Cape, they were obliged to pass through the ice which surrounded them. While they were engaged in this, they advanced more than they did before, and at length after great difficulty found themselves again in free water. As for the master, he was in the schuyt: and this vessel, which was a better sailer than the other, passed Icy Cape, after which they rejoined.

On the fourth, at noon, they saw by the prow the coast of Russia, and having approached it, they sailed close to the shore, and remained moored there till three in the afternoon, when they again set sail. They kept constantly close to the shore, and proceeded at a tolerable rate till midnight, when they discovered a Russian vessel, and called out *Candnoes, Candnoes;* but the Russians answered, *Pitzora, Pitzora:* giving the Dutch to understand that they were not yet near to Candnoes, as they imagined, but only near to Pitzora. This error arose from the variation of the needle of the compass, which was enclosed in a box encompassed with circles of iron, so that they were mistaken by two rumbs. As they had observed their error, they judged it proper to moor, and wait for day.

On the fifth a sailor, having landed, found some grass and small trees. He called the others and told them to bring firelocks, because there was game, at which they were extremely rejoiced: for the provisions were nearly exhausted, only some mouldy biscuit remaining. Besides, some of the crew were of opinion they should leave the vessels there, and proceed by land, because otherwise it was probable that they would perish by hunger.

On the sixth of August, the wind being contrary, they encouraged one another to row strongly, in order to depart from the gulf; but after having rowed for nearly three leagues, they could not advance farther, as much on account of the contrary wind, as of their weak condition; and besides, the coast stretched farther to the N. E. than they had imagined. On the seventh they left the gulf, and reached the point of land where they had been before. There they were obliged to fix themselves again with their hawsers, because the wind always remained contrary, which made them heavy at heart, seeing there was no end to their hardships, and finding disease and hunger consume them.

The eighth and ninth were not more favourable days. Some of the crew having landed, discovered a buoy between Candnoes and the continent of Russia, and they concluded that this was the channel through which the Russians passed. Returning, they met with a dead sea-dog. They dragged it into the schuyt, and regarded it as a good piece of game, so greatly were they pressed by hunger. But the others prevented them from eating it, telling them that it would certainly occasion their deaths, and that it would be better to suffer still, and wait what it should please God to do with them: that it should be hoped that out of his goodness he would at last provide for their wants.

On the eleventh they rowed till noon, when they had a fresh breeze from the S. and having set the sails they proceeded very quickly. In the evening, the wind increasing very much, they sailed towards the coast, and landed, in order to water the vessel if they could meet with any. They also erected tents on account of the rain which fell in heavy showers, and which at midnight was accompanied with lightning and loud claps of thunder. All these new misfortunes, following those with which they were already overwhelmed, reduced them almost to despair, and occasioned some to wish for death.

On the twelfth, at six in the morning, they resumed a little courage at seeing a Russian bark coming towards them at full sail. They hastened as much as they could to stand

out to sea and meet it. The master went on board the bark, and asked at what distance they were yet from Candnoes; but he could not learn any thing, being unacquainted with the language. They extended five fingers, and the Dutch imagined this signified that there were five crosses on the coast. They also drew out their steering compass, and shewed that the lands lay to the N. W. of them, and the Dutch found the same by their compass.

As the master perceived he could derive no intelligence from them, he entered farther into the bark, and pointing to a cask of fish, asked if they would sell it, and presented them a piece of forty sols. They comprehended his intention, and gave him a hundred and two fish, with little cakes, which they had cooked in the water in which they had boiled their fish. About noon they parted, the Dutch crew remaining very much satisfied at having obtained a little provision, because for a length of time they had only had each four ounces per day, with water, and nothing more. They divided the fish equally between them, without the least distinction.

On the thirteenth two sailors landed, in order to discover if the point of Candnoes stretched far into the sea. At their return, they said there was every appearance that it was the same point they had conceived, and on this the spirits of all the crew being revived, they rowed with great exertion along the coast. At three in the afternoon they observed that the cape which they had seen appeared at some distance to the S. and no longer doubted then that this was the Cape of Candnoes, whence they hoped to enter the mouth of the White Sea. With this intention the vessels approached each other side to side, and stood out to sea, in order to pass the White Sea, and go to Russia, according to their idea. They sailed with tolerable success till midnight, when there arose a violent tempest from the N. which separated the two vessels from one another.

On the fourteenth the weather clearing up, the crew of the schuyt discovered the others just within the reach of the eye, and used every exertion to rejoin them, but in vain, on account of a great mist which arose. On the fifteenth they had a fine breeze, and about noon discovered land. They then imagined that they were to the west of the White Sea, beyond Candnoes.

When they were near to land, they saw six barks of Russians lying at anchor. They saluted them, and asked them at what distance they were from Kilduin, or Kildun. The Russians gave them to understand that they were still very far from it, and that they were only on the eastern coast of Candnoes. They stretched out their arms, to signify that it was necessary to pass the White Sea, and that it would be very perilous to undertake this voyage with such small vessels. The Dutch having requested some provisions, they gave them a loaf, which they ate with great appetite, notwithstanding its dryness. Nevertheless, though they sufficiently comprehended, the crew of the schuyt could not persuade themselves that they were at the place which was signified to them: they were willing, at any rate, to believe that they had passed the White Sea.

On the sixteenth De Veer steered towards a bark, which he saw to starboard, and to which he came up with great difficulty. They asked the Russian crew if they were near Zemlia of Cool, or otherwise Kilduin. The Russians shook their head, and gave them to understand they were only at Zemlia of Candnoes. The Dutch were still unwilling to believe them. They entreated them to give them some provisions. The Russians gave them some plaice, and the master having paid a piece of silver for them, tacked about, in order to enter a channel before which they then were, and through which they would pass into the sea.

The Russians observing their tacking, and that they took a wrong course, besides that the tide was almost passed, sent two men to them in a little yawl, with a large loaf. These men gave them to understand that they would do well to return to the bark, where they would endeavour to give them more instruction. The master presented another piece of silver, with some cloth, to these messengers, who continued without wishing to part. Those who were in the large bark raised in the air a piece of bacon and some butter, to induce the Dutch to return. They therefore returned, and having shewed their chart to the Russians, these latter made them comprehend that they were still to the east of the White Sea and Candnoes.

The Dutch were not less surprised than afflicted with this intelligence, which they could not believe till then, and to find themselves so distant, especially on account of their companions in the shallop. The master purchased of the Russians three sacks of flour, a side of bacon, and half another, with a little cask of honey, as much for his crew, as for that of the shallop, if they should rejoin.

In the mean time the tide having passed, at the commencement of the ebb they crossed the channel, at the mouth of which they were when the little yawl came to recall them, and stood out to sea, sailing until they had discovered a large cape stretching very far, which they believed to be Candnoes. At night they anchored under the cape, and boiled a pot full of flour with water; a mess which they found excellent, the more so as they had mixed a little honey. They were yet extremely uneasy on account of the shallop, which they saw no more, and of the fate of which they were ignorant.

On the seventeenth, being moored, they saw a bark coming from the White Sea, to which they sailed. On boarding, they presented them a loaf, without being yet asked for one. The Russians wished to make them understand in the best manner they could that they had seen their companions to the number of seven in their shallop, and spoken to them. But as they found they were not understood, they lifted up seven fingers, and pointed to the schuyt, giving them to understand that it was as small a vessel without deck, which they had seen, and that they had sold them bread, meat, fish, and other things. The crew of the schuyt beginning to comprehend what they said, perfectly understood them, by seeing in their hands a little compass which they had seen with the boatswain's mate. They asked them if it was long since they had seen their companions, and where they then were. The Russians signified to them that it was the preceding day, and caressed the Dutch very much, who did not do less in thanking them, especially on account of the good intelligence they had given them with respect to the shallop. The master directed them to row with exertion towards the part where the shallop should be, in order to endeavour to rejoin them; and having ranged all day along the coast, about midnight they met with a spring of fresh water, where they watered the ship, and at the same place they also found some cochlearia.

On the eighteenth, at six in the morning, they drew up the large stone to which they were moored, instead of a stream anchor, and continued to range the coast, sailing till noon, when they again beheld another great cape, upon which there appeared indistinctly some crosses.

Towards six in the evening, they recognized distinctly by the marks that it was the Cape of Candnoes, which is at the mouth of the White Sea, and under which they had wished for a length of time to arrive. This cape is very easily known again by five crosses which are there, and it can easily be perceived how it bears off on each side, on one side to the S. E. and on the other to the S. W.

While they were preparing to cross to the west of the White Sea, towards the coast of Lapland, they perceived that the water had nearly all run out of one of their little casks. They had more than forty leagues to go before they could meet with fresh, so that they judged it proper to sail towards land, in order to seek for some spring; but the sea dashed so violently along the coast that they dared not approach.

They again set sail between ten and eleven at night, and sailed all that night and the following day with a good wind, by which they made a great progress; so that on the twentieth, between four and five in the morning, they saw the land to the west of the White Sea, having before perceived by the roaring of the sea that they were not far off. It was to them a great occasion to give thanks to God, that in thirty hours they had happily passed the White Sea, in which they had a very perilous passage of forty leagues.

When they were off the coast, and found that there was no way of advancing by sailing, they passed between some rocks, and came to a good road, where having entered, they saw a large bark at anchor, and some houses on the coast: they rowed towards the bark, and having moored the schuyt there, they landed and proceeded to those houses. The inhabitants received them with kindness; they led them to a stove, where they dried their clothes, and then served them with fish. In these houses were thirteen men, who went out to fish every morning, and two of which commanded the others; all of them living very soberly, and almost constantly on fish.

Besides these thirteen Russians, there were two Laplanders, with three women and a child, who lived in great poverty, only eating the remnants of the Russians, who left them some pieces of fish, and the heads, which they threw to them, and which the Laplanders picked up, with great humility and many thanks. The Dutch regarded this manner of living with great compassion, who, in whatever state they were themselves, and whatever pity they must excite, could not forbear being moved for others, and concerned at the misery of these unfortunate people.

On the twenty-first, the master had some fresh fish dressed, of which the crew ate as much as they pleased, which had not happened for a length of time, and they made a porridge of water and flour to supply the place of bread. In the afternoon, having advanced into the country to seek for some cochlearia, they perceived two men on a little mountain, and said one to another that there must be more inhabitants in the place than they had seen; and afterwards, without making any other reflection thereon, they returned to their schuyt.

These two men, who were their own companions, and of the crew of the shallop, descended from the mountain, and went to the bark, to endeavour to procure some provisions; but having come there without any design, and as it were without thinking of it, and having no money, they had resolved to give two pair of their breeches, because they had each two or three pair one over another. When they approached the bark they saw the schuyt, which was close to it at anchor, and recognised those who were within. The joy was reciprocal; they messed together, and drank water as clear as that of the Rhine at Cologne.

The crew of the shallop had suffered still more hardships than that of the schuyt, and both together returned thanks to God from the bottom of their hearts, because he had permitted them to meet again. On the twenty-second their companions arrived with their vessel, and this completed their joy. They entreated the cook of the Russians to wet a sack of flour and make some bread, to which he very willingly consented. As the fishermen returned at that time from the sea, the master bought of them four stockfish, which he had dressed.

While the Dutch were at dinner, the man who commanded the Russians came to see

them, and as they had but little bread, he presented them with some. They invited him to eat with them; but he would not, because it was a fast day, and they had thrown a little fat or melted butter over the fish. They could not even prevail on him nor his people to drink a single draught, because the cup appeared a little greasy, and they would not lend their cups, for fear they should grease them; so superstitious are they in the observation of their fasts.

On the twenty-third, the master made a handsome present in money to the commander of the Russians, and paid the cook for his trouble in making bread, for which they both returned many thanks. At six in the evening the two vessels set sail during the spring tide. On the twenty-fourth, at six in the morning, they arrived at the Seven Isles, where they met with many fishermen, of whom they asked for Kool, or Kilduil. The fishermen pointed to the east; and this was also the opinion of the Dutch crew. The fishermen threw them a stock-fish, but they could not pay them for it, being carried along too quickly by a strong wind: they only made different signs to signify that they thanked them, remaining besides surprised at the obliging manners of those people.

At six in the evening they met with other fishermen, who sailed towards them, and asked where was their *crabble*, that is to say, their ship? They gave for answer the two words which they had learned, *crabble propal*, the ship is lost: upon which the fishermen again cried out, *Cool brabante crabble*, by which they conceived they would say that there were Dutch vessels at Cool, or Cola.

On the twenty-fifth, at noon, they were in sight of Kilduin, and between one and two came to the western extremity of the island. The master immediately landed, where he found five or six small houses inhabited by Laplanders, of whom they asked if that country was not Kilduin? They answered yes; and that there were three Dutch vessels at Cola, two of which were to leave it that same day.

Upon this answer, they again set sail between four and five in the afternoon, with an intention to reach Wardhuis; but during their course the wind increased so that they could not keep the sea during the night: they therefore passed behind two rocks and bore towards the land. They saw a little hut there, to which they repaired, and found three men, who received them with kindness. They asked these men if they could find a vessel to go to Holland. They returned the same answer as the Laplanders, that there were three, two of which were on the eve of departure.

They asked them if they were willing to go to Cool with one of the crew by land, and they would pay them well for their trouble. The Laplanders excused themselves, saying they could not leave that place. Nevertheless, they conducted the master with one of the sailors over a mountain, where they met with other Laplanders, who engaged to conduct the sailor, on their promising two reals of eight. Thus one of them having taken a firelock, and the sailor holding a hook in his hand, they both departed towards morning.

On the twenty sixth they towed the two vessels to land, and drew out what they had there to expose it to the air: they afterwards went to visit the Russians, with whom they warmed themselves: they also dressed what they had to eat, and resumed two regular repasts every day, as having no doubt that henceforth they should meet with men from time to time, and the most part of those things for which they should have occasion. They drank also of the beverage of the Russians, which they call quass, made of every sort of old and mouldy bread, and which nevertheless they did not fail to find good, after having for such a length of time drank nothing but water. Some of them having advanced farther into the country met with a kind of little fruit, of the colour of the

sloe, which much resembled black goosberries, of which they ate, and found much benefit from them; for they perceived that these goosberries completed the cure of the scurvy.

On the twenty-ninth they saw on a mountain the Laplander returning to them, but without the sailor he had conducted to Cola, which surprised them, and caused some alarm. The Laplander being arrived, gave a letter to the master, who having broke it open immediately, found that the writer was extremely astonished at his arrival at that place with his crew; that he believed them all lost a long time since; that their return had given him the greater joy, as he had regarded their loss as certain; that he would come very soon to meet them, with all kinds of refreshments. This letter was signed John Cornelisz Riip.

So agreeable a piece of news was received with great satisfaction. They paid the Laplander, and besides made him a present of a pair of breeches, stockings, and some other clothes, so that he was quite clothed in the Dutch fashion. This man walked so quickly, that it was perfectly astonishing: they had constantly travelled for two days and two nights, in order to arrive speedily at Cola, when they were both together; and at the return of the Laplander alone, he had only been twenty-four hours on his journey. The sailors imagined there was a little witchcraft in the business: he gave them a partridge he had killed on his return.

On the thirtieth they remained all day in anxious suspense to know who this John Cornelisz was who had written. It occurred to them sometimes that it might probably be the same John Cornelisz who had been in their company; but they afterwards rejected this idea, because they could not believe he was living, in the same manner as on his side he could not believe they were still alive. The hardships he had suffered, and would suffer, appeared to them still greater than theirs, and they consequently concluded he could not have supported them, and that he was certainly dead. At length the master looked for a letter that this John Cornelisz, who had sailed with him, had formerly written, and finding it to be the same hand-writing, he no longer doubted he was still alive.

In the mean time they saw a yawl sailing towards the coast, and when it approached, they recognized John Cornelisz, who was with the sailor they had sent to Cool. This was a meeting of persons who had believed each other lost, and who beheld one another as risen from the dead. John Cornelisz brought with him a cask of Rostoc beer, wine, brandy, bread, meat, pork, salmon, sugar, and several other refreshments. On the last day of August they got ready, and departed to proceed to Cola, after having returned many thanks to the Russians, and having paid well for their lodging, setting sail at midnight during the height of the tide.

On the first of September, at day-break, which was about six in the morning, they found themselves to the west of the river of Cola, on which they proceeded, both rowing and sailing at the same time, till midnight. On the second they continued to ascend the river, on the banks of which they had the pleasure of seeing trees, and they imagined themselves arrived in another world; for they had never yet met with trees in all the other places where they had landed. Between seven and eight in the evening they joined the vessel of John Cornelisz. The meeting of the two crews was a new occasion for rejoicing, the more so as that of John Cornelisz had been in the voyage of the preceding year, with the same master.

At dusk they entered Cola, and on the following day they unloaded their vessels and landed to refresh themselves, after incredible fatigues, in order to recruit their strength, and be in condition to complete the voyage to Holland. On the eleventh they

obtained permission of the governor, who was there on the part of the great duke of Moscovy, to have their vessels conducted to the exchange, or warehouse of the merchants, and to leave them there as sacred, in order to preserve the memory of so long and dangerous a voyage, made by a route till then unknown, and in small vessels without any covering, which had navigated nearly four hundred leagues along the coasts, and in the main sea to Cola; at which the inhabitants of that city were in an astonishment which would have been difficult to express.

On the fifteenth of September they came down the river in a bark, to get on board the vessel of John Cornelisz, which lay half a league from the town, and in the afternoon the vessel also descended half way down the river, and beyond the strait. On the eighteenth they left the river and stood out to sea, in order to proceed to Holland. On the following day, at six in the evening, they came before Wardhuis, where they anchored, because Cornelisz had yet to take in there some merchandise.

On the sixth of October, in the evening, they weighed anchor and left Wardhuis, and on the twenty-ninth of the same month they entered the Meuse, sailing with an E.N.E. wind. The following day they proceeded by land to Maaslandt-sluis, Delft, Haerlem, and on the first of November they arrived at Amsterdam, in the same dress they had worn at Novaya Zemlia, and with the same furred caps of foxes' skins: thence they proceeded to the house of Peter Hasselaar, who was one of the directors for the city of Amsterdam at the time of the equipment of the two vessels at that place; that is to say, the one of John Cornelisz, and that of the master who had been to Novaya Zemlia, and returned.

The return of the remainder of the crew of the lost vessel occasioned much surprise to the people, who had thought them dead; and as the report quickly spread through the city, it came to the ears of the chancellor of the king of Denmark, then his ambassador to Holland, while he was at table, and dining at the Prinshof.* The high bailiff of Amsterdam went himself with two other lords of the city to fetch them, and they made a recital before the ambassador and the burgomasters of Amsterdam of their voyage and adventures; after that they retired. Those who had dwellings at Amsterdam went to their houses, and the others were placed at an inn, and their expences defrayed, until they had drawn up their accounts and had been paid. They were in all to the number of twelve.

* The house where the counsellors of the admiralty assemble.

DISSERTATION OF THE LEARNED JOHN ISAAC PONTANUS, IN WHICH HE ANSWERS THE OBJECTIONS OF THOSE WHO CONSIDER THE SEARCH OF A NORTHERN PASSAGE AS A TASK OF TOO GREAT DIFFICULTY; AND IN WHICH HE PROPOSES THE MOST PROBABLE MEANS OF ACCOMPLISHING THIS DESIGN.

(IBID. VOL. I. P. 254.)

THERE are some persons who might object that what has been attempted is absolutely impossible, that we have not been able to accomplish it, and that most probably we shall never succeed. But I answer, that the same was formerly said of the navigation to the East Indies, which at present is so happily practised by the Dutch and Portuguese,

as we shall mention in its place. It was said to be impossible to pass twice under the line, that the hope was too slender, and the danger too great and certain. These objections and some others did not dissuade Emanuel king of Portugal from his design; and he completed the discovery of that course through the ocean, which a year before had been shewn by his predecessor, to the Cape of Good Hope.

This prince having given the command of the fleet which he sent to the Indies to Velasco de Gama, who accepted it, this commander embarked in 1497 at Calismalis, or Cadiz.* He directed his course towards Arabia, doubled the Cape of Good Hope, made all the necessary discoveries, and arrived at the kingdom of Calicut. At his return he related in presence of the king every thing he had performed. For besides the testimonies of the ancients, they had entertained fresh hopes of succeeding in this navigation from the account of certain persons whom the king had sent to Alexandria, with orders to pass from that place into Mauritania, which is above Egypt, whence they were to proceed towards Italy, in order to learn in all those places from the most able persons what route should be taken, after having passed around the Cape of Good Hope, in order to reach the Indies.

With respect to the ancients, it is true it seems probable that the route by this Cape may have been unknown to Ptolemy; but Pliny expressly relates several circumstances, from which it appears that the inhabitants of Cadiz formerly much frequented the parts on this side of the Cape: for he says, that when C. Cæsar, son of Augustus, waged war on the Red Sea, wrecks of Spanish vessels were observed; and that during the flourishing days of Carthage, when its power was dreaded, Hanno, having sailed from Cadiz to the extremity of Arabia, had given a description of that voyage. Besides, it may be inferred from Cornelius Nepos, that this same route was also known to the Arabs; for he relates that in his time, one Eudoxus, who fled from Lathyrus king of Alexandria, having returned by the Red Sea, passed to Cadiz; which is also precisely mentioned by Pliny.

But we must finish this digression, and return to our subject. If therefore the Portuguese, from lending faith to these testimonies of the ancients, have met with a happy success, why shall we pay no regard to what these same ancients have related of the navigation by the north? Their testimonies and the thing itself well deserve that we should make every imaginable attempt.

I pass in silence what the chronicles of France and Denmark have said of those of Greenland; which chronicles of Denmark, Ansgarius, and after him Albert, ministers of the gospel, have published at Hamburg, though at present their name is scarcely known; but these things will appear in a new light, if they be compared with what has been related by Pliny already cited. This author tell us, on the faith of Cornelius Nepos, that formerly there was a famous navigation made by the north, and he advances this proof: that when Q. Metellus Celer was consul with C. Afranius, being also governor of the Gauls, the king of the Suabians made him a present of some Indians, who, being at sea for traffic, had been forced by a tempest and cast on Germany: he understands that part of Germany where the Weser and Elbe discharge themselves into the sea; for we have demonstrated elsewhere that the dominion of the ancient Suabians extended to that place. It may be conjectured that these Indians had parted from Cape Tabin, which is in the north of Tartary, and is called Mount Tabin by Pliny; and that they were of Seres, a neighbouring country, and where at present are the frontiers of Cathay, on the side of the Dead Sea, thus named, or Sea of Mar-

* This paper is only inserted on account of its curiosity. Pontanus must have been a miserable geographer.

mora, or Maramarusa, by the Cimbri, according as the same Pliny relates on the faith of Philemon; and that the tempest had carried them to the coasts of Germany.

If all these things be true, it will be found that the relation of the Samoiedes, which we have heretofore seen, is to be credited, and that it is of great importance, since it discloses that the Russians every year, taking their opportunity to sail to a certain cape, which they call Ugolita, beyond the river Obi, arrive there in five days by that same sea before it freezes; so that the voyages we would make by the north should be undertaken by this same route, which appears the most expeditious and sure, till better discoveries be made. We should follow the example of Emanuel king of Portugal, who, before equipping a fleet to proceed to the East, dispatched persons to reconnoitre the Red Sea, and the routes from that sea to the Indies, in order to know its nature, and the gulfs which might be there.

In the same manner, if we would wish to pass the Strait of Nassau, or of Weigats, persons should be sent at the public expence, who, taking the opportunity of the voyage made by the Russians every year, should join them, in order to proceed in their company; by this means we should ascertain if the sea beyond the Weigats is the great sea of Tartary, or only a gulf, beyond which we cannot pass: we should know if Cape Tabin be always frozen, or if it be possible to sail beyond: we might, I say, be informed of all these things by the people inhabiting those climates, and who are acquainted with them.

In order to facilitate this enterprise, there should be dispatched a ship of war of the lowest rate, and not so much attention paid to man it with a strong crew, as to compose the crew of officers and sailors already accustomed to sail in those climates. This vessel should be stored with provisions for a year, or even a longer time, and when arrived at the strait, the place should be chosen which might be judged the most proper to winter in, from which there might be communication with the Russians and Samoides, and where they should wait the time of the passage of the Moscovites. It would be well also that some of the Dutch who trade to Japan should come by that side to Cape Tabin, or at least to the places which are the most neighbouring, and observe the route and the country. These are the most certain, and without doubt the only means, which can be put in practice to clear up this great mystery, that is, whether vessels may there meet with a passage.

I am aware that others are of opinion it would be surer to direct the course through the main sea, and to sail around the northern coast of Novaya Zemlia, to the latitude of 82° or thereabouts, because the days and the summer are longer there, the ice not so frequent, nor in such quantity, along the coast; and in fine, because the cold there is less severe than in latitude 76°, and below. I admit that all these things are thus on the globe, which is extremely inclined and curved in this latitude, and which raises the sun on the horizon for nearly six months. Nevertheless, there are two reasons why this opinion should not be received. The first, that we have no knowledge of that climate, neither if it be all sea, or if there also be lands and islands. In the second place, supposing it possible to navigate there, the difficulty still remains the same; that is to say, that it is necessary to descend from the latitude of 80° to the latitude of 70°, and below, and there to suffer the inconveniences and the rigour of the cold and mountains of ice, in the midst of which we should find ourselves; to remain separated from all communication with men in unknown countries; to be deprived of the brightness of the sun; to contend with wild beasts; and finally, according to all appearance, miserably to perish.

To this has been reduced the success of the voyages which have been undertaken to the present time. The first of those who visited the northern coast of America was

Nicholas Zenetus,* who, in the year 1380, after having been driven here and there, lost the hope he had conceived. In 1500 Gaspard Cortesius, instead of the strait he sought, met with a river, and having been obliged to return, he again undertook the same voyage the following year, and perished; and his death was soon after followed by that of his brother Michael, who perished in the same research. Sebastian Cabot, a Venetian, having been sent, in 1506, by Henry VII, king of England, also to seek a northern passage, was impeded by the ice, and returned without success. John Varascenus having sailed there in 1524, in the name of Francis I, king of France, who was prepossessed with the same design, landed at Cape Britain, where he and his crew were devoured by the savages. Sebastian Gomesius, a Spaniard, took this same route in 1525, and all the honour he acquired was to bring away some savages.

After this, the English having formed the same design, Sir Hugh Willoughby, in 1553, arrived in latitude 72°, where, from the cold and other inconveniences, he and his whole crew perished. Three years after, Stephen Burrough took the same route, and discovered the isles of Gulgoievia, Novaya Zemlia, and some others; but having nearly experienced the severity of the cold of this climate, and foreseeing the consequences, he departed in time, and returned. Afterwards Martin Frobisher, Arthur Pet, Charles Jackman, and John Davis, of the same nation, made the same attempt without success. Frobisher, in 1576, returned on account of the ice: Pet and Jackman experienced the same fate in 1580, except that they more distinctly observed the coasts of Novaya Zemlia. In 1585, Davis discovered a gulf, but to the present time the extent has not been ascertained. Finally, the Dutch in our days having rendered themselves famous in the art of navigation, by their voyages and discoveries, were also willing to contribute to this last, and have acquitted themselves with honour, though they have failed; for we have seen above the success of their enterprise. Thus I do not see that this route can be completely discovered, unless by the means I have just pointed out.

* He speaks of the fabulous voyage of Nicholas Zeno.

A JOURNEY THROUGH FLANDERS, HOLLAND, &c.

BY M. REGNARD.

[Newly translated from the Stereotype edition of the Works of this celebrated comic Poet. Paris, 1801. Tom. v.]

WE left Paris in the Brussells diligence on the twenty-sixth day of April, 1681. I intended to sleep at Senlis, where I expected to find M. de Fercourt, who had set out from Paris three days before. All our fellow-passengers were young men, the eldest of whom was below twenty-eight years of age; five of them were Dutchmen, one of whom was M. de Wasenau, captain of the prince of Orange's guards: we had also in our company a little Spanish abbe, who was going to take possession of a petty canonship at Brussells. This little priest, humph-backed and humph-breasted, was a source of entertainment to us during the whole journey. We went next day to Pont, where we dined, after which we travelled to sleep at Gournai, where the residence of the president Amelot is situated: the chateau is surrounded with water, and the garden is intersected with various rivulets, which add considerably to its beauty. We left this place early in the morning, that we might be enabled to reach and sleep at Peronne, which is called La Pucelle, on account of its unshaken fidelity to the royal cause during the civil war. It is a small town, but extremely strong on the side by which it is entered, on account of marshes, which render any approach to it difficult, and which form a number of large and deep ditches, occasioning a thousand windings before the city can be arrived at. The river Somme laves its walls, and defends it on the same side, so that the place is almost inaccessible. These ditches produce excellent carp, which are famous throughout all France, as well as numbers of ducks, the pies made of which are equally esteemed. The distance from Peronne to Cambray is seven leagues. While we were on the road we were attacked with such a violent storm, that our horses, frightened, and blinded with constant flashes of lightning, which created day in the midst of darkness, overturned the coach in a deep ditch, where, in consequence of the violent fall, we were in danger of ending our days; but fortune so ordered matters that not one of us was wounded; we escaped with being completely drenched in water; and after we had been angled and drawn like fish from the coach, nearly in the situation of those who come out of a mine, in which they had been immersed to the ears, we were obliged to travel a league and a half on foot to Cambray, which, as may easily be conceived, we entered in a very dirty and disagreeable condition.

This city by no means deserves the renown which it has acquired in France: it is only formidable by the mischief which its garrisons have done to our peasantry; and I am astonished at the disturbance which it excited before it was taken by the greatest of kings. The fact is, Cambray of itself is of no importance; it is the castle only which is capable of making any defence, and the city had no strength but what it derived from its protection; and the works which are now carrying on at this place furnish a convincing proof that there is no intention of immediately giving it back; and that the Spaniards, who believed it so strong, that they said, "If the king of France wishes to take Cambray, he must build one," have now taken leave of it for ever. This fortress, so famous throughout the world, was begun by Charles the Fifth, and has been increased by many fortifications, which render it a very respectable place: its walls are astonishingly high, owing to the great depth of the ditches; but they are not on this account the stronger, as they are almost wholly undermined. We were conducted everywhere

by an officer, who with pleasure showed us every thing worthy of observation, and pointed out to us the breach by which the Spaniards escaped. The city contains nothing remarkable, except the spire of the cathedral, which has been lately built with surprising delicacy of taste. We lodged at the Raven, and were very ill accommodated, owing to the number of strangers at this place.

From Cambray to Valenciennes the distance is not greater than from Peronne to Cambray. Valenciennes is situated upon the Escaut, and they are fortifying it in such a manner as to render it impregnable. We observed carefully the place by which it had been taken, and the gate through which the musketteers entered. This gate is constructed like a gate of vaulted iron, and had communication with a glacis; it had not been open for twenty years, and it was only so at this time for the purpose of carrying in the body of the major, who had been wounded during an attack which had been made on this side: the musketteers, for whom it assuredly had not been opened, pursued the enemy, and, finding this entrance, continued their way; and notwithstanding a shower of bullets pushed on to another gate, the portcullis of which, not having been used for a long time, it was found impossible to shut, and they made themselves masters of the city. We entered the fortress, and as we had a kind of priest with us, they gave us two soldiers as conductors. It is known that there is nothing Spanish in this country but the disposition of the priests; and they are carefully and cautiously watched, to prevent them from engaging in any improper enterprise. We observed that all the females in this country were handsome. In travelling from Valenciennes to Mons, it is customary to dine at Reverain, a place worthy of attention, both on account of the residence of our armies, and of its being the spot which separates the territories of France and Spain: we arrived in good time at the city, and had sufficient leisure to view it with attention.

Mons is the capital of Hainault, and the first town under the dominion of Spain on this side; but it remains so only until it please France to take it under her protection: It may be considered one of the strongest fortresses of the Low Country, on account of its situation, being surrounded with marshes. The burghers form its garrison, and we saw them mount guard in the great square, which is extremely handsome. The prince of Aremberg, a Spanish nobleman, who is also duke of Arcot, and of the first family of the Low Country, is governor. That which gratified me much in Mons, and which is singular enough, was the royal college of Canonesses, founded by a ————, who established this community for the reception of ladies of quality, who remain here until they leave it for the purpose of being married. These ladies perform the service with peculiar gracefulness: they have one dress in which they attend church in the morning, and another in which they visit the city in the evening, when they attend the best company, and are perfectly well received, on account of the gallantry which they profess. We ascended the great tour, from whence we viewed the whole city, and where we also saw an excellent chime of bells, which the Dutch and Flemings are very fond of.

After leaving Mons, we intended to sleep at Notre Dame de Halle. This place of devotion has been, in common with others, much abused by the armies encamped in its neighbourhood, which have had no regard for the reverence which all Flemings feel for this church, dedicated to the Virgin. We observed on leaving Mons the spot where the famous battle of St. Denis was fought, on the evening previous to the proclamation of peace in the army, and at the time when the prince of Orange had in his possession the articles of peace actually signed: we were accompanied by an officer who was present at the engagement, and who shewed us the posts and positions which the two armies occupied. The battle is also denominated that of Cassiau, which is the appellation of a little village opposite to that abbey, whose name distinguishes this engagement.

We at length arrived at Brussels, the second city of Brabant: it is extremely agreeable, and very populous, as it is the ordinary place of residence of the governors of the Low Country, and consequently of a number of men of quality who attend the court; on this account it is called The Noble. The governor's palace is the finest building in the city, both on account of its size, and of the fine park which surrounds it, serving as an agreeable promenade to all the inhabitants, and delighting the sight by the number of fountains which it contains. The prince of Parma is the present governor: he has placed the militia on an excellent footing, re-establishing it by great levies made upon the people, who have not been extremely well pleased with the measure. The town-house is a curious structure: it was erected by an Italian, who hanged himself with vexation, as his epitaph informs us, because he had neglected to place the tower in the middle. This man performed that office for himself which a hangman should have done; for he deserved no better than a cord, for having been deficient in a point which men the most ignorant of architecture would by no means have neglected. The churches of Brussels, like those of the Low Country, are very handsome, and kept in excellent repair. We saw in the collegiate church, called St. Gudule, three miraculous hosts, on which we were told that some spots of blood could be discovered. We went to see the society of Beguins, which is a peculiar order in this country: they are clothed in white when at church; but they walk through the streets in a long black cloak, which covers them from head to foot: they have also a little cap on their heads, which forms a very handsome dress; and I observed girls in this religious habit, whom I should have loved in preference to many others shining in gold, and sparkling with diamonds. At this time there were eight hundred at Beguinage. The court of fashionables here is the same with the court among us: here all the ladies and cavaliers are to be met with; but there is this difference, however, that all the ladies are here on one side, and the gentlemen on the other. We passed three days very pleasantly at Brussells, and after having seen every thing worthy of observation in the city, we set out on the sixteenth day of May by the canal which communicates with Antwerp; but by which we only went to ———, where we left the boat, for the purpose of taking coaches to Malines, which we wished to see before our arrival at Antwerp.

Malines is termed The Beautiful, and not without reason; for it appears to be rather a painted, than a real city, the buildings being regular, and the streets handsome, and well paved. It is to this parliament, the first of the Low Country, that every process which is appealed is referred; and this circumstance renders the city celebrated. This province is dismembered from the rest of the Low Country, and forms a marquisite by itself. All the common people work, as is the custom throughout Flanders, at the manufacture of white lace, which bears this name; and Beguinage, which is the largest and most valuable of them all, is only supported by the labour in which the Beguins are engaged, and in which they excel. The Beguins are religious girls or women, who retire to this place as often as they think proper; they have each a little house to themselves, where they receive the visits of their relations; there are even some of them who take boarders. The place is called Beguinage, and the gates are shut early in the evening. There is at Malines a tower remarkable for its height, which commands a most extensive prospect. From Malines, where we dined, we were to go in the evening to Antwerp in coaches, which travel every day at a certain hour, and by the most charming and beautiful road which I have ever seen.

Antwerp, the capital, and the most extensive city of Brabant, and to which one might give titles still more respectable, surpasses all the cities I have seen, Naples, Rome, and Venice excepted, not only by the magnificence of its buildings, the pomp of its churches,

and the size of its spacious streets, but also by the manners of its inhabitants, the most polite of whom endeavour to imitate the French manners both with regard to dress and language, which they are proud of possessing in perfection. That which first excited our admiration in entering the city was the beauty of its superb ramparts, which, covered with trees, form the most delightful walk in the world: they are wholly covered with freestone, and washed by a ditch of running water, which surrounds the city, and which equally serves to embellish and defend it. The cathedral is well built, and the steeple, of English workmanship, is surprisingly handsome; but it may one day prove the source of vexation to the city. There are here several excellent paintings, and among others a descent from the cross, by Rubens, which is reckoned a master-piece.

The church of the Jesuits is not inferior in magnificence to any which I have seen in Italy, and is as superb; as the marble with which it is built has been conveyed from a considerable distance, and at a great expence: the whole roof is covered with pieces from the hand of the greatest masters. It is easy to judge of the magnificence of this church, when it is stated that the marble rail alone which guards the chief altar cost more than forty thousand livres: and I do not believe it possible to behold a more finished piece of sculpture; the marble is so delicately rounded, that it seems to have forgotten its native hardness, for the purpose of assuming that form which the workman wished to give it, and to yield like wax to the dictates of his will. The fortress, famed through all Europe for its regularity, has five bastions: it is larger, stronger, and incomparably better built than that of Cambray. Its glacis is extensive and spacious throughout, and superior in this respect to that of Cambray, which can be very nearly approached while under cover; which circumstance tended not a little to facilitate its capture. We were conducted hither by M. de Verprost, and carried everywhere by an officer, who would not allow us to walk upon the bastions. We saw the place where the Dutch attempted to take the city by surprise, where they descended by night in the river, and attempted to pass the ditch by means of little boats, which every man could carry upon his shoulder; but the centinel hearing a noise gave the alarm, in consequence of which the Dutch, disappointed in their expectations, retreated, and left all their boats and instruments, which are still kept in the citadel, and which were shewn to us as symptoms and monuments of victory.

We embarked at Antwerp for Rotterdam. We had Zealand on the left, and passed in sight of Bergen-op-Zoom, which belongs to the count of Auvergne. We were three days on our voyage, and passed the Brille: this place excited considerable disturbance during the troubles in Holland, which happened about a century ago.

During the reign of Philip the Second, son of Charles the Fifth, the Seven Provinces were governed by ———, sister of Charles, and consequently the king's aunt. Philip, to whom they belonged, wished to levy some new taxes from the people, and to establish the inquisition among them. The Dutch placed themselves in opposition to the new declarations, and the prince of Orange, supported by count Horn, and by ———, at the head of the populace, remonstrated to the governess, and proposed two hundred articles, respecting which they requested satisfaction. This lady, surprised at the tumult, turned round to one of the chief men of her council, who told her, in derision, *that she ought not to give herself any uneasiness about a set of Beggars.* This saying being reported to the mutineers, they became so enraged that they established a party, which has since been distinguished by the name of The Beggars. The governess, however, returned to Spain, being conscious of the factious disposition of the inhabitants of the Seven Provinces, and not wishing to shew them that she could not consent to a part of the articles which they proposed: this led Philip the Second to send the duke of Ava, who after-

wards shed so much blood, and produced the complete rebellion of the Provinces: it is said that he destroyed, by the hands of the executioner, more than eighteen thousand persons. He convoked the States at Brussels. Count Horn, not wishing to appear ringleader of the mutiny, went thither; but the prince of Orange, fearing the Spaniards, whom he distrusted, left the States, that he might not be obliged to attend. Count Horn meeting accidentally the prince of Orange, who absented himself, "*Farewell*, (says he) *Prince without territories*:" to which the prince replied, "*Farewell, count without a head*:" which was afterwards found to be true; for being arrested at the meeting of the States, they cut off the count's head, together with those of an almost countless number of individuals, who were supposed to belong to his party, or who were suspected to do so, it being treason in the opinion of the Spaniards to be an object of suspicion to the king. The prince of Orange, being sensible by the death of Count Horn and his adherents that he had acted with proper prudence, wished still to consult his safety, and strengthening the party of the factious, he put himself at their head, and after many battles, in which he was continually worsted, he at length took the Brille, from which the duke of Ava, endeavoured, in vain, to expel him. This gave occasion to the pictures made of him, in which he is ludicrously represented with spectacles on his nose, Brille in Dutch signifying spectacles. Holland is divided into Seven United Provinces, which are denominated Guelderland, Holland, Zealand, Utrecht, Friezland, Overyssell, and Groningen.

We arrived at Rotterdam at midnight, and were obliged to go over the walls, that we might enter the city, as the gates were shut. This city is the second of the whole country; and it is easy to judge of its richness, by the number of vessels which are to be seen here from every country, and which fill the canal of the city, though it is extremely large. This city is remarkable for the extent of its commerce, as well as the beauty of its houses, which are possessed of all that neatness so characteristic of all the cities of Holland. The statue of Erasmus is placed in the middle of the great square: he was born in this city, and certainly deserved from the republic, a statue in bronze upon the bridge which is situated in the middle of the square. We left Rotterdam at two o'clock of the afternoon, in boats, which are extremely commodious in all parts of Holland: they set out, every one at different times, and half an hour after each other; in consequence of which, some of them depart every half hour both of the day and the night for a hundred different places; and so punctual are they, that the horse is yoked to the boat as soon as the hour is ready to strike; and before it has fully struck the horse sets off. We travelled to Delft, a little village at the distance of two leagues from the Hague, where we saw the brother of one of our friends whom we had left in slavery at Algiers. We entered the principal church of the city, and viewed the tomb of the famous admiral Tromp. In the evening we arrived at the Hague, which is the finest village in the world: it is the prince of Orange's ordinary residence. He was not here at this time, but had gone to a great hunt in Germany, upon the lands of ————, with the ————.

The prince of Orange is denominated William the Third of Nassau. The late wars have rendered him popular in Holland, and he has, consequently, been declared Stadtholder, captain-general of the armies belonging to the United Provinces of the Low Country, and grand-admiral. The States allow him the sum of a hundred thousand francs per annum, besides defraying the expences of his private establishment. Some individuals wished him, and tried to entice him, to declare himself king of Holland, while he was absolute master of the troops. But those who had more wisdom pointed out to him, not only the difficulty attending the execution of this project, but the impossibility of maintaining

the sovereignty, even were he fortunate enough to acquire it. They argued that Holland would be completely and speedily destroyed, if it became the property of a master, and ceased to be a republic, and that on account of the great expence which would be constantly required for the preservation of the country; that a prince would be obliged to raise large sums upon his subjects, which, whilst they were indulged with the title of freemen, they would pay with pleasure, as all they gave was for the general good; it is on this account, that no country is more harrassed by taxes and imposts than Holland; and the people flatter themselves, that, as it is they who impose them, they have it in their power to refuse them whenever they please. This counsel, the most prudent and politic, was followed by the prince of Orange, who found his account in it.

The States of Holland hold their sittings at the Hague, which is the chief cause of its magnificence. The houses of some individuals are very beautiful, but the palace of the prince has nothing in it remarkable. On the contrary, it is surprising to see him so indifferently lodged, whilst some merchants dwell in far grander mansions. We saw the chambers of the States, one of which is handsome enough, and which M. Del—— said he would undertake to gild for two thousand crowns, though, according to the general calculation, it cost more than ten thousand crowns of gold; but, he added, he understood that they had furnished it for him. M. Davaux was here at this time, ambassador. We saw him in mourning on account of the recent death of the Chevalier M. Mesme, his brother-in-law, whom I have seen at Rome, and who had been lately killed by the stroke of a stone.

On leaving the palace, we viewed a gate in the neighbourhood of the house of M. De——, the place where the murder of Pensionary De Witt happened, who was destroyed by the populace, at the commencement of the war. This took place at the instigation of the prince of Orange, who was displeased with him for publishing an edict, which had been issued a short time before, forbidding the people to recognise the prince as their sovereign, which it was their wish to do.

Prince William of Nassau, who was at the head of the patriots when they threw off the Spanish yoke, behaved so generously during the whole of the war, that the Dutch, after the Spaniards had been obliged to recognise them and their Republic as independent states, were forced to reward his valour, by conferring on him the title of Protector of the States. This title is enjoyed by his successors. But the council of the provinces, and especially the De Witts, who composed a particular faction, and who were encouraged by many others, published that perpetual law, by which it was declared illegal ever to propose the prince of Orange as sovereign, and even obliged the present prince, while young, to sign it. During these transactions, war with France commenced; and the people, dreading the French yoke, and believing, that, if they had the prince of Orange at their head, they would perform wonders, proposed him. But being prevented by this perpetual edict, they broke out against De Witt, the general of the forces, and caused him to be arrested, accusing him of high treason, and of wishing to overturn the government; but finding no evidence sufficient to convict him, they contented themselves with banishing him, for the purpose of satisfying the people and the faction of the prince of Orange. His brother, pensionary, at the Hague for the affairs of the province of Holland, demanded permission to visit him; but, in endeavouring to enter the prison, the people mutinied, suffering with impatience the sight of a man who opposed their schemes, fell upon him, and barbarously assassinated him on the spot. They drew him to a little distance, where they hung him by the neck. Every body crowded to this scene, and so enraged were the people,

that they cut the body in pieces, and took away with them lumps of flesh, which they sold some days afterwards, at a high price, to those who had not enjoyed the satisfaction of being present at this massacre. The people, who are ferocious brutes, delighting always in extremes, because destitute of reason, and either too timid, or too rash, have already repented of this action. They are sensible, that the law was made for their interests; and the Pensionary's death was the first check which the republic received.

The United Provinces are indebted, under Heaven, to the princes of Orange for their liberty, who forced the king of Spain to sign the treaty, and to recognize the Dutch as a free people, independent of every other, which is a very remarkable circumstance. William the First cemented with his blood the foundation of the republic. Maurice and Henry, his sons, advanced its glory, by being conquerors in several engagements. William the Second, not inferior to the rest, died very young, and left, as the successor of his virtues, William the Third of the same name, the present prince of Orange, son of William the Second, and Mary Stewart, eldest daughter of Charles the First, king of England, who was beheaded. In the thirty-sixth or thirty-seventh year of William the Second's age, William the Third was born, who has since married the daughter of the Duke of York. He was not born till after his father's death, and he was, when eleven years of age, deprived of the princess royal, his mother, who died at London, of the small-pox, the same disease which had carried off her husband, William the Second.

It is known to all the world, that Holland is a state purely republican; but it will be proper to say something more particular respecting its government.

Every city is governed by a magistrate, burgo-masters, and councillors, besides a bailiff, in criminal causes, who discharges his office at the will of the council, and who determines absolutely, in criminal affairs, of the sentence of the burgo-masters. Above a certain sum, an appeal may be made to the provincial court, to which every city sends a councillor.

The deputies from the cities compose the States of the Province; and the deputies from the Provinces form the States General, who enter into alliances, form treaties, impose taxes, and attend to the general interests of the republic. The Provinces have all equally the same influence; but the province of Amsterdam generally sways the balance, and influences the decisions, according to its wish. That city alone is considered a province. It is a natural conclusion that the sovereignty is not resident in the States General, who consist solely of envoys from the cities, for the purpose of proposing in the council those matters which they wish to be considered.

The Hague is the place where the Dutch nobility reside, and it is, perhaps, the most charming residence in the world. A large forest of tall trees, bounded on every side by magnificent palaces, and surrounded by extensive and beautiful meadows, renders its appearance one of the most pleasant in Europe. Before the Stadthouse, there is a pond surrounded with pieces of hewn stone, while large trees on its borders adorn the palace of the prince. One can travel in a quarter of an hour from the Hague to the sea, by a charming road. In going thither, we saw a chariot with sails, which the prince of Orange had caused to be constructed, and we went into a place, where they ride round a ring on wooden horses. We went to view a residence of the prince, where he passes part of the year, and maintains a number of curious beasts. We also saw some cows from Calicut, of a peculiar structure, with bunches on their backs, besides a number of stags. We left the Hague, and dined at Leyden, which is called *Lugdunum Batavorum*, and which is respectable on account of its university, its anatomical preparations, and the propriety of its buildings; it is in my opinion, the most

respectable of all the Dutch towns. We saw here a number of curiosities, and among others, a hippopotamus or sea-cow, which had been brought from India. In the anatomical museum they show a quantity of preparations, so numerous, that a catalogue of them would be sufficient to fill a large volume.

From Leyden we travelled to Amsterdam, and saw Haarlem on the road, where we observed a large church: we arrived at Amsterdam in the evening. This city of cities, so renowned throughout the whole universe, may well be considered a master-piece. The houses are magnificent, the streets spacious, and the canals extremely large, with their banks fringed with trees, which, mixing their verdure with the various colours with which the houses are painted, form one of the most delightful scenes in the world. The city appears double. One can see it in the water, and the reflection of the palaces in the canals renders this place a charming residence. The town-house is situated on the dam; this structure might have been reckoned one of the finest in Europe, if the architect had not been deficient in the plan, and had made some distinction betwixt the windows and the entrance, which it is necessary to look for on all sides, and often to inquire for. We ascended the stairs of the building, where we saw a magazine of arms, and a very fine chime of bells. From the spire, we observed Utrecht, which was the place that bounded the conquest of the king. The house of correction is one of the most useful establishments I know, it contains all the females of infamous character, who are shut up in it, for a certain time, and obliged to work. Perhaps there is no town in the world, Paris excepted, where there is so much debauchery, as in Amsterdam. However, there is this difference between them, that in this city there are certain districts, where bawds reside, and maintain, in their houses, a certain number of girls. The gentleman is shown into a chamber, which has a communication with a number of small ones, of which he pays for the entrance. The portrait, and the price of the lady which the chamber contains, are fixed above the door; the choice is left to the gentleman; but the lady will not venture out till the price is paid, and if the portrait has flattered, so much the worse for him.

The work-house is another receptacle for vicious persons, and children whose parents have been unable to reclaim them, where they are employed to grind cinnamon. There is in the great church of Amsterdam a chain of immense value, on account of the excellence of its workmanship. At Amsterdam, and throughout Holland, all kinds of religions, except the Catholic, are tolerated; this exception is an example of their good policy, as they are convinced, that if ever the Catholics acquired power, it would be a great check to their liberty, and might prove its destruction. One sees here, Lutherans, Calvinists, Armenians, Nestorians, Anabaptists, and Jews, who are more powerful in this place than in any other country: Their synagogue here is infinitely superior to that of Venice. The India house, which is without the city, shows clearly that it belongs to the richest merchants in Europe. They were building here a very fine ship, which was to sail for India in a month. We went to see their ships of war, which had no very respectable appearance, and I did not distinguish one, which was equal in beauty to our own. They disapprove of quarter-galleries, which are frequent with us, and suppose that they obstruct the ship's motion, but this addition, so far from being any disadvantage, is, I find, extremely useful to the officers, and ornamental to the vessel. At Amsterdam, we lodged at Chellier's, at the Place Royale, in Kalverstraat. We knew M. de Reswic, who is descended of one of the first families in Holland, and who, in the late wars, expended large sums of money. He shewed Miss Hornia, his mistress, heiress to a very fine fortune, and, like him, a Catholic. We saw them together at the opera, at the re-

presentation of the rape of Helen. We were informed at the comedy that the whole sum received is given to the poor, and that the city pays the comedians, who receive a certain salary.

We left Amsterdam on the twenty-fifth day of May, 1681, and arrived at Enchuyse in the evening, where we only staid while we took a refreshment. We observed, that this city has three herrings upon its arms, on account of the great numbers which the inhabitants catch of this fish. We hired a boat in the evening to Workum, where we arrived next morning. This province is called North Holland, and I do not believe there are finer women any where, than what are here to be met with. The peasant girls possess charms not inferior to those of the ancient Romans, and they are sufficient to inspire love at first sight.

We arrived at Lewarden, the capital of Friesland, a very handsome town, which chose the prince of Nassau for its governor, not wishing to vote for the prince of Orange. This prince is about twenty-five or twenty-six years of age. He lost his father about eighteen years ago, at the seventh year of his age. This prince died in consequence of an unlucky accident: a pistol, which went off accidentally, at once deprived Europe of a great man, and Friesland of a generous governor. He left behind him a widow, illustrious for her birth and her merit, Albertine of Orange, daughter of prince Henry and Amelia de Solmes. The prince survived seven or eight days after the accident, and the people of Friesland, out of gratitude for the good conduct of the father, offered the government to his son, who was at that time extremely young, and appointed him no other governor than the princess his mother.

We left Lewarden, and having travelled the whole night, we arrived by day-break at Groningen, a city very pleasantly situated, and which became famous in the late war, for the siege which it sustained against the bishop of Munster, who invested it at the head of twenty-four thousand men. But the excellence of its fortifications and the courage of its inhabitants forced the besiegers to abandon their works after a siege of six weeks during which they lost a great number of men. From Groningen we travelled to Oldenburg, which belongs, at present, to the king of Denmark. This city has given its name to the whole county. Two years ago it was destroyed by lightning: they are beginning to rebuild it, and the king of Denmark is rearing some fortifications. They have here a horn of plenty, which has given rise to the story of a woman, who, rising out of the earth, presented herself to the count of Oldenburg, with this horn in her hand, full of a liquor which he was unacquainted with. The prince was then at the chace, at a distance from his people, and much exhausted. But being ignorant of this liquid, and seeing an extraordinary woman, he would not touch it, but poured it upon the buttocks of his horse. The strength of this liquor carried off all the hair from the places it had touched.

The king had departed from Oldenburg for Copenhagen only two days before our arrival. On the same evening we arrived at Bremen, a republic whose territories are surrounded with those of Sweden and Denmark. The city is handsome, but of such small extent, that the walls almost touch the territories of their neighbours. From Bremen we saw nothing remarkable, till we arrived at Hamburg; and we were five days and five nights constantly travelling in their post waggons, before we finished the journey. From Hamburg to Amsterdam the distance is calculated at sixty miles, which amount to a hundred and thirty French leagues.

Hamburg is a Hanseatic town, free and imperial, which, from its excellent militia and regular fortifications, has nothing to fear from a number of princes, who are very

anxious to possess this rich treasure, and, particularly, the king of Denmark, for whom it is very conveniently situated. This prince blockaded it during the late wars with five and twenty thousand men; but seeing the number of auxiliary forces which arrived from all quarters, he could do nothing more. He resigned, a short time after, for the sum of two hundred thousand crowns, all his pretensions to this city. It is governed by four burgo-masters, and eighteen councillors. The ladies here are very handsome, and cover their faces, according to the Spanish fashion. The Lutheran religion is professed here, where they have a hollow pine a hundred years old. Their operas are pretty well represented, and I found that of Alceste excellently performed.

The whole country is excellent, and very fertile. Their carriages are extremely convenient, and the horses are excellent, and run continually.

JOURNEY TO DENMARK.

FROM Hamburg, we set out for Copenhagen, which is about a hundred and twenty leagues distant from it. At Pinnenberg, three miles from the city, we saw the queen mother of Denmark, who was going to the waters of Pyrmont with prince George her son, and younger brother of the king. From Pinnenberg, we proceeded t Issoe, Rensburg, Flensburg, Assen, Niebury, Castor, Rochild. The latter was for v the residence of the Danish kings. Their tombs are still to be seen here; that o tian the First is beautiful. We saw the model of his statue, and it was with difficulty that I reached up to it.

The queen mother is of the house of Luneburg. She went to the camp to see the young queen, with whom she is by no means on a friendly footing; and she would not receive the visits of the ambassadors, because they visited the young queen before her.

All the above-mentioned towns are handsome: the women carry all kinds of baskets, made of very fine twigs, upon their heads. At Assen I lost a portmanteau.

Frederic the Third was the first king under whom the kingdom became hereditary. He was supported by the merchants of Copenhagen, who could not bear the tyranny of the nobles. They encouraged him in his enterprise, and rewarded him with their services. The merchants and people were so abused by the nobles, that they could kill any one of them, if they deposited a crown under the body of the deceased. Frederic did not attempt to take this privilege from the nobility; but he ordained, that if a merchant or a peasant killed a noble, in that case they should place two crowns below the dead body.

The coffin which contains the body of Frederic the Third, late king of Denmark, and father of the present, is very rich, and covered with various pieces of workmanship in silver.

Copenhagen is very advantageously situated on the Baltic sea. It is a frontier town on the side of the province of Schonen, and sustained a siege very vigorously, during two years, against Gustavus Adolphus, the father of queen Christina, whom we have seen at Rome. The spires of Sainta Maria bear the marks of this siege.

The Louvre is a very ordinary building, covered with brass, which was formerly the residence of bishops, when the king's court was held at Rochild. The stable is very handsome, and very long, and contains a number of excellent horses; and the riding-house, which is near it, is a very curious structure. It was here that the rejoicing took place when the queen of Sweden left Copenhagen.

There are no buildings worth looking at in this city, if we except the palace of the queen mother, the garden of the king, and that of the duke of Guldenleu, which is

the title of all the first bastards of the king of Denmark, and means *Lion dore;* and when the king upon the throne begets a Guldenleu, that of the late king takes the title of high mightiness.

We were four days and four nights in travelling one hundred and twenty leagues; and we arrived at Copenhagen on Thursday, at the opening of the gate. We lodged at Krants.

Frederic the Third was archbishop of Bremen, but was elected king, on the death of his elder brother. He had six children, two of them boys, and four girls. The sons were king Christian, and prince George. The eldest of his daughters, Anne Sophia, was married to George the Third, duke of Saxony; another to the duke of Holstein, the third, Sophia Amelia, to William Palatine of the Rhine, and brother to Madame d' Orleans; and the fourth, and youngest, Ulrica Eleonora, to the king of Sweden.

Christian the Fifth, the present king, has five children. Three of them are sons; prince Frederic eleven years old, prince Christian six, and prince Charles one. Two are daughters, the eldest of whom is called Sophia.

The tower of the observatory, which a carriage might ascend, is a very curious building. It was reared by Frederic the Second. From the top of the tower we see the whole of the city, which is not very extensive, but which appears almost wholly surrounded by water. There is a celestial globe of brass here, made by the hands of Tycho Brahe, a famous mathematician, and a native of this country.

The Exchange is a very handsome building, placed opposite to the Louvre. Its spire is very curiously constructed. Four lizards, whose tails are raised up in the air, form the circumference. It is here where all the curiosities are exposed to sale, as at the palace.

The harbour contains the king's ships, amounting to about fifty or sixty, the admiral's vessel has a hundred guns. The kings of Denmark never sent out such a number of ships before, and the last victory which they gained over the Swedes acquired them immortal honour.

The arsenal contains a number of fine pieces of cannon. There are even some of highly polished steel, which were manufactured in Moscovy. In a hall above, there are arms for sixty thousand men, a chariot which moves of itself, and another, in the wheels of which there is a clock, which strikes the hour according to the motion of the wheels. All the spoils which the Danes acquired in their late wars with the Swedes are here placed, with the equipage of seventeen vessels, which were taken at one time.

The king's cabinet is above the library. There are several chambers filled with curiosities; among others, there is a tail of a horse, which is the mark of authority among the Turks, and which the bashaws place before their tents, when they are at the army; the grand seignior has three, and the visier two. We saw a beautiful female mandrake, the slippers of a girl who was defloured without being conscious of it, a nail which they told us is one of Nebuchadnezzar's, and one of the children of that countess of Flanders, who brought forth, at one birth, as many as there are days in a year.

The king is very handsome, and takes pleasure in various exercises, such as riding on horseback, and the chace. He is four-and-thirty years of age, and married Charlotte Amelia, daughter of the Landgrave of Hesse.

There is no language so well adapted for beggars as the Danish. When they speak, one is always apt to think that they are crying.

The kingdoms of Denmark and Norway are subject to the same sovereign. They are bounded by Sweden on the east, England on the west, the Frozen Ocean on the north, and Germany on the south. They are connected with the latter by means of the Duchy of Holstein, which is near the isthmus. This place, at present denominated Jutland, and which is situated between the Ocean and the Baltic Sea, was known to the ancients by the name of Cimbric Chersonesus.

Denmark is a rich and fruitful country, containing a number of islands, the most respectable of which are, Zealand, Falster, Langeland, Laland, and Funen, the latter of which is famous for that last victory which saved the kingdom from total destruction, when the Danes, supported by the Dutch, put all the power of Gustavus Charles at defiance in this island, while he had besieged Copenhagen two years. The king of Denmark is still master of Iceland, which is supposed to be the *Ultima Thule* of the ancients. This island, although it is covered with snow, nevertheless contains burning mountains, whence issue fire and flames, to which the Iceland poets compare the breasts of their mistresses. It also contains smoking lakes, which turn every thing thrown in them to stone, and many other wonders, which render this island famous. Norway extends along the sea shore the whole way to the house of Wardhuis, which is beyond the North Cape, in approaching from the side of the White Sea, upon which Archangel, a sea-port of Muscovy, is situated. This extent of territory was ceded by the treaty of peace concluded betwixt Frederic the Third and Gustavus Charles, late kings of Sweden and Denmark. Greenland belongs to Denmark also; but it is only habitable three months in the year, which are employed in the whale-fishery.

Sweden has been several times joined to these two kingdoms, by alliances entered into between the princes or princesses of the two countries. But Sweden was totally separated from them by Gustavus the First, head of the family of Vasa, who caused himself to be crowned king of that kingdom in the year 1528, and introduced the Lutheran religion at the same time that Christian the Third established it in Denmark. The latter had always been an elective monarchy, as well as Sweden; but Frederic the Third, after having been engaged in several wars with his neighbours, and having saved the state by his vigilance and courage, procured the government to be declared successive and hereditary.

Frederic, third of the name, son of Christian the Fourth, who reigned more than sixty years, and of Anne Catharine, sister of John Sigismond, elector of Brandenburg, was father of the present king Christian the Fifth. He was archbishop of Bremen, before he succeeded to the kingdom, in consequence of the death of his father, and that of his elder brother, who was a year older; and he married, in the year 1643, Sophia Amelia, daughter of George duke of Brunswick and Luneburg, and Anne Eleonora, daughter of Louis, Landgrave of Hesse, chief of the house of Darmstadt. The last reunion of these kingdoms happened in 1397, by the marriage of Haquin, son of Magnus the Fifth, king of Sweden and Inselburg, and heir to Norway, with Margaret, eldest daughter of Waldemar the Fourth, king of Denmark.

The last separation, as I have already mentioned, took place in the year 1528, in consequence of the tyrannical conduct of Christian the Second to the Swedes. He obliged the inhabitants of Stockholm to give him hostages; and even after he had received them continued his cruelties. Gustavus Vasa, one of the hostages, escaped in Sweden, put himself at the head of the oppressed Swedes, who elected him king, and threw off the Danish yoke.

We learned in Denmark the nature of a Virschat. The ambassador took the trouble to give us the information himself. He told us, that this amusement

generally happened in the winter season, during which time the king, wishing to amuse himself, orders a Virschat throughout the whole court, and forms one of the party.

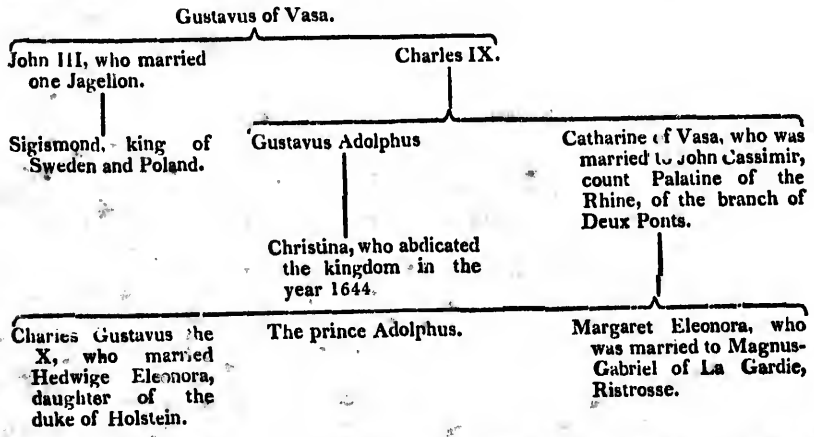
The whole court appears in different trades, with dresses appropriate to the business which they profess, and which has fallen to their lot. The king of Denmark himself appeared at the last, in the character of a coalman; and we were told that nothing can be more entertaining than this kind of masquerade. It is not practised in Denmark only, but is also prevalent in Sweden, and throughout all Germany.

It is worthy of observation, that justice is extremely well distributed in Denmark; and that every year a chamber is held, for the purpose of determining appeals from all the courts of the kingdom, which continues to sit till all the business is terminated.

The king of Denmark's guard consists of infantry and cavalry, dressed in blue turned up with red, and a large cloak of the same colour. He has always forty thousand men in arms, who are paid by the provinces, both in peace and war; and those which are the most wealthy furnish two regiments, one of infantry, and the other of cavalry.

JOURNEY TO SWEDEN.

GENEALOGY OF THE KINGS OF SWEDEN, FROM THE DAYS OF GUSTAVUS THE FIRST.



Charles XI, the present monarch, married Ulrica Eleonora, sister of the king of Denmark, by whom he had a daughter, his first child, in July, 1681.

That country at present denominated Sweden was anciently called Scandia, or Scandinavia, and is little else, if we may say so, than an island, which stretches betwixt the Ocean, the Baltic Sea, and the Gulf of Bothnia.

This province is not extremely fertile throughout. Lapland is sterility itself; and this people, whom I have had the curiosity to visit at the end of the world, are equally destitute of bodily and mental food, having neither corporeal nor spiritual nourishment.

But Gothland and Ostrogothia are so fertile, in some places, that they may be compared to France; and the soil is so rich, that it rears in the space of three months the same commodities, which it takes nine months, in other places, to produce. There are other places, where nature must be forced in order to produce nourishment sufficient for the inhabitants, Schonen, Schanmoland, Angermania, and Finland; and it is here, where nature, refusing fertility to the plains, grants in its stead abundance to the forests, which in winter are burnt by the inhabitants, for the purpose of sowing in their ashes grain in spring, which arrives at greater perfection, and in a shorter time, than any where else.

The Swedes are naturally a brave people; and without mentioning the Goths and Vandals, who, scaling the Alps and the Pyrennees, conquered Italy and Spain, let us for a moment attend to Gustavus Adolphus, the chief of conquerors, who was followed by very few Swedes, and who victoriously overran the whole of Germany, like lightning, making every prince sensible of the force of his arms. Let us consider a Charles Gustavus, the last king of this country, who reduced the Danes, his most formidable enemies, to such a degree, that they were obliged to retire within the walls of their capital, which was the only place in the kingdom remaining in their possession, where he besieged them two years, and who, after many engagements, died of a fever at Gottenburg, aged thirty-seven years, on the twelfth day of February, 1660.

This prince, who was constantly performing wonders, forced Heaven itself to aid and assist him, and to perform miracles in his favour. It hardened the waters of the Belt, for the purpose of affording him an opportunity of performing a heroic action. Charles the Tenth led all his troops over a frozen sea two leagues in width, with all his cannon, and encamped there, where he remained several days, with an intrepidity of resolution which surprised every body, but which was natural to him. If this prince was a great warrior, he was equally an excellent politician; and he displayed it clearly during the reign of queen Christina; for, while she amused herself with consulting men of letters, whom she invited from all quarters, but who taught her not the art of reigning, he embraced the opportunity of gaining the affections of all the senators, who were disgusted with the administration of the queen, and who obliged her to resign the government in his favour.

Was it not the great Gustavus Adolphus who led the way to this worthy successor? and who, after having led a life wholly warlike and heroic, ended his days in the field of victory, and in the midst of his troops, in consequence of a musket shot, which deprived Europe of its greatest conqueror. Queen Christina was a worthy descendant of this great prince. This princess had a soul truly royal, and exhausted all the praises of ingenious men. She might have reigned longer, if she had been more mistress of herself; and the jealousy which she excited amongst the senators, who beheld with impatience the greatest favours lavished on Ritrosse, by whom she had children, obliged her to resign the crown. She changed her religion at the instigation of the Spanish ambassador, who promised her, that if she became a Catholic, she should be married to the king his master. She remained at Rome almost all her life, after she abdicated the throne, and subsisted on ten thousand crowns, which the Pope gave her annually as a pension, till the king of France put her in possession of all her property. She kept in her own hand the fertile islands of Aland and Gothland, situated in the Baltic Sea, but she exchanged them, a short time ago, for the territory of Norcopin in Ostrogothia.

Charles XI, the present king, is son of Charles Gustavus, count Palatine, of the house of Deux Ponts, and of Hedwige Eleonora, youngest daughter of the duke of

Holstein. He is a prince who does not disgrace the dignity of his ancestors: his commanding and royal demeanour displays that he is descended from the race of the illustrious Gustavi. His disposition is completely warlike; and as he has no enemies to war with, his chief employment consists in hunting the bear. This sport is rather followed in winter than summer; and when a peasant has discovered traces of the bear, by means of his footsteps in the snow, he informs the chief huntsman, who conducts the king to the spot. The bear is an intrepid animal: he does not fly at the sight of man, but walks on without swerving from his path. When he is observed to be sufficiently near, it is necessary for the hunter to alight from his horse, and wait till he come pretty close to him; he then gives the animal a severe stroke, which obliges him to raise himself on his hinder legs: this is the time to strike, and it is very dangerous not to wound him mortally; for he now approaches the hunter with fury, and embracing him with his fore feet, generally stifles him; on this account it is necessary to have a pistol, for the purpose of shooting him, and if this fails, a short spear must be reserved for dispatching him. We saw one at Stockholm, which the king had killed with his own hand, in rescuing his favourite Vaqmester, who was almost destroyed by it. This animal lies in his den three or four months in the year, and during all this time takes no other nourishment than what he procures from sucking his paw. The king has always in his possession three or four little bears, whose teeth and claws are pared every month.

I knew at Copenhagen M. de Martangis, the ambassador, who conferred on me a thousand favours: I was several times entertained by him. He conducted me to the house of Madame countess of Rantzau, whose husband was ambassador in France: I supped there with the beautiful ladies Revinselau and Grabe, the latter of whom may justly be considered a perfect beauty. I also met there Madame de Ratelau and M. du Boineau, a native of Rochelle, one of the captains of the royal navy, who quitted the service on account of his religion.

I left Copenhagen, and set out for Stockholm, on the first day of July. We saw Fredericksburg, the king's pleasure-residence, which may be denominated the Versailles of Denmark. The chapel is very magnificent, the pulpit and altar, and a number of other figures, being solid silver; but that which appeared to me the most curious was, an organ made of ivory, the sculpture of which is said to have cost eighty thousand crowns. The oratory of the king, which is behind the chapel, and where he hears the service, is a place in which nothing has been spared for the purpose of rendering it magnificent. We were conducted through all the apartments of the palace, in which we observed nothing remarkable, except the great hall above, the ceiling of which was beautiful; the variety of colours forms a charming scene, the sight of which highly gratifies the beholder.

After leaving Fredericksburg we arrived at Elsineur, where we slept. This is at the strait of the Sound, where the vessels pay toll to the king of Denmark. Swedish vessels pay no toll, on account of which the greater number of ships which pass here take Swedish colours, which are blue with a yellow cross. The passage is guarded by a strong fortress; but I do not believe that it would be very difficult to pass without paying any thing. We slept at the house of the agent of the king of France, who is an Irishman. We crossed next day to Elsimburg with an unfavourable wind. This town defended itself in the late wars for a considerable time against the Danes. During the siege six thousand men were destroyed in eight days: they took it at last; but they gave it back, with all the other places which they had taken, to the crown of Sweden.

On our passage we saw Riga, Engelholm, Holm, and Halmstadt, a fortified town, and famous for the last battle which the king of Sweden fought there. This was the

first engagement in which he was engaged, and the first victory he gained: he was accompanied by M. de Feuquieres, a lieutenant-general in the king's service, and his ambassador in Sweden. It was in this battle that the young king, suffering himself to be hurried on by his courage, and believing himself followed by his regiment of drabans, who are his guards, and with whom he conceived himself invincible, advanced alone to the middle of the enemy's army, seeking everywhere the king of Denmark, and calling for him with a loud voice; but not finding him, he put himself at the head of one of the enemy's regiments, which he found without a leader, giving orders in German, like all the northern nations, and conducted it into the middle of his army, where it was cut in pieces.

From Halmstad we travelled to Jenycopin, whose situation on the borders of the Weser, a lake eight leagues in length, is delightful. We afterwards passed through Grenna, Norcopin, Lincopin, Nycopin, Vellit, and we arrived at Stockholm on Monday, at eleven o'clock at night, after having travelled six days and six nights among rocks and forests of pine and fir, which form the finest prospects in the world. We travelled this journey in a carriage which we purchased for four crowns at Drase, and we observed the peasants' houses, which are constructed in the Moscovite manner, with trees interlaced. The people have something savage in their appearance; the air and the situation of their country inspire them with this disposition.

The Swedish mile contains 6600 toises, and that of France 2600.

Stockholm is a city which the peculiarity of its situation renders delightful: it is situated almost in the middle of the Baltic Sea, at the mouth of the Bothnian Gulf. The approach is exceedingly dangerous, in consequence of the number of rocks which surround it; but from the moment that the vessels once arrive within the port, they are more safe than in any other in the world; they remain there without any anchor, and approach even to the walls of the houses. Stockholm has more trade than any other port in the Baltic Sea; and as this sea is only navigable during six months in the year, nothing has a grander appearance than this port, which is crowded with vessels from the month of April to that of October.

We had no sooner arrived at Stockholm than we waited on M. de Feuquieres, lieutenant general in the king's service, who has been ambassador here for ten years: he received us with all possible respect, and conducted us next day to kiss the king's hand. This prince, twenty-five years of age, is son of Charles, prince Palatine, to whom Christina, daughter of Adolphus, last king of the house of Vasa, resigned the Swedish crown, when she wished to retire from the throne and change her religion.

The king's taste is wholly martial: the warlike exercises and those of the chace are natural to him, and he takes no greater pleasure than in the pursuit of these occupations. We had the honour of conversing with him almost a whole hour, and the pleasure of contemplating him at our ease: he is well proportioned, his gait is majestic, and every thing about him bespeaks the king: he married, about a year ago, ———, daughter of Frederic the Third, and sister of the present king of Denmark. These two royal personages have always had an extraordinary similarity and sympathy, which it is not difficult to perceive: Nature had formed them in every respect for each other.

The prince never met with any one who could give him information respecting the princess, without asking questions of a particular nature, clearly showing that there was more love than curiosity in his disposition; and the princess was always so anxious about the prince, that it was remarked she was less anxious about intelligence of the prince, than about the prince himself.

During our stay at Stockholm great rejoicings were made for the birth of a princess:

we were present at the ceremony of her baptism. There was on the occasion an open table, and the prince, to display his satisfaction, undertook to intoxicate all the court; and, in a more merry manner than ordinary, made himself so. He even incited them by exclaiming, "A gentleman has no courage if he do not follow his king." He spoke the little French which he is possessed of to every body; and I observed that he was the only one at court who spoke it so imperfectly. All the Swedish gentlemen have a particular pride in speaking our language perfectly. Count Stembock, grand marshal of the kingdom, the Ristrosse or viceroy; count de la Gardie, the grand treasurer; Steinte Bielke, the count Cunismar, all speak French as elegantly as if they were Frenchmen themselves. The English envoy performed wonders at this feast, that is to say, he was first drunk. The envoy of Denmark, who had held the princess in the name of the king his master, immediately followed him, almost without reflection. After him the whole company followed in the same state. The ladies were also of the party. The two handsome daughters of the Ristrosse held the two ends of the pall which covered the infant; they distinguished themselves among all the other ladies by their beauty and politeness of manners. We went some days after to visit count de la Gardie at Carsbery: his palace is regular, and being surrounded with rocks, and situated on the borders of the lake, is one of the handsomest in Sweden. The proprietor of this mansion, who is certainly one of the greatest lords in the kingdom, has been four months ago very ill treated by a reduction, as well as a great number of others: he has lost more than eighty thousand crowns by this re-union of property to the royal domain.

The buildings of Stockholm are grand. The house of the nobles, the palace of the Ristrosse, that of the grand treasurer, and a great number of others, are worthy of observation. I should have spoken of the Louvre before all the other buildings; but although it is no doubt the first in the city, in consequence of the personage who inhabits it, we may safely say that it is only on this account, and in consequence of the number of its apartments, that it deserves to be taken notice of: there are some halls which are magnificently enough furnished, but they are not calculated to make a palace: and it is impossible to determine what are their shapes.

We saw, during our residence here, the execution of two servants, who had been present at the assassination of a gentleman, which their masters had committed: they were not the most guilty, but they were the most unfortunate. We admired the intrepidity and fortitude of these men on their way to the scaffold; they did not seem at all affected, and spoke carelessly to all the persons whom they met: one of them was married; his wife supported him on one side, and a clergyman on the other.

At Stockholm we knew M. de Feuquieres, the ambassador; M. de la Piquetiere, a learned and very intelligent man; M. le Vasseur, secretary to the embassy, and son of an advocate in the rue Quincampoix; M. de la Chenets, and father Archange, carmelite and chaplain of M——. We also saw M. Bart, a corsair, who remained at Stockholm for the purpose of recovering payment for some prizes which he had taken from the Danes and Lubeckers, and sold to the king, and which had been declared lawful.

At the hotel kept by Verschal, a Norman, we knew M. M. de Saint Leu, la Neuville, Grandmaison, master of the horse to the count Charles Oxstiern, Coiffard, surgeon, and ————.

The mine called Coperberyt is the most curious in Sweden, and is the source of the whole wealth of the country: although there are several other mines, this has been always held in the highest estimation: no tradition tells the date of its being opened: it is four days' journey distant from Stockholm. One descries this mine long before one

arrives at it, by the smoke which issues from all quarters, and which makes it appear to be rather the shop of Vulcan than the residence of men. We behold on all sides nothing but furnaces, fires, charcoal, sulphur, and cyclops, who tend to complete this infernal picture. But let us descend this abyss, the better to conceive its horrible nature. We were first conducted into a chamber where we changed our dress, and were each furnished with a stick shod with iron, for the purpose of supporting us in the most dangerous places. From hence we entered the mouth of the mine, which is dreadfully long and deep: we were unable to see the people working at the bottom, some of whom were raising stones, while others were throwing earth; some were blowing rocks, by fires prepared for the purpose; and, in fine, every one had his employment. We descended this pit by a number of steps which lead to it; and we now began to be sensible that we had as yet done nothing, and that our fatigue was only the beginning of severer toils. In fact, our guides now lighted their flambeaux of fir, which scarcely pierced the thick darkness of these subterraneous regions, and which only furnished us with light sufficient to distinguish the frightful objects which presented themselves to our view: the smell of the sulphur stifled us: the smoke blinded, and the heat broiled us: and if to these objects we join the noise of the hammers, which resound throughout these caverns, the sight of those spectres, naked as the hand, and black as devils, it must be confessed that nothing can give us a clearer idea of hell than this living picture, painted in the gloomiest and blackest colours which can possibly be imagined.

We descended more than two leagues in the earth, by frightful roads, sometimes upon trembling scales, sometimes on light planks, and always in continual apprehension. We perceived in our descent a number of pumps, and curious machines for raising the water; but we were unable to examine them, on account of the extreme fatigue which we had already experienced; we only perceived a number of unfortunate wretches who wrought the pumps. We went with considerable difficulty to the very bottom; but when it became necessary for us to re-ascend, *superasque evadere ad auras*, it was with inconceivable difficulty that we regained our former height, where we were obliged to throw ourselves upon the ground in order to recover our breath, which the sulphur had deprived us of. We at length arrived at the mouth of the mine, by the assistance of some persons who supported us under the arms. Here we began to breathe with as much joy as a soul escaped from purgatory: and we were beginning to re-acquire our lost vigour, when an affecting sight presented itself to our view: they were bringing up from the mine an unfortunate creature, who had just been crushed by a stone which had fallen on him. These accidents happen daily; and the smallest stones falling from such a dreadful height produce the same effect with the largest. There are always seven or eight hundred men who work in this abyss, who gain sixteen sous a day; and there is almost an equal number of overseers, with an axe in their hands, as a mark of authority. I know not whether one ought more to pity the lot of these wretches, or the blindness of men, who, for the purpose of indulging their luxury and gratifying their avarice, tear the bowels of the earth, confound the elements, and subvert the laws of nature. Boece was perfectly right, when, complaining of the manners of his age, he exclaimed,

> "Heu! primus quis fuit ille
> Auri qui pondera tecti
> Gemmasque latere volentes,
> Pretiose pericula fodit?"

What indeed can be more inhuman, than to expose so many individuals to such imminent danger? Pliny informs us that the Romans, who had more need of men than gold,

would not suffer the mines which had been discovered in Italy to be opened, for the purpose of preserving the lives of the people; and they thought that those wretches who had forfeited their lives could not be more cruelly punished than in suffering them to live, for the purpose of constantly employing them to dig their own graves. In this mine are found native sulphur, blue and green vitriol, and octaedrons, which are stones naturally cut in a pyramidal form on all sides.

From Coperberyt we came to a silver mine at Salberyt, a little village two days' journey distant from Stockholm, and one of the most delightfully situated places in that country. We travelled next day to the mine, which is about a quarter of a mile distant from the village. This mine has three large mouths, at which it is impossible to see the bottom: the half of a tub, supported by a cable, is employed instead of a staircase, for the purpose of descending this abyss: it rises and falls by means of a very curious machine, which is wrought with water. The extent of one's danger may easily be conceived, when one must descend in this manner, having only one foot in this machine, and one's life depending on the strength or weakness of a rope. A satellite, black as a devil, holding in his hand a torch of pitch and rosin, descended with us, and screamed out an air so melancholy, that it seemed to have been made on purpose for this infernal descent. When we were about the middle, we felt great cold, which, joined to the water which fell on us in torrents from all quarters, roused us from the lethargy into which we had fallen in descending to these subterraneous regions. We at length arrived at the bottom of this gulf, after half an hour's journey; there our fears began to disappear; we no more beheld any thing frightful: on the contrary, every thing was brilliant in these nether regions. We descended still farther below ground, upon extremely high scales, for the purpose of visiting a saloon which is in the bosom of this cavern, and which is supported by a number of columns of silver, with which every thing is covered. Four spacious galleries disclose themselves, and the reflection of the lights, which shone on all sides, and dazzled on the vaults of silver, and a clear rivulet which ran at their foot, did not tend so much to give light to the workmen, as to render this abode more magnificent than the palace of Pluto, which the ancients placed in the centre of the earth, where the god of wealth has established all his treasures. Men of all countries are to be seen in these galleries, seeking with care that object, which confers so much pleasure on mankind. Some draw carriages, others roll stones, and others are tearing the rocks asunder. It is a town below a town, and contains houses, taverns, stables and horses; and what is very remarkable, there is a mill in the bottom of this gulf, which raises the water out of the mine. One remounts by means of the same machine, for the purpose of viewing the different operations by which silver is made.

The first stones taken out of the mine are called stuff, which are dried in a furnace, which burns slowly, and which separates the antimony, arsenic, and sulphur, from the stone, the lead, and the silver, which remain together. This first operation is followed by another, in which the dried stones are thrown into troughs, and piled upon each other, for the purpose of being reduced to dust, by means of large hammers wrought by water: this matter is kept in water, which runs constantly upon a large cloth, placed in a sloping position, and by which all the thick and earthy matter is carried off, while the lead and the silver remain at the bottom; it is afterwards removed from hence, and thrown a third time into furnaces, which separate the silver from the lead, which is converted into scum.

The Spaniards of Potosi do not now employ so many different methods for the purpose of purifying silver, and rendering it malleable, since they found out the method of mixing it with quicksilver, which is the determined enemy of all the other metals,

which it destroys, except gold and silver, from which it separates all other bodies, for the purpose of uniting itself to them. Mercury is found in this mine; and this metal, although some refuse it such a name, because it is not malleable, is perhaps one of the most curious productions in nature; for being liquid, and flowing of itself, it is the heaviest of all bodies, and changes into the lightest, by resolving itself into vapour, which, meeting with a hard body, or a cold region, immediately thickens, and resumes its ancient form, without any possibility of ever being destroyed.

The person who conducted us to the mine, and who was overseer of it, showed us a great number of curious stones which he had collected from all parts: he showed us a large piece of that ductile stone, which, so far from being consumed, becomes white in the fire, and which the Romans employed for the purpose of burning the bodies of their dead: he assured us that he had found it in this very mine, and presented each of us with a small piece, which, as a particular favour, he cut off from it.

We departed the same day from this little city to go to Upsal, where we arrived early next morning. This city is the most respectable in Sweden, both on account of its university and its situation. Here all those who devote themselves to the church are obliged to study; but it is the policy of this country to prevent their nobility from taking holy orders, for the purpose of keeping up their numbers of gentlemen, who may be more usefully otherwise employed.

We saw the library, which contains nothing extraordinary, if we except the *Codex Argenteus*, written in Gothic letters of silver by a bishop of the Goths, called Uphila, who lived in Mesia. This book was found in the sack of Prague, and carried off by count Konigsmark, who made a present of it to queen Christina.

The remainder of my observations on Upsal may be seen in the end of my account of my journey to Lapland, because I visited it upon my return.

We also saw at Stockholm an envoy of the khan of the Lower Tartars, or Tartars of Chrimea, or Precopites, who inhabit the ancient Tauric Chersonesus, and the country which is situated betwixt the Borysthenes and the Tanais. This prince confers favours which cost him scarcely any thing; and permission to become his ambassador to Christian princes is one of his choicest favours. I was present when this envoy had an audience; the king was sitting in an arm-chair in the middle of his court: the envoy made a poor speech, without even looking upon the king: he then presented to him five or six letters, folded lengthways, and wrapped up in taffetas: one was from the khan: another from the wife of one of his brothers; and another from the minister. He offered some Tartarian horses, not extremely handsome, but remarkably strong. The king replied, that he would accept of them if they came from his master; and being assured that they did, he kissed the king's hand and put it upon his head. Five or six beggars were in his train; and indeed it was impossible to behold any thing more wretched.

OBSERVATIONS.

The cities of Bremen, Hamburg, and Lubeck, which are imperial, with the Dukes of Mecklenburg, Holstein-de-Sel, Lunebourg, Hanover, and, in general, the whole house of Brunswick, form Lower Saxony, which is called the Circle of Lower Saxony, and has a vote in all the diets of the empire.

Luther is buried at Wittenberg.

It ought to be observed, that the chace of the bear is also conducted in Poland in various manners. As there is nothing so delicate as the paws of a bear, which are served up at the tables of kings, so there is likewise no kind of chace in which gentlemen take greater pleasure. It is dangerous to miss in striking; for the animal, when struck, re-

turns, as has been already mentioned, upon the hunter, and embracing him with his fore-paws, stifles him. We were told by the governor of a Prussian province, that one of his relations a short time before had at the bear-chace his arm broken and his neck twisted, which were the causes of his death. The peasants chace in a different manner; they know the haunts of the animal, and go to attack him with a knife in their hands: when the bear approaches, they push into his throat their left hand wrapped up in linen, and with the right stab him in the belly. Another mode is less dangerous: the bear is very fond of the honey which bees make in the trunks of trees; he ascends, drawn by the odour of his prey, to the summits of the highest trees: the peasants put distilled spirits into the honey, and the bear, finding the taste agreeable, takes so much, that the strength of the spirit intoxicates him and makes him fall: the peasant then finds him without strength, in a recumbent posture, and easily becomes master of him.

The elector of Brandenburg is called ———: he has a son, fifteen years of age, who is denominated *Kurt-Prince:* he professes the Calvinistic religion. Amber is found upon his lands in Ducal Prussia; for Royal Prussia belongs to the king of Poland. It produces to him more than twenty five thousand crowns a month: he farms out the amber-fishery at from sixty to eighty thousand crowns; and there is a horse-guard for the purpose of watching the shore. When the wind is high it is found in greatest abundance. Before it comes out of the sea it is soft, and will take the impression of a seal. There are several pieces on which flies are found. This fishery extends from Dantzic to Memel.

The elk is an animal higher than a horse, and of a whitish colour: it has a branch like the deer, and a foot of the same shape, very long; its under-lip hangs down, and it has a bunch upon the neck like a camel. It defends itself, against the dogs who pursue it, with its fore-feet, with which it strikes them very forcibly.

The son of the elector of Brandenburg married a year ago the daughter of prince Bogeslas de Ratzevil, duke of Stuck, and of Kopil de Bitze, and of Dubniki, of the illustrious family of the Ratzevils, descended from the ancient princes of Lithuania, and for more than three centuries princes of the empire. He was the son of prince Jannalius, of the black branch, whose evil destiny led him to declare himself chief of that party which opposed the king, but who was soon after taken into favour, and of Elisabeth Sophia, daughter of John George, elector of Brandenburg, afterwards married to Julius Henry, duke of Saxe-Lawembourg: he was governor of Ducal Prussia.

This young princess was wholly educated at the court of Brandenburg. The —— paid his addresses to her, and spent a large sum of money on her account; but the elector would not suffer more than eight hundred thousand livres of rent to be sent out of the country. The Poles constantly complain of his conduct, as there is a treaty which stipulates that this princess should marry no other than a native of Poland. He who paid his addresses to her lost his reason in consequence of vexation.

The father of the grand duke of Moscovy was called Frederic Alexander, and the present duke, Alexander Michael, or Michael Federowitz, Michel son of Peter.

The prince of Transylvania is called Apaty, pays eighty thousand crowns of tribute to the Turk, and loves nothing but drinking. Reliqui governs the state, and Telechi is general of the rebels. The capital of Transylvania is Cujuar, or Albejule.

M. Acakias has been resident at the court of this prince for the purpose of treating with the faction of the rebels.

REFLECTIONS.

It is usual with travellers when they make a voyage to conjure up storms, and all the weather they meet with, which is not perfectly calm, is, according to them, a continual

tempest, which in one moment drives their vessels against the clouds, and in the next precipitates them to hell: such are the descriptions of some. For my part, without any exaggeration, I shall mention that the Baltic Sea is famous for the number of shipwrecks which happen in it; and that it can seldom be crossed in the autumn without being exposed to bad weather, for in winter it is not navigable. We were obliged in our passage to take in sail five or six times; and although it is generally made in three or four days, our passage was still longer.

These misfortunes were of some use: and the time during which we remained at anchor was not the portion of my life which has been the most uselessly spent. I went every day to the perpendicular rocks, on which I remained some hours, where the abruptness of the precipices and the view of the sea accorded extremely well with my reveries. It was during these solitary meditations that I entered wholly into myself, and investigated the inmost sentiments of my heart, to place truth in full view, without disguise, such as it really existed. I cast a look back upon the events of my past life, reflected upon my designs which had never been executed, my resolutions broken, and my unsuccessful enterprises: I considered my present mode of life, my wandering voyages, my changes of abode, the diversity of objects, and the constant motion to which I was exposed: I felt myself wholly in that state, where inconstancy is the prevalent inclination; and I came to this conclusion, without being in the smallest degree misled by the suggestions of self-love: I judged impartially of every thing: I reflected that all this conduct was in direct opposition to the real enjoyment of life, which consists solely in repose; and that this desirable tranquility of soul is to be experienced in the pursuit of an agreeable profession, which retains us in a steady position, like a ship held by an anchor in the midst of a tempest. All the vague designs, investigations of the future, chimeras, expectations of fortune, are only phantoms that mislead us, which we take pleasure in forming, and with which our minds entertain themselves. All the obstacles which ambition excites, far from stopping us, ought to make us distrustful of ourselves, and more than ever apprehensive.

You know, sir, as well as I do, that the choice of a profession is one of the most difficult attempts of a man's conduct; and on this account there are numbers who never embrace any, remaining in continual indolence, living not as they would have wished, but as they have begun, whether it arise from the fear of vexatious occurrences, the love of idleness, the hatred of toil, or any other causes.

There are other men who are not retarded in their career by obstacles, and who, giving themselves up to that inconstancy which is natural to them, cannot enjoy repose, even when unemployed: they are continually agitated with new ideas and designs: they change, solely from a desire of change and a natural inconstancy; and that which they have left pleases them always more than that which they enjoy. The whole life of these men is a continual agitation; and if they are sometimes observed to be at rest in their old age, it is not the hatred of change which influences them, but the lassitude of age, rendering them less capable of motion, and preventing them from undertaking any enterprise; like those restless individuals who are unable to sleep, but who, from frequently tossing, find at length that repose which weariness procures them.

I know not which of these situations are the most unhappy, but I am convinced that they are both extremely disagreeable: hence arise those tempests of the soul, and boisterous passions, which make one wish that one neither could nor dared to undertake any thing, when one fears every thing, hopes every thing, and is desirous to seek somewhere else that happiness to which one is a stranger: hence also arise those discontents, that displeasure with ourselves, that impatience at our idleness, those complaints which

we make at having nothing to do; every thing vexes us, company is troublesome, solitude frightful, light is disagreeable, darkness distressing, exercise fatigues, repose produces sleep, the whole world is odious to us, and we become at length insupportable to ourselves. There is nothing which men of this description do not desire; and the high opinion which they entertain of themselves leads them to attempt every thing: ambition makes them suppose all things possible; but they want courage, and irresolution stops them. The success of others, which is always in their view, serves at one time to foment their vague designs, and to excite their ambition; and at other times it exposes them to the gnawings of jealousy: they perceive with impatience the success of others; they wish their debasement, because they cannot rise to the same level; and the destruction of their fortune, because they despair of being able to acquire one equally good.

These men constantly cry up the cruelty of their fate, and complain of the insensibility of the age, and the depravation of human nature: they undertake distant journies, tear themselves from their country, and seek climates warmed by another sun: at one time, they expose themselves to the tempestuous ocean; at another time, disgusted either with its calms or its storms, they return once more to land: to-day, the voluptuousness of Italy enchants them; but no sooner do they arrive in that country, than they sigh again for France, with all its delights. "Let us leave the city," exclaims a man of this description, "where virtue is oppressed, where vice and luxury reign, and of which I am unable to suffer the noise." Immediately after he says, "Let us go back to the city; I languish in solitude; man was not made to live with beasts; and it is a long time since I heard the pleasing bustle which the confusion of a city excites." A journey is no sooner finished, than he undertakes another. In this manner, though always flying from himself, he cannot avoid himself: he carries his inconstancy always about with him; and the source of his uneasiness is in himself, without being conscious of it.

JOURNEY TO LAPLAND.

Travelling has its toils as well as its pleasures; but the fatigue which we experience, far from disgusting us, generally increases our desire of travelling. This passion, irritated by obstacles, engages us insensibly to go farther than we intended; and when we sometimes set out for the purpose of visiting Holland, we find ourselves, we know not how, at the end of the world. This circumstance, sir, has actually happened to me.

I understood at Amsterdam that the court of Denmark was at Oldenburg, which is only three days' journey distant from that place; and if I had not gone thither to see it, I should either have displayed very little curiosity, or considerable contempt for that court. I therefore sat out for Oldenburg; but fortune, who wished to take me still farther, so ordained, that the king had departed two days before my arrival. I was told that I should find him at Altona, which is only at the distance of a musket-shot from Hamburg. I believed myself bound in honour to follow my design, and to travel two or three days' journey farther, in order to enjoy the sight which I wished. Besides, Hamburg is a Hanseatic town, famous for its commerce with the whole world, and respectable on account of its fortifications and its government. I should have found at Altona the Danish court; but I only found a part of what I wished to see: I only saw the queen-mother and prince George, her son, who were going to the waters of Pyrmont. I visited Hamburg, which pleased me highly; and after having gone so far to see the king, I thought that I was bound to visit him in his capital city, where I was sure to find him. I sat out for Copenhagen: the ambassador presented me to the king,

and I had the honour to kiss his hand, and to converse with him some time. My residence in Copenhagen was extremely agreeable; and I found the ladies in it so witty and so handsome, that I should scarcely have been able to leave them, if I had not been assured that those of Sweden were equally agreeable. The anxious desire which I had of seeing the king of Sweden also induced me to visit Stockholm. We had the honour of saluting the king, and of conversing with him for a whole hour. As he knew we were travelling from motives of curiosity, he informed us that Lapland deserved to be seen by the curious, both on account of its situation and its inhabitants, whose mode of living is quite different from that of all Europe; and he gave orders to count Steinbielk, grand treasurer, to give us every necessary recommendation, if we wished to undertake the journey. And pray, sir, who could resist the advice of a king, and a great king too, like that of Sweden? Might not one, with his advice, undertake any thing? And could we be unsuccessful in an attempt which he himself had recommended, and to which he wished success? The advices of kings are commands; and it was on this account, that, after putting all our affairs in order, we set sail for Torno on Wednesday, the twenty-third day of July, 1681, at mid-day, after having paid our respects to M. Steinbielk, grand treasurer, who, obeying the orders which he had received from the king, his master, gave his recommendations to the governors of the provinces through which we were to travel.

We were carried by a south-west wind as far as Vacsol, where the ships are visited. On our passage thither, we were struck with the ridiculous position of Stockholm. It is almost incredible that a situation, such as that of this city, should have been chosen for the purpose of containing the capital of such an extensive kingdom as that of Sweden. It is said that the founders of this city, seeking a spot on which to build it, threw a stick into the sea, with the determination to build the city wherever the stick stopped: the stick consequently stopped in the place where the city now stands, which has nothing frightful about it but its situation; for the buildings are handsome, and the inhabitants polite.

We saw the island of Aland, forty miles distant from Stockholm: it is very fertile, and becomes the retreat of the elks, who go thither from Livonia and Carelia, when the winter allows them to pass over on the ice. This animal, though in some respects like the deer, surpasses it in swiftness and strength, which it employs against the wolves, with whom it frequently engages. The skin of this animal belongs to the king; and the peasants are obliged, under pain of death, to carry it to the governor.

After leaving this island we lost sight of land, and did not again descry it till Friday morning, in the neighbourhood of Hernen, or Hernesante, which is a hundred miles distant from Stockholm, equal to three hundred French leagues; and the wind continuing extremely strong, we soon descried the islands of Ulfen, Schagen, and Goben; so that on Saturday we found that we had left Angermania, and were now as far as Urna, the first city of Lapland, and which takes its name from the river on which it is situated. This city gives its name to the whole province, which is called Urna Lapmark. It is situated in 38° of longitude, and in 65° 11′ of north latitude, distant from Stockholm about one hundred and fifty miles, which amount to about four hundred and fifty French leagues.

We saw the islands of Quercken on Saturday, and the wind continuing always south-west, enabled us to perceive at mid-day the little island of Ratan; and at four o'clock of the evening we found ourselves as far as Cape Burockluben.

After passing this little cape we lost sight of land, and on Sunday morning, the wind having continued southerly during the whole night, we found ourselves as far as Mal-

hurn, a little island eight miles from Torno. Some fishermen belonging to it came off to us in a little bark, the thinnest I have ever seen, the boards of which were sewed together in the Russian manner. They brought us some *strumelin*, and we gave them in exchange biscuit and spirits, with which they returned completely satisfied.

The wind continuing still extremely favourable, we arrived within a league of Torno, where we cast anchor.

It is almost incredible that we could have travelled so far in four days. The distance from Stockholm to Torno is computed to be two hundred Swedish miles by water, which are equal to six hundred French leagues; and we made this voyage with a south and south-south-west wind, so favourable and so strong, that having left Stockholm on Wednesday, at mid-day, we arrived here at the same hour on the Sunday following, without having been obliged to shift our sails during the whole voyage.

Torno is situated at the extremity of the Gulf of Bothnia, in 42° 27′ of longitude, and in 67° of latitude. This is the last town in the world towards the north; the rest, as far as the cape, being only inhabited by Laplanders, savages, who have no fixed residence.

Here the northern nations hold their fairs in winter, when the sea is sufficiently frozen to allow them to travel in sledges. At this time all the people of the north, Russians, Moscovites, Finlanders, and Laplanders from all the three kingdoms, come hither on snow and ice, which is so convenient, that by means of sledges one can travel in one day from Finland to Lapland, and cross the Bothnian Gulf on ice, although it is in the narrowest places thirty or forty Swedish miles in breadth. The trade of this town consists in fish, which are sent to a great distance; and the river Torno abounds so much in pike and salmon, that it could furnish a sufficient quantity to supply all the inhabitants of the Baltic Sea: they salt some for exportation, and smoke others in shallow vessels, which are constructed like baths. Although this town is, strictly speaking, nothing but a confused mass of wooden huts, it pays annually two thousand pieces of brass, which amount to about a thousand livres of our money.

We lodged with the agent for the bark which conveyed us from Stockholm; his wife was not at home; she had gone to attend a fair to the distance of ten or twelve leagues, for the purpose of bartering salt and meal for the skins of rein-deer, minevers, and other animals: for the whole trade of this country is generally carried on in barter, and the Russians and Laplanders scarcely ever do business in any other manner.

We went next day, Monday, to see Johannes Tornæus, a learned man, who had translated into the Lapland language the Psalms of David, and had written an history of the country: he was a country priest, and had died three days before: we found him stretched out in his coffin, with the dress of his profession, which had been made on purpose for him. He was much regretted here, and had travelled through a considerable part of Europe.

His wife was in another part of the room, lying on her bed: she testified the regret which she felt at losing such a husband; and a number of other women, her friends, surrounded the bed, and re-echoed by their groans to the grief of the widow.

But that which consoled them a little, in such great affliction and general sadness, was a great number of large pots of silver, made in the antique manner, and filled, some with French, some with Spanish wines, and some with spirituous liquors, which they took good care never to leave long empty. We tasted of them all; and the widow often interrupted her lamentations to press us to drink: she even ordered tobacco to be brought us, but we declined taking any. We were afterwards conducted to the church of which the deceased was pastor, where we saw nothing worthy of observation; and

when taking leave of the widow, we were again obliged to drink to the memory of the dead, and to do that which is called *libare manibus.*

We afterwards went to the dwelling of a person who was in our company; his mother received us with all possible kindness; and these people, who had never before seen Frenchmen, did not know how to testify the joy which they felt at seeing us in their country.

On Tuesday they brought us a quantity of furs, to sell; and of large coverings furred with skins of white hares, which they offered to dispose of for a crown. They also shewed us dresses of the Lapponians, made of the skins of young rein-deer, with their whole appurtenances, boots, gloves, slippers, sash, and bonnet. We went, the same day, to the chace, around the house; we found numbers of wild woodcocks, and other animals unknown in our country; and we were astonished, that the inhabitants whom we met with were no less anxious to avoid us than the game.

On Wednesday we received a visit from the magistrate and burgo-master, who offered us their services in every thing which was in their power. After dinner they came to conduct us to their barks, and brought us to the priest of the town, who is son-in-law of the deceased Tornæus.

We now saw, for the first time, a Lapland sledge, and admired its structure. This machine, which they call Pulea, is made like a small ship-boat, raised in front, for the purpose of more easily keeping off the snow. The prow consists solely of a single plank, and the body is composed of several pieces of wood, sewed together with a large thread of a rein-deer, without a single nail; this wood is joined to another piece in front, which is very strong, and which extends over the whole length above, and, by going beyond the rest of the structure, serves the same purpose with the keel of a ship. It is upon this piece of wood that the sledge runs; and as it is only about four fingers breadth wide, it rolls constantly from side to side; the traveller places himself in the inside, as in a coffin, where the half of his body is covered; there he is tied, and rendered immoveable, with the exception of his hands, one of which is employed in holding the reins, and the other supports him, when in danger of falling. He is obliged carefully to balance himself; on which account, those who are unaccustomed to this mode of travelling are often in danger of their lives, and chiefly when the sledge descends the steepest rocks, over which it flies with such horrible swiftness, that it is impossible to conceive the rapidity of the motion, without having experienced it. We supped this evening in public with the burgo-master; and the whole inhabitants came in crowds to see us eat. We postponed our departure till the next day, and we took an interpreter.

On Thursday, the last of July, we left Torno in a little Finland boat, made for the purpose of performing voyages here; it is about twelve feet long, and three broad. It is impossible to see any thing better or more lightly built than this boat; and to such a degree is this carried, that two or three men can easily bear it, when they are obliged to pass the cataracts of the river, which are so impetuous, as to roll down stones of an immense size. We were obliged to walk on foot almost all the rest of the day, on account of the torrents which fell from the mountains, and of a boisterous wind, which forced the water into the boat in such quantities, that if it had not been immediately bailed out, the boat would soon have been filled. We went along the banks of the river, constantly hunting, and killed some game; we were astonished at the number of ducks, geese, and water-fowl, and several other birds, which we met with at every step. We did not to-day go so far as we had intended, in consequence of a violent rain which took place, and obliged us to pass the night at a peasant's house, at the distance of a league and a half from Torno.

We travelled the whole of Friday without stopping, and were from four o'clock of the morning till night in going three miles; if, indeed, it may be called night, where the sun is always in sight, and where no distinction can be made betwixt to-day and to-morrow.

We went more than half of the way on foot, in consequence of the dreadful torrents which it was necessary to pass. We were even obliged to carry our boat in some places; and we had the pleasure of seeing, at the same time, two little boats descending in the midst of the cataracts. The swiftest and the lightest bird could not fly with such impetuosity; the sight cannot even follow the course of these boats, which hide themselves from view, and at one time dive into the waves, where they seem buried, and at another time rise to an astonishing height. During this rapid course, the pilot is standing, and employs all his skill to avoid stones of an extraordinary size, and to pass through the middle of rocks, in a space no larger than the breadth of the boats, which would be driven into a thousand pieces, if they touched them in the slightest degree.

We killed to-day, in the wood, two young pheasants, three ducks, and two teal, without going out of our way, during which we were very much incommoded by gnats, which are the curse of this country, and which nearly drove us to despair. The Laplanders have no other method of defending themselves against these cursed creatures, than by filling the places of their residence with smoke; and we observed, on the road, that to preserve their cattle from these troublesome insects they light a large fire, in the place where their cows (which are all wholly white) graze, amidst the smoke of which they place themselves, and thus chase away the gnats, which are unable to remain.

We pursued the same method, and smoked ourselves, as soon as we arrived at the house of a German, who has resided thirty years in the country, and receives the tribute of the Laplanders for the king of Sweden. He told us, that this people were obliged to be in a certain place, appointed for them in the preceding year, to bring the necessary tribute; and that they generally preferred the winter season, on account of the convenience which it afforded them in travelling, by means of their rein-deer, upon the ice. The sum which they pay is very small; and it is the policy of the king of Sweden, as he is desirous that they should remain his tributaries, not to impose on them vexatious burdens, lest this people, destitute of any fixed residence, and to whom the whole of Lapland is a dwelling place, should remove to the territories of other princes, on account of the troublesome exactions to which they were subjected.

Some of these people, however, pay tribute to different countries; and sometimes a Laplander will be tributary to the king of Sweden, that of Denmark, and the grand duke of Moscovy; they will pay to the first, on account of residing within his territories; to the second, for permission to fish on the coast of Norway, which belongs to him; and to the third, that they may be allowed to hunt upon his lands.

Nothing worthy of observation befel us during our journey on Saturday; but we had no sooner arrived at the residence of a peasant, than we were astonished with finding every body bathing. Their baths are made of wood, like all their houses. One observes in the middle of this bath a great mass of stones, thrown together without order, except that they leave a hole in the middle, in which the fire is lighted. These stones, being once heated, communicate warmth to the whole place; but this heat augments to a great degree, when they proceed to throw water upon the flint stones, which, emitting a stifling smoke, cause the air which is breathed in these places to be warm as fire. But what surprised us most in entering this bath was, finding boys and

girls, mothers and sons, brethren and sisters, all promiscuously together, and observing that the naked females remained quite unconcerned at being exposed to the view of strangers. But we were still more surprised, at beholding young girls with a switch striking the naked men and boys. I at first supposed that nature, being exhausted by great sweat, required this assistance, for the purpose of showing that there still remained some signs of life in the bather; but I was soon undeceived, and learnt that this practice was followed, in order that the frequent strokes should open the pores, and assist in producing great perspiration. I afterwards with difficulty conceived how these people, issuing naked from their fiery baths, could run and throw themselves into an extremely cold river, which was within a few paces of the house; and I supposed that they must have very strong constitutions, before they could remain unaffected with those consequences, which such a sudden transition from heat to cold was naturally calculated to produce.

You would never have believed, sir, that the Bothnians, an extremely savage people, should have imitated the Romans in their luxury and their pleasures. But you will be still more astonished, when I inform you, that these same people who have baths among them, like emperors, have no bread to eat. They live upon a little milk, and nourish themselves with the tenderest of the bark, which they find on the tops of the pines. They gather it when the tree gives out its sap, and after exposing it some time to the sun, they bury it in large baskets under ground, over which they kindle a fire, which gives it a very agreeable colour and flavour. Such, sir, throughout the whole year, is the food of men, who eagerly indulge themselves in the luxury of a bath, and who can live without bread.

We were extremely fortunate at the chace on Sunday, and brought home a considerable quantity of game; but we saw nothing worthy of remark, except two long wooden planks of fir, with which the Laplanders run with such remarkable swiftness, that no animal, even the fleetest, can escape them, when the snow is hard enough to support them.

These planks, extremely thick, are two ells long, and half a foot broad; they are made pointed before, and are pierced through at the thickest part, for the purpose of passing a leathern strap, which keeps the feet firm and immoveable. The Laplander who stands upon it holds a stick in his hand, to one end of which a round piece of wood is attached, to prevent it from entering into the snow, and the other end is pointed with a piece of iron. This stick is employed to give him the first motion, to keep him up while running, and to stop him when he chooses; with this he also pierces the beast he is in pursuit of, when he approaches near enough for that purpose.

It is difficult enough to conceive the fleetness of these hunters, who can, by the aid of these instruments, outrun the swiftest animals; but it is impossible to have an adequate idea of their method of descending the steepest precipices, and how they can mount the most craggy mountains. All this, however, they perform, sir, with an address which surpasses imagination, and which is so natural to the people of this country, that the women are no less adroit in the use of these planks than the men. They go to visit their relations, and travel in this manner the longest and most difficult journies.

We met with nothing remarkable on Monday, except the quantity of game which we saw and killed; we made use of no less than twenty pieces this day; it is true, we had purchased five or six ducks from some peasants who had taken them. These people use no other arms in hunting than the bow or the cross-bow. They employ the bow in hunting the larger beasts, as the boar, the wolf, and the wild rein-deer;

and when they wish to take the less considerable animals, they make use of the cross-bow, which differs from ours only in its superior size. So skilful are those people in the use of these arms, that they never fail in striking the object at the greatest distance at which they can behold it. The smallest bird cannot escape them; there are even some who will strike a pin on the head. The arrows which they use are of various kinds; some are pointed with iron, or the bone of a fish; and others are round, shaped like a ball, cut through the middle. They make use of the first kind with the bow, when they go to the greater hunts; and of the latter with the cross-bow, when they attack animals which can be destroyed without giving them any dangerous wounds. They employ these round arrows in attacking the minevers, martins, and ermines, that they may preserve the skins whole; and because it is difficult to avoid leaving a mark on the skin, where the stroke has been given, the most ingenious never fail to hit the spot that they wish, and generally strike the head, which is the least valuable part of the skin.

We arrived on Tuesday at Kones, and stopped there on Wednesday, for the purpose of resting ourselves, and of seeing the iron and copper-works, which are at this place. We admired the method which they follow in working these metals, and of preparing the copper before it is made into Pelottes, which form the money of the country, after it has been stamped with the image of the prince. But that which astonished us most of all was, the conduct of one of the founders, who approached the furnace, and took into his hand a quantity of copper, which the violence of the heat had rendered liquid as water, where he continued to hold it some time. Nothing can be more frightful than these abodes. The torrents which fall from the mountains, the rocks and the woods which surround them, the blackness and the savage air of these founders, all contribute to form a horrible residence. These frightful solitudes, however, are sometimes agreeable, and please one, at times, as much as the most magnificent abodes; and it was in the midst of these rocks that I composed the following verses, a practice to which I had, for some time, been unaccustomed.

Tranquilles et sombres forêts,
Ou le soleil ne luit jamais
Qu'au travers de mille feuillages,
Que vous avez pour moi d'attraits !
Et qu'il est doux, sous vos ombrages,
De pouvoir respirer en paix !

Que j'aime avoir vos chênes verds,
Presque aussi vieux que l'univers,
Qui, malgre la nature émue,
Et ses plus cruels aquilons,
Sont aussi sûrs près de la nue,
Que les epis dans les sillons !

Et vous, impétueux torrents,
Qui, sur le roches murmurants,
Roulez vos eaux avec contrainte,
Que le bruit que vous excitez
Cause de respect et de crainte
A toux ceux que vous arretez !

Quelquefois vos rapides eaux,
Venant arroser les roseaux,
Forment des etangs pacifiques,
Où les plongeons et les canards,
Et tous les oiseaux aquatiques,
Viennent fondre de toutes parts.

D'un côté l'on voit des poissons,
Qui, sans craindre les hameçons,
Quittent leurs demeures profondes ;
Et pour prendre un plaiser noveau,
Las de folâtrer dans les ondes,
S' élancent et sautent sur l'eau.

Tous ces édifices détruits,
Et ces respectables débris,
Qu'on voit sur cette roche obscure,
Sont plus beau que les bâtimens
Où l'or, l'azur, et la peinture,
Forment les moindres ornements.

Le temps y laisse quelques trous,
Pour la demeure des hiboux ;
Et les bêtes d'un cri funeste,
Les oiseaux sacrés à la nuit,
Dans l'horreur de cette retráite,
Trouvent toujours un sûr réduit.

We left these forges on Thursday, to go to others which are distant from them about eighteen Swedish miles, which are equal to nearly fifty French leagues. We kept always in the same road, there being no other in the country, and pursued our journey to the northward, on the banks of the river. We learnt that it had here another name, and that it was called, by the inhabitants, *Wilnama Suanda.* We passed the whole night upon the water, and we arrived next day, being Friday, at the poor hut of a peasant, which, however, we found to be empty. The whole family, consisting of five or six persons, were gone out; some were in the woods, and others had gone to fish the pike. This fish, which they dry, serves them for nourishment during the whole year. They do not take it by means of nets, as others do; but by lighting a fire on the prow of their little bark, they draw the fish to the light of this flame, and harpoon them with a long stick, pointed with iron, in the shape of a trident. They catch great numbers of this fish, of an extraordinary size; so that nature, like a bountiful mother, denying them fertility of soil, furnishes them with the abundance of the waters.

The farther one advances in this country, the misery is the greater; the inhabitants are ignorant of the use of corn; fish-bones, ground with the bark of trees, are used instead of bread, and notwithstanding this horrid diet these people live in perfect health. As they are destitute of physicians, it is not surprising that they should be also ignorant of diseases, and should live to such an advanced age, that they generally survive till they are a hundred years old, and some of them a hundred and fifty.

We made little progress on Saturday, as we stopt the whole day in a small house, which is the last that one meets with in this country. We had various amusements while residing in this cabin. The first was to employ ourselves, every one at different exercises, as soon as we arrived. One cut a dry tree in the neighbouring wood, and drew it with difficulty to the place of its destination; another, after having struck a light with a flint, blew with all his strength to lighten a fire; some were engaged in preparing a lamb, which they were going to kill; and others, possessing more foresight, left these petty employments, and went to procure from a neighbouring pond, which was full of fish, something for to-morrow. This pleasure was followed by another; for no sooner were we seated at table, than we agreed, on account of our pressing necessities, to order a general hunt. Every body made preparations for this purpose; and having taken two little barks and two peasants with us, we abandoned ourselves on the river to

our good fortune. We hunted in the strangest and most delightful manner imaginable. No one has ever heard that people went a hunting with sticks in France; but such is the practice here, for so abundant is the game, that they make use of rods, and even sticks, to kill them. The birds which we caught in greatest numbers were divers; and we admired the address with which they were taken. The peasants followed them wherever they went; and when they perceived them swimming below water, they threw their stick, and struck them in the head at the bottom of the water with such address, that it is difficult to conceive the promptitude with which they performed this action. For our parts, who were not made for this mode of hunting, and whose eyes were not fine enough for piercing to the bottom of the river, we struck at random in the same places where we saw they struck, without any other weapons than sticks; and so much execution did we make, that in less than two hours we procured more than twenty or twenty-five pieces of game. We returned to our little dwelling, much pleased with having seen this hunt, and still more with bringing something along with us for our support. Good fortune, like bad, seldom comes alone; and some peasants, having heard of our arrival, which had been rumoured over the country to a great distance, partly from curiosity to see us, and partly to receive some of our money, brought us a sheep, which we purchased for five or six sous; and which increased our stock of provisions to such a degree, that we believed ourselves well enough furnished to undertake a journey of three days length, during which time we should be unable to meet with any other house. We set out early on Sunday morning, that is, at ten o'clock; for the necessity which we were under of taking rest prevented us from being ever on the road before this hour.

We were surprised at meeting with so many swallows in this northern latitude, and having asked the country people who conducted us, what became of them in winter, and whether they migrated to warm regions, they assured us, that they formed platoons, and buried themselves in the slime which is at the bottom of the lakes; and that they await in this place the return of the sun to his former vigour, when he pierces to the bottom of these marshes, and gives them again that life, which the cold had deprived them of. I was told the same thing by the ambassador at Copenhagen, and by several persons at Stockholm; but I could never believe that these animals could live more than six months buried in the earth, without any sustenance. However, such is the fact; and the truth of it has been confirmed to me by so many people, that I can no longer have any doubt on the subject.

We lodged to-day at Coctuanda, where Lapland commences; and next day, being Monday, we travelled four miles, and encamped on the bank of the river, where we were obliged to sleep in the open air, and where we made smoking fires, to preserve us from the importunity of the gnats. We made a large round intrenchment, formed of a number of tall dry trees, and of smaller ones for the purpose of lighting them; we placed ourselves in the middle, and made the best fire that I have ever seen. The wood which we burned would certainly have been sufficient to load one of those large boats which come to Paris with wood; and a small quantity more would have been sufficient to set the whole forest on fire. We remained in the midst of these fires the whole night, and we set out next morning, being Tuesday, for the purpose of visiting the copper-mines, which were only two leagues distant. We travelled towards the west, on the border of a little river, called Longasiochi, which formed here and there the most beautiful farms that I have ever seen: and after having been often obliged to carry our boat, for want of water, we arrived at Swapavara, or Suppawahara, where

the copper-mines are situated. This place is about a league distant from the river, and we were obliged to travel the whole way on foot.

We were extremely glad to hear, upon our arrival, that there was a Frenchman here. You see, sir, that there is no place, however retired, where Frenchmen are not to be found. He has wrought in these mines nearly thirty years, and he had really more the appearance of a savage than a man; but he was of considerable service to us, although he had almost wholly forgot his mother tongue. He assured us, that since he had first resided here, far from having seen any Frenchmen, no stranger had arrived, who was born nearer France than an Italian, who passed by this place fourteen years ago, and of whom he had never afterwards heard. We were much pleased with this man's recovering in some measure his native language, and we learned from him many things, which we could with difficulty have been informed of by any other than a Frenchman.

These mines of Swapavara are thirty miles distant from Torno, and fifteen from Konges (a Swedish mile is always equal to three French leagues.) They were opened about seven-and-twenty years ago by a Laplander, called ————, to whom a small rent of four crowns and two barrels of meal is paid: he is exempt from every tax. These mines were formerly better wrought than they are now; formerly they had constantly a hundred men working here, but at present one only sees ten or twelve. The copper found here is, however, the best in Sweden; but so deserted and so frightful is the country, that there are very few persons who can remain in it. Nobody but the Laplanders can remain here, and they reside in the neighbourhood of the mines only during the winter, as in summer they are obliged to leave the country, on account of the heat and the gnats, which the Swedes call *alcaneras*, and which are worse, a thousand times, than all the plagues of Egypt. They retire to the mountains in the neighbourhood of the western sea, for the purpose of fishing more conveniently, and finding more easily nourishment for their rein-deer, who live upon a little white and tender moss, which grows in summer on the Sellicean mountains, which separate Norway from Lapland, in the most northern regions.

We went next day, Wednesday, to view the mines, which were full half a league distant from our cabin. We admired the works, and the excavated abyss, which penetrated even to the centre of the earth, for the purpose of seeking, almost in hell itself, materials for the gratification of luxury and vanity. The greatest number of these pits were full of ice, and some of them were clothed from head to foot with a coat of ice so thick, that even the largest stones which we amused ourselves with throwing at them, far from making any breach, did not leave the smallest mark of the place were they had been struck; and when they fell to the bottom, we saw them roll and rebound, without making the slightest impression on the ice. And we were at this period in the hottest of the dog-days; but what is here called a violent summer would be reckoned in France a very severe winter.

The rock does not furnish the metal in every part, but it is found in veins; and when once one is discovered, it is followed with as much care as it was formerly sought after. For this purpose, fire is either employed to soften the rock, or powder to blow it to pieces; the latter mode is by far the most troublesome, but it is beyond measure more useful. We took stones of all colours, yellow, blue, green, and violet; but the last appeared to us by far the best, and the fullest of metal.

We made a trial of several pieces of loadstone which we found upon the rock; but they had lost almost all their power, by the fires which had been made above or below,

which prevented us from taking any away with us, as we thought it better to wait till our return, when we would procure it from the iron-mine. After having investigated all the machines and pumps employed for raising the water, we contemplated at our leisure all the mountains covered with snow that surrounded us. It is upon these rocks that the Laplanders live during winter; and this country has been in their possession since the division of Lapland, which took place in the reign of Gustavus Adolphus, father of queen Christina. These lands and mountains belong to them exclusively; and to mark their property, they have their names written upon some stones, or cut out in some parts of the mountain which they have had in their possession, or which they have inhabited. Such are the rocks of Lupawara, Kerquerol, Kilavara, Lung, Dondere, or rock of Thunder, which have furnished names to the families of Laplanders which dwell upon them, and which are only distinguished in this country by the surnames that these rocks furnish them with. These mountains are sometimes seven or eight leagues in length; and although they remain always upon the same rock, they do not hesitate often to shift their places, when necessity leads them to do so, and when their rein-deer have consumed all the moss which was near their habitations. Although some Laplanders have, during the winter, certain fixed places of residence, there are many more who constantly wander, and whose habitations cannot be discovered; they are sometimes in the woods, sometimes on the lakes, just as they have need of hunting or fishing, and they are never to be seen, except when they attend the fairs in winter, for the purpose of bartering skins for some other article which they stand in need of, and for carrying the tribute which they pay to the king of Sweden, but from which they might easily exempt themselves, if they did not wish to attend these fairs. But the need which they have of iron, steel, cordage, and knives, and other articles of this nature, oblige them to attend these fairs, at which they receive the commodities they are in want of. The tribute which they pay is also extremely small. The richest among them, when they have a thousand or twelve hundred rein-deer, which is the case with some, pay generally only two or three crowns at the most.

After being amply informed on all these topics, we began to return to our hut, and saw on the road those forges where the copper is first founded. Here the grossest alloy is separated, and when it has been long enough in the foundery to have all its impurities thrown out, before taking out the copper at the bottom, they lift up several sheets, which they call rosettes, in which there is only one half of copper, and which are afterwards placed in the furnace, to remove the quantity of dross which still remains. This is the first shape which is given to it here; but at Konges it is passed three times through the fire, that it may be thoroughly purified, and rendered fit to take that form under the hammer which is wished to be given to it.

On Thursday a priest of the Laplanders arrived, with four of that people, for the purpose of attending next day one of the days of religious exercise established throughout all Sweden, to thank God for the victories gained by them on that day.

These were the first Laplanders we had seen, and the sight of them gave us much satisfaction. They came to barter fish for tobacco. We regarded them attentively from head to foot; they are made quite differently from other men. The tallest of them is not more than three cubits high; and I know not any figure more truly laughable. They have large heads, broad and flat faces, level noses, small eyes, large mouths, and thick beards, descending to their stomach. All their limbs are proportioned to their littleness of body; their legs are thin, their arms long, and the whole of this little machine seems to move on springs. Their winter dress consists of the skin of a rein-deer, made like a sack, descending to the knees, and tied round the thighs with a sash

of leather, adorned with small plates of silver; the shoes, gloves, and boots of the same stuff: and this has led several historians to relate, that there were men in the northern regions habited like beasts, and who wore no other covering than that which nature had given them. They have always a purse made of the entrails of the rein-deer, which hangs upon their breast, and in which they keep a spoon. They change this dress in summer, and take a lighter, which is generally formed of the skins of birds, whom they flay for the purpose of defending themselves against the gnats. They have always above this a sack of coarse or whitish gray cloth, with which they cover themselves; for they are quite ignorant of the use of linen.

They cover the head with a cap, which is generally made of the skin of a bird, large as a duck, which they call *loom*, signifying in their language *lame*, because this bird cannot walk; they place it on their heads in such a manner, that the bird's head falls over their brow, and its wings cover their ears.

Such, sir, is the description of this little animal, called a Laplander; and it may be said, that, after the monkey, he approaches the nearest to man. We interrogated them on several subjects on which we wished for information, and, in particular, we asked them where we could find their comrades. These people gave us every information. They told us that the Laplanders began to descend from the mountains situated near the Frozen Ocean, from whence the heat and the flies had driven them, and spread themselves towards the lake Tornotracs, where the river Torno takes its rise, for the purpose of fishing a short time, till about Saint Bartholomew's day, by which time they arrive at the mountains of Swapavara, Kilavan, and others, where the cold begins to be felt, and where they intend to pass the winter. They assured us, that we should be certain of meeting with some of the richest of the Laplanders there, and that, during the seven or eight days which it would take us to travel thither, they would arrive in those places. They added, that, for their parts, they had remained the whole summer in the neighbourhood of the mine and the lakes around it, having found sufficient nourishment for fifteen or twenty rein-deer, which every one was in possession of, and being too poor to undertake a journey of fifteen days, for which provisions must be procured, which they had not in their power to do, in consequence of their having been unable to live away from the ponds, which furnished them daily with their subsistence.

On Friday, the fifteenth day of August, it was extremely cold, and snow fell on the neighbouring mountains. We had a long conversation with the priest, when he had finished the two sermons which he delivered this day, the one of which was in the Finnish, the other in the Lapponian language. He, fortunately for us, spoke pretty good Latin, and we interrogated him on every subject which he could be best acquainted with, such as baptism, marriage, and funerals. He told us, that, with respect to the first, the Laplanders were Christians, and baptised; but the majority were so only in form, and they retained so much of their old superstition, that it might be said of them, they had only the name of Christians, and they were still Pagans in their hearts.

The Laplanders carry their children to the priest, for baptism, a short time after they are born; if in winter, they carry them in their sledges, and if in summer, they place them upon the rein-deer, in their cradles, filled with moss, which are made of the bark of the birch-tree, and in a very peculiar manner. On this occasion they generally make a present to the priest, a pair of gloves bordered in certain places with feathers of the loom, which are violet streaked with white, and of a very beautiful colour. As soon as the child is baptised, the father makes it a present of a female rein-deer,

and whatever this rein-deer, which they call *Pannikeis*, produces, in milk, cheese, or any thing else, belongs to the infant, if a daughter, and forms her portion when she is married. There are some also who make a present to their children of a deer when they perceive the first tooth, and all the deer which are produced from this one are distinguished by a particular mark. They change the name which the child has received in baptism when they are unhappy; and on the first day of their marriage they lie together in the same hut, and caress their wives in the presence of every one.

Respecting marriage, he told us that the Laplanders married their daughters late, though they had several offers, when it was known in the country that they had a number of deer, which had been produced from those which their father had given them when they were baptised, and when they had their first teeth; for here this is all that they carry with them: and the son-in-law, far from receiving any thing from his father-in-law, is obliged to purchase the daughter by presents. They generally begin, like the birds, to make love in April.

When the lover has seen some daughter whom he wishes to marry, he must take care to be furnished with a quantity of spirituous liquor when he visits the father, or the nearest relation, to make his request: this is the only way of making love in this country; and a marriage is never concluded, until several bottles of spirits have been drank, and a considerable quantity of tobacco smoked. The more amorous a lover is, the greater quantity of spirits does he carry; and it is impossible to take a more effectual method of displaying the strength of his passion. They give a particular name to the spirituous liquor which the lover carries to the agreement, and call it the happy arrival of wine, or *soubbouvin, the lover's wine.* It is a custom among the Laplanders to affiance their children long before they are married; they do so with the intention of making the lover continue his presents; and if he wishes to succeed in his enterprise, he must not fail to continue sprinkling his love with such a delightful beverage. At length, after having a year or two performed all the necessary ceremonies, the marriage is sometimes concluded.

Formerly the Laplanders had a mode of marriage quite peculiar, whilst they continued buried in the darkness of paganism, which is still observed by some of them. They did not carry the parties before the priest, but the parents married them at home, without any other ceremony than that of striking some sparks of fire by means of a flint: they believed that there was no figure more mysterious and better fitted than this to represent the nature of marriage; for as the stone contains within itself the sparks of fire, which do not appear, except when it approaches iron, so, say they, there remains a principle of life unseen in both sexes, which only can be perceived when they are united.

I believe, sir, that you will not think this very bad reasoning in Laplanders; and there are many men, acute enough, who would feel considerable difficulty in giving so apposite a comparison. But I know not whether you will consider the following reasoning to be equally excellent.

I have already mentioned, that when a daughter is known in the country to have a number of rein-deer, she does not want suitors; but I did not tell you, sir, that this property is all that they expect in a wife, without giving themselves any trouble whether she is handsome or not; whether she has wit, or is destitute of it; or even whether she be a maid, or whether another has previously received any marks of her love. But what you will admire still more, and what at first surprised me, is, that these people, far from making a monster of this virginity, believe those girls who have lost it ought to be the more anxiously sought after; and that poor as they are, which often happens, they

frequently prefer them to the rich, who are still maids, or at least who would be considered such. But it is necessary to make this distinction, sir, that these girls, of whom I am speaking, must have granted their favours to those strangers who arrive here in winter, for the purpose of trade, and not to Laplanders. From hence they infer, that because a man, whom they believe to be richer and possessed of a better taste than themselves, has been anxious to give marks of his love for a girl of their country, she must therefore be possessed of some secret merit, of which, though they are at present ignorant, they will in time become sensible. So keen are they for these kinds of morsels, that when they come sometimes during the winter to the city of Torno, and find a girl with child, not only do they forget their interests, in being willing to take her without property, but, even after she has laid in, they pay for her to her parents as much as they can afford.

I know many persons, sir, who would be charitable enough to make the fortunes in this manner of a number of poor girls, and who would not ask any thing better than to procure them, without being put to much trouble, advantageous offers. If this fashion were to be adopted in France, one would not see so many girls remain so long unmarried: the fathers, whose purses are tied with a triple knot, would not be so much tormented, and the girls themselves would always have in their power a method, by which they could escape from the captivity in which they are held. But I do not believe, sir, that although the fathers would do all in their power, it would be very easy to introduce it.

As the Laplanders are naturally ignorant of almost all kinds of diseases, they have not been desirous of making some to themselves, like us. Jealousy and the fear of cuckoldom give them no uneasiness: these evils, which torment so many among us, are to them unknown; and I do not believe there is any word in their language to express the idea of a cuckold: and one may say jocularly with the Spaniard, in speaking of past ages and the present,

Passò lo de oro,
Passò lo de plata,
Passò lo de hierro.
Vive lo de cuerno.

And while these people are bringing back the golden, we are making use to ourselves of horn. In fact, sir, you are now to behold among them that which I believe took place in the days of Saturn, namely, a community of possessions which will astonish you. You have seen that the Laplanders are what are called cuckolds before marriage, and you are now to be convinced that they are no less so after it.

When the marriage is consummated, the husband does not carry away his wife, but remains one year with his father-in-law, at the end of which period he goes to settle himself where he pleases, and carries with him all that belongs to his wife. The presents even which he made to his father-in-law during the courtship are given back, and the parents repay those which have been made them by some rein-deer, according to their ability.

I have shown you, sir, that strangers have a great privilege in this country, which is that of honouring the daughters on their approach: they have another, which is not less considerable, that of partaking with the Laplanders a share of their beds and their wives. When a stranger arrives in their huts, they receive him in the best manner they are able, and think they treat him most kindly if they have a glass of spirits to give him; but after the refreshment, when the stranger they receive is respectable, and they wish to be kind to him, they make their wives and their daughters approach, and they think

themselves highly honoured, if the stranger behave to them in the same manner they do themselves; and as for the wives and daughters, they make no scruple of giving the visitor all that he desires; and they believe that he does them as much honour as their husbands and fathers.

As this mode of behaviour surprised me much, and as I had never an opportunity of experiencing it, I procured the most exact information in my power, and learnt several facts of this nature. I will then tell you what I have been assured is really true.

The Frenchman whom we found at the mines of Swampavara, who was a simple man, and I believe incapable of contriving a story, assured us, that to please a number of Laplanders he had assisted them in their conjugal duty; and to show us how these people had used means to induce him to take this trouble, he told us, that one day, after having drunk some glasses of spirits with a Laplander, he was solicited by this man to lie with his wife, who was then present, with all the family; and that upon refusing, which he did in the best manner he could, the Laplander, not finding his excuses satisfactory, took his wife and the Frenchman, and having thrown them both upon a bed, he went out of the room and locked the door, begging of the Frenchman, by every argument he could think of, to do in his place that which he was accustomed to do himself.

The story which happened to Joannes Tornæus, priest of the Laplanders, of whom I have already spoken, is no less remarkable. It was related to us by the same priest who had been his curate in Lapland, and who had lived under him more than fifteen years. A Laplander, he told us, one of the richest and most considerable in the Lapland of Torno, wished that his bed was honoured by his pastor; he knew no better method of multiplying his cattle, and of drawing down the blessing of Heaven upon all his family: he begged of him several times to do him that honour; but the pastor, from conscience, or some other motive, wished to avoid it, and always represented to him, that this was not the most certain method of rendering the Deity propitious. The Laplander by no means coincided with this mode of reasoning; and one day, when he found the pastor alone, he conjured him, on his knees, and by all that he held sacred among the gods whom he worshipped, not to refuse him the favour that he requested; and adding promises to his intreaties, he presented him with six crowns, which he was willing to give him, if he would debase himself so far as to lie with his wife. The good priest doubted some time whether he could do it conscientiously, and, not wishing to refuse the poor man, he determined that it was better to make him a cuckold, and gain his money, than to drive him to despair.

If this adventure had not been related to us by the same priest, who was at that time his pupil, and who was present, I could never have believed it; but he assured us of the truth of it in so earnest a manner, that, independent of any consideration of the manners of the country, I could not doubt it.

This kindness which the Laplanders display to their women does not limit itself to their pastors; but, agreeable to what has been already mentioned, and what shall afterwards be shown, extends also to strangers of every description.

I will not take any notice, sir, of a girl, whom a magistrate of Lapland, who receives the tribute for the king, had a child by. A Laplander purchased her of him who had dishonoured her, for no other reason than because she had been able to gain the affection of a stranger. Events of this nature are so common in this country, that, even during a short residence among the Laplanders, a person can scarcely fail to be convinced of their reality by his own experience.

They wash their children in a tub three times a day until they are a year old, and afterwards three times a week: they have few children, and it scarcely ever happens

that six are found in a family. As soon as they are born they are washed in snow, till they are deprived of breath, and then they immerse them in a bath of hot water: I believe they do this for the purpose of hardening them to the cold. As soon as the mother is delivered, she drinks a large draught of oil from the whale, and she believes that it is of great use to her. It is easy to know when in the cradle of what sex a child is: if it is a boy, they hang over its head a bow and arrows, or a lance, to teach them, even in the cradle, what ought to be their employment during their lives, and to inform them that it is their duty to render themselves expert in their exercise. Over the cradle of girls they hang the wings of the jopos, which they call rippa, with the feet and the bill, to insinuate to them from their infancy the advantages of neatness and agility. When the women are pregnant, these people strike the tabor, for the purpose of knowing what sex the child will be of: they prefer girls, because they receive presents in marrying them, and they are obliged to purchase their wives.

Diseases, as I have already mentioned, are almost unknown among the Laplanders, and when they are affected with any, nature is strong enough to cure them herself; and without the assistance of physicians they soon recover their health: however, they employ some remedies, such as the root of the moss, which they call jeest, or that which is denominated stony angelica. The sap which oozes from their fir-trees serves them for plaisters, and the cheese of the rein-deer is their divine ointment. They apply these remedies in various manners. They have the gall of the wolf, which they mix with gunpowder, in spirits. When the cold has frozen some part of their bodies, they spread the cheese cut in slices over the part affected, and they are cured by it. The second method of employing the cheese, both for external and internal remedies, is by inserting a red-hot iron into the cheese, which by its heat draws out a kind of oil, with which they rub themselves on the part affected; and this remedy is always followed with a certain and marvellous success: it strengthens the breast, removes the cough, and is good for all contusions; but the usual remedy for the most dangerous diseases is fire: they apply a piece of charcoal perfectly red to the wound, and suffer it to remain as long as they are able, that every thing impure in the sore may be eaten out. This is a custom among the Turks; they have no remedy which they conceive more sovereign.

Those who are fortunate enough in France, and other countries, to arrive at an extreme old age, are obliged to suffer a great deal of inconvenience which it brings along with it; but the Laplanders are totally exempted from them, and they feel no infirmity in this state, except a small diminution of their ordinary vigour: it is even impossible to distinguish the old men from the young; and white heads are very rarely to be seen in this country: they always retain their own hair, which is generally red. But what is still more remarkable, one meets with very few old men who are not blind: their sight, naturally weak, is unable any longer to support either the glare of the snow, with which the earth is almost constantly covered, or the continual smoke issuing from the fire, which is always burning in the middle of their huts; they consequently become blind in their old age.

When a person is sick, they have a custom of playing on a tabor, of which I shall treat afterwards, for the purpose of discovering whether the disease will terminate fatally; and when they suppose themselves certain of unhappy consequences, and that the sick person is drawing near to his end, they gather themselves round his bed; and that they may assist the soul of the dying in its passage to the next world, they bring to him as much spirits as they can, and drink as long as it lasts, to console themselves for the loss of their friend, and to excite them to weep. No sooner is he dead, than they abandon the house, and even demolish it, lest that which remains of the soul of the de-

ceased, which the ancients called manes, should do them any injury. The coffin consists of a tree hollowed out, or even sometimes of their sledge, into which they put all that the dead person had most valuable, as his bow, his arrows, and his lance, with the intention, that should he one day return to life he may be able to exercise his former profession. Some of them are even such gallant christians, as to confound christianity with their ancient superstitions; for, having heard their priests tell that we should one day arise again from the dead, they put into the coffin of the dead person his hatchet, a flint, and a piece of iron, to strike a fire (Laplanders never travel without these necessaries) that when he arises he may be able to cut down trees, level rocks, and burn all the obstacles that he may meet with in his road to Heaven. You see, sir, that, notwithstanding all their errors, these people move thitherward as much as possible; they wish to arrive at it, either peaceably or by force, so that it may be said, *His per ferrum et ignes ad cœlos grassari constitutum*, and that they expect by iron and fire to enter the kingdom of Heaven.

They do not always inter their dead in cemeteries, but very often in forests and caverns: they sprinkle the place with spirits; all the mourners drink of them; and three days after the funeral they kill the rein-deer, which had borne the dead to the burying-place, and a feast is made of it to all the company present: the bones are not thrown away, but gathered carefully, for the purpose of burying at the side of the deceased. It is at this repast that they drink the paligavin, that is, fortunate liquor, because they drink in honour of a person whom they believe to be happy.

Successions are settled nearly in the same manner as in Sweden: the widow takes the half; and if the deceased has left any property, the boy takes two-thirds of it, and leaves the rest to his sister.

We were very earnestly engaged in this conversation, when we were informed that some Laplanders with their rein-deer were observed approaching on the tops of the mountains: we sallied out to meet them, that we might have the pleasure of seeing their equipage and their march; but we fell in with three or four persons only, who carried on their deer some dried fish for sale at Swapavara. I have long spoken to you, sir, about the rein-deer, without having given you a description of that animal, which I have already so often alluded to. It is but reasonable, therefore, that I should now proceed to gratify your curiosity, as I have at present gratified my own.

Rheen is a Swedish word, by which they have been distinguished, either on account of its neatness or its swiftness; for rhen signifies neat, and renna means to run, in that language. The Romans were totally ignorant of this animal, and the modern Latins call it rangifer. I cannot give you any other reason for this, than that the Swedes formerly called this animal rangi, to which word fera was added, as if they had said, the animal called rangi. Although I do not wish to say that the horns of this animal, which shoot out in the form of large branches, have led them to give it this appellation; for in that case they would rather have called it ramifer than rangifer. Whatever may be in this, sir, one thing is certain, that although this animal is almost like a stag, it nevertheless differs from it in some respects. The rein-deer is larger, but the horns are totally different; they rise to a great height, and become crooked in the middle, forming a kind of circle round the head, which is covered with hair from top to bottom, of the colour of the skin, and is full of blood throughout, so that, if it is hard pressed by the hand, the animal shows by its conduct that it feels pain in that part. But that which this animal has in particular to distinguish it from all others, is the great quantity of horns with which nature has provided them, for their defence against wild beasts. The stag has only two horns, from which sprout a number of sharp points; but the rein-deer has another, in the centre of the forehead, which produces the same appearance with that which has been

painted on the head of the unicorn, besides two others, which branch over the eyes and fall upon the mouth. But all these branches spring from one root, although they take different roads, and assume different figures; which circumstance gives them so much uneasiness, that they can with difficulty graze, which induces them rather to feed upon the buds of trees, which they are able to seize with less difficulty.

The colour of their hair is blacker than that of the stag, particularly when they are young; and at that time they are almost as black as the wild rein-deer, which are always larger, stronger, and blacker, than those which are tamed.

Although their limbs are not so slender as those of the stag, they nevertheless surpass it in swiftness: their feet are much serrated, and almost round; but that which is most remarkable in this animal is, that all its bones, and particularly the joints of the foot, crack, as if one was breaking nuts, and they make a noise so loud, that one can hear this animal at almost as great a distance as one can see it. It is also observable in the rein-deer, that although they have the cloven foot, they do not chew the cud; and that they have no gall, but only a small black mark in the liver, without any bitterness.

And although these animals are naturally savage, the Laplanders have so completely found means to tame them and domesticate them, that there is not an individual in the country who is not possessed of troops of them, like those of sheep: they nevertheless leave great numbers wild in the woods, and it is these whom the Laplanders cruelly hunt, both for their skin, which is much more esteemed than that of the domestic deer, and for their flesh, which is much more savoury. There are even some of these animals half-wild and half-tamed; and the Laplanders allow their female deer in rutting-time to go into the woods, and those which are produced by this connection are called by a particular name: they denominate them *kattiagiar*, and they grow much larger and stronger than the others, and are consequently fitter for the sledge.

Lapland nourishes no other domestic animal than the rein-deer; but in this creature alone as many useful qualities are found, as are to be met with in all those which we possess. They throw away no part of the animal; but make use of the hair, the skin, the flesh, the bones, the marrow, the blood, and the nerves.

The skin serves to protect them from the inclemency of the weather, and in winter they wear it covered with its hair, while in summer they put on another from which it has been removed. The flesh of this animal is full of sap, fat, and extremely nourishing; and the Laplanders never eat any other flesh than that of the rein-deer: its bones are of astonishing use to them, for making their cross-bows and bows, for arming their arrows, for making their spoons, and for adorning every thing that they make. Its tongue and the marrow of its bones are their greatest delicacies; and lovers carry these parts to their mistresses as the most valuable presents, which are usually accompanied with the flesh of the bear and the castor. They frequently drink its blood, but they generally preserve it in its bladder, which they expose to the cold, and allow to become dense and assume a regular form in this state: and when they wish to make soup, they cut out from it as much as they desire, and boil it along with fish. They have no other thread than that which they draw from the nerves of this animal, and which they extract from its cheeks: they employ the finest to sew their clothes with, and the coarsest to join the planks of their barks. But not only does this animal furnish the Laplanders with food and clothing, it also affords them drink: the milk of the rein-deer is the only beverage that they possess; and because it is extremely fat and quite thick, they are obliged to mix it with nearly an equal quantity of water: they only draw a gallon of milk daily from the best rein-deer, which give no milk, except when they have a young one: they make very nutritious cheeses from it; and the poor inhabitants, who cannot afford

to kill a deer for its flesh, live on nothing else than its cheese: these cheeses are fat, and have a very strong smell; but being made and eaten without salt, they are quite tasteless.

The greatest advantage derived from the rein-deer is, their usefulness in travelling, and in carrying burdens. We had so often heard with astonishment of the manner in which the Laplanders employ these animals in travelling, that we wished to gratify our curiosity upon the spot, and to see in what manner the deer are fixed to the sledge: we immediately ordered them to bring us one of these machines, which the Laplanders call pulaha, and which we denominate a sledge, and which I lately described: we made them fix the rein-deer before, at the same distance which our horses generally are, to that piece of wood of which I have already spoken, and which they call jocolaps: it has no other collar than a piece of skin covered with hair, from which a piece descends towards the breast, and passes under the belly between the legs, and is attached to a hold which is in the fore part of the sledge. The Laplander has no other guide than a cord fixed to the root of the animal's horns, which he throws on the back of the animal, sometimes on one side, sometimes on the other, and directs it in the road, by drawing to that side on which he wishes it to turn.

We travelled to-day, for the first time, in these sledges, with inconceivable pleasure; and it is in this carriage that they perform a long journey in a short time: they advance more or less quickly, according to the strength and vigour of the animal. The Laplanders rear them intentionally from a cross breed, which is produced from a wild male and a tame female, as I have already mentioned, and they are far more swift than the others, and more fit for travelling. Zieglerus says that a rein-deer can in one day three times change the horizon, that is, can three times arrive at the most distant mark which can be perceived. This length of road, though very considerable, and not ill expressed, does not furnish us with a sufficient idea of the swiftness of the rein-deer: the Laplanders express it more exactly, when they say that it can travel twenty Swedish miles in a day, or fifty leagues, in only calculating two leagues and a half of French measure to one mile of Swedish. The Swedish mile is six thousand six hundred toises long, and the French league is two thousand six hundred; however, the Swedish mile is generally calculated as equal to three French leagues. This computation is more satisfactory than the other; for as in this country the day may be extended to any length, and as the Laplanders in their calculations do not make any distinction betwixt the natural day of twenty-four hours, and the day in which a traveller is on his journey, it will be more correct, for the purpose of giving a clear idea of the distance which a deer can run in an hour, to state, both from the preceding computation and my own experience, that those which are to be met with in Lapland, *kimi lapmarch*, and which are celebrated for being the swiftest and strongest, can make, when pushed, six French leagues in an hour; but for this purpose the snow must be hard and frozen. It is true the animal cannot continue to travel long at this rate, and that it requires rest after seven or eight hours of toil. Those who wish to go farther do not travel so fast, but continue longer on their way: the animals in this case support the fatigue during twelve or thirteen hours, at the end of which it becomes necessary to allow them rest for a day or two, unless the traveller wish them to die in the sledge.

This distance you see, sir, is very considerable; and if there were posts of the rein-deer established in France, it would not be very difficult to travel from Paris to Lyons in less than twenty-six hours: the diligence would be delightful; but although it appears that this mode of travelling would be very convenient, yet it would undoubtedly be extremely fatiguing: the leaps which it would be necessary to take; the ditches over which it would be necessary to skip; the stones which must be passed over; and

the constant toil which the traveller would be exposed to in preventing himself from falling, and of raising himself up when overturned, would make one desirous of travelling more smoothly, and of running less risk.

Although these animals suffer themselves to be conducted with great docility, there are nevertheless many of them restive and almost untameable: so that when you push them too hard, or wish them to travel farther than they themselves incline, they immediately turn round, and, erecting themselves on their hinder feet, they attack with such fury the driver in the sledge, who can neither defend himself, nor escape from it, on account of his being tied, that they often break his head, and sometimes destroy him, with their fore-feet, in which they have so much strength that they have no other means of defence against the wolves. The Laplanders, to ward off the blows of these animals, have no other remedy than to turn themselves towards the ground, and to cover themselves with their sledges, until the anger of the rein-deer has been somewhat appeased.

They have also another kind of sledge, much finer, and made in a different manner, which they call *racdakeris:* they make use of it to seek after their wood, and to remove their property, when they change their places of abode.

Such, sir, is the manner in which the Laplanders travel in winter, when the snow completely covers the ground, and when the cold has covered it with a slippery crust. In summer they are obliged to travel on foot, for the deer are not strong enough to carry them; and they never yoke them in chariots, which is a practice they are totally ignorant of, on account of the badness of their roads: they however still carry burdens, and the Laplanders take a strong bark of the birch-tree, which they bend into the form of a bow, and place upon its broadest part that which they are to carry, which does not exceed on every side forty pounds weight. In this manner do they carry children in summer to be baptised, and they themselves follow behind.

The most ordinary food of the rein-deer consists of a little white moss, extremely fine, which grows in abundance throughout all Lapland; and when the earth is wholly covered with snow, nature has imparted to these animals an instinct, which enables them to know the place where it is to be found under the snow; and whenever they discover it, they make a large opening in the snow with their fore-feet, which they do with a surprising swiftness; but when the cold has so hardened the snow that it becomes ice itself, the deer then eat a certain moss, like a spider's web, which hangs from the pine-tree, and which the Laplanders call *luat*.

I believe I have already said that the rein-deer have no milk, except when they have a young one, which sucks three months; and soon as the young one dies, they have no more milk. When they wish them to eat, they place before them the pods of the pine-tree; and when they tease and irritate the mother, she strikes them with her horns.

It is said of these animals, that they speak in their ears if they wish them to go on one side or the other: this is completely false. They travel almost constantly with a conductor, who leads six of them; and when any one wishes to travel to any place, if he can find a rein-deer on its return to that place to which he wishes to go, he will not require any guide, as the deer will take him to the place of destination without any guide, and that too although there be no regular road, and the distance be more than forty leagues.

On Saturday we set out to go on foot to the priest's house, which was about five miles distant, and from whence we afterwards determined to travel north-west, and go to Tornotresch, where we were to find the Laplanders whom we were in search of. We were no sooner out of Swapavara than we had supper prepared for us: we killed three or four birds, which are called in this country *siælripa*, or *birds of the mountain*, and which the Greeks denominated *lagopos*, or *hairy-footed:* it is of the size of a hen,

and during summer has the plumage of a pheasant, but more of a brown colour, and is distinguished in certain places by whitish spots; in winter it is quite black. The male imitates, while flying, the noise of a man who laughs extremely loud: it sleeps rarely among trees; and further, I know no game of such an agreeable taste; it has at the same time the delicacy of the pheasant and the tenderness of the partridge. It is found in great plenty on the mountains of this country.

Two miles distant from Swapavara we met with the barque of the Laplanders to whom we had spoken the day before, and who were to conduct us to Tornotresch: they had been fishing the whole night, and brought us very excellent salmon-trout, which are called in this country *œrlax*. From thence, continuing our journey by water, we encamped on a little height. We passed the night in the middle of the wood, which we found very agreeable; for the cold being extremely violent, we were obliged to make such a large fire to protect us from wild beasts, and especially the bears, that we this day set fire to the forest. We forgot to extinguish it on our departure, and it extended with such rapidity, by means of a tempest, that on our return, fifteen days after, we found it still burning in certain parts of the forest, where it had burned with sufficient success: but this did harm to nobody; and incendiaries meet with no punishment in this country.

We travelled only half a mile on Sunday, in consequence of torrents and an impetuous wind, which constantly hindered us; and during the time which we took to travel this length we could not advance four steps, without seeing or hearing extremely large pines fall, which in falling made a dreadful noise, which resounded throughout the whole forest. This tempest, which lasted the whole of both day and night, obliged us to stop, and to pass this night as we had done the last, with equally large fires, which, however, we made with more precaution, that every thing might not be burned on our route: this led our boatmen to say, that four Frenchmen would be sufficient to burn the whole country in eight days.

Next day, Monday, unwilling to be exposed to the north wind without advancing, we failed not, notwithstanding the continuance of the tempest, to proceed on our journey, upon a lake which had the appearance of an agitated sea, so high were the waves; and after five or six hours of exertion we arrived, after travelling three-quarters of a mile, at the church of the Laplanders, where the priest lived.

This church is called Chucasdes, and it is the place where the fair of the Laplanders during winter is held, to which they come, for the purpose of bartering the skins of the rein-deer, of ermines, martins, and minevers, for spirits, tobacco, and *valmar*, which is a kind of coarse cloth, with which they cover themselves, and surround their huts. The merchants of Torno and the neighbouring country do not fail to attend on this occasion, which continues from the Conversion of St. Paul in January to the second day of February. The magistrate and the judge of the Laplanders attend in person; the one, to receive the tribute which they pay to the king of Sweden; and the other, to terminate any differences which may arise among them, and to punish all vicious and abandoned persons, although it seldom happens that any of this description can be found; for they live with each other in great confidence, without ever having heard of thieves, who nevertheless would find no difficulty in prosecuting their projects, as the huts, full of various articles, remain quite open during the whole summer, while they travel to Norway, where they remain three or four months. They leave in the middle of the woods, on the top of a tree which they have cut, all the necessary ammunition, and their being stolen is very rarely heard of.

The priest, as you may well believe, sir, is not absent on this occasion; and it is at

this time that he receives the tenths of the skins of rein-deer, of cheese, of gloves, of shoes, and other articles, according to the ability of those who make them presents.

The Laplanders, who have the most christianity, do not confine themselves to making presents to their pastors, but they also make offerings to the church. We have seen a number of skins of minevers, which hung before the altar, and when they wish to ward off some disease which affects their flocks, or to pray to God for prosperity, they carry skins of the rein-deer to church, and extend them on the path-way which leads to the altar, and over which the priest must necessarily pass; and in this manner they believe that they have drawn down the benediction of Heaven. The priests have a great deal to do at this time; for as the greater part come only at this period, once during the whole year, it becomes necessary to perform as much religious business in eight or fifteen days, as is done in other places throughout the whole year. It is during this time that the majority have their daughters baptised, and that they bury the bodies of those who have died during summer: for when any one dies whilst they are at the western sea, or in some other part of Lapland, as they are unable to carry the body, on account of the badness of the roads, and as they have no opportunity of removing them, they inter them near the spot where they expired, either in some cavern, or below some stones, for the purpose of taking them up again in winter, when the snow allows them an opportunity of conveying them to the church. Others, to prevent the body from putrefying, place them in their coffins under water, which consist, as I have already mentioned, of a tree hollowed out, or of their sledges, and never draw them out again till they intend to carry them to the burying-ground. They also marry at the fair; for as all their friends are present on this occasion, they generally put off the marriage ceremony till this time, for the purpose of rendering it more solemn, and for procuring more amusement.

The goods which the Laplanders bring to these fairs are rein-deer and their skins: they also sell at this time the skins of black, red, and white foxes, and otters, *gulonum*, of martins, of castors, of ermines, of wolves, of minevers, and bears; besides the dresses of the Laplanders, with boots, gloves, shoes, and all sorts of dried fish, and cheese from the rein-deer.

They give these articles in exchange for spirits, coarse cloths, silver, copper, iron, sulphur, needles, knives, and hides, which are brought to them from Muscovy. Their goods bear always the same price: a rein-deer, of middling value, is sold for two crowns; four skins are equal to one deer: a *limber* of minevers, which consists of forty skins, is valued at a crown; the skin of a martin the same sum; that of the bear costs as much; and three white fox skins cost no more. The price of goods is in the same manner limited: half an ell of cloth is valued at a crown; a pint of spirits as much; a pound of tobacco the same price; and when they wish to purchase articles of smaller value, the sale is concluded by means of one, two, or three skins of minevers, according to the value of the commodity.

All these affairs are not concluded with the same frankness as formerly; and as the Laplanders, who conducted themselves with fidelity, saw themselves cheated, the fear of being still deceived puts them so much on their guard, that they rather cheat themselves, than expose themselves to be cheated.

Nothing is a better evidence of the little christianity which the majority of the Laplanders possess, than the reluctance which they display towards an attendance at church, to hear the priest, and to assist in the service. It is necessary for the magistrate to force them to attend, which he does by sending men to their huts, for the purpose of observing whether they are there. Some of them, to be allowed to absent themselves, pay money;

some think that they can avoid attendance on sermon, by stating that they were there last year; and others suppose they have a legitimate excuse in absenting themselves, when they say that they belong to another church, which they have already attended. This clearly shows that they are only Christians by means of force, and that they never give any evidences of their religion, except when forced to do so.

We were employed during the remainder of this day, and all the morning of Tuesday, in cutting on a stone lasting memorials, which should inform posterity, that three Frenchmen had continued to travel till they could go no farther; and that notwithstanding the difficulties which they had encountered, and which had frightened many others; and that they had come to erect a trophy at the end of the world, materials having been rather wanting for their further toil, than courage to endure it. The inscription was the following:

Gallia nos genuit; vidit nos Africa; Gangem
Hausimus, Europamque oculis lustravimus omnem;
Casibus et variis acti terrâque marique,
Hic tandem stetimus, nobis ubi defuit orbis.
De Fercourt, De Corberon, Regnard. 18 *Augusti*, 1681.

"Gaul begot us; Africa has beheld us; we have explored the Ganges, and travelled over all Europe; having been exposed to various accidents, both by sea and land, here at length have we arrived, at the farthest boundary of the world."
De Fercourt, De Corberon, Regnard. 18*th day of August*, 1681.

We cut out these verses upon stone and upon wood; and though the spot on which we were was not the best place to put them, we left those which we had engraven on the wood, and they were placed in the church above the altar. We carried the others with us, to place them at the end of the lake of Tornotresch, from whence the Frozen Ocean can be seen, and where the world terminates.

When the Laplanders who were employed in conducting us, and in showing us the road, had returned from where they had been sent, to purchase some little provisions, consisting of seven or eight cheeses of the rein-deer, and some dried fish, we left the priests at five o'clock in the evening, and stopt, for the purpose of sleeping, at an impetuous torrent, which they call Vaccho, where we arrived an hour after midnight. We had the pleasure, during the whole road, to behold the rising and the setting of sun at the same time. The sun set to-day at eleven o'clock, and rose at two, whilst it remained, during the whole, as clear as at noon-day. But when the days are longest, that is, three weeks before Saint John, and three weeks after, the sun is constantly in sight during this period, without touching, in the lowest parts of his course, the tops of the highest mountains. He is also, during the shortest days in winter, two entire months without being visible; and at Candlemas the people ascend to the tops of the highest mountains, for the purpose of observing him to peep forth for an instant. Night, however, does not constantly endure, as at mid-day a little glimmering light breaks forth, which continues about two hours. The Laplanders, by the assistance of this light, and the reflection of the snow, with which the whole earth is covered, take this time to go to the chase, and to fish, which they never leave off, although the rivers and the lakes are completely frozen, and in some places as thick as the length of a

pike: but they make large apertures in the ice, at stated distances, and push, by means of a pole which goes below the ice, their nets from aperture to aperture, and draw them out in the same manner. But what is still more surprising is, that they often catch swallows in their nets, which hold, by means of their claws, themselves attached to some small pieces of wood. They appear dead, when they come out of the water, having no symptoms of life; but when they are placed near to the fire, and begin to feel the heat, they recover a little, then clap their wings, and begin to fly, as they do in summer. This strange fact has been confirmed to me by all those whom I talked with on the subject.

We set out on our journey on Wednesday morning, and after having crossed to the other side of the torrent, we walked a short league on foot. We observed on the road a Lapland-hut, composed of leaves and turf. All the property was behind the house, placed on some planks: it consisted of some skins of the rein-deer, some utensils for working with, and several nets, which hung upon a rod. After having examined the whole, we pursued our course to the east, in the woods, without any road. We found in the middle a Lapland-magazine, constructed upon four trees, which made a square space. The whole of this edifice, covered with planks, was supported upon four pieces of wood, which are generally fir, and from which the Laplanders remove the bark, for the purpose of preventing particularly the wolves and the bears from climbing up these trees, which they rub over with grease and train-oil. It is in this magazine that the Laplanders lay up their whole wealth, which consists of dried fish or flesh of the rein-deer. These fortified habitations are in the middle of the woods, at the distance of two or three leagues from the Laplander's hut: the same individual will sometimes have two or three in different places. It is in this manner, that, as they are continually exposed to the fury of the wild beasts, they employ their whole address to render their attempts unsuccessful; but it frequently happens, notwithstanding all their exertions, that the bears destroy all the toil of a Laplander, and eat in one day all that he has collected during a whole year, which actually happened to one whom we met on the lake of Tornotresch, and whom we again found on our return, extremely disconsolate at the destruction of his magazine by the bears, who had devoured all that it contained.

They have also another kind of reservoir, which they call *nalla*, like the rest also in the middle of the wood, but which is only placed on a single pivot. They cut down a tree six or seven feet high, and place upon the trunk of it two pieces of wood, across each other, upon which they erect this little edifice, which has the same appearance with a pigeon-house, and is covered with planks. They have no other ladder, with which they amount to this reservoir, than the trunk of a tree, in which they cut a kind of steps. After having still marched about half an-hour, we arrived at the borders of the lake, where we found a little Laplander, extremely old, with his son, who was going to fish. We asked questions on several subjects, particularly with respect to his age, which he was ignorant of; this want of knowledge is general among the Laplanders, who, almost every one, not only are ignorant of the year in which they live, but who only know time by the transition from winter to summer. We gave him some spirits and tobacco, and he told us, that having seen us from his hut, he retreated into the wood, from whence, however, he beheld us, and having observed that we had done him no injury, and had carried nothing off, he had ventured to sally out from his hiding-place, that he might attend to his usual occupation. The good treatment which we displayed to this poor fellow, in giving him tobacco and spirits, which are the most acceptable presents which could be made to a Laplander, induced him

to promise, that on our return he should take us to his place of residence, and show us his rein-deer, to the number of seventy or eighty, besides all his little property.

We passed on, and travelled till we arrived at the hut of a Laplander, which was on the side where the lake begins to form the river. I have talked a long while, sir, of the houses of the Laplanders, without telling you what they were: I should now, therefore, endeavour to gratify your curiosity.

The Laplanders have no fixed abode, but they go from one place to another, carrying with them their whole property. This change of abode takes place, either for the convenience of fishing, by which they subsist, or for the nourishment of their rein-deer, which they seek somewhere else, when it is finished in the place where they lived. They usually establish themselves in summer on the borders of the lakes, in the place where the torrents are; and in winter they remove to the thickest places of the wood, where they expect to find a sufficient quantity of animals in hunting. They have no difficulty in packing up quickly; for in a quarter of an hour they have taken down their whole house, and tied all their utensils upon rein-deer, who are of wonderful use to them. They employ, on this occasion, five or six, on which they place their whole baggage, as we do upon horses, besides their children who are unable to travel. The deer go one after the other; the second is attached, by means of a long strap, to the neck of the first, and the third is tied to that of the second, and so on. The father of the family marches behind these deer, and precedes all the rest of his flock, which follow him, as the sheep follow the herdsman. When they arrive at a spot proper for a residence, they unload their animals, and begin to build their house. They raise four pieces of wood, which are the supporters of their whole building; these planks are pierced from the bottom to the top, and are joined together by means of another, upon which are placed a number of other planks, which form the whole building, and produce a figure shaped like a bell. All these planks are employed to support a large cloth, which they call Woaldmar, and which forms, at the same time, the walls and the strength of the house. Those who are rich employ a double covering of cloth, the better to preserve them from the rain and the wind, whilst the poor employ turf. The fire is in the middle of the hut, and the smoke goes out at a hole, which is left for that purpose at the top. This fire is continually burning, during winter, and during summer; on which account the greater part of the Laplanders lose their sight, when they become old. The pot-hanger descends from the roof above the fire; some of them are made of iron, but the greater part are formed of a branch of the birch-tree, at the end of which a hook is fixed. They have always a pot hanging over the fire, and particularly in winter, when they melt the snow; and when any one wishes to drink, he fills a large spoon with snow and sprinkles boiling water upon it, till it is completely melted. The floor of the hut is made of branches of the birch-tree, or the pine, which they throw down in a heap, when they employ them to make their beds of. Such, sir, are the habitations of the Laplanders. There, the old and the young, the male and the female, the fathers and the children, live together: they all sleep promiscuously, and quite naked, upon the skins of rein-deer, which frequently produces very serious disorders. The door of the hut is very straight, and so low, that it is necessary to enter it on the knees; they generally place it towards the south, in order that they may be less exposed to the north wind.

There is also among these people another hut, which is fixed, and of a hexagonal form, with pines, which they fix the one above the other, and of which the apertures are lined with moss. These huts belong to the richer individuals, who do not fail to change their places of residence like the rest, but who return always after some time

to the same place, which is generally in the immediate neighbourhood of a cataract, which affords them a great facility in procuring fish.

It was in one of these huts that we passed the night: it was covered only with branches interwoven, which were filled with moss. We met here two Laplanders, whom we saluted, by giving them our hand, and saying *Pourist*, which is the Lapponian salutation and means *Welcome*. These poor people saluted us in the same manner, and returned our salute by the words *Pourist oni*, *You are also welcome*. They accompanied these words with their ordinary bow, which they performed in the manner of the Muscovites, by bending their knees. We did not fail to give them five or six kinds of spirits, for the purpose of becoming acquainted with them, which they took so heartily that they became intoxicated, and their brain beginning to turn, one of them wished to act the sorcerer, and took his tabor. As this instrument is the most essential point of their superstition, you no doubt wish, sir, that I should speak to you of their religion.

All the world knows, that the people who lived nearest to the north have always been addicted to idolatry and to magic: the Finlanders, in this respect, surpassed all others; and we may say, that they were as well versed in that diabolical art, as if they had had for their teachers, Zoroaster or Circé. The ancients knew them to be so; and a Danish author, in speaking of the Finlanders, from whom the Laplanders are descended, says, *Tunc Biarmenses arma artibus permutantes, carminibus in nimbos solvere cœlum, lætamque aeris faciem tristi imbrium aspergine confuderunt.* "The Biarmenses, having recourse to arts instead of arms, change, by means of their incantations, serene weather into dreadful tempests, and cover the cheerful face of Heaven with gloomy clouds." This writer informs us that the Biarmenses, who were the ancestors of the present Finlanders, were as bad soldiers as they were good magicians. He speaks of them in another passage in these terms. *Sunt Finni ultimi septentrionis populi; vix quidem habitabilem orbis terrarum partem culturâ complent: acer iisdem telorum est usus; non alia gens promptiore jaculandi peritia fruitur, grandibus et latis sagittis dimicant, incantationum studiis incumbunt*, &c. "The Finlanders," says he, "are the people who dwell farthest towards the north; they live in the most uninhabitable part of the world, and make use of arrows so skilfully, that there is no other people so adroit in drawing the bow; they fight with large and broad arrows, and give themselves up to the study of enchantments." If the Finlanders were so much addicted to magic formerly, their descendants, the Laplanders, are not less so at the present day. They are only Christians from policy, and by constraint. Idolatry, which is much more palpable, and which affects the senses more than the worship of the true God, cannot be rooted out of their affections. The errors of the Laplanders may be classed under two heads; those which arise from their superstition and paganism, and those which are owing to their enchantments and their magic. Their first superstition is generally to observe their unlucky days, during which they are unwilling to go to the chace, and believe that their bows would break on these days, which are the days of Saint Catharine, Saint Mark, and others. They will scarcely venture out on Christmas-day, which they belive to be unlucky. The origin of this superstition is, that they have misunderstood what happened on this day, when the angels descended from Heaven, and astonished the shepherds; and they believe that on this day evil spirits are abroad in the atmosphere, and might destroy them. They are also superstitious enough to believe, that after death there remains something called *manes*, of which they are much afraid; and when any one is killed in a dispute with another, it is necessary for a third person to go to the place where he is buried, that he may be enabled to pro-

mote a pacification between the person who is dead and him who is alive. This is, strictly speaking, the error of the ancient Pagans, who called Manes *quasi qui maneant post obitum.* All this is only superstition: but you shall now see how much they have of impiety, paganism, and magic.

In the first place they mix Jesus Christ indifferently with their false gods, and they make only one being of God and the devil, whom they believe they may worship in the manner most agreeably to their taste. This mixture is particularly to be remarked on their tabors, where they place Storiunchar and his family above Jesus Christ and his apostles. They have three principal gods; the first is called Thor, or the god of thunder; the second Storiunchar; and the third *Parjutte*, which means the sun.

These three gods are worshipped only by the Laplanders of Lula and Pitha; for those of Kimiet and of Torno, among whom I have lived, know of one only, whom they call Seyta, and who is the same among them, as Storiunchar among the others. These gods are made of a long stone, destitute of any other figure than that which nature has given it, and such as they find it on the borders of the lakes. So that every stone made in a peculiar manner, rough, or full of holes and concavities, is with them a god; and the more remarkable its structure is, the greater is their veneration for it.

Thor is the chief of the gods, and he is, they believe, ruler of the thunder, and they arm him with a hammer. Storiunchar is the second, whom they suppose to be vicar of the former, as if one should say, Thoriunchar, lieutenant of Thor. He presides over all animals and birds, as well as fish; and as it is him of whom they have most need, it is to him also that they chiefly make sacrifices, to render him propitious. They place him generally on the borders of lakes, and in the forests, over which he extends his jurisdiction, and displays his power. The third god, whom they have in common with several other Pagans, is the sun, for whom they have much veneration, on account of the benefits which they receive from him. This is the one of all the three that they adore, whom, in my opinion, they have the greatest reason to worship. In the first place, he chases away, at his approach, that cold, which has tormented them during more than nine months; he uncovers the earth, and affords nourishment to the rein-deer; he brings a day which lasts several months, and dissipates the darkness in which they had so long been buried; on which account they have, during his absence, a great respect for the fire, which they believe to be a living representation of the sun, and which produces on earth the same effects, which the other does in the heavens.

Although each family has its own particular gods, the Laplanders nevertheless have public places, which belong to the community. I will talk to you afterwards of one of these places which I visited, to see their altars: and it is there that they generally make their sacrifices, in the following manner:

When the Laplanders have known, by the noise of the tabor, that their god is desirous of blood, and that he demands an offering, they conduct the victim, which is a male rein-deer, to the altar of the god to whom they wish to sacrifice, and they permit no wife or daughter, who are also forbidden to sacrifice, to approach the altar. They slay the victim at the foot of the altar, in piercing his heart with a knife, plunged into his side; then approaching the altar with reverence, they take the fat of the animal, and the blood nearest to the heart, with which they sprinkle their god, with fear, in making crosses to him with the same blood. They place behind the idol the horn of the feet, the bones, and the horns; they hang upon the one side a red thread, adorned with carded wool; and upon the other those parts, by means of which the animal augments

its species. The sacrificer carries away with him every part which can be eaten, and leaves only the horns to his god. But when it happens that the altar of that god, to whom they intend to sacrifice, is situated on the summit of inaccessible mountains, where they believe him to reside, in that case, as they are unable to sprinkle their god with the blood of the victim, they take a small stone, which they steep in it, and throw it towards the spot which they are unable to reach.

They do not offer up sacrifices to their gods only, but they also make them to the *manes* of their parents, or their friends, to prevent them from doing them any injury. The difference which takes place with respect to the sacrifice to the manes is, that the thread, which is red in the other case, is black in this, and that they bury the remains of the animal, as the bones and the horns, and do not leave them uncovered, as they do upon the altars.

Thus much, sir, have they in common with the Pagans: let us now consider what they possess in particular, with respect to their magical art. Although the kings of Sweden have been able to do something by their threatening edicts, and the punishment of some sorcerers, yet they have found it impossible entirely to abolish the intercourse of the Laplanders with the devil; they have only lessened their number, and prevented the practisers of the art from professing it openly.

Among other enchantments which they are capable of producing, they say, that they can stop a vessel in the middle of its course, and that the only remedy against the power of this charm is the sprinkling of female purgations, the odour of which is insupportable to evil spirits. They can also change the face of the sky, or cover it with clouds; and that which they perform with the greatest facility is, their sale of the wind to those who have need of it; and they have for this purpose a handkerchief, which they tie in three different places, and which they give to him who has need of it. If he untie the first, he procures a gentle and agreeable wind, if he require a stronger he unties the second, but if he loosen the third, he is certain to excite a dreadful tempest. They say, that this mode of selling the wind is very common in this country, and that the very lowest sorcerers have this power, provided, that the wind which is wanted has already commenced, and requires only to be excited. As I have never seen any thing of all this, I shall give no opinion respecting it; but with respect to the tabor, I can tell you something with a greater degree of certainty.

This instrument, with which they perform all their charms, and which they call Kannus, is made of the trunk of a pine and a birch-tree, and the veins of which ought to proceed from east to west. This kannus is made of a single piece of wood, hollowed in its thickest part in an oval form, the under part of which is convex, in which they make two apertures, long enough to suffer the fingers to pass through, for the purpose of holding it more firmly. The upper part is covered with the skin of a rein-deer, on which they paint, in red, a number of figures, and from whence several brass rings are seen hanging, and some pieces of the bone of the rein-deer. They usually paint the following figures; they draw first, towards the middle of the tabor, a transverse line, above which they place the gods whom they hold in the greatest veneration, as Thor, with his underlings, and Seyta, and they draw another line a little below the former, but which extends only half across the tabor; there Jesus Christ, with two or three apostles, are to be seen: above these lines are represented the sun, the moon, the stars, and the birds; but the situation of the sun is under these very lines on which they place the animals, the bears, and the serpents. They also sometimes draw upon them the figures of lakes and rivers. Such, sir, is the figure of a tabor; but they do not place upon every one the same thing, for there are some on which troops of rein-deer are drawn, for the

purpose of knowing where they may be found, when any of them are lost. There are some figures which tell the proper places for hunting, and others for fishing; some for discovering whether the diseases with which they are affected will be mortal; and in this manner, of several other matters of which they are in doubt.

Two circumstances are essential to the making use of this tabor; the index, for the purpose of marking the thing which they desire, and the hammer to strike the tabor, for the purpose of moving the index, till it stop at some figure. This index usually consists of a piece of brass made in the form of studs, which are fixed in the bridles of horses, from whence several other little rings of the same metal are pendant. The hammer is made out of one bone of the rein-deer, and is of the form of a large T. Some are made in a different form, but this is the most usual. In such veneration do they hold this instrument, that they keep it always wrapped up in the skin of a rein-deer, or in something else: they never carry it into the house by the same door through which the women pass; but they introduce it, either through the cloth which surrounds their hut, or by the aperture through which the smoke issues. They generally make use of the tabor for three principal purposes: for hunting and fishing, for sacrifices, and for knowing the transactions which are taking place in the most distant countries: and when they wish to know something on this subject, they take care, first, to bend the skin of the tabor, in taking it near to the fire; then a Laplander, falling on his knees, together with all those who are present, he begins to strike his tabor all round, and redoubling the strokes with the words which he pronounces, as if he were possessed, his countenance becomes blue, his hair stands erect, and he, at length, falls motionless on his face. He remains in this state as long as he is possessed by the devil, and as it is necessary for his genius to bring him a sign, to prove that he has been at the place where he was sent; then, recovering his senses, he tells that which the devil revealed to him, and shows the mark which has been brought to him.

The second manner, which is less important, and less violent, is, how to discover the event of a disease, which they learn, by means of the fixture of the index upon the fortunate or the unlucky figures.

The third, which is the least considerable of all, shews them in what direction they ought to move, when they wish for a good chace; and when the index, agitated several times, stops at the east or the west, the south or the north, they infer from hence, that in following the quarter which is pointed out to them they will not be unsuccessful.

They have also a fourth use, to which they apply the index, viz. for the purpose of discovering whether their gods desire sacrifices, and of what kind they wish them to be. If the index stop at the figure which represents Thor, or Seyta, they sacrifice to him, and learn at the same time what victim gives him the greatest satisfaction.

Behold, sir, the usefulness of this wonderful Lapponian tabor, of which we in France are totally ignorant. For my part, I who believe with difficulty respecting sorcerers, I shall cheerfully oppose the general opinion of the whole world, as well as of many intelligent men, who have assured me that nothing was more true, than the Laplanders could know distant events. John Tornæus, whom I have already mentioned, priest of the province of Torno, an extremely learned man, whose veracity I would readily believe, asserted, that this had happened to him so frequently, and that certain Laplanders had told him so often every thing that had occurred in his journey, even to the smallest particulars, that he had no difficulty in believing all that had been related concerning it. The archives of Bergen testify a fact which happened to the servant of a merchant, who, wishing to know what his master was doing in Germany, went to visit a very famous Laplander, and having written the information of the sorcerer in the

archives of the city, the fact turned out to be as was related, the merchant having afterwards confessed, that, agreeably to the sorcerer's information, he had, on such a day, slept with a girl. As the Laplander had mentioned a thousand other facts of this nature, which had been related to me in the country by so many men worthy of credit, I confess to you, sir, that I could not help believing them.

Whether these things which I have mentioned to you be true or false, this is certain, that the Laplanders have an implicit faith in the effects of the tabor, in which they are strengthened every day by the strange success which they observe to attend it. If they had no other instrument but this to exercise their diabolical art, it would do harm to none but themselves: but they have, besides this, another method of inflicting danger, grief, disease, and even death itself, on those whom they wish to injure. For this purpose, they employ a little ball of the size of a pigeon's egg, which they send forth to every part of the world, within a certain distance, according to the extent of their power; and when it happens that this animated ball meets with any one on its road, whether man or beast, it goes no farther, but produces the same effect upon the person whom it has struck, as it would have done on those for whom it was intended. The Frenchman who was our interpreter during our journey in Lapland, and who had resided thirty years at Swapavara, assured us, that he had several times seen these balls pass close by him. He told us, that it was impossible to know the form which they might assume; he could only assure us, that they flew with remarkable swiftness, and left behind them a little blue track, which it was easy to distinguish. He told us also, that one day, while crossing over a mountain, his dog, who closely followed him, was struck by one of these *gants* (for so these balls are called) in consequence of which he expired on the spot, although he was in good health the moment before. He tried to discover the place where his dog had been wounded, and observed a hole under his throat, without being able to find in his body that which had struck him. They preserve these *gants* in leather bags, and those among them, who are malicious, scarcely suffer a day to pass without throwing some of these *gants*, and when they have no person whom they wish to injure, they throw them at random into the air; and when it happens that a Laplander, engaged in this profession, has any resentment against another of the same fraternity, and wishes to injure him, his *gant* will have no power, should the other be more expert than him at the business, and a greater devil. All the inhabitants of this country dread very much these emissaries, and those who are known to have the power of throwing them are highly respected, and no one dares to molest them. Such, sir, is the whole information which I have been able to acquire (respecting their magical arts) by my own experience, as well as by the intelligence which I have received from all the people of the country, whom I believed extremely worthy of belief, and particularly from the priests, whom I have consulted on all these subjects.

As soon as our Laplander became intoxicated with spirits, he wished to counterfeit the sorcerer; he took his tabor, and beginning to strike it with the agitations and contorsions of a person possessed, we asked him, whether our fathers and mothers were yet alive. It was very difficult to speak with certainty on this subject; we were three in number; the father of one, and the mother of another, were alive, while the third had neither father nor mother. Our sorcerer told us all this: and extricated himself very well from the difficulty. Although those with whom we were consisted of Finlanders and Swedes, and could not have any knowledge of this matter, which they might have communicated to the Laplander, yet, as they had to do with those who were not easily satisfied, and who wished to have something more palpable, and more precise, than a

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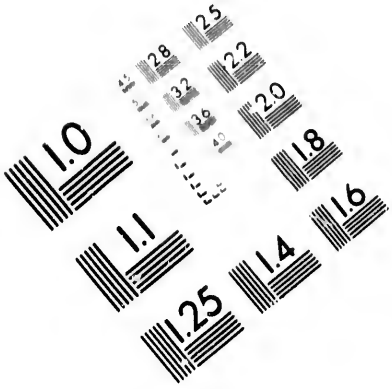

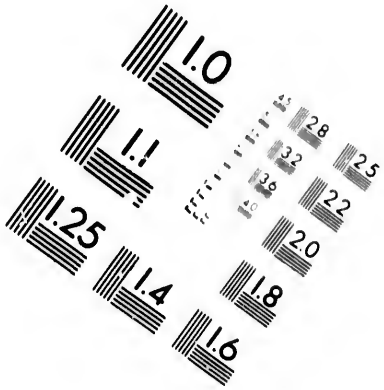

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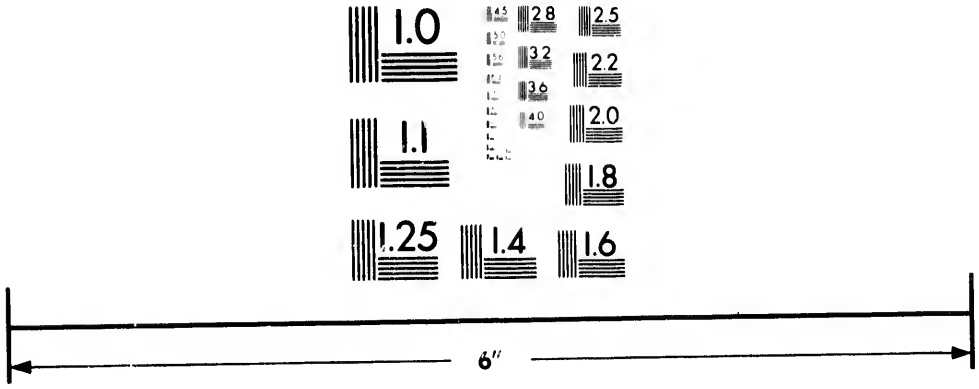

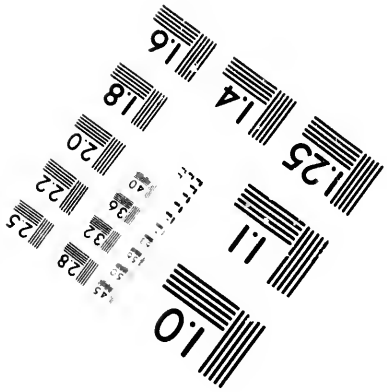

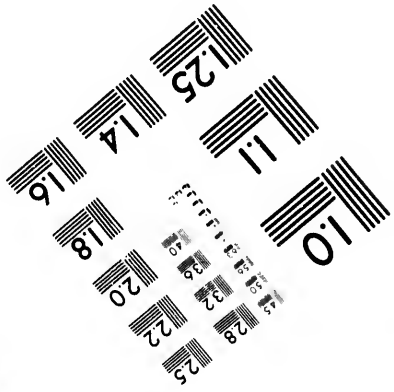

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simple effect of chance, we told him that we should believe him to be a real sorcerer, if he could send his demon to the lodging of any of us, and bring back a sign, to convince us that he had been there. I asked him for the keys of my mother's cabinet, which I well knew he could only find upon her, or under her bolster, and I promised him fifty ducats, if he could bring them to me. As the journey was pretty long, it was necessary for him to take three or four good draughts of spirits, that he might travel the more gaily, and be enabled to employ the strongest and the most powerful charms to call his familiar spirit, and to persuade him to undertake the journey, and to return speedily. Our sorcerer used his utmost exertions; his eyes rolled round, his face changed colour, and his beard bristled violently; he almost broke his tabor, so violently did he strike it, and he fell at length upon his face, as stiff as a rod. All the Laplanders who were present carefully hindered any person from approaching him while in this state, and kept off even the flies, not suffering them even to remain upon him. I assure you that, when I saw this ceremony, I believed that I was going to see fall in at the hole in the roof of the hut the keys which I had asked for; and I waited till the charm would be finished, that I might make another request, and beg of him to procure me a quarter of an hour's conversation with the devil, from which I expected to learn many things. I should have known whether Miss —— is still a virgin, and the nature of the intercourse betwixt Monsieur and Madame ———. I would have asked him if Monsieur ——— had ——— his wife during three years that he has lived with her; whether the last child of Madame ——— is her husband's or not: in fine, I should have known a great number of things, which none but the devil knows.

Our Laplander remained as if he had been dead during a good quarter of an hour, when, beginning to recover a little, he began to look upon us, one after another, with haggard eyes; and after having examined us all very attentively, he addressed himself to me, and told me that his spirit was not able to act agreeably to his inclination, because I was a greater sorcerer than he, and my genius was more powerful; and that if I would give orders to my devil to intermeddle nothing with his, he would give me satisfaction.

I confess to you, sir, that I was exceedingly surprised at having been so long a sorcerer, without being sensible of it. I did every thing in my power to put our Laplander on the road; I commanded my familiar demon to give no disturbance to his; but after all these efforts we could gain no intelligence from our sorcerer, who extricated himself very aukwardly from so difficult an affair, and who sallied out in great wrath from the hut, to go, I believe, to destroy all his gods and devils, who had deserted him in the time of need, and we never saw him more.

On Thursday morning we continued our journey to the lake of Tornotresch; and at the place where it begins to form a river one can observe a little island on the left, which is surrounded on all sides with dreadful cataracts, which descend with an awful precipitation among the rocks, where they excite a terrible noise. A famous altar, dedicated to Seyta, has been established there since the earliest times, to which the Laplanders of the province of Torno resort, for the purpose of offering up sacrifices on the most urgent occasions. John Tornæus, of whom I have already spoken several times, mentioning this place, speaks of it in the following manner: *Eo loco ubi Tornotresch ex se effudit fluvium in insulâ quâdam, in medio cataractæ Dara dictæ, reperiuntur Seytæ lapides, specie humanâ collocati ordine. Primus altitudine viri proceri, post, quatuor alii paulò breviores, juxta collocati; omnes quasi pileis quibusdam in capitibus suis ornati: et quoniam res est difficillima periculique plenissima, propter vim cataractæ indictam navigium appellere, ideò Lapponi pridem desierunt invisere locum istum, ut nunc explorarni equeant, utrum quomodove ulli fuerint in istam insulam.* "In the place," says he, "where the lake of

Tornotresch begins to form a river, on a certain island in the middle of the cataract called Dara, Seytan stones are found, placed in regular order, and bearing the human form. The first is of the size of a tall man, and four others, somewhat less, placed at its side: every one of them has on its head a kind of little hat; and because it is very difficult, and even dangerous, to approach this island in a boat, the Laplanders have for a long time past ceased to visit this altar; and they cannot understand how it has been possible to adore these gods, and in what manner these stones have been conveyed thither." We approached this altar, and perceived rather a large heap of rein-deer's horns, than the gods, who were behind. The first was the thickest and the largest: it was not at all shaped in the human form, and I cannot well say what it resembled; but this I can say, that it was very greasy and very dirty, in consequence of the blood and fat with which it was covered. This one was called Seyta; his wife, his children, and servant were ranged on his right side, in regular order; but all these stones had no other shape than what they received from nature, when exposed to a fall of water; they were as thick as the first, but much shorter. All these stones, and particularly that which represented Seyta, were placed upon branches of the birch-tree, which had been lately cut; and there was to be seen on one side a mass of carved pieces of wood, upon which some characters were engraved. We observed one in the middle, which was much thicker and taller than the rest; and this was, as our Laplanders informed us, the staff which Seyta employs when on a journey. A little behind all these gods there were two others, thick, greasy, and covered with blood, under whom there was, as well as the rest, a number of branches: these were nearer the river than the others; and our Laplanders told us that these gods had been thrown several times into the water, and that they had always been found again in their places. Some time after I saw a circumstance contradictory of the information of Tornæus. He says, in the first place, that this spot is no more frequented by Laplanders, in consequence of the difficulty of approaching it; and it is on this account that it is held in such great veneration by them, because, according to them, the Seytan gods take delight in places difficult of access, or even inaccessible, as is evinced by the sacrifices which they make at the bottom of the mountains, where they imbue the stone with the blood of the victim, and throw it to those places which they are unable to reach. But, according to the assurances of our Laplanders, this place is at present as much frequented as formerly; and this we were induced to believe, by the green leaves which still remained on the branches which supported these stones, and by the fresh blood with which they were still sprinkled. With respect to the hats which Tornæus mentions the gods had upon their heads, they consist merely of a flat figure, which is at the top of the stone, and juts out a little from it: but only the two first, which represent Seyta and his wife, have this appearance; the rest being merely stones of a long shape, full of protuberances and holes, and ending in a point; they represent the children of Seyta, and all the rest of his household. In fine, the altar is composed solely of a single rock, which is covered with grass and moss, like the rest of the island, with this difference, that the blood spilt, and the quantity of wood and bones of the rein-deer, render the place more frequented.

Notwithstanding all that our Laplanders could say, to prevent us from carrying off these gods, we failed not to diminish the number of Seyta's family, and to take each of us one of his children; while they failed not to threaten us, and to call down imprecations on our head, by assuring us that our journey should be unsuccessful, if we excited the wrath of their gods. If Seyta had been thinner and less heavy, I should have carried him off with his children; but having taken him in my hand, it was with great difficulty that I could move him from the ground. The Laplanders, observing this, con-

sidered me a man already doomed to destruction, who could not go many steps without being at least thunder-struck; for the most certain mark, in their opinion, of a god incensed, is the weight discovered in the idol; as, on the other hand, when the god is propitious, and ready to go where he is desired, the idol can be lifted with great ease: it is by this means also that they learn whether he is desirous of a sacrifice.

We had no sooner left this island than we entered the lake of Tornotresch. From this lake the river Torno takes its rise: it is in length about forty leagues from east to west, but in breadth it is very inconsiderable: it is frozen from September to St. John's day, and furnishes an almost inconceivable quantity of fish to the Laplanders. The tops of the mountains by which it is surrounded are so high, that they conceal it; and the snows with which they are constantly covered prevent one almost from distinguishing them from the clouds. These mountains are totally bare, and have no wood growing on them: there are nevertheless a number of beasts and birds upon them, and chiefly *sielripor*, which prefer these situations to any other. It is around this lake that the Laplanders spread themselves when they return from Norway, whence they have been banished for a season by the heat and the gnats; and it is here, and in the neighbourhood, where the greater number of them deposit their riches: they have no other strong box to hold their money and their most valuable articles. They take a pot of copper and fill it with their most precious goods, after which they carry it to the most secret and retired spot which they can think of; there they bury it in a deep hole dug for the purpose, and cover the place with grass and moss, to prevent any one from discovering it. All this is done by the Laplander, without giving any information respecting it to his wife or children; and it often happens that the children lose a treasure, in consequence of its being too well hid, when the father happens to die an unexpected death, which prevents him from discovering where his riches are concealed. All the Laplanders hide likewise their property: and quantities of rix-dollars, and vessels of silver, rings, and other trinkets and ornaments, which have no other owner but him who finds them, and who does not give himself very much trouble in seeking after the true owner, are often discovered. We advanced pleasantly about seven or eight leagues upon the lake, near to a mountain which surpassed all the rest in height; it was here that we ended our journey, and erected our memorial. We were full four hours in ascending to the top, by a path which had never before been trod by a human being: when we had at length arrived at the summit, we saw the whole extent of Lapland, and the northern ocean, as far as the North Cape on the western side. It was here that we planted the following inscription, which was its proper place, but which will never be read, I believe, except by the bears:

> "Gallia nos genuit; vidit nos Africa; Gangem
> Hausimus, Europamque oculis lustravimus omnem;
> Casibus et variis acti terrâque marique,
> Hic tandem stetimus, nobis ubi defuit orbis.
> *De Fercourt, De Corberon, Regnard. Anno* 1681, *die* 22 *Augusti.*"*

This rock will be at present known in the world by the name of Metavara, which we gave it. This word is compounded of the Latin word *meta*, and another Finland word *vara*, which means *rock*; as if we had said, the rock of boundary. In fact, sir, it was here that we stopped, and I do not believe that we will ever go farther.

While we were mounting and descending from this mountain, our Laplanders went

* For the translation, see page 175.

to find out the habitations of their comrades: they did not return till an hour after midnight; and they told us, that after having travelled a great way they had not been able to find any body. This intelligence vexed, but did not depress us, for we had only come this length for the purpose of seeing the most distant spots, and we had left a number of objects behind us, which we had deferred visiting till our return. We had been desirous of employing our first ardour in visiting the most difficult objects, lest, this fire of curiosity being lessened, we should have been contented with observing the nearest objects.

We resolved therefore now to retrace our steps; and the wind being westerly, we set sail early in the morning, and returned in one day to find that little old Laplander whom I have already spoken of, and who promised to entertain us on our return: we met him on the river fishing, and we induced him, by our present of tobacco and spirits, to take us to his hut, although he endeavoured to avoid it, and seemed to forget the promise which he had made us. He informed one of our Lapland conductors, who was his son-in-law, of the place of his residence; and having set out through the woods with one of our interpreters, whom we expressly prohibited from quitting him, we continued our route by water. Having arrived in two hours opposite to the place where the hut was situated, we went ashore, and finding that it was still at a considerable distance, we took with us a quantity of tobacco and a bottle of spirits, and followed our Laplander, who conducted us during the whole night through the wood. This man, who was not intimately acquainted with his father's residence, which had been lately changed, was as much embarrassed as ourselves: sometimes he put his ear to the earth, in order to hear some noise; sometimes he examined the footsteps of the animals which we met with, in order to discover whether the rein-deer which had passed were savage or tame; sometimes he climbed like a cat to the tops of pine-trees, to discover the smoke, and always roared with his whole force, with a dreadful voice, which resounded through all the wood. At length, after having wandered a long time, we heard a dog bark; never did a voice appear to us so charming as that of this dog, which came to console us in the desert. We turned to that side from whence the noise proceeded; and after having still travelled some time we fell in with a large troop of rein-deer, and a short time afterwards we arrived at the hut of our Laplander, who had only just arrived, like ourselves.

This hut was in the middle of the wood, constructed like all the rest, and covered with its *valdmar*; it was surrounded with moss, for the purpose of feeding about eighty rein-deer which the Laplander possessed. These rein-deer form the whole wealth of this people: there are even some who have a thousand and twelve hundred. It is the employment of the women to take care of them, and they tie and milk them at certain hours: they count them twice every day; and when one strays, the Laplander searches for it in the woods till he finds it. They sometimes run a very long time after these animals, and follow their tracks in the snow for three whole weeks. The women, as I have already said, have a particular care over the rein-deer and their young; they watch them constantly, and guard them day and night against the wolves and other savage beasts. The best method of guarding them against the wolves is that of tying them to some tree; and the wolf, who is very suspicious, and fearful of being taken, is afraid that this is only a feint, and that there is near the animal some snare, in which he may be caught. The wolves are in this country extremely strong, and quite gray; they are almost quite white during the winter, and are the most deadly enemies of the rein-deer, who defend themselves against them with the fore-feet, when they cannot escape by flight. There is also an animal of a grayish brown colour, about the height of a dog, which the Swedes call *jœrt*, and the Latins *gulo*, which also carries on a bloody warfare

with the rein-deer. This beast will ascend to the tops of the highest trees, for the purpose of seeing and surprising its enemy, while it remains concealed. When the *jært* discovers a rein-deer, whether tame or wild, passing under the tree on which he is seated, he throws himself on its back, and placing its hind-feet on its neck, and his fore-feet towards its tail, he stretches out and stiffens himself with such violence, that he slits open the rein-deer's back, and inserting his snout, which is extremely sharp, into the animal, he in this manner drinks its blood. The skin of the *jært* is very handsome and very beautiful; it is even compared to that of the sable.

There are also some birds which carry on a destructive warfare with the rein-deer; and among the rest the eagle is extremely fond of the flesh of this animal. In this country great numbers of eagles are to be found, of such an astonishing size, that they often seize upon with their claws the young rein-deer of three or four months old, and lift them up in this manner to their nests, at the tops of the highest trees. This particular immediately appeared to me, what I suppose it will also do to you, very doubtful; but so true is it, that the guard employed to watch the young rein-deer is only used for this very purpose. All the Laplanders have given me the same information; and the Frenchman who was our interpreter assured me that he had seen many examples of it; and that having one day followed an eagle, which carried a young rein-deer from its mother's side to its own nest, he cut the tree at the foot, and found that the half of the animal had already been eaten by the young ones. He seized the young eagles, and made the same use of them which they had made of his young deer, namely, he ate them. The flesh is pretty good, but black, and somewhat insipid.

The rein-deer remain pregnant nine months. When the Laplanders wish to wean the young ones, they put upon their heads a circle of pine, the branches of which are made sharp, and prick very much, so that when the young one approaches its mother, in order to take its usual nourishment, she, finding herself pricked, pushes away the young one with her horns, and obliges it to seek for nourishment elsewhere. This is not the only employment of the women; they make the clothes, the shoes, and the boots of the Laplanders; they draw the carded wool to cover thread: this they do with their teeth, while they hold the bone of a rein-deer, through which there have been several holes made of various sizes, and they first pass their wool through the largest, then through the next, and so on, till it be brought to the state they desire, and fit to cover the thread of the rein-deer, with which they ornament their dress and every thing they make. This thread, as I have already mentioned, is composed of sinews extracted from the rein-deer, which they draw by fibres, and entwine them afterwards on the cheek, while they continue constantly to twist them, and from time to time to moisten them: this is the only method they make use of to make thread. All the harness of the rein-deer is likewise made by the women: this harness is composed of the skin of the deer; the breast-leather is ornamented with a number of figures, made of woollen thread, from which several little bits of serge of all colours hang, which form a kind of fringe: the little bell is in the middle; and there is nothing which gives vigour to this animal, or which gladdens it more, than the noise which it makes with his bell whilst travelling.

As I have begun with speaking to you of the occupations of the females of this country, I am naturally led to talk of the employments of the men. I shall now state, in general, that all the inhabitants of this country are naturally sluggish and lazy, and that nothing but hunger and necessity can chace them from their huts, and oblige them to labour. I should have concluded that this general vice arose from the climate, which is so cold that no one can easily expose himself to the air, had I not found that they are equally lazy in summer as in winter; but, in fact, as they are almost constantly neces-

sitated to use exertions for their subsistence, they are nearly always engaged in hunting and fishing: they hunt during winter, and fish during the summer; and make with their own hands all the instruments necessary for each of these employments. Their boats are made of fir, and are joined together by the thread of the rein-deer, which makes them so light, that one person can easily carry one of them upon his shoulder. They require a quantity of these boats, in consequence of the number of cataracts which they frequently meet with; and as they are unable to ascend these, they have in many places a boat on each side of them: they leave them on the bank of the river, after having drawn them to land, and put two or three stones into them, to prevent the wind from carrying them away. Some employ thread and cord to fasten them; the thread is made of hemp, which they purchase from the merchants: they often rub it with a kind of red glue, which they make of the scales of fish dried in the air, for the purpose of strengthening and rendering them less disposed to putrefaction. They make their cords of the bark of the birch-tree, or the root of the fir; they are extremely strong when immersed in water. The men are continually employed in making sledges of all kinds; some of them for the purpose of conveying their persons, which are called *pomes;* and others for carrying the baggage, which are called *raedakeres*, and are shut like coffers: they also make their bows and arrows. The bows are composed of two pieces of wood placed one above the other; the lower one consist of burnt fir, and the other of birch: these pieces are glued together, and covered throughout their whole length with a very thin piece of bark of the birch-tree, which prevents one from perceiving that which it contains. Their arrows are of various kinds; some are composed solely of wood, and are employed to kill, or rather to stun, the minevers, the ermines, and the martins, and other animals, whose skins they are desirous of preserving; there are others covered with the bone of the rein-deer, made in the shape of a harpoon, and long-pointed; this arrow is thick and heavy: the latter is employed against birds, and never comes out of the wound when it has once entered the body; it also by its weight prevents the bird from flying, and carrying away with it the arrow and the hopes of the huntsman. A third kind is covered with iron, in the form of a lancet, and is employed against the large animals, such as the bears and the wild rein-deer; and every arrow of this sort is placed in a little quiver, made of the bark of the birch-tree, which the huntsman carries in his girdle. In fact, the Laplanders are extremely expert at the use of the bow, and they oblige their children to engage in those practices, which several warlike nations in former times wished that they had done; for they give them nothing to eat, till they have previously hit an object prepared for them, or have knocked down some mark, which has been placed for the purpose on the top of some high pine.

All the household utensils are made by the men: their spoons are cut out from the bones of the rein-deer, and they adorn them with figures, in which they put a certain black composition. They make lids to their sacks also from the bone of the deer, and little baskets of bark and rushes, and likewise those planks which they employ in running upon the snow, and with which they pursue and catch the swiftest animals. The description of these planks has been formerly given.

But that which is truly remarkable is, that the men always perform the business of the kitchen, and that they prepare all the food they procure, whether in hunting or fishing; the women never intermeddle with this part of their duty, except during the absence of their husbands.

We observed this immediately on our arrival, and the Laplander dressed some fresh *sichs* which he had taken that day. This fish is somewhat larger than a herring, but incomparably better; and indeed I never tasted fish more delicious than this. As soon

as it was dressed they prepared the table, made of pieces of the bark of the birch-tree sewed together, and spread it upon the ground. The whole family placed themselves around it, with their legs crossed in the manner of the Turks, and every one took his share from the pot, which he placed either in his cap, or in a corner of his dress. Their drink is placed in a large wooden dish at their side, if in summer, and in winter it is in a pot on the fire. Every one takes according to his inclination his share of the food, by means of a large wooden spoon, and drinks in the same manner according to his thirst. When the meal is finished, they strike their hands in token of friendship. The most ordinary food of the poor consists of fish; and they throw some bruised bark of the pine in the water, which serves to dress them in the same manner as boiled meat. The richer individuals eat the flesh of the rein-deer which they have killed at Michaelmas, when they are fat. They suffer no part of this animal to be lost: they even preserve the blood of it in its bladder; and when it has thickened and become hard, they cut it, and place it in the water which remains from the dressing of the fish. The marrow of the bones of the deer is considered with them a delicious morsel; the tongue is no less so; and the limb of a male rein-deer is one of their greatest delicacies. But although the flesh of the rein-deer be much esteemed among them, that of the bear is incomparably more so: they make presents of it to their mistresses, which they accompany with that of the castor. They have during the summer a ragout, which I tasted, and which I thought would have killed me. They make use of certain little black fruit which grows in the woods, about the size of a gooseberry, which they call *crokbergt*, and which means *raven's gooseberry*. They put these along with the spawns of fish in a dish, and mix the whole together, to the great torment of the stomachs of all those who see them, and who are not accustomed to such kinds of *ragouts*, which however are considered by them as the most exquisite luxuries. When the meal is finished, the richer individuals take, by way of desert, a small piece of tobacco, which they draw from behind their ear; this is the place where they dry it, and they have no other box in which to preserve it: they then chew it, and when they have drawn all the juice from it, they place it again behind the ear, where it acquires a new taste; they still chew it once more, and replace it again in the same manner, and when it has lost all its strength, they smoke it. It is astonishing to see with what facility these people live without bread, and how anxious they are at the same time about a paltry herb, which grows at such a distance from them.

We interrogated our Laplander upon many subjects. We asked him what he had given his wife at their marriage: he told us that she had been very expensive to him during his courtship, having cost him two pounds weight of tobacco, and four or five pints of brandy; that he had made a present of the skin of a rein-deer to his father-in-law; and that his wife had brought with her five or six rein-deer, who had multiplied exceedingly during the forty years in which they had been married. Our conversation was enlivened with brandy, which we poured from time to time, by means of our entreaties, down the throats of this good man and his wife; and the return of this pleasing practice became so frequent, that both began to feel the effects of it. They now caressed each other, in the Lapland manner, as ardently as you can well imagine; and their tenderness went so far that they began both of them to weep, as if they had lost all their rein-deer. The night passed away in the midst of these mutual endearments; and we observed on this occasion, what I believe I have already told you, that the whole family sleeps on the same skin. This confusion is always prevalent among the Laplanders; and a husband not only lies with his wife on the first night of his marriage, but with all the family together.

Next morning we each of us caused a deer to be killed, which cost us two crowns

in order to have its skin to carry to France. If I had returned by a direct road, I should have endeavoured to carry some live rein-deer along with me. Several individuals have in vain endeavoured to do so; and last year three or four were conducted to Dantzic, where they died, not being able to live in such a climate, it being too hot for them. We delayed killing them till we should visit the priest, when we could do it more conveniently; and after having taken two or three of those little collars which are employed to guide these animals, and some others for the purpose of securing them, we set out on our return, and made our rein-deer pass the river: we arrived the same day, Saturday, at the residence of the priest of the Laplanders, where we had stopt in passing.

No sooner had we arrived than we were anxious to kill our animals. The Laplanders for this purpose employ a bow, and an arrow of the same kind with that which they make use of in killing large beasts. We had the pleasure of perceiving the address with which they prepared their stroke, and we were astonished that a beast so large as a rein-deer should die so quickly of so very inconsiderable a wound. It is true, the arrow pierced as far as the half of its shaft; but I should have believed that a more dangerous wound would have been necessary to kill it so soon.

———Hæret latere lethalis arundo.

We had our animals skinned in the best way we were able: the Laplanders took possession of the blood, and we gave them the half of one. It is difficult to conceive how two men alone could eat the half of a large deer, without bread, without salt, and without drink: it is however very true; and we saw it, in this instance, take place in our Laplanders, with great astonishment.

We observed that the rein-deer have no gall, but only a little black spot on the liver. The flesh of this animal is very good, and has a considerable resemblance in taste to that of the stag, but it is stronger; the tongue is a delicious morsel, and the Laplanders are fond of the marrow. At Saint Michael's day it becomes fat as a pig; and it is at that time that the rich Laplanders kill it, for the purpose of furnishing themselves with provisions during the rest of the year. They make the cold dry the flesh, which produces the same effect as when it is dried by fire, and which dries it up, so that it can be easily preserved. Their salting-tub consists of the trunk of a tree hollowed out by the hands of nature, which they cover in the best manner they are able, to prevent the bears from stealing it.

We remained some days with the priest, waiting for a Laplander who was considered a great sorcerer, and whom we had sent our Laplanders to bring from a distance of several leagues. They returned at the end of some days, and made such exertions, in order to procure the money which we had promised them if they brought him, that in three days we saw them return with the sorcerer, whom they had discovered in the heart of a wood. We were now as happy as if we had held the devil by the tail, if I may use the expression; and what gave us pleasure was the promise that our enchanter made us, of telling us many things which would surprise us. We now set out, therefore, on our journey through woods, over rocks, and through marshes. Where will not one go to see the devil in this world? We travelled more than five leagues, during which we met with a number of birds and beasts, with the names of which we were unacquainted, and particularly of minevers. These minevers are what we call in France squirrels, which change their red colour when the winter and the snows makes them turn gray: the farther north they are, they become the more gray. The Laplanders carry on a constant war with them during winter; and so well trained are their dogs to this chace,

that they never passed any without observing them, even upon the highest tress, and informing, by their barking, the Laplanders who were with us. We killed some with our fire-arms; for the Laplanders had not on this occasion their round arrows, with which they knocked them on the head; and we had the pleasure of seeing them skin them with surprising quickness and propriety. They begin to hunt the minevers on Michaelmas-day, and every Laplander is usually engaged in this employment, by which means they have a great market for them, and they sell a *timbre* for a crown; this timbre consists of forty skins. But there is no kind of merchandise in which there is more deceit than in that of selling minevers, and ermines' skins, as they are bought without being seen, and the skin is turned, so that the fur is on the inside. There is also no distinction made; all are at the same price, and it is necessary to take the good with the bad, which cost no more, the one than the other. We learned from our Laplanders a surprising peculiarity respecting the minevers, which was afterwards confirmed to us by our own experience. These animals are not always to be found in the same number; they frequently change their country; and they will not be able to find one during a whole winter, where the year before thousands were to be met with. These animals change their place of residence. When they wish to remove to some other spot, and find it necessary to pass some lake or some river, which they meet with at every step in Lapland, these little animals take the bark of a pine or birch-tree, which they draw to the edge of the water, upon which they place themselves, and in this manner, abandoning themselves to the mercy of the wind, they lift their tails in the form of sails, and in this manner, when the wind becomes a little strong, and the water grows rough, the vessel and the pilot are in the same instant overwhelmed. This shipwreck, which frequently amounts to more than three or four thousand sail, generally enriches those Laplanders who find those wrecks upon the bank, and employ them to their ordinary use, provided these little animals have not remained too long on the sand. There are many who make a prosperous voyage, and who arrive safely in port, provided the wind has been favourable, and has excited no storm upon the water, which indeed would not require to be very violent, for the purpose of swallowing up these little structures. This particularity might pass for a fable, had I not been convinced of it from my own experience.

After having travelled a long time, we arrived at the hut of our Laplander, which was surrounded by a number of others belonging to his comrades. Here it was, that we learned the nature and condition of the Laplanders and Lapland. We resided three days among them, for the purpose of observing all their manners, and of being informed respecting a number of particulars, which we could only learn from themselves. First, our sorcerer intended to fulfil his promise, we began to entertain some expectation of learning some of those things which we wished to know, when we observed that he had brought with him his tabor, his hammer, and his index, which he drew from his breast, which served him instead of a pocket. He put himself in a condition to call the devil by his conjurations. Never did a person possessed place himself in so many different postures as our magician. He struck his breast so rudely and so unmercifully, that the black wounds, with which it was covered, showed clearly that he was really in earnest. To these blows he added others, which were no less harsh, and which he gave himself with his hammer upon the face, so that the blood flowed from every part. His hair stood erect, his eyes turned, his whole countenance became blue, he suffered himself to fall several times in the fire, yet he was never able to tell those things which we demanded. It is true, that even a perfect sorcerer would have found it difficult enough to give the satisfactory evidences which we inquired after. I wished

to have some certain proof from France, in proof of the mission of his demon; and this was the stumbling-block of all the sorcerers whom we had yet consulted. This person, who was considered very expert at his profession, assured us, that he had formerly been able to do what we desired; but that his genius had never been farther than Stockholm, and that there were very few who could go farther; and that the devil began to leave him as he grew old, and lost his teeth. This peculiarity astonished me. I inquired respecting it more particularly, and I understood that it was very true, and that the power of the most intelligent sorcerers decreased as they lost their teeth; and I concluded, that, in order to be a good sorcerer, it was necessary to hold the devil by the teeth, and that he could only be well fastened in this manner. This man, observing that we drove him, by means of our questions, to extremities, promised that, with the aid of spirituous liquors, he would tell us something surprising. He took, and looked upon it several times, after having made a number of invocations and grimaces; but he only told us very ordinary things, which one could very easily understand without being a great sorcerer. All these circumstances led me to draw a conclusion, which was a very just one, that all these people are more superstitious than sorcerers; that they easily believe the fables which are related to them respecting their ancestors, who, it is asserted, had a great intercourse with the devil. It may be true, sir, that there were, in reality, some sorcerers among them in former times, when the Laplanders were buried in the errors of paganism; but at present I believe it would be extremely difficult to find one, who well understood his profession. When we saw that we could procure no information from our Laplander, we amused ourselves with making him drunk; and this deprivation of reason, which continued three or four days, gave us an opportunity of stealing from him all his magical instruments: we took his tabor, his hammer, and his index, which was composed of a number of rings, and several pieces of brass, which represented several infernal figures, or some characters tied together by a chain of the same metal; and when, two or three days after, we were on the point of setting out, he came to us to demand all his articles, and inquired particularly at every one, if he had not seen them. The answer we gave him was, that he could easily know, and that, if he was a sorcerer, he would find no difficulty in discovering who had them.

We left these people, in order to visit others, that we might see and learn something further of their manners. We entered first into a hut, where we found three or four women, one of whom was completely naked, and was giving suck to a little child, which was also in the same condition. The cradle was at the end of the hut, hanging in the air; it was made out of a hollow tree, and full of a fine moss, which supplied the place of linen, mattrass, and coverlid; two small circular pieces of osier covered the upper part of the cradle, over which was placed a wretched piece of cloth. This naked woman, after having washed her child in a pot filled with hot water, placed it again in the cradle; and the dog, who was instructed how to rock the child, placed his two fore-feet upon the cradle, and gave it the same motion which a woman does. The dress of the woman differs very little from that of the male sex; it is of the same *valdmar*, and the sash is larger; it is adorned with pieces of tin, which cover its whole breadth, and differs from that of the men in this respect, that the latter is only marked with pieces of the same metal, placed one after the other. At this sash a sheath, filled with a knife, hangs; the sheath is adorned with filaments of pewter; there is also a purse, adorned in the same manner, in which they place a steel, to strike fire with, and all their most precious articles; this is also the place where they hang their needles, attached to a piece of leather, and covered with a piece of brass, which

they push over it. All these articles are adorned on the lower side also with a number of brass rings of various sizes, the noise and sound of which amuse them extremely; and they believe that these ornaments tend essentially to set off their natural beauty. But perhaps, sir, whilst I am speaking of beauty, you will have the curiosity to inquire whether there are any handsome Laplanders. To this question I will answer, that nature, which has been pleased to create mines of silver and other metals in the northern regions, the most distant from the sun, sports herself sometimes with forming beauties which are supportable in these very countries. It is always however true, that those individuals, who surpass the rest by their beauty, are still but Lapponian beauties, and could only be considered such in this country. But, generally speaking, it is certain that all the Laplanders, male and female, are horribly ugly; and very much resemble monkeys: I do not know a comparison by which they can be more properly designated. Their face is square; their cheeks are much elevated; the rest of their countenance is narrow; and the mouth extends from ear to ear. Such, in a few words, is a description of all the Laplanders.

Their dress, as I have already mentioned, consists of the valdmar. The cap of the man is generally made of the skin of the *loom*, as I have already described, or even of some other bird which has been flayed. The head-dress of the women is composed of a piece of cloth; and the richest among them cover their heads with a skin of a fox, a martin, or some other beast. They do not make use of a stocking, but they have solely, during the winter, a pair of boots of the leather of the rein-deer, and put over them shoes like those of the men, that is, a piece of leather which surrounds the foot, and which is elevated on the fore-part: a hole is left for the purpose of putting the foot in, and they tie them above the ancle with a long woollen cord, which goes round five or six times; and that these coverings for their legs and feet may give them no uneasiness, and allow them to walk with ease, they fill their shoes with hay, which they have boiled for that purpose, and which grows in abundance throughout all Lapland. Their gloves are made of the skin of the rein-deer, which they divide into several compartments with another kind of leather, which is whiter, sewed and fixed upon the glove. They are made like mittens, without any fingers, and the handsomest are lined on the lower side with the skin of the *loom*. The women have an ornament, which is peculiar to them, and which they call *kraca*, made of a piece of red cloth, or some other colour, which encircles the neck, like the collar of a Jesuit, and descends upon the stomach, where it finishes in a point. This cloth is ornamented with their most valuable articles: the neck is covered with various plates of pewter, but that part which fronts the breast is adorned with their rarest commodities. The rich place here buttons and plates of silver, the most beautiful that they can procure, and the poor content themselves with putting on the same place pieces of pewter and copper, according to their abilities.

We also made inquiry among these people respesting all those matters which we had been informed of by others, and they confirmed the truth of them in every point; and what particular information they gave us, I have given in the place where I spoke on that subject. But we wished to gain some knowledge of all the quadrupeds that are to be found in this country, and they related to us the following particulars.

They assured us in the first place, that in this country they were frequently exposed to winds, so impetuous, that they carried away every object that they encountered. The strongest houses are unable to withstand them; and they carry to such a distance even whole troops of beasts, when they are on the summits of the mountains, that it frequently is unknown what has become of them. The hurricanes bring with them such

a quantity of sand in summer, from the coasts of Norway, that they lessen the view to such a degree as to render it impossible to see two steps distant; and in winter they drive such a quantity of snow, that they bury the huts, and whole flocks. When the Laplanders are suddenly surprised on the road with one of these storms, they have no other means of defence than that of overturning their sledge over them, and remaining in this posture as long as the storm continues: others retire into the cavities of mountains, with all that they can take along with them, and remain in these caves till the tempest, which continues sometimes eight or fifteen days, shall have wholly subsided.

Of all the animals of Lapland, there are none so common as the rein-deer, whom I have already so particularly described. Nature, like a kind mother, has provided for countries cold as those of the north, in giving them a number of animals fit for providing them with furs, which defend them against the excessive rigours of winter, and which last for ages. Among those whose skins are most esteemed for their warmth, those of the bear and the wolf hold the first rank. The former animal is very common in the north; the Laplanders call him king of the forest. Although the bear is generally of a red colour, yet some are nevertheless observed to be white; and there is no animal against which the Laplander wages such a cruel warfare as this, in order that he may procure his skin and his flesh, which he reckons the most delicate of all food. I have sometimes eaten of it, but it appeared to my taste extremely insipid. The chace of the bear is the most solemn action of the Laplander; nothing is more glorious among this people than to kill a bear, and they carry evidences of their having done so about with them: so that it is easy to see how many bears a Laplander has killed, by the hair of them which he carries in various places of his bonnet. He who has made the discovery of some bear goes to inform his companions; and he whom they believe to be the greatest sorcerer plays upon the tabor, to learn whether the chace will be prosperous, and on what side the animal ought to be attacked. When this ceremony is over, they march against the animal; he who knows the spot marches first, and leads the rest, until they arrive at the den of the bear. There they surprise him in the speediest manner they can; and with arrows, lances, sticks, and firelocks, they kill him. Whilst they are attacking the animal, they all sing a song in these words: *Kihelis pourra, Kihelis iiscada soubi jœlla jeitti.* They beg earnestly of the bear that he will do them no mischief, and that he will not break the lances and other arms which they employ to destroy him. When they have killed him, they put the body into a sledge, to carry it to the hut; and the rein-deer who has been employed to remove it is exempted during the whole year from labour in this sledge; and means are also taken to prevent him from approaching any female. They construct a hut for the express purpose of dressing the bear, which is employed in no other manner, and in which the huntsmen attend, with their wives, and begin again their songs of joy and of thanks to the animal, that they have been allowed to return in safety. After the meat has been dressed, it is divided between the men and the women. The latter are unable to eat any of the hind parts, but always partake of the fore part. The whole day is passed in rejoicing; but it deserves to be remarked, that all those who have assisted in taking the bear must not approach their wives for three days, at the end of which they must bathe themselves, in order to be purified. I had forgotten to observe, that when they have arrived with the bear near to the hut, they do not carry it in at the door, but cut it in pieces, and throw them in at the hole through which the smoke issues, in order that it may appear to have been sent and descended from Heaven. They do the same, when they return from the chace of other animals. There is nothing more estimable, in the opinion of a Laplander, than to assist at the death of a bear, and he glories in it all his life-time. The skin of a bear generally costs ——.

The wolves are almost all of a witish gray colour; there are some of them white; and the rein-deer has no enemy more determined than the wolf. It avoids the wolf by flight; but when it is surprised by its adversary, it defends itself with its fore feet, in which consists its chief strength, and with its horns, when they are strong enough to sustain the shock; for the rein-deer cast their horns every year, and when they are new, they cannot be made use of. To prevent the wolves from attacking the rein-deer, the Laplanders tie them to some tree, and it seldom happens that they are attacked in that situation; for the wolf, being a suspicious animal, is afraid lest there should be some snare laid for him, and that this is employed as a bait to draw him thither. The skin of a wolf may be worth ————, and there are few persons, even the greatest nobles of Sweden, who do not wear dresses of its fur; and there is no better defence against the cold.

Foxes are abundant in every part of Lapland; they are almost all white, although some are found of the ordinary colour. Those of a white colour are in little estimation; but sometimes those of a black colour are met with, and these are the rarest, and the most costly: their skins are sometimes sold for forty or fifty crowns; and the hair is so fine and so long, that it hangs from any side; so that, in taking the skin by the tail, the hair falls by the side of the ears, and lies towards the head. All the princes of Muscovy and the nobles of this country seek with anxiety the furs of these skins: and, after those of the sable, they are the most esteemed. But as I have mentioned the sable, it is but proper that I should mention to you all that I know of it. That which we denominate sable, was formerly called *Zabel*. This animal is the same size with a pole-cat, and differs from the martin, in being of a less size, and in having much longer and finer hair. The true sables are damasked with black, and are caught in Tartary and Muscovy; very few of them are found in Lapland. The blacker the hair is, the more is it sought after, and is sometimes worth sixty crowns, although its skin be no more than four fingers in breadth. Some of a white or gray colour have been met with; and the grand duke of Muscovy has made presents of them to the king of Sweden by his ambassadors, as being skins exceedingly valuable.

The martins approach nearer to the sable than any other animal, they imitate them pretty exactly in the fineness and length of their hair; but they are much larger. I have met with some as large as a cat, and there are few countries, in which they are more abundant than in Lapland. The skin is worth a rix-dollar, and those of them whose skin is of an ash-colour above the throat are in higher estimation than those who have it white in the same place. This animal makes a great havoc among the minevers of whom it is extremely fond, and seizes them in the chace, without great difficulty: it does not live solely on squirrels, but it hunts also after birds; and mounting to the tops of trees, it waits till they are asleep, and then jumps upon them, and devours them. If they are nevertheless strong enough to fly, they abandon themselves to the air with the martin, whose claws are as strong and as sharp as those of any other animal, and which maintains itself on the back of the bird, and bites it in its flight, till at length the bird falls down dead. This fall is often equally fatal to the martin with the bird; and when it has risen to a great height in the air, the martin frequently falls among rocks, where it is destroyed, and has no better fate than the other.

I have spoken in another place of the *jœrts* in Swedish, and *gulones* in Latin, when speaking of the rein-deer, whom they cut in two. This animal is about the size of a dog; its colour is dark brown, and its skin is compared to those of the sables; it is damasked, and very precious.

The quantity of fish is the reason why one meets with so many castors in Lapland (the Swedes call them baver) and they take great delight in those places, where no noise of the traveller disturbs their repose. But the best place to find them is in the province of Kimi and in Russia. The kidney of this animal is employed in the cure of many diseases. Every body asserts that there is no greater specific against the plague; and that, if it is taken every morning, it dispels the bad air: it is also said to be an ingredient in the most efficacious compositions. Olaus, chief priest of the province of Pitha, presented me with the half of one at Torno, and assured me that he made use of nothing else for his best remedies; he was well acquainted with pharmacy. He further assured me that he extracted an oil from the tail of the same animal, and that there was no remedy of more efficacy in the world.

There are also in Lapland a very great number of ermines, which the Swedes denominate *lekat*. This animal is about the thickness of a large rat, but twice as long. It does not always retain the same colour, for in summer it is somewhat red, and in winter it changes its hair, and becomes as white as we see it: its tail is equally long with its body, and it terminates in a little point black as ink, so much so, that it is difficult to see an animal which is at the same time either blacker or whiter. The skin of an ermine costs four or five pence. The flesh of this animal smells disagreeably, and it lives upon minevers and mountain-rats. This last little animal, wholly unknown every where else, and very singular, as you shall see, is sometimes found in such abundance, that the earth is wholly covered with them. The Laplanders call it *lemucat;* it is of the size of a rat, but the colour is redder, marked with black; and it seems as if it fell from Heaven, for it is never seen, except after great rain. These beasts do not flee from the approaching traveller; but, on the contrary, run to him with a great noise; and when any one attacks them with a stick, or any other weapon, they turn upon him, and bite the stick, to which they continue hanging by the teeth, like little angry dogs. They fight with the dogs, whom they are not afraid of, and leap upon their backs, and bite them so severely, that the dogs are obliged to roll themselves on the earth, to get rid of this little animal. It is even said that these animals are so warlike, that they sometimes declare war against each other, and that when the two armies arrive near to the place which they have chosen for the field of battle, they fight bitterly. The Laplanders, who observe the quarrels of such small animals, conclude, that the battles of other individuals must be much more bloody; and they think that Sweden has a good right to go to war with Denmark or Muscovy, who are her most mortal enemies. As these animals are warlike, they have also many enemies, who make considerable havoc among them. The rein-deer eat all those they can meet with. They are the most delicate food of the dogs; but they never eat their hind parts. The foxes fill their dens with them, and lay up magazines of them for times of scarcity; this vexes the Laplanders, who know when they have procured this food, for this prevents them from seeking food elsewhere, and from falling into the snares which have been laid for them. Even the ermines fatten themselves on these animals. But that which is remarkable in this creature is, its sensibility of its approaching destruction. Foreseeing that it cannot live during winter, it retires to the top of a tree, between two forked branches, where great numbers are caught; others of them, not relishing this kind of death, jump into lakes, where they are often in the body of the pike, newly swallowed; and those of them, who do not wish to be the authors of their own destruction, and who patiently await their destination, perish in the earth, when the rains which brought them into existence likewise deprive them of it. They chace a great number of hares,

who are generally quite white, and do not take their red colour, except during the two hottest months of the year.

There are almost as many birds as quadrupeds in Lapland. The eagle, the king of birds, is found in great abundance; and so prodigiously large are some of them, that they are able, as I have already said, to carry off the young rein-deer, and take them to their nests, which are at the tops of the highest trees; on which account it is necessary to have them always watched.

I do not believe that there is any country in the world, which abounds more with ducks, teal, divers, swans, wild-geese, and other aquatic birds, than this; so perfectly covered are the rivers with them, that one can easily kill them with a stick. I do not know how we should have lived during our journey, had it not been for these animals, which were our usual food; we sometimes killed thirty or forty in a day, without stopping a moment, and we employed ourselves in this business only on the road. All these animals migrate, and leave this country in winter, for the purpose of visiting warmer regions, where they can find some rivers which are not frozen up; but they return in the month of May, when they deposit their eggs in such abundance, that the whole country is covered with them. The Laplanders take them in their nets, and the skin which has been flayed from the swan is made use of as a bonnet; the others are used for food. There is a bird very plenty in this country, which they call loom, which furnishes the inhabitants with their finest ornaments for the head. The plumage of this animal is of a violet and white colour, and is curled in a peculiar manner; it is the size of the goose, and is sometimes taken in the nets which the fishermen employ to take fish, when the keenness for their prey carries them too far, and they pursue some fish under the water. They also adorn with its skin the extremities of the finest gloves. The heath-cock and wood-hen are also found here in great abundance. But there is in this country a particular kind of bird, which I have not seen elsewhere, which is denominated *snyeruiport*, and the Greeks called *lagopos*, about the size of a hen; the plumage of this bird in summer is gray, of the same colour with a pheasant, and in winter it is quite white, like all the animals that live in this country; and beneficent nature gives them the same colour with the snow, that they may not be recognised by the hunter, who could easily perceive them, if they were of any other colour than the snow, with which the earth is totally covered. I have already described this animal: its taste is more savoury than that of a partridge, and it gives, by its cry, a certain mark that it will soon fall among the snow, as may be easily understood by its name, which signifies bird of the snow. The Laplanders place their nets upon the snow, and form a little hollow, in the midst of which they leave an empty space, where the snares are placed, and through which the birds must pass.

It is impossible to conceive the quantity of fish in Lapland. It is everywhere intersected by rivers, lakes, and rivulets, and so full of fish are those rivers, lakes, and rivulets, that a man can take as many with a single line in half an hour, as he is able to carry. This is also the sole nourishment of the Laplanders; they have no other bread; and they do not catch them solely for their own use; they form the only article of their commerce, and purchase those commodities they stand in need of with fish or skins; for which reason, fishing is all their occupation; for whether they wish to eat, or to indulge themselves in luxury, which is not suffered to reign in this country, they have no other means of doing so. It is true, that the rich never fish; the poor fish for them; and they give them tobacco, or spirits, or iron, or some article of that nature, in exchange. Without stopping to take notice of all the fish in this country, I will mention, that there is no place where salmon are found in greater abundance. They begin to arrive in the month of May, and they are at that time much

fatter and more delicious than in the month of September, when they return. There are some years when, in the river of Torno alone, they fish to the amount of three thousand tons, which are sent to Stockholm, and to all the inhabitants of the Baltic Sea, and the Bothnian Gulf. The pike is equally abundant with the salmon; they dry them, and carry immense quantities of them. I have already described the method they employ to fish at night by the light of a large fire, which they kindle on the prow of their boats. The trout is very frequently met with; but there is a kind of fish which I never saw before, and which they call siel; it is of the size of a herring, and extremely delicate.

After having remained some days with these Laplanders, and learned from them all the information we wished, we returned by that road which led us to the priest; and on the same day, Wednesday, the twenty-seventh of August, we left him, and slept at Cokluanda, which is the boundary between Bothnia and Lapland. But, sir, I know not whether you consider it strange that I should have talked to you so much of the Laplanders, while I have said nothing of Lapland. I do not know how it has happened, but I am going to end where I should have begun: but it is better to speak of it late, than not at all; and before I leave the subject, I will tell you all I know respecting it.

I cannot tell you what name this province was known by among the ancient geographers, because it was unknown to them; and Tacitus and Ptolemy know no province more distant than Scrifinia, which we now call Bothnia, or Biarmia, and which stretches along the Bothnian Gulf. All that we know of Lapland to-day is, that it is divided into east and west: on the west it faces Iceland, and is under the dominion of the king of Denmark; on the eastern side it is bounded by the White Sea, in which the port of Archangel is situated, which belongs to the grand duke of Muscovy. It is proper to add a third division, which is in the middle of these two, and which is much larger than both the others, and this is under the government of Sweden, and is divided into five different provinces, which have all the general name of Lapland; and are called Uma Lapmarch, Pitha Lapmarch, Lula Lapmarch, Torna Lapmarch, and Kimi Lapmarch. They take their names from the rivers which water them; and these same rivers give all their names to the cities they pass, if this appellation may be given to a parcel of huts made of trees.

The province of Torna Lapmarch, which is exactly situated at the bottom of the Gulf of Bithynia, is the furthest in the world on the side of the arctic pole, and extends as far as the North Cape. Charles the Ninth, king of Sweden, being anxious to know the situation and extent of his dominions, sent to this place, at various times in the year 1600, two illustrious mathematicians, the one called Aaron Forsius, a Swede, and the other Jerome Bircholto, a German. These individuals performed the journey, with all the necessary provisions and instruments, very successfully; and they reported, on their return, that they found no continent on the north beyond the seventy-third degree of latitude, but an immense frozen ocean; and the last promontory which bordered on the sea was Nuchus, or Norkap, not far from castle Wardhuis, which belongs to the Danes. It was in this part of Lapland that we travelled; and we have re-ascended the river which waters it to the source.

We arrived next day at Jacomus Mastung, which was only distant two leagues from the place where we had slept: we made three or four on foot, in order to arrive at it, and we did not lose our labour. There is at this place a very good iron mine, but it is almost abandoned, on account of its great distance. We went thither to see the iron-work; but although we were disappointed in this expectation, we were more fortunate than we expected: we went into the mine, from whence we procured very beautiful

stones of adamant. We observed with much pleasure the surprising effects of this stone, when it is still in its native state: it required a great deal of force to separate stones so large as those we wished to procure; and the hammer that was employed, which was as thick as a man's thigh, remained so fixed when it fell on the chissel in the stone, that the man who struck with it required some assistance before he could withdraw it. I wished to try this myself; and having taken a large iron bar, similar to that which is employed to lift the heaviest bodies, and which I could scarcely move, I struck the chissel, which bounded with extreme violence, and sustained the shock with inconceivable force: I put a compass which I had in the middle of the aperture of the mine, and the needle turned round with inconceivable rapidity: we took the best stones, and remained no longer in this place. We went to find our boats, and travelled to sleep at Tuna Hianda, at the house of one of our boatmen, who showed us his letters of exemption from taxes, which he had received from the king, for discovering this iron-mine. This peasant called himself Lars Larzon, Laurentius à Laurentio.

The next day, Sunday, we travelled a considerable way, and arrived in the evening at Koenges, where we had stopped a day in passing. We purchased in this place sledges, and all the harness which is necessary to yoke the rein-deer; they cost us a ducat each. We did not depart till Monday at mid-day, as we were obliged to wait for the boats, which were at a great distance, and which it was necessary to carry a great way, to avoid the cataracts, which are extremely violent in this place. We slept this night at Pello, where we had the pleasure of seeing on our arrival that method of fishing the pike, of which I have already spoken to you, and which appeared to me so astonishing. It is not surprising that the inhabitants of this country should adopt every possible method of catching fish: they have nothing else to subsist on; and nature, which often gives the remedy along with the disease, when refusing grain to this people, gives them fish in greater abundance than in any other country in the world. We came next day, being the first of September, to sleep at the house of the magistrate of Lapland, a German, of whom I have already spoken; and on the next day we arrived at Torno, after having passed more than fifty cataracts. These cataracts are very impetuous falls of water, which make a dreadful noise in falling: there are some which continue during the length of two or three leagues; and it is the greatest pleasure in the world to see these torrents descending with an inconceivable swiftness, and making three or four Swedish miles in an hour, which are equal to twelve French leagues. The more strong the cataract is, it is necessary to ply the oar with the greater vigour, in order to defend the boat against the waves; by which means, being at the same time hurried on by the torrent, and assisted by the oar, you make an astonishing distance in a little time.

We arrived at Torno on Tuesday, and we came in good time to see the ceremony of the funeral of John Tornæus, whom I formerly mentioned, and who had been dead two months. It is the custom in Sweden to keep the bodies of their dead a very long time; this length of time depends on the quality of the deceased; and the higher the rank of the person, the longer is the funeral deferred. This time is afforded, that every thing may be prepared for this event, which is the most solemn that takes place in this country; and if it be said that the Turks lay out their property on marriages, the Jews on circumcisions, and the christians on law-suits, we may add, the Swedes on their funerals. In fact, I was astonished at the great expence laid out upon the funeral of a man who was not by any means of rank, and that too in a country so barbarous, and at such a distance from the rest of the world. They had no sooner heard of our arrival, than the son-in-law of the defunct immediately began to study a Latin oration, which he intended to deliver the next day in our presence, inviting us to attend his father's funeral:

he was dreaming about it the whole night; and when he came before us next day, he had forgotten the whole of his discourse. If low bows say any thing, and be the marks of eloquence, I can assure you that our haranguer was the prince of orators; but I believe the bending of his body was employed rather to hide the confusion which appeared upon his countenance, than to adorn his discourse. As we were acquainted with the object of his visit, we understood that he came to request our assistance at the ceremony, for we could understand nothing from his discourse; and a short time after the burgomaster of the city, with an officer who was there in garrison, came to take us in their boat across the water to the house of the deceased. On our arrival we found the whole house filled with priests, habited in long cloaks, and hats, which appeared by their height to be columns employed to support some beam of a house. The body of the deceased was deposited in a coffin, covered with cloth, and placed in the middle of them. They watered him with their tears, which trickled down their moistened beards, the separated hairs of which formed various channels, and distilled this sorrowful humour, which was employed instead of holy-water. All these priests had left their parishes, and had come from a great distance: some of them had travelled more than a hundred leagues; and we were assured that such is their regard for this ceremony, if it had happened in winter, when the roads are in the best situation for travelling, there was no priest within two hundred leagues distance who would not have attended. The oldest delivered a funeral oration to all his assistants; and he must surely have said something very affecting, since his mournful air had almost drawn forth even our tears, who knew not a word he spoke. The women were in a little chamber, separated from the men, and they groaned in a dreadful manner; among others, the widow of the deceased interrupted by her sighs the discourse of the preacher. While this sermon was delivered here, another was preached in the Finland tongue at the church; and when the two discourses were ended, they set out to conduct the body to the church. Seven or eight respectable inhabitants carried him on their shoulders, and every one was anxious to lend their aid. This brought to my recollection what Virgil says of the entrance of the horse into Troy, when he mentions that both young and old were anxious to lend their aid to draw that machine into their city: *Funemque manu contingere gaudent.* We followed the corpse like the chief mourners; and the widow was afterwards conducted under the arms of two of her daughters, the one of whom grieved much, while the other seemed not at all affected. The body was placed in the middle of the church, while some psalms were sung; and the women, in passing by the deceased, threw themselves upon the coffin, and embraced him for the last time. Now commenced the grand and principal funeral oration, delivered by John Plantinus, priest of Urna, who received a dish made of silver for his trouble. I cannot say whether he merited it; but I know that he cried much: and that to render every object more sad, he made himself hideous, in leaving his hair in disorder, and full of pieces of straw, which he had not had time to take out of it. This man related every occurrence in the life of the deceased, from his birth to his last sigh: he mentioned the places, and the masters whom he had served, the provinces which he had seen, and did not omit the minutest circumstance of his life. It is the custom in this country to deliver a funeral oration over lacqueys and servants, provided the relations are able to pay a crown to the orator.

I attended through curiosity the funeral of a servant at Stockholm. The priest who delivered her funeral oration, after mentioning the place of her birth, and her relations, expatiated on the good qualities of the deceased, and exaggerated highly her knowledge of kitchen-work, distributing his discourse into various divisions, according to the number of ragouts which she knew how to prepare; and formed a part of his oration, by

telling them that she had only one fault, that of making every thing too salt, and that she shewed by this conduct the regard she had for prudence, of which salt is the symbol, and her little regard for the things of this world, which she threw away in profusion. You may see by this, sir, that there are few people, who may not give occasion to a funeral speech, and furnish an orator with a wide field for the display of his eloquence. But our present subject had a more noble career. John Tornæus was a learned man: he had travelled, and had even visited France, as tutor to Count Charles Oxenstiern. When the funeral oration was ended, they came up to us, and paid us a compliment in Latin, desiring us to stay to the banquet. Although we understood no more of this compliment than we had done of the first, we had no difficulty in guessing what they wished to say: our stomachs informed us very intelligibly what it was; and they complained so loudly that it was near three o'clock, and that they had not yet eaten, that it was no more difficult for these people to understand our language, than for us to understand theirs. They conducted us into a large hall, in which were three long tables; and this was the most honourable place. There were beisdes these five or six other tables, still better covered, for the entertainment of all the people who were present. The preludes to the repast were spirituous liquors, beer, and another liquor, which they call *calchat*, composed of beer, wine and sugar, two of the most execrable liquids which could enter the human body. The tables were at length served, and they placed us at the upper end of the first table, with the priests of the highest rank, such as the chief preacher and others. They commenced their meal in silence, as is the general custom, and as the season demanded; which led Plantin to remark, who was at my side, that they called the guests *Nelli*. *N* signifies *Neque vox, nec sermo egreditur ex ore eorum; loquebantur variis linguis; in omnem terram exivit sonus eorum.* All these words are taken from scripture, and I do not believe that it is possible to apply them better than on this occasion; for one can scarcely figure a more exact representation of the marriage at Cana, than the picture in which it was now represented to us, more beautiful and more natural than that of Paul Veronese. The tables were covered with strange, and, if I may use the expression, antique dishes; for it had been at least eight days since they were dressed. Large pots, of different kinds, made for the most part like those which were used at the sacrifices of the ancients, covered this table, and produced by their number a confusion similar to that which took place at the banquets of the ancients. But what gave the finishing stroke to this picture was, the venerable air of all the priests, clothed in their beards, and the Finland dress of all the guests, which are as becoming as can well be imagined. There was among others a little old man, with short hair, a thick beard, and a bald forehead; I do not believe that a more exact representation of the figure of Saint Peter could possibly be produced by the imagination of any painter. This man wore a green robe, turned up with yellow, without any shape, and producing the effect of a drapery tied with a sash. I could not cease contemplating this man, who was the brother of the deceased. Whilst I was engaged in looking at this man, the rest were employed in more important occupations, and were drinking to the honour of the defunct, and the prosperity of his family, in an astonishing manner. The priests, like the best friends, drank the most copiously; and after having toasted several healths, they came at length to kings and great men. They began first by drinking to the health of handsome girls, which is the custom throughout all Sweden, and from thence they rose to kings. These healths are drank out of vessels, the size of which is proportioned to the rank of these royal personages; and to induce me to drink, they proposed the health of the king of France, in a vessel as much larger than the rest, as this monarch surpasses the other kings in power. It would have been a crime to refuse this toast; I

drank it, and emptied the pot very courageously. It was not likely that, as we were in Sweden, we should drink the king of France's health, and forget that of the king of Sweden; it was therefore drank out of a vessel which was scarcely inferior in size to that of the other; and after having drank several healths out of it, every one was silent, to say prayers. It happened, unluckily, that at this time one of our party said something witty, and obliged us to burst out into loud laughter, which continued so long, that the whole assembly, whose eyes were turned towards him, were extremely displeased: and what was still more vexing was, that as every one was uncovered during the repast, on account of our being present, our hats had been carried away; so that we had no means of hiding the laugh, which we were unable to resist, and the more we endeavoured to stifle it, the more it burst out: on which account the priests, supposing that we made a jest of their religion, left the assembly, and were unwilling to return. We were informed by a little priest, who was more our friend than the rest, that they had determined to attack us on the subject of religion: however, we avoided talking with them on this subject, and we went to find them in another place, to which the company had retired, for the purpose of smoking, whilst the servants cleared the tables: they brought, as a desert, pipes and tobacco, and all the priests drank and smoked till they fell under the table. In this manner it was that they watered the grave of John Tornæus; and thus the feast ended. Olaus Graan, son-in-law of the deceased, endeavoured, as well as he was able, to conduct us to our boat, with his pot in his hand, but his legs failed him; he was very near falling into the river; and he was obliged to be carried home by two men.

We believed that the whole ceremony was finished, when next morning Olaus Graan again made his appearance, followed by some other priests, who came to request our attendance on the morrow. I assure you, sir, that this surprised me: I had never heard of a second day's feast, except at a marriage, and I did not suppose that it was the same with regard to funerals. We were necessitated to resolve on a second attendance, and we had a conference with Olaus Graan, during the happy interval he enjoyed between past and future drunkenness.

This Olaus Graan, son-in-law of the deceased, is priest of the province of Pitha, a learned man, or at least calling himself such, a geographer, chemist, surgeon, mathematician, and above all pluming himself on his knowledge of the French language, which he spoke in a manner you may have some idea of from the following compliment he paid us; "La grand ciel," he repeated several times, "conserve vous et votre applicabilité, tout le temps que vous verrez vos gris cheveux." 'The great Heaven preserve you, and your applicability, every time that you look upon your gray hairs.' He shewed us two medals, the one of queen Christina, and the other a shekel of the Jews, which on one side represented the rod of Moses, and on the other a cup, from whence a kind of incense issued. Besides all his other qualifications, he pretended to possess a perfect knowledge of pharmacy; and to convince us, he drew from several pockets a quantity of boxes of all sizes, and of cordials sufficient to fill an apothecary's shop. He gave me a piece of the testicle of a castor, and assured me that he extracted an excellent oil from the tail of this animal, which was useful in all kinds of diseases. When our conversation was finished, we were conducted to the place where we had been the day before, where every one, to pay honour to the defunct, drank plentifully, and those who were able returned home.

We remained at Torno, on our return from Lapland, eight days. Wednesday and Thursday were spent at the funeral; Friday, Saturday and Sunday were only distinguished by the frequent visits we received, when it was necessary to make every one drink. On Monday the burgo-master gave us a dinner; and on Tuesday, at day-break,

the wind being westerly, we set sail. The wind continued very good the whole day, at night it became less violent, and next day, Wednesday, we were becalmed. On Thursday the weather was equally unfavourable, and we remained motionless like towers. We heaved the lead several times to make soundings, but not being able to find any, we continued our course, in continual apprehensions of running aground somewhere. On Friday, the mist having dispersed, we made a little way by means of an east and north-east wind, and we passed the little islands of Querken; but the wind being contrary next day, we were obliged to turn back, and to rest ourselves in a port called Ratan. We spent part of this day in a neighbouring island at the chace; and in the evening we went to church, at about half a league's distance. The priest gave us a supper; but fearing that we had fresh young men returning from Lapmark, who would be anxious to make some attack upon his honour, he anxiously endeavoured, lest we should have spent the night with him, to convince us that the wind was fair, although it was completely contrary. We returned to our boat to pass the night, after having purchased a hare at his house; and on Sunday morning the major of the regiment of this province sent two soldiers to the boat, to inquire after us: we waited on him, and found all his officers present, besides a good dinner prepared for us. We were obliged to drink in the Swedish manner, that is to say, to empty the bowls at one draught; and when we came to the health of the king, they brought upon a dish three glasses full of liquor, which were completely emptied. I confess that I had never before experienced this triplicity of glasses full, and that I was as much astonished at observing that it did not suffice to drink the toast out of one. It is also a part of the ceremony here to turn the glass upside down on the dish, to show that the liquor has been faithfully drank. We returned to our vessel; and next day, at six o'clock of the morning, we went to see how the wind blew: it was easterly; and such was the ignorance of our captain and our pilot, that they believed we could not go out of the port with this wind. I asserted the contrary, and I induced them to venture on departing from the harbour: we did so without any accident; and at mid-day the wind became so strong at north-east, that, after continuing so the whole night, and on Thursday till mid-day, we made during twenty-four hours more than a hundred leagues; but the wind having fallen all at once, we remained at a distance of eight leagues from Agbon, a place where it was necessary for us to land, in order to travel by land to Coperberyt. We were unable to do so till next day; and having fortunately found on the shore some little boats which were returning from the fair of Hernesautes, we slept at Withseval, a little town on the border of the Gulf of Bothnia, and the next day we took post-horses, and made a very disagreeable journey, partly on account of the roughness of the roads, and partly on account of our being so little accustomed of late to travel post, for which reason we felt more acutely the fatigues of it. We lost our way during the night in the woods; and if it be at any time vexatious to wander in darkness, it is much more so in Sweden, in a country full of eternal precipices and forests, where we were totally ignorant of every word of the language, and where it was impossible to find one to inform us of the road when we required it. Nevertheless, after advancing a considerable way on our road, during a dreadful rain, with the assistance of a little candle, a thousand times more agreeable in this dark night than the most beautiful sun in one of the finest days in summer, we arrived at the post-house; and next Friday, being much fatigued with our preceding day's journey, we only travelled three leagues, and slept at Alta. We set out at six o'clock in the morning, that we might be able to make four Swedish miles, which are equal to twelve French leagues; and after having travelled till two o'clock of the afternoon, we arrived at a wretched hut, which we could not believe was the place where we were to change horses, which however was the case; but finding no person

to speak to, we continued our journey by roads which no one can conceive the difficulty of, except those who have passed them. We believed that we were very near the post-house, and we travelled till four o'clock, without seeing a single individual to direct us, on our road, or any roof to cover our heads. To add to our misfortune, the rain fell in such quantity, that it made up this night for the three preceding months, during which not a single drop of water fell. The hope with which we flattered ourselves, that we would meet with some peasant's hut, enabled us, notwithstanding the dreadful fatigue with which we were affected, to continue on our journey; but at length the rain fell so plentifully, and the night became so dark, that our horses, disheartened, not having eaten any food, like ourselves, during the whole day, stopped on a sudden, and we found it impossible to make them advance one step.

Behold us then sorrowfully remaining in the middle of the wood, without having any thing in the world to cover us, except the bellies of our horses; and one might do so without danger, for the poor animals were so fatigued, that they passed the night without stirring, and without eating, as well as their masters. Our only consolation was a good fire that we made, which warmed us a little; but nothing could be more amusing than to see us in this plight, all extremely sad and overcome, like men who had not eaten for twenty-four hours, and who languidly bowed their heads, to receive the rain which it pleased Heaven to pour down plentifully upon us. And what tended to make our adventure still more curious was, that next morning, by the break of day, we were no sooner on horseback, than we discovered, at a distance of about two gun-shots a little house, which we had so anxiously inquired after, and to which we repaired to drink some milk. Misfortune is good for something, they say; for this wandering enabled us to reach Coperberyt the next day, which was Sunday, where we should not otherwise have arrived till the day after: we discovered that town by means of the smoke which issued from it, and which resembled more the shop of Vulcan than any thing else: nothing was to be seen on every side but furnaces, fires, coals, and frightful cyclops. It is necessary to descend to the town through holes.* To give you an idea of the frightfulness of it, they conducted us first into a chamber to change our clothes, where we took a stick shod with iron, to support us in the most dangerous places: we at length descended to the mine, which is astonishingly wide and deep. We scarcely perceived the workmen, some of whom were raising stones, others throwing earth, and others making fires, to loosen the mine, and every one, in fact, at his separate employment. We descended this pit by a number of roads which led to it; and we now began to find that we had as yet done nothing, and that this was only a beginning to more serious labours. Our guides lighted their flambeaux, which were scarcely sufficient to dispel the thick darkness which reigned in these subterraneous regions. One sees nothing on every side, and that too by endangering the sight, but subjects of horror, by the aid of some glimmering lights, which are only sufficient to enable one to distinguish them; the smoke blinds, and the sulphur choaks one: add to this the noise of the hammers, and the view of these shades, these wretches, who are stark-naked, and black like devils, and you will be of my opinion, that nothing can be a better representation of hell than this living picture, painted with the blackest and most sombre pictures that can possibly be imagined. We descended more than two leagues into the earth by frightful roads, sometimes on trembling ladders, sometimes on thin planks, and always in continual apprehensions. We observed on the road a number of pumps to raise the water, and very curious machines, which we had not leisure to examine; we only saw numbers of those wretches who wrought at the pumps. We penetrated to the very bottom with great diffi-

* This description is preserved, though nearly a repetition.

culty; but when we began to re-ascend, the sulphur choaked us to such a degree, that it was after inconceivable pain that we regained the first descent: we were obliged several times to throw ourselves upon the earth, and our knees being unable to support us, we were obliged to walk by the assistance of our hands. We at length arrived, after dreadful exertions, at the mouth of the mine: here it was that we began to breathe, in the same manner as a soul drawn out of purgatory. A pitiable object now presented itself to our sight: they were carrying away one of those miserable wretches, who had been crushed by a little stone, which the fall from a great height had rendered dangerous. These poor people expose their lives very lightly: they receive sixpence a day; and there are six or seven hundred men constantly employed in this place. I know not whether we have more reason to pity the lot of these wretches, who work in this infernal place, or to curse the avarice of those men, who, for the purpose of gratifying their luxury, tear out the bowels of the earth, confound the elements, and reverse the order of nature. Boethius had a good reason to say, speaking of his own age,

> "Heu! primus quis fuit ille
> Auri, qui pondera tecti,
> Gemmasque latere volentes,
> Pretiosa pericula fudit?"

And Pliny tells us that the Romans, who had more need of men than gold, would not suffer those mines to be opened which had been discovered in Italy. The Spaniards go to Guinea for wretches, whom they destine to labour at their rock of Potosi; and there are some countries which send those thither whose crimes have merited death, and who continue to dig their graves their whole lives.

In this mine of Coperberyt are found native sulphur, blue and green vitriol, and octadrons; the latter are curious stones, naturally cut into an octagon shape. We departed from this place the same day, to visit the silver mine at Salsberyt: we arrived there next day, which was Tuesday: its real name is Sala; and its situation is one of the most pleasant in Sweden. Next day we went to the mine, which is a quarter of a mile distant from it: this mine has three large mouths, like pits, of which it is impossible to see the bottom; the half of a tub, supported by a rope, is the only stair which leads to this abyss: the water makes this machine move in a curious manner; it wheels about, and turns on both sides, for the purpose of ascending and descending. The imminence of the hazard can easily be conceived; you are half in a tub, in which you have only one leg; a satellite, black as a devil, with a flambeau in his hand, descends along with you, chaunting a mournful song, made on purpose for this descent. The mode of travelling is pleasant enough; but one can scarcely be quite at ease here, when one sees one's self at the end of a rope, and remembers that one's life depends entirely on its strength, or its weakness. When we had reached the middle, we began to experience great cold, which, joined to the torrents which fell from all quarters, roused us from our lethargy.

We arrived at length, after half an hour's journey, at the bottom of the abyss: here our fears began to disperse; we no more beheld any frightful objects: on the contrary, every object sparkled in these subterraneous regions; and after having descended still farther, supported by extremely high ladders, we arrived at a saloon, which is at the bottom of the mine, supported by columns of this precious metal: four spacious galleries next appeared; and the light of the fires which burned on all sides, and which sparkled on the vaults of silver, and a clear rivulet which flowed by their side, tended less to afford light to the workmen, than to render this the most magnificent abode which can well be imagined, and somewhat like the enchanted palaces of Pluto, which

the poets have placed in the centre of the earth, where she preserves her treasures. In these galleries men of all countries are constantly to be found, who labour hard to find that which gives so much delight to the rest of mankind. Some draw carriages; some roll stones; some are dividing rocks; and every one has his different employment. It is a town below another town: here are taverns, houses, stables, and horses; and what is most astonishing of all is a wind-mill, which goes continually in this cavern, and which is employed in raising the water. We re-ascended by the same machine in which we descended, in order to see the various operations necessary to make silver. The first stones which are drawn from the mine are called stuff, and are placed in a furnace to dry, which burns slowly, and separates the antimony, arsenic, and sulphur, from the stone, the lead, and the silver, which remain together. This first operation is followed by a second, when these dried stones are thrown into troughs, where they are piled up, and reduced to powder by means of large hammers wrought by water. This powder is deposited in water, which runs constantly upon a plank placed in a sloping direction, and which, carrying off the grosser particles, leaves the silver and the lead behind at the bottom on a cloth. The third operation separates the silver from the lead, which falls to the bottom in dross; and the fourth serves at length to bring it to perfection, and to put it in a condition fit for the hammer. One would not suppose that so many operations were necessary to produce a metal, which is only an excrement of the earth. The Spaniards at Potosi do not give themselves the trouble of performing all these operations, in order to purify their silver, as they have discovered the method of cleaning it with quicksilver, which being an enemy of all the other metals, which it destroys, except silver and gold, it separates them of all their grosser and earthy matter, in order to unite itself entirely to them. Mercury is found in this mine; and this metal, though some refuse it the appellation because it is not malleable, is perhaps one of the rarest productions of nature; for being liquid, and flowing of itself, it is the heaviest body in the world; and it changes to the lightest, and is resolved into vapour, which, encountering a solid substance, or a cold atmosphere, immediately becomes thick, and re-assumes its former form, without any possibility of ever being destroyed. The person who conducted us in the mines afterwards shewed us, in her possession, a number of curious stones, which she collected from all quarters; among others a large piece of that soft stone, which, instead of being consumed by the fire, assumes a white colour, and which the Romans employed to burn the bodies of their dead. She had found it in this mine, and presented each of us with a small piece of it. We left this little town the same day, to go to Upsal, where we arrived early next morning.

This is the most considerable town of all Sweden, both on account of its university and its situation; it is to this place that all those who intend entering into holy orders are sent, from which profession all the Swedish nobility are excluded; for it is the policy of this country, lest the number of nobles should be diminished, to employ them more usefully otherwise. We saw the library, which contains nothing worthy of notice, except the *codex argenteus* manuscript, written in Gothic letters of silver, by a bishop called Ulphila, in Mesia, about the year 370, found at the destruction of the city of Prague, and brought away by count Koningsmark, who made a present of it to queen Christina. We went afterwards to the church, where we saw the tomb of Saint Eric, king of Sweden, who was beheaded. They gave us his head and his bones to touch, which are wholly preserved in a box of silver. We saw in a large chapel, behind the quire, the tomb of Gustavus the First, and his two wives, one of whom had in her hand a whip, on account of her cruelty. They shewed us in the vestry an ancient idol, called Thor, which the Swedes adored, and a very beautiful communion-cup, which

was a present from queen Christina. There are several learned men here, and, among others, Rudbekius, a physician, who has written a very curious book, which he shewed us himself. This man shews, by all that is contained in authors, such as Herodotus, Plato, Diodorus of Sicily, and others, that the gods came from his country; he gives very strong reasons for it: he persuades us, from the connection which subsists betwixt his language and all the names of the gods. Hercules is derived from *her* and *coule*, which signifies Captain; and Diana comes from the Gothic word *dia*, which signifies *nurse*. He shewed us that the Hesperian apples had been in this place, which rendered those immortal who tasted them. He pointed out to us, that this immortality arose from knowledge, which makes men live for ever. He mentioned a passage in Plato, where, addressing himself to the Romans, he tells them, that they had received their gods from the Greeks, and that the Greeks had taken them from the Barbarians. He anxiously endeavoured to persuade us, that the pillars of Hercules were situated in his country, and a number of other matters, which you may believe if you choose.

We saw in his cabinet many pieces of mechanism; one of the Runic sticks to learn the course of the sun, which the Swedes, according to his account, knew before the Egyptians and the Chaldeans; all the Runic letters are made in the form of a dragon, which, he said, is the same with that which guarded the garden of the Hesperides; the Runic letters which the Swedes made use of were only sixteen in number. Ovenius is still a celebrated physician. Redelius and Loxenius are celebrated, the first for antiquities, and the other for jurisprudence; Columbus for history; and Sheffer, who has written respecting the Laplanders, is much esteemed for logic. In the old town of Upsal a number of antiquities are to be seen, such as the tombs of the kings of Sweden, and the four-fronted temple of Janus, which is one of the subjects on which Rudbekius has written. We went on board a little boat, which was bound for Stockholm, for certain reasons; but the wind, which was favourable, having changed, being still within view of Upsal, we travelled two large Swedish miles, which are equal to five or six French leagues, and arrived at the post-house, where we took horses, and they conducted us in the night time to Stockholm, which we entered at four o'clock in the morning of Saturday, the twenty-seventh of December. Here at length terminated our hazardous journey, of which I would not have been deprived for a great deal of money, and which I would not begin again for much more.

A JOURNEY TO POLAND.

We left Stockholm on the third day of October, 1683, to go to Dalles, for the purpose of finding our vessel, which had departed two days before us. We were escorted by all our good friends a league beyond the city; when we took leave of them, and travelled the whole night; we arrived next day at Dalles. This is the place where the duties upon all the goods which enter, or are exported, are paid to the king of Sweden: it is here where the rocks which surround Stockholm are first observed, and among which it is difficult to travel. Our boat was not yet there, but it arrived on the morrow at mid-day; it came from Stettin, in Pomerania, which belongs to the king of Sweden, and which gave so much employment, during the late wars, to the troops of the elector of Brandenburg, who remained nine months before its walls, which were only defended by a few respectable inhabitants. It has been since given up to the king of Sweden, as well as all the other places he had lost, which the king of France obliged

them to return to him. We set out next day, being Sunday, at day-break, with a favourable wind, which changed immediately after, and obliged us to go for safety to Landsor, near to the place from which we had set sail. We had considerable difficulty in retiring between two rocks, which served us as a shelter from the tempest, which was extremely violent, and we expected a hundred times to be driven among the stones, with which this sea is crowded. The fourth day of October is celebrated for being unfavourable to us: it is just three years since, on this day, dedicated to Saint Francis, my patron, we were taken prisoners by the Turks, in the Mediterranean, within sight of Nice. It is difficult to forget these days, when they are drawn in our memory with such strong and vivid colours. We remained three days in this place; and the wind becoming a little more favourable, we set sail, and came within sight of Wisby, the capital of the island of Gothland. This island, which is the most fertile in all Sweden, was given as an appendage to queen Christina, who has exchanged it and that of Oëland for the city and lordship of Norkopin, in ————. There is a book of the laws of Wisby, which is made use of to compile the regulations of naval commerce.

Fortune, which appeared only to be favourable to us that we might feel more acutely our disappointments, was not long in making us experience her usual caprice: there arose during the night such a dreadful tempest, that, after remaining a long time in continual terror, we were obliged, as soon as day-light appeared, to set sail with all our canvas, to stop for safety once more in Sweden, at Westerwick, in the province of Smaland. In this place we saw two objects deserving of pity; the first was, the general destruction of the city, which the Danes had burned in the late wars, and which was still full of desolation: they were now beginning to rebuild it: The other was more recent, and made us reflect still more upon the danger we had been exposed to; we saw the sad remains of an English vessel, loaded with salt, which had been wrecked, and the crew of which had been with considerable difficulty saved.

We remained in this wretched place six days, during which the wind prevented us from leaving it: I went every day, for some hours, to the steep rocks, where the height of the precipices and the view of the sea accorded very well with my reveries. I have written some of them in my journey to Sweden. At length we sailed; but our favourable weather continued no longer than was necessary to carry us out to the open sea, and to put it out of our power to go to any place for shelter. The tempest became now so violent, that our captain, one of the most ignorant that was ever at sea, had fifty times a desire to suffer himself to be wrecked upon some bank of sand.

We remained in continual apprehensions during more than eight days, that a thick mist prevented us from distinguishing day from night; at length we arrived within sight of the light-house at Danztic, where our captain came foolishly to anchor, and which he approached so near, that two hours afterwards, a dreadful north-west wind having arisen, he gave us one of the most serious alarms that we ever had in our lives. He entered the cabin, in which we were asleep, weeping and crying, like one in despair, and assuring us of our approaching destruction, and that nothing but God could deliver us from the imminent danger in which we were placed. It is vexatious to waken those who sleep soundly to give them information of this kind; but it was to us still more horrible, when, having run upon deck, we beheld the sea in fury, the noise of which, together with that of the wind, foreboded to us nothing but danger; but we were at the height of misery, when, our cable breaking, we felt the vessel, in a dreadfully dark night, strike on a bank of sand. No words can paint the wretchedness of a man who finds himself in this horrible situation; for my part, sir, I remember nothing else, except, that during the whole remaining part of the night I began more than five hundred *Pater Nosters*, and was never able to finish one.

At length morning returned, the most delightful I ever saw; and having hung out our flag, to shew the danger we were in, they came from on shore in wherries to find us, and we were conducted into the city.

Dantzic is situated on the Baltic Sea, at the mouth of the Vistula. The largest vessels come into the streets, which are cut into canals; the entrance to the harbour is defended by an excellent citadel, which they call Mund. This city is under the protection of the king of Poland; but however ostentatiously these gentlemen may talk of their liberty, they have only the name of it, and their protector may, with justice, be considered their master. They lost, four years ago, a number of their privileges, on account of the conduct of one Doctor Stoff, who was the author of a kind of a sedition. The king visited them, and, that he might chastise the rebels, he fined them in large sums of money. The burgomasters gave him a Starostie, called Poschi, which was engaged for twenty thousand ducats. The king also ordered, that all law suits respecting sums above one thousand livres might be appealed to the court of Warsaw.

Dantzic is called *Gedanum* in Latin; and the German word is derived from the verb *dantzen*, which signifies, to dance. The origin of this etymology is the following; a number of peasants generally assembled on the spot where it is built, and intending to build a town, they applied to the bishop, whose property the ground was, for leave to build houses upon it, who gave them as much ground as they could encircle whilst holding each other by the hand, and making a round in the form of a dance.

Dantzic pays about sixty thousand crowns to the king of Poland. There are commissaries appointed at the gates, for the purpose of dividing the customs. The government of the city is divided into three parts. The first division consists of four burgomasters, who are taken from the patrician families, and of thirteen councillors. The burgomasters preside one year each, after one another, and are, as well as the councillors, appointed for life; the second division consists of twenty-four inferior magistrates; and the third of a hundred men.

The principal trade of this city is in corn, which comes down the Vistula, from Poland, and in wax, steel, and amber, which is collected on the sea-shore from this place to Memel. It is true, that this fishery belongs to the marquis of Brandenburg, who farms it out for more than sixty thousand crowns. When the wind is high, then is the fishery most productive; and at this time, also, the guards and the farmers discourse together, and ramble on the shore with more exactness; and they are strictly prohibited, under pain of death, from purloining the smallest quantity. It is soft before it has been exposed to the atmosphere, and will take the impression of a seal; there are many pieces found with flies in them. I was astonished, when I was told what a great traffic is carried on in this single article; and as I make little use of it myself, I believed that others consumed no more than me; but I learnt at the same time, that the chief trade of the Dutch to India consists of amber, where they consume it greedily. A great Indian lord will sometimes burn, at one grand feast, more than twenty thousand crowns worth of amber; and the odour of it is not only agreeable to the smell, but is also very medicinal, and useful in curing pains of the head.

Their traffic also consists of ashes, honey, and litharge.

The fortifications of the city are very well kept in repair, and equally serve to adorn and defend it. The gate called Hædor is a piece of excellent architecture; and I have never seen any thing better proportioned. We observed in the city very spacious streets, which are, however, disfigured by the large balconies which occupy the half of them. There is in the middle of the great square a fountain, which represents Neptune, in bronze. The houses are very handsome, and well furnished.

The arsenal is very large, and adorned with several beautiful pieces of cannon, but the great church is a structure equally beautiful on account of the height of the roof, and the elegance of the carpenter's work. There is in this church a certain hole, into which the Lutherans threw all the saints and all the ornaments that they found in the Catholic church; and, on this account, they call the place hell.

The Catholics have three or four churches, the services of which are performed by Jesuits, Jacobins, Carmelites, and decayed Carmelites; and I was never more surprised than when I first attended mass: when the priest was on the point of raising the host, I was rather informed of the action which he intended to perform by the noise of the strokes which his assistants gave themselves, than from the noise of the little bell, which it was impossible to hear. Few men are so religious, in appearance, as the Poles; they are very strict observers of the fasts ordained by the church. They eat no butter on meager days, but only linseed oil. They can take no flesh on Fridays; and there would be danger of eating it in Massovia; and a Pole would believe he performed a meritorious action, if he killed a man in that state.

What is also remarkable at Dantzic is, the mill with thirty wheels, which produces a ducat to the city every hour. There is in the great church a remarkable picture of a Flemish painter, who, on his way to Rome, was taken by Corsair Turks, and afterwards retaken by the Christians; his name was John of Chêne, from Antwerp. He has so well represented the last judgment, that nothing more excellent can be conceived. I have never seen such a finished performance; although it is certain that justice of design is not to be found throughout every part; it is said that an elector of Brandenburg offered fifty thousand crowns for it. We ascended to the top of a spire, from whence we commanded a view of the whole city, and of the sea, which is half a league distant from it. It is nearly of the same size with Orleans; but there the houses are more crowded together, and there are also a much greater number of inhabitants.

As for the ladies it is necessary to give them their due. I have never seen in any country a greater number of beauties; they are all very fair, and are extremely agreeable. The wives of Messrs. Mathias are extremely handsome, and especially the youngest, who might pass for a perfect beauty.

We observed the Polish dance, which is peculiar. The servants march before, and the masters follow; they do scarcely any thing else but march.

There are oxen in this country of a prodigious size; they are brought from Podolia, which belongs to the Turks, or from the Ukraine, the best part of which belongs to them also. This province of the Ukraine is inhabited by the Cossacks. The soil is so good, that it is sufficient to sow seed in it once in three or four years; that which falls from the sickle in cutting is sufficient to sow the crop; and those who wish to sow them a second time, gather in the same manner. There are few finer countries.

We understood at Dantzic that M. de Bethune was very much esteemed by the Poles, and extremely generous. At the election of the present king of Poland, not one general of Lithuania opposed his coronation; but the rest wished for the prince of Lorraine, or that of Neubourg. The prince of Lorraine married a princess Mary, dowager queen of Poland; but he was not supported by France.

The king, Michael Coribut Wesnowischy, was chosen king as if it had proceeded from the vexation of those, who could not agree before the election. He received a pension of five thousand livres from the queen for his subsistence. He died very opportunely; for the Poles were deliberating about his deposition. His funeral obsequies were performed at the same time with those of king Casimir, who died at Paris.

The prince of Condé has several times in the diets been proposed as king; but the Poles are too much afraid of him: they are extremely apprehensive that he would be desirous of encroaching on the liberties of Poland, of which they are extremely jealous. Count St. Paul died two days too soon, and was deprived of the pleasure of seeing himself king. He had been chosen by common consent; but Heaven ordained otherwise. The Poles made some scruples about crowning the queen, because the dowager was still alive, and wished to relieve the state, which was unable to support two queens; but the king had taken his measures with such prudence, that she was crowned a short time after him.

The starosties are the governments of a province; the king gives them to the gentlemen, and cannot deprive them of them.

The cities send deputies to the diets, which the king assembles when he pleases; and the most insignificant of these gentlemen, or of these envoys, can put an end to a diet; for there is a law in Poland, by which it is enacted, that their affairs must be decided, *non pluralitate* votorum, sed nemine contradicente, 'not by a plurality of voices, but by unanimous consent.'

The wayvodes, or palatinates, are larger than the starosties; they are subdivided into starosties.

The palatinate of M. Vaubrenic, called Boncosci, was injured by a Polish gentleman, who abandoned it, and was received and brought to France by him. Madame, the marchioness of Bressoi, his aunt, was expelled from the court, and obliged to leave the city by the intrigues of the queen, who dreaded the king's engagements, and felt some pangs of jealousy. The story adds, that it was Seinkamer, called the Wolget.

We saw, on the day of our departure, the great Hevelius, professor of astronomy, one of the learned men of the age, who received pensions from a number of princes, and, particularly, from his most christian majesty. This man shewed us all the works which the fire had spared. He related to us, with tears in his eyes, the loss he had sustained by a dreadful fire which had happened two years ago, had consumed more than forty houses, and which unfortunately had begun with his.

This great man has continued to labour, night and day, for nearly fifty years. At night he is employed in observing the stars from the top of his house, with glasses more than a hundred and eighty feet in length; and during the day he reduces to writing what he had observed the preceding night. Among several other learned subjects on which he entertained us, we learnt that he was of the same opinion with Copernicus; and he told us that it was perfectly absurd to believe that the heavens turned round the earth, and he supported his assertion by several demonstrations, by which we were convinced; he shewed us, on this subject, a terrestrial and celestial globe, which proved in a surprising manner that which he told us; he mentioned, as one of his strongest reasons, that he always remarked at one time the same distance betwixt the earth and the fixed stars, which are attached, as well as the sun, to the firmament; and that at another he found that it was much more distant from them; which convinced him that the motion was in the earth, and not in the heavens; and on this subject, we having told him that this opinion was condemned among us as heretical, he told us that Father ———, confessor of his holiness, had written to him on this subject, and pointed out to him that the church condemned this opinion, till it was proved; but, so soon as any one had demonstrated it to be true beyond a doubt, he would then find no difficulty in adopting the more probable opinion. In the observation which he made at first upon this motion of the earth, and upon this nearness and distance from the stars, he thought he had been mistaken, as he told us, in his calculation; but having, during

a lapse of fifty successive years, made the same observation, he had now no doubt of the truth of his opinion.

He also told us that he had discovered the libration of the moon, which no person before him had been acquainted with, and the knowledge of which had been of great use to him in all his works, the number of which exceeds all belief. He has dedicated them to almost every prince in the world, and the volumes are full of plates made with his own hand: he shewed us them all, besides fifteen large volumes, as thick as the lives of the saints, full of letters, which the most learned men of the whole world had written to him on various subjects.

The moon is a round body, full of depressions and elevations. He has drawn a chart of it several times, and has given particular names to the mountains and remarkable places which he has observed; not that there is any water in the moon, but a certain kind of matter, which has the same appearance with water. He is at present constructing a globe of a spherical form, in which he intends to shew all the scientific discoveries which have been made during more than fifty years: he is assisted by the king, to whom he intends to dedicate his performance. He shewed us the most beautiful geometrical instruments that I have ever seen, and a piece of amber, on which, as soon as it was drawn from the sea, he imprinted himself the impression of a seal, whilst it was still sufficiently soft to receive it; for the moment it has been exposed to the air it becomes hard, as we observe it.

The marquis of Brandenburg has made a present to the emperor of a chair of amber, which is said to be the greatest curiosity in the world; and to the dauphin, a mirror of it, which is considered a master-piece. This prince is certainly the most powerfull of all Germany; his territory is more than two hundred miles in extent; and the province of Prussia alone, of which he has only a part, produces of revenue to him more than twenty-six thousand crowns a month. He gave a feast this last summer, when he was at Pyrmont, in which he expended, according to report, fifty thousand crowns: there were present forty royal persons, that is to say, descended of royal families, or of sovereigns. The two queens of Denmark and prince George were present. His court is more splendid than any other in Germany, and if he be destitute of the rank of a king, he is not destitute of the heart, the court, and the revenues of one.

The elector of Brandenburg is called Frederic William, great chamberlain of the empire, and has married Louisa Henrietta, daughter of Frederic Henry, prince of Orange. He has a son about fifteen years old, called the Court Prince; he is of the Calvinistic religion. We lodged at Dantzic, with Payen, in the Schyher Gulden Haus. We knew there M. Macé, watchmaker, who had resided long in Constantinople, and who purchased his wife there, who is from Dantzic; the story is very interesting. This Pole is called ———, and his brother is now agent at the Constantinopolitan court, where he himself had been with his father, who was ambassador.

We kept up a correspondence with the Transylvanian Michael Apaffei, whom France bribed largely to grant a passage through his territories to sixty thousand Frenchmen, and an equal number of Tartars, whom he kept in pay during the last wars, and who necessarily diverted the attention of the emperor. The duke of Transylvania is chosen by the states of the country, and is confirmed by the grand Turk, to whom he pays tribute. He swears, on his arrival at supreme power, to maintain in the country the free exercise of five religions, which are, the Roman-catholic, the Greek, the Lutheran, the Calvinistic, and the Anabaptist. He receives tribute from the princes of Moldavia and Wallachia.

The late prince of Transylvania was called Ragotski, of the kingdom of Hungary; and his predecessor was Bethlem Cabor, who married Catherine of Brandenburgh.

We set out from Dantzic for Warsaw on Wednesday the twenty-ninth of October, in a little covered chariot, which we hired for four-and-twenty crowns, current money of the country, which amount to about twenty French livres. On our departure we passed through a very large suburb, a German mile in length, which is called Schotland. The road is very fine, the country very good, and the inns very wretched; but one does not observe this wretchedness, because it is the custom in Poland for travellers to carry every necessary along with them, even their beds; for in the inns nothing is to be found but what one carries. This custom has its advantages and its disadvantages; one disadvantage is, that it becomes necessary for one to carry a great equipage; but it has this advantage, that one always has something good to eat, and that one always sleeps in one's own bed; which is undoubtedly a great convenience for a traveller, who is very happy at enjoying repose at night, after the fatigues of the day: this consideration alone is sufficient to make one support the toil of a journey.

The reason why nothing is to be met with in Poland is, that the gentlemen take every thing from the peasant, and pay him most frequently with stripes. All the peasants are born slaves; and so great is the power of the lords of the soil, that it extends even to the jurisdiction over life and death; and when a gentleman has killed one of his peasants, he is acquitted by paying ————, which amounts to about seven francs of our money; and this sum is employed to bury him.

The lands are not sold according to their value, but the number of peasants which are upon them: they are obliged to work five days in the week for their master, and the sixth for themselves and their families, who are more wretched than it is possible to express. It frequently happens that the lords, having need of money, sell to their slaves their liberty for a certain sum of money; but without this they are not permitted to remove their habitations: and a peasant who should be found in flight would undoubtedly be massacred by his master. This dominion extends over the women, as well as the men, and even somewhat further; and if the peasant has a handsome daughter, the gentleman does not fail to take the privilege of the lord of the soil.

We passed through Graudentz, a city situated on the Vistula, which is a magazine of the grain which is carried down this river to Dantzic and Culm, where we attended mass, in a very fine church, on Toussaint's day; and we arrived at Thorn, a city finely situated, which for this reason is called Die Schenste, the handsomest.

Thorn is a free city, under the protection of the king of Poland, like Dantzic, and it is the capital of Prussia-royal; it is almost in the middle of the distance betwixt Dantzic and Warsaw. The government is almost like that of Dantzic, except that the four burgomasters are changed every year, fifteen days before Easter, on the Sunday of Judica. These four burgomasters are elected; but the burgrave, who is the chief, is appointed by the king of Poland. We went to see the town-house, which is very magnificent; and in the magistrates' hall are portraits of the kings of Poland, from Casimir the Fourth, who reigned forty-five years. To him succeeded John Albertus, who sat on the throne eight years; and was followed by Alexander, who reigned five years; and after him Sigismond the First remained on the throne forty-one years: Sigismond Augustus was next elected, who remained king four and twenty years; but his successor, Henry the Third, who was afterwards king of France, reigned only three months. This prince received two crowns, and had for his motto, *Manet ultima cœlo;* but others changed *cœlo* to *claustro.* After him came Stephen, who reigned six years; and Sigismond the Third, king of Sweden and Poland, succeeded him. The former kingdom

was snatched from him by Charles the Ninth, his uncle, whilst he was in Poland. This prince was chosen king of Sweden, and engaged at his election to live every fifth year at Stockholm; but being unable to keep his promise, on account of the continual wars in which he was engaged with the Turks, the Tartars, and the Muscovites, he determined to send them a senate, composed of forty Jesuits, who should represent his court: this senate was received at Dantzic with great magnificence, and embarked for Stockholm; but intelligence of their departure being received at Stockholm, the council assembled, in which Charles, the king's uncle, presided, who dissuaded the Swedes from receiving a government of priests; and the vessel containing them having arrived in the road, he went in a twenty-gun vessel, under pretence of receiving them; and having given a salute rather too rough to the vessel containing the holy brotherhood, he drove it to the bottom, without attempting to save any Jesuit, whom he jeered, in crying to them, *Perform now your miracles, as in Japan, when you walked on the water.*

Sigismond in this manner lost his crown of Sweden, which his uncle acquired; who, knowing well that there was no better means of exciting a war than under the pretext of religion, expelled all the Roman-catholic priests, and established the Lutherans in their stead. He was engaged in a war with his nephew in 1604, which continued two years; but the king of Poland was unable to undertake any attempt of consequence, from the attention which it became necessary to pay to the Tartars, who pressed him strongly on the other side.

This did not prevent the kings of Poland, after Sigismond the Third, from taking the title of kings of Sweden, until the time of John Casimir, at the last pacification, which took place at Oliva, near Dantzic; where it was ordained that John Casimir, being the last of his family, should condescend to enjoy this title only during his life-time, in his intercourse with all the princes of the world who should give him this title, except the Swedes.

Sigismond had two sons, both of whom succeeded to the throne: the eldest was Uladislas the Fourth, who reigned fifteen years. It was during this reign that the celebrated entry of the Poles into Paris, to demand the princess Mary for their queen, took place. Uladislas being dead, his brother Casimir was chosen in his stead, who married his brother's widow, and reigned sixteen years, at the end of which he resigned the crown, and retired to pass the remainder of his days in France, where he died. To him succeeded Michael Coribet Wesnowischy: this prince was too good; and his nobles despised him to such a degree, that they put it into his head to retire into a convent, which he would have done, if death had not prevented him. The queen agreed to it, because she was to have been married to count St. Paul, whom the majority wished to raise to the throne. It was under him that Sobieski, who at that time was only grand marshal, gained the famous battle of Cochin, in the Ukraine, between the Niester and the Pruth. The Turks were encamped and well entrenched under a fortress; and the Poles, being about eighty thousand men strong, having passed the Niester on Sunday, encamped the following days almost within sight of the Turks. Thursday and Friday were spent in making some skirmishes, and on the evening of this day the Poles charged the enemy. This attack continued the whole night, and on Saturday morning the defeat commenced, and continued only two hours, during which more than eight-and-thirty thousand Turks were killed, without giving quarter to a single individual. Hussain Pacha, who commanded the Turkish army, with great difficulty saved himself, with two thousand men, who alone remained of the whole army, which amounted to more than forty thousand men, and which by flight avoided the fate of their companions. The booty was great, and it was wholly given up to the soldiers, except the tent of

Hussain, which was carefully preserved, and sent as a present to the king. Nothing could be more superb than this tent: it had more the appearance of a city than a pavilion of war, and all the officers were lodged in it. Hussain Pacha repassed the river with near six thousand men; but the bridge fell when the whole army was upon it, and more than four thousand men were drowned, without any relief to those who experienced the cruelty of the waves, except that of being cut to pieces by their enemies.

The king Michael received this intelligence with great joy, and this caused his death, which happened eight days after. There were great factions after his death, as always happens in Poland on similar occasions. Sobieski was then grand marshal, and general in chief, and he made the whole army swear before he left them, that they would give their votes for the prince, although at that time he was not beloved by the lesser nobles. M. de Beauvais was sent from France; and whether it was not the interest of France that the prince should become king, or that he found too many obstacles among the nobility, he made before the assembled senate one of the finest speeches ever delivered, telling the republic that both in gratitude for past services, and in the hope of those which might in future be received, no election could be so favourable to the public good as that of Sobieski, who in consequence was chosen king, and afterwards crowned at Crackow, under the name of John the Third.

The dowager of king Michael has since been married to the prince of Lorraine, who has more influence than any other at the court of Poland, if the intrigues of France had been less powerful, and if it had not been wholly her interest to prevent this prince from arriving at the throne, since by this new acquisition of power he might have been enabled to undertake some enterprise against France, for the recovery of his duchy.

Although Poland be united to France by friendship, without having much intercourse with her, it is more her interest to remain on good terms with the emperor, whose growing strength in Hungary is alarming. It was made apparent two years ago that the Poles were not ignorant of this maxim, when M. de Bethune was at that court, for the purpose of fomenting the rebellion of the Cossacks, both by means of men and money. The queen ordered the recruits which M. de Bethune was sending off to the rebels to be arrested, near the Hungarian mountains, by the Palatine of Russia, by which she evinced that Poland had no concern with what passed in that quarter, and that the whole proceeding originated with the court of France, which, for want of money, allowed the troops commanded by M. de Guenegaut to be disbanded. These troops were composed of some Frenchmen, Tartars, but the greatest part were rebels, who, finding that it had been more than two years since they had received any pay, they mutinied against their generals, whom they attacked and arrested prisoners in a village, where they wished to massacre them.

This conduct of the palatine of Russia, ordered by the queen, produced a great alteration in the mind of M. de Bethune, who was a considerable time without attending the court, which was also the case with madame the marchioness, who could not remain on good terms with the queen. M. de Bethune did not wish well the more for this action to the palatine of Russia, under-general of the crown, and in some degree put him at defiance, by telling him, if they were each of them at the head of five hundred horse, it would be seen who was superior: however, they afterwards became friends, and the palatine afterwards made a present of a fine Turkish horse to M. de Bethune.

M. de Bethune was extremely popular in Poland: no man ever sustained his character better in that country than him; he always kept open table, and had more than a hundred persons in his house: he lodged at the Cassimerian palace, built by the princess Mary.

The diets are held once in three years; two are held in Warsaw, and one at Grodno, or Wilna, the two most respectable cities of Lithuania. This province has the same officers with Poland, and general Spas is commander in chief in Lithuania. It is said in the country, that it might so happen that the Lithuanians might choose a king; they see themselves despised by the Poles, and even by the king, who has not the same regard for them as for his other subjects: it is feared that they may put themselves under the protection of Muscovy. They cry out for war in every diet; but they, as well as the Poles, are in no condition to carry it on.

When war is declared, you see all the little gentry on horseback attending the army: they remain as long as their provisions last, which consist of a great number of little cheeses, hard as wood, a kitt of butter, and something else of that nature; and when this is consumed, and they have eaten the price of their horses, they return home, and are thus in a very poor state for continuing the war.

The last diet was held last year, and was broken up by a little gentleman, who was of a different opinion from the rest. It was at that time that the affair respecting the ambassadors took place, who returning from the castle were insulted by some Poles, who had endeavoured to seize the sword of a page: he drew his sword; but some gentlemen having alighted from their chariots, among others the marquis of Janson, the whole was appeased. The Poles departed for assistance, and returned with nearly three hundred persons, to fall once more upon the attendants of the ambassadors, with hazel sticks and cudgels, crying, *Zabi, zabi, fransleute; tue, tue.* The attendants alighted from the chariot, and went into the residence of the palatine of Russia, where they defended themselves as well as they were able against this multitude, whom the presence of the ambassadors was unable to overawe, and which could not prevent several gentlemen from being wounded, and some remained apparently dead on the spot.

The king came next morning incognito to the ambassadors, who lodged at the Holy Cross with the fathers of the mission, to settle matters: the palatine of Russia came thither also, and offered to put all his people into the hands of the ambassadors, to treat them as they thought proper. Envoys are sent from all parts to these diets: some were there from Persia, Turkey, and Muscovy. The Muscovite was conducted in the chariot of the grand marshal, drawn by the king's horses. The Turk was there, on account of the limits which he had established with near thirty thousand men seven leagues from Leopold, according to his inclination, for they were in no condition to contest with him. This gave great vexation to many individuals who had property in that quarter, who however received promises of being otherwise recompensed. This is a pretty good way of establishing boundaries, at the head of an army.

The first office belonging to the crown is that of general, which is possessed by prince Nitre, nephew of the king, although older.

The second is that of grand marshal, possessed by Lubomirsky.

The palatine of Russia is under-general.

The chevalier Lubomirsky is grand ensign, and M. de Morstain is great treasurer of the kingdom, without being obliged to give any account: he is immensely rich, although it is not yet eight years since his circumstances were very straitened.

All these offices are sold by the possessors of them; but if they happen to become vacant by death, the king disposes of them.

The archbishop of Gnesne, who is at present ———, is primate, and first prince of the kingdom, born a legate, and governs the whole country during the interregnum, which continues a year. The money is marked with his image.

There is almost no other kingdom in Europe, except Poland, which is elective. The

king proposed at the last diet that they should recognise his son as his successor; but the Poles said that they could only recognise him as son of the grand marshal, his father filling that office when he was born. The troops are raised and paid at the expence of the republic, which supports only five or six thousand men, for the purpose of protecting the frontiers from the incursions of the Tartars. They have some regiments of hussars, who are men armed in a very particular manner. To equip one of these hussars costs more than two thousand livres: they have large horses, and carry a tiger's skin upon their shoulders, a quiver and arrows behind their back, a coat of mail upon their head, a sabre, pistols, and a cutlass. The servants of these men precede the squadron on horseback, with a lance in their hand; and it is very singular that these people have wings fixed to their backs: they rush occasionally into the midst of their enemies, and frighten their horses, who are accustomed to these visions, and make way for their masters, who closely follow them. The republic has also some Tartars whom it supports in time of peace, who are, like the Swiss, willing to hire themselves out to those who will pay them: these are in other respects the worst troops in the world: they shewed clearly that their horses were better than themselves, when, observing the Swedes passing the Vistula, they chose rather to avoid than to await them, and left king Casimir, who had only leisure to help the queen into her chariot, and who saw from his residence the Swedes pass the river, and enter into Warsaw; and, on the other hand, observed the Poles and the Tartars flying swifter than the wind. They ravaged the whole city, conducted by Gustavus Charles, father of the present king, who gave a wished-for permission to his soldiers to carry away the beautiful column at the entrance of the gate of Warsaw, provided they removed it without breaking it.

In the last diet it was resolved that no candles should be lighted there, to prevent those who slept from being seen; for it often happens that as the Poles go to the diet at three or four o'clock, after dinner, when they have drank too freely, others took the opportunity of passing some resolutions, while they knew those who were of an opposite opinion were asleep, and which consequently passed unanimously: it is on this account that they have been anxious to banish light from their assembly, that the confusion in it may be increased, if indeed it could be greater, and that those who slept might not be observed.

Warsaw is in Mazovia, the capital of Upper Poland, and is the place where the diets are held every three years. This city is situated upon the Vistula, which comes from Cracow, and on which a great quantity of commodities are conveyed from Hungary, and chiefly wine, the most excellent which can possibly be drunk. It contains nothing worthy of observation, except the statue of Sigismond the Third, erected by his son Uladislas, which is placed at the entrance of the gate, on a pillar of jasper, at which the Swedes fired several cannon: the gilding of the figure is deeper than the thickness of a ducat. The city is very dirty and very small, and, properly speaking, consists solely of the great square, in the middle of which the town-house is situated, and around it there are numbers of shops kept by Armenians, very richly furnished with stuffs and merchandise, in the Turkish manner, such as bows, arrows, quivers, sabres, carpets, knives, and others: here they have a great number of churches and convents. We saw the Cassimerian palace, built by the late queen, which is at present so much neglected, that every part of it is falling to decay: we saw there several of those chairs, by means of which they ascend and descend from one chamber to another. It was from this palace that the queen beheld the Swedes pass over the river, which washes the feet of the walls; and it was here where M. Bethune dwelt.

We went to pay a visit to M. Lubomirsky, grand marshal, who is one of the richest

princes of Poland. His father was generalissimo, and entertained great jealousy of Potosky, another general: however they became friends in consequence of the marriage which Lubomirsky brought about betwixt his son and Potosky's daughter: she is dead, and this prince has since married the daughter of the great chamberlain. Lubomirsky, his father, took up arms against his king, and defeated his troops several times: he was accused of favouring Austria in the approaching election, and of assisting the great party of the confederation.

This nobleman shewed us his whole house with great condescension; he purchased it five or six years ago, and had an excellent bargain of it; it is called Jesdoua, and is only about a cannon-shot distant from the city. This prince is constantly building in his garden hermitages and baths, which are very beautiful. His palace is full of a great number of very beautiful originals, which he has collected at a great expence. His gallery is very curious: he shewed us a large piece of mechanism, which he had received from the neighbourhood of Augsburg, which contained a clock, a chime of bells, a perpetual motion, and a number of other things; the whole was made in the form of a large cabinet of silver.

He shewed us the spot on which his grandfather had gained the battle over the Turks at Choczim, where Osman was present, and where several thousand of the enemy were left on the field of battle. This place is favourable to the Poles; they have gained two signal victories on it, and especially the last, which tended not a little to the peace which succeeded.

We went to the castle, which contains nothing beautiful, except the chambers of the senate, and that of marble, where the taking of Smolensko by the Poles from the Muscovites is painted, and where they killed great numbers, and took two sons of the grand duke prisoners, whom they brought to Warsaw, where they died; and a chapel was built for them, which is still called the Chapel of the Muscovites, and is situated before the place where we lodged. There is in the castle some very fine tapestry, wrought with gold, which was brought from France by king Henry; a part of it was pledged to the inhabitants of Dantzic by Casimir, to induce them to relieve the necessities of the state.

The palace of M. Morstain, grand-treasurer of the kingdom, is the most magnificent of all, both with regard to the fine effect of the structure, and the richness of the furniture with which it is adorned. This nobleman received us with all possible affability; he shewed us all the apartments of his palace, and a number of pictures in his gallery. We saluted the treasurer's lady, who is a native of Scotland, whom we met with at general Bearn's, who served in the French army in Hungary. M. Morstain has purchased from the Marquis de Vitri the territory of Montrogue, in France. He pretends that his son, who is called M. de Chateau-Villain, and whom the queen in derision denominates Little-Villain, will remain in France, and possess all his property there; and what remains in Poland is to be the property of his grand-daughter, who is now marriageable. He requested us to take a repast with him.

The house of the palatine of Lublin is also to be seen.

General Spas is chief general of Lithuania: he made a strenuous opposition to the election of Sobieski; but it was carried by means of money.

It is prohibited under severe penalties to draw a sword during the diets, and to fight any where in Poland within three leagues of the king and the grand marshal.

M. de Beauvais only proposed in his harangue the prince of Noubourg to be elected, and did not give himself much concern who was king, provided it was not the prince of Lorraine. The election of the king takes place in the country, where they erect a wooden structure. A circumstance took place at the coronation of the present king,

which never happened before, and which will probably never happen again, which was, that the king followed the bodies of two others, king Michael and king Casimir, to the grave. The coronation takes place at Cracow.

King Michael had a little soul; he took pleasure only in procuring images and watches; and requesting from the queen one day a watch, he told her he wished to make buttons of it to his waistcoat. When he was elected, the queen settled a pension on him of five thousand livres; M. Seryeant lent him a third part of it.

The Poles are extremely proud, and plume themselves highly upon their nobility, the greater part of whom are obliged to till the ground, so wretched is their condition. A petty nobleman wears his sabre while proceeding to cultivate the ground, and lays it down beside some tree; and if any one passing would refuse him the appellation of Mouche-Panier, and simply call him Panier, which is equivalent to Mr. he would be treated very roughly.

In other respects they are very civil, and are always the first to put their hands to their hat: they are great observers of fasts, and practise more abstinence than is demanded of them. Some Poles eat no flesh on Monday and Wednesday; on Friday almost nobody eats butter; and on Saturday they eat nothing boiled, but take that which has been roasted. This devotion extends towards all the animals; and our valet having one Saturday given some fat to a dog, our hostess wished to punish him, thinking she was performing a meritorious action.

The Poles lay out considerable sums on their interments, and delay them a long while, from motives of magnificence. There are great lords, who are not interred for five or six years after their death, and who are deposited in heated chapels, which cost large sums. On the day of interment they cause armed men to enter, like the ancient chevaliers, who come, as if on horseback, into the church, and run to break their lance at the foot of the coffin.

The house of the fathers of the mission, where the ambassadors lodge, is very large. They built a church, called Holy Cross; but it remains there till some good man finish with his pence that which the fathers have begun. They were established with the religious of St. Mary by the late queen; they are very rich, and the bishop of Cracow is at present establishing them in his diocese: the superior was not there, but we saw father Mumasan.

The rebels of Hungary have revolted, on account of religion, against the emperor, who wished to deprive them of liberty of conscience.

Michael Apaffei is prince of Transylvania: he swears, at his accession to power, to maintain four religions in his states. The greatest pleasure of this prince consists in drinking, and whoever is able to do so, is sure to make his fortune in his service. The capital of Transylvania is Cuisvar.

The young prince, six or seven years old, is educated in the disposition of his father, and carries always a bottle at his side, in the form of a bandoleer. M. Acakias was a long time the resident in this country; at present it is M. du Verdet. The chevalier de Bourges, who left it with M. Acakias, but who, being sick, stopt at Leopold, assured us that he had, in a feast which he gave to the resident, taken the hair of a slave, and having passed a stick across, he took pleasure, for the purpose of diverting the company, to make him swing during the whole repast: he afterwards obliged him to run quite naked eighteen leagues, at the side of the chariot of the princess Telechi; this is the wife of the minister of state, through whose hands every thing passes. The prince does not open even a single letter, and thinks of nothing but drinking. This Telechi is the most barbarous man in the world; there are more irons in his house than in Marseilles,

Telechi is the chief of the army, and supports the rebels. This prince of Transylvania pays eighty thousand crowns of tribute to the Grand Seignior: this year he has paid double tribute, because some Turks had been killed on the territory of Transylvania.

Bethlem Gabor was the first who became tributary to the Porte; he paid ten falcons. His successor Michael Basons was obliged to pay ten thousand crowns; and Ragotski paid twenty; and the present prince pays eighty thousand.

We travelled from Javarow to Javarouf in six days; it is a distance of about forty leagues. Javarouf is the most abominable place, not only of Poland, but of the whole world. The court remained here this winter, on account of the pregnancy of the queen, who intended to lie in at this place. The court stops but a short time in one place: it travels constantly, and in the most agreeable manner imaginable; for the whole of Poland is the finest country for hunting I have ever seen, and this journey is a continued chace. We had the honour to salute the king, and to kiss the hand of the queen. This prince received us with all that goodness which he shews to every one, and especially to strangers: he took great pleasure in making us relate the particulars of our voyage to Lapland, and he never ceased to interrogate us respecting it. The queen had equal curiosity, and wished to be informed of every particular. This princess is one of the most accomplished in Europe; she is about thirty-eight years old, and nature has been pleased to impart to her a portion of all her gifts: she is the finest person at court, the handsomest, and the most witty: it is only to see her, that she may be known; but one is the better persuaded of her excellencies, when one has had the honour of conversing with her. It was she who placed the crown on the king's head; and ambition, which is the noble failing of great souls, was enjoyed by this princess in the highest degree. It was she who incited the king to endeavour to ascend the throne; and for this purpose she spared neither money nor promises, and exerted herself so much, that she was at length successful, notwithstanding the great intrigues of the prince of Lorraine. It is true that the arrival of M. de Bethune was of no little use; he arrived the night before the diet was to have been finished, when it was intended to proclaim the prince of Lorraine king the day after; he made such use of the little time he had, and he managed the members of the diet so successfully, that they prolonged it for some days, during which time he had leisure to act with that success which he met with.

The royal family is the most accomplished which can be any where met with. The eldest prince is called Louis Henry Jacob; the king of France, the queen of England, and his grandfather, were his god-fathers and god-mother. This prince is in his fourteenth year, and promises every thing that can be expected from a great prince; he is handsome, dances well, and speaks four languages as well as his own, the German, Latin, French, and Polish: to gratify the king, who knows these languages perfectly, he says, that he wishes to learn all the languages of Europe. The princess, about six or seven years of age, is very handsome, and was crowned before she was born. The prince Alexander, six years old, is the most amiable prince that can be seen: there is also the prince Amour, three or four years old. The queen, who is at present pregnant, has had fourteen children, and is still as fresh, and in as good health, as a woman of twenty years of age. I had the honour of holding the game of the king at ombre, of playing with him, and, to crown me with honour, of eating with him at his table, the ambassador being placed on his right, and I on his left. The master of the horse was there, with the staroilat of ———. We this day accompanied the king to the chace. Poland is a country wholly adapted for this amusement: this is expressed by the word itself; for *Poln*, from whence the word is derived, signifies level country, in the Sclavonian language. But the chace is not conducted here as in France: they make an en-

closure of nets, near which they place soldiers, who drive out the game at an opening which is left for that purpose: they send in a great number of dogs at this opening, accompanied by huntsmen on horseback, to assist them, who drive out all the animals which it contains. Every one takes his post, two musket-shots distant from each other, and when any animal appears, whether wolf, fox, roe-buck, &c. they let loose such a number of greyhounds, that the animal must be very fleet, if it can escape. We were extremely successful this day: in less than four hours we took more than ten roe-bucks, three wolves, five or six foxes, and a number of hares; but what rendered the hunt delightful and bloody, was a wild boar, of the size of a horse, who was killed, after a long contest with the dogs: he killed some of them, mangled others, and wounded both men and horses; but at length he was killed by the shot of a blunder-buss: they carried him on a little cart to the king, and every body owned that they had never seen so furious an animal. It was necessary to procure a chariot for the removal of the mangled dogs, in the same manner as the wounded are removed after a battle.

We saw at the court M. de Vitri, ambassador extraordinary, who received us with particular kindness. During all the time we were at court, we had no other house and no other table than his. We saw at his house M. de Valalé, his equerry; M. Noblet, who departed for France the day after we arrived; Mess. Pelissier and Devilles, secretaries; the marquis of Arquien, to whom the queen gives twenty thousand livres a year; this is the rendezvous of all the French, for pleasure and for play; the count of Matigny his son, who is captain of dragoons, and to whom the queen gives two thousand crowns. We saw at the house of the marquis of Arquien M. D'Alerac, M. de Valalé, &c.

The queen has three French gentlemen, Mess. Ryon, Forges, and Villars, who was in the Swiss regiment of Monsieur: he made a tour through France.

We knew at the court the master of the horse, M. Jalonsky, vice chancellor of the queen, who is a man of genius; M. Sarinski, king's secretary; M. Dalanty, an Italian secretary of the king; and M. Dumont de l'Espine, valet de chambre.

In Poland it is a custom to make presents on festival days. The princess Radzivil is called Catharine; her fete took place while we were at the court; the queen made her a present, and wished that there should be a dance at the court.

These kind of dances never terminate; and from the beginning to the end every one dances with his own partner without stopping.

They have a mode of dancing in the Russian manner, which is very pleasant: M. the chevalier Lubomirski, grand ensign of the kingdom, dances it perfectly well.

They never dance more than at marriages, where the king is at all the expence during the six or seven days in which the wife does not live with her husband; and the day in which she is put into his possession, he treats every body.

The Poles are proud, are extremely vain of their high rank, and lay out every thing to procure a fine horse, an elegant dress, and a beautiful sabre: they are handsome; but in this the women do not resemble them: with difficulty could two be found at the court, who were supportable. They gratify themselves with a number of attendants; and the petty nobles, who have nothing to live on, attach themselves to some of the richer.

The women almost never go abroad, and go to embrace their husband's thigh when they return home: this is the most customary mode of salutation in Poland; and the women of quality are saluted in no other manner than by embracing their thigh. There are some whose embraces are a little too rough, and who are very willing to feel that which they embrace. Their dresses are very rich, and are wholly covered with gold

and silver. Their dress consists of a man's waistcoat unbuttoned, and a petticoat; they wear boots like men.

There is no country in the world more flat than Poland; we have travelled through almost the whole country without finding a single mountain; whence, the country being flat, there are few rivulets, as they are unable to flow, on which account the water is very scarce; but, to make up for this deprivation, they make very good beer, particularly at Varca, which is renowned throughout the country as being the best. All these extensive plains are sown with corn, and it is exported to various parts of Europe.

There is no fortified place in Poland, except Leopold, which is situated on the Turkish frontier: still, however, these are fortifications in the Polish manner, which the French would willingly destroy. It is by this means, they think, that they preserve their liberty; and having no place where they can intrench themselves, they are obliged to make ramparts of their bodies. They are certain to beat the Turks, when they choose, as they have always done; but, nevertheless, they do not cease to lose their country with them. The Tartars are the enemies whom they fear most: these men do not seek after glory; they only desire booty, on which they live. Their troops are never placed in regular order; they fall suddenly on the enemy's camp, and take every thing they can find; and at the first sound of the drum, which the captain has fixed to the bow of his saddle, they retire, and return a quarter of an hour afterwards to attack some other place; so that they are constantly on the alert; by which means they confound their enemies, and continually stop and molest them. They are, in fighting, particular in this respect, that they fight when flying, and shoot arrows from behind their heads, which are discharged upon their enemies. They make frequent incursions into Poland, when the Poles do not pay them the ten thousand cousuques, which they are obliged to furnish them with every year, which are dresses made of sheeps' skins. The Tartars, when making their incursions, travel thirty or forty leagues in one night, carrying with them a little sack filled with straw, attached to the head of their horses, who do not stop, that they may eat it, and a piece of flesh, which becomes baked under the saddle; so that their enemies, unapprised of their approach, they take all that they can find in the country, men, women, and children, whom they afterwards carry by the Black Sea, to sell at Constantinople. But they have this peculiarity, that they never attack fortified places; nor will forty thousand Tartars attack a paltry village, provided it be only shut up with planks, because they are afraid of ambuscades, and they do not wish to fight regularly.

The Poles are anxious to procure the alliance of the Tartars, and make use of it, unless when at war with the Turks, for whom they always declare themselves, as being Mahometans, and rendered tributaries to the grand seignior, in consequence of which, if the Ottoman race became extinct, the khan of the Tartars would succeed to the empire.

King Casimir had more than twenty thousand of them when the Swedes entered Poland, but they did not await the enemy, and as soon as they knew that they were only two leagues distant from them, they fled as if they had been at their heels.

The republic always maintains seven or eight thousand regular troops on the frontiers, to prevent the incursions of the Tartars. The king does not maintain these troops; he only pays the Heydukes, the Semelles, and the Janizaries. The first-mentioned are dressed in blue, with large buttons and plates of tin, and have bonnets made of felt upon their heads. They have firelocks, and the bardiche, which they say is a very good weapon. The Semelles are other soldiers, all armed in the same manner; but all the

Janizaries are Turks, dressed like those whom I have seen in Turkey. A very curious circumstance happened during the sitting of the last diet. A Turkish company of the garrison of Kaminiek deserted completely, with its arms, colours, money-chest, and officers, and came to offer their services to the king of Poland. The king behaved, on this occasion, in a manner that became a great prince, and with his usual intrepidity: for, notwithstanding the solicitations of the queen, and of all his council, who advised him not to take these men into his service in the present conjuncture of affairs, as he had at that time a Turkish ambassador at the court, which made them suppose, what was not unlikely, that they were spies (the event shewed, however, that he was better informed than them all) he has them still, and gives them double pay. But it is a very extraordinary thing to see a whole company desert, with its officers.

The finest militia of Poland consists of hussars, Tavaches, and Pansars, who are all nobles. The armour of the hussars is somewhat singular. The king has still a company of about a hundred *reitres*, who accompany him on all occasions.

We saw at Veroni M. Acakias, who returned from Transylvania, and gave us information respecting that country; he told us that the people consisted of Transylvanians and Saxons; that the former were masters, and the latter somewhat like slaves. The Saxons are people who came from Saxony, who are here treated like Jews, although they are more men of property than the others. The Transylvanians travel without expending a halfpenny, as they live upon, and lodge with the Saxons. When the Transylvanian noblemen have caught some game, they send one of their servants to sell it, and the masters demand some game to eat; the poor Saxon is obliged to go and purchase from the servants of these masters the game, and to pay them whatever they demand for it. Almost every person speaks Latin in this country.

The Polish language is Sclavonian, like that of Muscovy and Tartary; and there is as great a difference between these languages, though they are derived from the same source, as betwixt the Italian and Spanish, which are derived from the Latin. The living languages which are spoken in Europe may be classed under two heads; for I am not speaking of the dead languages, like the Greek, the Hebrew and the Latin. The Arabic language is in Asia what the Latin is in Europe; and with a knowledge of this language, one may pass from the Bosphorus to the most distant parts of India. There are, therefore, only two mother-tongues, which have their dialects, and these are the Teutonian and the Sclavonian. The Sclavonian is familiar at Constantinople, and its principal dialects are the Russian, spoken by the Muscovites, the Dalmatian by the Transylvanians and the Hungarians, the Bohemian and the Polish, and some others, which are spoken among the Wallachians, Moldavians, and Lesser Tartars.

The Teutonic has three principal dialects, the German, the Saxon, and the Danish; and from these proceed other idioms, as the English, the Swedish, the Flemish, &c. The Greek language is dead, and less corrupted than the Latin; but it is still spoken in the islands of the Archipelago, in Achaia, and in the Morea. There are also several other lesser original languages, which have very little extent; as the Albanese, in Epirus and Macedonia; the Bulgarian, Servia, Bosnia and Bulgaria; that of the Cossacs, or Lesser Tartars, on the banks of the Tanais; that of the Laplanders, and the Fins; that of the Irish; and the Biscayan, and the Breton.

We left the court, after having taken leave of their majesties, on Friday, and were conducted by the Sieur de Valalé. We passed next day through Jeroslans, which gives its name to a duchy, the half of which belongs to the queen. We saw some little villages, which contain nothing remarkable. On our journey we were attacked by three robbers; we were in our chariot, which, on account of the wind, was shut up on all

sides: they cried out to our coachman to stop, who had no inclination to obey them, and made a signal to us to prepare our pistols, which we immediately did, and descended from the chariot with the pistols in our hands, accompanied by our valet, who, armed with a firelock, kept them in check. When they observed this arrangement, they stopt short, and regarded us, without daring to approach. We continued our journey on foot, with our pistols in our hands; and as it was late, we arrived a short time after at the inn, where they sent two of their companions, who came, like passengers, to observe the situation of our countenances. They saw that we had our arms ready, and that we were on foot during the whole night. We did not know them to be what they really were; and as it was already late, we had been unable to remark them, on account of the obscurity. They set out two hours before day-break, and we were arranging matters to set out, when the coachman told us that he had seen them join four others in the neighbourhood of the house, and that they had entered the wood, which was about a hundred paces distant. We did not think it prudent to depart till the return of day; and we were waiting till it should be light, when we heard four carriages passing, containing two oxen each. We embraced this opportunity of passing through the wood; and as it was clear moon-light, we obliged all the drivers to take white sticks in their hands, which appeared, by the light of the moon, as if they had been muskets. In this manner we passed on, while they dared not attack us, although we heard them rustling on every side. At the first village we arrived at, the people informed us that the wood was full of them, and that it was difficult to pass it without being robbed.

We arrived at Cracow on Thursday morning; we had some difficulty in procuring lodgings, for there was no tavern in the place. We found an Italian, who conducted us to his house. This man, like all his countrymen, immediately deafened us with his loud noise; he talked about nothing but millions, his equipage, his horses, and his chariot. We were not long in discovering that the fellow was one of the greatest scoundrels that ever lived. We were no sooner seated at table, than he went to borrow three wooden spoons of his landlord, and told us that he had given out his own, which were silver, to be cleaned. We talked of going out after dinner, and having inquired whether he had a sword, he told us that he had unfortunately fallen the day before, and that in falling he had broken it, and had consequently given it to an armourer. In looking at our pistols, he told us that he had a pair, which he had purchased at Amsterdam, which were double-barrelled, and which were at present in the hands of the armourer, that they might be cleaned. He told us that he would take us in his chariot to see the mines; but when the time came, he said his chariot was newly painted, and four of his horses were lame. But what was most entertaining was, that he was always protesting that he would take nothing for our lodging with him; and when it was necessary to go to market, he came to ask a crown, saying, that he had given away all his cash for letters of exchange on Mess. Pessalouki, of Vienna. He said he had a law-suit respecting two houses in the city worth ten thousand francs, which had come to his possession through his wife; and, nevertheless, he wished to return with us the following day, without any intention of ever coming back. And having asked the reason why he would leave such a fine property, and such excellent expectations? "O," said he, "that gives me no uneasiness; I shall settle all that business to-morrow; I shall gain my law-suit; I shall sell my houses." We saw quite well his rascally intentions, but we wished to amuse ourselves with him to the end; and to push the raillery a little farther, I asked him, if he would give me letters of exchange on Vienna, for money which I should pay him? At this proposition joy began to sparkle on the scoundrel's

countenance; he began to prepare the most excellent letters of exchange that were ever made by the most celebrated banker; but unfortunately neither ink nor paper were found in the house. I afterwards asked to see his horses; the scoundrel perceived that he was laughed at, and that he had to do with men as intelligent as himself. I never saw a man more confounded in my life, and we amused ourselves with repeating his usual phrase, *Italiani non sono miga crilloni;* and we said *Francesi*, instead of *Italiani*. We threw in his teeth an infinite number of his deceptions, lies, and contradictions; and we had the pleasure of confounding the greatest scoundrel in the world.

Cracow is the chief city of Upper Poland, and is infinitely more handsome, larger, and has more trade than Warsaw. It is situated on the Vistula, which takes its rise at no great distance. Its academy is much esteemed: it was founded, about three hundred years ago, by Casimir the First, who asked for professors from the colleges of the Sorbonne at Paris, who were the causes of that great reputation which it acquired. The object most worthy of notice in Cracow is the castle, situated on a little hill; it is very extensive, but without form, or any regard to the rules of architecture; the chambers are spacious, and the ceilings superbly gilt; on which account this residence might be fit for a king. In the church of the castle, the tombs of the kings are to be seen; and they never inter one king, till another has been elected. King Casimir and king Michael were interred the same day that the present king was crowned; for they all come to be crowned at Cracow.

The body of Saint Stanislas is in a shrine of silver, placed in the middle of the church, and covered by a canopy. This saint, who was killed by one of the kings of Poland, is the cause why the Poles go with their heads shaved, and eat no butter on Friday, and some of them on Saturday; this was imposed on them as a penance, by one of the popes, during a hundred years; and this custom became a law; for although the time of the penance had expired, they never cease to observe this fast, and the custom of shaving the head.

There are few cities, I do not say in Poland, but in all Europe, where there are more churches, priests, and particularly monks, than in Cracow. They are as rich and as much respected here as in Italy; and this is the reason why they are so numerous. With respect to the churches, to do them justice, it must be confessed that the Poles are extremely anxious about the beauty and the service of their churches; the gold shines in them on all sides; and one is astonished to find a church gilt to the very vault, in a wretched village, where it has been impossible to procure a morsel of bread. The finest churches in Cracow are the Dome, dedicated to Saint Mary, which is in the middle of the square, the Minims, and the Bernardins; the Jesuits have a very beautiful one, lately built in the Italian manner. The great square is very spacious, and the principal streets branch out from it: chiefly the grand street, which leads to Casimir, the residence of the Jews, who have in that place their republic, their synagogue, and their court of justice. These gentlemen are no better treated in Poland than in Italy and Turkey, where they are the dregs of the human race, and the sponge which is pressed from time to time, and chiefly when the state is in danger. Although they were not distinguished by any particular mark, as in Italy by a yellow hat, in Germany by a dress, in Turkey by a turban, in Poland by a ruff, it would be impossible not to know them by their excommunicated air and their haggard looks. However rich they may be, they are unable to leave off that villainous disposition in which they were born, and which excites horror in those who have seen them, chiefly in Poland, in the inns which they keep. Throughout the whole of Black Russia, where there are thirty or forty of them in a little chamber, the children are naked as they were born, and the fathers and mothers are only half

covered. I do not believe there is any nation in the world more fruitful: one finds in the same box filled with straw, and the same cradle, four or five children of the same mother, who are so black and hideous, that they appear like little crows in a nest.

The tribute which the Jews of Cracow pay to the republic amounts to twenty thousand crowns; they give, besides this, three hundred ducats annually to the king, two hundred to the queen, a hundred to the prince, and a number of other lesser expences, to which they are daily subject. There are some cities in Germany, where they are not permitted to reside; and when their business calls them to these places, they give one ducat for the first night they sleep in the city, two for the second, and three for the third.

This is also the case at Warsaw, where they are not permitted to reside, except during the sitting of the diets; but there is no kind of rascality, which they do not practise; and when any one is to [illegible] another time, the scholars are let loose upon them, and have a right over their persons; so that it is easy to imagine what kind of treatment they will receive from these gentlemen.

We went to pay our respects to the palatine of Cracow, the first of the kingdom, called Vicliposky, grand chancellor of the crown, and brother-in-law of the king. We had letters to deliver to him from the ambassador, and others for the lady of the grand-chancellor, from the queen, and from the marquis of Arquien, his father. This nobleman requested us to dine with him: a number of excellent fish were on the table, but the greater part in oil, as it was Saturday; and here it may be observed, that the Poles do not relish oil, unless it be very strong; and they say, when it is sweet, as we prefer it, it has no smell. The equerry is at the end of the table, with a large spoon, by which every body is served; it is necessary to have a knife and fork in one's pocket, else one may very probably be obliged to make use of one's fingers. The grand-chancellor has a very handsome daughter, about thirteen or fourteen years of age, and two boys somewhat younger.

This nobleman had the goodness to send us a chariot, to go to the salt mines of Vicliska, which are a good league distant from Cracow. It was to this place we went, to admire the effects of nature in her different productions. In the middle of the square of the city one sees a shed, under which one no sooner enters than a large wheel is observed, which horses are turning, and which is employed to raise the stones which are drawn from the mine. Near this wheel there is a hole dug, as wide as a very large pit, and covered wholly over with large pieces of wood, fixed the one to the other. It was by this aperture that we descended to that abyss; but before setting out on this journey, they clothed us with a kind of surplice. They moved a great number of ropes and girths, which were fixed to the great cable, the one after the other. Five or six men made preparations to go down with us, and lighted a number of lamps, while others surrounded the mouth of the hole, and began to sing that passage of the Passion where these words are, *Expiravit Jesus*, and still continued, in the most frightful tone, the *De profundis*. I confess that, at this time, my whole blood freezed; all the preparations for this living interment appeared to me so horrible, that I wished to be a great way off from the place where I was; but matters had gone too far; I was obliged to bury myself alive in this grave. One of our guides placed himself at the end of the cable, with a lamp in his hand; I then placed myself on my girth above his head; one of the miners placed himself above me; my comrade was above him, and another was over his head, with a lamp in his hand, and another above him; so that there were more than a dozen of us, one above another, fixed to the cable, like strings of beads,

in a posture not the most agreeable in the world; for not only did we run the risk of the cable breaking, but we were also afraid lest the cords that supported us should give way, and lest those of others, which would fall upon us, should break.

We descended a hundred long toises in this manner; and we at length found ourselves in a place, very spacious and very deep, in the middle of which we found a chapel, where mass was frequently said; from whence we were conducted by roads without end, where they had removed the salt, which they break off in large pieces, which three horses can with difficulty draw. This stone is of an ash colour, and sparkles like diamonds; it is not hard, and the small pieces which fall off in cutting it are put into barrels, and are sold in that state. This stone is infinitely salter than our excise salt, and becomes white when it is piled up; but they make a salt of the water which they draw from the deepest places of the mine, which, after it hardens, becomes the whitest and the finest that can possibly be seen. From this quarry we descended to another, for there are seven of them, the one above the other, and when we were near the last we found a rivulet of fresh water, the best I ever drank. This is one of the greatest curiosities I ever beheld in my life, to see a water issuing from and running over stones of salt, without taking the taste of it. There are also other rivulets found here, but their waters are perfectly salt. After having descended for two hours, we arrived at length at the last quarry, where the men were working: they cut for us a stone, which fifty horses would have been unable to draw; and a single man severed this stone from the rock with great ease. When this piece has fallen, they cut it into round pieces, the shape of a barrel, that they may be able to roll it into the carriage. We found in this pit a number of men and horses, who wrought at wheels made for the purpose of raising the water.

In this mine salt is found of various prices and veins, some of which are better than others. The smallest is called Ziclona, the next Zibicoa, and the best of all Ockavata. The first kind is sold for twelve guldens the ton, which weighs six hundred pounds, the second thirteen, and the third sixteen. This last is like crystal, and equally transparent, and is divided into little squares, like ice.

We travelled near four hours in this mine; and we were assured that, so great is its extent, a person would be unable to go through every part of it in fifteen days. Along the whole length of the vaults of this quarry, salt water, petrified, may be observed, hanging like icicles at a rain spout; and when it has become hard enough to be wrought, the workmen make chaplets of it, and little utensils of that kind.

We ascended by the same ladder by which we descended, and I was still more uncomfortable in going up than in coming down; for the rope that supported me, not being sufficiently fixed to the cable, slid off from time to time, and caused me great uneasiness; and, without deceiving, I confess that I felt extremely disagreeable, and I promised that I should never revisit these subterraneous regions. To travel this journey once in one's life is perfectly sufficient.

We remained three or four days, after which we set out for Vienna. We passed through Zator-Ozvienzin, and other places belonging to Poland.

A JOURNEY TO GERMANY.

The first city in Germany which one meets with in Silesia is ———, and which is dependant on a particular prince, who is called count Balthasar. We travelled from thence to Olmutz, the seat of the bishopric. The palace of the bishop, who is both spiritual and temporal prince, is as fine a one as can be seen in Germany. We observed

that the principal occupation of the scholars is, to go at night, from street to street, and sing, when they beg for alms: this is a common practice of all the students of Germany.

We arrived at Vienna on the twentieth day of September. One part of the court was absent, and there was only here that of the empress dowager, who is of the house of Tyrol. The emperor was at Oldenburg, where he held a diet, which all the palatines and great lords of Hungary attended, both to settle the affairs of the rebels, which have occupied attention for more than fifteen years, and to assist in the coronation of the empress, queen of Hungary. The emperor arrived two days after at Vienna, and we returned with him from Hungary. He intended to pass the whole winter at Vienna, and afterwards to go to the diet at Ratisbon.

The Hungarians are proud, and magnificent in diamonds. The palatine of Hungary, or vice-king, is the richest: he had lately received the order of the Fleece from the king of Spain, vacant by the death of the president, who had married the princess of Holstein, where I was present, and where all the people have their rendezvous; he had long administered the affairs of the empire, and has since been blamed, and turned out of the ministry. Abeley has taken his place in the government.

The Hungarians are not tall, but their dress tends to give them a good air; together with the cock feathers which they wear upon their heads, they carry as many feathers as they have beheaded Turks in battle. Their country is the most productive in the world in corn, wine, and pasturage, but they are at present ruined; their wine of Tokay is esteemed the best.

Vienna is the capital of Austria, and the seat of the empire; it was attacked in —— by the great Soliman, with an army of an hundred thousand men; but he was obliged to raise the siege. The Turkish arms, which are above the tower of Saint Stephen, are witnesses of a good resistance; they have been left there, either as a mark of this action, or from the articles of the capitulation concluded in this manner. The city of Vienna is not large, but it is populous, notwithstanding the horrid ravages of the plague two years ago, which destroyed more than two hundred thousand men. The streets are handsome, and especially those of the quarter of the nobles. The churches are magnificent here, and above all those of the Jesuits, who have three convents here, and are the masters at Vienna. They gather a very considerable tax upon those who enter the city after eight o'clock in summer, and six in winter; one must pay four pence, and this is a dreadful monopoly. All the fashionables assemble in the church of Saint Michael and Sainte-Croix; the ladies are placed on one side, and the gentlemen on the other. We saw there the sister of Montecuculi, the countess of Arach ——— and for cavalier Nostiche Bouquin ———.

The gala days with the emperor are certain days of rejoicing, when every body is superbly dressed. The precious stones are to be met with in abundance; and I do not believe there is any place in the world where they are more plenty: the rejoicings take place on the emperor's birth-day, on those of the empress, &c.

The emperor is a younger son of Ferdinand the Third. His elder brother died archduke at eighteen or twenty years of age; he was a very handsome prince. The emperor was taken from among the Jesuits, to be put in his place; but he was rather born for the convent than the throne.

Ferdinand the Third had three wives, the first was called Mary, the daughter of Philip the Third, king of Spain, by whom he had three sons. The first, as I have said, died king of the Romans, the second is at present emperor, and the third died bishop of Passau and of Breslaw.

The second wife of Ferdinand was of the house of Inspruck, who died in child-bed very young: her tomb is to be seen at the church of the Dominicans.

The third, who is still living, is called empress Leonora, dowager; she is of the house of Mantua, aunt of the dutchess of York. She has two daughters; the eldest married Michael Coribut Wienowieski, king of Poland, and has since been married to the duke of Lorraine; the second was married about two years ago to the duke of Neubourg, brother-in-law of the emperor.

The emperor is called Leopold Ignatius, son of Ferdinand the Third and of Mary, daughter of Philip the Third, king of Spain. He was born the ninth day of June 1640, and was raised to the imperial dignity in the year 1659. He has had three wives, like his father. The first was the infanta of Spain, daughter of Philip the Fourth, only sister of the present king, Charles the Second, and sister of the father of the present queen of France. She has a daughter called the arch-duchess, about fourteen or fifteen years of age, who is lame.

The second was of the house of Inspruck.

The third is of the house of Neubourg. He married this princess about four or five years ago; and he has a son by her, about four years old, who is called the arch-duke.

The arch-duchess had great expectations of being married to the king of Spain; it is even said that they saluted her as queen for some time at the court. There has been always much jealousy between this young arch-duchess and the other daughter of the empress dowager, who has been married to the duke of Neubourg, as having both of them the same pretensions, and both hoping to be queen of Spain. And the old empress was much surprised when she learned the marriage of the king of Spain with Mademoiselle, because they had flattered her, that, if she made the emperor declare war against France, her daughter would be queen of Spain; in which she was successful, for she is very ingenious.

This princess, seeing her hopes disappointed in one quarter, sought after a crown elsewhere, and endeavoured to negotiate her marriage with the king of Sweden; but the princess of Denmark had previously made too deep an impression on his heart, to be supplanted: thus, seeing no more crowned heads, she was obliged to marry the duke of Neubourg; but she treated him with inconceivable haughtiness.

The present arch-duchess is niece of that princess, and they have often been rivals. No other match can be observed for her but the duke of Florence, the princess of Saxony being at present married to the elector of Bavaria.

The emperor is arch-duke of Austria, and king of Hungary and Bohemia; he has the only arch-duchy in the world, and his children bear the title of it. They bend the knees before him: and the emperor himself, when bowing at the altar, bends his two knees, without, however, putting them to the ground.

The council of conscience of the emperor is composed of a capuchin, called Father Emeric, bishop of Vienna, and of Father Richard, a Jesuit, from Lorraine.

The emperor is very devout; he goes almost every day to dine with the monks or the religious. When he travels, it is without noise, for he has neither drums nor trumpets. His guards, called drabans, in number a hundred or two hundred, with a partizan in their hands, clothed in black, all in a cloak laced with yellow, form a hedge, in the middle of which the emperor passes in his chariot, which is liker a chest than any thing else. There is never any person at his side, and the empress seats herself at the other end.

The horses are harnessed with ropes, and the coachman is on horseback, since one of them heard upon his seat a secret that he revealed. All the attendants travel on horseback.

Before the emperor can be elevated to the imperial dignity, he must have been elected king of the Romans, and he cannot enjoy this title till he is fourteen years of age. The emperors are elected and crowned at Frankfort, but the crown is at Aix-la-Chapelle.

The emperor is very fond of hunting; I was at a hunt which he made on his return from Oldenburg, where they killed eighty or ninety wild boars with the sword. Those who are near the emperor kill them from a lodge, which is prepared for him. They treat the emperor with the respect due to his sacred majesty. He carries the order of the Fleece; but he does not give it, and it belongs solely to the king of Spain.

We never have ambassadors at Vienna, because Spain wishes to have the precedence, as being of the same house. The marquis of Seleville was, at this time, envoy extraordinary. We lived with the marquis, and I had a private conversation with the marchioness; she is one of the most intelligent and virtuous ladies I have ever known. We knew there M. de Saint Laurent, cousin of madame the marchioness Pigore. We dined several times with the count de Stirum.

The count of Staremberg is governor of the city; he wished to have a dispute with Messrs. de Marsillac and d'Alincourt, because they had not told their names at the court.

Vienna takes its name from a little river, which passes between the suburb of Islaw and the city, which, when it overflows its banks, makes dreadful ravages. The Danube passes here also. It is the largest river in Europe; it takes its rise in ————, and, after flowing seven or eight hundred leagues, it falls into the Black Sea, by seven mouths. Its course is contrary to that of all the other rivers of the world; it flows from west to east, and there is no other, except the Po, that resembles it.

The Louvre is a large square structure, which contains nothing remarkable. Its court is used as a riding-house. The gentlemen have steps of wood, to assist them in mounting their horses.

MEMOIR READ BEFORE THE ROYAL ACADEMY OF SCIENCES, THIRTEENTH OF NOVEMBER, 1737, ON THE MEASURE OF A DEGREE OF THE MERIDIAN AT THE POLAR CIRCLE.

[BY M. MAUPERTUIS. NEWLY TRANSLATED.]

EIGHTEEN months ago I submitted to this assembly the object and plan of a voyage to the polar circle: I have now to render them an account of its success; in doing which it may first be necessary to advert to the ideas which were the cause of its being undertaken.

M. Richer having noticed at Cayenne, in 1672, that gravity in that island near the equator was less than in France, the learned turned their eyes towards the consequences that might result from this famous discovery. One of the most illustrious members of the academy maintained, that it proved as well the revolution of the earth on its axis (which did not require to be proved) as the flatness of it towards the poles, which was a paradox. M. Huygens, applying the theory of centrifugal force, of which he was the author, to the parts which constitute the earth, demonstrated, that taking these parts as gravitating uniformly towards a centre, and making their revolution round an axis, it must necessarily follow, to support an equilibrium, that they form a spheroid flattened towards the poles. M. Huygens even determined the proportion of flatness, and this by the ordinary principle of gravity.

Newton was the partisan of a different theory, of the attraction of the particles of matter one towards the other; and came to the same conclusion, that the earth was flattened, although, by his computation, in a different proportion. In fact, when by the laws of statics we examine the figure of the earth, every theory leans to its being flat: and one cannot imagine a lengthened spheroid, unless by very forced hypotheses on gravity.

From the first establishment of the academy, one of its principal objects had been the measurement of a degree of the meridian of the earth: M. Picard had determined this degree towards Paris with such exactness, as left nothing further to wish for in appearance. But this measure could be general only in case the earth were spherical; if the earth were flattened, it would be too long for the degrees towards the equator, and too short for those towards the poles.

When the measurement of the meridian which traverses France was finished, we were surprised to learn that the degrees towards the north were shorter than those towards the south; this was diametrically opposite to the effects which ought to follow, if the earth were flat towards the poles. According to these measurements, it should be lengthened towards the poles; other experiments, made on the parallel which traverses France, confirmed this extension, and these measurements had great weight.

Thus the academy was divided; the information it possessed caused it to doubt; when the king chose to have this great question decided, a question, not like those vain speculations with which the idle amuse themselves, not a useless subtlety of philosophy, but a matter of real influenc on astronomy and navigation.

In order to determine properly the figure of the earth, it was necessary to compare two degrees of the meridian, as different in latitude as possible; because, whether the degrees increase or diminish in length towards the pole, the slight difference between adjoining ones might be lo in the errors of observations; instead of which, if the two degrees compared were at great distance one from the other, the difference being re-

peated, as often as there are intermediate degrees, would make together a sum too considerable to escape the observers.

M. Le Compte de Mauripas, who is attached to the sciences, and who is desirous of rendering them serviceable to the state, found united in this undertaking, an advantage to navigation, and to the academy, and the prospect of its being of utility to the public insured the attention of the Cardinal de Fleury, in the midst of war. The sciences found in him that protection and assistance, which could scarcely be expected in time of the most profound peace. M. Le Compte de Mauripas quickly after sent to the academy the orders of his majesty, to have the question decided respecting the figure of the earth; the academy received them with joy, and hastened by several of its members to put them in execution; some were destined to the equator, to measure the first degree of the meridian, and set off a year before us; the others for the north, to measure a degree as near to the pole as possible. The same zeal actuated those who went to expose themselves to the sun under the torrid zone, as them who were to experience the horrors of winter in the frozen regions; either had but one aim, that of rendering themselves useful to their country.

The party designed for the north was composed of four academicians, Messrs. Clairaut, Camus, Le Monnier, and myself, and of Mr. L' Abbe Outhier, accompanied by M. Celsius, the celebrated professor of astronomy at Upsal, who assisted us in all our labours, and whose information and advice were very useful to us. Were it permitted me to speak of my other companions, of their firmness, and their talents, it would be visible, that, however difficult the work we undertook, with their concurrence it must have been easy.

A long time has elapsed since we heard last from those gone to the equator: little more of that expedition is known, beside the trouble it has met with, and our experience has taught us to feel for those engaged in it; we have been more fortunate, and are returned, to bring to the academy the fruits of our toil.

The vessel that bore us having arrived at Stockholm, we hastened to set out towards the bottom of the gulph of Bothnia, where we could choose, better than by trusting to charts, which of the two coasts of the gulph would be most suitable to our operations. The perils with which they threatened us at Stockholm did not deter us; nor the kindness of his majesty, who, in spite of the orders that he issued for us, ceased not from testifying his concern at seeing us depart on so dangerous an adventure.

We arrived at Torneo in time to see the sun shine without setting for several days, as is usual in those climates about the summer solstice; an admirable sight to an inhabitant of the temperate zones, notwithstanding his knowledge of such being the case at the polar circle.

It perhaps will not be useless here to give an idea of the work we had laid down, and the means we had to take in measuring a degree of the meridian.

Nobody is ignorant, that as one advances towards the north the stars placed towards the equator appear to sink; and on the contrary, those situated towards the pole to rise: it is very probable that the observance of this phenomenon afforded the first proof of the roundness of the earth. This difference in the meridian height of a star, which we perceive in tracing an arc of the meridian, I call the amplitude of that arc; it is this which is the measurement of its curve, or, in other words, it is the number of minutes and seconds which it contains.

Were the earth entirely spherical, this difference of the height of a star (this amplitude) would always be in proportion to the arc of the meridian passed over. If, in order to see a star change its elevation one degree, it might be necessary at Paris to pass

over a space of fifty-seven thousand toises, the same distance should be gone over at Torneo, to find the same change in the height of the star.

If, on the contrary, the surface of the earth were uniformly even, however great the distance passed over towards the north, the star would appear neither more nor less elevated.

If then the surface of the earth be unequally curved in different regions, to find the same difference of the elevation of a star, it will be necessary, in those different regions, to pass over unequal arches of the meridian of the earth: and those arches, whose amplitude is a degree, will be longer where the earth is more flattened. So that if the earth be flattened towards the poles, a degree of the terrestrial meridian will be longer towards the poles than at the equator; and hence the figure of the earth may be ascertained, by comparing the different degrees one with the other.

By this will be seen, that to have the measure of a degree of the meridian of the earth, a distance on this meridian must be measured, and the change of the elevation of a star at the two extremities be known, in order to be able to compare the length of the arch with its amplitude.

The first part of our work consisted then in measuring a considerable space upon the meridian, and for this purpose a succession of triangles was necessary, which might communicate with some base, whose length might be measured by the pole.

We had always entertained the hope of being able to make our observations upon the shores of the Gulph of Bothnia. The facility of crossing by sea to the different stations, of transporting the instruments in boats, the advantage of observations, that the islands of the gulf marked in such number upon the charts seemed to hold out to us; all these had pre-determined us in favour of the coast and isles. We proceeded with impatience to reconnoitre, but all our voyages for that purpose served only to shew us the necessity of giving up our first intention. These islands, which lay off the shores of the gulph, and the coast of the gulf itself, which we had represented to our fancy as promontories, visible at a great distance, and from which we might distinguish others equally distant, all these islands were level with the water, and consequently quickly hid by the roundness of the earth. They even concealed each other towards the borders of the gulf, when they were too near; and where ranged along the coasts, they did not advance far enough into the sea, to afford us the direction we required. After repeated fruitless endeavours to obtain in these islands what they could not afford, we were obliged to give up all hope, and abandon them.

I travelled from Stockholm to Torneo in a coach with the rest of the company; but chance having thrown in our way, in the course of this long journey, the vessel which bore our instruments and servants, I went on board, and arrived at Torneo several days before the others. On landing I met with the governor of the province, who was going to visit Northern Lapland (part of his government.) I joined him, in order to gather some idea of the country in the absence of my companions, and penetrated fifteen leagues towards the north. On the night of the solstice I ascended one of the highest mountains of this country, called Avasaxa; and returned in sufficient time to be at Torneo on their arrival. In this journey, which lasted but three days, I remarked that the river Torneo ran pretty closely in the direction of the meridian, as far as I had gone; and noticed on all sides high mountains, that afforded stations perceptible at great distances.

We thought then of beginning our operations to the north of Torneo, upon the summits of these mountains, but this appeared to us scarcely possible.

We had, in the deserts of a country hardly inhabitable, in the immense forest which extends from Torneo to the North Cape, to effect operations, difficult even in the most

commodious countries. There were but two modes of getting forward in these deserts, to both of which we were obliged to have recourse; the one by navigating a river full of cataracts, the other by proceeding on foot through thick forests, or deep marshes; and allowing we should get through the country after the most tedious marches, we had to scale rugged mountains, clear the summits of these mountains of the trees which there impeded the sights, live in these deserts upon the coarsest food, and exposed to flies so tormenting, that they oblige the Laplanders and their rein-deer to abandon the country during this season, to seek, on the shores of the sea, a more tolerable residence.

To sum up all, the work was to be undertaken without knowing, or being able to learn, whether it was practicable; without knowing whether, after so much pains, the want of one mountain might not absolutely stop the course of our triangles; and without knowing whether we should be able to find upon the river a base, that could be united with our triangles. Should all these succeed, we had afterwards to construct observatories on the most northern of our mountains; a train of instruments, more complete than are to be found in many of the observatories of Europe, were to be transported there; and astronomical observations to be made, the most minutely exact.

If on one hand these different obstacles were sufficient to alarm us; on the other the work had many attractions. Besides the difficulties we had to overcome, we had to measure a degree, in all probability as far towards the north as is permitted man t measure, the degree which cuts the polar circle, and of which one part is in the froze zone. After all, giving up the hope of being able to make use of the islands of the gulf, this was our last resource; for we could not satisfy ourselves, by descending to the more southern provinces of Sweden.

We left Torneo on Friday July sixth, with a company of Finnish soldiers. and a great number of boats, laden with instruments, and the most indispensible necessaries of life; and began to ascend the great river, which, proceeding from the extremity of Lapland, empties itself into the Bothnick Sea, after dividing into two branches, which form the little island Swintztar, on which the town is built, in latitude 65 degrees 51 minutes. From that day we lived in the deserts and on the tops of mountains, which we were desirous of uniting by triangles. After having ascended the river from nine o'clock in the morning until nine at night, we arrived at Korpikyla, a hamlet on its banks, inhabited by Fins; we landed there, and after marching a long time across the forest, we arrived at the foot of Nirva, a sharp mountain, whose summit is composed of rock alone, which we ascended, and upon which we established ourselves. On the river we had been grievously incommoded by large flies with green heads, which drew blood wherever they stung; on Nirva we were plagued with several other kinds, still more tormenting.

Two young Lapland girls were keeping a little herd of rein-deer upon the summit of this mountain, and from them we learned an antidote against the flies of the country: these poor wenches were so much hid by the smoke of a great fire which they had kindled, that we could scarcely see them; and very soon we were surrounded by a smoke as thick as theirs.

While our party was encamped on Nirva, I left it at eight in the morning with Mr. Camus, to reconnoitre the mountains towards the north; we ascended the river again as far as to the foot of Avasaxa, a high mountain, whose summit we stripped of its trees, and erected a signal upon it. Our signals were hollow cones, made by a number of great trees, which, being deprived of their bark, were so white as to be easily distinguished at the distance of ten or twelve leagues; their centre, in case of

accident, was easily to be found again, by marks which we made on the rocks, and stakes which were driven deep into the earth, and covered again by great stones: in short, these signals were sufficiently commodious for observations, and as substantially constructed as most of the buildings of the country.

As soon as the signal was finished we descended the mountain, and having embarked on the little river Tenglio, which, passing the foot of Avasaxa, empties itself into the great river, we went up it as far as to that part which seemed to us nearest to a mountain apparently calculated for our work; there we landed, and, after a march of three hours across a marsh, arrived at the foot of Horrilakero. Although greatly fatigued, we ascended it, and passed the night in cutting down what trees we found. A great part of the mountain is of red stone, interspersed with a sort of white crystals, long, and tolerably parallel to one another. The smoke was not here a preventative against the flies, more vexatious upon this mountain than on Nirva. We were obliged, notwithstanding the excessive heat, to cover our heads with our Lapmudes (a dress made of the skins of rein-deer) and to cause ourselves to be surrounded by a thick rampart of branches of fir, and even by whole trees, which almost overwhelmed us, but which preserved us only for a short time.

After having felled all the trees on the top of Horrilakero, and constructed a signal there, we left it, and retraced our road, to find the boats which we had drawn into the wood; it is thus the inhabitants of the country manage, for want of cordage, which is very scarce with them. A few very thin planks of deal compose their skiffs, so light, and so flexible, that notwithstanding they continually strike against the stones, with which the rivers are full, borne by the whole violence of the torrent, they bear the shock without injury. It affords a sight, terrible for those unaccustomed to it, and astonishing to all, to behold this frail machine in the midst of a cataract, the noise of which is deafening, carried away by a torrent of waves, froth and stones; sometimes borne up aloft, and at others lost amid the waves; one dauntless Fin steering it with an oar, while two others row with all their might, to escape the following waves, that threaten to overwhelm them; at such times the keel is often above the water, and only supported by one extremity pressing on a wave, which sinks at every instant. Although these Fins be particularly bold and skilful amid cataracts, they are everywhere else ingenious in steering small vessels, in which most frequently they have nothing but a tree, with its branches, to serve for a mast and sails.

We re-embarked on the Tenglio, and having entered the Torneo, we sailed down it, to return to Korpikyla. Four leagues from Avasaxa we left our boats, and, after walking nearly an hour in the forest, we found ourselves at the foot of Cuitapari, a very rugged mountain, whose top was a rock covered with moss, commanding a prospect all around for a considerable distance; from it on the south we could distinguish the sea of Bothnia: we raised a signal here, from which we saw Horrilakero, Avasaxa, Torneo, Nirva, and Kakama. We continued then to fall down the river, which, between Cuitaperi and Korpikyla, contains dreadful cataracts that it is not usual to pass in boats. The Fins did not fail to land in the neighbourhood of these, although excess of fatigue made it more supportable for us to pass them in boats than to walk a hundred paces. At length, the eleventh of July at night, we came to Nirva, where the remainder of our company was established; they had seen our signals, but the sky had been so much charged with vapour, they had been unable to make any observation. I know not whether it was owing to the continual presence of the sun above the horizon, which raised vapours that there was no night to condense, but during the two months that we passed upon these mountains the heavens were always overcast, until the north wind

came to dissipate the mist. This disposition of the atmosphere often detained us eight or ten days on a mountain, in waiting for the favourable opportunity of seeing distinctly the objects we wished to observe. It was not until the day after our return to Nirva, that some angles were taken; and the following, under favour of a very bleak north wind, we completed our observations.

July the fourteenth we left Nirva, and while Messrs. Camus, Le Monnier and Celsius went to Kokama, Messrs. Clairaut, Cuthier and myself passed on to Cuitaperi, whence on the sixteenth M. L'Abbé Cuthier departed, to place a signal on Pullingi. The eighteenth we took observations, which, notwithstanding the interruption of thunder and rain, we completed by night, and the twentieth we set off, and arrived at midnight at Avasaxa.

This mountain is fifteen leagues from Torneo, on the bank of the river; the access to it is difficult; to ascend it, we had to pass through a forest that continues for half its height; it is there divided by great heaps of sharp and slippery stones from its remainder, which extended to the summit; I say extended, because we caused all the trees that covered the top to be cut down. The north-east side is a frightful precipice of rocks, in which some falcons had made their nests; at the foot of it the Tenglio runs, which turns round Avasaxa before it throws itself into the Torneo. From this mountain the prospect is beautiful; nothing interrupts the sight towards the south, and the course of the river is discernible for a vast extent; towards the east the Tenglio is traced through several lakes that it passes; on the north the view extends twelve or fifteen leagues, where it is interrupted by a multitude of mountains, heaped one upon the other, resembling chaos, among which it was not easy to find that which we had seen from Avasaxa.

We passed ten days on this mountain, during which curiosity often procured us visits from the inhabitants of the neighbouring country; they brought us fish, sheep, and such wretched fruits as grow in their forests.

Between this mountain and Cuitapari the river is exceeding broad, and forms a kind of lake, which, as well as that it was extensive, was very advantageously situated for our base; Messrs. Clairaut and Camus took upon themselves the care of ascertaining its direction, and for that purpose remained at Oswer Torneo after our observations upon Avasaxa were completed; while I went to Pullingi with Messrs. Le Monnier, Cuthier and Celsius. On the same day that we left Avasaxa we passed the polar circle, and arrived the next day (July thirty-first) at three o'clock in the morning, at Turtula, a kind of hamlet for the reapers of the little barley and grass that grow in those parts. After walking some time in the forest, we embarked on a lake, which carried us to the foot of Pullingi.

It is the highest of the mountains, and extremely difficult of access, from the suddenness with which it arises, and from the height of the moss, in which we could scarcely walk. We got to the summit however at six o'clock in the morning, and the stay we made, from July thirty-first to August sixth, was as painful as our ascent. It was necessary we should cut down a forest of the largest trees; and the flies were so troublesome, that our soldiers of the regiment of Westro-Bothnia, a regiment distinguished even in Sweden, where there are so many brave men, these men, inured to the greatest hardships, were obliged to envelope their faces, and cover them with pitch; these insects infected every thing we were about to eat; as soon as exposed, our meat was black over with them. The birds of prey were not less famished; they flew round us continually, to seize on some joints of mutton which were cooking for us.

The day after our arrival at Pullingi, M. L'Abbé Cuthier left us, accompanied by an officer of the same regiment which had rendered us so much service, to erect a signal towards Pillo. On the fourth we perceived one on Niemi, that the same officer had raised: having taken the angles between these signals, we left Pullingi the sixth of August (having suffered severely) to go to Pillo; passing four cataracts, we arrived there the same day.

Pillo is a village inhabited by a few Fins, near to which Kittis, the lowest of the mountains, is situated, upon this our signal was placed. In ascending towards it, we found a spring of the purest water, issuing from a very fine sand, and which in the severest frosts of winter preserves its liquid state; when we returned to Pillo, at the end of winter, while the sea at the bottom of the gulf and all the rivers were become hard as marble, this water still ran as in the middle of summer.

We were so fortunate on our arrival as to complete our observations, and staid at Kittis only till the following day; leaving it at three o'clock in the afternoon, and arriving the same evening at Turtula.

Already a month had passed that we had lived in the deserts, or rather on the tops of mountains, having no other bed than the ground, or a stone, spread over with deer skins, nor any other nourishment than a few fish which the Fins brought us, or which we ourselves caught, and some species of berries, or wild fruits, which the forests afforded. The health of M. Monnier, which was not proof against this kind of life, and which was considerably hurt at Pullingi, diminished visibly, and entirely failing him here, I left him at Turtula, to descend the river, and go for its re-establishment to the house of the rector of Oswer Torneo, which was the best and almost the only asylum the country possessed.

At the same time I left Turtula in company with Messrs. Cuthier and Celsius, to traverse the forest in search of the signal that the officer had erected at Niemi; this was a terrible journey; we proceeded as far as to a little rivulet on leaving Turtula, when we got on board three small boats, but they passed with so much trouble among the rocks, that we were every now and then obliged to get out, and leap from one to another. This rivulet led us to a lake, so full of little yellow grains of the size of millet, that its water was entirely coloured by it; I took them to be the chrysals of some insect, and conjectured that they were those of the flies which had so much tormented us, since I saw no others whose numbers could answer the quantity of grains requisite to fill a lake of tolerable size. At the end of this lake we had to walk to another of the finest water, on which we found a boat; we put our quadrant in it, and followed it along the shore. On these shores the forest was so thick, that we were obliged to cut our way through, every moment inconvenienced by the height of the moss, and by the fir trees which we met with lying on the ground. In all these forests there are nearly as many of these trees fallen as standing; the soil which nourishes them to a certain point is incapable of affording them nutriment beyond, and not deep enough to allow them to establish themselves firmly; one half perishes, or is blown down by the least wind. All these forests are full of firs and birch trees, thus rooted up. Time has reduced the latter to dust, without occasioning the smallest change in the bark: we were surprised to find that with the least stroke we could crush and break them, although of some size. It is this, most likely, which gave origin to the use that the Swedes make of the bark of birch; they cover houses with it, and in fact nothing can be better adapted for the purpose.

In some provinces this bark is covered with earth, upon which gardens are formed upon the roofs, as on many of the houses at Upsal. In Westro-Bothnia the

bark is fastened by cylinders of fir, fixed to the ridge, declining on both sides the roof. These woods seemed only the ruins of forests, of which the greater part of the trees had perished; it was one of this description, and the most hideous of them, that we had to pass through on foot, followed by twelve soldiers, who carried our baggage. We came at length to the border of a lake of great size, and of the finest water in the world; we found two boats on it, into which having put our instruments and luggage, we waited their return at the side. A heavy gale, and the bad state of the boats, made their voyage tedious; they came back at length, we went on board, traversed the lake, and got to the foot of Niemi at three o'clock in the afternoon.

This mountain, which the surrounding lakes, and the difficulties we had to surmount in reaching it, made appear like the enchanted grounds of fairy tales, would be delightful in any other part but Lapland: on one side a clear wood, the walks of which were as even as the alleys of a garden; in it the trees formed no impediment to our way, nor prevented the view of a charming lake that washed the foot of the mountain; on the other side were parlours and closets, seemingly cut out of the rock, and to which nothing but the roof was wanting: these rocks were so perpendicular, so lofty, and so even, that they looked more like walls begun for some palace, than a work of nature. Frequently while there we saw those vapours rise out of the lake, which the inhabitants of the country call Haltios, and which they conceive to be the spirits to whom the guardianship of the mountains is committed: this particular mountain was formidable, by its being the residence of bears; however, we saw none, and it had more the appearance of the habitation of genii and fairies, than the dwelling for bears.

The day following that of our arrival a fog prevented our observations; on the tenth they were interrupted by thunder and rain; the eleventh we completed them, and leaving Niemi, after repassing three lakes, we arrived at Turtula, at nine o'clock in the evening; whence on the twelfth we again set out for the house of the rector of Oswer Torneo, which we reached at three o'clock in the afternoon, and where we met with our companions: leaving M. Le Monnier, and M. L'Abbé Cuthier, on the thirteenth, I proceeded with Messrs. Clairaut, Camus, and Celsius, for Horrilakero, with four boats. We entered the Tenglio, which has its cataracts, but is more inconvenient from its shallowness, and the great number of stones in it, than from the rapidity of its waters. I was surprised to find on its banks, so near to the frozen zone, roses of as lively crimson as those which grow with us. At nine o'clock in the evening we arrived at Horrilakero. We did not complete our observations here until the seventeenth, and leaving it the next day, we got to Oswer Torneo by night, meeting with all our company.

The most suitable spot for establishing the base had been fixed upon; and Messrs. Clairaut and Camus, after having visited the banks of the river, had determined its direction, and fixed the length of it by signals, which they had caused to be erected at its two extremities.

Having ascended Avasaxa in the evening, to observe the angles which were to unite this base to our triangles, we saw Horrilakero all on fire. This is an accident frequent in these forests, where there is no subsisting during summer except in the midst of smoke, and where the moss and the firs are so combustible, that oftentimes the fire that is lighted occasions the conflagration of thousands of acres. The smoke of these fires has frequently hindered us in our work as much as the thickness of the air. Seeing that it was highly probable that the fire of Horrilakero arose from the embers of that we had kindled, and which had been badly extinguished, we sent thirty men to cut away its communication with the neighbouring woods. Our observations on Avasaxa were not completed before the twenty-first. Horrilakero still continued burning; we saw it co-

vered with smoke, and the fire, which had reached the forest below, at intervals broke out with violence.

Some of the people sent to Horrilakero reporting that the signal had been damaged by the fire, we sent to re-construct it, a work of no difficulty, from the precautions before noticed.

The twenty-second we went to Poiky Torneo, on the bank of the river, where the northern signal of the base was stationed, to make the observations necessary to unite it to the summit of the mountains; and on the twenty-third we left it for the other extremity of the base, where, on the bank of the river, at a place called Niemisby, the southern signal was placed. That night we slept in a pretty pleasant meadow, from which M. Camus the next day went on to Pello, to prepare huts for us, and construct an observatory on Kittis, where we were to make astronomical observations, for ascertaining the amplitude of our arch. After taking our observation from the southern signal, we again ascended Cuitaperi at night, where the last observation, which was to unite the base with the triangles, was completed on the twenty-sixth.

We had just learned that the sextant which we expected from England had arrived at Torneo, and we hastened to that place to get it ready, with the other instruments that we had, to carry to Kittis, where the severity of winter was more to be dreaded than at Torneo, and where for which reason we were desirous of beginning our observations for determining the amplitude of the arch, before the frosts set in. While all was preparing for the journey to Pello, we went up the steeple of the church built on the Isle of Swintztar, which I notice, in order that it may not be confounded with the Finnish church built in the Isle of Bierckhohn, to the south of Swintztar; and having observed from this steeple the angles which it made with our mountains, we again left Torneo the third of September with fifteen boats, the largest fleet which had ever been seen on the river, and arrived to sleep at Kuckula.

The succeeding day we reached Korpikyla, and while part of our company continued their route towards Pello, I set off on foot with Messrs. Celsius and Cuthier for the Kakama, where we arrived at nine in the evening, through a heavy rain.

The whole summit of Kakama consists of foliated white stone, its leaves having a vertical direction, almost perpendicular to the meridian. These stones held the rain, which for some time back had fallen in such manner, that every part which did not consist of rock was covered with water; and it continuing to rain through the night, our observations could not be completed till the next day; we were consequently obliged to pass a second night as damp and as cold as the preceding: on the sixth our observations were finished.

After the uncomfortable stay that we made at Kakama we left it, and, urged by a continual rain through a forest where we had difficulty to keep our feet, we exerted ourselves greatly to get forward, and after five hours walking arrived at Korpikyla: we slept there that night, and continuing our journey the next day, we reached Pello the ninth of September, where we met all together.

Our different expeditions, and a residence of sixty-three days in the deserts, had given us the best succession of triangles possible: a work, the practicability of which was uncertain, and in which we ran great hazard of not succeeding, had turned out as fortunately as it could have done, had we possessed the power of disposing the site of the mountains at our pleasure.

Our mountains collectively with the church of Torneo formed a close figure, in the midst of which was Horrilakero, a focus serving to unite all the triangles of which our figure was composed: it was a long heptagon, in the direction of the meridian. This

figure was susceptible of a proof rather singular in these operations, depending on the natural qualities of polygons. The sum of the angles of an heptagon on a level is 900 degrees: the sum of our heptagon on a curved surface ought to exceed this a little, and we found it 900 degrees 1 minute 37 seconds, according to our observations of sixteen angles. Towards the middle of the figure we formed a base, the largest perhaps that ever was measured, and the most even; since it was on the surface of the river that it was to be measured, when it should be frozen. The extent of this base secured to us an exactitude in measuring the heptagon, and its position left no room to apprehend that there could be any errors of moment, from the small number of triangles, in the midst of which it was placed.

Indeed, the length of the arc of the meridian which we were measuring was very convenient for the certainty of our work. If there be an advantage in measuring large arcs, inasmuch that the errors which may arise in computing the amplitude are not greater for large than small arches, and that diffused amid small ones, they make a more considerable total of error than amid larger ones: on the other hand, the mistakes which may be made in the triangles may have consequences dangerous in proportion to the distance to be measured, and the number of the triangles. If the number be great, and the conveniency of a base for frequent proofs be wanting, these last errors may form a very diverging series, and more than counterbalance the advantages derivable from large arcs. I had read to the academy before my departure a memoir on this subject, in which I determined the most advantageous length to be measured for a certainty of exactitude; this length depends on the precision with which the horizontal angles are observed, compared with that which the instrument may give, with which the distance of the stars from the zenith is taken; and applying the reflections which I made to our work, it will be found that a longer or shorter arc than ours would not have afforded so much certainty of its measure.

For observing the angles between our signals we used a quadrant of two feet radius, with a micrometer attached, which, being verified round the horizon, always gave the sum of the angles very nigh by four proofs: its centre was always placed in the centre of the signals; every one took and wrote his observations separately; and afterwards we adopted the mean of all the observations, which differed very little one from another.

On every mountain we took especial care to observe the elevation or depression of the objects chosen for taking the angles, and the reduction of the angles to the level of the horizon we established on these heights.

This first part of our work, which might have been impossible, being thus happily terminated, we gathered fresh spirits to go through the rest, which simply required labour.

In a succession of triangles joined one to another by common sides, the angles of which are known, one side being ascertained, it is easy to find the remainder: we were sure of possessing the exact distance from the steeple of the church of Torneo, which terminated our heptagon towards the south, to the signal of Kittis, which was its northern extremity, as soon as the length of our base should be known; and the measurement of this we postponed till winter, when we should not want either for time or ice.

We then turned to another part of our work, to determine the amplitude of the arc of the meridian comprehended between Kittis and Torneo, the measurement of which we looked upon as complete. I have already stated what this was which we had to determine. It was necessary to observe how much higher or lower the same star when on the meridian appeared at Torneo than at Kittis, or, what is the same, how much this star on crossing the meridian was more near or distant from the zenith of Torneo than of Kittis. This difference between thet wo elevations, or the two distances from the zenith,

was the amplitude of the arc of the terrestrial meridian between Kittis and Torneo. This is a simple operation; it does not even require that one should have the positive distances of the star from the zenith of each place; it is sufficient to take the difference between the distances; but this operation exacts the greatest nicety and the utmost precaution. We had for the purpose a sextant of about nine feet radius, similar to that which Mr. Bradley uses, and with which he made his curious discovery of the aberration of the fixed stars. The instrument was made at London, under the inspection of Mr. Graham, of the Royal Society of England. This able mechanic had studied to unite in it every advantage and convenience that we could desire, and himself graduated the limb.

There are too many things to notice in this instrument for my giving now a complete description of it. Although what properly constitutes the instrument be very simple, its size, the number of pieces serving to render it commodious to the observer, the weight of a large pyramid nearly twelve feet high, which forms its pedestal, made its getting up to the summit of the mountains of Lapland almost an impracticable matter.

On Kittis two observatories had been built: in one was the time-piece of Mr. Graham, a quadrant of two feet, and an instrument consisting of a telescope fixed perpendicularly, and moveable about an horizontal axis, for which as well we were indebted to the care of Mr. Graham; this instrument was placed exactly in the centre of the signal, which served as a point to our last triangle; it was used for determining the direction of the triangles with the meridian. The other observatory, much larger, was adjoining, and so nigh, that one could distinctly hear the ticking of the time-pieces from one to the other; the sextant almost filled it. I shall say nothing of the difficulty of transporting so many instruments to the top of the mountain: it was effected, the limb of the sextant was placed exactly on the level of the meridian we had traced, and we satisfied ourselves of its exactness by the time of the passing of a star, of which we had taken the elevation. To sum up, every thing on the thirtieth of September was ready to begin observing, and the succeeding days the observations of the star ϑ of the Dragon were made, in which the greatest difference that occurred did not exceed 3 seconds.

While observing this star with the sextant, the other observations were not neglected; the time-piece was regulated every day with care by corresponding elevations of the sun; and with the instrument which I before mentioned we observed the passage of the sun, and the time of passing the verticals of Niemi and Pullingi. By these means the situation of our heptagon in respect to the meridian was ascertained, and eight of these observations, the difference between the widest of which did not amount to a minute, gave for a mean of the angle formed with the meridian of Kittis, by a line drawn from the signal of Kittis to the signal of Pullingi, 28 degrees 51 minutes 52 seconds.

All these observations were very happily completed, but rains and fogs had so much retarded them, that we had reached a period, at which it was scarcely possible to undertake a return to Torneo; nevertheless, other corresponding observations upon the same star remained to be made there, and we were desirous that the smallest possible interval should occur between the observations, in order to obviate the errors which might arise from any motion of the star (in case it should have any of which we were ignorant.)

It is sufficiently distinguishable that the whole of this operation, being founded upon the difference of the meridional height of a certain star observed at Kittis and at Torneo, it is necessary that the star should maintain the same position; or at least, if it should be liable to any change of elevation, that it should be known, in order not to confound such motion with the curve of the arc desired.

Astronomers for many ages have noticed a revolution of the stars round the poles of

the ecliptic, which causes the precesssion of the equinox, and a change of declension in the stars, which we can compute upon in the matter of which we speak.

But there is in the stars another change of declension, on which, although more recently observed, I believe we may reckon as securely as upon the other. Although Mr. Bradley be the first who discovered the rules of the change, the exactness of his observations, and the excellence of the instrument with which they were made, are equivalent to many ages of ordinary observations. He found that every star observed during the course of the year seemed to describe in the heavens a small ellipsis, of which the great axis is about 40 seconds. As there appeared at first to be a great variety in this motion of the stars, it was not till after a long succession of observations that Mr. Bradley discovered the theory upon which this motion, or rather this appearance, depends. If to discover so small a motion required his nicety of observation, his intelligence as well was necessary to find out the principle which produced it. We will not attempt to explain the system of that celebrated astronomer, which may be much better seen by consulting No. 406. of the Philosophical Transactions; all that we shall observe on the subject of this difference in the place of the stars, observed from the earth, is, that it arises from the motion of the light radiated by the star, and the motion of the earth in its orbit, combined together. Were the earth motionless, it would require a certain inclination of the telescope, through which a star is observed, to permit the ray emitted by the star to traverse its centre in coming to the eye. But if the earth, which bears the telescope, move with a velocity comparable to the velocity of the ray of light, it is no longer the same inclination which is necessary to give to the telescope; its position must be changed, to allow the ray of light penetrating its centre to reach the eye; and the different positions of the telescope will depend on the different directions in which the earth moves, at the various seasons of the year. The calculation being made on this principle, according to the velocity of the earth in its orbit, and according to the velocity of light, known by different experiments, the change of declension in the stars is found to be as stated by Mr. Bradley, from observation; and one is enabled to subtract from the declension of every star the quantity necessary for considering it as fixed, during the time that must elapse between the observations that are compared with each other for determining an arc of the meridian.

Although the motion of every star in the course of the year follows very exactly the law which depends upon this theory, Mr. Bradley has discovered yet an additional motion of the stars, much smaller than the two which we have mentioned, and which is not sensible until after the lapse of several years. To perfect nicety this third motion should be reckoned; but for our work, in which the time that passed between the observations was very short, its effect is insensible, or rather much smaller than one can reasonably hope to determine in these kind of operations. In fact, I consulted Mr. Bradley, to know if he had any observations upon the two stars that we used for ascertaining the amplitude of our arc. Although he had not observed our stars, because they pass too far from his zenith to be observed with his instrument, he has been so good as to communicate to me his last discoveries on the aberration and the third motion of the stars, and the corrected copy which he has sent for our amplitude, in which attention is paid to the precession of the equinox, the aberration of the stars, and this new motion, does not sensibly differ from the amended scheme which we had made for the precession and aberration alone, as in the detail of our operations will be seen.

Notwithstanding we might safely rely upon the amendment for the aberration of light, we were willing to make this amendment as little as possible, in order to satisfy those (if any there should be) who might be unwilling to admit of Mr. Bradley's theory, or

who should imagine that there were other motions of the stars; for this purpose it was fit that the interval between the observations at Kittis and at Torneo should be as short as possible.

We had perceived ice as early as the nineteenth of September, and snow on the twenty-first. Several parts of the river were already frozen, and these first frosts, which were imperfect, prevented navigation for some time on it, yet left it impassable with sledges.

In case of waiting at Pello, we ran the chance of not arriving at Torneo until a period, which would occasion too long an interval between the observations already made and those we had to make there; we even risked losing the star, by the sun, which was approaching it, merging it in its rays. It would then be necessary to return in the midst of winter, to take fresh observations of some other star upon Kittis; but it was apparently neither practicable nor possible to pass whole nights taking observations during the winter on that mountain.

By setting off, we ran the risk of being surprised by the ice in the river, and detained with all the instruments; there was no computing where, nor how long: we risked as well the rendering fruitless our observations at Kittis, and we readily perceived how difficult it would be to repair such a loss, in a country where observations can so seldom be made, where throughout the summer we could not hope to see any of the stars which our sextant could embrace, from their smallness, and from the continual day, which renders them invisible, and where the winter made the observatory of Kittis uninhabitable: we weighed all these difficulties, and resolved to risk the voyage. Messrs. Camus and Celsius departed the twenty-third with the sextant; the following day Messrs. Clairaut and Le Monnier; and on the twenty-sixth M. L'Abbé Outhier and myself: we were fortunate enough to arrive by water at Torneo the twenty-eighth of October, and were assured that the river had scarcely ever been navigable so late in the season.

The observatory which we had caused to be prepared at Torneo was ready to receive the sextant, and it was placed there on a level with the meridian. The first of November it began to freeze hard, and the succeeding day the river was frozen over: the ice no longer melted, but was quickly white with snow; and this vast river, which a few days before was covered with swans and various other water-fowl, was now no more than an immense plain of ice and snow.

On the first of November we began to observe the star we had before observed at Kittis, and with the same care: the widest of these observations did not differ one second.

These observations, as well as the former at Kittis, were made by day, without throwing light on the threads of the telescope: then taking a mean, reducing the parts of the micrometer into seconds, and having due regard to the change of the declension of the star, during the time elapsed between the observations, as well for the precession of the equinox as for the other motions of it, we found the amplitude of our arc 57 minutes 27 seconds.

Our work now, as far as it could be, was complete; it was stopped, without our being able to tell if we should find the earth lengthened or flattened, because we were unacquainted with the length of our base. What remained to do was not an operation difficult in itself, it was only to measure with a rod the distance between the two signals that were raised the summer before; but this measurement was to be made upon the ice of a Lapland river, in a country where the cold became daily more and more intolerable, and the distance to be measured was more than three leagues.

We were advised to delay the measurement until the spring, because then, in addition to the length of the days, the first thaws which happened on the surface of the snow, which are quickly succeeded by a new frost, form a sort of crust capable of bearing men; instead of which, during the coldest part of winter, the snow of these countries is

nothing but a fine and dry powder, generally four or five feet high, in which it is impossible to walk, when once that height is attained.

In spite of what was every day before our eyes, we were fearful of being surprised by a thaw. We were ignorant of its being sufficiently in time, in the month of May, to measure the base, and all the advantages we sought in spring disappeared before the ungrounded fear of missing our measurement.

In the mean time we did not know whether the height of the snow would allow of our walking on the river between the signals of the base; and Messrs. Clairaut, Outhier and Celsius set off the tenth of December to try. The snows were found already very high; but as they did not leave us without hope of being able to measure, we all departed together for Oswer Torneo.

M. Camus, assisted by L'Abbé Outhier, employed the nineteenth and twentieth of December in adjusting eight rods, of thirty feet each, by an iron toise which we had brought with us from France, and which, during the adjustment, we took care to keep in a place where the thermometer of M. Reaumur was at 15 degrees above 0, and that of M. Prius at 62 degrees, which is the temperature of the months of April and May at Paris. Our rods once adjusted, the change which cold could effect in their length was not to be apprehended, since we had observed that heat and cold caused upon our deal measures much less sensible changes than upon the length of iron. Every experiment that we tried gave us variations of length almost imperceptible. Some trials which we made give me reason to suspect that cold possesses the quality of lengthening, rather than diminishing, the length of wood, contrary to its known effect on metals. Possibly a remnant of sap, which was contained in the measures we used, froze, on being exposed to the cold, and caused it to participate the property of liquids, whose volume augments upon freezing. M. Camus took such pains in adjusting these rods, that in spite of their extreme length, when they were placed between two gauges of iron, they fitted so exactly, that the thickness of a leaf of paper of the thinnest kind, additional or less, made the putting them between them impossible, or left room.

On Friday, the twenty-first of December, the wintry equinoctial day, a remarkable one for such a work, we began the measurement of our base towards Avasaxa. The sun at that time scarcely rose by noon; but the long twilights, the whiteness of the snow, and the fires with which the heavens in this country are illuminated, afforded us every day sufficient light to work during four or five hours. We left the house of the rector of Oswer Torneo, where we lodged during this work, at eleven o'clock in the morning, and got on the river, when we were to begin the measurement, with such a number of sledges, and so numerous an equipage, that the Laplanders descended from their mountains to enjoy the novelty of the sight. We divided ourselves into two companies, each of which carried four of the measures we have spoken of. I shall say nothing of the fatigue, nor of the dangers of this operation: conceive what it must be, to walk in two feet depth of snow, loaded with heavy rods, that we had to place continually upon the snow and take up again, and this during so intense a frost, that our tongues and lips froze to the glass on drinking brandy, which was the only liquor which could be kept sufficiently liquid to drink, and could not be got away without taking off the skin; a frost which nipped the fingers of some of us, and which continually threatened us with greater accidents. While our extremities were frozen, our labour made us sweat. Brandy did not slake our thirsts; we were obliged to dig deep pits in the ice, which were almost as quickly closed, and from which the water could scarcely be brought in a liquid state to the mouth; and we were obliged to run the risk of the dangerous consequences which were to be apprehended from taking this iced water at a time our bodies were so warm.

However, the work advanced: six days labour had brought it so near to an end, that no more than five hundred toises, which could not be marked with stakes sufficiently soon, remained to be measured. The continuation of the measurement then was interrupted, the twenty-seventh, and while Messrs. Clairaut, Camus and Le Monnier busied themselves in fixing the stakes, in company with M. L'Abbé Outhier, I employed the day in an enterprise rather singular.

An observation of the slightest moment, and which in the most commodious countries might be overlooked, had been neglected the summer before; the height of an object used on Avasaxa, in taking the angle formed by Cuitaperi and Horrilakero, had not been observed. The desire which actuated us, that nothing should be wanting in our work, impelled us to be scrupulously exact. I undertook to ascend Avasaxa with a quadrant. Figure to yourself a very lofty mountain, full of rocks, hid by a prodigious quantity of snow, and the cavities made by which, alike concealed, threaten the adventurer who should attempt to ascend it with destruction; it will be deemed impracticable; nevertheless, there are two modes of effecting it; the one, by walking or rather sliding on two narrow planks of eight feet long, as the Fins and Laplanders do, in order to prevent their sinking into the snow, a custom that requires a long practice; the other, by trusting to the rein-deer, who are able to make such a journey.

These animals are not able to draw any other than a very small boat, into which the half of the body of a man can with difficulty enter: this boat, designed for travelling through the snow, in order to find the least resistance from it, in cutting it with its prow, and sliding over, is fashioned the same as boats used at sea, that is to say, with a pointed prow and a sharp keel below, which causes it to roll and overturn continually, unless he who is within be careful in preserving a balance. The boat is fastened by a thong of leather to the breast of the rein-deer, who, if upon a beaten and firm track, runs with fury. However desirous of stopping him, you pull in vain at a kind of bridle fastened to his horns; intractable as he is, it causes him only to change his road, sometimes even he comes back, to be revenged by kicking you. On such occasions the Laplanders turn the boat over them, making it serve as a shield against the rage of the animal. For our part, little able to employ such a remedy, we should have been killed before we could have shielded ourselves. Our only defence was a little stick that was put in our hand, with which we had to steer as with a rudder, and shun the trunks of trees. Thus trusting to the rein-deer it was that I ascended Avasaxa, in company with M. L'Abbé Outhier, two Laplanders, one Lapland woman, and Mr. Brunnius, their rector.

The first part of the voyage was completed in an instant, there was a hard beaten road leading from the house of the rector to the foot of the mountain, which we passed over with a swiftness comparable only to the flight of a bird. Although the mountain, on which there was no road, delayed the progress of the rein-deer, they drew us to the top, and we completed immediately the observation, the object of our journey. In the interval, our rein-deer had dug deep holes in the snow, where they grazed the moss with which the rocks of this mountain are covered; and our Laplanders having kindled a great fire, we approached it to warm ourselves. The cold was so severe, that the heat had no power to extend itself the shortest distance; if in such places as the fire immediately touched the snow it melted, it froze again all around it, and formed a hedge of ice.

If our troubles were great in ascending Avasaxa, our fear of returning too quick over a craggy mountain was not less; exposed in carriages which always slided, even while sunk into the snow, and drawn by animals which excited our apprehensions even on the plains, and which, notwithstanding they sunk to their bellies, extricated themselves

by the velocity of their course. We were shortly at the foot of Avasaxa; and in a minute afterwards we had passed the great river, and were housed.

The following day we finished the measure of our base, and had no right, when we saw the precision that our level had afforded us, to regret the trouble which our measurement on a frozen river had caused. The difference found between the measurement of our two parties amounted to no more than four inches on a distance of seven thousand four hundred and six toises five feet; a precision which we could not expect, and which one should almost fear to tell. Neither can it be considered as the result of chance, or compensations for more considerable former differences; for this small one almost wholly arose during the last day. Our two parties measured daily by the same number of toises, and on none did the difference of the two measurements exceed an inch, which sometimes one exceeded the other, and at other times the reverse. This nicety, although due to the ice, and the extreme care we employed, shewed at the same time the exactness of the lengths of our rods; for the slightest inequality between the rods must on so considerable a distance have made a very sensible difference.

We had ascertained the amplitude of our arc, and our figure being completed, waited for nothing but the length of the base to be fixed to the scale. We then found that the length of the arc of the meridian intercepted between the two parallels that cut our two observatories of Torneo and Kittis was fifty-five thousand twenty-three and a half toises; that this length, having for its amplitude 57 minutes 27 seconds, the degree of the meridian under the polar circle was greater by nearly one thousand toises than what it should be, according to the computations of the book on The Size and Figure of the Earth. After this operation we hastened to return to Torneo, to endeavour to secure ourselves from the latter rigour of winter.

The town of Torneo, when we arrived there, the thirtieth of December, offered a dreadful spectacle; its low houses were sunk in snow to the roof, which would have excluded all light, if there had been any; but snow continually falling, or threatening to full, scarcely ever allowed the sun, the few minutes it was above the horizon about noon, to shew itself. The frost was so sharp in the month of January, that our thermometers of mercury, constructed by M. Reaumur, those thermometers that we were surprised to see sink to 14 degrees below the freezing point at Paris in the great frosts of 1709, sunk to 37 degrees, while those of spirits of wine froze. On opening the door of a warm room, the external air immediately converted into snow the vapour which was formed, making white whirlwinds: on going out, the air seemed to tear the breast. We were continually warned of and threatened with an increase of cold, by the noise of the splitting of the wood, of which all the houses are built. To behold the solitude which reigned in the streets, one would conceive that all the inhabitants were dead. We frequently saw people who had been frost bitten, and the inhabitants of so rude a climate frequently lose a leg, or an arm. Cold, always rigid in this country, is sometimes suddenly so sharply increased, as to destroy infallibly those who may have the bad fortune to be exposed to it. Sometimes storms of snow arise even more dangerous; woe to him who in the country is surprised by such; in vain would he strive, by his recollection of places, by trees he had marked, to find his way; he is blinded by the snow; if he makes a stop, he is swallowed up.

If the aspect of the earth be horrible in these climates, the sky affords the most beautiful spectacle. As soon as the nights grow dark, fires of a thousand colours, and a thousand various shapes, lighten the sky, seemingly to indemnify this country, used to enjoy continual day, for the absence of the sun which leaves it. These fires in this country have no constant position, as in southern parts; for although an arch of fixed light be frequently seen towards the north, they seem more commonly to occupy indif-

ferently every part of the sky. Sometimes they begin by forming a large scarf of clear and moving light, whose extremities reach to the horizon, and which rapidly traverses the heavens with a motion resembling the cast of a fisherman's net, preserving in this motion very preceptibly a direction perpendicular to the meridian. Most frequently, after these preludes, all the lights unite towards the zenith, where they form the head of a kind of crown. Oftentimes arcs, similar to those we see in France towards the north, are seen towards the south, at times in the north and south at once, their tops approaching while their extremities retire sinking towards the horizon. I have seen some of these opposites, whose summits nearly touched each other at the zenith; both one and the other have frequently beyond them several concentric arcs. They have all of them their tops towards the south, with however a trifling variation westward, which did not appear to me to be constantly the same, and which at times is imperceptible. Some of these arcs, after appearing broadest upon the horizon, become narrower as they approach each other, and represent above more than half a great ellipsis: to describe all the figures which these lights assume, and all the motions they make, would be an endless task. Their most ordinary motion is one which makes them resemble curtains flying in the air; and by the shades of colours which they assume, one would take them to be of those taffeties which are called flame coloured; sometimes they carpet part of the heavens with scarlet. At Oswer Torneo (one day) it was the eighteenth of December, a sight of this description, in spite of my being accustomed to them, excited my astonishment. Towards the south a wide region of the sky was tinted with so lively a red, it seemed as though the whole constellation of Orion was tinged with blood; at first fixed, the light soon began to move, and after assuming other colours, such as violet and blue, it formed a dome, whose summit was very little distant from the zenith towards the south-west; the brightest moon then shining took away nothing from the spectacle. I saw no more than two of these red lights, which are rare in these countries; and where they are dreaded as portents of some great misfortune. Indeed, surveying these phenomena, one cannot be surprised that those looking on them differently than with the eye of philosophy, should fancy them chariots of fire, fighting armies, or any other prodigious things.

We remained at Torneo, shut up in our rooms in a state of inaction, until the month of March, when we began new undertakings.

The length of the arc we had measured, which differed so much from the computation of the book on the size and figure of the earth, astonished us; and in spite of the incontestability of our operation, we resolved to verify our work by the most rigorous proofs.

As to our triangles, all their angles had been so many times observed, and by so great a number of persons, who all agreed, that no room was left to doubt of the truth of that part of our work. It had even an advantage above any other former work of this nature: hitherto, two angles only having been used, and the third computed, whereas all our angles had been observed, notwithstanding the inconvenience it occasioned, by causing us to make several very disagreeable procrastinations of our residence on the tops of mountains.

Moreover, although only eight triangles were necessary to determine the distance between Torneo and Kittis, we observed several supernumerary angles, and our heptagon thereby afforded combinations or successions of triangles without number.

Our work, at least this part of it, had been done, we may say, a great many times over; all that was necessary therefore was to compare by calculation the lengths given by all these different successions of triangles. We carried our patience so far as to

compute twelve of these, and in spite of some triangles improper for such computations, from the small angles they contained, we found the greatest difference given in the distances between Kittis and Torneo did not exceed fifty-four toises in the widest of these combinations, and we fixed on two, which we deemed preferable to the rest, the difference between which was four and a half toises, the mean of which we took to determine the length of our arc.

The small difference between any of these results would have surprised us, if we had not known how much time and care had been taken in observing our angles. Eight or nine triangles had cost us sixty-three days, and every angle had been so often taken, and by so many different observers, that the mean of all these observations could not fail to be very near the truth.

The small number of our triangles enabled us to make a singular calculation, and which would shew the fullest extent of all the errors which the greatest awkwardness and most complete misfortune, joined together, could possibly produce. We placed as a position, that in all the triangles from the base we had made an error of 20 seconds in each of the two angles, and 40 seconds in the third, and that all these errors were on the same side, and tended to diminish the length of our arc. And the result, allowing so strange a position, was, that fifty-four and a half toises of error was the whole that it could occasion.

The care with which we had measured the base left no apprehension on that score. The agreement of a great number of intelligent persons, who separately wrote the number of rods; and the repeating of this measurement, with only four inches of variance, made a certainty of correctness even more than sufficient.

The rest of our examination was therefore turned to the amplitude of our arc, and the little difference which we found in our observations, either at Kittis or Torneo, left us nothing to wish for of greater nicety.

There seemed, on noticing the solidity and the mode of construction of our sextant, and the precaution we used in transporting it, no room to fear that we had any ways deranged it. The limb, the telescope, and the centre of this instrument, were of one piece, the threads in the focus of the object glass were of silver, fixed by Mr. Graham in such manner that no change of their position could happen, so that, in spite of the effects of heat and cold, they remained equally extended. So that the instrument could no otherways be out of order than by its figure being altered, and the telescope bent; but if a computation be made of the effects of such a change, it will be seen, that in order to cause an error of a second in the amplitude of our arc, it must be so much bent as to be easily perceived. This instrument was transported from Kittis to Torneo by water, in a very solid box: always some of us were with it, and on passing the cataracts it was carried by men.

Moreover, the position of the star which we had observed secured us against any flexion which one might apprehend could happen, either to the radius on the telescope of these large instruments, when the star to be observed should be distant from the zenith, and the instrument should be inclined to direct it to the star. Their weight alone might make them bend, and the practice of observing a star with the two different sides of the instrument, which may remedy other accidents, would be of no avail in this instance: for if any flexion should take place in the instrument while observing with its face towards the east, on turning it towards the west there will be a new flexion, in the opposite direction, and nearly equal; so that the line which answered with the zenith, when the front of the instrument was turned towards the east, will very possibly answer the same, when turned towards the west; and yet the arc which measures the distance from the zenith be wrong. The distance of our star from the zenith of Kittis

was not more than half a degree; consequently, there was no room for apprehending that our telescope, in a position so nearly vertical, should have swerved in the smallest degree.

Although for all these reasons we could not doubt of our amplitude being correct, we were desirous of proving it so by experiment; and for this purpose we employed a proof of the most laborious description, but best calculated to satisfy us, as it would shew us at the same time the exactness of our instrument, and the precision which we might reckon upon in the arc we had taken.

This proof consisted in ascertaining anew the amplitude of the same arc by another star. We waited then for an opportunity to make succeeding observations of a star, which in this country is difficult, since it seldom happens that three or four fine nights follow each other: and beginning on the seventeenth March, 1737, to observe the star *a* of the dragon from the same spot as before at Torneo, after taking three nice observations of the same star, we departed, to take corresponding ones at Kittis. On this occasion our sextant was conveyed on sledges, at a foot pace, over the snow, the most easy mode of conveyance that can be imagined. Our second star passed even nearer to the zenith than the first, since it was no more than a quarter of a degree from the zenith of Torneo.

The meridian already traced in our observatory at Kittis enabled us to fix our sextant in very little time, and on the fourth of April we then began our observations on *a*. We took three observations at Kittis as well, which, comparing with those of Torneo, gave for our amplitude 57 minutes 30½ seconds, which made no greater difference between this and our observation on 8 than 3 ½ seconds, after making allowance for the observation of light.

And not admitting the theory of the aberration of light, the amplitude by the last observed star did not differ a second from that found by the first.

The agreement of the two amplitudes, with so very slight a difference, a difference which will even be shewn to be less than it now appears; this agreement afforded the most solid proof of the exactness of our instrument, and of the perfect precision of our observations.

Having thus repeated our work, we found that, by a mean of the two amplitudes, the amplitude of the arc of the meridian between Torneo and Kittis was 57 minutes 28¾ seconds, which, compared with the length of that arc, fifty-five thousand and twenty-three and a half toises, gives, for the degree which cuts the polar circle, fifty-seven thousand four hundred and thirty-seven toises, a greater length by three hundred and seventy-seven toises than that which was ascertained by M. Picard between Paris and Amiens, which he made to be fifty-seven thousand and sixty toises. It is however necessary to remark, that, as the aberration of the stars was not known in the time of M. Picard, he could make no allowance for it: if this be done for him, and the additional ones for the precession of the equinox, and for refraction, which M. Picard omitted, be added thereto, the amplitude of his arc being 1 degree 23 minutes 6½ seconds, and the length seventy-eight thousand eight hundred and fifty toises, it will give for the degree fifty-six thousand nine hundred twenty-five toises, and make it less than ours by five hundred twelve toises.

And were aberration not admitted, the amplitude of our arc would be 57 minutes 25 seconds, which, compared with its length, would make the degree fifty-seven thousand four hundred and ninety-seven toises; longer than the degree measured by M. Picard by four hundred and thirty-seven toises.

To conclude; our degree, allowing for aberration, varied nine hundred and fifty toises from what it should have been according to the computation of M. Cassini, in his book of the Size and Figure of the Earth, and differs one thousand from it, if aberration be not allowed. From which it is apparent, that the earth is considerably flat towards the poles.

During our stay in the frozen zone, the frost remained yet so severe, that on the seventh of April, at five o'clock in the morning, the thermometer sunk to 20 degrees be-

low the freezing point, although every day at noon it rose to from 2 seconds to 3 degrees above it, thus changing as much between morning and evening, as it does in common between the greatest heat and cold that are experienced at Paris; bringing into twelve hours an equality of vicissitudes with what are felt by the inhabitants of the temperate zones in the space of a year.

We chose to scruple the meridional direction of our heptagon. This, as has been noticed before, had been determined upon Kittis, by a number of observations on the passage of the sun over the verticals of Niemi and Pullingi; and it was not to be apprehended that our figure should have received any alteration in its direction, seeing the small number of triangles of which it consisted, and the closeness with which the sum of the angles of our heptagon approached to 900 degrees. Nevertheless, we were inclined to make the trial of the direction at Torneo.

For this purpose a different method to that which had been used at Kittis was adopted; this consisted in observing the angle between the sun when on the horizon, and some one of the signals, with the hour at which the angle was taken. The three observations that we made gave, for a mean of the direction by this process, within 34 seconds of what we had determined by the observations from Kittis.

Every part of our work having thus been repeated, nothing remained but to examine the primitive construction and divisions of our sextant. Although we had no ground to doubt its correctness, we undertook to try it in the interval, between the time at which the weather would allow of our departure, and this trial, from its singularity, from its demonstrating how much our instrument was to be relied upon, as well as to shew the means to be used for discovering its being out of order, if it should be desirous that I should mention it.

On the fourth of May, upon the ice of the river, we measured a distance of three hundred and eighty toises one foot three inches, which was to serve as a radius. And upon measuring this twice over, we found no variation. Two firm stakes, with two sights, in a line drawn perpendicularly at the extremity of this distance, were fixed; and having measured the distance between the centres of the two sights, this distance was thirty-six toises six inches six lines two-thirds, which was to serve as a tangent.

The sextant was placed horizontally in a room upon two firm stocks, supported by an arch, in such manner that its centre was exactly at the extremity of the radius of three hundred and eighty toises one foot three inches; and five different observers having taken the angle between the two sights, among whom the greatest difference was not two seconds, the mean of which being taken, the angle between the two sights was 5 degrees 29 minutes 48 seconds 95. By calculation the angle should have been 5 degrees 29 minutes 50 seconds, that is to say, it differed from the angle observed by $1\frac{1}{10}$ second.

It will no doubt be thought surprising, that a sextant of 5 degrees 29 minutes $56\frac{1}{4}$ seconds, in a climate so temperate as that of London, and divided in a chamber which certainly was not cold, should be found precisely of the same angle at Torneo, when we tried it. The parts of the sextant were certainly contracted by the cold in this last experiment; but one's surprise will vanish, on consideration that the instrument being made wholly of the same matter, its parts would contract proportionally, and consequently its figure remain the same, which was the case.

Having thus found such a wonderful exactness in the whole arc of our sextant, we wished to know if the two degrees of its limb which we used, the one for *s*, the other for *a*, were perfectly equal. M. Camus, whose ingenuity had already been so useful to us on several occasions, procured us the means of making this comparison with all possible exactitude; and having compared together our two degrees, the mean of the observations, taken by five observers, gave 1 second more for the degree of the limb used in taking *s*, than that used for *a*.

We were surprised, when we saw that this inequality between the two degrees tended to diminish the very trifling difference found between our two amplitudes, reducing it from $3\frac{1}{4}$ seconds to $2\frac{1}{2}$ seconds; and it will be seen in the detail of the operations, that this difference between the two degrees of the limb, however small, may be accounted for by the means used to discover it.

Thus we verified, not only the total amplitude of our sextant, but also different arcs, which we compared together; and this proof from arc to arc, joined to that of the total which we had made, satisfied us that nothing had been left to wish for beyond in the construction of the instrument, and that so great a precision could not have been expected.

We did not know what else to imagine as necessary for the measurement of the degree of the meridian; for I shall not say any thing here of our experiments on gravity, a matter equally important, and which we treated with equal care. It will be sufficient now to say, that if disposed to follow the example of Messrs. Newton, Huygens, and some others, among whom I scarcely dare to name myself, one might be disposed to compute the figure of the earth by gravity. Every experiment we made in the frozen zone will shew the earth to be flattened; which is confirmed also by what we learn of the experiments made by Messrs. Godin, Bouguer, and La Condamine, on the torrid zone.

In the mean time the sun drew nearer to us, or rather no longer left the horizon: it was a singular sight to behold it so long illuminate a frozen horizon, to see the summer in the heavens, while rigid winter grasped the earth: we were then in the morning of that long day which lasts for several months: in the mean time it did not seem that the continued sun caused any change in either ice or snow.

On the sixth of May it began to rain, and some water was perceptible on the frozen river. Every day at noon the snow melted, and every night winter resumed its sway. At length, on the tenth of May, the earth was visible, unseen for such a length of time: some elevated points, exposed to the sun, began to appear, like the summits of the mountains after the flood, and soon after the birds, natural to the country, were seen again. Towards the beginning of June the ice gave up both land and sea: we immediately turned our thoughts to our return to Stockholm, and departed the ninth of June, some by land, and some by sea; but the rest of our adventures, or our shipwreck in the Gulf of Bothnia, do not belong to this subject.

ACCOUNT OF A JOURNEY TO THE EXTREMITY OF LAPLAND, FOR THE PURPOSE OF FINDING AN ANCIENT MONUMENT.

[BY M. MAUPERTUIS.]

WHILST we were at Pello, where the arc of the meridian which we had measured terminated, the Fins and Laplanders frequently spoke to us of a monument, which they looked upon as the wonder of their country, and in which they conceived was contained the knowledge of every thing of which they were ignorant. This monument was reported to be situated from twenty-five to thirty leagues towards the north, in the middle of a vast forest, which separates the Gulf of Bothnia from the ocean.

To arrive there one is obliged to be drawn over the snow by rein-deer, in those dangerous sort of carriages called pulkas, of which I already have given a description in the account of our observations. Although it was the month of April, there was yet a risk of being frozen in the deserts, where there was no hope of finding an asylum; and this risk was to be undertaken upon the assertions of Laplanders.

I am almost ashamed to tell that I undertook it. The want of occupation, during a

stay which we were obliged to prolong in these countries till the season for our departure; a disposition from curiosity of penetrating to the centre of Lapland; the most slender hope of seeing the only monument of this description perhaps extant in the world, with the habitude which we had of encountering hardships and danger; these perhaps may excuse me. I resolved then on going, and had the good fortune of being accompanied by M. Celsius, who, to a most profound acquaintance with astronomy, joined a profound knowledge of the northern languages, and who had made a particular study of Runic inscriptions, to which we thought this which was spoken of to us might have some relation.

It perhaps may be pleasing to know the method used in travelling in Lapland. In the beginning of winter the roads conducting to frequented places are marked with branches of fir: scarcely have the sledges and pulkas beaten the first snow which covers the road, and begun to hollow it, before a succeeding fall, driven by the wind, fills it, and brings it to a level with the surface of the country, lake, or river. The next carriages that pass beat again the way, which other falls of snow cover anew, and these roads, alternately hollowed by carriages, and filled by the wind, that reduces everywhere the snow to a level, although not more raised than the circumjacent parts, form, nevertheless, causeways or bridges of compressed snow, from which, by varying to the right or left, one is engulfed by the snow. Great care is taken not to swerve from these roads, and mostly towards the middle they are hollowed by a kind of furrow, made by the pulkas travelling over them; but in the midst of forests and unfrequented places no such roads exist. The Fins and Laplanders only find each other by marks cut on trees. Sometimes the rein-deer plunges up to the horns in snow; and in these places, if overtaken by one of those storms, during which the snow falls in such quantity, and driven by the wind on every side in such manner, that it is impossible to see two steps from one, it would be impossible to find again the way passed over, or to pursue one's course; destruction must infallibly follow, and above all, if not provided with tents, as we were, to shelter us from part of the storm.

While on our journey, our Laplanders, fruitful in wonderful stories, related to us on this subject many accounts of men, who had been taken up into the air in these storms, with their pulkas and their rein-deer, and precipitated sometimes on rocks, at others into the middle of the lakes.

I left Pello the eleventh of April, 1737, and arrived in the evening at Kingis, which is twelve or fifteen French leagues distant. I did not stop there, being desirous of getting to the place where rein-deer were to be provided for me as soon as possible; I therefore proceeded five leagues farther, and slept at Pellika; this is one of the houses which forms the village of Payala. In these countries villages are composed of no more than two or three houses, each some leagues distant from the other. I there found six rein-deer, with their pulkas; but as we could yet go three leagues further in sledges, I reserved our horses for the next day, to carry us to Erckiheicki, to which place I sent forward the rein-deer to wait for me.

In these unfortunate climates, incessantly burnt during the summer by the rays of the sun, which never goes down, and afterwards during the winter wrapt in profound and continual night, one could not expect to meet with such an agreeable asylum as that we found. The house called Pellika, in spite of its remoteness from the inhabited world, was one of the best I had met with in the country; we stretched out skins of bears and rein-deer, on which we prepared ourselves, by taking a little rest, for the fatigues of our next day's journey.

Long before sun-rise I left Pellika on the twelfth of April, and soon arrived at Erckiheicki, where I stopped no longer than was necessary to leave our sledges, and get tied

in our pulkas; a precaution, without which, when the rein-deer is at its speed, one should not long remain in the carriage. At this season, however, our precautions against the rapidity of the rein-deer were superfluous: they were no longer those ungovernable deer which drew me last summer with such swiftness over the river, and almost flew with me from the top of Avasaxa. Their former smooth horns were now no other than white and dry bones, which one might mistake for parched ribs of dead animals: their bones came through their skin, and they looked as though incapable of dragging us a hundred steps.

The difference of the seasons was the cause of this change. When they drew me to Avasaxa they came from Norway, where, during the summer, they had nothing else to do but to feed and get fat: at that period I would advise no one to travel in pulkas; but at the present season, after having undergone all the toil of winter, and returned from the Lapland fairs, we had nothing to fear from the rein-deer, unless it were to be left behind. If it be difficult to stop this animal when in its full strength, at the time of his exhaustion it is not less difficult to make him proceed.

We travelled thus dragged through a forest, having eight or nine leagues to go: there was no road which led to the spot we were going to, which made it so much the more laborious for the rein-deer; at every short interval we were obliged to suffer them to rest, and give them moss, which we had brought with us: this moss is their only food. The Laplanders mixed it with ice and snow, and form very hard cakes of it, which serve at the same time as food and beverage for the animal, who gnaws it with avidity. In spite of this, we were under the necessity of leaving a deer on the road: he was tied to a tree, and some of these cakes left beside him.

We ourselves were much incommoded by the uneasy posture which we were obliged to assume in these pulkas: the only amusement afforded us during this tiresome journey was in noticing in the snow the footsteps of the different animals, with which the forests are filled: we easily distinguished the different ones, and saw with surprise the number of various animals which had passed in a very short space during a few days.

We saw on the road many snares laid for ermines, in some of which were prisoners. The Laplanders tie to a tree, whose top is cut off level with the height of the snow, a log of wood, covered by another ready to fall, beneath which a small passage is left for the ermine, and which, upon its entering to eat the bait that is set for him, falls on and crushes him.

It is thus that ermines, which are very plentiful in Lapland, are snared: these animals are cinnamon-coloured in summer, having only the belly and tip of the ears white: we frequently met with such on the banks of lakes and rivers, where I imagine they watch for fish, of which they are particularly fond; sometimes even we have found them swimming in the middle of the water. In winter they become entirely white; which was the case of those we found in the snares. However, upon leaving Torneo, a tame ermine that I had in the house had already lost its white in many places; and on my return some days afterwards I found it perfectly gray. It is true, if it be the cold, which, by any cause whatever, whitens them, those which were exposed to the air should naturally remain longer white than those shut up in a house: perhaps the ermines found by us had been caught some time; for, as may be conceived, frozen animals are preserved all the winter. In the packages of ermines sold by the Laplanders, when the skins are turned inside out, there are always a number of gray, or spotted with gray, which are not used for trimmings.

We arrived at Keyma, situated at the foot of a little mountain called Winso, at one o'clock in the afternoon: we ascended it; it was there we were to find the monument we were seeking, but it was covered with snow. Our Laplanders sought for it without

being able to find it, and I began to repent me of having undertaken so fatiguing a voyage upon such suspicious information, when, after a long search, it was discovered: I caused part of the snow to be removed, and lighted a great fire, for the purpose of melting the remainder, in order that we might examine this pretended wonder.

It is a stone, of which a part of irregular form advances out of the earth to the height of a foot and a half, and is about three feet broad: one of its faces is tolerably even, and forms a surface not altogether vertical, but which makes an acute angle with the horizon. On this face are two very straight lines of characters, rather more than an inch long, and which are cut tolerably deep into the stone, like notches made by the stroke of an axe in wood, or a chisel, being broad at the surface, and ending at the bottom with an acute angle.

At the bottom, and out of the two lines, are some larger characters; in spite of all the signs which these characters shew of having been engraved with iron, I dare not venture to affirm whether they be the work of man, or a sport of nature.

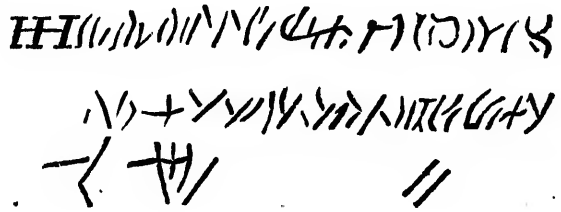
I leave to those who have made a longer study than myself of ancient monuments, or who may be more bold than me, to decide this question. If the resemblance of several of these characters, and even of many which succeed each other, appear to discountenance their being letters, I should not therefore conclude that such characters were without signification. If we mark one, eleven, one hundred and eleven, &c. in Arabic figures, it will readily be seen what different meaning may be made by the addition of a similar character.

The most ancient inscriptions of China are composed of no more than two characters, and one cannot doubt of these being the work of man, or of their containing a meaning, should they be no other, as some with much apparent reason imagine, than arithmetical works. If the tradition of the country be consulted, all the Laplanders assure us that they are characters of great antiquity, containing valuable secrets; but what can one believe in regard to antiquity from those people, who even do not know their own age, and who for the greater part are ignorant who were their mothers.

M. Brunniers, their rector, speaks of this monument, in a dissertation that he has caused to be printed upon the town of Torneo and the neighbouring country: he looks upon it to be a Runic inscription, and relates that there were formerly three crowns on it, effaced now by time. But M. Celsius, very well acquainted with the Runic, could not read these characters, and found them to differ from all the inscriptions subsisting in Sweden; and as for the crowns, if there ever were any, time has effaced them in such a manner, that no vestige of them remains.

The stone on which these lines are engraved is composed of different beds; the characters are written on a species of flint, while the rest, and above all between the two lines, seems to be of a stone more soft and foliated.

However it may be, M. Celsius and myself copied separately, and with care, all that we could discern.



Should it be no other than a sport of nature, the reputation which the stone bears in this country deserves that we should have given the description of it.

This stone does not certainly possess the beauty of the monuments of Greece or Rome: but if what is on it be an inscription, it very possibly has the advantage of being the oldest in the universe. The country in which it is found is inhabited only by a race of men, who live like beasts in the forests: we cannot imagine that they can have ever had any memorable event to transmit to posterity, nor, if ever they had had, that they could ever have invented the means. Nor can it be conceived that this country, with its present aspect, ever possessed more civilized inhabitants. The rigour of the climate, and the barrenness of the land, have destined it for the retreat of a few miserable wretches, who know no other.

It seems therefore that our inscription must have been cut at a period when this country was situated in a different climate, and before some one of those great revolutions, which we cannot doubt have taken place in our globe. The position that its axis holds at present, with respect of the ecliptic, occasions Lapland to receive the sun's rays very obliquely; it is thereby condemned to a winter long, and fatal to man, as well as to all the productions of nature; its land is barren and a desert.

No great movement possibly in the heavens was necessary to cause all its misfortunes. These regions may formerly have been those on which the sun shone most favourably: the polar circles may have been what now the tropics are, and the torrid zone have filled the place now occupied by the temperate. But how could the situation of the axis of the earth be changed? If attention be paid to the motion of the celestial bodies, but too many causes may be seen, capable of producing this and even greater changes.

If the knowledge of anatomy, of all the parts and all the springs which cause the motion of our bodies, occasions those acquainted with it to wonder how the machine can possibly last so long, the same may be said of astronomy. The knowledge of the celestial movements discovers to us many causes, which could effect, not only upon our earth, but on the general system of the universe, material changes.

The varition in the obliquity of the ecliptic, which several astronomers consider as demonstrated by the observations of the ancients, compared with our own, might of itself, after a long lapse of ages, have produced changes similar to those we speak of. The obliquity at which the equator of the earth at present cuts the ecliptic, which at present is no more than 23 ½° degrees, may possibly be the remainder of a much greater obliquity, during which the poles may have been in the temperate or the torrid zone, and have had the sun at their zenith.

Whether there may have been such changes, or more sudden ones, it is certain there have been some. The print of fish, and fish themselves petrified, which are found in countries most remote from the sea, and even upon the summits of mountains, are incontestible proofs of these places having been formerly low, and covered with water.

Sacred history teaches us that the waters formerly covered the highest mountains. Such an inundation it would be difficult to imagine, without the transposition of the centre of gravity of the earth, and of its climates.

If repugnant to the allowance of such changes, the inscription at Winso may be conceived to owe its origin to some event as singular as our voyage. An inscription, which should contain the history of the operation which we went to this country to effect, might in some future day, perhaps, be as obscure as this is now; and if all the sciences were to be lost, who could then discover, who could imagine, that such a monument had been the work of Frenchmen; and that what was cut thereon was the measurement of the degrees of the earth, and the solution of its figure.

I leave my reflections and the monument to the conjectures which may be entertained on them, and take up the thread of my relation. After we had copied what we found on the stone, we embarked in our pulkas, to return to Erekiheicki. This journey was still more fatiguing than it had been in the morning: the posture in the pulkas is so very incommodious, that it gives the sensation of a broken back after a few hours; notwithstanding, we were so seated continually from four in the morning until one in the afternoon. Our return was still longer; our deer stopped every minute, and the moss we carried with us being all consumed, we were obliged to seek some. When the snow is in powder, which is the case till spring, although it cover the earth entirely to a great depth, a rein-deer digs himself a stable in a moment, and brushing away the snow on all sides, discovers the moss which is hid at the bottom. It is pretended that the animal has a particular instinct for finding the moss so covered with snow, and that he is never deceived when he makes his hole; but the state of the surface of snow hindered my ascertaining whether this account be true or false. As soon as this surface has been thawed by the power of the sun, the frost which succeeds freezes it, and forms a crust sufficiently hard to bear men, deer, and even horses; but when so hardened, the rein-deer being unable to penetrate it, the Laplanders are obliged to break it; and this is the total of the returns which they make them for their services.

These rein-deer deserve that we should say something of them; they are a kind of deer, whose spreading horns branch out before the forehead; they seem designed by nature to satisfy all the wants of the Laplanders; they serve them instead of horses, cows, and sheep.

The rein-deer is fastened to a small boat, called a pulka, pointed before, to cut through the snow; and a man, in a posture half-sitting and half-lying in this carriage, may go with great speed, provided he does not fear overturning, or being ingulfed in the snow. The flesh of them is excellent to eat, either fresh or dried. The milk of the doe is rather sharp, but as thick as the cream from cows' milk: it is capable, when frozen, of being preserved for a long time, and the Laplanders make cheeses of it, which however would be much better than they are, if more care and cleanliness were used in making them.

The skin of the deer serves for all sorts of clothing: that of the young ones, covered with a yellowish hair, a little curly, forms a very soft lining for the clothes of the Fins: when older, the hair becomes brown, when those dresses are made of it, so well known over Europe by the name of Lapmades; they are worn with the hair outwards, and are a very light and warm dress. The skin of the old deer is prepared in the same manner as that of bucks and does, and makes excellent gloves, the finest waistcoats, and most handsome girdles. The Laplanders make the nerves and guts, by twisting them, into thread, which is the only kind they use. To conclude, that every part of them may be serviceable, they offer their horns in sacrifice to their deities.

Being returned from Pellika after having experienced much fatigue, cold, and tiresomeness, we left it again on the thirteenth, early in the morning, and arrived by nine o'clock at Kingis.

This place, although a wretched one, is rather more known than the others, by the iron forges in it: the ore is brought there during the winter by rein-deer, from the mines of Junesvando and Swappawara. These forges are worked only for a short part of the winter, the extreme frost not allowing the wheels to act upon the bellows and hammers. Kingis is situated on a branch of the river Torneo, which has a dreadful cataract before it, impassable for boats. The masses of ice and foam precipitated with violence, and forming a cascade, the edges of which appeared like crystal, formed a most noble spectacle. After

dining with the clergyman at Kingis, M. Antilius, we left it, and arrived in the evening at Pello, where we slept in the same house that we had resided in so much, and which we beheld very likely the last time.

Proceeding from Kengis we met upon the river several caravans of Laplanders, carrying skins and fish to Pello, which they had been bartering for at the fairs of Upper Lapland with the merchants of Torneo. These caravans formed long files of pulkas: the first rein-deer, who is guided by a Laplander on foot, draws the first pulka, to which the second rein-deer is fastened, and in like manner the remainder, to the number of thirty or forty, who every one follow exactly in the little furrow traced in the snow by the first, and deepened by all the rest. When they are tired, and the Laplanders have pitched on a spot where they mean to encamp, they form, with the deer fastened to their pulkas, a large circle: every one makes his bed in the snow on the middle of the river, and the Laplanders distribute moss among them: they themselves are little more difficult in their accommodation; many are satisfied with lighting a fire, and lie on the river, while their wives and children fetch from their pulkas some fish for their supper; others erect a kind of tent, a receptacle worthy of a Laplander, being no other than miserable rags of a coarse woollen cloth, rendered by smoke as black as if it had been dyed; it is fastened round certain stakes, which form a cone, with an opening at the top, which serves for a chimney. There the most voluptuous, stretched on bear and rein-deer skins, pass their time in smoking tobacco, and looking with contempt on the occupations of the rest of men.

These people have no other dwelling than tents; all their wealth consists in their deer, which live on nothing but a moss that is not everywhere to be found. When their herd has stripped the summit of one mountain, they are obliged to conduct them to another, thus obliged to live continually wandering in the deserts. Their forest, dreadful in winter, is even less fit for living in in summer: an innumerous swarm of flies of every description infect the air; they follow men by the smell from a great distance, and form around every one who stops an atmosphere so thick as to exclude the light. To avoid them, it is necessary to be continually moving without rest, or to burn green trees, which causes a thick smoke, and drives them away by its becoming insupportable, as it is almost to man himself: and lastly, they are sometimes obliged to cover their skin with the pitch that exudes from the firs. These flies sting sharply, or rather many of them frequently occasion real wounds, from which the blood flows abundantly.

During the time that these insects are most violent, that is to say, in the two months which we passed in forming our triangles in the forest, the Laplanders fly to the coasts of the ocean with their rein-deer, to get free from them.

I have not yet spoken of the appearance or size of the Laplanders, of which so many fables have been related. Their diminutiveness has been greatly exaggerated; it is impossible to exaggerate on their ugliness. The rigour and length of a winter, against which they have no other shelter than what the wretched tents afford which I have described, in which they make a blazing fire, which scorches them on one side, while they are frozen on the other: a short summer, but during which they are incessantly burnt by the rays of the sun; the barrenness of the ground, which produces neither grain, nor fruit, nor pulse, seem to have caused a degeneration of the human race in these climates. As to their size, they are shorter than other men, although not so much so as some travellers have related, who make pygmies of them. Out of a great number of men and women that I saw, I measured a woman, apparently of twenty-five or thirty years of age, and who suckled an infant, which she carried in the bark of a birch-tree:

she seemed to be in good health, and well proportioned, according to the idea I formed of the proportions of their stature; she was four feet two inches five parts high, and certainly she was one of the smallest I met with, yet without appearing from her diminutiveness either deformed or extraordinary in that country. People may have deceived themselves as to the stature, or large heads of Laplanders, who have not made the observations which I did, in spite of the general ignorance of their ages that prevails among them. Children, who from their tenderest youth have their features disfigured, and frequently the appearance of little old men, begin very early to conduct their pulkas, and to follow the same labours as their fathers. I suspect the greater part of travellers have formed their judgment of the size of Laplanders, and of the largeness of their heads, from those of the children; and I myself have frequently been nearly deceived in this point. I do not mean to deny that Laplanders are shorter than other men, for the greater part; but that I esteem their shortness to have been stated as too great in the relations of travellers, owing to the error I have mentioned, or possibly to that inclination toward the marvellous, which is so predominant. To me there seems to be a head difference between us and them, which is a great deal.

A country immediately contiguous to Lapland produced a real wonder, of an opposite description. The giant exhibited at Paris, in 1735, was born in a village but little distant from Torneo. The academy of sciences having caused him to be measured, found him to be six feet eight inches eight lines in height. This Colossus was made up of matter sufficient to have formed four or five Laplanders.

JOURNAL OF A VOYAGE TO THE NORTH,

IN THE YEARS 1736 AND 1737.

[By M. Outhier. Newly translated from the original. Paris, 1744, quarto.]

IS the earth lengthened or oblate at the poles? This is the famous question so long agitated among the learned, which neither the ingenious systems conceived by different persons, nor geometrical and astronomical observations up to 1735, have been sufficient to decide.

The best mode of terminating the dispute was, to measure under the equator, and at the polar circle, one or more degrees of the meridian, by trigonometrical and astronomical observations, of the exactest nicety.

M. Le Comte de Maurepas, always busied in contributing to the advancement of the sciences, and the welfare of commerce and the state, obtained for the gentlemen of the academy of sciences all the assistance necessary from his majesty, towards making observations, the result of which was important, as well to the perfection of the sciences, as the greater security of navigation.

The academy received the orders of his majesty; all the necessary instruments were constructed. Although at that time France had to sustain a war of magnitude, no expence was spared; several members of the academy set off in the month of May 1735, for Peru, under the equator; M. de Maupertuis offered himself for the voyage to the polar circle. Its length, the excessive fatigue incident thereon, the risks he had to run, nothing lessened his zeal: Messrs. Clairaut, Le Monnier, and Camus, of the academy, were associated with him; he did me also the honour to ask for me to accompany him.

Although before-hand prejudiced against the northern climates, I left immediately, and without hesitation, the agreeable society of the lord bishop of Bayeux, with whom I was, to join him. We were not to leave Paris before April 1736; nevertheless, I went there in the beginning of December 1735: M. Celsius, professor of astronomy at Upsal, was to join us on the road. M. de Maupertuis requested as well of M. Le Comte de Maurepas, to have M. Sommereux for secretary, and M. d'Herbelot as draughtsman.

The four or five months preceding our departure were passed in overlooking the construction of the instruments which we required, and in providing whatever might be useful to us on our voyage: We made also upon the simple pendulum many observations, the corresponding ones to which we were to make at the polar circle. It was there that M. de Maupertuis had resolved to go, to make his experiments for ascertaining the figure of the earth; but for a long while he was undetermined whether it should be in Iceland, on the coasts of Norway, or towards the bottom of the Gulf of Bothnia. The best maps have a great number of islands described along the coasts of this gulf, which promised to be advantageous to the work to be effected; in consequence M. de Maupertuis gave it the preference, and requested of M. Le Comte de Maurepas to obtain the orders of his majesty, the necessary recommendations, and to cause advice to be sent to Sweden.

The answer was no sooner received than we immediately prepared for our departure. All the instruments were ready, and packed with care. The carrier which conveyed them was accompanied, as far as Dunkirk, by a servant which M. de Maupertuis took with him; he as well had four others, one of whom had before been at Stockholm, and understood the Swedish language. As soon as the day of our departure was settled,

we took all the places of the St. Omer's post coach, for Friday, twentieth of April, 1736.

We set off, Messrs. de Maupertuis, Clairaut, and Camus, of the academy of sciences, Messieurs Sommereux, Herbelot, and myself, by the post coach, on Friday the twentieth of April, with four servants. M. Le Monnier, who had been detained by business, followed in a separate carriage, and overtook us before we arrived at Louvre, where we dined with Messrs. Nicoli and Hellot, of the academy of sciences, who accompanied us so far; we passed by Senlis, and arrived to sleep at Pont St. Maxence. On Saturday the twenty-first we dined at Gournay, where there is a fine castle, with canals and beautiful fountains; and slept at a small town, called Roye. On Sunday the twenty-second we dined at Myaucour, and slept at Perenne. It is a pretty town; the ramparts, mostly of turf, form agreeable prominades; the town is surrounded by a great deal of water, and marshy lands. Monday the twenty-third we dined at Bapaume, and slept at Arras: we arrived there early, and went to see the abbey of St. Vaast, its library, and treasury; in which was shewn to us a thorn of the holy crown, and a bit of the sponge.

Tuesday the twenty-fourth we dined at Souchet, and slept at Bethune, a very handsome town, with good fortifications. Wednesday the twenty-fifth we dined at Aire, and slept at St. Omer's; both these towns are handsome, large, and have very clean streets. At St. Omer's we saw the abbey of St. Bertin and its church; in it, on the summit of a pillar, are the toad and lizard, the history of which is known to every one.

Thursday morning the twenty-sixth we embarked on the canal in a very pretty boat; we dined at Bourbourg, and continued our route in the same boat to Dunkirk. We made a quick passage, with sails set all the way, and a favourable wind. Near Dunkirk we found, on the banks of the canal, Dr. Lythenius, a Swedish physician, who came to France with M. Le Comte de Chronihelm, a Swedish nobleman; M. Le Comte de Maurepas had directed that they should both accompany us to Stockholm; he also ordered M. de la Haye d'Anlgemont, commissary of the marine at Dunkirk, to get ready a vessel for us, and store it with every thing needful.

As soon as we arrived, we went to see the vessel which was to take us to Stockholm; it was small, but safe, and abundantly provided with every thing necessary. M. d'Anglemont had taken a lodging for us at Dunkirk. Friday the twenty-seventh we dined at his house, in company with Messrs. de Jansac and d'Alembon. Sunday evening the twenty-ninth, while we were at supper, M. Celsius arrived from London; he had seen M. de Maupertuis at Paris, and had taken upon himself to cause some instruments to be constructed in England, which were of material service afterwards.

On Wednesday the second of May Messrs. de Maupertuis, Clairaut, Camus, Le Monnier, Celsius, Sommereux, Herbelot, and myself, accompanied by M. Le Comte de Chronihelm, and Dr. Lythenius, embarked at Dunkirk, on board the Prudent, commanded by captain Francis Bernard, and piloted by Adam Guenstelik.

The whole of the ship's complement was four men and a boy. We had five servants brought from Paris, and a cook, which M. d'Anglemont provided us with.

We weighed anchor, and sailed at half past five in the morning; M. de la Haye d'Anglemont accompanied us for the space of half a league.

Although the sea was not much agitated, it was not long before we were almost all attacked by the sea-sickness; and I was worse than any. As the vessel was small, our beds were between decks, which was only three feet high; the hatchway served both for door and window.

On Thursday the third we were all very well. M. Celsius had brought a small quadrant from England, of a new construction, for taking elevations at sea; we tried it, and on the following days made use of it. We studied and calculated. M. de Maupertuis amused us with his liveliness, and the charms of his conversation.

On Friday the fourth we saw a little greenfinch among the yards; it flew sometimes to the edges of the deck, at others amid the rigging, following us until the eighth of the month, after which we saw it no longer.

There came also a great bird, similar to a buzzard, which perched on our main-mast, to rest itself; it came from the east, and after half an hour flew away towards the west.

We took an observation with the English instrument at noon, and found the latitude 54 degrees 34 minutes.

The captain and the pilot, with the forestaff, found it 54 degrees 36 minutes.

At the beginning of the evening we saw a fine aurora borealis. The pilot remarked that it presaged a tempest.

Saturday the fifth the weather became squally, and I was very sick.

We observed again the height of the sun with our English instrument, and found our latitude within a minute of our computation by the log.

When the weather was fine, although it was windy (as was almost always the case) we dined on the deck; it was sometimes so much inclined, that we were frequently near oversetting, dishes and all, which created some little confusion at our meals.

All day, Sunday the sixth, the weather has been rather squally; I have been continually sick, and unable to eat any thing.

A wave broke, and nearly covered the deck: the captain ordered us to make haste into the cabin.

Monday the seventh, which was Rogation Monday, the sea was very much swelled.

The night very dark. The sea entirely covered with sparks of light. We hoisted up water in a pail, and agitating it with the hand, we distinguished a number of similar sparks, which followed the motion of the water, and for the most part sunk to the bottom of the bucket.

A Norwegian ship, large, and of a bad appearance, as well as its sailors on the deck, pursued us in an insolent manner astern, and going faster than us, would have run us down, had we not steered out of its way.

Thursday the tenth (Ascension-Day) very bad weather, we went at a great rate, all on one side, from Skayen, very nearly to the Sound. The pilot has not lost sight all day long of a vessel which went before us, and has followed its track. Kept all day on deck, not being able to bear shutting up; was obliged to hold by the rigging on the upper part of the deck. Were so much inclined, that the gunwale was frequently under water.

At night-fall the captain and pilot much embarrassed, afraid to enter the strait, and equally fearful of keeping out at sea, lest we should be driven by the winds on the coasts. We reefed all sails, and passed a most horrid night, rolling dreadfully and continually. All the things in our lockers struck and rolled against each other. This situation appeared the more dreadful to us from its being new; M. de Maupertuis kept all his presence of mind, and encouraged us by his serenity, and the liveliness of his wit.

At length, on the eleventh, by two in the morning at dawn of day, we set sail, entered the strait, and anchored before Elsineur. Messrs. Le Monnier and Celsius disembarked, to proceed by land to Stockholm: Messrs. Chronihelm and Lythenius went on shore, as well to proceed to Gottenburg: Messrs. de Maupertuis and Camus accompanied the captain to Elsineur, to make their declaration. These gentlemen learned of M.

Ans, the French consul, that ours was the first French ship which had passed this year. Messrs. de Maupertuis and Camus, on their return at five in the evening, said, that when they first landed, it was with great difficulty they could keep on their legs.

Elsineur is a little town, almost wholly of wood; the view of the strait from it is very pleasing. There is a handsome castle with guns, under which one is obliged to pass: it is a fine coast, covered with verdure and trees. The Swedish coast on the north is more dry and barren. Helsinborg is seen upon it, with a large tower, and terrace covered with cannon.

Saturday morning the twelfth we passed the south-west side of the island of Huane, formerly the residence of Tycho Brahe. Where his observatory was situated, there is no longer any thing remaining but a small house.

The coasts of Sweden and Denmark were entirely covered with snow, which fell in the night.

The night being very dark, we drew water in a bucket, but however much we disturbed it, it yielded no sparks: we discovered as well that the water of the Baltic contained very little salt.

On Monday the fourteenth, from eleven o'clock till noon, a halo round the sun was seen; its radius, from the centre of the sun to its interior circumference, was 21 degrees 30 minutes, and to its exterior circumference 22 degrees 30 minutes. The external edge of the circle was confused, but the internal edge was distinctly marked, at least towards the zenith and the horizon.

The same day I took an elevation at noon, and found the latitude 55 degrees 40 minutes. The pilot found it no more than 55 degrees 30 minutes.

Tuesday the fifteenth the sea was much swollen, although there was little wind; we were obliged to steer as near to it as possible; the vessel pitched dreadfully.

The seventeenth a Swedish boat requested to accompany us; but had great difficulty to keep up with us. As it was rather distant behind, M. de Maupertuis desired our captain to back sails, and invite the master to dine with us. Our captain made a tack; this manœuvre is extremely simple; by moving the rudder the vessel makes a small half circle, which is described on the water; he then lowered sails, and waited.

The master of the Swedish brigantine thanked us.

Another Swedish vessel which we spoke accompanied us to Dalheron.

At eleven o'clock saw an aurora borealis, notwithstanding a clear moon light.

On the nineteenth saw the tower of Langsoort, situated on a point of land: the tower the farthest advanced is about six thousand toises more towards the south, than the place where we took an elevation at noon; found the latitude 59 degrees 15 minutes.

Our passage for the last four days delightful; night and day we made a league an hour, without feeling the least motion.

Dalheron is a large village, divided in two; on the rocks on both sides the passage; its houses, extremely small, of wood painted red, with their white chimnies, and their little glazed windows, offered a very pleasing spectacle.

Near to Dalheron is a very handsome country house on the shore. As for the rest, the country on both sides the Lidt, or bed of the river (which is rather an arm of the sea) is frightful, being nothing but rocks extremely arid, with a few very small firs.

Sunday the twentieth (Whitsunday) we followed the Swedish galliot, and another small vessel. I said mass, and at the communion the pilot thundered out *Domine, salvum fac regem nostrum Ludovicum,* in which he was joined by all the assembly. No night; at midnight, I read in a book of very small letters.

We passed by a small village called Lindal, and near to Ouxyoup, where there is a castle a mile farther on. We entered a very narrow strait, the current in which was rapid; the sailors went on shore, to draw the vessel through with ropes. We made a half circle round a rock, and found ourselves before the castle of Vaxholm, where M. de Maupertuis went to shew his passports to the governor, who spoke French. We passed between the castle and the village, which is still more charming than that of Dalheron. This village of Vaxholm is placed on a rock, forming a promontory opposite the castle of Vaxholm.

At night, as the vessel made but little way, M. Camus and myself got into the yawl belonging to the Swedish pilot, and rowed out of curiosity to some houses on the banks; we had some difficulty in regaining the ship.

Monday the twenty-first, at half past three, we entered the port of Stockholm: we saluted with three pieces of cannon; other vessels arriving saluted, as well: to which a fort, or neighbouring castle, answered several times.

The visiting of the vessel being over, we landed at nine o'clock, and met with Messrs. Monnier and Celsius. I went with Messrs. de Maupertuis and Camus to M. de Casteja's, the French ambassador: I said the mass of Whit-Monday there. Such it was in France; but here, with the Catholics as well as Lutherans, it was the Monday after the third Sunday from Easter, they having kept Easter five weeks later than us.

The protestants in Sweden have not received the new calendar of Pope Gregory the Thirteenth. Contrary to rule, they not only keep Easter the second full moon after the equinoctial day, but on the second Sunday after the second full moon. Notwithstanding, the Catholics conform themselves to the custom and stile of the country, in order to prevent confusion in the commerce of civil life. The almoner of his excellency the ambassador informed me that they were authorised so to do by a bull of the Pope.

We had some employment while we remained in this city; first, our baggage was to be examined at the custom-house: we had reason to be pleased with the custom-house officers; they for the most part accepted as enough the declaration which we made; satisfied that they might rely upon its truth, they took pains in forwarding us immediately on our arrival.

Every one of us did what he could: M. de Maupertuis was everywhere; he settled with bankers for our receiving what money might be necessary; he looked out for recommendations for the country to which we were going, and means for transporting thither both ourselves and luggage: in a word, he provided like a father of a family for the necessities of a large party that he was going to establish, in an unknown country, for an indeterminate time.

M. Le Comte de Casteja, ambassador of France at Stockholm, was exceedingly obliging towards us, and obtained for us every comfort that we could desire. He told us, if he had had room enough, he would not have suffered us to remain in an inn; and M. de Maupertuis in particular he so strongly solicited to take a room at his house, that he could not deny him.

Wednesday the twenty-third, H. E. the ambassador presented us to the king of Sweden; after which we dined with H. E. and in the afternoon were presented to the queen, having the honour again of paying our court to his majesty: he shewed us much kindness, and spoke to all of us in very good French: he told M. de Maupertuis that we were about to undertake a dreadful voyage; that although he had been in many bloody battles, he would prefer the most desperate of them to undertaking such a voyage as we were about to do; that it was however a game country. He presented M. de Maupertuis with a fowling-piece, which he said he had used himself for a long time.

Saturday the twenty-sixth, after dining with the ambassador, we went to see a ship launched: afterwards the abbot Hennegan, one of the almoners of the embassy, accompanied me to see the churches of St. Catherine and St. Nicholas, which are tolerably handsome.

Sunday the twenty-seventh, he conducted me and M. de Maupertuis to the church of St. Claire, to see the Lutheran office performed. The officiator had a chasuble, at the back of which was a crucifix embroidered in silver: they sang in the Swedish language the Gloria in Excelsis, Credo, Sanctus, and the Pater Noster: several persons received the communion, and returned very devoutly, apparently with great self-satisfaction. Their singing, accompanied by the organ, appeared to me very fine. During the sermon a beadle carried a long cane, with which he hit the heads of such as were asleep; it is his office as well, in a large purse, which he advances into the crowd at the end of a long cane, to collect the alms for the church.

Another day we went to the Greek office of the Muscovite schismatics, in a chapel which they are allowed to hold at Stockholm. The congregation consisted of not more than a dozen or fifteen persons, among which was a young man who spoke French very well; he caused us to enter the sanctuary, which is closed. In entering the chapel they make a number of reverences to the holy images, and the rest of the congregation, and after every bow a sign of the cross. There is always a good fire in chafing-dishes; the officiating priest frequently throws in incense; he makes use of warm water to mix with the wine in the chalice. Their singing is very singular; they repeat with quickness certain words, but so quickly as to be almost out of breath, as if we were to repeat over and over Deo gratias, Deo gratias, Deo gratias. Their ceremonies are performed in a slovenly manner: the priest blows his nose occasionally through his fingers; in other respects they have a very devout appearance.

The twenty-ninth I went with the abbot Hennegan to see the king's library. M. Benksilius, the librarian, shewed us whatever there was curious: he made me a present of a Lapland manual, which is a prayer-book in the Lapland tongue, telling me I should be the patriarch of the Laplanders.

The thirty-first we went to the office for geographical maps. There are several persons who are employed in arranging the geography of that country: during the winter they measure over the ice; and in the summer they digest their measurements, and draw their maps with much order and exactness. The king of Sweden had the goodness to order them in the office to give us drafts of the coasts of the Gulf of Bothnia, where we relied on making our experiments. In consequence, a beautiful draft of the western side was presented to us, which we carried with us: there was not before our departure sufficient time to complete the eastern side, but it was sent to us some days after.

We went the same day to see the king's garden, where we saw in green-houses orange-trees, with oranges on them. We had before noticed in other gardens ivy, such as creeps on our walls, planted in pots, and which appeared to be highly esteemed.

We then went to Cadesberg, a royal palace, and to Ulriksdale, another, where there is a tolerably large park, with plenty of game.

THE CITY OF STOCKHOLM.

Stockholm is a fine and large city; all the houses of the city, and part of those of the suburbs, are of stone, well built, and four or five stories high: the other part of the houses in the suburbs are of wood; they are built with square beams placed horizontally, laid one upon the other, their extremities crossing at the angles of every apartment

which they make. These houses are painted in red, not only for neatness sake, but also to preserve them: above the timber-work planks are nailed, which are covered with birch-bark first, and afterwards with turf or earth. Many of the stone houses are covered with iron plates, or wrought iron; some are covered with copper, others with ridge tiles. To some of their windows they have Venetian blinds, which move on a pivot, so as to increase or diminish light at pleasure.

Every night, after ten o'clock, a number of men parade the streets, crying or rather singing the hour, and afterwards a kind of prayer; they watch as well to prevent any noise or disorder during the night; they are armed with a staff, at the end of which is a machine with springs; the use of it, to seize by the neck or the leg those whom they are desirous of stopping, or who insult them, and it is impossible to get loose from it.

While we were at Stockholm a fine palace for the king was being constructed. There are in the town many handsome and large churches; that of St. Catherine is perfectly new, and built with a dome, the great altar of it is very handsome: I noticed there a painting of the Purification of the Virgin, very well executed. On one side of the altar is Hope holding an anchor: on the other, Religion holding a cross and a chalice. They have in almost all their churches a very handsome pulpit, with an hour-glass.

In the great church of St. Nicholas, close to the king's castle, there is a large painting of the Judgment, thirty-three feet high by twenty-two broad. There is also another, which represents Christ upon the Cross, all the circumstances of his passion being represented in different basso-relievos; and a handsome statue of St. George.

The church of St. James is in the same taste as that of St. Catherine, new, and nearly of the same shape.

That of St. Claire is built similarly to ours; it is beautiful and large. The chapel of the Russians, or Greek schismatics, which is at the town-house, is of no consideration, and very badly lighted; nevertheless there are many figures of saints gilt, and some sculpture, but badly proportioned, and somewhat after the Chinese taste: the sanctuary, where the altar is, is kept shut; the priest opens and shuts it several times, in performing the office. At Stockholm are many Roman-catholics, who exercise their religion freely, in the chapels of H. E. the French ambassador and the envoy of the emperor.

In the mean time we thought of our work, and of proceeding in as little time as possible to the most northern parts of the states of Sweden. We amused ourselves in looking about the city, only when we could not occupy ourselves in accelerating our voyage: every thing at length was ready; M. de Maupertuis had made every necessary arrangement. At Stockholm he met with M. D'Hegreman, son-in-law of the burgomaster of Torneo, a little town situated at the bottom of the Gulph of Bothnia, and through him he had secured a vessel to carry our luggage and instruments. M. de Maupertuis hired as well a servant, who spoke Swedish and French, besides which H. E. the ambassador gave one of his own; and as our intention was that the operations should be carried on on the coasts of the gulf, his excellency insisted on our shipping his own boat in the vessel which carried our luggage and instruments. M. Sommereux and most of the servants went on board, and sailed on Sunday the third of June.

Monday the fourth, after dining with the ambassador, he presented us altogether, to take leave of the king of Sweden. We had bought two coaches, to travel from Stockholm to Torneo by land: M. de Maupertuis set off in one, with Messrs. Clairaut and Celsius, on Tuesday morning the fifth, to visit M. le Comte de Horn, who was at his country-house, and proceed thence to Upsal, where we were to meet together. M. de Maupertuis always intended that we should have pursued our route from Stockholm to Torneo by sea; but we prevailed upon him to alter our plan, from the repugnance to the

sea which some of us manifested. It is true, the expence of travelling by land was not considerable. Coaches made entirely of wood, lined with fustian, and with common glass instead of plate, cost no more than five hundred livres a piece; each horse in Sweden is paid for after the rate of eight sous for a mile, which is equal to two French leagues, and in this manner we travelled; this formed almost all our expence.

Wednesday the sixth, at eight o'clock in the morning, we set off in the second coach, Messrs. Camus, Le Monnier, Herbelot, and myself; we went again to take leave of the ambassador, and left Stockholm at nine o'clock. We changed horses at Rotebron, two miles off, that is to say, nearly four French leagues: the Swedish mile contains eighteen thousand Swedish ells, each ell one foot ten inches of French measure. From Rotebron to Maestrad one mile and three quarters; from Maestrad to Alsik one mile and three quarters: these are the names of the places where we changed horses. From Alsik is one mile and a half to Upsal, where we arrived at ten o'clock at night.

It is seven miles from Stockholm to Upsal, through a country filled with rocks and small hills, covered with firs, among many branches or sinuosities made by the river of Stockholm. We passed a river to the north of Alsik in a flat boat; and a little before our arrival at Upsal we entered a beautiful wood of large firs, traversed by a road in a straight line.

The roads from Stockholm to Upsal, and even as far as Torneo, are fine, well kept, and marked at every quarter of a mile by a wooden post, properly shaped, and painted red, on which is marked the number of miles and quarter of miles from Stockholm. Some ancient posts are found as well, or rather pillars of stones; but within a few years the roads have been measured by the pole, and since wooden posts have been placed. Frequently along these roads gates are met with, which shut in a most ingenious manner. M. de Maupertuis soon after arrived, with Messrs. Clairaut and Celsius. On the seventh we all went together to see the governor of Upsal, who detained us to dinner. At the end of the repast white wine, in which orange and sugar were mixed, was handed round in a large glass; every one drank from the same glass, which went round several times, first to the health of the governor and his lady, and afterwards other toasts. After dinner we went to see the great church, which is the cathedral, the university, and the garden of the castle; and all of us supped with M. Celsius.

The city of Upsal is rather large, most of its streets are perfectly straight. Except the cathedral and seven or eight houses, which are of stone, all the other buildings are of wood, covered with birch-bark, and turf upon that: there are only the houses of the governor and the archbishop which are covered with birch-bark without turf; and throughout the remainder of the road towards the north they are as well without turf. On an eminence to the south of the city the castle stands in ruins, but the garden is yet handsome. Looking on the town from the castle, it has the appearance of a large garden, the streets of which, in straight lines, sufficiently resemble the alleys, and the houses covered with turf the squares. A river passes through the city, the water of which is red. Over this river there are two bridges, suspended to beams arching from one side of the river to the other.

The cathedral is rather large, but ill paved: there is an excellent choir, a fine altar, with a great crucifix, and a very handsome pulpit: in the sacristy are ornaments sufficiently rich, among others a suit of black for Good Friday; two chalices, one of which is of gold; wood of the real cross, on a great cross of silver gilt. In a chapel of the cathedral the tomb of St. Eric, king of Sweden, is seen, a martyr: both the tomb and the relics are greatly neglected.

In the university are four auditories, or apartments for teaching: there is a cabinet

of rarities, and a tolerably good library. I noticed a quadrant of Hevelias; it is of wood, divided into spaces of ten minutes, four feet and a half radius, with sights.

Friday the eighth we went to the archbishop's, but he was then holding a consistory, and we could not see him: M. de Maupertuis returned there in the afternoon, or the next morning, and held a long conversation with him.

If we had set off together we should frequently have been delayed at the stages, where we should scarcely have been able to meet with sufficient horses for our two coaches; we therefore took the precaution of sending a servant before on horseback, who ordered the horses to be got ready for the first coach, and this gave information at the different stages where we changed, that another would follow in seven or eight hours, in order that the horses might be got ready, and we arrived the quicker at Torneo.

Messrs. Camus, Herbelot, and myself, began our journey at five in the evening in the first coach. M. Meldecreutz, a Swede, who was fond of geometry, and spoke French, should have made the fourth, and promised to join us at Upsal; he however did not come: he arrived not till some days after in a chaise with a young Swedish nobleman, son of M. de Cederstrom, secretary of state: this young nobleman, having a desire to see the country which we were going to, determined to take the opportunity of our expedition.

We found about half a mile from Upsal, a little before our entrance into the wood, a church and some ruins, which we were told were Old Upsal. We changed horses at Hoystadt, one mile and a quarter from Upsal; at Laby, one mile and a quarter from Hoystadt; at Yffetel, two miles beyond Laby; the road all the way excellent, but through a country made up of marshes and woods.

We arrived at Yffetel a little before midnight; we found some eggs, which we made them boil hard for us, and they formed our supper. We left it on Saturday the ninth, at two o'clock in the morning, went through the woods as far as Mehede, a distance of two miles and a half, and always through woods and low grounds, yet covered with water, from the thawing of the snow, to the great town of Elfskarby, one mile and a half beyond Mehede. To arrive at this town it was necessary we should pass over a great river, which has a handsome cataract, where there are iron founderies, in a boat. We left it at eleven o'clock, by a road through woods of fir, between lakes and rocks; having passed a river by the way, over a bridge, we arrived at three in the afternoon at Geffle, which is two miles and a half from Elfskarby, and eighteen from Stockholm.

Geffle is a pretty large town; through it a river passes, over which is a wooden bridge; vessels come up the river into the town. In the middle of the town are seen the remains of a stone castle, which seemed to have been somewhat grand. Some of the houses of the town are of stone, the remainder of wood, without turf on the roof. The enclosure of the town is the same as at Stockholm; and at Upsal is a pallisado, with very neat wooden gates; it encloses several large gardens; by the remains of the church which was burnt, it appears to have been of size.

We found a good inn at Geffle. After dinner we went to the governor's, who was absent: we begged his secretary to forward orders for our obtaining post-horses, and set off at six in the evening, before the coach of M. de Maupertuis arrived.

After half a league of open country, we again met with woods and rocks, as far as Troye, a mile and a half distant, where finding fresh horses, we went on, through a marshy and woody country, to Hamrung, one mile and three quarters farther: we arrived there at eleven o'clock at night. We soon after again set off; we passed through very thick woods for the space of six French leagues, in the midst of which are some houses, on the banks of the river Liusna, which we crossed in a boat; farther on we crossed

another; afterwards we continued our route between lakes on the right and left, and arrived at Skoog, a three mile stage, at five in the morning. This night the gnats plagued us greatly: to get quit of them, we were obliged to draw up the glasses of the coach, when, the weather being extremely hot, we were nearly suffocated: this inconvenience, however, was more tolerable than the gnats.

As it was Sunday, the tenth, we could not obtain horses until the people returned from church; we consequently threw ourselves on beds to take some rest, having first eaten some bread and cheese which we took with us; for in general we could meet with nothing to eat, sometimes eggs and milk, but the milk mostly sour; they make it sour immediately upon milking the cows. When the good people we travelled among had any thing to give us, they gave it most willingly; and it was necessary for us to insist, before they could be persuaded to receive for it. Every thing there is cheap, and our liberality astonished them.

The post-master is not obliged to keep more than one horse in the stable: when several are wanted, he informs the individuals of his neighbourhood, who go to the woods to seek theirs. These individuals, sometimes as many as three, came, bringing their horses; one mounted the coach-box, another one of the horses, and at times they ran on foot a great length of way. It is the rule to pay them eight sous per horse per mile; for the drivers, we paid them twice or three times as much as the people of the country are wont to do, which was very trifling. If we gave them eight sous for two or three miles, they were surprised at our generosity; they took us by the hand, with an air of joy and friendship, exclaiming: "For myck, tak myn herr;" you give too much, thank you, sir.

After reposing ourselves a little, we set off at one in the afternoon: the road still through woods; some lakes and mountains are seen. We passed in a boat by rowing across a river, and arrived at half past four at Soderella, two miles from Skoog.

From Soderella we went to Noralla, one mile off: between these places we passed by Soderham, famous in Sweden for its musquets.

From Noralla we proceeded two miles and a half through woods, wherein were marshes, and here and there some houses, and arrived at Upangè at eleven o'clock, leaving it at midnight. One Swedish mile farther on, on the eleventh, we entered a more pleasing country, but more mountainous: there are lakes, and a river which works a considerable forge, near to which is a handsome house, close to the post-house of Eksunda, one mile and a half distant from Upangè.

We left Eksunda at three o'clock in the morning, and at a mile distance passed close to Hudswikswald, without entering it; it is a town of a neat appearance; it had two steeples, and a town-house with a kind of dome; the town is situated at the bottom of the gulf.

A little farther, that is to say, one mile and three quarters from Eksunda, we took fresh horses at the post-house of Sand, and again others, three quarters of a mile farther, at Weista: these two latter places are situated in a fine country, of vallies abounding with barley and rye.

From Weista we went on to Hermongar, one mile and three quarters off, always among woods. For the first time on the road we saw a rein-deer, which shepherds were guarding, and which appeared very tame. Leaving Hermongar we passed a river; all the way was lined with woods of birch, for one mile and a half, to Gnarp, which we reached at two o'clock in the afternoon.

We waited there for M. de Maupertuis, who arrived at nine in the evening. While waiting for him we dined and slept, and departed at ten o'clock, leaving our companions

in the second coach to take their rest in their turn. Almost always woods of fir; we passed through a hamlet, crossed a torrent, and at last a great river, over a bridge, at the end of which is the post-house of Niaronda, two miles and three quarters from Gnarp. Messrs. de Cederstrom and Meldeereutz joined us here.

At six in the morning of Tuesday the twelfth, after going one mile and a half, we arrived at the little town of Sundswald, very prettily situated at the bottom of a small gulf, where vessels come up: the church and the town-house have a very neat appearance, as well as the houses themselves. We passed a great river, a quarter of a mile before we came to it, and a small one on leaving it, which empties itself into the gulf. We asked for bread, and were told there was none. There is no post-house in this town, wherefore we went on, with the same horses, one mile farther, to Dinguelstadt, two miles and a half from Gnarp.

We left Dinguelstadt at eight o'clock, and, through roads mountainous and full of sinuosities, came to the great river of Lindal: we passed in a bark the two branches which it forms on different sides of an island; and after landing we changed horses at Fiahl, one mile and a quarter from Dinguelstadt.

At noon we quitted Fiahl, going through woods of birch, and at three o'clock arrived at Marck, one mile and seven-eighths distant; we dined there and left it at seven o'clock. We met now with an unequal country, but in which were fine vallies, intermixed with lakes; mid-way passed a river, and got to Skoog by ten o'clock, one mile and three quarters from Marck.

We were now near Hernosand, and passed by the country-house of its bishop. M. de Maupertuis afterwards informed us that he went to sleep there, and received at his hands every mark of politeness. M. de Cederstrom, his relation, told us as well he would have been much gratified to have seen us.

We left Skoog, on the thirteenth, at eleven o'clock at night, and towards midnight arrived at the borders of a gulf, into which the great river Angeran empties itself. It blew fresh; the boatmen advised us not to go over with the coach; they joined two boats together, fastening them well; they placed the two hind wheels of the coach farthest from the shore, making them run on planks, and afterwards the two fore ones in the other, and got over by dint of rowing, being ill-favoured by the wind, which had much to work upon in the coach. We were obliged to use the same means in the passage of several other rivers on the road. After the coach was landed, they returned to pass us over; this manœuvre cost us nearly three hours.

On landing we met with horses ready for us on the banks at Veyda, and at four in the morning we reached Skullerstadt, three quarters of a mile from Veyda, and one mile and five-eighths from Skoog. We slept at Skullerstadt, and did not leave it till eleven o'clock; the roads were very crooked, and over high mountains, the vallies of which are mostly lakes, or arms of the sea. We went two miles and a half farther, and arrived at four in the afternoon at Saltzoker, thence over mountains to Essya, five-eighths of a mile from it: we found there flat bread, in the form of cakes, which was good, as well as the milk and butter; for a long time we had not fared so well. The country still full of mountains, but the best we had seen since we left Upsal. The vallies end in lakes, or gulfs; but there are many fields sowed with barley and rye. We quitted Essya at six o'clock, and, on account of the mountains, did not arrive at Dokstat, although no more than a mile distant, until nine. We could have embarked our coach in boats at Saltzoker, and passed by water to Dokstat; it was proposed to us, but would have given us too much trouble.

At a quarter of a mile beyond Dokstat we passed under mount Skula; above we perceived the entrance of an apparently inaccessible cavern; we were told, however, that people had entered it, and that it was very white inside. We travelled between the sea, which was east of us, and this mountain, which is nothing but one prodigious rock. The country continually mountainous, but the roads much better. We arrived the fourteenth, at one o'clock in the morning, at Biestadt, two miles from Dokstadt. We waited here for M. de Maupertuis, who came up with us, together with Messrs. Clairaut, Le Monnier, and Celsius, at half past five. M. de Cederstrom, with M. Meldecreutz, arrived nearly at the same time. M. Herbelot staid behind, to follow in M. Cederstrom's chaise; and M. Meldecreutz occupied his place in the coach, which carried M. Camus and myself.

We set off at six in the morning, meeting with many mountains and woods, and after travelling a mile arrived at the post-house of Hoonas. We left it at ten o'clock; many mountains, the vallies of which were fertile, frequently lakes and gulfs; we passed over one by a bridge, and arrived at Brostadt, a mile and one eighth from Hoonas.

As all their moveable feasts were four weeks behind, they were now keeping Ascension Day, and we could not obtain horses till one in the afternoon. We were twice obliged to have some parts of our coach mended, and M. de Maupertuis overtook us. After proceeding a mile, we crossed a large and rapid river over a bridge; the water of it was red, the case with the most part of the rivers of this country; we crossed a second by a bridge called Husa, a little while before we reached Onska, two miles and three quarters from the last post-house.

We arrived at Onska nearly all together; a man came to inform us that M. Sommereux and our luggage was at anchor about three leagues from us. M. de Maupertuis went first in his coach; one of our servants driving him, on going down from Onska (for the peasants of this country do not understand driving) ran the coach against the gate, and broke the shafts, which obliged him to return to the post-house to have them mended; and as we were still together, M. de Maupertuis, tired of the inconveniences of travelling by land, took horse, and joined the ship. M. de Cederstrom in our coach took the place of M. de Meldecreutz, who remained at Onska, to wait for M. Sommereux, who M. de Maupertuis was to send back from the vessel.

The fifteenth we journeyed for two miles through woods of fir and birch, and by midnight came to the post-house of Afwa, and one mile and a half farther to that of Lafwar. Thence to Sodermiola was three miles and three quarters, and two miles and a quarter from Sodermiola to Rodbek; we passed entirely through forests of fir and birch, over very sandy roads, with now and then a lake.

Rodbek is a fine and large village, at the west of a great plain or meadow, interspersed with a number of small sheds for housing the hay. In this village there is very good water, said to be mineral. We changed horses at Rodbek, which is only a quarter of a mile distant from the town of Uhma; we crossed a part of this great plain, and passed in a boat the river of Uhma, where we arrived at half past five in the evening; the second coach followed us very closely.

The city of Uhma, sixty-eight miles one eighth from Stockholm, is no otherways handsome than from its situation on a river of the same name, wide as the Seine, at Paris, and on which the vessels come up to the houses. There are four streets in a straight line, running from east to west, and parallel with the river: they are crossed by several others north and south. At the eastern extremity of the city is a great square, in which is the church: on Sundays and holidays there are numbers of men with halberts in the city, to prevent noise and disorder. And further on towards the north, in every parish in

the country, there is a lansiman, that is, a man to whom the governor addresses all orders for the public service; in towns he is called a burgomaster.

The prospect of the neighbourhood is pleasing; it consists of large plains, full of small houses or sheds for hay, beyond which are the mountains, rather elevated; half a mile from the city to the east, on the northern side of the river, is the house of the governor of the province, built entirely of wood, nevertheless very handsome for that country; people were at work in making large gardens, sufficiently pretty.

It having been noised about in the city that some Frenchmen were to arrive there, a number of persons had collected to see us. M. Clairaut arrived with the second coach, the care of which M. de Maupertuis had left to him; we supped together in a good inn, and met with wine: at half past ten, Messrs. Camus, Celsius, Herbelot and myself set off; M. Clairaut with the coach waited for Monsieur Sommereux, and to hear of the embarkation of M. de Maupertuis.

Leaving Uhma we met with nothing but fields, with some valleys, for the space of a mile, and arrived at Taffley by midnight: thence still the same country: we passed a river, and beyond it found a camp, consisting of two companies only; they exclaimed, in German, *war das;* M. Celsius answered, *goth wan;* that is to say, a good friend. The sixteenth we changed horses at Saswaar, one mile and three eighths from Taffley, and again entered woods, which continued one mile and seven eighths to Diekneboda. About a mile farther, at six o'clock in the morning, we came to the village of Bygdo; we saw there an arch formed by two trees from thirty to forty feet high, from which is suspended a kind of circle made of branches; here the troops exercise themselves in throwing hand grenades. We did not change horses at Bygdo, the post-house was at Riklera, a little farther, one mile and three-eighths from Dickneboda; from thence we went on to Gamboda, through a pleasant country, the same distance of one mile and three eighths. Afterwards higher mountains succeeded, one in particular which extends a great way from north to south, at the bottom of which is a lake: we passed this mountain in an oblique direction, and arrived at noon at Grimmersmack, one mile and one eighth distant; we left it, without waiting, and travelling through a similar road, came by a beautiful valley, between two lakes, to the post-house of Selet, one mile from the former. We met here with good fish, and dined; they asked next to nothing for our dinner, and when we offered them more, made some difficulty in accepting it.

It was two in the afternoon when we arrived at Selet; we left it at four o'clock; we passed a river, over a bridge, between two lakes; soon after another; then succeeded a flat country, and fine woods of fir, as far as the post-house of Dagbostadt, one eighth of a mile off. Thence through woods of fir for one mile and a half, when we reached Burea. We left this place at seven o'clock, and shortly after passed a river, then through a long valley, in which runs a large river, on the banks of which we left our horses at Simmanasin, which is divided from Sialefstadt only by the river, which we passed in a boat. From Burea to Sialefstadt two miles; it was midnight, on the seventeenth, when we landed; we did not go into Sialefstadt, which is a large town; we found horses near the church, to the west of the village; the lansiman had been informed of our coming, and many were collected, waiting to see us. At first they put horses to our coach which did nothing but rear, not knowing how to draw. We had others harnessed to, and when about to depart, the countryman who was to drive us was much puzzled where to place himself, and, after considering some time, at last clapped himself in the boot, where we could scarce perceive him, which diverted us highly. We slept without fear, all four of us, during a great part of the way, notwithstanding the bad coachman we had, and the horses which drew us having been just

caught in the woods, and which were very little suited to coaches, and that through immense forests, and sometimes deserts, where for four or five miles not a house was to be seen.

We at length set off; travelled through a tolerably fine country, and crossed two rivers by bridges, and arrived at Fraskager, one mile and a half farther, at three o'clock in the morning; we left it again immediately; the road was perfectly level, through forests of fir and birch, intermixed with marshes. We passed a handsome and large river called Busti[illegible] four o'clock, whereat the coach was put in two boats; same road, level and amid w[illegible] Abyn, two miles and a quarter distant. We arrived there at seven o'clock; afterwards we passed a river over a bridge of wood (in this country there are none of stone.) We then had a very even road, amid woods of fir and marshes, but very sandy, and in which we had much trouble to get on, so that we did not arrive at Geffre, no more than seven-eighths of a mile distant, before eleven o'clock. The valley of Geffre is sufficiently pretty; one of its extremities reaches to the sea to the south-east, and at the other is a lake, through which the river runs. A number of houses are dispersed about, and a great quantity of land is under cultivation. We passed the river, and after riding two leagues, over an even but sandy road, amid woods, we perceived a handsome common, well cultivated, with two hamlets: yet some woods, and a sandy road, till we came to the great river Pithea, which we passed in a boat at four in the afternoon, and arrived at Pithea, two miles and a quarter from Geffre.

It is the ancient Pithea, which, besides a large village built round about the church, comprises a great number of houses, dispersed in a beautiful meadow, on the borders of some lakes contiguous to the sea, and the great river, which is rather an arm of the sea. New Pithea, or the town, is a French league from it; we saw it on our return.

The eighteenth we dined, and stopped at Pithea till Monday morning. M. de Cederstrom and Meldecreutz arrived at two in the morning, their chaise much damaged. M. de Clairaut came shortly after with his coach. As soon as these gentlemen had breakfasted, we were desirous of going on, but had to seek M. Celsius, who had gone to sleep at the clergyman's, or rector of the parish, at some distance from the inn. M. Clairaut and myself went to look for him, but neither of us knew where he lived. We knocked at the door of a seemingly genteel house, imagining it to be that of the clergyman: although M. Clairaut already knew something of the language, he could not make the servant understand him, and we were going further at hazard, when the master of the house, who was the judge of the place, came out, and said to us in French, qui demandez vous, Messieurs? (What do you wish, Gentlemen.) We were both surprised and pleased: he politely accompanied us to the house of the clergyman, which was some way off. M. Celsius returned with us, and set off in the first coach with M. Camus, M. Le Monnier, who took the place of M. Herbelot, and myself. M. Clairaut and M. Sommereux reposed themselves a little, and afterwards set off in their coach, with M. Cederstrom and Herbelot.

It was eight o'clock when we left Pithea, and after a mile and seven-eighths, through woods intermingled with fields and lakes, we arrived at Roswik by noon; thence travelling on, we passed a bridge over a river, and after going up hill for a long time in the woods, we descended into a beautiful plain, and arrived at two o'clock at Ernas, one mile and an eighth from Roswik. Leaving Ernas, we passed an arm of the sea, which looked like a marsh, and afterwards, through woods of fir, to a river, which we crossed in a boat about five o'clock. After passing this river, in a wood of fir we had a very bad and sandy road to get through; when we passed the river, our two coaches were together: Messrs. Clairaut, Celsius, and some others, went in a boat to Lullea: M.

Sommereux and myself continued our route by land with the coaches, and arrived there at seven o'clock in the evening. This place is called Lullea gammal stadt, that is to say, Lullea the old town; it is a large place built about the church; there are streets in it, as in a town, but without being surrounded by palisades. New Lullea is a town, a good league from it on the sea shore, which we did not see from Ernas to Lullea, a mile and a quarter.

On quitting Lullea, we entered a country much diversified by woods, marshes, and fine fields, well cultivated. After passing a large collection of water over a bridge, at a mile and a half from Lullea, we reached the post-house of Porseon, situated in delightful meadows. We left it at eleven o'clock at night; passing the plain, we went up hill, through a wood: from this eminence we saw the sun entire, although it wanted but a quarter of an hour of midnight. M. Le Monnier and myself climbed up trees; we wished much to see the sun at midnight, and would gladly have waited, but we could not hold out against the gnats, which plagued us to death: continuing our route, we descended into a valley, and lost the sun. The country continued covered with woods of fir and birch, and marshes, and after a mile and a half, we passed a great river in a boat, to get to Raunea, where we arrived the nineteenth, at three o'clock in the morning, and by a similar road at Huitathn, a mile and a quarter beyond. For there we passed two bridges, over watery marshes, and reached Toreby at eight o'clock, distant a mile and five eighths; we passed through great woods by a mountainous and unequal country. It was nearly noon when we found ourselves on the bank of a great river, which forms a lake, from which it issues with rapidity. On both sides the river the country is well cultivated, with some houses; till two o'clock we followed the course of its southern bank, and after two miles riding we crossed it in a boat, to arrive at Calix: M. Celsius and some others of our party went to the clergyman's, or rector's, called in Swedish Kyrckher.

From Calix we set off at four o'clock, always through woods, with bad and sandy roads. The servant which we had with us, who went before, sent us horses to the middle of the wood, and we changed after having gone a mile. We walked another mile, passed between two lakes, and came to a little river, just before a village called Sangis, where there are some well cultivated fields, as is generally the case round about the villages and hamlets of the country, which are ever near the banks of some river, or the shores of some gulf.

At Sangis we crossed in a boat a large river, and took horses, with which we travelled for a mile between lakes, through a mountainous country, interrupted by marshes, as far as Sanhiwitz, where we arrived at eleven o'clock at night. We yet continued among woods and marshes, crossed two bridges over small rivers; then an arm of the sea in a boat, at two o'clock on the twentieth, and a similar at four: yet some woods and marshes; after which we arrived at Hupparanda, upon the shore of the gulf, formed by the river Torneo, at five o'clock, two miles distant from Sanhiwitz, and one hundred and seven miles and three eighths from Stockholm.

We passed this gulf with our coaches by boats, to go to Torneo, where we reckoned on taking up our quarters; but having learned that M. Piping, burgomaster of the town, lived near the bottom of the Gulf at Martila, in his house called Nara, we did not go down to the town, but went in the same boat to the bottom of the bay, and entered the house of M. Piping, who had been informed of our journey by M. D'Hegreman, his son-in-law, a merchant of Stockholm, and in consequence prepared apartments for us. M. Clairaut and those who were in his coach arrived soon after us. We were all very much fatigued, and rested ourselves during Wednesday and Thursday. It was

the day of the summer solstice, on the twenty-first, a season when in this country the sun is seen passing the meridian at midnight, in the north. We looked for this sight, but in vain; the vapours with which the horizon was overcharged hindered us. Charles the Eleventh, king of Sweden, incited by the same desire, purposely undertook a voyage from Stockholm to Torneo, to see it; he was more fortunate than us, for getting into the belfry, he saw more than a quarter of the diameter of the sun, at midnight.

M. de Maupertuis had made a fortunate voyage; he had seen, from sea, the sun during a whole night, at least a part of its disk. He arrived at Torneo nearly two days before us, and found there M. Gullingrip, governor of the province, who was going into Lapland. M. de Maupertuis did not hesitate to accompany him, impatient to examine the country; he went as far as Oswer Torneo, and ascended mount Avasaxa, to see if he could not draw some advantage for the observations from the mountains. He did not choose to go farther, wishing to be at Torneo against our arrival. We had the pleasure of seeing him there, and of meeting altogether on Thursday evening.

The twenty-second M. Duriez, lieutenant colonel of the regiment of Westro-Bothnia, was then at Torneo. We went altogether on Friday to visit him, at a somewhat elegant house which he had at Hapaniemi; he treated us with great civility, and during our stay in the country we saw him frequently. There were only two persons in Torneo who spoke French, M. Duriez, and a young man, whom the governor pointed out to M. de Maupertuis, and who served us for an interpreter.

From Hapaniemi we went to the town: we ascended the balcony of the town-house, to observe the neighbourhood; for we thought of nothing but finding situations proper to form a succession of triangles. M. de Maupertuis, on his journey to Oswer Torneo, and from the summit of Avasaxa, had seen some mountains, which appeared advantageous to our purpose; but he noticed that the greater part of these mountains were near to each other, and covered with trees.

We employed Saturday and Sunday in visiting the neighbourhood of Torneo, and in deliberation on the measures most proper to adopt for the success of our operations. At length we resolved on going to visit the coast of Ostro-Bothnia, and the islands along that coast. We no longer thought of the coast of Westro-Bothnia, since M. de Maupertuis informed us, that, coming by sea, he had noticed it, and that both the coast and islands were nearly level with the water, and covered with wood.

M. Camus, Sommereux, and myself, were charged with the examination of the course of the coast, and the islands met with there, from Torneo as far as Brakestadt: we took seven men, who were to row and steer the boat, which was a common one, in which we embarked with two servants, and provisions for a fortnight: that is to say, biscuit, and some bottles of wine, remaining of the stock laid in at Dunkirk.

We began our voyage Monday the twenty-fifth, at half past six in the afternoon. I continually observed with my compass the direction we took, the position of the islands, and the most apparent parts of the coast. The twenty-sixth, at four in the morning, we had already advanced seven miles and a half from Torneo; the wind became northerly, and we set the sails. We were all extremely cold; we landed on the island of Knawaniemi; we made a good fire, beside which we breakfasted. The wind continued northerly, with very fine weather; we carried sail, and arrived at Ullea, at half past five in the evening, on the same day (Tuesday) which with them was Whit-Tuesday.

Ullea is a pretty considerable town of Ostro-Bothnia; the streets are in straight lines, and very long. There is but one church, and a town-house, where there is a public clock. Vessels come up nearly to the town; it is built entirely of wood, as well the church as the houses of the town. There is a dock-yard, in which vessels are built. The castle of Ullea, called

Ullaborg, is in a small island to the north of the town; it is built also of wood. The custom-house is in another little island not far from the town, at north-west; and west of the castle.

At Ullea we found a pretty good inn; we supped, and slept there. Ullea is fifteen miles from Torneo, and eight from Brakestadt, where we were bound: we could very well have dispensed with going there, for we found neither the coast nor islands fit for our work; however, not to neglect any thing, we continued our voyage. M. Camus had recommended a second boat with two oars, to accompany us from Ullea, and we departed with our two boats on Wednesday, the twenty-seventh, at five in the morning; we steered south-west till noon; we carried the little English quadrant with us; on Tuesday we had observed the height of the lower margin of the sun, and found it 48 degrees 6 minutes; this day we found it 48 degrees 25 minutes.

From our leaving Ullea we had had but little, although contrary, wind, and by noon we had advanced no more than three miles. Shortly after noon, the wind having much increased, and the sea being greatly agitated, we endeavoured to reach the shore; at first we got behind a large heap of stones, projecting somewhat into the sea; for the sea being very shallow along the coasts, there are few places where it is easy to land; in the mean time, the seamen informing us that if the sea ran higher we should not be in safety behind this heap, we returned about half a mile, in order to find a safe harbour. We landed, erected our tent, and rested ourselves till eight at night. The wind having slackened then, we sent back our second boat, which was useless to us, and set off in the first, to continue our route. By midnight we had advanced two miles, and were about five miles from Ullea; M. Camus, deeming it unnecessary, wished to return towards Torneo, and visiting the islands of Carloohn and Sandhon, we steered then north north-west. The sailors were much surprised, and knew not what to make of us; they said they had never before in such a boat proceeded so far from land; for these islands are five French leagues from the shore. We thought first of going to Sandhon, although a desert, and without any habitation, but we could not get near enough to it, owing to the extreme shallowness of the water. We returned towards Carloohn, where we landed, with difficulty, at five o'clock in the morning: one of our mariners was obliged to carry us on his shoulders for a considerable distance, the boat, while loaded, not being able to approach near. We found there a hamlet, and entered the best house, called Heikis; they shewed us into a room with two beds in it, the room furnished with benches all round. We remained there above two days, living on our provisions, with some milk and fish that we bought in a village; for shortly after our landing the wind blew so violently, and so adversely the whole time, that we could not leave the place.

Towards evening M. Camus and Sommereux went to the house of the clergyman, which we were informed was about three quarters of a league distant. He shewed them great civility; the next day he sent us eggs, and on Saturday morning he came to see us. I accompanied him a good part of the way on his return, and we had a long conversation together: as he had learnt that I was a priest, he often inquired of me, why are you not allowed to marry? This good chaplain was shortly about to marry the daughter of the rector of Flaminia, who had recently died, and expected thereby to insure to himself a succession to the rectory, of which he was only the curate: he took all our names, and was delighted with our having touched at his island. We saw there very fine crops of rye and barley. Every countryman here, as well as in Westro-Bothnia, has several out-houses; he has his windmill, and manufactures his own cloth. This island is four miles from Ullea, and two miles from the main land; it nearly joins

the little islands of Hanis and Lappakari. Carloohn is the only island which we saw on our voyage which is inhabited.

At length, on Saturday the thirtieth, at nine in the evening, the wind having abated, we returned to our boat, to proceed towards Torneo. At half past eleven a large flock of birds, called Curlews, came over, making a horrid noise, and flying very near us; occasioned by our approaching an island formed by a great heap of stones, on which they made their nests. We arrived there at midnight, and landed; this caused an increase in the cries of the birds, who, when we took any of their little ones, appeared ready to attack us. We afterwards passed by three similar islands. A strong south-west wind rising, which caused a great swell, at two o'clock in the afternoon we got into a creek, where we landed. In this place were fishermens' houses; it is called Muscalackti, and is a little to the north-west of Simoka. We were told that M. de Maupertuis had been there on Friday. At five o'clock we left this place, and arrived by ten at the island of Mounolota, where we landed, and from which Torneo is easily distinguished. We did not descend the river by the same course we took on leaving Torneo; we steered then east of the Finnish church, and the island of Biorckholn, near the little island of Rugen, and returned by the other branch of the river to the west of the island of Biorckholn, and arrived at the burgomaster's on Monday, the second of July, at three o'clock in the morning, where we communicated to M. de Maupertuis all the remarks we had made on our voyage. He had himself undertook a journey along a part of the eastern coast of the gulf, and saw that there were no means of forming a succession of triangles. M. Celsius proposed to postpone the work until winter, and to effect it by actual measurement on the ice of the gulf; but what should we have been doing for three months, during which we could see no star, the sun being always above the horizon, or so little set, that there was a continual strong twilight? Besides, we had not yet received the sextant, by which we were to observe the distance of certain stars from the zenith; and the inhabitants of Torneo could tell us nothing for certain of the state of the gulf in winter: they imagine that the whole of it is frozen over; but no one could tell us how far we might with safety venture on the ice. And if certain of being able to traverse it, a south wind happening to blow, the ice would be opened, and sometimes piled up, and thereby our plans become interrupted, and lost.

It was proposed to cut a line directly north and south, and measure it with a rod, through the woods; this was a proposition superior in value to our trusting to the ice; it was more certain, but subject to great inconveniences. Although the country be not very uneven, we could never expect to meet with twenty leagues without considerable elevations, and without having lakes, rivers, and marshes, to pass, which would have made this measure difficult of execution.

At last M. de Maupertuis resolved on undertaking the operations on the mountains. M. Viguelius, director of the schools of Torneo, who had for a long time acted as pastor, or chaplain, in Lapland, informed us that the river Torneo ran more nearly from north to south, than what the maps described, which gave us further encouragement. M. de Maupertuis laid his plan with M. Duriez, to have a number of soldiers ready to forward us in their boats: these men are peasants, residing in their own houses, always ready at call, either to pass in review, or to join the army; a very courageous set of men, and not afraid of fatigue. There is not an inhabitant of Torneo without one or more boats; for during the summer, and as long as the river be navigable, they travel in no other manner; and it is terribly laborious to walk, as we, in the event, were obliged to do, through a country made up of marshes and forests, and where the moss grows so high, that a man can scarcely extricate himself from it.

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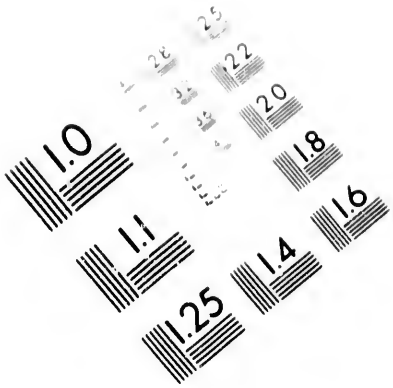

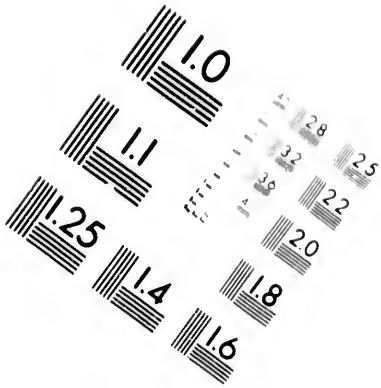

IMAGE EVALUATION
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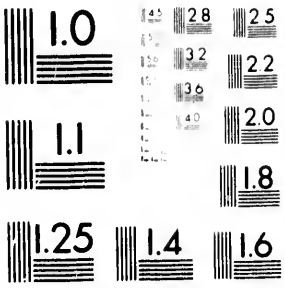

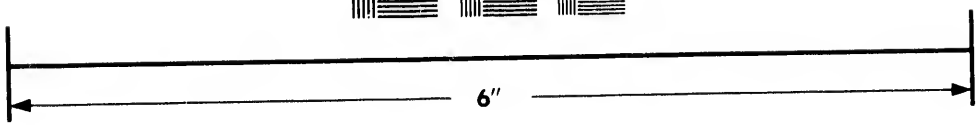

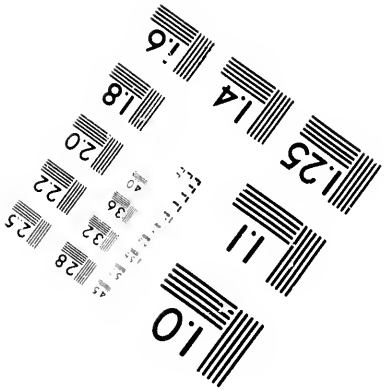

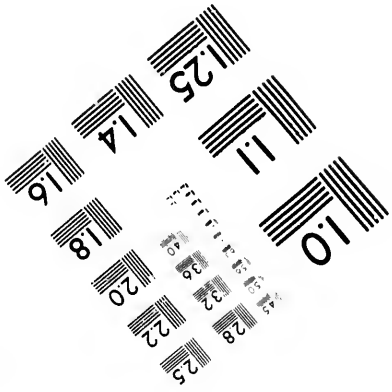

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Tuesday the third, and Wednesday the fourth, we employed ourselves in preparing for travelling: some biscuits, a few bottles of wine, some rein-deer skins for our beds, four tents, which could contain no more than two persons each, two quadrants, a plane-table, a pendulum, thermometors, and all the instruments necessary or useful towards the completion of our operations; this was our baggage.

We went twice near the Fins' church, in the island of Biorckholn, in order to reconnoitre properly two or three mountains perceivable from that spot, and the belfrey, which we went up. Thursday the fifth was the feast of St. John, which they keep eleven days later than us, according to the old stile; it was a grand solemnity, and we could not depart that day, notwithstanding every thing was ready.

Friday the sixth, by nine o'clock in the morning, our instruments, our provision, and the few clothes which we took with us, were embarked, and we departed in seven boats, each boat manned by three men. We were all eight of us together, with five servants, the other two being left at Torneo; besides, we carried with us our host, M. Piping, the young M. Helant, who M. de Maupertuis had met with at the governor's, and who served as an interpreter throughout the expedition. M. Piping and M. Helant spoke the Finnish tongue, the only one in use among the soldiers, and throughout the country beyond Torneo, and which is entirely different from the Swedish; he spoke Latin also. We landed, and walked along the banks, while the sailors with great difficulty got the boat up the cataracts of Wojackala and Kuckula.

The mountains which we saw from Torneo were Nieva and Kukama: the first is not far from the river, it is nigh some houses called Corpikyla; and it was on this mountain that M. de Maupertuis wished to make his first station, and begin the operations; but for this purpose objects to be seen were necessary. Kukama presented itself as fit for this purpose, and the first thing to be done was to construct a signal there. At six in the evening, while all our flotilla was before the village of Karungi, I detached myself, with Messrs. Sommereux and Helant, two servants, and two boats; of the six men which manned these, one was left in care of them, and with the five others we undertook to go to the mountain of Kukama. We met with dreadful roads; as the snow had but lately thawed, the marshes, which formed a great part of the road, were impassable. The inhabitants, to pass these marshes, had joined together fir-trees, end to end, on which, by keeping a due balance, it were possible to pass, if the knots of these trees, which are like so many points, allowed of treading on them: and there was nothing impossible to our soldiers; they carried our provisions and their own, with hatchets, the plane-table, with a part of our clothes; and when we could no longer walk on the trees, we trudged through the marshes; once I sunk in up to the knee, and with difficulty got out. We traversed two lakes; a boat which was in the first of these lakes not being on the side nearest us, our soldiers gathered together some pieces of timber, upon which two of them got, to go to fetch the boat, on which they ferried us over. On the second lake there was no boat; in the same manner as before they fastened together six pieces of timber, on which we all ten embarked; but as it sunk a little under our collected weight, two soldiers re-landed, with our two servants; they joined five pieces of wood together, on which they passed, while we went over on the first. On all the road we found only a deserted mill, on the river Musta, and two barns for hay near the lakes. We suffered a great deal, not only from fatigue on the road, but from the stinging of gnats and the heat. Although it be no more than three French leagues from Karungi to Kukama, we were eight hours in going, and did not arrive there before two o'clock on Saturday morning.

Our soldiers went to the side of the mountain to cut some firs, and carried them to the top, which is naked and craggy: most of the rocks composing it are foliated with large leaves and small, all laying like bow-traps, and supporting one another, so that it is difficult to walk on them. On the most elevated part of these rocks we planted one of our firs, which we supported at foot by means of the other trees. Although we had no need of warmth, we kindled a large fire, to drive away the gnats, and to be enabled to sleep a little, laying on the rocks. I observed with the plane-table the angles made by the Finnish mountains. We luckily found abundance of excellent water, in a sort of natural cisterns made by the rocks, and after eating of our provisions, we descended from the mountain at noon.

By different, but equally difficult, roads we proceeded to mount Nieva. After passing a lake in a little boat, which came close to the side, M. Sommereux, a servant, and four soldiers, went for the two boats which we had left at Karungi; and the fifth soldier conducted M. Helant and me straight to Nieva, by tolerable roads.

We arrived at seven in the evening at the top of Nieva, where we found the tents erected, as well as a signal imagined by M. de Maupertuis, of a most advantageous description. Instead of a single tree to serve as a signal, as I had done at Kukama, M. de Maupertuis constructed a pyramid of trees, stripped of their branches, and placed one against the other. These trees, fastened together at the top, and spreading towards the bottom, made at the same time a signal, the point of which could be distinguished with nicety, and an observatory, in the middle of which was placed the instrument for observing the angles, without any reduction at the centre. This plan was afterwards adopted for all the signals which we constructed, even for that of Kukama, which was rebuilt.

Shortly after M. Helant and myself had arrived at the top of Nieva, M. de Maupertuis, with M. Camus, two servants, and twelve soldiers, having M. Piping as interpreter with them, departed, to plant signals on such mountains towards the north as he should find sufficiently high, and in situations suitable to forming good triangles.

Sunday the eighth we had a great deal of company; the Fin inhabitants of the neighbourhood came in flocks to see us. Our party, on reaching the mountain, found two Lapland women feeding their rein-deer; their hut was at the foot of the mountain, towards the north-east.

We suffered greatly from the gnats on Nieva, and multitudes of other different flies. To preserve us from them, we covered our faces with a kind of gauze; if this veil happened to touch the face, or to have any vacancy, in an instant the gnats covered us with blood. While eating, when it was necessary to uncover our faces, we kept in as thick a smoke as we were able, which we found to be the best remedy against the gnats and flies. At night especial care was taken to drive them out of the tents, which were afterwards closed as exactly as possible. Their humming was heard continually about the tent; but as they could not get in, it served but to lull us to sleep. That in which I was upon Nieva being exactly shut, I could scarcely support the heat it occasioned. On Monday the ninth I caused the soldiers to bring firs, which they hewed on the side of the mountain: I inclined them against a rock, which was perpendicular, and about nine or ten feet high, at the bottom of which was a large rock, very even and horizontal, which served me for floor and bed, in the chamber which I made with these trees. Our party having very hard beds in the tents, as well as myself, we made ourselves mattresses with the little twigs of birch, which we covered with a rein-deer's skin; this was the extent of the schemes for our accommodation. I had air sufficient in my new apartment; but the flies and gnats were to be guarded against: my boots, which I never pulled off, served to defend my legs, and fitting my veil over my face, I managed to sleep pretty tranquilly.

Tuesday the tenth, in the afternoon, it thundered; we had however no rain. At seven in the evening we perceived a signal, in shape of a pyramid, which Messrs. de Maupertuis and Camus had erected on Mount Horrilakero; we had already, on Sunday evening, perceived one on that called Avasaxa. Wednesday morning, the eleventh, we perceived a third on Cuitaperi; and on the evening of that day Messrs. de Maupertuis and Camus came back with their detachment.

Nieva, Kukama, and Cuitaperi, are the only mountains whose summits were uncovered by trees; on the two others Messrs. de Maupertuis and Camus were obliged to cause a number of trees to be felled, to make the signals visible, which were erected on the most elevated spot. They had very bad roads through the marshes which they had to pass, in going to Horrilakero; there they suffered more than on any of the other mountains from gnats; neither fire nor smoke could entirely drive them away; they were obliged to cover themselves with their skin dresses, and inclose themselves with branches of trees, in order to take a little rest, if it were possible to rest, half-smothered as they were, during a heat as powerful as in France. They crossed again the same marshes to reach their boats, on the bank of the river Tengelio, by which, and through lake Patimo, they passed into the great river Torneo, turning round the foot of Avasaxa, where they erected their first signal on Sunday evening.

These gentlemen saw at some distance from the river a mountain, four leagues below Avasaxa, which appeared to them fit for their operations: they left their boats, and by hilly and difficult roads they got to the summit of this mountain, which is called Cuitaperi; from it they perceived all the mountains upon which there were signals, and the belfry of Torneo; they erected a signal there, and returned to their boats. After these gentlemen had advanced a league on the great river, they found themselves at the cataract of Waojenna, which is the largest and most violent of all we met with between Torneo and Pello.

It is not usual to pass these cataracts in boats, particularly Waojenna. The Fins who conduct them take care to cause the passengers to land; their interest, as much as the safety of the passengers, influences them in this. They wish to make them so light as scarcely to touch the water, to avoid the stones, against which the boat is every moment exposed to be broke; to keep it above the billows, and to secure it from the waves which threaten it astern, while two men pull lustily at the oars, with another the third continually steers it one way or another, to avoid the rock. Sometimes, when we landed, we saw from the bank these boats half in the air, skimming over the tops of the waves, as if over rollers, so quick was their motion; at other times they seemed swallowed by the billows.

All the boats of this country, even large ones, such as that which brought us to Ullea, are extremely light; they are made of planks of deal, extremely thin, fastened to a skeleton, composed of a keel and ribs; the planks are only nailed on the sides, they are sewed to the keel, and to one another, for their whole length, by thread made from the nerves of the rein-deer, which is like catgut; after this the whole is well covered with pitch. These skiffs, so slender, possess two advantages in their flexibility, which prevents their breaking when they strike; and their lightness, which not only causes them to draw very little water, but renders cordage unnecessary for fastening them on landing; they are easily drawn out of the water, and are left on the beach; most of them are furnished with a mast, which is raised and lowered by three lines, to carry a sail when the wind favours. We saw many, in which, for want of a sail, the seamen had raised a small fir with its branches on. The inhabitants need sails in most parts of the river, which forms lakes, where the water is, as it were, stagnant, till you arrive at the spot where it discharges itself with impetuosity through some cataract. It is in this that

the address and courage of the Fins, who are the inhabitants of the country, are particularly conspicuous.

The danger which there was in remaining in the boat while going down the cataracts did not intimidate Messrs. Maupertuis and Camus; perhaps fatigue had its part in preventing their landing. M. de Maupertuis was without any apprehension; he amused himself in the boat with observing the different effects of the water, while rushing forward with violence: as for M. Piping, who only remained in the boat out of complaisance, he was terribly frightened, and said nothing, except that "it was no laughing matter;" but the following morning, pretending business, he returned to Torneo.

Wednesday evening we were all assembled together. We began, on Thursday the twelfth, the observation of the angles; we finished them on Friday the thirteenth; and it was proposed to move. Messrs. Camus, Le Monnier, and Celsius, undertook to make the observations upon Kukama: they set off on Saturday morning the fourteenth, with two servants, and six sailors or soldiers, who relieved each other in carrying on their shoulders the quadrant, of two feet radius. Shortly after we all descended the mountain with M. de Maupertuis, to regain our boats on the side of the river; we left two for those of our party who were gone to Kukama, and we embarked in the others to go up towards Cuitaperi. We landed at the cataracts of Matka and Waojenna; it was even necessary to transport by land part of the baggage and instruments. It was nine in the evening when we arrived at Cainunkyla, one of the first hamlets of the parish of Oswer Torneo, which begins at the cataract Waojenna; thence ascending towards the north the space of six or seven leagues, the river becomes very large, and is full of small islands, covered with grass, which is mowed. Both sides of the river are well furnished with houses, surrounded by some very verdant meadows, little fields of fine round-eared barley and rye; in many places also hops for making beer: some sow hemp, but it grows hardly two feet high.

After taking repose, and eating some milk, at Cainunkyla, we left it at ten o'clock. We proceeded in the boat a league farther; after which we left the river, to cross the woods and rocks between it and the summit of Cuitaperi, which we did not reach until Sunday morning the fifteenth, at three o'clock.

We immediately erected our tents, to shelter us from the fog, and a very cold rain, which fell on our journey. On this mountain, as well as on Nieva, and Kukama, we were obliged to look about a long while, before we could find proper spots for fixing the tent-posts; for the summit of the mountain is almost entirely covered with rocks.

Monday the sixteenth, at seven in the morning, the fog had dispersed: we mounted the eighteen-inch quadrant on its stand, and made some observations. Comparing the angles taken upon Nieva with this little quadrant with those taken with the two feet quadrant, we found a difference; by examination we discovered the cause. The little quadrant gave for the circle of the horizon 360 degrees 4 minutes, while the other gave exactly 360 degrees. M. Langlois, known for his skill and exactitude in the construction of mathematical instruments, made them both; and I owe him the justice to state, that the one of two feet radius was as perfect as can possibly be made.

M. de Maupertuis, who considers no impediment when truth is to be obtained, descended with M. Clairaut from Cuitaperi, to return to observe on Nieva with the little instrument of eighteen inches: I left it at the same time with M. Helant, to go towards the north, in search of mountains fit for continuing our triangles. Messrs. Sommereux and Herbelot remained on Cuitaperi.

Monday, at eleven at night, we left our boats near the houses of Marcosari, to proceed to the neighbouring mountains of the same name: we were there almost devoured

by gnats, which scarcely allowed us the liberty of examining the neighbourhood. We returned to our boats, ascending the river as far as the mountains of Kattilla, which we went up: we visited three of their summits, and thence perceived another mountain towards the north, which seemed perfectly adapted to our operations, but which was entirely covered with trees. Our sailors told us it was Pullingi, and we immediately resolved on going there.

While our sailors with great difficulty got the boats up the cataract of Katilla, we proceeded on foot along the bank; and here it was I first passed the polar circle. It was nearly seven in the morning when our boats received us above the cataract: we found the river still fine and spacious, some very good fields on its sides of excellent rye, barley, and hops, near the hamlets of Komnus, Hiougsing, and Rattas. We got out of the boat again, to examine the mountains of Rattas, but found they could be of no use to us. We left them at noon, and arrived by two o'clock at Lambisen Nieva: we found there a comfortable house, where we left a part of our things, in order to get to Pullingi, through the woods and marshes, with greater facility. It was too leagues distant; we attained its summit at seven o'clock, exceedingly tired; the gnats tormented us here more than any where before; besides these, the air was full of extremely small flies, whose stings drew blood. In order to eat our bread, for we had nothing else, we were obliged to be very quick in passing our hand under the veils which covered our faces; without this precaution, we should have been covered with blood by their stinging, and have swallowed as many of them as crumbs of bread. M. Helant and I were by ourselves, with six soldiers or sailors; we enveloped ourselves both together in the cloth of a tent, in such a manner as to leave no entrance to the flies, and seated ourselves near a large fire, in order to sleep.

The eastern extremity of Pullingi is the most elevated part of the mountain, but covered with fir-trees, of a much larger size than any which we had hitherto met with. From the top of a tree I discovered Avasaxa and Horrilakero, and I determined on erecting a signal; but it was necessary to fell beforehand a part of the trees. Our six men were employed about it incessantly, and the signal was raised on Wednesday the eighteenth, at four in the afternoon; we then retraced our way, to take our clothes at Lambisen Nieva, and re-ascend the river in our boats. We were so much fatigued, that we did not land on going down the cataract of Kattilla, which in truth is not the most dangerous; and at nine in the evening we left the frigid for the temperate zone. We afterwards descended the cataract of Sompa, and continued our route till Thursday morning the nineteenth, at five o'clock, when we arrived at the top of Cuitaperi, where we were all collected together. All the morning it continued raining; in the afternoon the observations, begun by the gentlemen whom we joined, were continued; they were completed on Friday the twentieth.

M. Meldecreutz, who left Stockholm with a design of accompanying us through our operations, preferred travelling with M. de Cederstrom through the country, not to say the deserts; for to the north of Pello few habitations are to be met with. As soon as they arrived at Torneo they set off, going to the sources of the river, and the lake of Torneo; they even saw the north sea. M. de Cederstrom, on leaving us, proposed to us this journey; but M. de Maupertuis, with the whole party, were of opinion it would be better to begin the work which formed the subject of our voyage.

M. Meldecreutz, on his return, learnt we were upon Cuitaperi; he came there. M. de Maupertuis behaved with great civility towards him; but as he had not thought proper to begin the work with us, we paid no attention to the inclination he manifested of continuing it with us, and he departed, to join M. de Cederstrom.

At four in the evening we sent down all our baggage, and at seven we embarked in six boats, each conducted by three men, to proceed to Avasaxa, on whose summit we arrived at midnight. After having pitched our tents, and taken food and rest, on Saturday the twenty-first we came down the mountain, to go to Oswer Torneo, or rather Sarkilachti, to see M. Brunius, pastor of Oswer Torneo, and M. de Guilingrip, governor of the province, who was at his house. We were very well received; we dined there; and he promised to come the next day to dine with us. If we had to suffer from the flies and the heat, we had yet the consolation of perfect freedom as to our dress; we were in our jackets, with Finnish shoes, a kind of leathern socks; we dressed as we pleased, in short, and no one looked upon it as extraordinary. We received the governor and all his retinue in the same dress. Our tents were too little; we could not shelter ourselves from the sun under them; we therefore made our soldiers build a dining-room with trees and leaves, furnished with a table and benches; we had there the remainder of our wine, and there it was finished.

It is difficult to descend the mountain. After having got down through a little wood, we met with large and slippery rocks, lying very unevenly; afterwards we entered into a forest, which stretched to the foot of the mountain, where we found the river Tengelio, which on three sides runs round it, and afterwards empties itself into the great river Torneo. In going up and down these mountains, notwithstanding their difficulty, two of our soldiers, marching with a steady pace, carried on their shoulders our two feet quadrant, and so by two and two our baggage and provisions; they never objected to the labour, although it was incessant. Notwithstanding their fatiguing work, these Fins ate very little; a few dry fish, which they carried in a bag, made of the bark of the birch-tree, and which hung at their side, with a cask of soured milk, was all their food and beverage. They sometimes have a little barley-cake, extremely dry, and as they empty their cask of sour milk, they replenish it with water.

The inhabitants of the neighbourhood came to our mountains in flocks; many of them offered their boats and their services; we gave two thalers per day to each man, which is about twenty-four sols French money, very high wages for that country. The ardour which inspired them to serve us engaged some to buy their places of those who brought us from Torneo; others brought us milk, sheep or fish. On the two first mountains, Nieva and Cuitaperi, we ate a quantity of fresh salmon: we bought one at Cuitaperi, three feet ten inches long, for which we paid three livres, and the seller thought it a great deal; he would not have obtained for it more than forty sous from his country people.

Pullingi was the only mountain on which we had a signal towards the north, and another was to be found, to continue the triangles further. For this purpose, I set off with M. Helant and six soldiers, in two boats, on Sunday the twenty-third, at eight in the evening. We embarked on the river Tengelio; we crossed the lake Portimo, and continued yet on the river until three o'clock in the morning: we then left our boats, and went across the marshes and forests to mount Horrilakero; we made the signal larger, to be the better perceived. From thence I examined the mountains which are perceived beyond, but which appeared confounded, and piled one upon the other. Our soldiers told me, that one which appeared the most likely for our purpose was called Lango, but was very distant; that they knew it, and could lead us to it. We were not sufficiently well provided with food to go so far into a desert, where there were no habitations; we therefore came back to Avasaxa, reaching it on Monday night.

We always landed while the boat was worked through the cataracts in the Tengelio; the sailors made use of a different method here to that used in the Torneo; instead of

rowing in the cataracts, they held fast with their poles, and oftentimes got out of the boat and held it by the sides, in order to get between the stones which fill the bed of the river, and cause the cataracts.

After conferring with M. de Maupertuis and the rest of his company, and having taken some provisions, we departed anew, M. Helant and myself, with our six men, on Tuesday the twenty-fourth, in the afternoon, at two o'clock, and after re-ascending the Tengelio, and crossing the lake of Portimo, by ten at night we arrived at the cataract of Luonion, at the bottom of which we leave the river, when going to mount Horrilakero. We walked up this cataract, and at midnight were in the middle of lake Maiama Lombole.* We passed through lake Lohi in a thick fog, and arrived on the twenty-fifth, at three o'clock in the morning, at the houses called by the name of the lake Lohi Jerfwi. All the family were asleep there, in the middle of a very dirty chamber, which is called Porti: we entered into a similar room, where we ate some fresh eggs. This was the only inhabited house we met with beyond lake Portimo; some huts are met with, but they are no other than places of retreat for the fishermen, who in the season go as far as these distant lakes. The inhabitants arrange among themselves the distribution of the fishery, and every one has his own fixed station.

We left the place at five o'clock, passed the cataract of Pessa, and the lake of the same name, and after continuing our route pretty far into the great lake Miecko, we found ourselves at the foot of mount Ketima: we went to the summit of it; and as I perceived Horrilakero and Pullingi, upon climbing a tree, we should immediately have raised a signal there, if I had not imagined that mount Lango would be a more advantageous spot.

We therefore returned to our boats, and set off at three o'clock in the afternoon, to proceed further. We had a favourable wind, and hoisted a sail during the remainder of our passage along the lake; but at the cataract Lango, where there was but little water, we were obliged to get up it from stone to stone, with much difficulty, on foot, the wood on the sides being so thick as to prevent our passing through it. Our sailors had a still harder task to get their boat up. Above the cataract we embarked again on lake Lango, and at seven at night we had got up the mountain of that name, east of the lake.

On the twenty-sixth we were so greatly fatigued that we quickly fell asleep, laid by a fire upon the rock. In vain did I travel over all the mountain; I could not distinguish any of the others on which the signals were placed; our soldiers had made a mistake at Horrilakero, and taken some other mountain for that of Lango. We conceived nothing to be better than to return to Ketima; but on entering lake Miecko again, we saw on its western side mount Pieska, which promised to be of service. At six o'clock, with much trouble, we got up it, for it is very rugged on the side of the lake; the top is entirely covered with large firs, and here we were greatly plagued by gnats; we were only free from them when we had climbed up one of the largest trees, from which we could distinguish nothing.

When we had determined on climbing this tree, as it was lopped too much, our Fins felled another in a little time, and stripping it of its branches, made notches all along one of its sides, which served us as steps to ascend its highest branches.

We then returned, on the twenty-seventh, to Ketima. Before we ascended it, we supped on the side of a lake, in order to take advantage of its water, and towards midnight we walked up to the summit of the mountain. We pitched a tent, which it

* Lombole, Jerfwi, and Ripi, are three different denominations of lakes in the Finnish language; Jerfwi, signifies a lake simply; Lombole, a very long lake; Ripi, a small lake.

was not long before we needed; it rained, with thunder, till nine in the morning; our soldiers sheltered themselves from it as well as they could with the sails of their boats.

Immediately after the rain we began felling the trees, which was continued all day long. While our men were so occupied, I went down the mountain with M. Helant, to drink, in the afternoon, at the lake, and to fetch water for ourselves and the soldiers. We saw for a long time from the side of the lake a large animal, which was swimming a great distance from us: our sailors told us it was probably a large pike; they were not so visionary as a number of the inhabitants, who take them for spirits, called by them Haltios: others say they are bears, who swim towards the boats for the purpose of overturning them, and devouring the men in them. Scarcely had we re-ascended the mountain, when we saw M. de Guilingrip with six boats crossing the lake; he was going into these lost countries in search of mountains containing iron.

We saw a singular appearance in the sky at seven o'clock; as the sun shone from the north-west, there appeared in the rain which was falling in the south-east three rainbows, the colours of the internal and external of which were vivid; of the middlemost, which was parallel to the internal one, and which bisected the external, the colours were not so lively.

On the twenty-eighth, at night, it rained heavily, with thunder, after which we constructed the signal, and continued stripping the mountain till four in the afternoon. We descended and re-embarked, and after two hours, which it took to cross the lake, we again entered the river. Fortunately we arrived by eight o'clock in the evening at the house of Lohi Jerfwi, where we sheltered ourselves from the rain, which fell in abundance throughout the night, accompanied by dreadful thunder. We slept upon heaps of new-mown hay, the best bed we had met with since we left Torneo.

We did not leave this place till near ten in the morning, to continue our journey towards Avasaxa, where we expected that M. de Maupertuis yet remained. Our provisions failing, we proceeded to the house of Portimo, on the lake of that name, to try what we could find to eat: we met with bread, or rather dry barley-cake, made half of straw; extreme hunger made this appear delicious. We reached the top of Avasaxa at ten o'clock, as those gentlemen were returning from the house of M. Brunnius. The length of my voyage had given them time to make their observations; they had not been able to see the signal on Ketima, and waited for our return, in order to determine on the course we should take.

Mount Avasaxa is situated in the best peopled and finest part of the river: its bed, above all, towards the south, for the space of four or five leagues, is extremely wide, and offered the most proper spot we could desire for an excellent base, whose extremities would be visible from Cuitaperi and Avasaxa. This base could not be measured at any other time than in winter, over the ice; but it suited to fix upon it, and erect signals at its extremities, to join it to the triangles, and to make the necessary observations before winter came on.

Monday the thirtieth, shortly after noon, we all came down from Avasaxa: Messrs. Clairaut and Camus took upon themselves to determine the direction of the base, and its extremities; and M. de Maupertuis with the rest of his party embarked in five boats, to go to Pullingi. At nine at night we landed, to get up the cataract of Kittilla, which is intersected by the polar circle: our seamen took us to Hiougsing, on the western side of the river, to a good house, where we supped; we found there good barley-bread, dry fish, milk, cream, butter, and cheese, and were served in a very cleanly manner.

We left this house at eleven o'clock, and instead of going to Lambisen at Pullingi by land, we went on in the boats to the little village of Turtula, and from thence to the

mouth of the river Keutas, which is not navigable. We left our boats on the banks of the great river, and proceeded on foot to the side of Lake Keutas.

The thirty-first. Ordinarily they have a little boat on each lake, to fetch the hay mowed in the marshes: on this lake we found two, and we made use of one on several expeditions to the foot of the mountain of Pullingi. We had much trouble to reach the summit; it is very steep, and at every step we made we were up to the knees in moss. The mountain itself is the highest of all those on which we went, and incomparably the most pestered with gnats and flies. What we suffered there from these insects is inconceivable; the Fins, our soldiers, of the regiment of Westro-Bothnia, men as courageous as indefatigable, and insensible to the intemperance and inconveniences of the weather, were not able to hold up against them, but were obliged to cover their faces with pitch. The servant given to us by the ambassador had his head prodigiously swelled by their stinging. M. Le Monnier, also, had great difficulty in supporting this continual torment, and his health was very much hurt by it: a disgust of the food we ate did not a little contribute to his illness. We found in the little village of Turtula plenty of mutton, milk, and fish; but scarcely were they ready, and withdrawn from the fire, than they were quite black, from the little flies which covered them. During our three first encampments we were obliged to go down the mountain to the river, to obtain what water we wanted; at Pullingi, we found a fountain towards the south-west, on the declivity of the mountain. We found there also an abundance of a small black fruit, which they call blober; the plant on which it grows is seven or eight inches high, and the leaf similar to that of the myrtle; the fruit consists of small black grains, of the size of juniper berries; this fruit is met with in France. All day Tuesday was very fine; we discerned very well the signals of Avasaxa, Horrilakero, and Ketima; but other signals were requisite towards the north.

On the first of August M. de Maupertuis had met with a serjeant or subaltern of the regiment of Westro-Bothnia, at Avasaxa, a well informed active man; he engaged him to accompany us to Pullingi. The day after we arrived there, this officer, M. Helant, and myself, set out towards the north, to seek for some mountain, whence we might discover at least Pullingi and Ketima, if we should not be able to distinguish as well Horrilakero. We went to the most northern houses of Pello, and we got down to that of Corten Niemi by two in the afternoon, where we dined. We made every possible search; for this no one could be better adapted than our officer; no inhabitant, not even the master of Corten Niemi, who did not want for intelligence, could give us any satisfactory information.

At last, after having examined all the neighbouring mountains, which are low, we found nothing to answer our purpose better than the little mount Kittis; we easily discerned Pullingi from it, but could not perceive either Ketima, or Horrilakero. We saw other mountains to the east of Pullingi; but one gave them one name, another a different one, and were as little agreed about the roads which led to them. We should have gone farther towards the north, if, after going up to the summit of Kittis, we had perceived some higher mountain more advantageous; but none was visible, and the direction of the river swerved greatly from that of the meridian, and ceased to continue favourable to our operations. On the second we determined therefore on constructing a signal on the highest part of Kittis; we caused all the trees to be felled, which might hinder the sight of it from Pullingi, and the mountains which we saw to the south-east. As we foresaw that our signal would appear almost overwhelmed by the surrounding country, in order to render it more visible, we put in practice a suggestion of M. de Maupertuis; it was, to split the trees which we used for building the signal, and to place the

internal split part outwards, in order that its whiteness might make it distinguishable with ease.

We returned to our boat on Thursday the third, at eight o'clock in the evening, and arrived on Friday morning, at one o'clock, at the summit of Pullingi. After having related to Messrs. de Maupertuis, Le Monnier, and Celsius, the difficulties we had met with, and after informing them that beyond Kittis no place was visible, proper for continuing the triangles, that the river did not even continue from the same direction, its course being from a great inclination towards the west, we resolved, in concert, to set off immediately in search of some mountains to the eastward, from which we might discover Pullingi, Horrilakero, or Ketima, and Kittis. We then at noon left Pullingi. M. Celsius had instructed the Swedish officer in what was necessary for making good triangles: this officer with six soldiers went towards the south-east, while M. Helant and myself went with six soldiers to the east-north-east. We passed through the village of Turtula, where they were reaping some very fine barley; and after going through a short distance of wood, intermixed with marshes, we embarked on lake Pamas: we continued a little forward into the river Hanki, having marshes in the woods at its sides, and afterwards, having walked for a long time amid woods and marshes, we found mount Kukas, the summit of which we reached at nine in the evening. Immediately we made a great fire; this was always our first measure, on account of the gnats, and after taking with a compass, from the tops of trees, the directions of Horrilakero, Pullingi, and Kittis, the signals on which I discovered on the fourth, we caused those trees to be felled which were in the suitable directions, so forming avenues, in the midst of which the signal was placed, whence we perceived Horrilakero, Pullingi, and Kittis. We did not finish till Saturday, at six o'clock; we then returned to our boats, and by the lake Pamas entered the river of that name; there was so very little water, that every instant we were obliged to get out of the boat, and leap from rock to rock, for the river is full of them. We did not get to Turtula until midnight. We took up our abode with a rich farmer, whose house is called Martila. M. Helant threw himself on a bed; for my part I preferred sleeping on a bench, with which all their chambers are furnished, going entirely round, and of a good breadth. We left this place on the fifth, shortly after four o'clock in the morning, and reached Pullingi by seven o'clock.

All day, Sunday, the weather was delightful, and very few flies; the observations were continued: the signal upon Kittis was distinctly seen, as well as that I had constructed upon Kukas; and two which the Swedish officer had erected, the one on Niemi, which was employed in the triangles, and the other on mount Alpus. This last would have made a better triangle, but it was not distinguishable from Kittis. The two constructed by M. Helant and me upon Ketima and Kukas were not used, Niemi being more advantageous than Kukas, seeing that Kukama was seen from it, and that it thence completed a heptagon.

On Sunday evening we began sending down our baggage, and at seven o'clock in the morning of Monday the sixth we all went down, to embark on the lake Keutas, and proceed in our five boats to the side of the great river.

The river Keutas is not navigable, as well from want of water, as from what there is being employed for turning a saw mill; this mill is as ingeniously contrived as those in France; after the log or trunk of a tree which is placed to be sawed has advanced to its whole length, and it has been sawed through from one end to the other, the motion of the water carries it back again, to receive a second sawing. In other places on these little rivers, they have very small mills for grinding grain, which have only one horizontal wheel turned by the water: the stones placed on the same axis are very small, and make

no more revolutions than the water wheel; it only crushes the grain very coarsely with the straw which is mixed with it, to increase the bulk. There is one of these mills on the Tengelio, below Lake Portimo; they have some, the water wheels of which are vertical, but as small as the former, and which grind no better: we met with one in going from Karungi to Kukuma, on the little river Musta, in the middle of the woods; M. Piping has a similiar one at Torneo: north of Torneo we met no longer with windmills.

The health of M. Monnier was far from being re-established; notwithstanding, he made, besides observations of the angles, some on the meridional elevation of the sun, in concert with M. de Maupertuis and Celsius; and observed an eclipse of Aldebaran by the moon, which was useful in ascertaining the difference between the meridians of Pullingi and Paris. To get better, it was necessary he should be more comfortably lodged, and above all receive nourishment of a less disgusting nature than flies. In vain did M. de Maupertuis use the most pressing intreaties to induce him to remain at Turtula, where he would have had very comfortable accommodation at the farmer's of Martila; or to descend the river to Oswer Torneo, and go to the house of M. Brunius. where he would have found Messrs. Clairaut and [illegible]us; he insisted absolutely on accompanying us to Pillo. We therefore all went on board, and at noon found ourselves close to a large even rock, on the western side of the river, on which we dined. The inhabitants call it Pellon Pyta, which in the Finnish language signifies the table of Pillo; it is a practice among them on going up the river to make a meal there, before they ascend the cataracts: these were not so full of rocks as the cataracts of Katilla, and the others lower down: nevertheless, the river is very rapid, and they are not got up without difficulty.

We landed at the house of Saukola, the most northern of Pillo, and the nearest to Kittis. We arrived at our signal at five o'clock; the weather was delightful; we observed the angles between Pullingi, and Niemi, and Kukas, as well as the elevation of the signals. We slept on the mountain, and the next day took the meridional height of the sun. We made secure here, as in every previous instance, of the centre of the signal, by different marks, and lines of trees and neighbouring rocks, by stakes deeply sunk, in order to find it again, if by any accident, and above all by fire, it should happen to be destroyed. We found a number of small flies, but fewer gnats, on this mountain.

At four in the afternoon we went down Kittis, to visit the houses of Corten Niemi, and Purainen, and to know if the owners could furnish lodgings for us, when we returned to make the celestial observations. The house of Saukola would have been nearer to the mountain, but it was not fit for us; while here we found two sufficiently commodious rooms in each of these. We went on board at five o'clock, and arrived at Turtula at eight, where we supped, and slept at the house Martila. Were it not for the small gnats during the night, it would have been pleasant, he weather being charming: they had just gathered in their hay here, as well as at Pello, and were about the end of their barley harvest. We began to see small birds, such as sparrows and finches; till now we had seen none but swallows. Many more ducks were seen on the river. After leaving Torneo, we met no longer with any domestic fowls, unless at the house of M. Brunius. The country people fasten to the bottoms of trees logs of wood, or trunks of trees hollowed, to attract certain large birds, who come to these places to lay their eggs, which they take and eat. The sun set at nine o'clock, and at midnight there was scarcely sufficient twilight to read.

On the eighth I joined M. de Maupertuis, and we persuaded M. Le Monnier, who was in a very languid state, to go to rest himself and recruit his health at Oswer Torneo; Messrs. Sommereux and Helant accompanied him; and sent their boat back to Tur-

tula, to be of use to us on our return from Niemi, where Messrs. de Maupertuis, Celsius, and myself, went to make observations with the quadrant of two feet.

Niemi is the mountain on which the Swedish officer erected a signal; he went there with us, to serve as an interpreter, understanding the Finnish, as well as the Swedish language.

Wednesday, at seven o'clock in the morning, we left Turtula, and we went to some distance to embark in three of those little boats, which the inhabitants have in almost every part for fetching fodder from the marshes; ours we left on the banks of the great river; they would have been too large to be any ways of use on the little river Pamas, on which we had great trouble in passing even the small boats which carried us between the rocks; and from which we were frequently obliged to get out, in order to step from stone to stone. At length we entered Lake Pamas, which I had crossed before with M. Helant. The water of it was not clear; it was entirely filled with small, round, yellowish grains, resembling millet; and which M. de Maupertuis took to be the chrysalides of gnats, or of those little flies with which the air swarmed. Our sailors told us this was always the case during the autumn, and that at other seasons, from the time of the melting of the ice, the water of the lake was perfectly clear.

We left the lake by the river Sika, which we went up in our boats, and afterwards left.

After about an hour's walking through the woods, we came to the little lake Kassuri, on which there was but a very small boat and a raft; we loaded them with our baggage and quadrant, and went on foot round its side, through the wood, which was so thick that we were obliged to cut our way. There was besides a very high moss, which covered many trunks of trees blown down by the wind, in such sort that we never knew where we placed our feet, and frequently thinking to be walking on higher ground, we stepped into a hollow; we walked on in this manner for two hours, and arrived at length at the side of a great lake, on which were two boats: we loaded them with our baggage and instrument, to be transported to the foot of Mount Niemi, which is washed by the other extremity of the lake nearly a league long. Our sailors brought the boat back to take us over, and not having any sail, they substituted branches of fir. At length, before four o'clock, we had attained the summit of Niemi.

The lake which we passed is called Ajangi; it is at the north of our mountain, and communicates with other lakes at the south of the same. We saw on this lake towards the south some vapours rise, which some of the inhabitants take to be spirits, and call them haltios. The soldiers, who served us both as workmen and sailors, were not so credulous.

M. de Maupertuis was delighted with Mount Niemi: I ought not to say any thing, after the description he has given of it in his work on the Figure of the Earth. It is true the objects seen there form a contrast, a variety, which present a spectacle equally agreeable and singular. It might be thought nothing but bears and wild beasts should be met with in a place so distant as four or five leagues from any habitation, and lost as it were amid woods and lakes; nevertheless, we saw there nothing but the haltios which I have before mentioned.

The remainder of the day the horizon was much loaded with vapour. On Thursday the ninth, thunder and rain interrupted our observations during the whole day. Friday the tenth, foggy all the morning, and the remainder of the day rain, which prevented our work.

The weather was fine when we left Turtula. We reckoned upon its continuance, and that at the latest our observations would be finished by Friday. Neither ourselves nor

our sailors had laid in provisions for more than two or three days; in the mean time we had no prospect of fair weather, and had already begun to divide the provisions which we had remaining among our soldiers: we therefore dispatched five of them to Turtula on Friday evening, for victuals for us and for themselves.

Saturday the eleventh, the weather becoming fine, we began our observations at three o'clock in the morning, and they were completed before noon: we sent our baggage down to the foot of the mountain, thinking that the soldiers sent to Turtula would make haste back. The boats returned, and we embarked at five in the evening; we had difficulty in crossing; a very violent contrary wind had rose, and the boats were not sound; the sailors took the precaution of keeping close to the side, to be under shelter from the wind by the forest. It was ten o'clock before we reached Turtula; we supped at the farmer's at Martila, and although there were two empty beds, Messrs. de Maupertuis and Celsius slept in a tent, which was pitched before the house; and as three could not commodiously sleep in it, I returned to sleep on the bench which had been my bed before.

M. Le Monnier had sent back the boat which carried him to Oswer Torneo, and we had five on the bank of the great river. We went on board them with all our baggage on Sunday the twelfth, at nine in the morning, and arrived somewhat before two o'clock at Ruktula, where we dined. We afterwards crossed the river, to go to the house of M. Brunius, the pastor of Oswer Torneo; we found at the water-side Messrs. Clairaut and Camus, with M. Le Monnier, who was much recovered. The weather was delightful, and the air free from flies; together we took rather a long walk, entertaining ourselves with plans for spending the winter at Torneo; we met all at M. Brunius's, who with much politeness offered us his house.

M. de Maupertuis willingly took upon himself whatever was laborious, and insisted upon every one faring better or less ill than himself. I did not spare myself, particularly when I had to accompany him; notwithstanding, he obliged me to remain at M. Brunius's, to take repose. I stopped with Messrs. Le Monnier, Sommereux, and Herbelot, who had remained there since their departure from Avasaxa; and Messrs. de Maupertuis, Clairaut, Camus, and Celsius, departed on Monday the thirteenth, at nine in the morning, to make observations on mount Horrilakero.

Messrs. Clairaut and Camus had determined the base, and caused a signal to be constructed at each of its extremities. Messrs. Le Monnier, Sommereux, and myself, after dinner, took a walk to the signal at the northern extremity of the base; we secured the centre by different directions, taken from the neighbouring trees, which we marked, that we might know its position again, in case of any accident; and as we could not see the signal on Avasaxa from this one, on account of the trees on the summit of that mountain, I went up it with two sailors, in order to fell them. I rejoined Messrs. Le Monnier and Sommereux, and we returned together to the house of M. Brunius.

I went by myself in the evening to take a walk on the little mountain Sarki Wara, which joins the Presbytery: from the top of it I had a most beautiful view towards the south, along the course of the river, as far as Kainenkyla; the weather delightful, and no gnats.

M. Brunius returned from Hieta Niemi, a chapel of ease to Oswer Torneo: we supped with him and Mad. Brunia; he exercised the functions of curate, and expected to succeed his father in the rectory of Oswer Torneo, who was blind, and incapacitated from fulfilling his duties.

Tuesday the fourteenth, at nine in the morning, I set off alone with three sailors in a boat to go to the southern extremity of the base, in order to secure the centre of the

signal: I could not effect it by directions taken from tree to tree, for there were none except what were very small; but I made a more certain mark, by the means of a great rock which was near the signal.

We passed the day of the assumption of the Blessed Virgin (whose feast is not held in Sweden) very tranquilly. M. Brunius kept company with us almost all the day; we entertained ourselves in talking Latin with him. Just as we were all in bed, at eleven o'clock, M. Camus returned from Horrilakero, to go the next day to Kukuma, in order to rebuild the signal which the winds had blown down. He took some rest; and Thursday morning the sixteenth we both set off, with a servant who spoke Swedish, and nine soldiers, one of which also spoke Swedish. We embarked in three boats, of which we left one at Hieta Niemi; two being sufficient for us, a third would only have embarrassed and detained us in passing the cataracts.

M. Camus and myself were in the same boat, in which we kept going down the cataracts. At that of Waojenna, a wave on the side where I sat spent itself over the boat, and almost covered me with water. We were obliged to keep ourselves in a posture almost lying, in order that we might not hinder the pilot from seeing the rocks, which he continually avoided by the means of the rudder, while two Fins rowed with all their might: in some places, however, they suffer the boat to fall down the stream, guided only by the pilot. The cataract Matka was quite as terrible as the first; we were, as it were, buried amidst the waves, but this was of short duration. We arrived at Korpikyla at three in the afternoon; we stopped more than two hours at a farmer's; we dined there, as well as our sailors, who required a little rest.

We got to the top of Kukuma by ten o'clock: the heat and almost continual rays of the sun had somewhat dried the marshes, and we found the road pretty good. A rein-deer belonging to the Lapland girls who lived at the foot of mount Nieva took a liking to us, and followed us in spite of his mistress, who could not prevent him; he stayed on mount Kukuma all the time we remained there. The nights began to be cold, and we passed this near a great fire. At three o'clock in the morning of the seventeenth we set to work to re-establish the signal; we set off at nine o'clock, and arrived by noon at Korpikyla.

The rein-deer came back with us, and returned to his mistresses, who had five or six others. We ascended the cataracts on foot; the waters were very low in them, and the navigating through them incommodious: we got into the boats again at Kainunkyla, and arrived at M. Brunius's, where all were in bed except himself, who was returning from fishing at midnight.

Saturday the eighteenth was very fine, scarce any gnats or small flies; there were only a few flies remaining, similar to those we met with in France. Messrs. de Maupertuis, Clairaut, and Celsius, returned from Horrilakero at five in the afternoon, and we were all met together. In the evening we perceived a fine aurora borealis.

On Sunday the nineteenth, some of our party going to church, where there was a sermon, were astonished to hear the sobbing of the audience, affected by the discourse of M. Brunius. On their return from church, it was said that the forest of Horrilakero was on fire; this turned out but too true: after dinner we saw from the top of Avasaxa the smoke of the fire; it even prevented our observing the angles of the extremities of the base, or seeing Horrilakero. We were obliged to send an express there, to know if the signal was not damaged; as for the rest, the weather continued fine, and the nights rather cold. Messrs. de Maupertuis, Celsius, and myself, notwithstanding, slept on the mountain. Messrs. Clairaut and Camus went to M. Brunius with M. Le Monnier, as yet convalescent; they found M. Herbelot there, who on taking a trip in a boat was

near being drowned: as all the ill that followed the accident was only his fear, we did nothing but laugh at it, and kept ourselves alive by our gaiety.

Monday the twentieth, the smoke was still thicker; it was distinguishable in every quarter. In dry weather, as it was then, the mountains of the country often take fire, which communicates in an instant to the dry moss, and spreads prodigiously; sometimes three weeks elapse before it is extinguished. The smoke of these fires extends over the gulf, hides the beacons from the pilots, and frequently causes shipwreck. This shewed us how wisely we had acted in not losing time in Sweden and at Torneo, and in nearly completing our trigonometrical observations before this smoke was common, which would not allow the perception of distant objects, such as the points of our triangles were. Messrs. Clairaut and Camus returned in the evening, to sup and sleep with us on the mountain.

Tuesday the twenty-first, the express sent to Horrilakero having reported that the signal there was burnt, Peter, the servant which the ambassador gave, an intelligent man, and who knew the centre of the signal, departed with six men to re-construct it. We never failed to take exactly the centre of our signals, and in the observation of the angles to make the intersection of the two reflectors of the instrument answer to it. When we left a signal, if it was on a rock, we made a mark at the centre on the rock; and we made more sure of it, by taking its distance and direction from certain neighbouring trees and rocks, of which frequently we preserved a copy in the register of our observations. If the signal was placed on the ground, or we were any ways able to drive a stake in at the centre, we did so, and on leaving the place we covered it with a large stone; it is thus we had acted at Horrilakero.

Madame Brunia sent to us on the mountain a dish of harshed meat, and one of green peas; but they were so much sugared and seasoned with lemon-peel, according to the taste of the country, that we could not eat it.

At four o'clock in the afternoon the smoke was dispersed, and we took the two angles remaining. At nine o'clock we went down to sleep at M. Brunius's, where we found letters announcing the arrival of the sextant, which M. Celsius had ordered in England, and which was to serve us to examine the distances of some stars from the zenith.

The next day, Wednesday the twenty-second, early in the morning, we all went to the northern signal of the base: we caused it to be rebuilt in as solid a manner nearly as the houses of the country are wont, preserving in a scrupulous manner the same centre. We had only to take the angle between Avasaxa and the southern signal of the base, and were not able to effect this, owing to the smoke, till four in the afternoon; we were even obliged to send a man to spread a very white cloth over the signal. At nine o'clock we returned to sup and sleep at M. Brunius's: his house was the best retreat we met with; it was placed nearly in the middle of the space comprised by our triangles, and very near the northern extremity of our base: we always found there three rooms that we could occupy, without inconvenience to the family, which was very numerous. They furnished us abundantly with every thing necessary for our sustenance, and every one there exerted himself to serve us. The good father, old and blind, the mother of the same age, their son and son-in-law, with their family and servants, formed a very natural representation of a house of the ancient patriarchs. Hospitality is exercised pretty generally throughout the country: if want of rest, or dread of bad weather, at any time induced us to take refuge in a house, the master, before we could say any thing to him, sometimes even without an interpreter to make ourselves understood, immediately opened for us an apartment, apparently destined for strangers only, and remained standing, looking at us, his family assembled about him, and every one quickly hastened to wait on us. If it were in the smallest degree cold, fire was immediately

kindled; and frequently they brought what little they had to eat before we asked for it. As M. Helant, the only Finnish interpreter we had, could not be everywhere, that we might not want for necessaries in his absence, we learnt to salute in this language, and to ask for milk, butter, bread, water, or drink.

Thursday morning the twenty-third, not content with giving us an excellent breakfast, M. Brunius put several bottles of beer into our boats: we had five ready, and at ten o'clock we embarked, to go to the southern extremity of the base. M. Brunius went with us; he was going to lay in his stock of salmon: he told us, for many years there had not been so great a scarcity of water in the river, nor so much dry weather; in consequence on every side there were fires in the forests. Peter returned then from Horrilakero, where he had employed twenty-two men in extinguishing the fire, and re-establishing the signal: he left seven, to watch lest it should break out afresh.

At three in the afternoon we reached the southern signal of the base, at a moment when the clouds of smoke were tolerably dispersed; but scarcely had we begun our observations, before the wind changing brought them back again. We were impatient to finish them, and to profit of the remaining time, before the frosts set in, to go to Kittis, in the neighbourhood of Pello, in order to make the necessary observations with the sextant, which had just arrived from England at Torneo. In the evening we went down to Niemisby, which is a small village; we pitched our four tents there in the meadow, where we passed the night. After listening to all the means proposed for preventing the loss of time, M. de Maupertuis thought it would be best for some one to go to Pello, to prepare every thing necessary, in order that, on arriving there with the sextant and other instruments, we might be enabled to begin immediately the necessary observations. M. Camus took these preparations upon himself, and for that purpose left us on Friday the twenty-fourth, accompanied by M. Herbelot.

We returned to our southern signal, where we happily terminated our observations: we then came back to Niemisby, to embark in our four boats, to go to Cuitaperi, to take the angle between the southern signal of the base and mount Avasaxa. Friday night, and Saturday the twenty-fifth, we made many fruitless attempts; we were unable to make our observations, the clouds of smoke which covered the country keeping us on this mountain, where our residence was extremely disagreeable; in spite of cold, we had numbers of gnats. A little rain which fell in the night was not sufficient to extinguish the fires; it had however beaten down and dispersed the smoke, and we had clear weather sufficiently long to make our observation, which was only of one angle, on Sunday morning the twenty-sixth.

At two o'clock in the afternoon we came down the mountain; we found five boats at the banks of the river, M. Camus having sent his back as soon as he had reached Oswer Torneo, where he took another. I embarked in the same as M. de Maupertuis, and we kept in it going down the cataract of Matka. A little below this cataract, as we were threatened with a heavy rain, and it was late, we made for land at a good house of Korpikyla, on the western side of the lake made by the river: the rain dispersed, we pitched our tents, and passed the night there. M. Viguelius, chaplain and director of the schools of Torneo, was with us; he had that day preached at this house, which was called Tepane Piping; the inhabitants of the neighbourhood, having been informed of it, had assembled there. M. Viguelius told me that this was often the case at places distant from a church; and further, that when there was any one ill, he used to make the consecration to them to administer the communion. In the evening we saw between the clouds an aurora borealis.

Monday morning the twenty-seventh, there was in the court a Lapland man and woman; they were two ill made persons, almost always sitting on their heels, and came begging; they would not have been very short, had they stood up.

We left this place at seven o'clock in the morning. We landed, on passing the cataracts of Kuckula: we amused ourselves in noticing the movements of our boats from the banks, how at times they appeared in the air, and at others engulfed by the waves. We saw there an ermine, which hid itself so cunningly among the stones, that we were unable to find it; we sometimes saw them run into the water towards the banks of the river or lakes. We saw also birds of the eagle species dart into the waters of the cataract, and carry away fish in their claws: we were told, that when these birds dart upon fish of too considerable a size for them to bear away, they are sometimes drawn beneath the water by them, and drowned, not being able to withdraw their claws. At three in the afternoon we arrived at M. Piping's, where we first landed, on our arriving at Torneo; we found there again the same rooms and beds. It was the first time from the sixth of July that we laid between sheets.

From the mountains of Nieva, Kukuma, and Cuitaperi, we distinguished the belfry of Torneo, and from this belfry we had to take the angles between those three mountains: the two first were easily distinguished; but neither on Monday, nor at any time on Tuesday the twenty-eighth, could we perceive the third. At length, on Wednesday morning the twenty-ninth, we perceived from the belfry of the town mount Cuitaperi, and we ascended with our quadrant to make our observations; the weather did not allow of our taking them to our satisfaction. During the night it rained a great deal, and still more on Thursday morning the thirtieth. The rain began again in the evening, lasted all the night, and the whole of Friday the thirty-first.

After wandering about so long among the lakes and mountains, Torneo appeared to us another world. Lieutenant-colonel Dariez came to see us, and invited us to dine with him; we all of us went on Friday; Messrs. de Cederstrom and Meldecreutz were of the party. The next day these gentlemen accompanied us to the belfry, where we staid all day, waiting in vain for an opportunity to observe our angles. We then regretted the tranquility of the mountains; we were surrounded by spectators, who incommoded us, and were no ways interested in our observations.

Sunday the second of September there was clear weather, very fit for our taking the angles; we thought of nothing else. In order to get rid of troublesome company, and to make our observations at ease, M. Celsius, who went to church, as soon as it was over went up the belfry, and shut himself in. M. de Maupertuis and myself pretended to take a walk, and when by ourselves we ascended to the tower of the belfry, where M. Celsius, as we had concerted, was waiting for us, and where we had shut up our quadrant some days before. Before evening service we had sufficient time to complete our observations.

We had now no more than one angle to take, to perfect our trigonometrical series; it was at Kukuma, to take the angle of Horrilakero and Niemi, in order to close the heptagon which the situation of places had allowed us to form, and which afforded us singular advantages for proving the series of our triangles.

During the too long stay we had made at Torneo, we had got ready every thing we had to take to Pello, for making the different observations. For the sextant alone three boats were required: we had besides, three pendulums vibrating seconds, several simple pendulums, quadrants, barometers, thermometers, and a variety of other instruments, to take with us. M. de Maupertuis had obtained an order for the lansiman of Oswer Torneo to furnish us with fifteen boats; the soldiers and countrymen were so anxious to serve us,

that instead of fifteen, there were eighteen or nineteen. There was a long dispute among these Fins; they would all go, and siezed on the different packages to load their boats with; but the lansiman had sent a list of fifteen which he had engaged, and in these we all set off on Monday the third, a little after noon. We only left two servants at M. Piping's at Torneo, with M. Herbelot, who was just returned from Pello. Along the cataracts we walked, and again saw birds taking fish. It rained a little, and as it increased after passing the cataract of Kukula, we landed on the island Toiwolan, otherwise Kukulan; there were some houses there, wherein we spent the night.

Tuesday the fourth, about six in the morning, we departed, and arrived with our little fleet at Corpikyla at ten o'clock. After dining here all together, while the rest of the party continued their road to Pello, M. de Maupertuis, M. Celsius and myself, set out towards Kukuma; the rein-deer which followed us on the nineteenth of August resolved again to be of the party, and would not leave us. At two o'clock in the afternoon one of our sailors or soldiers perceived we were gone wrong, and one of them returned to Corpikyla, to obtain a guide. We were then obliged to wait for him in a heavy rain; and after our guide had arrived, we were able to proceed but very slowly, our Fins being very heavily laden.

We arrived on the top of Kukuma a little after eight o'clock; it was already very dark, and the rain came on heavier; the whole summit of the mountain was nothing but rock or water: nevertheless we pitched a tent in a spot as damp as it was hard, and Peter, who was with us, pitched the other near the signal, to put the quadrant under shelter. Our Fins, well skilled in making fires, kindled one, in spite of the badness of the weather; we endeavoured to warm and dry ourselves, but the cold rain, which fell in torrents, rendered our attempts useless. M. de Maupertuis, tired of being cold, and getting wet by the fire, retired towards the tent: the night was very dark, it was one of those not lightened by the aurora borealis. M. de Maupertuis, walking on the points of the rocks, on which by day it is difficult to walk, put his leg between two rocks, and fell. Peter and myself ran to him on hearing the noise, and found him in such a situation as to give us apprehension he had broke his thigh: we helped him into the tent, and we cut twigs of birch to serve as a mattress for him. I supped by the fire with M. Celsius; we went to lay down in the tent beside M. de Maupertuis, and passed the night coolly enough.

It rained again on Wednesday the fifth, all the morning, with a fog; in the afternoon we endeavoured to take our angle, but could not satisfy ourselves; we were however comforted by learning that M. de Maupertuis found himself better, and that he had nothing to fear from his accident. It rained very much through all the night again: our poor Fins bore with all the constancy imaginable the brunt of the weather, without any shelter; they appeared as insensible to its roughness as our rein-deer.

Thursday the sixth, by ten in the morning, it ceased to rain; we made our observation very well, dined, and left the mountain at three in the afternoon, to go by very bad roads, and often through water, to sleep at Corpikyla. M. de Maupertuis walked very well, and felt scarcely any pain; our rein-deer came back with us, and rejoined the others feeding by the hut of the Laplanders.

Friday morning the seventh, one of the Lapland women, very infirm, came, drawn by a rein-deer, to M. de Maupertuis, to bring him a basket which she had made, and which she sold to him. At six o'clock we set off in five boats; we ascended all the cataracts on foot as far as Cainunkila. While waiting there for our boats, we saw them thresh their barley: they put it first in a room to dry, in the corner of which is a kind of stove; it is a large square block of stone, rather longer than wide, through the middle

of which a cavity is cut, which runs its whole length. They kindle a fire in this hollow, as we do in our ovens, and this causes an amazing heat, which continues for a great length of time in the block of stone. It is in this room that they finish the drying of the barley, which beforehand, after the harvest, has been exposed to the rays of the sun on large ladders, which are erected for this purpose near to every house; there are even some in the middle of the town of Torneo. They thresh their grain, thus dried, with flails, sufficiently resembling those which the country people make use of in France; and after clearing the grain, by throwing it from one side of the barn to the other, to separate the dust, they complete the operation of cleaning in rather deep baskets, which serve them for fans.

I ought to have observed before, that they reap their rye and barley with a sickle, as is the practice in France; not so with the hay; they use a scythe, the blade of which, almost as long as ours, is much more narrow; it is fastened to a handle, which is no more than two feet four inches long, or at most two feet and a half: they dart this scythe among the grass, first to the right, and then to the left, with such quickness, and stooping so low, that it is wonderful how they are able to support the fatigue.

We began to see some horses, which were returning from their summer quarters. The manner of living of these animals is among the most surprising things of this country: it is only in the winter that they are made use of in dragging sledges, which serve for travelling in, as well as to carry the different necessaries of life, particularly wood and fodder; for during the summer all travelling and carriage of every thing is effected by water.

During the month of May, earlier or later according to the length of winter, the horses leave their masters on the first thawing of the snow, and go into certain quarters of the forests, where they seem to have established among themselves a rendezvous. These horses form separate troops, which never interfere or separate from each other: each troop takes a different quarter of the forest for its pasturage, and keeps to that which is fixed upon, without encroaching on the others. When their food is exhausted, they decamp, and go in the same order to occupy another pasture.

The police of their society is well regulated, and their march so uniform that their masters always know where to find them, if by chance they should want in the spring or summer to travel any where in a carriage or sledge, which sometimes happens to be the case; or if any traveller should want horses. In that case the countrymen, receiving the orders of the gifwergole, that is to say, the post-master, go into the woods to fetch their horses, which, after rendering the services required, return to the forest of themselves, and join their companions again. When the season becomes bad, which it began to do in the month of September, the horses quit their forest in troops, and every one proceeds to his own stable: they are small, but excellent, and lively, without vice; their masters lay hold of them sometimes by the tail to catch them, and they seldom make resistance. There are however some, in spite of their general docility, who defend themselves on taking them, or attempting to harness them to carriages. They are very healthy and fat when they return from the forest; but their almost continual labour during the winter, and the little food given them, makes them lose their good appearance very soon. When fastened to the sledges, they frequently, as they run, seize on mouthfuls of snow; and as soon as released they roll amid the snow, as ours are wont to do in the grass; they pass the night as frequently in the yard as the stable, even in the sharpest frosts; they frequently are in want of food, particularly when the winter is very long; the horses then go and forage for themselves, in places where the snow has begun to thaw.

Not so with the cows; in the villages along the rivers they go to no distance from the houses, to which they are daily taken to be milked. At Torneo, in the summer, there are few cows brought to the town: during rainy years, when the isthmus of Nara is overflowed by the river, they can only reach it by swimming; on this account, many of the burghers have sheds on the western banks of the river, south of Matila, to which their wives and maids go by water to milk them; they are small, almost all white, and many without horns.

By then our boats had got up the cataract Waojenna, it was ten o'clock in the morning; we re-embarked, and took shelter from a very heavy rain at two o'clock at Alkula. We arrived at night at M. Brunius's, where as usual we were received in the most gracious manner.

Saturday morning the eighth, after taking tea, which is much the practice in the better houses of the country, and eating our breakfast, we set off for Pello, with only four boats: the conductor of the fifth could not accompany us; he was a corporal, and had received order to be at a certain place, to attend the exercise of the soldiers. At eight o'clock at night we arrived at Turtula, that is to say, to the house of Martila, where we always took up our abode. We left it on Sunday the ninth, at seven o'clock, and proceeded to dine on the rock of Pello Pyta: there was a fog, and very cold north wind; we made a good fire, for wood in this country is nowise scarce.

At length, at three o'clock, we arrived at Pello, where we all met together, except M. Herbelot, who was employed at Torneo on some drawings he had to finish. M. Camus had been a fortnight at Pello; he had been alone, before joined by Messrs. Clairaut and Monnier, who accompanied the sextant with all the instruments. M. Camus in that time had got ready for us two apartments in the house of Corten Niemi, one of which was intended for observations on the simple pendulum, and to fix a telescope in, to regulate them by the motion of the fixed stars. M. Camus, for that purpose, had caused the floor of the apartment to be cut, in order to erect a shaft of stone, on which to fix the telescope, and hang the simple pendulums; there remained therefore no more than one room for sleeping at Corten Niemi. He had provided two others in the house of Purainen, about one hundred and fifty toises from the other; one of these apartments was occupied by Messrs. Clairaut, Le Monnier, and Celsius; the other by M. de Maupertuis and myself.

In the house of Saukola we should have been much nearer to mount Kittis; but it belonged to a poor man, who had not a single room fit for us. M. Camus bought of him his cotta, that is, a sort of pavilion, higher than the other parts of the house, and larger at the top than the bottom; at the top there is usually a long pole, with a weather-cock. In this cotta it is that snow is melted and water warmed, to give to the cattle during the winter; some make their brandy in it from grain. M. Camus bought this cotta then, and had it taken to pieces, and afterwards carried and put together again on the mountain, where it served as an observatory to place the sextant in, and to take the distances of some stars from the zenith. We had the convenience of a forge at Corten Niemi; although not in very good condition, it was useful to us; we even forged several pieces of iron work for which we had occasion.

Monday morning the tenth we employed a great number of workmen, the horses were returned to their homes; those of our two hosts were used in drawing upon sledges the cases which contained the parts of our sextant; a small observatory was begun, quite new, precisely over the point of the last of our triangles, to take there the direction of the meridian, and to fix a pendulum. The following days these different works were continued; every one worked at the part assigned him; all was in motion

at Corton Niemi, and on the mountain: the shaft of stone was finished, and secured with clamps; the fixed telescope was set up, and an excellent pendulum of Julien Le Roi was in its place, on Thursday night the thirteenth. The two last nights there had been an abundance of rain: this was remarkable for a very beautiful aurora borealis, whose streams of light formed at times a vault, gushing upwards from every side, and joining at the zenith; incessantly they changed their shape; in every quarter fresh ones were thrown out, less however in the north than in the other divisions of the sky.

Friday the fourteenth was one of those grand prayer-days, of which the king of Sweden obliges the inhabitants to keep four in the year; on them they do no manner of work; they are obliged to send one from every family to church, though it should be thirty miles distant, that is to say, sixty leagues. Five families, however, in the village of Pello are exempted, for fear of accidents happening from fire, or any other cause; and each inhabitant in his turn succeeds to the exemption. At church the names of those who attend are registered, and there are penalties for such families as are absent without satisfactory reason; on these days they remain very long at church. At Oswer Torneo there were two successive sermons, and the people were in church from nine or ten in the morning until three in the afternoon.

Saturday the fifteenth, a man coming from Wardhuis, M. Celsius had a long conversation with him; if we had had nothing else to do than to satisfy our curiosity, he would have created in us a desire to visit a country still colder and more desert than that which we were in. There came some Laplanders, most frightful figures, to ask charity of us, crying all the time; they came in without tapping at the door, entering our apartment without ceremony; and, whatever they said, we could only comprehend the word Jesou Christou, which they repeated pretty often. Some girls of the village who were betrothed came with their mothers, to beg a few pieces of money towards celebrating their nuptials. As we paid our workmen well, in so poor a country it caused a high opinion of our opulence. M. Camus had provided a case of drugs and medicines for our voyage; this made him esteemed throughout the country some famous physician. A girl, who had fallen ill at Torneo, sent an express to Pello to consult him on her complaint, and to request the proper remedies; he answered with so much gravity, that she certainly would be cured, if all that were wanted in the cure were to strike the imagination. These little adventures added to the gaiety which we constantly enjoyed in the midst of our operations.

The sky was cloudy, and we had not hitherto been able to observe by our fixed telescope the passage of a star; nevertheless, the observatories were ready on Kittis. Sunday afternoon the sixteenth, we placed the sextant in the grand observatory; the weather continued heavy, with a little rain the rest of the day, and all Monday the seventeenth, and Tuesday morning the eighteenth.

Tuesday afternoon it began to be fine, and Messrs. de Maupertuis, Clairaut, Sommereux, and myself, went to take a walk; at night, the sky being clear, we observed the passage of the bright part of the Eagle over the threads of the fixed telescope, which was fastened to the stone shaft. We had fixed another telescope against the planks of wood, which served as a wall to the apartment: but we very soon perceived that the wood gave, and that no reliance could be placed on the observations made with this telescope.

During the night there were auroræ boreales, and it froze. Wednesday the nineteenth the weather changed, the wind got round to the south, it was misty, with an appearance of snow. It rained very hard during the night, so that no opportunity offered of observing an eclipse of the moon: we only began, at a quarter past four on

Thursday morning the twentieth, to see the moon, which was then entirely eclipsed; it was very feebly distinguished, perhaps owing to the twilight; at a quarter past five it had not begun to pass the shadow of the earth, and sinking below the horizon, it was again concealed by clouds.

We continued to work at what related to the observations which we had to make: we went to place in the little observatory on the mountain a pendulum which Mr. Graham had sent, with the sextant. In the same observatory an instrument was placed, for taking the direction of the meridian. From the time of the sextant being put up, some one of us had slept every night in the great observatory, in order that the instruments might not be deranged or spoilt.

The inhabitants began to bathe frequently; their bath is so hot, that M. de Maupertuis, who wished to try it, found that the thermometer of Reaumur rose to 44 degrees above the freezing point. In their baths they have a kind of stove, exactly resembling that which I described as in use among them for drying their corn; it is as well placed in the corner of the chamber. When the block of stone which forms it becomes well heated, they throw water upon it, and the steam from this water makes their bath; they generally go in two together, each holding a handful of twigs, with which they whip each other, to excite perspiration. I have seen very old men at Pello go out of a bath quite naked, and violently sweating, and pass across a court through the frosty air, without receiving any injury from it. At Corten Niemi, and in the house of every farmer at all of easy circumstances, besides the room designed for the bath, they have another, larger, wherein there is a stove; two or three little square holes, of six inches wide, serve for windows; here the family sleep during the winter. In the day-time the men work at mending their nets for the fishery, or making new ones; the women sew, or weave cloth: they are, as it were, in a hot-house in these rooms, which are called Porti, or Pyrti. Small slips of deal, exceeding thin, two or three feet long, which they light, serve them instead of lamp or candle; these slips of wood, which are very dry, burn well, but do not last long; the wick, which falls off on its being consumed, is received into dishes of snow, to prevent danger from fire.

Thursday night we were yet troubled with some of those vexatious small flies. At night the sky overcast; and Friday morning the twenty-first a quantity of snow fell until ten o'clock; afterwards the weather became serene: we took advantage of it to ascend the mountain, in order to observe the direction of the meridian, and to fix the sextant in that direction. All night long the weather was serene; there was not however any aurora borealis; the wind north, with a frost. The fine weather continued all day, Saturday the twenty-second; we passed it on the mountain, taking corresponding heights of the sun, to regulate the pendulum, and describing a meridian with a stretched thread in the great observatory, to prove the position of the sextant in the line of the meridian.

We had placed in the small observatory an instrument, for the purpose of having the direction of the meridian with respect to the triangles: it was placed exactly at the point of the last triangle. The telescope of this instrument being pointed to the sun at noon, or to a star on its passing the meridian, was lowered vertically, and gave on the horizon a point, between which and Pullingi and Niemi we observed the angles. We repeated this observation several times during our stay at Pello. The fine weather continued all night; there were auroræ boreales, and it froze harder than on the preceding night.

Sunday the twenty-third, notwithstanding the north wind and the cold continued, it was very cloudy. Monday morning the twenty-fourth the north wind increased; a

large quantity of snow fell, which however began to thaw before night. The bad weather continued throughout Tuesday the twenty-fifth; at times it snowed, at others it rained; all our attention was occupied in preventing the penetration of the snow, which the wind drifted through the smallest crevice, from being of any injury to the instruments upon the mountain.

When we left Torneo we did not expect to meet with such bad weather; and as there was not any great likelihood of its changing, M. de Maupertuis sent two servants to Torneo for provisions, that is to say, for flour and brandy, with bed clothes and reindeers' skins, which the severity of the cold began to render necessary. We occupied ourselves variously during the bad weather; we got up barometers, and proved them, as well as the thermometers, and made places for our observations on gravity, with the different simple pendulums which we had brought from Paris.

There was some appearance of fine weather during the night, and the next day, Wednesday the twenty-sixth. We were always anxiously looking for fine weather, in order to profit by it immediately: for this purpose Messrs. de Maupertuis and Celsius passed the night on the mountain; M. Le Monnier the following night; but we had constantly cloudy weather, although it was ice cold, and were unable to make any observation with the sextant, or take the passage of the bright part of the Eagle by the fixed telescope, to make use of in our experiments on the simple pendulums.

The weather, so continually adverse, gave us much uneasiness. We had chosen ϕ of the Dragon as the most proper star for the observation of the sextant: it passed the meridian near enough to the zenith, at the most suitable hour to be again observed at Torneo; but we were under continual apprehension of not finishing our observations at Kittis sufficiently in time: in the interval, we were approaching the period when we should be stopped, not only by our observations, but also by the ice in the river, which, in the beginning of winter, and frequently for a long time, serves as an impediment to all navigation, but is not sufficiently strong to bear sledges. This difficulty became so much the more serious for us, from our having to transport thither the sextant, the foot of which alone was extremely heavy.

Had the weather been tolerably favourable, and left us without inquietude about the success of our operations, our residence at Pello would have been pleasant enough. We formed a society very much attached to each other, had comfortable apartments, considering the country, and had on the banks of the river walks as pleasant as they were recluse; beer, brandy, and water from the river, supplied the place of wine; and if some things were wanting, we had a superfluity of others. To-day two dozen of fat moor-game were brought us, which cost us no more than two sous each, which was however much more than what the inhabitants of the country were wont to pay; we frequently also had woodcocks and hares. M. Brunius came to see us; and some days after M. Antilius, chaplain of Kengis, who had been preceptor to M. Helant, our interpreter; he staid two days with us at Pello: he shewed us his Lapland almanac; it was a piece of wood, two feet long, with different characters engraved on its four faces; it was ornamented at top by a little plate of silver, and at bottom with a very long iron ferrel, badly made: he gave to M. Camus a loadstone, armed, but very weak: he brought us in his boat from Kengis, beer, poultry, and barley-bread spiced. M. de Maupertuis presented him with several bottles of excellent French brandy. We had the comfort of receiving news from France almost every week, for the post arrives weekly at Torneo; and although we were thirty leagues distant, our letters were quickly delivered.

Holy Thursday the twenty-seventh, at night, the barometer got up a line; the sky always covered with the same north wind, but less cold during the day, so that the snow was nearly all melted. It froze again during the night; and at length, on Saturday the twenty-ninth, we had clear weather.

We passed all the morning on the mountain, verifying the position of the sextant in the line of the meridian, and regulating the pendulum of Mr. Graham by corresponding heights, in the little observatory where it was placed.

I began, in the apartment where the stone shaft was, to observe the vibrations of a simple pendulum; it was a bar of well polished iron, somewhat thicker below than at the top, where it was open, and suspended on a pivot of steel, made like a knife. I compared the vibrations of this simple pendulum with the vibrations of an excellent second pendulum of M. Julien Le Roi, placed in the same apartment, and which was regulated by the fixed stars.

At night we observed the passing of the bright part of the Eagle by the fixed telescope; but we were not yet able to make any observation with the sextant; we only fitted it more exactly in the line of the meridian. It was very cold in the night. Sunday morning the thirtieth the thermometer was eight degrees below the freezing point, and the edges of the river were frozen the thickness of ten lines. It was very fine all day; but at night cloudy, with snow, which continued on Monday the first of October. I had gone on with my observations on the simple pendulum: on Monday M. de Maupertuis came to continue them with me, and went to the mountain in the evening, where he remained all night with Messrs. Monnier and Celsius; they passed all Tuesday the second there as well, which was a tolerably fine day, and at length began to take observations with the sextant. It had not thawed throughout the day, notwithstanding the sun was out for some time, still we did not much feel the cold. The following night it was so extreme, that the river was frozen almost to the middle by Wednesday morning the third; at the edges the ice was from fourteen to fifteen lines thick. Scarcely a night passed without auroræ boreales. Game and birds became every day more plentiful; we saw large flocks of ducks on the river; and frequently heard the cry of cranes and storks, as they flew over us.

M. de Maupertuis came in the morning from the mountain to the apartment of the stone shaft, where I was continuing experiments on the simple pendulums, during the time of the stay of the others of our party on the mountain, occupied with their observations. M. de Maupertuis divided his attention between one and the other. This evening he received a letter from M. de Maurepas, which he communicated to us; it was highly complimentary in what regarded us.

The weather was still cold, and, although cloudy, it never failed to freeze at night. Thursday the fourth it was more mild, and very fine, and at night we made our observations as well as we could desire: M. de Maupertuis, M. Camus and myself, that on the bright part of the Eagle with the fixed telescope; and Messrs. Clairaut, Le Monnier, and Celsius, that on the star δ of the Dragon, with the sextant. The two following days, the fifth and sixth, it continued fine, and we again made the same observations. At the sextant we always observed three together, and not every day the three same persons: one counted the pendulum, and another attended to the micrometer, while the person observing through the telescope moved it backward or forward by the micrometer, without looking to it before he saw the star cut by the thread of the telescope, and pass through its whole scope.

Sunday the seventh the weather continued fine; but unfortunately during the observation a motion was communicated to the sextant, which made us suspicious of error.

Monday the eighth, still fine weather; the observation at night was perfectly made: the cold increased, and the ice in the river, which had thawed, appeared again. Tuesday the ninth was cloudy. Wednesday the tenth fine, and our observations were very well made; but time now no longer allowed of more, and M. de Maupertuis was perfectly satisfied with those already made. All those by the sextant gave the same distance of the star ν of the Dragon from the zenith, within two or three seconds. The different observations on the simple pendulums had also been made with all possible care, but did not give the same result to equal nicety. Two of these pendulums were bars of iron, well polished; one cylindrical, turned; the other lozenge-shaped, with four sides: three others of these pendulums were made with a ball of brass, filled with lead, strongly soldered to a rod of steel, at the end of which it was suspended upon two knives.

Wednesday night, when I returned to Corten Niemi to Purainese, I found M. de Maupertuis come back from the mountain, who acquainted me with the result of the observations on the simple pendulums, and told me he was desirous that at least one of the ball pendulums, instead of being suspended on two knives, should be hung on a ring, or rather a simple shaft, fixed at the extremity of the rod of the pendulum: this, on the next day, I effected; in returning from one side to the other, its motion was more uniform than it had been when hung on two knives. I took away the ball from another of these pendulums, and substituted a lentil, in order to determine, whether, the resistance of the air being less, there would not be a difference in the movements of the pendulum; there did not appear to be any.

Thursday the eleventh the weather had become very mild, but there was a thick fog, which ended in rain; and afterwards there was nothing but a succession of fog and rain: if at any time some short intervals of clear weather occurred, they never happened at such hours as were seasonable for our observations. Any man, except M. de Maupertuis, would have been satisfied with those we had already made, as well with the sextant as the simple pendulum; he however wished to wait for a return of fine weather, to repeat them. We had now reached the twentieth of October, without any appearance of it; the barometers rose several lines, and, notwithstanding, we had continually either fogs, rain, or snow, which melted as it fell. In case the weather should become clear, the season being far advanced, we ran great risk of being detained at Pello at least for a month: there would have been a frost sufficiently sharp to freeze the river; and as long as this remained, without becoming much more severe, the ice would have prevented the navigation of the river, without being sufficiently hard to bear sledges. Besides, it was desirable to suffer as short an interval as possible to elapse, between the observations made at Pello and those to be made at Torneo.

All Saturday, and Sunday the twenty-first, was passed in deliberating on what should be done; and at last, the bad weather still continuing, we determined on going. Monday morning, the twenty-second, we went up the mountain, and took down the sextant and all the instruments, which kept us employed till five in the evening, when we returned to Corten Niemi.

Tuesday morning the twenty-third, the sextant, part of the simple pendulums, the pendulum of M. Le Roi, and almost all the instruments, were put on board five boats; Messrs. Camus and Celsius embarked at the same time, to fall down to Torneo, and prepare there a proper place to fix the sextant in, and to make observations upon it. On arriving at Oswer Torneo they took fresh boats, and sent back the five they took from Pello: Messrs. Clairaut and Le Monnier set off the next day in the afternoon, with three of these boats. We should have departed together, but the presence of all of us at Torneo was not indispensable during the preparation of a place for, and fixing the

sextant; and M. de Maupertuis was yet desirous of making, for two days longer, some experiments on the simple pendulums. We continued therefore those which we had before begun; but as the weather was still bad, and we could make no observations with the fixed telescope, to ascertain the motion of the pendulum of Mr. Graham, which we had reserved, M. de Maupertuis, fearful of being detained too long a time, if the river should happen to be frozen, resolved on our departure the next day. He wished to make experiments of gravity, without interruption, by the pendulum of Mr. Graham, which for some days back we had placed in the apartment of the stone shaft: we therefore left it at Pello, with the other simple pendulums which had not been tried, designing to come back in a sledge during the winter, when we were given to understand we might expect a very serene sky.

Friday the twenty-sixth Messrs. de Maupertuis, Sommereux, Helant and myself, embarked for Torneo: we dined at Hyougsing, in the house where we had been so well received the thirtieth of July, and by night reached the house of M. Brunius. The sailors who brought us from Pello knew the danger to which they were exposed, by being at any great distance from home at such a season: they were apprehensive, if the frost began, of being stopped by the ice in the river on their return; on which account they besought us to take others for the continuation of our voyage. We took four at Oswer Torneo, and departed early on Saturday morning the twenty-seventh. We dined at Coifwunkyla, at a friendly farmer's, whose nephew, then in the house with him, spoke Latin. M. de Maupertuis made him dine with us; and we were looked upon with great curiosity by all the family.

We did not land to go down the cataract Waojenna, which was frightful, as much from the contrary wind, as the great abundance of water; for many years the river had not been so much swollen at that season. The cataract Macka was so strong and impetuous, that not only did we land, but the sailors themselves were obliged to unload their boats, to carry their loading along the bank of the river for the space of from one hundred to one hundred and fifty toises, and afterwards to pull their boats ashore, and drag them the same distance, to launch them again into the water below the cataract; there they loaded them afresh, and we embarked. We reckoned upon sleeping at Tohiwolan Sari, where we had before slept on the third of September; but at five o'clock, getting dark, and the bad weather continuing, we landed at the house of Frankila, belonging to a very hospitable farmer, where we fared pretty well; we slept there, as usual, some on benches, some on tables, and others on the floor.

Sunday morning the twenty-eighth the sky became serene, and our watermen, fearful of cold and ice, set off with us a long time before day-light; they would not allow us to remain in the boats at the cataract of Kukula, below which we again went on board. We saw a number of swans on the banks of the river. We passed over the isthmus of Nara in our boats, where the waters of the river formed a little cataract, entirely surrounding with water the town of Torneo.

M. Piping, the burgomaster, could spare us no more than four apartments, one of which was required for our servants: we were very well able to bear with being a little straitened for room, where we passed a few days only at his house; but now having to pass the winter at Torneo, we sought to lodge more comfortably. Instead therefore of landing at M. Piping's, at his house of Nara, at the village of Matila, we advanced farther with our boats, and landed pretty nigh the town-house, and proceeded to the house of a citizen, who had provided for us a dining parlour and two bed rooms, which Messrs. Le Monnier and Celsius chose for themselves; Messrs. Camus and Herbelot lodged in the same street, with M. Planstron; M. Clairaut lodged at M. Creuger's; and M. de

Maupertuis with M. Piping, a relation of the burgomaster. M. Helant went to his father's, at the southern extremity of the town. There were then only M. Sommereux and myself unaccommodated. M. de Maupertuis found a spare room at the house of his host for M. Sommereux, with whom he had frequent business, as he stood in the double capacity of secretary and treasurer. M. Herbelot, who had stopped at Torneo, and knew the town, took me to Madame Tornbery's, mother-in-law of M. Rockman, the surgeon: I there found an apartment, which was very quickly put in order, and where I lodged during the whole of my residence at Torneo. All the others were in the same street, along the margin of the water; I alone was in the second street, but directly opposite to M. de Maupertuis' lodgings, a back door of which led into my street.

Torneo is a little town, of about seventy houses, which are all built of wood: there are three parallel streets, extending from north to south, a little towards the turning at the bank of a branch of the river, which is nothing but a bay during the summer, when the town is not entirely surrounded by water; these three principal streets are crossed by fourteen lanes. The church, which also is of wood, is somewhat separated from the houses, although within the palisades which surround the town, and which as well incloses a space of ground which is cultivated, of rather considerable extent.

In this church the prayers are read in the Swedish language, on account of the burghers, who speak that language. The town and this church are situated in an island or peninsula, called Swentzlar. There is another church, built with stone, in another island, called Biorckholm, a quarter of a mile to the south of the town: here the service is read in the Finnish language, for the benefit of the servants of the town and the peasantry of the neighbourhood, very few of whom understand the Swedish. The house of the rector is near the second church, and he is unable to go to the city, except by a boat, or over the ice. In 1737 there were, besides, three curates or chaplains, who assisted the rector, and preached or read the service sometimes: they all dwelt to the west of the river, and came to town over the ice in winter, and in summer in boats, to avoid the greater length of road by Nara. One of these chaplains was director of the schools, and came every day to town; it was M. Viguiliers, of whom I have spoken, and who came very frequently to see us.

All the houses in town as well as country have a large court, inclosed at least on two sides by apartments, and on the two others by stables and hay sheds.

In the country these courts are perfectly square; in town they are oblong. The sleeping-rooms have the chimney in the corner, as was the case in all of ours: the chimney-places are no more than from two feet and a half to three feet wide, by four or four feet and a half high. Above the chimney-piece there is a very narrow horizontal slit, in which a plate of iron is inserted, called Spihel, in order to shut the funnel of the chimney entirely, or in part, at will.

When they make a fire the wood is placed upright in sufficiently large quantity, and as soon as lighted it is speedily reduced to charcoal; the spihel is then shut, and a degree of heat proportionate to their wish is communicated to the apartment. In my room I made the thermometer of Reaumur rise to thirty-six degrees above the freezing point, at a time when the glasses of my windows were covered with ice. A candle placed in a candlestick near the window became so soft, that it bent and fell.

In the country, the bed-rooms and the kitchen are made pretty nearly in the same manner as in town; the chimneys are made of brick and unhewn stones, which is the only mason's work known in the country: frequently, under the same chimney-flue, near the fire in the kitchen, they have an oven for baking bread; and sometimes an alembic for distilling brandy from barley.

Beyond Torneo, in going up the river, every countryman has a kind of pavilion, which they call Cotta, larger at top than at the bottom, and higher than the rest of the house, at top of which, at the end of a long pole, is a weather-cock. Close to the window of the cotta, without the house, there is a well; through the window the water is made to pass into cauldrons, where it is heated, and where snow for the cattle is sometimes thawed; occasionally as well they make their brandy there. Moreover they have their granaries, which are several small apartments separate from the house, their baths, their rooms for drying and threshing their barley, somewhat resembling their baths; and besides, their kitchen, and room called Pyrty, of which I have before spoken; ordinarily they have two very decent rooms for strangers, to whom they always offer the best in every thing.

The burghers in town, no more than the country people, use above one blanket on their beds, a coverlid of white hare-skin serves instead of a second. Many of these farmers have silver forks, large spoons, and goblets; with those who are less rich they are of wood: they are kind, studious of making themselves serviceable, and perfectly honest.

I said before that every farmer had his magazines: the greater part of those of Torneo are along the side of the river. This magazine is a room built of wood, like the others, but raised from the ground; many even placed over the water, on four or six blocks of stone, to keep away rats: they get up to them by a wooden ladder, which is divided from the door by the space of a foot. It is in this room that they inclose a good part of their provision. Those who are in easy circumstances have several of these magazines.

They are forbid having many coats of the same colour: they are not allowed to wear any cloth coat, which is not marked in the folds with the king's signet; any venturing to do so would have it seized. There are officers, whose duty it is to go from house to house, to see if the chimney-places are properly kept; if they have a lanthorn; in short, if every thing be in proper order.

They are forbidden also, under a penalty of fifteen hundred dollars, being present at the mass of the Catholics, to whom the laws of the kingdom only permit the exercise of their religion in closed apartments.

They season all their meats with sugar, saffron, ginger, lemon and orange-peel, and mix cummin in all their bread. The ordinary drink is beer, which they make very good: they have a little white wine at Torneo, which they call Vin de Picardon; all red wines they call Pontacte. Many country people know nothing of red wine; some of those who followed us to the mountains, seeing us drink of it, imagined we were drinking the blood of the sheep we had bought of them.

Along the river there are houses from space to space, a certain number of which, although very widely dispersed, make up a village. All those from Torneo, to a spot beyond the cataract of Waojenna, belong to the parish of that town; and all north of the cataract to that of Oswer Torneo, that is to say, Upper Torneo.

In this parish of Upper Torneo there are as well two churches; the chief at Sarki Lushti, where the rector Brunius lives; the other at Hieta Niemi, where service is sometimes performed, for the convenience of those parishioners at too great a distance from the principal church. Besides these, there is a chapel at Kengis, with a chaplain, who does the duty of the rector. The villages the most apart are Turtula and Pello; at the first are only nine houses; at Pello are seventeen, nine or ten of which are nearly contiguous to each other.

At Pello, the ninth of September, there was rye already up, very green and promising. They cultivate the land with shovels and spades alone, and know nothing of either ploughs or carts. The second of October, as the earth was much frozen, they suffered

their horses to graze this fine rye. They sow barley at the earliest in May, but generally in June, and it is ripe in the beginning of August, as well as the rye; they then reap it with a sickle, the same as in France. All the barley is round-eared, and makes a very well-tasted bread. The inhabitants have near their houses long poles, placed horizontally, into holes made in two or three upright beams; the whole forms a kind of ladder, very wide, on which they expose their barley to the rays of the sun, during the remainder of the month of August, while it yet appears for some time above the horizon: when the season is adverse, they take them into the rooms set apart for threshing; they place them on large ladders, with the ears downwards, so that birds, not being able to perch on them, should do them no damage.

Their harrows are contrived very ingeniously; they are composed of small pieces of wood, which are fastened together very much in the manner of certain chains made for watches: there are several ranges of these pieces, each range consisting of twelve; the first rank hung entirely upon two cross pieces, to which the harness is fastened, by which the horse draws.

In all the country through which we passed scarcely any other trees were seen but fir and birch. In the islands of the Gulph of Bothnia there grows a tree resembling the acacia; it bears bunches of white flowers, which turn to berries of a very lively red: there are a number of these trees in the church-yard of Torneo: no use is made of their fruit. A little to the south of Torneo, in West-Bothnia, a tree is met with, of a middling size: some of them have leaves which resemble those of the pear-tree; others resembling cherry leaves; this tree bears bunches of white flowers; it is called Eque.

At Torneo, and even beyond Uhma, there are no fruit trees; we did not find either black or white thorn, nor even bramble: strawberries, however, grow even north of Torneo, with some currants, and wild roses. North of Torneo no raspberries are met with; they have yet however a good sort of fruit, which they call Ocrubeus; it is between a raspberry and a strawberry, and of a size between both; its leaf resembles that of a raspberry, its height is inconsiderable, its stem woody: it bears a red flower, which turns to a red fruit, pleasing to the taste. In some of the islands of the Gulf white-flowered ocrubeus are met with; they bear five or six white flowers on the same stalk, very much like the raspberry, while the red-flowered ocrubeus has seldom more than one flower on each stalk.

They have also some other fruits: the hiouteron, a sort of mulberry; its stem resembles that of the ocrubeus, five or six inches high, and its fruit, on ripening, becomes yellow; it is found in marshes and meadows. In dry places, in the woods, lingen is met with; it grows on a small plant, whose leaves are like box; the stems, after creeping in nearly the same manner as verenica for four or five inches, lift themselves up, and bear at their extremities a bunch of very pretty bell-shaped flowers, of a purple colour, which in autumn produce red berries, a little sour; the flavour like that of our barberry: this fruit, notwithstanding its sharpness, frequently incloses a small worm. The blober is another fruit of this country; it is a small black berry, which is often met with in different places of Normandy, and in the mountains of Franche Compté. That of the north is of two kinds: one is at most but five or six inches high, the leaves of a bright green, and the fruit of a fine black; the other is above a foot high, and has the leaves and fruit somewhat of an ash colour; both one and the other have leaves similar to those of the myrtle.

Besides fir and birch, there are some sallows, and here and there aspins, very high and straight.

In the meadows is seen a kind of narcissus, very pretty: the leaf is thick, and like that of clover; it is called Sceptrum Carolinum, and known to the French botanists by the same name. We saw a small lily of the valley, much less than ours, whose leaf was heart-shaped. They have also pirola, golden rod, cudweed, or goldy locks, and a plant with long leaves, whose root has two bulbs; it bears, on a lofty stem, a bunch of hood-shaped flowers; they are not handsome, but have exactly the same smell as honeysuckle. There is, besides, a sort of serpent's tongue, or herb without partition, a great quantity of small shrubs, which they call small broom; most of the marshes are full of them.

Monday, and Tuesday the twenty-ninth, after our arrival at Torneo, were employed in putting the observatory in order, where the sextant was to be placed. M. Hellander, the host of Messrs. Le Monnier and Celsius, and at whose house we dined, had a room, like the cotta before described, which was very fit for our purpose. We dug into the ground beneath it, to fix the more firmly some large stones, on which, as a base, we were to place the sextant: we opened the ceiling of this room, as we had before done with that of Pello, and M. Stenols, a Swede, sent into that country to visit the mines, made a pull, of very ingenious contrivance, to lift with ease, and quickly, the covering of the opening of the roof, when it was necessary to make an observation.

Wednesday the thirtieth, the sky being clear, we hastened to place the sextant. Messrs. Le Monnier and Celsius had already marked the direction of the meridian in our new observatory: we verified it anew; and in the evening the sextant was ready, so that we made an observation on the star of the dragon, which we had observed at Pello. We moved the sextant, but in the slightest manner imaginable, to place it more exactly in the line of the meridian; and we continued taking observations every day, the fair weather continuing to the seventh of the next month.

The weather was fine, but very cold, and Thursday the first of November the river was entirely frozen over, between the town and Hapa Niemi: no one however passed over as yet upon the ice; but the waters having somewhat subsided, people passed from stone to stone to the isthmus of Nara.

We saw ourselves now established in the town for all the winter; each was obliged to make his own individual arrangements, and at the same time to attend to whatever concerned the operations and object of our voyage. From the observatory, where the sextant was, we could not see the horizon, nor make any other observations than with the sextant. We caused another small observatory to be built on the side of the water, entirely separated from the houses of the town: the little English instrument was placed here, which served to take the direction of the meridian, with a pendulum, and a quadrant. Messrs. Le Monnier and Celsius took their corresponding heights, regulated the pendulum, determined the south, and a point at the horizon, by the means of which, with the little English instrument, we always found again the passage of the stars over the meridian. We made new barometers. M. de Maupertuis was very careful throughout the winter in noticing their variations, as well as those of the thermometers, whether filled with spirits of wine or mercury, constructed upon the principles of M. de Reaumur.

Saturday the third the ice of the river was strong enough to allow of passing from the town to Hapa Niemi. Sunday the fourth M. Sommereux and myself crossed it, to go to see M. Viguelius at his house of Granwik: we were obliged to make use of a boat, to go from the shore to the ice, and again from the ice to land; a south wind had swelled the river, by driving up the waters of the gulf, which caused the ice to break along the sides. The water, notwithstanding, was much lower than on the twenty-eighth of October, when we passed in a boat over the isthmus of Nara; we crossed it on foot,

returning from Granwik to the town; it is true, we were obliged to step from stone to stone. The ice, owing to the rapidity of the water, was not firm there, although the cold was so intense that our shoes were glued to the stones, upon our waiting only for twenty seconds in the same place. M. Marilius, a surveyor, arrived from Stockholm, to see our operations: he was sent by M. Nodelcreutz, director of the office established at Stockholm for geography, and charts and maps of the kingdom. It was M. Nodelcreutz who prepared for us in his office the charts of the coasts and islands of the gulf.

The weather continued fine, and observations with the sextant were made every day, as well as could be wished; they were continued on Monday night the fifth; but during the night it began to snow. It continued on Tuesday morning the sixth, and from that time till towards the end of May, there was neither ice nor earth to be seen, there was nothing but snow. People began travelling in sledges on the rivers and lakes, as if upon land. Orders were issued, and almost as immediately executed, for planting small firs on the ice in avenues along all the places through which the road was to go, which is most usually made over the ice, as soon as sufficiently strong, on account of its being more even, and the shortest way.

They are obliged every year thus to mark the road, without which it would be impossible to follow it, and travellers would frequently be lost in the snow, when increased to the height of four or five feet. The first sledges which pass over the snow press down and harden it; soon other snow falls, which fills up the road, and which succeeding sledges, keeping the same path, harden anew; so that by the middle of winter the snows which have fallen, or which frequently the winds have drifted into the road, thus hardened, present a kind of highway, extremely hard, as high as the rest of the snow above the ice or ground.

Wednesday the seventh it was so cold, that the thermometers fell to 20 degrees below the freezing point: in the remarkable year of 1709 it did not fall below $14\frac{1}{2}$ degrees. This extreme cold did not last long. Thursday morning the eighth it was much milder. Friday the ninth, and Saturday the tenth, it thawed; already a foot and a half of snow had fallen; a good part had thawed; but the ice was not yet sufficiently hard to bear.

Sunday morning the eleventh the sky was partly clear, and we prepared every thing for observing the passage of Mercury over the disk of the sun; but fog succeeding, we were not able to make the least observation. The weather became more cold, and it froze very hard till Wednesday night. Monday the twelfth was a grand holiday, the feast of All Saints, according to old stile, which is followed by the Swedes: in the morning were two services in the church of the town, and one in the afternoon.

The last vessels were not yet returned from Stockholm; they were expected with impatience, and much apprehension was entertained for them from the north winds, and more rigid frosts, which would freeze the Gulf of Bothnia. It created much joy on Thursday morning the fifteenth, to behold the wind turn to the south: it continued Friday the sixteenth, with snow from time to time, and a beginning of thaw, which lasted throughout Saturday the seventeenth, and Sunday the eighteenth. The wind was continually south, and very violent; the ice began to be dangerous; a horse harnessed to a sledge was drowned, but the men in it were saved. The violence of the wind threw so much water from the gulf into the river, that our little observatory was already a foot under water: Messrs. de Maupertuis, Le Monnier and myself, went in a boat, to bring away the quadrant, the pendulum, and the English instrument, which however we could not effect, without being up to the knees in water.

Miss Bek, the lady to whom the medicines were sent from Pello, was lately married to Dr. Ervaste: it was he who preached on Sunday; the subject was, the father of a

family celebrating the nuptials of his son. Monday the nineteenth the same mild weather continued, with a violent wind. Thursday the twenty-second, the interment of a young girl, who died the fourth of the month, took place; she was exposed for fifteen days at her mother's, with her face uncovered; all the inhabitants of the town and neighbourhood attended the funeral; from all quarters people were flocking in sledges, the ice having become firm again, and travelling safe; there was only half a foot of snow. I went with M. Camus over the ice to Matila on Friday the twenty-third, to visit M. Piping, our first host; it was scarcely two o'clock when we saw the sun set.

The ships which were expected from Stockholm had arrived pretty near the shore on Saturday the seventeenth of the month, but the ice had prevented their reaching it, and was not strong enough to bear on sledges the merchandise they brought; many of the men had got to the town over the ice; my host was one of the number, and had arrived on Saturday last. This day, the twenty-fourth, the ice was sufficiently firm, and some of the goods were brought on shore: they consisted of grain, rye, rice, cabbages, salt, apples, and some oranges; till four days more they did not trust their heavier commodities to the ice, less capable of bearing, and more dangerous on the gulf than what it was in the river.

Although the different observations made at Torneo and at Pello all agreed to two or three seconds, and though there was no ground for suspecting any injury to have happened to the instrument, in its passage from Pello to Torneo, particularly as it was transported in a boat, M. de Maupertuis, always as scrupulous as he had been upon the mountains with respect to the observations on the angles, thought of nothing but of contriving means for verifying the observations made with the sextant. We talked of taking it back to Pello; but it was resolved, instead of this, which was a difficult expedient, and would have taken a long time, to transport it to Matila, a quarter of a league from Torneo, and observe whether, after bringing it back and replacing it in the observatory, subsequent observations made upon the same star would have the same results, so proving no alteration in the instrument.

Tuesday the twenty-seventh we got every thing ready, in order to observe, as soon as the weather would allow us. We began as well to prepare whatever might be necessary to us for the measure of our base; while M. Brunius got made at Oswer Torneo eight large rods, very straight, each five toises long, with a good number of supports, according to the idea which we had given him, and which we had entreated him to attend to.

We lived very comfortably at Torneo. M. Duriez, lieutenant-colonel, the rector, named Proubst, that is to say, priest, answering to deans in our dioceses, our ancient host M. Piping, M. Viguelius, the brother of M. Brunius, made up our general society; they were pleasant and sensible men: as for the rest, our unanimity and gaiety were sufficient for making our mode of life agreeable. The inhabitants of the country had conceived a friendship for us. M. Helant, our interpreter for the Finnish language, informed us at dinner on Wednesday the twenty-eighth, that several countrymen wished to go to France with us, where they said they would teach our fishermen how to take salmon.

Thursday the twenty-ninth the weather became very mild, the thermometers stood at the freezing point: the wind was south, pretty strong, and drove the water of the river over the edges of the ice. Saturday the first of December was fine, and an observation was made with the sextant.

Sunday the second two Laplanders from Corpikyla came to Torneo, each drawn by a rein-deer. We had never seen these sledges in motion before; the construction of

them is singular, and the Laplanders and Fins made use of them with wonderful skill. I shall speak more at large of them at the twenty-seventh of December.

Monday the third was fine, and we made other observations with the sextant. The cold increased of a sudden so much, that, on Tuesday morning the fourth, the thermometer of spirits of wine was at 18 degrees, and that of mercury at 22 degrees, below the freezing point. During the night, and all day on Wednesday the fifth, it snowed. Thursday morning the sixth we took off the telescope from the foot of the sextant; we put it into its box, and caused it to be carried to Matila, and brought back again into the observatory. The good people were very much surprised at this ceremony; they looked upon it in some measure as mysterious: some of them asked M. Helant how he came not to attend the procession of the French? We replaced the sextant on its pedestal: that night we made an observation, which gave the same elevation to the star, and shewed that the sextant had not suffered by all the motion given it in the porterage: by a second observation, made on Saturday, we found still the same height for the star.

Wednesday evening the seventh M. Brunius arrived, and was to go back on Friday morning: the rods for the measure of the base were made, as well as the supports: but we knew not how to act. Were we to measure the base now, or defer it until the spring? A great deal of snow had fallen already, and frequently it snowed; sometimes even the weather was mild, and it rained, as was the case all this day; all this rendered the work of measurement very difficult, and very laborious. In putting it off till the spring, we were sure of having much longer days; and had a right to expect that the surface of the snow, a little melted by the rays of the sun, and afterwards hardened by the frost at night, would make a crust hard enough for us to walk upon, and perform our work with ease. Many citizens of Torneo advised us to put off the measurement till the spring, when the days would be longer, and the cold less severe. M. Brunius and some others gave different advice; they said some considerable thaw might take place sooner than expected, and we run the risk of losing our measurements.

After consulting among ourselves, Saturday the eighth, and Sunday the ninth, it was resolved that M. Clairaut, M. Celsius and myself, should go to the spot, to examine if the operation was then practicable. We took two sledges, and all three departed, with one servant, on Monday afternoon the tenth: we passed by Matila and Neder Wojakala, thence we crossed the river, to go to change horses at Oswer Wojakala; from which place we proceeded continually among woods as far as Kukula, on the eastern bank of the river, because the ice was not passable in the cataracts; they were very rugged there, with large chasms in them in several places. From Kukula we crossed the river again, to go to change horses at Lactilu: we left it at half past five o'clock, and arrived at three quarters past six at Corpikyla, at the house of Tepane Piping, where we supped, slept, and took fresh horses on Tuesday morning the eleventh. We passed on still among woods, on the western side of the river, and passed over a small lake in the forest of Taipala. We arrived at Witza Niemi, whence we went down upon the ice of the river: we passed before Pekila, near to the church of Hieta Niemi, and from there to Coifwunkyla; we changed horses there, and after leaving Niemisby, we followed very near the line of our base, as far as Mickolen Sari, whence we proceeded to M. Brunius's, where we arrived at noon.

We had a long conference with him on the project we had formed of measuring our base immediately; he strongly advised it, notwithstanding the difficulties started by M. Celsius.

Monday it was very cold, and still more so on Tuesday. The last night, while we were at Corpikyla, the wood with which the houses are built cracked with a loud noise,

as though it was about to split in every direction. Tuesday evening the weather was milder, it snowed, and spoiled all the roads, greatly retarding our return. We were however under no apprehensions of mistaking our road, because it was marked by trees on one side and the other. We traced the same road we came by. The road upon the river was perfectly safe, except over the cataracts. Above Waojenna, and through a good part of its current, there was a considerable space not frozen, from which continually a prodigious quantity of vapour arose, thrown up by the impetuous motion of the water. We arrived at ten o'clock at Torneo: we made our report on the state in which we found the ice and snow, and the next day, Thursday the thirteenth, in the morning, it was resolved to go and measure. We prepared every thing necessary for this work, and every one made his individual arrangements.

M. Camus and myself departed, Friday the fourteenth, at nine in the morning, to adjust the rods with which we were to measure, and trace the line of the base. Messrs. Helant and Herbelot came with us; we had five sledges, in which we took a quadrant and some necessary instruments, thermometers, files, mallets, and several iron works for our measures. We arrived a little after eight o'clock at the house of M. Brunius, where we found one room short of our former accommodation; his sister-in-law, wife of the chaplain of Torneo, was on a visit to him. We managed as well as we could, I had my bed with me, which I laid on a large table.

Saturday the fifteenth, and Sunday the sixteenth, there was dull weather, and it snowed occasionally. Monday the seventeenth the weather was fine; we went to look about the course of the base; on the eighteenth we began to fix stakes, and continued our work on Tuesday. Messrs. de Maupertuis, Clairaut, Monnier, Celsius, and Sommereux, arrived the same day, and Tuesday we were all assembled together at the house of M. Brunius.

We had brought from Paris an iron toise, well adjusted by that of Chatelet, with a standard of iron as well, into which the toise exactly entered. Both one and the other were adjusted at Paris, at a time that the thermometers were 14 degrees above 0, of Reaumur. Wednesday the nineteenth we kept them in a chamber of the same temperament, by means of a good fire. We made five toises of fir, which we armed at each of their extremities with a large round headed nail, filing it away till the toise exactly fitted the standard. We carried our precision so far, that a sheet of paper could not enter between the measures and the standard. While we were adjusting the toises, beds were prepared for us, and I ceased from keeping mine on the table.

Thursday the twentieth, while M. le Monnier and some others continued fixing stakes along the base, Messrs. Camus and myself, with the five toises which we had adjusted the day before, had fashioned eight long fir rods, of the length of five toises each. We made for this purpose a sort of long standard. We fixed in the apartment a large nail, and another in the porch, at a distance some trifle short of five toises; we placed supports in a line, forming a kind of scaffold from one nail to another; we ranged along them our five toises, end to end, very carefully. We then drove our two nails apart, and filed away from them just enough to allow of the five toises, when they were closely joined at their ends, to enter between them, the nails being driven into the wooden walls of the house. It was between these two large nails that we adjusted our eight rods, as exactly as possible of the length of thirty feet. We proved the length of the five wooden toises, and afterwards the distance of thirty feet, between the two large nails.

We made ready on Friday the twenty-first to begin our measurement from the northern signal. As a great deal of snow had fallen, eight machines were prepared to clear the road for those who measured: they were large logs of wood, fastened together

in the shape of a triangle, drawn by a horse, with the most acute angle foremost, so that the sides, encreasing to the end, ranged the snow on both sides. Those machines, each of which was so heavy that one horse could scarcely draw it, did not however sink deep enough into the snow, and had not all the effect which the country people gave us reason to expect, so that we made no further use of them.

As soon as we had arrived at the northern extremity of our base, between ten and eleven o'clock, we concerted together, to begin exactly at the centre of the signal, and to go on the ice from the shore some toises distant from the signal: we then divided into two parties, each consisting of four measurers. Each of us had a pencil; some made use of paper, others hung a slip of board to their neck, on which to mark a stroke with their pencil every time they laid down their rod. We did not trust these rods to any of the country people, nor even to our servants; they only supported one end of them, to help us in carrying them, one of us always holding the other, and taking care to unite exactly the nail which ended it with that at the extremity of the one before. We had the precaution to mark our rods, that they might succeed in the same order; already we had measured seven hundred toises at half past two, when night coming on, we returned to the house of M. Brunius. That day it was exceeding cold; the thermometer was at 18 degrees below the freezing point. While we were upon the base, M. le Monnier drinking some brandy out of a silver cup, his tongue was glued to it, in such a manner as to tear off the skin.

Saturday the twenty-second it became milder; it snowed a little till noon; it did not however interrupt our measuring; even till three o'clock the weather became open, enabling us to see sufficiently well.

Sunday the twenty-third was very mild and clear; while we were on the base at noon, we saw the sun entire, elevated about a quarter of a degree, that is to say, about half its diameter above the horizon, in the direction of the river; we saw it as well on Tuesday the twenty-fifth; it rose at half-past eleven, and set half an hour after noon. The weather continued fine and moderate on Monday, Tuesday, and Wednesdey. Messrs. De Cederstrom and Meldecreutz came to see us measure, and remained with us Tuesday and Wednesday.

Wednesday the twenty-sixth, in the evening, the cold increased; we all suffered greatly in returning to M. Brunius's, from which we now proceeded as far as full two French leagues. We got into our sledges, heated by the exercise of measuring, and proceeded two leagues in this state without moving our limbs, and exposed to an extreme cold; notwithstanding which none of us was materially injured; 'tis true M. de Maupertuis had some of his toes frost nipped; and I for some weeks felt pain in my fingers; but this was little to what we had a right to apprehend. Wednesday evening the thermometer was at 15 degrees below the freezing point, and Thursday at 25 degrees.

On the twenty-seventh there was yet one part of the base to measure, which was not planted with stakes; Messrs. Clairaut and Camus went to fix them, while M. de Maupertuis and myself undertook a short but terrible excursion. On taking observations of the angles at Avasaxa, we had omitted to take the height of a tree which entered into the angles observed. This could not cause any sensible error in our observations, but M. de Maupertuis was too scrupulous to pass over the slightest matter. We therefore ascended Avasaxa, drawn in pulkas by rein-deer: they are sledges made like small boats, pointed before, and ending in a keel, which is only two or three inches broad. The Laplanders have sledges of this description five or six feet long, which are used for transporting their dry fish and rein-deer skins; but those common among the inhabitants for travelling, which were what we made use of, are at most only four feet long;

the deck of these sledges is covered with boards, and on the edge of them a rein deer's skin is nailed, which he who travels in the pulka draws over his breast, and fastens with cords round his body, to prevent the snow, in which he is sometimes nearly buried, from entering the sledge. The principal difficulty is to preserve a balance, the pulkas having no more footing than the skaits which are commonly used in France. M. Brunius, who accompanied us, accustomed to this sort of conveyance, managed his so well, that he preserved a perfect equilibrium; M. de Maupertuis and myself were continually oversetting; when we attempted to raise ourselves with a little stick on one side, we fell over to the other; M. de Maupertuis even bruised his arm.

The rein-deer which drew us are a kind of stag, whose horns are large, with the branches turned down before. These animals serve for many purposes: the flesh of them is eaten, which is tender, but insipid; the inhabitants, particularly the Laplanders, dry and keep it for a long time; with the nerves of them they make thread, which is used especially for sewing of the planks of boats together; they eat their milk, and make cheese of it, which is not good. Their skin serves for dresses, particularly that of the young ones, the hair of which is soft. There is no inhabitant whatsoever, whether Fin, or Laplander, or even Swede, without his coat of rein-deer skin; we as well had each of us one of them; they are called Lapmudes, and are used instead of great coats. The hair is worn outside, and it is lined with cloth, serge, or another skin, with the hair turned inwards. Of the skin of the old rein-deer, stockings or rather pliant boots are made, the hair of which also is worn outside; they are very warm, and very serviceable for walking with on the snow, when it freezes; when it thaws, they are not worn.

Rein-deer are used for travelling in places difficult for horses to pass, or in countries where there is a scarcity of fodder for horses, as in the neighbourhood of Kengis, and to the north of it, that is to say, in all the northern part of that continent. Some travellers have pretended, that on being told in its ear the place to which you were disposed to go, the rein-deer understood you; this is a mere tale; they are very fleet, but not strong; harnessed to a sledge, provided the road were well beaten, they might travel thirty leagues in a day; but when the road is not hard, and well beaten, and the snow resists the sledge, the rein-deer gets on with difficulty, and very slowly. It has the advantage of being able to find its food everywhere. When tired, his master, well wrapped up to keep himself from the cold, loosens the animal, who does not wander far: he scratches up the snow, and at bottom finds a white moss, which is almost his only food, so that the traveller only carries provision for himself; he puts it on the head or fore part of the sledge. A matter which will appear extraordinary is, that on a journey to Wardhuis the traveller is obliged to carry provision of wood, on account of passing over great extents of country entirely naked, and without trees.

From the house of M. Brunius we proceeded over the ice with dreadful rapidity, there the road being beaten as far as Narki, at which place we were at the foot of the mountain. It was entirely covered with snow, there was no beaten track, and we had to apprehend falling between rocks, where we should have been overwhelmed in the snow. A Fin, who had long and narrow boards fastened to his feet, walked slowly before us, to fathom the road; he led with a string the rein-deer of the first sledge: this poor animal sunk into the snow up to its belly, and had great difficulty, as well as those which followed him, to draw us to the top of the mountain; we were frequently obliged to stop for them to rest, and take breath.

We however arrived, and immediately made ready our quadrant of eighteen inches, for taking our observations, while two Laplanders and a Lapland woman, who served

us for guides, made a large fire, and the rein-deer were digging in the snow, and feeding on the moss they found. The cold was so extreme, that the snow did not melt before the fire, nor a foot from it. On going down the mountain, our Laplanders cautioned us to plunge our sticks into the snow as deep as we could, to lessen the velocity of the sledges, and to prevent their continually falling on the hind legs of the rein-deer, which were fastened to them. When we were at the bottom of the mountain, our Laplanders left their own sledges at Narki, and each guide seated himself on the fore-part of a sledge, and kept it poised with singular address. We went all the way to the house of M. Brunius without once overturning, and very rapidly.

M. Muritius, belonging to the chart and map-office of Stockholm, arrived at Torneo, and came to see us continue and complete our measurement of the base, and returned again to Torneo. We measured in two distinct parties, as before noticed; the result of the measurement of one was seven thousand four hundred and six toises five feet four inches, of the other seven thousand four hundred and six toises five feet exactly. The second party, in measuring, fixed in the ice a stake at every hundred toises. M. de Maupertuis, Camus, and myself, went on Saturday the twenty-ninth, and Sunday the thirtieth, to be certain that no error had occurred in the number of the hundreds, and measured, with a long cord of fifty toises, the whole length of the base.

We completed this at three o'clock in the afternoon of Sunday; a quantity of snow fell, with a bleak north wind. M. de Maupertuis with M. Helant set off for Torneo, to which place Messrs. Clairaut, Le Monnier, Sommereux, and Herbelot, had gone the Friday before. M. Camus and myself returned to M. Brunius, whom we left on Monday morning the thirty-first, accompanied by M. Celsius, and two servants, and arrived at Torneo at seven o'clock in the evening. It was very fine in the morning, and sufficiently temperate, but at four in the afternoon a very cold south wind blew, with snow.

Tuesday the first of January was very fine, but very cold: the thermometer remained for a long time at 20 degrees, and even fell so low as 22 degrees, below the freezing point. Wednesday morning the second the thermometer of mercury was at 28 degrees, and that of spirit of wine at 25 degrees. On the evening of the same day the cold increased, the thermometer of mercury was at 31½ degrees, and a bottle of strong French brandy was quickly frozen. We heard the wood of which the houses are built, in the night, crack with a great noise. The noise resembled that of musquetry. In spite of this dreadful cold, the inhabitants travel a great deal, and seem to prefer this season for their business.

Thursday the third it snowed in quantities: at night the sky was clear, and Friday morning the fourth it was covered with auroræ boreales; the thermometers were at 25 degrees and 28 degrees, which they continued to be at on Saturday the fifth, the day on which they kept Christmas, which they call Jule; the inhabitants passed a great part of the day at church, and the rest in their houses, very much retired, and occupied with reading, or singing the psalms and canticles of the church.

The thermometer of mercury in the evening was 31 degrees, and Sunday morning the sixth 33 degrees. An entire bottle of French brandy was frozen in a room without a fire. The evening of the same day the thermometer was at 37 degrees, while that of spirit of wine was but at 29 degrees, and this last was frozen on Monday morning the seventh, and had risen to the temperature of the cellars of the observatory. M. de Maupertuis carried it into his room in this state; immediately after thawing it fell a great deal, and afterwards rose to the temperature of the apartment. The weather became milder in the evening, and the thermometer of mercury was at 25 degrees; a quantity of snow fell, with a south wind.

M. de Maupertuis had begun at the house of M. Brunius, while we were measuring

the base, an experiment, which he repeated several times at Torneo, to ascertain if the toises and rods of woods were lengthened, or shortened, by the different temperatures of air: he kept continually in his apartment two of the wooden toises that we had adjusted in the iron standard, and two others without in the court; he never distinguished any sensible diminution or lengthening; he was rather of opinion that those which had been exposed to the cold were lengthened. By the height or distance from the zenith of the star δ of the dragon, taken at Pello and Torneo, we obtained the amplitude of the arc of the meridian comprehended between the two observatories. We had but to compare it with the distance in toises from Kittis to Torneo, which we were enabled to calculate, after ascertaining the length of our base. The Parallel of the observatory of Torneo was different from that of the steeple, which served for the point of the last triangle. We had not measured the distance between these parallels; but, from the measurement I had made for taking a plan of the town, I knew within a trifle the distance between them. We every one were occupied in private, calculating our triangles. M. de Maupertuis has published those which he made by several successions of triangles, in his book on the Figure of the Earth, with all the corrections, and subtractions, which the most rigid geometrician could require.

Besides our usual occupations, and the observations which we had sometimes the opportunity of making, although very rarely, every one had some distinct pastime: I passed many of my leisure moments in copying fair the plan of the town of Torneo which I had taken, and the course of the river comprised within the extent of our triangles: M. de Maupertuis had brought a great number of books, which he lent to us; we were rather long at table after dinner and supper; frequently visited each other; went often to see our friends in the town and neighbourhood. These, together, made our time pass pleasantly enough.

During the night the wind abated, and Tuesday the eighth it was fair, and not so cold. In the morning I went to see our old landlord the burgo master, and afterwards we all went to dine with the lieutenant-colonel, who had invited us. There was a large company, we were twenty-nine at table, fourteen ladies and fifteen gentlemen. It was All Saints Day; we saw one hundred Fins come out of church at noon, who were returning to their houses, some in town, some in the country, higher up the river. This succession of so large a number of sledges formed a singular spectacle, and at Hapa Niemi we were most advantageously placed for seeing it.

Wednesday the ninth was fine, and rather mild, as well as the next day; still the thermometers were at 17 degrees to 19 degrees, and although the cold was much more intense than it was in France in 1709, we could bear it very well.

Thursday the tenth there was a grand dinner at Papilla, or Preskhot (the presbytery, or priest's house) at Mr. Foulq's, the rector of Torneo: during the night, and on Friday the eleventh, it snowed, with very mild weather; the thermometer of mercury was no more than 3 degrees below the freezing point, and that of spirits of wine 5 degrees; instead of which difference, before the severe colds of Sunday and Monday, they were both of them at the same degree, 4 degrees or 5 degrees below 0.

Saturday the twelfth was new year's day, a great holiday in this country; it was fine, but rather cold. After dinner M. Duriez arrived with his lady; they supped with us, and did not leave us till midnight. The cold increased continually, and on Sunday the thirteenth, at noon, the thermometers were, that of mercury at 27 degrees, and that of spirits of wine at 23 degrees. Monday the fourteenth it was less cold, and in the afternoon it snowed, with a strong south wind. Tuesday the fifteenth the two thermometers were at 13 degrees; it was cloudy, and snowed all night.

Thursday the seventeenth it continued to be very mild, at least we found it such, although it froze hard: M. de Maupertuis invited to dinner all those who had shewn us

civilities, and the principal inhabitants of the town, we were thirty-five at table, and treated them handsomely. The court and street were full of Fins, and children, who came to see the novelty of the entertainment.

It was at the time of the fair of Jukas Jerfwi; it begins the fourteenth of January, and ends the day of the Conversion of St. Paul. It is held thirty miles from Torneo, about sixty French leagues; the citizens of Torneo go there in crowds; they alone have the right of buying there. They are obliged to obtain a permit from the governor of the province to go to this fair; this costs them three dollars, worth about thirty-four or thirty-five sous of French money: were they to go to this fair without this licence, they would be fined one hundred and fifty dollars Coppermyth, that is to say, eighty livres French money (the silver dollar being worth about thirty-four sous, the coppermyth dollar only eleven sous.) To go any where else requires a similar permit; however, when they are going no farther than Oswer Torneo, or Pello, the allowance of the lieutenant-colonel who commands in the town is sufficient, and is given gratis. They set off for the fair of Jukas Jerfwi in their sledges, drawn by horses as far as Oswer Torneo; there they take sledges drawn by rein-deer, and send their horses back. They have at the place where the fair is held a great number of shops, which belong to them, wherein they dwell. These shops, which are abandoned during the rest of the year, compose the village of Jukas Jerfwi, with the church and the house of the rector. It is there that the citizens of Torneo trade with the Laplanders; they carry there some bottles of low brandy, syrup which they bring from Stockholm, and dried bread in cakes. The Laplanders in exchange give them cod, and other dried fish, skins, and dried meat of the rein-deer, bear and foxes skins, of different colours, ermines and martins. I wished to see this fair; the base being measured, I had leisure, but I could not find any suitable company to go with, the burgomaster not going. I did not much regret it, however, the whole country being covered with snow, so that I could not have distinguished either lakes or rivers, scarcely even the forests.

Friday the eighteenth the weather was delightful, not at all cold; M. Camus and myself had begun to turn, with exactitude, some balls of iron, for experiments on the simple pendulum. M. Camus also himself cast some balls of pewter, silver, and copper; he turned these as well for the same purpose.

We had alternately snow and fine weather, almost always cold. The thermometers, on Saturday the nineteenth, were at 19 and 21 degrees below 0. Monday morning the twenty-first at 12 and 13 degrees; the evening 16 and 18 degrees. Wednesday the twenty-third 20 and 22 degrees. All day on Thursday the twenty-fourth, and all the following night, at the freezing point, with a strong south-west wind, and the snow melted a little.

All day Saturday, all night, and Monday morning the twenty-eighth, very fine and mild, the thermometers at 1 degree below 0. This weather continued the remainder of the month, but it frequently snowed.

On the last day of January the cold began to increase, in such manner, however, that it frequently all on a sudden became mild. The variations of cold in this country are extremely sudden; at times we were almost frozen, and immediately afterwards found the cold very easy to bear. The thermometers confirm the reality of these variations; and that they are not to be attributed simply to the individual temperament of men, and less to the imagination.

At Stockholm the idea they entertained of this country was not very correct; it is not to be wondered at that we should be ignorant of it in France. When we came away, M. Le Comte de Maurepas presented us with church plate, with directions to

make use of it, provided our ambassador should not disapprove of our doing so. His excellency, after consulting with his friends, told me by no means to perform mass in the country to which we were going; since, if we were to give offence in any measure to the inhabitants, we might expose ourselves to inconveniences, which would incapacitate us from executing the work we were upon. Notwithstanding, the inhabitants of Torneo took no umbrage at our performing the offices of our religion, provided it were in private, and with closed doors. Having from motives of prudence abstained for some time, we met with gentle reproaches on the occasion from M. Foulq, the rector, and M. Viguelius.

Sunday the third of February, although the thermometers were at 10 degrees below 0, as it was fine, M. Sommereux and myself went to take a walk in the vicinage of the town, as folks in France are wont to do in summer, a little before sunset.

Wednesday the sixth it was much more sharp, the thermometers sunk to 20 degrees and 25 degrees. During the night a great wind arose, which continued all Thursday the seventh, with snow. It was dreadful weather; the wind had raised in different places prodigious heaps of snow, particularly along the houses; of many it covered all the windows, and some small houses were buried in the snow.

The thirteenth, the Feast of the Purification of the Virgin Mary was celebrated in a very solemn manner; there were prayers twice in the town church. Many people received the communion. The cold had somewhat abated, the thermometers were not lower than 13 degrees below 0.

Tuesday the nineteenth the weather was fine and mild; some snow melted in the sun; Messrs. de Maupertuis, Sommereux and myself, went out walking. This fine weather did not last; the same evening it became cold, with wind and snow, which continued the two following days. Friday the twenty-second, on going to the southern extremity of the town, I was much pleased with the singular appearance which the heaps of snow, drifted by the wind, and collected along the houses, and on the tops, offered. The road through the town was exceedingly rugged, and the masses of snow by which it was bordered very much resembled rocks; notwithstanding this, Messrs. Le Monnier and Celsius went to Kimi, where there was a large assembly.

Monday the twenty-fifth it was much colder; the thermometer, which was already at 15 degrees, yesterday sunk to 20 degrees. The burgomaster and four Romans, who are the judges of the town, went to meet the governor. He did not arrive till Tuesday morning the twenty-sixth, and, without stopping at the town, continued his route to Oswer Torneo, where he stopped a fortnight.

The first of March we had a Swedish officer to dine with us, who served in France; he came from Petersburg in sixteen days, and after dinner departed for Stockholm. I conformed to the ancient stile in keeping the feast days, as the catholics in Sweden are wont; we kept that of St. Matthias on Thursday the seventh.

Monday the eleventh, at night, M. de Guillingrip, governor of the province, returned from Oswer Torneo; Messrs. de Maupertuis, Clairaut and Celsius, went to dine with him at M. Silfrisson's, where he lodged. We went to pay our respects after dinner.

Saturday the sixteenth I made ready a telescope, and went to the house of M. Viguelius, at Grenwick, on the other side of the water, to hang a second pendulum, and all of us went over in the evening to observe an eclipse of the moon. We had the whole horizon towards the west uninterrupted, which we should not have had in the town. The horizon was thick, and full of vapour: we notwithstanding observed this eclipse of the moon; but we could not observe that of any of the satellites of Jupiter, because of his not being but very little above the horizon at that time.

Although we had every reason to rely upon the exactitude with which we had determined the amplitude of the arc of the meridian, comprehended between Kittis and Torneo, by the observations of the sextant made upon the star δ of the dragon, the star a of the same constellation passing very nigh to the zenith, we formed a design of taking advantage of the time which the long winter afforded us, to observe again at Torneo, and afterwards at Kittis, the distance to the zenith from the latter star a. We made ready the sextant for this purpose, and the sky being clear on the seventeenth, eighteenth, and nineteenth, we made the observation on those days.

The south was determined at the little observatory built at Torneo, upon the edge of the water. Already several days had passed since we had fixed stakes in the snow, following the direction of the meridian: on this line we sought with a quadrant two points, from which two perpendiculars set off, the one answering to the grand observatory of the sextant, the other to the steeple of the church of the town. We measured on Thursday the twenty-first the distance between these two points, that is to say, between the parallel of the church of Torneo and the parallel of the observatory of the sextant. We found the distance seventy-three toises four feet five inches.

Friday the twenty-second the weather was very mild, the snow sunk, and melted a little. Saturday the twenty-third we took down the sextant; we put it into the cases, and prepared whatever was necessary for the voyage to Pello, which we proposed beginning the following Monday. M. de Maupertuis, on Sunday the twenty fourth, gave a grand dinner to the governor. More than thirty persons were present.

On Monday the twenty fifth Messrs. Clairaut, Le Monnier, Celsius, and myself, set off, one after the other, each having care of the instruments, which we transported in sledges; we followed the same road we had gone before; and all of us had arrived at nine o'clock in the evening at the house of M. Brunius, and the next day, Tuesday the twenty-sixth, we reached Pello. We could not always keep on the ice of the river, it was too uneven in the cataracts; there were even some considerable breaks; we were on this account sometimes obliged to traverse the woods. We found in them three Lapland families, who had erected there their huts.

These huts were formed of a number of poles, twelve or fifteen feet high, one end leaning on the ground, where they formed a circle of about twelve feet: by the other extremity these poles joined at the top, and formed a cone. They put over these poles some rags, and some rein-deer skins, which only covered a part. The top is entirely open, and serves for a chimney for the fire, which they make in the middle of this sort of tent. They pass their winter thus, very badly clad, and often sleep with the snow for their pillow. When they change their abode, they carry away their rags and deer-skins, and leave their poles as they were, secure of finding others everywhere in the forests. We saw a number of these huts which had been abandoned. One of the three families which we met with consisted of twelve persons, the two others of no more than five or six.

When we were at our landlord's at Purainen, we found his court full of Laplanders, with their sledges loaded with merchandise; that is to say, cod, dried fish, and rein-deer skins. These poor Laplanders lay in the middle of the court during a most rigid frost, in some of the sledges which were empty; we even saw a child among them, who was perhaps not a year old.

Wednesday the twenty-seventh Messrs. Sommereux and Helant arrived with the telescope of the sextant. We had already placed upon mount Kittis a large three feet quadrant, and the instrument for taking the south. Thursday the twenty-eighth we returned to the mountain, and verified the quadrant by a back observation. Friday

the twenty-ninth it snowed a little; M. de Maupertuis arrived, and told us that M. Camus was ill, and would remain at Torneo, with M. Herbelot. Saturday the thirtieth we placed the sextant on the mountain, and the pendulum of Mr. Graham in the apartment of the stone shaft, that is to say, the apartment of Corten Niemi, where we had constructed a stone shaft. We saw a large number of Laplanders arrive in their pulkas, followed by many sledges, full of merchandise; the following days some of them came into our rooms; they entered without knocking, and placed themselves on their knees to ask alms, making a long speech, of which we comprehended nothing but the word Jesou Christou. As soon as we had given them a piece of money, they immediately asked the master of the house for brandy, and after drinking some, danced and sung with all their might in the court; there was no harmony in their singing. They have dogs who make such a singular noise, that we mistook it for the catterwauling of grimalkins.

It continued to snow occasionally; on Wednesday the third of April it snowed while the thermometer was at 5 degrees below 0. M. Le Monnier and myself fastened the fixed telescope to the shaft, and observed the passage of Regulus, for the experiments of the simple pendulum; Messrs. de Maupertuis, Clairaut and Celsius, were upon the mountain, disposing properly the sextant for observing the passage of the star *a* of the dragon. They began to make their observations on Thursday morning the fourth, and continued it the succeeding days.

The balls which M. Camus had made of different metals were finished, and M. de Maupertuis had brought them. The pendulum of M. Julien Le Roi was placed in the stone shaft room, its rod was split, and was separable into two pieces; the different balls were successively fitted to it, to observe the length or the number of their vibrations in a determined time, which was known by the pendulum of Mr. Graham, regulated by the observation of Regulus, keeping the temperature of the apartment always the same, by increasing the fire, or suffering the admission of cold air at the door.

Thursday night the thermometer out of the room was 9 degrees below 0. And Friday morning the fifth it was 17 degrees; the night was fine, we made the observation with the sextant. M. de Maupertuis had his bed placed in the apartment of the stone shaft, where the pendulums were, in order to be more within reach of preserving a regular heat. That day the Annunciation of the Virgin was celebrated with great solemnity: We continued our observations on the simple pendulums; we made that of the passage of Regulus by the fixed telescope; afterwards, M. Le Monnier and myself went to observe the star *a* of the dragon with the sextant; we were very well satisfied with this observation: a little after we took the elevation of Venus, at its passage to the meridian towards the north; she was 1 degree 15 minutes above the horizon. We descended from the mountain, and entered our apartments on Saturday the sixth, at three in the morning. The twilight finished at eleven o'clock at night, and the dawn began at one in the morning. The thermometers yesterday were in the evening at 12 degrees below 0, and this morning they were at 16 degrees. The wood of the houses cracked, as it had done in the months of December and January; M. de Maupertuis was all the morning observing the balls, and I all the afternoon.

Again it was exceeding cold during the night. Sunday the seventh, at five o'clock in the morning, the thermometer of spirits of wine was at 20 degrees, and Monday morning the eighth at 18 degrees. These two days we continued the observations of the balls and pendulums. We went to the mountain on Monday, to take down and pack up the sextant, and the other instruments, to be ready to return the sooner to Torneo. The cold still continued, and Tuesday morning the ninth the thermometers of spirits of wine were $17\frac{1}{2}$ degrees below 0: there were yet some balls and pendulums to make experiments

with, which was done on Tuesday and Wednesday; and on Thursday the eleventh we set off to return to Torneo, where we arrived on Friday the twelfth, in the afternoon.

M. de Maupertuis had set off from Pello with M. Celsius, to go beyond Kengis, to look after a great stone, on which certain characters were engraven, and which was spoken of as a curious monument. They only arrived at Torneo on Sunday the fourteenth, at ten or eleven at night. We remained at Pello as short a time as possible: it was time to come back to Torneo, in order to prevent our being exposed to the hazard of being obliged to wait five or six weeks, or perhaps longer, at Pello. Travelling is altogether impracticable during the height of the thaws, whether by land or water; these begin earlier or later, and last sometimes a very long while. The snow began to melt, afterwards it froze again, and formed a crust sufficiently hard to bear almost every where. On Monday the fifteenth the weather was fine; but on Tuesday the sixteenth there was a south wind, and much snow. The thermometers at 4 degrees below 0.

Thursday the eighteenth, in the holy week, the inhabitants went to church; there was a sermon, but no communion. On Friday the nineteenth they went more generally: they gave a sermon, with the communion; many received the Lord's Supper. In the afternoon a second discourse was given, and the priest sang something from the pulpit. They do not fast commonly, even on Good-Friday; they however practise some mortifications, as they think proper; some, more devout than the rest, ate nothing during the whole of Friday. Saturday the twentieth, and Easter-Sunday, the twenty-first, very fine and mild weather, the snow melted in the sun. Easter-day, the rector and the ministers did not administer the communion: people, however, went to church, and a sermon was given morning and evening.

M. de Maupertuis, immediately after his return from Pello, resumed his observations on the lengthening, or diminution of length, of the wooden toises, from exposure to heat and cold. During Easter week we observed the variation of the needle, which we found to be 5 degrees and about 5 minutes; it was nearly the same as we noticed in the Baltic, before our arrival at Stockholm.

The house which M. Camus lodged at looked upon the bay which the river forms to the west of the town; and one of the rooms was a very fit one to verify the sextant and its divisions in, by actual measurement upon the ice. M. Camus caused the floor of the room to be taken up, in order to fix with more firmness, upon a vault which was below, two strong cross trees, to serve as a support for the sextant, and enable it to move in the line of the horizon with its divided limb. M. de Maupertuis sent a servant to Oswer Torneo, who brought thence four of the large rods, with which we measured the base, for the purpose of measuring a suitable space for the proving of the sextant.

The weather was continually changing: at times the snow melted, especially when the wind was southerly; at others it snowed again, and frequently it was very cold.

Tuesday the thirtieth, after Low Sunday, there was a great dinner at the rector's, at Preskhot: we were invited; but as there was to be a prodigious number of guests, and as we saw sledges going there from every quarter, M. de Maupertuis, M. Sommereux, and myself, did not go, nor M. Camus, whose health was not yet perfectly re-established.

Wednesday the first of May, at half past two in the morning, we saw Venus, on her passing the meridian towards the north, elevated about 4 degrees above the horizon; it had frozen very hard, and the weather was beautiful; the heat of the sun melted the snow from nine in the morning till six at night. M. Camus and myself adjusted to their proper length of five toises, the four rods which were brought from Oswer Torneo, and which were found each too short by about half a line.

Saturday the third we placed in the ice a large log, with a sight opposite to the room wherein M. Camus had caused the sextant to be fixed horizontally, at the distance of three hundred and eighty toises. We afterwards placed a log of wood, as large as the first, with a sight in such a position, that a line drawn from it to the first sight should fall perpendicularly on the line drawn from the first sight to the centre of the object-glass of the sextant. In this last space, of upwards of three hundred and eighty toises, not half a line of difference was found on our twice measuring it.

Sunday the fifth, after mass, we began to observe the angle which the two objects formed at the sextant: we began on Monday the sixth, and finished on Tuesday the seventh. It was yet cold at times; but it began to thaw, the snow melted, and occasionally it rained; all this made the roads very bad. The letters, which ordinarily arrived on Sunday and Monday, did not reach us till Wednesday the eighth. On the first of the month I was presented with small sprigs of birch in a phial, as flowers are wont to be presented in France. The warmth of my apartment made the sprigs open their leaves. By night it froze a little; in the day-time it was fine, or at least mild.

On Thursday the ninth the ground appeared; being fine, we walked out of the town to the Bolplass (bowling-green.) A part of the isle of Lammas was visible; notwithstanding, people passed over to it upon the ice, and there were there already two horses, who had left their master's house. At our return, passing by the church, we saw the funeral procession of a girl; it consisted of ten men, dressed in black, who carried the bier; the priests and assistants, five or six in number, followed, having the father in the midst of them; after them, another relative of the deceased. The procession was very orderly, and well conducted: no female accompanied it, it is not the custom; they go to the church before.

Friday the ninth, and the two following days, are set aside for familiar instruction. A catechism is made, in which, indifferently, young and old are examined. Thursday, and Saturday the eleventh, it is conducted in the Finnish language, for the men and maid servants; and on Friday in Swedish, for the burghers, who attend very punctually.

Sunday the twelfth the weather pretty fine, the thaw continued; and on Tuesday the fourteenth the water began to spread in quantity over the surface of the ice, and made the passing over it very difficult. The burgomaster and M. Viguelius came to reside in the town till the passage in boats should be free, after the melting and dispersion of the ice. A great number of country people coming to town had planks on their feet, four or five inches wide, and eight feet long: they make use of them in winter for hunting with, and travelling over the snow, when there is no beaten road. These skaits are also useful during the thaws to pass over the ice with; they hinder it, weak as it is in some places, from giving way under them. They use, particularly in the forests, machines of this description, of no more than six feet long.

M. de Maupertuis, before the thaw, caused a lump of ice to be cut out of the river; it was two feet thick: we were told that it was frequently thicker; but that the snow, which had fallen immediately after the first frosts, prevented its becoming so thick as usually it did. The post did not arrive until Wednesday night the fifteenth, owing to the snow, and the difficulty of the passages.

Thursday the sixteenth, the weather being pretty fine, we walked into the northern part of the island, where more than half the ground was visible. Friday the seventeenth, and Saturday the eighteenth, it was colder; some snow fell, and it froze during the night. Sunday the nineteenth was finer. Monday the twentieth it snowed all day, but it melted immediately along the streets; however, large heaps of it remained. Tuesday the twenty-first it was fine: in walking about we looked for some proper

place on which to erect a monument, commemorative of our expedition, with a suitable inscription. On going out of the town we found a large rock, which was not far from the church; we examined it, and finding it solid, began to work upon it. In this country they have no masons: instead of working with the mallet, they make a fire on the rock, and when the part they wish to open is sufficiently heated, they throw water upon it, which makes the rock splinter. A letter which M. de Maupertuis received, on Wednesday the twenty-second, stopped the work. We thought of nothing now but returning to France, as soon as the navigation should be free. The same day M. de Maupertuis learnt, by a letter from M. de Maurepas, that his majesty had granted a pension of a thousand livres to M. Celsius.

Friday the twenty-fourth was another of those grand prayer-days which I have before noticed. The river brought down a quantity of floating ice, and people began to pass it, although not without danger. The sun set entirely at ten minutes past ten. We ascended the highest part of the isle of Swentzlar: we observed with a quadrant the angle between the sun at the horizon and the signal of Kukama, at the same time counting seconds by a pendulum which we had placed near the spot, in one of those houses used for keeping fodder and cattle in, and which then was empty. The night was very fine: the next morning we returned to take the angle between the rising sun on the horizon and the same signal. The direction of our succession of triangles, with respect to the meridian, as found by these observations, differed by some minutes from the direction found at Pello. We were at first surprised; but quickly reflected that, Kittis and Torneo not being under the same meridian, we ought to find some difference, on account of the two meridians approaching sensibly towards the poles in the country where we were. M. Clairaut very quickly made the calculation of what this approximation of the two meridians amounted to; and it was found, by taking this into computation, the directions of the triangles taken at Kittis and Torneo agreed within half a minute of a degree.

There was now scarcely any ice on the river; yet the sea was quite white with the floats of ice covered with snow. There was very little snow remaining on the ground, even on the northern side of bushes: and the inhabitants began to sow their barley all over the island.

Sunday the twenty-sixth there was no longer any night; and a fortnight had elapsed since our being enabled to read in our apartments the most small characters at midnight. I had my fire only once made up in the day. I was much amused for a long time on Sunday afternoon, admiring the address of a citizen of Torneo, who could draw, without having ever been taught, and delineated figures with singular skill; had he been under the hand of a master, he would have excelled in this line; he drew pictures, made coats, and was the only tailor at Torneo.

They kept Easter the same day as we did, and Rogation Sunday as well. Monday the twenty-seventh, and Tuesday the twenty-eighth, people went much to church: that day they preached on the gospel which we have for the Rogation mass. They call these days Gonge dagen, the days of procession; they however have no procession, and are satisfied with preaching, and singing the hymns of the church.

I went to M. de Maupertuis, to help him to place two pendulums near to each other; he made use of them for examining if two pendulums, moving very near each other with unequal vibrations, had any sensible influence one on the other: M. de Maupertuis did not find that they had.

The horses had all proceeded to their summer quarters; my landlord sent for his, which he wanted, to go to Kimi. The horse on his return rested at his master's; and

Wednesday morning the twenty-ninth departed, of himself, to join his companions, which he could not effect without swimming across the river.

M. Viguelius, assistant minister and director of the schools of Torneo, had composed a Latin poem in honour of the king of France, and the academicians which his majesty had sent into the North; he invited us to dine with him on Wednesday, and gave each of us a copy.

Thursday the thirtieth, Ascension Day, was kept very solemnly; we kept it also in our little chapel. We had a large company to dine with us: the lieutenant-colonel, with the gravin which answers to countess, was of the party. Sunday the second of June very fine weather, and Monday the third the same. I went with M. Sommereux to the highest part of the island, to see the sun set: the upper edge passed behind mount Nieva, near to Corpikyla, and shortly afterwards it again appeared on the other side, that is to say, on the right of the mountain; it did not entirely disappear before two or three minutes after eleven.

M. de Maupertuis went in the afternoon to see the vessel which was to carry our instruments and luggage to Stockholm. We began to make ready for our departure; the following days were dedicated to this purpose, and were fully occupied. On Wednesday night the fifth, many cases filled with instruments were carried on board the vessel, nearly two leagues distant from Torneo: the sea and the river are so shallow, as not to allow vessels to approach nearer to the town. We took our leave: M. de Maupertuis rewarded, in a noble manner, all those who had rendered us service, and we thought no longer of any thing but our departure.

DEPARTURE FROM TORNEO TO RETURN TO FRANCE.

All the instruments, baggage, and one of our coaches, were put on board a ship belonging to Torneo, which was speedily about to sail for Stockholm. Sunday the ninth, Whit-Sunday, I said mass early; and M. de Maupertuis, after hearing it, had every thing ready to go by sea to Stockholm. Messrs. Le Monnier, Sommereux, and Herbelot, were to accompany him; Messrs. Clairaut, Camus, Celsius, and myself, intending to go by land, in the coach which for that purpose was left behind at Torneo. The wind became fair in the afternoon; and as M. Le Monnier, who was gone to Kiemi with M. Celsius, was not returned, M. Clairaut took his place, and went after dinner with Messrs. de Maupertuis, Sommereux, and Herbelot, to embark on board the vessel in the harbour of Puralakti, two or three leagues from the town: Messrs. Camus, Helant, our interpreter, and myself, accompanied them on board: we saw them set sail at seven in the evening, and returned in one of our boats. We went to Hapa Niemi, to take leave of the lieutenant-colonel, and at ten o'clock got back to town, where we met with M. Le Monnier returned; M. Celsius came back during the night, that is to say, towards midnight, for there was continual day. Monday morning the tenth, M. Camus and myself looked to our coach being put in order, and got every thing ready for setting off.

It was two in the afternoon when we left the town; we passed in a boat with our coach at Hapurunda, where we were to find horses; we had much trouble in obtaining any, they had but lately returned to their summer quarters; a number of them, however, was brought, but very meagre, not having yet got over the fatigues of their winter service. We at length set off at five o'clock; there was yet some snow along the coasts of the gulf: we found some at Sangis, where we arrived on Tuesday the eleventh, at half past one in the morning. We could not obtain horses here until the afternoon, and then very bad ones; of the four which were brought us, only two could draw: M. Le Monnier and myself were obliged to mount the other two, which were badly

saddled, and had much difficulty in keeping on their legs. We arrived at Calix towards six in the evening: thence, on Wednesday the twelfth, at ten in the morning, at Ranea. In Sweden they observe the fourth day of Whitsuntide with more strictness than the preceding ones, and we could not get away until Thursday the thirteenth, at five in the afternoon. We passed at midnight by Old Lullea; there they gave us such bad horses, that in order to reach Bac, which is only half a mile from Bourg, we were obliged to send back twice for fresh ones; it is true, the roads were through sands, and very bad. Afterwards we obtained better horses: we were seven minutes and thirty-five seconds in passing over the wooden bridge, which the maps describe to have one hundred and two arches, and notwithstanding went at a good rate.

On our arrival at Old Pithea, as M. Celsius was conducting us to the proubst, or rector, we were much surprised at meeting with one of the servants which M. de Maupertuis had taken on board with him. He told us that the vessel was run upon the coast at two miles from the town of Pithea, from which we were at the distance of a good French league; that these gentlemen had gone to the town, and begged us to join them there. We went immediately, and arrived to dine with them; and after hearing the account which M. de Maupertuis gave of his shipwreck, we made arrangements for continuing our journey in company.

Scarcely had the vessel on which these gentlemen were embarked left Puralakti, at seven o'clock in the evening, and proceeded three or four hours on its course, before the wind changed, and became furious: all Monday they were beaten about by the tempest. On Tuesday morning M. Sommereux, from his bed, perceived the pilot apparently very uneasy and agitated, and learnt that the vessel made a great deal of water. At this news every one rose and stirred about: there was but one pump, at which a part worked, while the others emptied the water with buckets through the skuttles. As soon as there was any respite taken, instantly the water gained upon them. The wind was continually changing. They often went up aloft, but could descry no land; they could only distinguish at a distance long white flats, which were supposed to be floating ice. At length, the same day in the evening, the wind was more favourable: the pilot ordered all sails to be hoisted before the wind, while they continued emptying the water; and at length they discovered the shores of Westro-Bothnia. The pilot, who was experienced, and had much frequented the coast, found a proper place on which to run the vessel ashore; and he did this with so much caution and management, that the ship was no ways damaged by it. They had thrown overboard a part of the boards with which they were loaded; as soon as she grounded, they quickly landed the rest, with the luggage, and all our instruments. It was on the skirts of a wood; the servants erected tents, and remained there, while M. de Maupertuis, and his companions in the shipwreck, went to the town of Pithea.

M. de Maupertuis departed on Friday the fourteenth, in the coach which brought us, with Messrs. Clairaut, Celsius, and Camus, who was directed to examine with attention the copper mines of Fahlun; while M. Sommereux remained with M. Le Monnier and myself at Pithea, until the vessel was put into condition to resume its course to Stockholm.

Saturday the fifteenth, the wind being southerly, and favourable for returning from the vessel to town, Messrs. Le Monnier, Sommereux and myself, went with two boats to bring back the coach which had been embarked at Torneo, and which was with the servants, the luggage, and the instruments. The vessel remained there no more; it had been brought closer to the town, to be nearer to the workmen who were to refit it; we found it laying on one side, and entirely empty. We came back to town, the wind

being favourable, remarkably quick; on the road we had thunder and rain, but in the evening and the night there was fair weather: there was yet some clouds; and I remarked at midnight that the sun illuminated them as far as to the horizon on the side of the south, the same as with us it does on the side of the west some minutes before rising; it rose at nearly half past twelve in the morning.

Sunday the sixteenth, as our lodging was in front of the bridge, we had the pleasure of seeing all the people come from church: there was a very large congregation, great part of them very well drest, and all returning with much decorum. During our residence at Pithea I took the plan of it: I went therefore, while all the inhabitants were in bed, to step the principal streets about midnight. The situation of the town is singular enough; it occupies entirely a small island, which has no communication with the town but by a wooden bridge, at the end of which is a gate which shuts. The church is out of the town, and people go to it over the bridge. The streets of the town are all straight; in the middle is a little square, regular enough, one side of which is made up by the town-house and school. This town is half a mile, that is to say, a league, from the old town, whence it is distinguishable. The road leading from one to the other was our customary walk: having lost our way one day in the wood, we found a woodcock's nest, where as yet there was only eggs.

Tuesday the eighteenth the vessel was in proper condition, and we now only waited for a fair wind, to put our baggage and instruments on board. It became fair on Wednesday the nineteenth; we immediately repaired to the spot where the baggage was, and off which part the vessel had proceeded to lay: we began to load, and continued the next day, the twentieth, in order to depart immediately. We came back to the town, whence we designed setting off in our coach on Friday morning early, the twenty-first; but it was one of those grand prayer-days, on which, under great penalties, they are obliged to attend both at service and sermon, that we could not obtain horses until they had come from church.

At length, at four o'clock in the afternoon, Messrs. Mornier, Sommereux, and myself, set off; M. Herbelot, shortly after the vessel grounded, embarked in another, which went from Pithea to Stockholm. When we had passed Aby, we came to a river called Byka; our coach was put into two boats joined to each other, to pass it: we then took fresh horses; we went on to Fraskayer, and arrived on Saturday the twenty-second, at ten o'clock, at Sielefflat, which is a large town, where we dined. Leaving it, we passed a very broad river, on a wooden bridge, quite new, and very well built. We were surprised to see so considerable a work entirely finished, having passed by there in boats a year before, without seeing any preparations for the construction of it.

We arrived at eight o'clock at Selit, where there is a church; and as we could not obtain horses until the afternoon of Sunday the twenty-third, we went on with the same as far as Gremmersmark, where we arrived at eleven o'clock: we passed the night there, lodging very badly, and very cold; it froze, and they were under much concern on account of the barley. We made so much interest as to get horses by ten o'clock in the morning: we passed by the side of the church of Nasastra; afterwards through the village of Saswar; then across a river, over which was a bridge: we passed afterwards a heath, where there were some Swedes encamped; the sentinels cried out in German, who goes there? they came to reconnoitre, and suffered us to go on.

About a mile beyond the camp, at eleven o'clock at night, we arrived at Uhma: we supped and slept in the inn, which is a very good one; and Monday morning the twenty-fourth M. Sommereux and myself went to see M. Guilingrip, the governor of the province, whom we had met with several times at Torneo: I found there a letter

which M. de Maupertuis had left for me, in which he mentioned that M. Camus waited for us at the copper mines of Fahlun. The house of the governor is about a quarter of a mile out of the town: we dined with him, and went to rejoin M. Le Monnier, at Rodbek, where he went in the morning to examine the mineral waters. We left Rodbek at six in the evening, and arrived at Sodermiola at eleven o'clock; which, after changing horses, we left at midnight.

On leaving Sodermiola, we had for three miles and a quarter, that is to say, nearly seven leagues, a woody country, without any house or fields; after which the country is much better, but mountainous. Tuesday the twenty-fifth, in going down these mountains we fastened our wheels with a cord, which we had fixed to the shafts for that purpose: the coachmen admired the invention, and exclaimed to one another, *Bra const*, that is, the excellent plan. They are not wanting of genius; but they see so few coaches, that it is not wonderful they should be ignorant of this simple expedient.

We arrived at Hoonas at eight o'clock at night; we supped and passed the night there, during which a great deal of rain fell. We left it at five o'clock in the morning of Wednesday the twenty-sixth, passing on to Dorkstat; and by ten in the evening came to the great river Angerman. The watermen made some difficulty at ferrying us over, because there was a strong south wind, and the water was much agitated. Nevertheless, seeing us anxious to get over, they made a deck of planks from one boat to another, after first tying and fastening them very tight, on which they placed the coach, with the wheels on; and thus we passed the river, which is full a league in breadth, and the passage of which was so much the more difficult, from the body of a coach taking a great deal of wind, which happened to be contrary.

North of the great river, from the entrance into Angermania, the country is very mountainous; but south of this great river the country is more even, with many lakes, in the vallies. The country as far as Maik is well cultivated: we saw more churches also; that of Sion, through which we passed, is built entirely of brick, as well as another with a steeple, which we perceived three quarters of a mile before we arrived at Sundswald: we saw another very little distant from this, and in a country well croped with barley and rye; both in agreeable situations.

On Thursday the twenty-seventh, at half past three in the afternoon, we arrived at Sundswald; it is a little but pretty town: we left it at four o'clock, and arrived at six o'clock at Niuranda, and at midnight at Gnarp. The weather was fine, and one could even yet see to read. We reached Hermenger on Friday the twenty-eighth, at three o'clock in the morning: the church at this place is handsome, the belfry of stone. We passed beside the town of Hudwickswald, and arrived by nine at night at Noralea, which is a large place, in the middle of a well cultivated plain. We crossed at midnight the great river Liusna in a boat passing on to Skoog and Hamrung, two considerable villages, and arrived at Geffle, or Guiewle, on Saturday the twenty-ninth, a little before noon.

We passed all the way without being troubled with gnats till Friday evening; but the last night, and on Saturday, they were very troublesome. We left Geffle on Saturday, at six o'clock in the afternoon; all night long we were incommoded with gnats. We passed by Bek and Hop, through an unpleasant country, as far as Halstad, which is a large village, situated in a beautiful country: from there to Lingsore and Boriklo, which is four miles to the south of Swersio Kyrka, which is the parish. The people returned very late from church on Sunday the thirtieth, and we were obliged to wait till four o'clock at Boriklo, the road being shut with a gate and chain till after service. The road passes in two places on causeways, very long, elevated above the level, among fields, lakes and rivers: along these causeways, which are said to be natural, we met

with some houses, with a number of forges for melting the copper ore. From these forges to Fahlun nothing was seen but woods, mountains and stones; we arrived there on Sunday, at nine o'clock.

The town of Fahlun, otherwise called Copperberg, is very large: it is not surrounded with barriers, as are all the other towns of the country; the streets of it are perfectly straight. There are two squares, one of which is handsome, large, and regular. North of this is a large house, built of stone; it comprises the hall where justice is rendered, a cellar, a granary, and a public dispensary. East of the square is a large stone church, the belfry of which is lofty; there is in it a very good ring of bells: the church is covered with copper; the gates are of brass; as for the rest it is not ornamented within. In the church-yard are many tombs of metal. Out of the town, on the eastern side, is another church, built as well of stone; it is covered with copper, as well as the steeple of the tower, which is very handsome. Besides these two churches, among the buildings belonging to the mine there is a chapel for the officers and workmen of the mine.

At the south-east of the town is a tolerably handsome house, which belongs to the king of Sweden: the governor of Fahlun dwells in it; and the king sometimes goes there. The neighbourhood is embellished by many pretty country houses, which belong to the inhabitants of the town. They are all concerned in the mines; without it they cannot obtain the rights of citizenship: they are called Busemans, that is to say, men of the company; and those who work themselves, Brukande Busemans. The greater part, instead of sticks, carry little hatchets; they wear hats without loops, like our priests, black coats without pockets, black stockings, and black gloves.

All the western side of the river, for at least the space of half a mile, is entirely barren and rocky. Among these rocks are the mines of copper: several canals conduct, by different channels, water for working an infinite number of machines. There are to be seen the houses of the officers; besides these, nothing but masses of scoriæ, which form hillocks; between which roads are kept up, for carrying the ore to little carts, drawn by one horse.

The eastern side of the river is not so barren; there is all along the town pretty good meadows, for three or four hundred toises; beyond there are only mountains and woods.

Monday the first of July we went to see the mines, M. Le Monnier, M. Sommereux, and myself. They made us all change our dress at M. Bentzel's, one of the bailiffs of the mine; they gave us breeches, jackets, waistcoats, wigs, and hats, and each of us a guide. We at first descended to the bottom of a very large pit, about one hundred toises wide, and one hundred and fifty feet deep: we went down by stairs cut in the rock, and by wooden stairs, when the rock was wanting. Our guides carried several bundles of long slips of deal: at the bottom of the pit they each lighted one, that we might see; and, each preceded by a guide, we entered one after the other, through a very narrow cavern. We at first descended by a great number of stone steps, which winded frequently, and arrived at a square hole perpendicular to the horizon, three or four feet wide, and at least thirty feet deep, furnished on two of its sides with ladders, which they have been obliged to tie together two by two, in order to get to the bottom of the hole. We entered into a very narrow cavern, through which having advanced a little, we found eight or ten men, almost naked, having nothing but their breeches on; they were lying on the ground, and had no other light than what was yielded by some deal splinters: the way was so narrow, that we could scarcely pass them. The heats which were emitted from these caves, added to that of the flambeaux of our guides, almost suffocated us; we were every now and then obliged to turn our heads to breathe.

After passing these naked men, we again descended, and found ourselves at length in cavities from thirty to forty feet broad, some of which were terminated by very large wells. We passed by narrow passages to get from one of these cavities to the other. The greater part of these roads are furnished below with a wooden channel, to direct the wheels of the tumbrils, in which the horses draw up the ore, to conduct it opposite to the wells which are cut to the top. It is through these openings that the ore is raised in very large buckets. These buckets are suspended to cables, rolled over the axis of large wheels, some of which are turned by horses, and others by water. They are so constructed, as while one bucket descends, another is raised. When it is required to let down a horse, a band which goes under the whole of his body is fastened to one of these cables.

On each side of the canal I am speaking of there is sufficient room for a person to pass; and to prevent passengers from being hurt by the tumbrils, they are confined by a middle wheel, placed under them, to the middle of the channel. In some places there are other wooden channels fastened along the rock, the use of which is to conduct the water necessary in the working the mine. In these subterraneous places we saw two stables for horses, and a smithy, wherein tools, and shoes for horses, were made.

In all these caverns, but above all in the larger ones, we saw a great number of workmen, some clothed, others naked; they make a fire on the stone they are desirous of breaking, and, when sufficiently heated, remove it, and directly throw water upon the hot stone, which splits; on every side there are a number of these fires. Here we saw levers of every description for moving the ore, and placing it within reach of the tumbrils. There were various pumps for raising water from parts where it was injurious, and directing it to others where it was of use. Sometimes we saw rivulets running, which apparently lost themselves in the crevices of the rock.

There is in these mines a great number of roads, which we did not see, on account of the gates being shut. In many of the caverns the rock is supported by walls; in others by planking joined together, some with iron clamps, others with wooden stays. In spite of these precautions the tops of the mines are not firm, for workmen are frequently either wounded, or crushed to death, by the fall of large fragments. These unfortunate beings know the danger to which they are exposed, and in consequence a sombre sadness reigns among them it seems as though mirth were prohibited indeed, for they are not allowed either to whistle or sing in the mine. Women are also expressly forbid going down them.

After having gone through different caverns during two hours, we found ourselves at the bottom of the largest well, and thought it rained abundantly, notwithstanding the serenity of the sky, the vapours ascending from all parts resolving into real rain, which continued to wet us, till we had ascended two thirds of the height of the well. It is three hundred and fifty Swedish ells deep, which make six hundred and forty French feet.

We now wanted no more than two guides to bring us to the light of day; one of them placed himself with M. Le Monnier and myself, in a large bucket, which is used to draw up the ore. We had neither of us more than one leg in the bucket, and held by the chain with which it is fastened to the cable. While ascending, every now and then our guide touched the sides of the well, in order to direct the bucket, and avoid the points of the rock which projected, as well as the descending bucket, the shock of which would have been dangerous. The coachman of this singular kind of carriage required a considerable portion of skill; for the swinging of the bucket, the turnings which the cord occasioned by its twisting, and the small size of the well, rendered the

passage difficult. Notwithstanding the horses which drew us went at a very good rate, we were nine minutes in rising from the bottom to the top of the well.

There are two water-works, which draw up the ore in chains instead of cables. They are composed of large overshot wheels, with two rows of buckets, one of which is opposite to the other. These wheels are placed in large wooden buildings, closely shut up. At the top of the building is a large reservoir, into which pumps continually throw up water, carried to it by large wooden pipes; at each opposite side of the reservoir there is an opening with a flood-gate, which corresponds with the buckets; so that by opening one of the flood-gates, the water falls into the buckets that answer to it, and the wheel turns one way; instead of which it turns the other way, upon the shutting that and opening the opposite flood-gate.

We saw another water-work, which had two wheels, each twenty-seven French feet in diameter. It was not at work when we went there; it is used for raising the ore, and to work a prodigious quantity of machinery for pumping, and other purposes. There are besides several other machines worked by water and horses, for drawing such water from the mine as is superfluous; the machinery for working these pumps extends to a very great distance, and divides and sub-divides in a number of branches, for pumping at the same time in a great many different places. Some of this machinery moves vertically, others horizontally; and if the mountain be frightful from its rugged rocks, the moving forest, formed by the different machinery, is an object well worthy a curious eye. All the bodies of the pumps are of wood: the wheels, the levers, and all other parts of the machinery, are perfectly well constructed. All the reservoirs as well are of wood, very closely joined and pitched, so as no water can escape.

As the ore is drawn it is separated into different heaps, which are the property of individuals. Every proprietor carries away his share in little tumbrils, to take it to the foundery, where they prepare it for fusion.

The mines are south-west of the town, about one hundred and fifty toises distant from the nearest houses. Between the houses and the town, and the town itself even, and along the banks of the river, there is nothing to be seen but forges, the bellows of which are moved by water. Near these forges are a number of furnaces, where the ore is extended on two layers of wood, which is set fire to, and is left to burn for several days; this is the first part of the process for the preparation of the ore, and is called Kallerostat.

The second is in a nearly similar kind of furnace; it is longer only and narrower. They then make the metal run in a very violent fire blasted by immense bellows, worked by water. There then remains to refine it only. Of this I shall speak presently, when I come to Afsta.

On passing near the Kallerostats to leeward, the smoke is so thick and sulphurous, as not to be respirable. Sometimes it entirely covers the town, and although incommodious to the inhabitants, it procures them the advantage of being never troubled with gnats; an insupportable vexation throughout the rest of the country.

The officers of the mine made us each a present of a Berseman's hatchet, on the part of the company; they are very small; the inhabitants of Dalecarlia always carry one, which is to them in lieu of a stick. The governor invited us to dinner, and shewed us the greatest civility.

Tuesday the second of July we went to see a man, who they said was petrified; he had been crushed under a mass of rock. After forty or fifty years, in digging, his body was found; it was so little changed, that a woman recollected him; for sixteen years he had been kept as a curiosity in an iron chair. We saw nothing but a body perfectly black, much disfigured, and which exhaled a cadaverous smell.

Saturday the sixth, after dinner, we took leave of the governor, and departed in our coach; we stopped at the country-house of M. Trohili, the burgomaster: it is very elegant; the garden is extensive, the prospect diversified by woods, meadows, and large sheets of water, in which some excellent fish were caught for our supper. We did not depart till eleven o'clock in the evening; we rode all night through a fine country, and more than two thirds of the way on very large causeways. We passed the great river Dalu three times on floating bridges.

These floating bridges are large planks of wood joined together, parallel to the current of the river, and laid over other planks, similar but longer, which are at right angles with the first; all these planks are well joined: when loaded with a heavy carriage, they sink a little, and the water sometimes comes to the highest edge. These floating bridges are of two descriptions; the one extends from one side of the river to the other, as is the case with some at Stockholm; the other occupies but a small part of the river, and is crossed along a cable extended from one side of the river to the other, in the same manner as our ferry boats. Sunday noon, the seventh, we arrived at Afsta, seven miles from Fahlun.

Afsta, to which name Fors is added, signifying forge and cataract, is a very small place, situated on the side of the great river Dalu, below a most frightful cataract, which turns a large number of wheels used for refining copper. We first went to see the inspector of the works, who received us very politely; he told us he would cause the whole process of refining to be gone through as soon as we pleased after midnight, for they observed the Sunday with great strictness.

At midnight we went to see them at work. The copper is forwarded from Fahlun to Afsta in blocks, in a very impure state, only having undergone the first fusion. When it arrives at Afsta, an exact account is taken of what belongs to each individual, in order to know what he may have to receive, after deducting the king's dues, and the charges of refining.

They began by putting into a kind of large crucible, cut in the ground, a bed of charcoal, and above that a heap of large ingots or blocks of copper, till there was about eight or nine thousand weight, with a quantity of charcoal above it. This was set fire to, and blasted by two large bellows, which the water kept continually playing, until the ingots were entirely melted; after this the bellows continued to play for a long time, fresh charcoal being added as often as requisite; now and then the crucible was opened, the charcoal which floated on its surface was taken away, and the melted ore skimmed of whatever dross swimmed upon it. At length, a little before ten o'clock, the whole of the charcoal was removed, and the bellows ceased from working. On the melted copper a little water was thrown, which, not being able to evaporate at the instant, rolled backwards and forwards on the surface in little drops: this water having chilled the top, a crust was formed, which was taken off with hooked poles, and other iron instruments; water was thrown on a second time, and a second crust taken off; and thus until the crucible was empty; it gave, if I mistake not, forty crusts, or round sheets of copper, the last of which are always the purest and the best.

This work was completed by ten o'clock; the inspector came to seek us, and carried us to see the last fusion, which was not long. A great number of these round sheets were put into a crucible nearly resembling the former; they were very soon melted; they then dipped out of it with large iron spoons, suspended as a lever by chains, the melted matter, which was poured into moulds as large, and nearly of the shape of the top of a hat. This matter become solid, but yet red, was placed on an anvil, and flattened by the strokes of a heavy hammer, which the water worked. These sheets of copper were

afterwards cut into narrow plates, and passed between rollers, to make them even and of equal thickness. Three men weighing upon a large pair of sheers, the lever of which was horizontally placed, cut the plottes, that is to say, the large copper coin. Four others, each holding a corner of the pieces with its impression, received the stroke of a large hammer moved by the water, which stamped the coin. Others cleaned it in rolling casks. The inspector went with us every where, and invited us to dine with him.

Tuesday the ninth, at five in the morning, we went in our coach to Messinsbrok, a quarter of a mile distant from Afsta, to see them make brass. They have three subterranean furnaces, each furnished with a lid; they let down with large hooks to the bottom of these furnaces nine very deep crucibles, which have been filled with red copper, calaminaris, with some raspings of yellow copper. Some time after they take up these same crucibles, in which the matter is founded; they pour it into a large mould, very flat, to make sheets of brass; some are cut into long slips, which are put to heat again in a large oven, wherein the fire is on one-side; they are afterwards cut for brass wire, at first square, and large, but they are rendered round and slender as they please, by being drawn through guages by means of water that works nippers, which lay hold of the wire on its being forced through the guage, and draw it forward with violence. On one machine there are twelve of these guages, with their nippers, which the tree of one single wheel works with surprising celerity. They melt and work also a number of different articles in yellow copper.

The inspector made us take tea there, and to dine we returned to Afsta, which we left at noon for Salsberg, four miles and an half distant from Afsta. The whole road through an even country, but very barren, and almost wholly wood: through the whole distance we passed but three villages. We had bad horses, and did not arrive till eight o'clock at night.

Salsberg is a large and handsome town; the streets are straight, and paved, as well as the square, which is handsome and regular. On the twenty-first of August, in 1736, this town was almost wholly destroyed by fire, and presented a very sad appearance, few of the houses being yet re-built. The town is watered by a very small river. We went on Wednesday morning the tenth to see the silver mines; as they were not of any magnitude, we did not go down them; the burgomaster shewed us all the pits; there is but one machine, both for pumping the water, and drawing up the ore. This machine is well made, but not so large as those at Fahlun.

At three o'clock in the afternoon we left Salsberg; for seven miles we travelled through a very fine and well cultivated level country: we saw quantities of rye, barley, peas, and even very fine crops of wheat; plenty of meadows, several parishes and villages, and but little wood. The rest of the road was more diversified; plenty of wood, mixed however with cultivated fields in the vallies, and often lakes; we passed a strait between two lakes on a floating bridge, which was drawn over by a rope. We were then two miles and a half from Stockholm; we travelled all night, and arrived on Thursday, at eleven o'clock in the morning; we put up at the same inn which we lodged at the year before; we met then Messrs. de Maupertuis, Clairaut, Celsius, and Herbelot, with all the servants, and the luggage, which had arrived with the vessel, after a good voyage.

On Sunday the fourteenth, after saying mass, Messrs. de Maupertuis, Camus, and myself, went to dine with the ambassador. On Monday the fifteenth his excellency took us to Carlsberg at ten in the morning, and presented us to their majesties. It was the day of St. Ulric, whose name her majesty bore; on this occasion an entertainment was given in the gardens of Carlsberg; the king wished to see the drawings of some

plants and animals, of some Laplanders, and their dwellings, which M. Herbelot had designed, and conversed with much familiarity and benignity with all of us; we took leave of their majesties, and returned to Stockholm.

Tuesday the sixteenth M. Clairaut, M. Camus, and myself, went to see the count de Tessin; afterwards I went to Mr. Horleman, and to see Mr. Bentzilius, at the king's library. After dinner we employed ourselves in cleaning the quadrants and other instruments, which had got wet in the ship. Wednesday the seventeenth we put them in their cases, and M. de Maupertuis got every thing ready for our departure. For M. Sommereux and himself he had engaged a passage in a vessel going to Amsterdam; M. Herbelot and some servants remained at Stockholm, till some vessel should sail for Rouen, on board which they might ship the luggage and instruments. One of the coaches was presented to M. Celsius, and the other was designed to carry Messrs. Clairaut, Camus, Le Monnier, and myself, to Amsterdam, whither M. de Maupertuis went by sea.

Thursday the eighteenth, at five in the morning, M. de Maupertuis departed with M. Sommereux; Messrs. Clairaut, Camus, Le Monnier and myself, after taking leave of the ambassador, set off in our coach, at six o'clock. We passed over two very fine floating bridges, and by midnight arrived at Soder Talge, and on Friday the nineteenth, at eleven in the morning, at Nicoping. We did not leave it till six in the evening, and arrived on Saturday the twentieth, at four o'clock in the morning, at Nordkoping: it is a large town, in which there are many stone houses: below a very rapid cataract, which works the wheels of an iron forge, we saw a great number of vessels. By noon we were at Linkoping, twenty-two miles from Stockholm.

The city of Linkoping is handsome; it is the see of a bishop; there is a cathedral, with a large burial place, which many good houses look out upon; we lodged in one which was very neat, and in which we felt ourselves at ease; two or three miles before we arrived at the city, there began a handsome causeway, planted on both sides with willows. We left Linkoping at seven o'clock, we travelled frequently among rocks, and came near to the side of the great lake Water. For two miles we continued our route along its side, at first over rocks which surround it, and afterwards under the rocks, along the margin of the lake. We passed through a village, very small, and very poor, opposite to which, on the top of the mountain, the remains of a castle are distinguished, called Brahuss, or good house, which had been burnt down; to judge from its remains, it must have been very handsome.

On Sunday the twenty-first, a quarter of a mile further, below the same range of rocks, from one hundred to one hundred and fifty toises from the lake, is the little town of Grenna, thirty miles from Stockholm. The houses are very small, and all of wood; they form two parallel streets, on the same line as the length of the lake. The largest of them is very broad, and nearest to the lake; in the middle of the street there is a row of lofty trees, which divides it from beginning to end, and affords a pretty prospect; it is nearly three hundred toises long, running north north-east; a third part down this street towards the north-east is a pretty regular square, situated between the two streets, into which five or six little cross streets fall. The church, the only stone building, is about two thirds up the great street, going towards the south-west. Between the town, which is quite at the bottom of the rocks, and the lake, is a well cultivated country, about one hundred and fifty toises broad, stretching along the lake. There are several gardens, in which cherries are very plentiful, which appeared to us to be of a good kind. We arrived there at nine o'clock in the morning, and departed at four in the afternoon.

After travelling about a quarter of a mile at the foot of the rock, upon leaving Grenna, we ascended it, and passed to the east of a small lake. Some time after we descended to the side of the great lake, along which we continued to Jonekoping. West of Grenna in the lake we perceived a large island, with houses upon it.

At nine o'clock in the evening we arrived at Jonekoping; the town appeared to us large and handsome; a large and very broad street passes through it; the houses of it are neat, although almost all of wood. It is situated at the southern extremity of the great lake Water, the water of which as well forms a large bason within the town. We saw no boat either on the bason, or on the lake, which much surprised us: I had before remarked that there was none on the lake near Grenna, nor in any of its extent, while we were coasting it over the rocks. I was not able to learn the reason of it at Jonekoping; we waited only an instant there, because there were some German noblemen behind us, who took sixteen horses, and we were fearful of their getting before us. We left it on Monday the twenty-second, at ten o'clock at night.

We found an even country on proceeding, the road almost always sandy, and through woods; to this succeeded fields, meadows, lakes, and heaths; we passed two rivers, and on Tuesday the twenty-third, at four o'clock in the morning, we arrived at Hionby, where we saw more empty shops than houses; it is a place famous for markets and fairs. At eight o'clock we arrived at Hambneda or Hamna, where we rested ourselves; the hostess took us for people out of their senses, to ask to go to bed at nine o'clock in the morning. We did not set out till five in the evening; we passed a river, and afterwards through coppices, where we saw beech for the first time.

By seven o'clock we reached Trahry; we went slowly through the woods the space of two miles, as far as Muskarid, where we arrived at midnight; afterwards, having got to Fayerhalt, one mile and a half further, by two o'clock on Wednesday morning the twenty-fourth; we left it at four o'clock, passed by Orkliona, and Lenby, and reached Helsinborg at six o'clock in the evening.

We had travelled for a long time through a country, the language of which was not familiar to us. We were delighted with finding at Helsinborg several persons who spoke French. The town of Helsinborg is not handsome; there is a small terrace on the bank of the strait, where many cannon are placed.

The wheels were taken off our coach, and it was put into a large boat, in which we embarked at seven o'clock. The wind was southerly, we kept as near to it as possible, and, using our oars, we passed the Sound in an hour; but as the wind and the current had thrown us out of our course, and carried us somewhat to the north of the castle of Elsineur, we were obliged to pull against wind and tide, to get to the town at the south south-east; we did not land at Elsineur until nine o'clock; this town is pretty, the houses have a neat appearance, but they have very few lodgings, and do not behave with much politeness to strangers.

We left Elsineur on Thursday the twenty-fifth, at one in the afternoon; we met with roads very ill kept, and sometimes very bad, and did not arrive at Copenhagen until nine o'clock in the evening. We lodged at an inn, which was opposite the palace of the king of Denmark. Friday the twenty-sixth, M. de la Noue, envoy of France, invited us to dinner. After dinner I went with Messrs. Clairaut and Camus to see a royal palace, called Frederiksberg, which is handsome, and has fine gardens.

Saturday the twenty-eighth I heard mass said by the Jesuits, who officiate at the emperor's chapel. This chapel is elegant; a number of catholics were collected there, to hear divine service. M. de la Noue did us the honour of visiting us; and we passed

the remainder of the day in looking about the town, canals, ports, and vessels of the king.

On Sunday the twenty-ninth, M. de la Noue again invited us to dine; he invited as well M. Herrebon, astronomer of the king of Denmark. After dinner we went to M. Herrebon, who made each of us a present of some books of his composing: he gave us a collation in his garden; he had requested the company of a clergyman, whose dress appeared to me extraordinary; he had on a long coat, with a ruff of very fine linen round his neck, and wore a cap, terminated at top by a large round piece of felt, about eighteen inches in diameter, placed horizontally; this is the usual dress of professors of divinity at Copenhagen. We afterwards went to see the astronomical tower, where several of the instruments of Tycho Brahe are preserved, and part of the original registers of his observations. We saw the library of the university, over the vault of the church, contiguous to the astronomical tower. M. Le Clerc, son of the famous Le Clerc, designer and engraver at Paris, invited us to supper.

Monday the twenty-ninth we all went to the king's library, to the stables, and the riding-school, where M. Le Grand, equerry of the king of Denmark, then was, and caused several horses to be mounted; we saw hunters and riding horses very well trained. Thence we were conducted to a royal castle in the town, which contains great wealth, a great quantity of gold plate, of a handsome shape, and well wrought: we were shewn as well cabinets of medals, and natural history, very complete; with many paintings and statues of great value. The king of Denmark was ten or twelve leagues from Copenhagen, which prevented our paying our court to him. We went to take leave of M. de la Noue, and departed at eight o'clock in the evening.

After travelling four miles, we arrived on Tuesday the thirtieth at Roskild, at one o'clock in the morning, a middling city, the see of a bishop; four miles farther, at Ringstead; and again four miles more, at Slagen, a town much resembling Roskild, and near to which is a castle, much like a monastery. At length, at five in the evening, we came to Korser, a little town on the point of a tongue of land; in going out of the town is a little castle, with a garrison. From Copenhagen to Korser is fourteen Danish miles; the country is level enough, and the roads good: there are fine forests of beech, several lakes and fields, some uncultivated, others cultivated, but the soil bad. We gave for each horse fourteen sols; the postilions are lazy, and fond of drink.

At six o'clock at night we were on the shore of the Great Belt; we embarked in a small vessel, on the deck of which, with its wheels on, our coach was placed. The wind was south; we kept near to it, in order to go west south-west, and arrived by nine o'clock on the other shore; we slept at an inn on the quay, the gates of the town of Niuborg being shut.

We left that place at seven in the morning of Wednesday the thirty-first; we passed through Niuborg, where there is a garrison, and after travelling four miles arrived at noon at Odenzee, a handsome and large town; we went six miles farther to Middelfast, a small town, which we reached at eleven o'clock at night; we immediately embarked, to cross the Little Belt, in a large flat boat. We were obliged to row against the wind, which was south-west; at every stroke of the oar (which was very long) we perceived a luminous train of sparks on the surface of the agitated waters. The water of the Belts being the same as that of the Baltic Sea, which is scarcely at all salt, it is presumable that it is not the agitation of the saline particles alone which causes these sparks: after having gained on the wind by dint of rowing, we hoisted sail, and passed over in an hour and a half, landing at one in the morning.

We set off on Thursday the first of August, at three o'clock, and after travelling three miles arrived at Kolding, a small town, in which is a garrison: we travelled four miles farther, arriving by noon at Hattersleben, a pretty town, but without gates. The postilions drove us very slowly: we journie all night, and did not arrive at Flensborg till Friday the second, at six in the morning, where we had to do with very uncivil people, disobliging, and selfish in the extreme. We left Flensborg at eight in the morning, passing over nothing but heath to Rensborg, where we arrived at ten o'clock at night. As the gates of the town were closed, we took up our abode with a friendly farmer, who, from his courteous behaviour, might well have been taken for a stranger.

From this place the country houses, and even some in the town, are singularly planned: they consist of a large court, to which you enter by a great gate; at the bottom of this immense court are some apartments; all round, in sheds, the cattle and poultry are kept, who in consequence are habituated to live very familiarly with the family: the kitchen is in the corner of the court, which is large enough to serve for a coach house; carriages are kept in it.

We continued our journey, passing through the town of Rensborg; it is well fortified; it is divided in two by a canal, on which were many handsome boats, carrying masts; the southern part is very handsome. At four o'clock in the afternoon we arrived at Itzehoa; it is a fine town, of great trade, but not inclosed. We set off thence at six o'clock in the evening; we passed over a fine fertile country, variegated by meadows, and watered by canals. A mile beyond Itzehoa we saw on the side of the road a fortified castle, surrounded by meadows. We stopped a little at midnight in the town of Elmeshem, and arrived on Sunday the fourth, at eight o'clock in the morning, at Hambourg.

We went to pay our respects there to M. Poussin, envoy of the king; he kept us to dine with M. de la Chetardie, who was returning from his embassy to Prussia. On Monday the fifth, and Tuesday the sixth, we dined there again: we cannot speak too highly of the eagerness he manifested to have us continually with him. Tuesday he gave a dinner to M. de Chavigny, who was going as ambassador to Copenhagen.

Wednesday the seventh we went to see M. Rochefort, commissary of the marine, and to take leave of M. Poussin. We dined at our inn: towards the close of dinner some Prussian soldiers, extremely tall, gave us a concert with a bass viol, a bassoon, violins, a guitar, and French horns.

At four o'clock in the afternoon we set off in our coach; and after travelling two miles along the northern bank of the Elbe, we crossed it at Blankinese in a very incommodious boat, and conducted by very unskilful boatmen. We continued our route in this boat along a little river, which discharges itself into the Elbe, and which allows of decked vessels to go up of some burthen; we landed at eight o'clock in the evening on the bank of this little river. We went on a mile farther to Boxtehode, situated on the same river; we arrived there at midnight; we changed horses there, and left it on Thursday the eighth, at two o'clock in the morning. There are four or five villages on the road, both sides of which present barren uncultivated plains, as far as near to Bremen. We dined at one of these villages, and fared very well; they presented us first with tea and coffee, which is the custom of the country.

At ten o'clock in the evening we arrived near the gates of Bremen, which were already closed. Bremen is a very fine and large town; we were told it contained a church for the catholics.

After travelling a mile we passed by Delmerhorst, continually in a bad country, nothing but heath and sandy roads. Two miles farther we reached Villenhusen; we

left it at seven o'clock, going through a very unpleasant country, composed of heath and sand, and arrived on Friday the ninth, at three o'clock in the morning, at Klappenborg, all the inhabitants of which are Catholics. We departed at five o'clock, and by nine reached the village of Largning, where we heard mass. In this country they no longer conform to the old stile: the feast of St. Laurence was celebrating, whose mass was solemnly sung, accompanied by the organ.

We went afterwards to the town of Hasselune, thence to Lingen, and arrived on Sunday the twelfth, at two in the morning, at Nothoron, a small town, in which the Catholics, Lutherans, and Calvinists, each publicly exercise their religion. The post-masters of this country are not famous for their honesty; they asked us twice what they had a right to receive, and we were obliged to wink at their roguery, in order to get on. We travelled over heaths almost as far as Dolden, a large village, near which is a fine castle; there we came to a better country, as well in what regarded the soil, as its inhabitants.

When we passed Dolden, we perceived many castles, with fine avenues to them; notwithstanding there yet was a quantity of heath, on which they cut turf, which is almost their only fuel. We arrived at the gates of Deventer, which were shut, at midnight: we passed the night in the suburbs, and on Monday the thirteenth, at six o'clock, entered the town, which is pretty, neat, and apparently well fortified. We took fresh horses there, and departed at seven o'clock: on leaving it, we went over a handsome floating bridge of boats. The country afterwards was beautiful for two miles from the town: we then came to a very handsome and very large castle, a short time before we reached the post-house; afterwards a forest of beech, and immense heaths, without villages, until within a mile of Amersford, where the country begins to improve.

We saw there a great number of fields of tobacco, and several very long buildings for drying it. We passed through the town of Amersford, which is handsome and large; the fortifications are not in repair. At midnight we arrived at Narden, as pretty a town as possible to be; its fortifications are respectable; it is separated by several canals, over which are bridges. We continued our road along a canal until we arrived at Amsterdam, on Tuesday the thirteenth, at nine in the morning.

We had again the pleasure to meet with M. de Maupertuis; he had only arrived the day before: the wind for a long time had been adverse on his passage, and the vessel had been tempest tost. The rest of the day, and the succeeding one, we employed in examining the city and the port. Wednesday the fourteenth we embarked in a schuyt, where we were not very comfortable till we arrived at Leyden: we there took another boat, much more commodious, and more clean; and again another at Delft, which conducted us to Rotterdam. All these towns are elegantly handsome, and yield nothing in neatness to Amsterdam.

The banks of the canal are adorned with magnificent houses, and very fine gardens, particularly opposite to the Hague. On one of the bridges of Rotterdam is the brass statue of Erasmus, dressed as a Cordelier, holding a book in his hand. The vessels seen on every side in this town, on the canal, and on the river, offer a very fine spectacle.

M. de Maupertuis hired two calashes to continue our journey. Friday the sixteenth, at two in the morning, we crossed the Meuse in a large flat-bottomed boat; at nine we passed the Scheldt, at a place where its waters are stopped by three fine locks, which serve to let down into the canal the barks and small vessels with which this prodigiously wide river is covered. Near the locks there is a very large lanthern at the top of a mast, with a ladder to go up to it.

We sent back our calashes on arriving at the banks of the Scheldt; and after passing it we met with fresh ones at Mordyk, which carried us to Antwerp, where we again changed our carriage: we there hired a large coach, which would hold eight persons.

From Antwerp we had the best road possible, well paved, straight, and planted with trees on the sides; afterwards beside a fine canal, which we passed by a bridge, on coming nigh to Brussels. The side of the canal towards the west is adorned with country houses, and magnificent gardens, where fountains are seen playing, and very high and well cut hedges.

On Saturday the seventeenth, at seven o'clock in the evening, we arrived at Brussels, whence we followed the customary road to Paris, where we arrived on Tuesday the twentieth, at eight o'clock in the morning.

M. de Maupertuis went forward from Perenni; we proceeded to his house, and after resting ourselves, we completed our voyage by supping all together.

We arrived too late on Tuesday to complete our first duty, which was to go and render an account of our expedition to his majesty, the cardinal, and M. de Maurepas. On Wednesday the twenty-first we all proceeded to Versailles: we first went to M. Le comte de Maurepas, who received us in the most kind manner; he presented us to the cardinal minister, and afterwards to the king. The cardinal observed to us, that the perfect union which had reigned among us during so long a voyage delighted him extremely. M. Le comte de Maurepas afterwards carried us home to dine with him.

It was scarcely possible for M. de Maupertuis to prevent the loss of some time, occasioned by the earnestness of so many friends. It was a week after our arrival before he laid the account of our trigonometrical observations before the academy; in which, on a large scale, he exposed the series of our triangles.

Friday the thirteenth of September we all went to the comte de Maurepas'; I took my leave of him, and returned to the bishop of Bayeux, to resume my former course of life.

A Norwegian killing a Bear.

TRAVELS OF M. ARWID EHRENMALM INTO WESTERN NORDLAND, AND THE LAPLAND PROVINCE OF ASEHLE, OR ANGHERMANLAND, IN THE MONTH OF JUNE, 1741.

[FROM THE HIST. GEN. DES VOY. XXV. 464.]

THIS work, translated from the Swedish, is perfectly new to foreigners, and the translation has been made for the History of Voyages and Travels: It will enlarge our knowledge of a country, which, though barren, and but a waste, is sufficiently near our civilized states to merit the attention of the reader. Should an invasion in Europe ever take place, it will, we have no doubt, proceed from those countries which we at present despise. The most indigent nations only wait for some violent convulsion, some rupture in Europe, to fall upon it from all quarters; and perhaps the Nordlanders will perform their part in this great revolution. We regard it as a mere chimera; because history does not present the same event twice, and that the past, we imagine, far from being an example which should alarm the present, is, on the contrary, the guarantee of our security; so does the difference of time and situation change the order of causes and effects. We confide in the political connections of Europe, which balance all its powers by one another, which give the faculty of foreseeing, and time to guard against, irruption. We trust in the progress of the art of war; in the security of fortresses; in the inexhaustible resource of fire-arms; in money, which creates numerous armies; in the multiplicity of states, which mutually thwart the enterprises and retard the progress of one another; in commerce, in fine, which, multiplying and mingling interests and wants, diverts, towards labour and industry, that restless and furious activity of men, which formerly inclined them to war. But is not the invention of fire-arms favourable to the northern nations, whom nature has furnished with iron, to conquer the land? Citadels, which may prevent surprise, will they bear against famine and devastation, with which it is easy to surround them? The gold which pays the troops, will it inspire them with courage? If it serve for defence, will it not be an allurement for attack? All the riches of the new world, which flow in three or four channels of Europe, do they not invite the inhabitants of the north towards the south? May not the connections of powers hasten the revolution they are destined to prevent? Would not the preponderance of one of these northern confederacies bring on the fall and ruin of the equilibrium? Would not each petty member unite with the greatest, with the strongest, to complete the destruction of the whole body? Does not commerce point out the way to conquest; does it not inspire temptation? What but a ten years war in Europe is sufficient to deprive the richest powers in America of their colonies? Why assure ourselves that these, at the least shock of the mother country, would not throw off the yoke of the power which oppresses them? To what purpose serves the commerce of the two Indies, but to enervate, perhaps even by the riches it yields, the nations who have seized on it, to the exclusion of all others. The northern nations, full of vigour, with their forces united, would fall upon our southern countries. They are open to invasion by the passage of the two seas, which at present form the path of all countries; by the effeminacy of the only inhabitants who have interest, without power; by the misery of the only inhabitants, who have power, without interest, to defend the state. What, when Rome possessed all the riches of Asia, and all the strength of Europe; a discipline unique; a nation trained up to war by the conquest of the world; nations which it had enlightened and civilized; laws, arts, knowledge, and enjoyments, which should have rendered it

dear to the extent of its dominion; even at that time it lost all, beheld every thing sink under its feet: in less than two ages, the barbarians seized on all its western conquests, arrived at its gates, overturned its empire, annihilated its power! And we dare to hope, that with all its vices, and without its resources; without spirit of union and patriotism among the principal families of each nation, all debased or corrupted by the servitude of courts; without any political link between the people, who, by turns enemies and allies, know neither the interests nor sentiments which should unite or divide them; without attachment for a land, in which the soldiers who defend it possess nothing, where all the fundamental bands of society are relaxed by the licentiousness of the manners, and by the fatal necessity of a celibacy, which luxury ordains, though proscribed by nature; we hope that, in such a situation, the nations will not dare nor be able to attempt any thing? Slumber in indolence, ye that are born to slavery; it is of little consequence to you, into what hands your chains may fall.

In the mean time let us consider the land, we idle contemplators, who can only think, without acting; we, whom the spectacle of the vices of the age and our native country strongly repels toward regions, dreary indeed to the sight, but consolatory to the mind. Let us follow an enlightened traveller, who seeks, in the ruins and the deserts of nature, the traces and hopes of socialness: he is an academician of Stockholm, who has visited regions, where the liberty which reigns in his country might give rise to culture, and correct the defects of the climate. This journey will not be found the least instructive of this volume, nor of the whole collection. Let us give the traveller leave to speak for himself; permitting ourselves to add and blend our reflections with those with which he has embellished his work.

I acquit myself of a duty, by presenting the observations I have been enabled to make in my journey to the academy * which had countenanced it: whatever good it will meet with will be the least of the happy fruits it has produced; what defects and errors will be seen, only belong to the most useless of its members.

Before commencing the description of the province of Asehle, which is the principal object of this journey, let me be permitted to say a few words of the country which I have traversed, with my faithful companion, the baron of Cederhielm.

The road leading from Upsal to Flædsund is divided into three branches, towards the south, the north-east, and the north-west; the latter, which conducts to Old Upsal, extends in a line so straight, that on departure the extremity may be perceived. This road appears to me the image and emblem of the order which should reign in all our ideas, whether of speculation or of conduct, and be directed towards the utility of man. The studies of the learned, the enterprises of the politician, conducting to the same end, ought equally to concur to the happiness of society; all which does not lead there deviates from the paths of nature and of truth.

The country, extending for two miles and a half from Upsal, presents a soil nearly all argillaceous, or fertile, whether in the cultivated lands or the meadows, without any other wood than juniper-trees, which are regarded by skilful economists as a sign of fertility. This land, which has never been manured, and which is but indifferently cultivated, produces sufficiently good crops, with a certain abundance. The pasturages furnish a turf, which might make useful fuel. If trees were planted along the hedges, the flocks would find shade to repose in the night-time, during the long stay of the sun in summer, and the peasants wood, in the winters still longer. Great conquests would cost more to Sweden, and yield less, than the knowledge and cultivation of the good lands

* The Academy of Sciences of Sweden.

of that kingdom. It is high time that man, who has ravaged and depopulated the earth for ages, should at last endeavour to fertilize it completely, and to cover it with inhabitants.

The road leading from Læbi to Ghefle is bordered with a land producing nothing but firs; but if peace continue long, these trees, yet young, will become of great utility to navigation. This district, however, possesses villages, the fruits of cultivation, and exhibits some fertility. The sand of this soil is covered, in some places, with a bed of black earth; but this bed is of such little thickness, that it is more prejudicial than advantageous to burn the fields, in order to render them fertile.

No land is entirely useless in the eyes of an industrious economist. In these countries, almost deserts, the intelligent cultivators have left the hills to be covered with woods, while they have distributed the plain into fields and pasture lands. Here are found fields of a sandy soil, which receives fertility by manure; lands, a mixture of sand and argil; and soils of pure argil: beneath the beds of sand there must be a bed of argil, of the same nature as that of the vallies.

At two miles and a half on this side of Ghefle we crossed the river of Dal, which proceeds from Dalecarlia, and passes to the manufactory of Avesta. Near this passage we saw a fall, or cataract, which, we were told, is the strongest of this river. At that place two islands divide it into three arms, which form three falls; that on the east the steepest, and four fathoms high, falls from four rocks, which increase the rapidity: the two other cascades, the one more feeble than the other, are little remarkable, and sometimes fail of water.

Below these falls the shores of the river are of a bed of sand, which at the depth of two fathoms covers a bed of argil. The annual increase of the waters in the spring raises up the sand, and transports it to the bed of the river, where there are formed moving banks, from ten to twelve feet in height: the ice of the river breaking up also detaches the sand, and augments the banks of the river at the expence of its shores; thus the shores are undermined, and its channel lessened; the lands become the prey of the waters, which should nourish them. An attempt might be made to dig the shores of the river when the waters are low, and to plant trees, which would protect the lands against the inundations: the river, then compelled to run in its proper channel, would soon destroy the banks of sand which time has accumulated. It would become navigable; and posterity would bless the generation, who should have thus prepared for the welfare of its descendants.

It would be the means of deriving fertility even from the bosom of this river, which consumes the countries that it waters, to dig in the argil, or the rich land, which is buried under the sand; the two mixed together would enrich the fields. This work might be attempted during the summer; it would often be laborious, on account of the depth of the sand. But there are places where the argil, lying very near the surface of the earth, would reward the labourer for the pains which this method of fertilizing his land would cost. Thus the river Dal, which, besides very full of other fish, furnishes great quantities of salmon and lampreys to the inhabitants of its shores, would also become a great resource for agriculture. There are few countries where the waters do not offer to man more means of subsistence than it deprives him of: the torrents, which ravage in winter, water the lands in summer. The great rivers, which desolate their shores to the right and left, moisten the lands far distant from these same shores, which they never cease to overflow. The sea, which exercises over the globe an eternal and insurmountable empire, receives men and nourishes them, when it has dispossessed them of their lands, or transports them to countries which it permits to exist, during some

ages, on their foundations. Holland, China, the commerce of the whole world, the fishermen of the north, and of all the savage islands, every thing demonstrates that the sea, notwithstanding its deluges, inundations, and shipwrecks, is yet an element more bountiful than terrible.

All the country is sandy from Elfcarleby to Ghefle; at that place Upland ends, and Ghestri-Keland commences. It is impossible too much to admire the road leading to that province across marshes; or to be weary of beholding the manner in which human industry has furnished it on both sides with a rampart of flints, which protect and border it like walls; at the price of what labours the inhabitant of an inaccessible country has been able to open these means of communication, which compensate for the avarice and the ruggedness of nature!

Ghefle is of no great compass; most of the houses are built of stone and wood together; the streets are narrow, and sometimes crooked; the market therefore, for want of outlets and openings, has no fixed place; it is even held in the streets, which it incumbers, an inconvenience still more grievous in great cities, where carriages and equipages are multiplied by luxury. But Ghefle is recompensed for this inconvenience, inseparable from its smallness and construction, by innumerable advantages, for which it is indebted partly to nature, and partly to industry. It is situated at the extremity of a gulf, which the sea has formed half a mile in the land: the vessels are sheltered there from the rocks and breakers, which beset the coasts of Sweden with dangers: large vessels, it is true, cannot anchor in the harbour; but as the town is traversed by a river, this establishes a continual intercourse between the magazines built on its banks, and the merchandise unloaded or embarked at the port. A crowd of small boats carry on this communication. A machine, which serves to carry off the mud, never ceases clearing this channel of navigation and commerce. Ghefle is a commercial and manufacturing town, rich and populous; all the mechanics profit, all the inhabitants labour. This town, happily situated between the sea and the mountains, serves as a magazine to the whole country, stamps a great value on its mines, and scatters abundance throughout its lands. By the mediation of this port, the copper attracts provisions, and the provisions occasion the exportation of the copper: the manufactures serve as vehicles for this commerce. Under a heaven which only yields snow is seen a bakehouse of sugar, a production which only thrives under a burning sky; this manufacture is without the town; within is a manufacture of tobacco, another production of the torrid zone. But what occasions one of the smallest cities of the north to flourish in an extraordinary manner, is a school for the thread and linen trade. The principal citizens send their children there, as well for their own advantage, as for an example to the people, who find in this school a certain resource for the maintenance of their families.

I cannot conceal the sentiment of joy with which my soul was affected at beholding an establishment so patriotic, so founded on humanity. The great quantity of flax which grows in this country, and the laborious and careful character of the women, united with the moderate price of provisions, cannot fail rendering the manufacture of cloth very advantageous, by increasing the cultivation of flax, so natural to lands which produce little else. The manufactures of which the materials are foreign are not near in so great a proportion; yet the bakehouse of sugar, established at Ghefle, is of great benefit. The proprietor, who prepares five thousand pounds of sugar weekly, supports many men by this labour. The first who opened this branch of industry was compelled to buy of foreigners sugar-loaf moulds, for the value of twenty-four or thirty thousand copper crowns. But the love of gain has occasioned the discovery in the country itself of an earth sufficiently fine for these brick moulds; and the inventors are enriched, as

well as their country, with all the money which would have gone out of it without this discovery. Virtues, as also vices, whether in morality or politics, never go single; one branch of commerce has given birth to others. Happy the countries whose inhabitants love labour, and endeavour to procure it by their ingenuity! When the material of the manufactures is at a great price, and the return of the great advances slow, the workmen are long idle, for the enterpriser will not overcharge himself with merchandise. In the uncertainty of gain he avoids hazard, or makes it fall on the purchaser, by raising the price of these articles: from that time he diminishes the consumption, and leaves unemployed a great many hands, whom often he has taken from agriculture, to which they no more return. Such is the inconvenience of manufactures of luxury. Those of Ghefle are not liable to it: the two thirds of its inhabitants, which industry or commerce does not occupy, are employed in fishing; and even the peasants have recourse to this business, when the earth is not sufficient for their subsistence.

The rich people possess in the town a school, and a small college, with six lecturers. Children, to whom nature has given genius or taste for the sciences, may there acquire sufficient theory to perfect the practice of the civil arts.

Ghefle is the residence of the governor of Western Nordland, which comprehends Ghestri-Keland, Helsingeland, Medelpad, Jemteland, and Anghermanland. There was formerly a small castle, which the government have not possessed the pecuniary means to rebuild, but which, nevertheless, would ben ecessary to protect the town from any insult.

In Ghestri-Keland nearly all the peasants live with comfort; they dwell in houses tolerably well built: it is because they are citizens of a country where their class is an order of the state, a body respected by all the others, as the most numerous, the most powerful, and, above all, the most useful, in the views of nature. It is not inquired in Sweden whether it is proper to give propriety of lands to the peasants; they have it, and they cultivate them, because they are in possession of them.

The inhabitants of Nordland are more active, laborious, healthy, and strong, than those of the south of Sweden; they receive strangers with much more affection, if they are not importunate. Most of the Nordlanders paint the interior of their chambers, to enliven their abodes, which the climate renders dreary. They are cleanly in their dress, and also in their food; but their nourishment is not very delicate: cheese and butter are sufficient for the simple inhabitants: they eat barley and oaten bread in scarcity of rye, which is observed to decrease, both in quantity and quality, the farther we advance north. But the vices which exist in the south are observed to diminish in the same proportion: travellers are there as safe as the inhabitants, without locks or bolts. Beggary is very rare, because idleness excites no pity; but the wants of old age and infirm indigence are supplied by the social affection which unites families. The duties of kindred, the sentiments of friendship, have no reputation, they are so common: little falsehood, and no oaths. The candour of youth is perpetuated in the uprightness of old age: there are no vices between these two ages, which wither the flowers of the former, and the fruits of the latter. The picture of these manners, worthy the pencil of Tacitus, is not a mere fiction.

The peasants of Nordland are excellent cultivators: meadows are the mothers of fields; they are acquainted with this rule of agriculture. In order to obtain the best grass, they every year cultivate a portion of their pasturages: the first year they sow flax without manure; the second, barley, or mixed grain; the third winter they cast dung on it, especially that of the horse; they afterwards plough this field, and in the spring sow oats. When the harvest is got in, they again appropriate this land to

meadows, and change the land of men into what they call cows' land: the grass, rich and abundant, which they derive from it for seven or eight years, pays them with usury both for their manure and labour. These large meadows are intersected by hedges, where each peasant proprietor has his barn: the fields, in the same manner, are divided into as many partitions as there are families or cultivators; these latter commonly only sow the argillaceous lands, which may reward their pains.

If this country possessed more inhabitants, it would become more fertile. I have seen many places capable of cultivation, and much marshy ground, which might be turned into excellent meadows. Not merely that on the heights there is found much stony sand, which, scarcely having an inch of rich land, would not be worth the pains of clearing the wood. But good crops might be drawn from many vallies, covered with herbs, which grow naturally amongst birch and oziers: these trees are of a green, and vigour which indicate a land fit for cultivation.

The products, as well of the land, of the commerce of grain, the fishery, the flocks, of which they sell, the milk and butter, mines, manufactures, and especially of those of flax, pay for their subsistence, and the imposts of Nordland. In the west of this province they also collect hemp, of which they make sails. They are inferior to those of Stockholm; but if they are not sufficiently strong for vessels, they serve at least for barks, and to make tents and sacks.

The peasants of Nordland have procured a species of cows, which are small indeed, but yield a great quantity of milk, a profit for which they are indebted to the assiduity of their cares, and the quality of their pasture lands. They have excellent hay; and the straw of the grain they sow is better than that of rye. They are careful during the summer to collect leaves of birch, alders and oziers, which they dry. They mix them in the winter with the bran of their grain, in hot water, and fill large tubs with them, which are in the stalls of the cattle.

The forage of the meadows is reserved for the winter. Thus during the summer the Nordlanders lead the cattle, far from their dwellings, into kinds of stalls, or they leave them at liberty to graze on the environs. Some of these pens are common to whole villages: some belong to particular families. A peasant has in his fold one or several chambers, where he dwells, prepares and keeps his milk food. These folds are established in the midst of the woods, at places where there is tolerably good grass. These uncultivated spots are by degrees changed into meadows, fields, and gardens. The cattle pass the night in these grounds, when they would prepare them for tillage; or else they carry the dung there from the stalls.

In each family the greater number passes the summer with their cattle. During that time they prepare the fallow ground, by burning the woods and heaths; inclose fields; they till them, gather the little they have sown, spin, and make cloth. At the time of the hay harvest they all go, men and women, to reap and gather in their crop.

The Nordlanders have many goats, a cattle easily bred up; but few sheep, the wool of which is too coarse to repay them for the trouble it costs. The swine, nearly all the summer, seek their food in the woods. They are only seen in the winter in villages, where they are fed with bark of trees.

The peasants dwelling near the mines are those who may possess the greatest number of horses: but they have scarcely one for nine cows. These horses are at the most four feet and a half high. The finest are those which were left by the Finlandish regiments of cavalry in Nordland, during the winter quarters of the war preceding 1740. In proportion as we advance north, the horses decrease in size and strength. Those of Western Nordland are of a singular form. They have the head and eyes large, small

ears, very short neck, full chest, strait ham, the body of little length, but large, short loins between the tail and the belly, the upper part of the leg long, the lower short, the bottom of the leg without hair, the hoof small and hard, the tail large, the hair thick, small feet, sure, and never shoed: they are good horses, seldom restive or obstinate, climbing up all the mountains. They owe their strength to the excellent grass on which they feed. The odour of clover announces fine meadows from afar. When these horses are moved to the pasture lands at Stockholm, they seldom pass a year there without growing lean, and losing their vigour. On the contrary, the horses which come from more northern countries into Nordland, though sick the first year, recover their strength. But on the other hand, stallions brought from a more southern climate would here degenerate, perhaps at least in size.

From Ghefle to Hernosand, we never lose sight of the gulf of Bothnia, which by its fishery might support the inhabitants of its shores; but there are also found in the midst of the woods, lakes, some of them extensive, others smaller, which abound in large fish, and of good flavour, such as pike, bream, and perch. These lakes are bordered with verdant shrubs; they flow in small vallies, which they clothe with grass, and often form, by their union, rivers, in which salmon is found. Most of these lakes are in elevated situations, and their waters turn many mills. The trees of this district are tolerably good in some places, and fit for timber-work, but, in general, small, weak, old, and overgrown with moss.

There is but a single peasant's house between the inns of Hammarangria and Skog, which are at the distance of three miles from each other. It is situated by a lake abounding in fish, near the bridge thrown over the little rivulet separating Ghestrikeland from Helsingeland. The peasant who dwells there possesses lands, which, bordering the highway for the space of a mile, extend half a mile into the country. A wood to the south serves in common for the parish of Hammarangria; a wood to the north serves in common for the parish of Skog. Each of these woods is a mile and three quarters in length, and one in breadth. This country only wants men. Although the whole extent of this road is covered with sand and aged firs, at intervals there are seen lakes and vallies, clothed with herbage and wood. Nature is ready to assist cultivation.

From Skog we proceed to the river of Saderahl, where is found a ferry-boat. This river merits attention. It yields a very considerable salmon fishery. It serves to transport to Soderhama the iron which is worked in the mills it turns. Every thing which contributes to the subsistence of man, to the relief of his real wants, ought to interest him. The iron mines of Nordland do not present to the imagination of the reader those torrents of blood and carnage, with which we see the mines of gold overflowing, in the deplorable history of the New World. Man, born good and virtuous, delights to travel, at least in imagination, into these barren countries of the North, which, existing under a free and patriotic government, do not repel the heart by scenes of crime and vexation, engendered by one another. Nature there is sad, and even harsh; but there man is not malevolent; man, who nearly over the whole earth occasions the woes of his kind.

The soil of Helsingheland is similar enough to that of Ghestrikeland; equally stony, more barren, overspread with steeper mountains. Helsingheland has besides a mixture of every kind of soil; gravel and sand which produce firs, rich and firm argil, marshes, miry plains, black earth; in fine, it is intersected with lakes, of which the bottoms are sometimes sand, and sometimes mud. In the district where the road borders the sea, there appear to have been woods fit for timber work, but they have all been cut, and

no more is seen than pines, and woods of which the blackish verdure is eternal, like the sadness and melancholy which it imparts.

The difference observed of one province from another is composed of insensible shades. It gradually augments and diminishes. Nature does not proceed by leaps: all her works form a chain, the links of which are imperceptible to the eye which regards them the nearest, while the vulgar eye only sees in the picture of the physical or moral world strong and sharp colours, which diversify it, without observing the intervals where they mingle and ground with one another. The people vary but little, like the climate and soil they inhabit. A sudden difference is seldom seen between neighbouring nations. Yet, in the same manner as the constitution of our bodies depends on our food, the method of thinking and acting is the fruit of education, example, and custom. The government, which may be termed the education of the people, modifies the natural disposition of the mind and body, and sometimes derogates, by transient variations, the constant law of the climate. But as the policy of states has little influence in Nordland, nature alone has there formed the constitution of the men.

The inhabitants of Helsingheland are of thick stature, with large limbs. They are vigorous, industrious, and expert in the mechanical arts. Their culture differs from that of the environs of Stockholm. All their lands are sowed with spelt, excepting one or two acres intended to produce rye. These latter are first lightly ploughed in the spring; but they undergo several operations in summer. The harrow is passed over them eight days after the plough or mattock. The land fit for rye, which is so rank as to produce many tares, requires hard labour, but short, and little expensive, because it does not extend far. Flax is sowed in the lands prepared for the culture of corn, in untilled land, and in argillaceous earths, where it greatly thrives.

The dung is not conveyed, either during the summer, because the corn is then standing, nor during the autumn, because the cattle graze the stubble, but in the spring, because in that season the cold is not sufficiently strong, nor the sun sufficiently hot, to dry up the moisture of the earth. The dung is then of greater bulk and less weight. It is spread at several different times, and in thin beds. The manure does not so soon loose itself in the sand, and the rain much better dissolves the salts. But the dung and the lands are often burnt, in the idea and hope of increasing the fertility.

When they reap, the sheaves of corn are never placed upright in the fields. But if the weather is serene, several sheaves are arranged in crosses on one another, which are pierced through, and fixed to the ground by a stake six feet in length. When the wind has blown for two days on these sheaves, during very dry weather, they are carried into the barns. But during cloudy or rainy weather, they are laid up in a machine called a *hassior*. These are vertical beams, through which pass cross bars; these beams are often composed of two pieces fastened together with oziers, to raise or lower the cross bars at pleasure. The sheaves are spread on these bars. The lowest is a little raised above the ground. A bed of corn-ears is placed on it, which is fixed by the second bar, which presses it. This latter supports a second bed, fastened and pressed by a third bar; and this heap of sheaves is thus raised to the height of four or five fathoms. Under the bar which supports the first bed from below is placed a pole, fastened at one of its extremities, with an ozier, to the second bar from above. At the other extremity is a hole, and through it passes a cord, by which the whole mass is raised, so that a man cannot reach it; this pole perhaps raised from one extremity of the hassior to the other. The whole heap is covered with straw. The corn thus collected is left under the roof of the straw, for any length of time, and in all weather. Beyond Hernosand, towards the north, the hassior serves as a granary, not only for corn, but to dry and preserve the hay.

The hay harvest lasts longer in these northern provinces, than towards the south, though both men and women labour. In Helsingheland, the hay mowed in the morning in the evening is placed in small heaps. In other parts it is spread in beds in the barns, where it is left to dry, before it is laid up. In Angherman-land it is kept in the hassiors, which are by the side of the meadows, until the approach of winter.

Formerly the fields of Helsingheland were not inclosed. At present they more resemble gardens than fields, by the moats with which they are surrounded. Their economy proceeds so far as to draw all the herbs from these ditches, which are left to rot, to make manure. Green turf and peat equally serve for this purpose. This manure prepares the lands for the sowing of the corn.

The corn has two plagues to dread, frost and mildew. This latter stains the ears with a dusky red; but it only blasts the corn near the mines. The fogs of the morning and evening, so destructive to corn in many countries, are salutary in Nordland. On the other hand, the serenity of the nights sometimes occasions scarcity.

In the months of July and August we often experienced a hot day and a cold night. We felt a very sharp cold, especially in the vallies covered with wood. This might perhaps be a reason for clearing the country of all the useless wood. The naked lands, and the open heights, are less exposed to the cold. If the land were more cleared, it would increase in population. The rye thrives well in those parts where the wood has been burnt. The ears of corn I have seen were full and rich; the straw strong. But a small number of inhabitants cannot undertake an extensive cultivation. New colonies must be established in these desert districts, or at least the number of families and houses should be increased. But new farms are not formed, because the lands are never divided. A father of a family is only succeeded by one of his children; all the others, having no share in the estate, rather choose to become mariners.

Yet if they remained in Sweden, they would be of essential service to the state. But after having been trained to the sea in Nordland, they often engage at Stockholm, with vessels which sail to distant countries. The allurement of a greater recompence occasions them to lose sight of their country: they serve foreign nations, and seldom return to Sweden. In vain do the laws forbid them to leave their province; interest prevails, both over the wisdom of the regulations, and the vigilance of a few magistrates, who are unable to manage a country too extensive. The ordinances which limit the rights of a free nation are never observed, when they would detain in a land, but thinly peopled, men who have no share in the possession. They have no native country, who possess no land. A country is in fact only peopled in proportion to the number of its proprietors. Artizans, sailors, and soldiers, belong to any country who can afford to pay them. Man properly only belongs to the land which belongs to him. Mankind is increased by lands. All other methods of population are precarious and transient.

Nordland has still more occasion to attach her inhabitants by possession, since the soil is more unkind. The dales are scarcely inhabitable. Most of the villages and parishes are situated on hills. The cold of the climate, which permits but little cultivation, and occasions frequent scarcity, compels the Nordlanders to live, not on acorns, which nature denies them, but even on the bark of trees. From underneath the thick rind of the fir they take a white cuticle, covering this wood, dry it, first in their hassiors, then in the oven, and reduce it to flour. In fruitful seasons it feeds the swine, and makes them become very fat. But in time of scarcity, the rich people mix this flour with barley, and the poor with bran, and make a kind of bread. It is dry, and rough

to the palate; those who eat it, are neither less healthy nor vigorous. Perhaps the cheese and butter, with which they season this hard and insipid mess, may supply the want of substance and moisture. Beholding on one side the treasures and crimes produced by the torrid zone; on the other the want and peace which reign towards the frozen zone; we are at a loss for which we should be most thankful, the prodigality or avarice of nature! Happy are the countries, where she is neither so harsh as to compel men to war, nor so liberal, as to dispense with labour. Such is the situation of Nordland.

At the distance of half a mile from the ferry-boat of Sæderahl, towards the north-west, is found the linen manufactory of Flors. We saw children of the country, who had been at the business but three or four years, working with all the confidence and address which might result from a long experience. Here are manufactured fine and coarse cloth, thread stockings, night-caps, damasked table-cloth, as fine as the foreign. Yet it is complained that the works of this manufactory are of unequal texture, and little duration. This defect arises from the inequality both of heat and humidity, which reigns in the rooms where they work. Each workman leans his loom against a window; the exterior air is often moist, while that of the room is hot. The air which then enters at the crevices of the window meeting the nearest threads preserves them in their full length; and those which are farther in the chamber dry and contract. The warp therefore becomes unequal, shorter at one of its extremities than the other, and breaks when worked. It must often be renewed, and the cloth in consequence is weakened. When it is used, the change of dryness and humidity which it experiences, giving an unequal tension, occasions it to yield and break.

The hot water which is kept in these rooms might give a temperate heat, and the vapour arising from it might preserve the threads in nearly an equal degree of tension. But the sun, whose light is requisite, shining on one side of the room, still occasions inconvenience. To remedy this, M. Bennet, the director of this manufacture, has buried his shop in a sandy eminence, and constructed a large parapet, raised to the windows, made of bark of trees, moss, heath, and everywhere covered with green turf. By these means he gives a moderate degree of humidity to his rooms, nearly everywhere equal, which must produce the best works. If the manufacture of Flors had not been placed in such skilful hands, it would have fallen into discredit, from which the greatest expence could have raised it again but extremely slow; since it is not more easy to restore fashion to articles, than reputation to men.

Thanks to the cares of an industrious administrator, I have seen in the bleaching yard of the manufacture of Flors thread as fine as that of Holland. The method of sowing the linseed in the environs is the same as formerly. But this manufacture has inspired them with desire, and afforded them the means, of cultivating flax proper for fine works. They have learned the art of making the flax and cloth more quickly, and rendering them extremely white. When the inhabitants of a country are able to improve the gifts of nature, to procure themselves a livelihood, which affords greater comforts, at the same time that it requires more labour; when the increase of industry ensures that of fortunes and families; a commerce more extended, the means of subsistence multiplied, agriculture brought to perfection, a general activity, a more universal prosperity; this moving spectacle fills the heart of a true patriot with a lively and unaffected joy, with love for the labour which produces all these benefits, with zeal to employ his talents and power for the happiness of his brethren. A happy and contented people is never beheld without a delightful emotion, which makes us rejoice in our existence. We do not contribute to this public felicity, without gathering ourselves the

first fruits. How is it possible there can be princes and ministers on the earth, who do not enjoy this foretaste of the immortality reserved for their labours!

The manufacture of Flors spreads industry and fertility around it. In its eastern environs, which border the sea, few families are found, either rich or poor, who are not occupied in making spinning-wheels and looms. This labour procures them the means of living tolerably well, notwithstanding the dearness of the corn they must buy, and their objection to pay a tax which is well administered. The town of Soderhamm, which is a mile and a half distant from Flors, feels but faintly the influence of this manufacture. It is small, situated between two mountains, on the banks of a rivulet. Few houses are seen, which are better constructed than those of the peasants around it. To paint them would be an idle luxury. The inhabitants only labour in order to subsist. The works of their hands clothe them, and their food would be little relished elsewhere. But the method of spinning and making cloth they have brought to perfection. Commerce would thrive well, if the town were not too far from the sea. Yet fishing, the common resource of all the Nordlanders, a little agriculture and gardening, in a soil which produces with difficulty, contribute to support its inhabitants in that state of mediocrity, which leaves nothing to wish for, nothing to regret. These men, who lead a life of innocence, are besides employed in the manufacture of arms, for the chastisement of vicious nations.

The forge of Soderhamm is the most ancient of the kingdom of Sweden, and at present the least excellent. Yet there is seen a handsome pump, which is worked by means of a single wheel; a simple and wonderful invention of Polheim, a man of great talents in the most useful arts.

Soderhamm is besides remarkable for the church of Ulrica Eleanora, a tolerably good building. It has some ornaments of wood, as its dome, sufficiently tasteful, though little expensive. As a man is allured even to piety by the senses, an organ has been constructed in this church, and I can affirm that it will be one of the best in Sweden, for strength, harmony, and purity of sound. When I saw it, besides the ordinary tones of an organ, it produced those of a woman's voice, and German flute: the latter was so accurate, that the ear was completely deceived. The name of the artist who constructed this organ is Daniel Strale. This man deserves to be much more known, since he is unaffected in his manners, mild, without any arrogance, and without that spirit of cupidity, by which intriguing men obtain the reward of the inventors.

Helsingheland extends to a village two miles to the north of the inn of Gnarp. On this road we meet with nine or ten villages, and some lonely houses. In several places of this road we observed those stones called *lapis violarum spurius*. If intelligent miners were sent to these districts, they would no doubt find mines; and this discovery would be extremely useful to the proprietors of the smitheries established in the environs. It would even increase the number of mills with much greater facility, since the whole country abounds with woods and water-falls.

Between Igghesunid and Sanna I saw, on my journey, the town of Houdwikswald. It is situated on a small tongue of land, stretching between the sea and the lake Houdwik. It has a very good and deep harbour. Its inhabitants are employed in fishing and the mechanical arts. They manufacture in particular a great number of wooden chairs, which are transported to Stockholm. Every town which labours for the capital deserves some fame. The smallest branch of industry is interesting, in a country where nature offers few means of subsistence. It is pleasing to see the men struggling against the cruelty of her denials, endeavouring by labour to avoid that insignificance, from which she appears to have drawn them with regret, to involve them quickly

again. Where the earth is sordid, man is the creator; where the earth yields every thing, man alone is nothing.

On the road leading from Ghefle to Sundswald, I observed some hop plantations, on hillocks exposed to the sun. Beyond Sundswald, the only plantation I saw was by a small house situated on the Niouronda. Perhaps these are the last efforts of a land, which, removing from the sun, sinks into the obscurity and solitude of the frozen zone.

When we passed through Gnarp there was a little fair. We saw merchants enough, but little merchandise. This parish is the mart of the towns of Nordland. All commerce is carried on there by reciprocal exchange. The peasants come to pay for the merchandise they have taken on credit; they acquit themselves by provisions. This species of commerce, by exchange, is universal throughout Nordland, although the merchandise is not every where the same.

The peasants, who in winter have occasion for corn, tobacco, or clothes, in spring and summer for salt, iron, and even money, to pay the taxes, borrow what they want of the citizens. When their fortune and credit warrant their solvency, they lend them what they require, on condition of re-payment at the first fair, at the current price of the place, in butter, cheese, meat, fish, flax, cloth, stockings, pitch, and tar, and sometimes in planks. But if they are little known, the price of what they lend is fixed before hand. The opulent people, who repair to the fair to sell, proportion the price of their merchandises to the want the purchaser has for them. Those who pay ready money for the commodities they purchase for the maintenance of the whole year, might sell these for a greater price, which they would not be obliged to give in return. But the citizens never buy of a peasant, who sells to any other but his confidential merchant. The latter, on his side, never buys any more of the peasant, who does not confine to him alone the whole of his commerce, and endeavours to injure the merchant who succeeds him.

It is a species of monopoly; but it arises from the Nordlanders being compelled to bring the produce of their land to Stockholm, and to derive all their consumption from that city. The government will no doubt correct these abuses, and render the commerce of the capital more favourable to the peasant. The higher class, whose interest it is to participate in every kind of riches, will be enabled to trade, in proportion as the population increasing in the countries will stock the towns with real dealers, and particularly mechanics.

Example has more effect than rule. The inferior classes imitate the higher; and villages are modelled after cities. Let manufactures be established at Stockholm, and the provincial towns will bring their industry and commerce to perfection, in imitation of the capital.

From Helsingheland we pass into Medelpad. The first object which meets the attention of the traveller is the river of Niouronda. It descends from Heriedale, deriving its source from the mountains; it is large and navigable. Its shores are bordered with large woods and rocks; few fields which admit of cultivation, and yet fewer which are tilled. Towards Sundswald, the land is sandy, useless to the inhabitants, and incommodious to travellers. Sundswald is situated in the midst of a plain, covered with barren sand, and surrounded by high mountains. A small gulf, extending for half a mile to the sea, renders this town extremely fit for commerce, affording to vessels the facility of coming there, and taking in their cargo almost entire. The exports from Sundswald consist in chairs, pitch and tar, planks, the bark of trees to make bread, works of wood, linen cloth, meat, and milk food. The imports given in exchange consist of corn, salt, tobacco, woollen cloth, spices, wine and brandy.

A dock for building of ships has lately been established. It might also serve for the provision of the salt of all Nordland. A manufactory of wool is also seen there, which is only in its infancy, but happily enough begun to increase and prosper. The sheep of the country have a coarse fleece. If the peasant were assisted by the advances of the rich proprietors, he would soon have flocks with fine wool. For this purpose it would only be required to improve the forages by culture.

The church of Sundswald is of wood, and very ancient, as are all the houses. Opposite to the custom-house a church has been constructed of free-stone, on a sandy hill. Its form is oval; the walls and roof are finished; but the dome, which is but half made, is every where cracked. The architect is a peasant of the vallies. But the workman is less to blame than those who have employed him. A good architect would say, that the dome has cracked, because the arch is too elevated, or too flat; or because the foundation lies in a moving and little stable soil; or that the building itself, without pillars, is too wide for its length. But I dare affirm that all these defects are there united. Besides, the walls are too thick, and the windows small.

The country to the north of Sundswald appears to be a little better cultivated than that towards the south. In general, it rather wants cultivators than fertility. The banks of the river Indahl, on the right and left, for the space of a league and a half, are deep sands, but fertile, and covered with a thin bed of black earth. Between two large neighbouring mountains are found many cultivatable lands, composed of sand and argil. In this prospect we observed a great number of alders thriving on the heights; they resemble nut-trees, in their leaves, bark, and wood; but they are a little larger.

We imagined we saw beds of argil, sometimes thick, sometimes thin, underneath the sand of the heaths we traversed. In several places we met with people who assured us they had found beds of argil, sometimes of the thickness of three fathoms, and sometimes of only a foot. The banks of the rivulets and rivers of the whole of this district are very much elevated, and the bed of argil lying under the sand may be distinctly seen. The sands appear to be the effect of a very ancient inundation. Most of the hills of sand are steep, and increase in height from south-east to north-west; while the rivers descend from the north-west to the south-east, towards the sea, which probably has formed the hills and rivers. Add to this observation, that there is seldom found in the vallies a pure sand, without a mixture of argil. The latter no doubt must belong to the nature of the soil, the former may have been cast there by the sea.

The woods of Medelpad, especially those through which the road lies, are nearly all cut or burnt. Few firs are seen, but many small pines and other shrubs. The country of this province resembles that of Helsingheland; with this difference, that we meet with more inclosed fields, and a richer soil. Does this advantage arise from the mountains with which the country is surrounded? We know that vallies and plains are enriched at the expence of the mountains, which are thinned by the torrents. Is not this land indebted for its abundant moisture to the number of lakes which water it? The pasturages are more fertile; the fields, more multiplied, remain unemployed for a longer time; the flocks are not led there, nor is there so much flax sown as in Helsingheland.

The men at Medelpad are large and athletic, more able, lively, adroit, and more addicted to commerce, than in that province. The cattle are larger, give more milk, assume a whitish colour, which gradually augments, so that there are very few at Asehle which are not white. Is this a quality of the same species of cattle? Is it owing to the climate, to the nature of the pasture lands? Or have the peasants chosen in preference white

animals? The climate is one of the strongest reasons. It has a singular influence on colour.

In the middle of the river Indahl, by the place we passed, is seen a very beautiful island, which has on each side a bridge, formed of flat boats: beyond and below this isle the river appears to be a thousand fathoms in width; it is rapid; it springs from the lake Storsion, or great lake, and receives in its course nine small rivers, which descend from the mountain. Beyond this isle are many water-falls: a mile below it runs into the sea on the east, which supplies it with salmon.

The province of Medelpad is separated by a small rivulet from Angherman. On entering this latter Hernosand presents itself, situated in an island surrounded by the sea, and joining the continent by a bridge thirty fathoms in length. This town, burnt by the Russians in 1719, like all those of Nordland, is composed of wooden houses and narrow streets. The south side is built on the declivity of a hill, extending to the sea; on this side it only receives lighters and large barks; but on the northern side the largest vessels may anchor, and load before the magazines. There are few inhabitants. Bodies of trades are useless here, for want of capital; and the college is of no benefit, in the want of occupations more essential than study. The women spin, warp, and manufacture cloth; though they succeed indifferently, it is one of their principal resources.

Nearly all the men fish during the summer: they salt all the fish they take, or sell them fresh to the peasants, who salt them for their use. When the birds of the sea collect together, it is a signal for the fishermen that the fish are not far off: the sea is immediately covered with boats and nets. Every society would have laws relative to its kind of life and property. The fishermen of Hernosand have a maritime code, according to which they are judged, by a particular council. All the inhabitants of Hernosand, excepting five or six, live on the product of their fishery or lands.

The lands are divided between all the citizens; they burn them, and sow them with rye; they have pasture lands, which they hire of each other on occasion, at a price varying with the abundance or scarcity of forage. Near a soil which they have observed to be fit for the bearing of flax, they have built in the town itself a manufacture of linen cloth. This establishment will become considerable, if we may judge from the situation of the town, the character of its inhabitants, and the nature of the soil.

The commerce of this country consists particularly in flax: it has besides, like the other districts of Nordland, a resource in the traffic of game, which it sends to Stockholm during the whole of the winter. In Hernosand there are factors, who travel in the summer to certain parts of Lapland, to buy, or exchange for brandy, all merchandise suitable to that town: these merchants travel farther than fifteen miles. They would render greater service to commerce and the state, if they employed themselves in tanning of hides, and preparing the skins of the beavers they procure from Anghermanland and Lapland: they would add or substitute the profit of the manufacturer to that of the dealer: the returns of their capital would augment in their hands.

The town of Hernosand is paved with a species of flint, which might be used as whetstone; but it is so common, that the commerce would not compensate for the expences. The mineral waters of the environs, very rich in ochre, form a more lucrative object. Hernosand has the advantage of being the residence of the superintendant of all Nordland, which is the most extensive and perhaps the best government in Sweden. But there exists an abuse, common enough in that kingdom, which is, that the superintendant possesses the prebends destined for the lecturers of the colleges, who never enjoy them: thus the patron becomes the incumbent; nevertheless, Hernosand without a college

would merely be a village. Indigence often reigns there, from the scarcity of corn, and the smallness of the product of the fishery: there are successive years, in which the earth and the sea are equally sordid. The inhabitants of Hernosand might remedy these defects by the resource of labour, if it were sufficient to be miserable, in order to become industrious; but they would have occasion for advances and encouragement. Perhaps the rich part of the community gains more by the poverty of the people than by their prosperity: at least it is a political maxim, sufficiently spread over Europe, to prefer the opulence of a small number to the easy circumstances of the people at large; and to divide society unequally into two classes, of which the one labours, and the other enjoys.

The commerce carried on by Nordland in dried and smoked meats is one of the most opposite to the prosperity of that country, however advantageous it may be to the citizens and peasants of northern Angherman. The butter and cheese are excellent in that country, and they have the cruelty to kill, in order to make salt meats, many shegoats and cows, which afford good milk; but like the boy in the fable, they would have all the golden eggs of the hen at once. If the labour and industry were directed by wise views, if the administrators of the states had immediately for end the public utility, and only employed as the means the wealth of individuals, the happiness of all the citizens would be the result of their operations.

We left part of our equipage at Hernosand, and we embarked on a large gulf near that town. We afterwards ascended the river of Anghermanna for eight miles and a half, north-west; at its mouth it is nearly a league in width; large vessels can only navigate to the inn of Hanmar, where the merchants and manufacturers have established a depot for the iron, planks, and other materials, distributed among the manufactories of this country. Beyond this magazine, which is five miles from Hernosand, flat-bottomed boats are used.

The fields and pasture-lands bordering Anghermanna are, for the most part, well situated, handsome and fertile, to the parish of Solett, where the land consists of a rich and fine argil: here we meet the first cataract of the river. This river might easily be rendered navigable for a much greater distance, by constructing a sluice, which would serve to raise the flat-bottomed boats to the level of the water-fall; but as this is followed by several others, only separated by short intervals, the number of sluices which would be required for the navigation of the river would incur great expences.

Near the fall of Solett, on the western shore of the Anghermanna, is found a low land, where it seldom freezes, while the elevated places are constantly frozen. Much farther to the south the heights are not subject to frost, and the low parts are commonly exposed. It may be presumed, from this singularity, that the nature of the soil contributes, as much as its situation, to the effect of the influence of the seasons.

Half a mile to the north of Solett the Anghermanna receives the river of Adale, which rises in the mountains, and issues by the Rock of Swans, near Kitschewari. In the parishes of Solett and Botea, a third part of the lands is every year left unemployed: the other two thirds are sown, half with autumnal grain, half with that of spring; sometimes they sow them only with the latter. The soil is rich and fertile; but without doubt cold, since the inhabitants warm the water they give their cattle to drink.

The country of the environs of Solett, which borders the river, is called Adal; the appearance is very pleasing: the shores are crowned with hills of a tolerable height, the declivity of which is insensible. These hillocks are argillaceous, and owe partly to art the agreeableness of their prospect, intersected with fields and meadows. The shores of

the Anghermanna are equally spread with straight and high hills, forming vallies nearly as deep as the bed of the river.

Its shores are also adorned and enlivened with smitheries, founderies, and saw-mills: but these machines are not turned by its waters; its swells are too strong, and its falls too feeble. Water-falls, of a surprising height, formed by the torrents which descend from the woods of Anghermanna, are the soul of the mechanism of the forges and mills.

The undertakers of the manufactures of this district derive their ore from Utoo, and the unwrought iron from other founderies: the expence occasioned by the transport of these materials makes it desirable to find in the vicinity of the forges the iron ore which they work into bars. When the material is in the neighbourhood of the place where it is manufactured, the work becomes less expensive. Abundance of provisions alone can maintain the balance between the undertakers of manufactures, and the merchants who sell them the materials.

From the mouth of the Anghermanna to the heights of Liens we meet with salmon fisheries, which afford subsistence to the fishermen, and duty to the government; but often neither yield the expences, nor the reward of the labour.

From the parish of Solett, proceeding to Liens, we pursued on horseback the course nearly taken by the river, to the north-west; but it makes a great many windings: both its shores are bordered with hills of sand, covering a rich and fertile land, which nature seems to have been willing to preserve from the overflowings, or rather which is concealed under the heaps of rubbish brought even by the inundations; since the waters, which in their source sometimes wash away the mountains, in stripping them, sometimes in their course raise hills of sand.

However it be concerning the formation of these sands, and the rich lands underneath, the country we traverse on leaving Solett is entirely composed of mountains and rocks: yet we perceive some good lands before arriving at Liens; but the soil of this parish is stony and barren, intermingled with marshes, which might be fertilised. The little river which waters it, and supplies it with salmon, is divided by a large rock, or rather an island, forming a water-fall little considerable: the rock from which it is precipitated is scarcely six fathoms in height.

The land of this district is mixed with sand; it requires a third part of the fields to be left unemployed every year, to enrich it. No hedges are seen; the fallow ground is not even divided from the pasture land, because the cattle remain in the folds till the hay harvest.

The farther we penetrate into this country, the more do we meet with beautiful woods, especially beyond Resilla. The saw-mills have consumed the greater part of the woods on this side, not only on the banks of the river, but as far in the land as the peasants have had conveniency to export the wood. Every hamlet extends its territory to one or two miles on both sides of the Anghermanna: most of these hamlets are built on the banks of this river: the cold even compels men to live near it; for it always freezes the corn in the dry lands, which do not receive any influence from the running waters. It is the same of the vicinity of great rivers, as of the influence of courts, of which there is constant complaint, and yet they are always approached. It is an injustice, or at least a folly, of courtiers to complain of the disgraces which they should have foreseen, by facing them; which they purchase before-hand, by the value they set on the shortest favour; and which they constantly deserve, were it only by the good offices they render themselves, by corrupting or pilfering their master. But it is an ingratitude in people who dwell on the banks of rivers, when they complain of inundations.

A large river overflown ravages, it is true, cultivated fields; sometimes carries away hamlets, with their inhabitants and flocks; destroys the provisions of one year, the crops of another, and the resources of several. But this river has produced during ages an immense population, by the fertility of its banks, by navigation, and commerce; it has given water to the cattle, who manure the land, and afford food to man; it has supplied the inhabitants of its shores with fish: if it had not fed the regions which it traverses, we should not behold them covered with fields, towns, rich and populous cities. Happy therefore are the states which are watered by great rivers, if the inhabitants know how to take advantage of the benefits they offer, and provide against the disasters they may occasion! Egypt has subdued the Nile: the Po, the Rhone, the Loire, and Garonne, are they more formidable? Everywhere do the waters require the assistance of art, either to become useful, or to prevent their being prejudicial to mankind.

It seems even as if Nordland should rather expect its subsistence from the waters than the land: it scarcely possesses any other soils fit for cultivation than those which are marshy. Near Resilla is seen a hill covered with bushes, which are only fit for burning; it is the most elevated part of the environs; the soil is good, but uncultivated, because it is overspread with streams, which render it miry. Nearly in all Nordland, each peasant possesses a small water-mill, the wheels of which are horizontal. Water even which refuses to the culture of lands, lends at least its assistance to the labour of man.

Between Liens and Iunsila the lands, nearly all stony, are covered with moss and wood: they could procure timber, if they had the means of conveying it. A merchant of Hernosand has attempted to procure some: during the winter he had some cut, and carried to the river side; then, about the middle of summer, at the greatest swells of the waters, he had his wood thrown into it in pieces: the river has brought several of them to the place he wished; but many others have been stopped by the sinuosities of the river: perhaps another swell will bring the remainder of his cargo of wood. This method of conveyance would be useful to navigation; for in those woods there are found trees which appear very fit for masts: it is true that they are in general injured by the inclemency of the seasons; many are frozen, beat down by the wind, or at least broken; the greater part is cracked.

The cold, which is injurious to the trees, is yet more fatal to the corn. The inhabitants of all the country to the north of Resilla are unable to derive from the land either any thing for sustenance or to pay duty: the nights there are so cold, when the corn ripens, that it is often frozen, and irrecoverably lost. The parishes of Liens and Iunsila have few hamlets which are not exposed to this calamity. The greater part therefore of the inhabitants of this district, and the parish of Asehle, give themselves up to the care of their cattle, in which consist all their riches; that is, which afford subsistence to the cultivator, and duty to the state.

From Iunsila to the village of Hellan, in the parish of Asehle, we traversed for four miles marshes, woods, and mountains: we followed for some time by water the windings of the river, in the places where there were no falls.

Those kinds of channels, where the calm of the waters is not interrupted by any fall, are called in the Nordland language Sehles. Stark is a name given to the intervals of water where the current is stronger, but not sufficiently rapid to prevent the passage of vessels: those where the waters, without falling, run with sufficient rapidity to carry away every thing, are called Forss: lastly, they give the name of Fall to those where the waters are precipitated, from whatever height they fall. This is a land as much neglected by nature, and disregarded by man, as that of which the unequal declivity occasions so irre-

gular a course to the waters, so little navigable. How should a country be inhabited, which presents so many difficulties to the traveller?

We travelled about four miles, over six of these sehles, where the water seems to repose: the first was that of Iunsila. Hence we travelled half a mile by land to the sehle of Ial, upon which we navigated a quarter of a mile. Afterwards, having travelled three quarters of a mile by land, we travelled a fourth by water on the sehle of Korting; then one and a half by land, and three quarters of a mile on the sehle of Gouhle. A small island which we meet in the middle of this last sehle separates Anghermanland from Western-Bothnia.

We again travelled by land seven eighths of a mile, then a quarter of a mile on the sehle of Alfwets; afterwards half a mile by land; lastly, we navigated on the sehle of Hellan, to the village of that name. We arrived there in the evening, very much fatigued, by a route of about twelve leagues, in which we were obliged to embark and disembark six times in the space of twenty-two hours, passed in the open air, during a continual rain; for no house is met with in the whole of this road, intersected with deep marshes, high mountains, and extensive countries of gravel and sand. Hellan is two miles and a half from the church of Asehle, where we went the next day, as much by foot as by water. The course on these routes is directed, as at sea, by the compass and map; not that the waters vary as much as the winds, but their direction is oblique and sinuous. The terms north-east and by north, north and by east, should be as familiar and as frequent in a journey in Nordland, as they are in the journal of a navigator.

Though the province of Asehle be in Lapland, there are no Lapland inhabitants in its southern part: some peasants have formed in these deserts colonies, which they call Nybygghes.

They reckon twenty-five; the parish of Asehle contains a part of them: Hellan and Gaffehle are the most ancient: they have been established nearly fifty years; the others are recent.

The first traces up even to the reign of Charles the Eleventh. This great monarch, by an ordinance of the twenty-third of September, 1673, exempted from the militia, the lodgement of troops, and the poll-tax, all those who would settle in the province of Asehle; and these privileges were confirmed by the states of the kingdom, at the diet of 1720. Each colony only pays, like the Lapland districts, a fixed sum, which never varies with the wealth of the contributors. The richest peasant only pays twenty-one crowns of copper, which amounts to twenty-five livres and four sous of France; but the greater part only pay three crowns of copper, or three livres and twelve sous. For this price they may possess a land of about twelve miles, or four leagues, in circuit; and often even any quantity of land they choose. The land indeed is so barren and poor in these countries, that it need not be measured. The exemption from service, and the smallness of the taxes, are the least encouragements which may induce men to come and cultivate these barren and frozen mounts.

The inhabitants of Asehle are large, laborious, active, able in their kind of commerce, and hospitable to strangers: their houses are tolerably well built, very similar to those of Nordland, except that their walls are not of stone or lime. The province neither affords that material, nor the kind of argil which might be substituted: in two places only is found a very fine argil, of which they make bricks, which serve for building. These people are very comfortable, notwithstanding their little wealth, which consists in their cattle and nets; but this latter resource seldom disappoints their hopes. The river of Anghermanna, which traverses the province, and all the small lakes by which

the land is intersected, furnish a sufficient quantity of fish to feed the inhabitants, and to sell to strangers.

A rich colony may possess twelve or fifteen cows, with their calves, sheep, a horse, and goats. The hay of this province is so nourishing, that the cows yield an abundance of milk three times a day. Each cow affords two pounds of butter, as good as that of Helsingheland, which is the best that is eaten in Sweden, and perhaps it is superior to that of Holland.

This butter is an object of commerce, and constitutes, with cheese, dried fish, birds, and some firs, all the wealth of the country. These provisions serve to procure, in exchange, corn, salt, tobacco, and other objects of consumption.

The peasants are not much of cultivators: the whole sowing of the year only amounts to three casks of barley and rye. The men and women till the lands, and gather in the crops in all Nordland. Their scythes equally serve to cut the hay and corn. They mow the grass very short, and close to the ground; but this labour is slow, and they lose in time what they gain in hay. When they employ this scythe to cut the corn, they fix a bow to it, which serves to collect the ears together, and to spread them as they mow. But a single night has often cropped the whole; and when the colonist rises in the morning, he finds the grass withered, the corn-ears blemished, his labour lost, and his hopes destroyed by the frost, in the middle of summer.

It is difficult to determine the cause of these accidents. The high latitude, and the neighbourhood of the frozen zone, do not alone produce this extraordinary cold. The Alps and the mountains of Sweden, though much nearer the tropic, have snow all the year. Holland, though farther north than Swisserland, is yet less cold. Even in Nordland there are found, in the midst of the mountains, two parishes, called Nordlian and Sudlian, in which rye and barley are sown, which never freeze. In certain districts a field is frozen by the east wind, while that wind does not produce the same effect elsewhere: another field freezes with a west wind, which does not affect the surrounding fields; another freezes by the south wind; another, in fine, by the north wind. These sudden and unforeseen frosts happen from the end of July to the beginning of August, the hottest part of the year. The cold nights of the summer are accompanied with ice, which soon melts, because the sun only quits the horizon for a short time, and does not delay, to warm it.

Among the reasons assigned for these pernicious phenomena, the peasants, who complain of them, attribute them to the fogs which arise from the marshes, with which the fields are surrounded. As these vapours are not attracted by the course of any water, they fall again about the marshes which have exhaled them; but this cause, which may augment the cold, does not produce it. Near Solett is observed a field, which often freezes; while the neighbouring fields, which are surrounded with marshes, do not experience the same misfortune. The corn of Hellan is never frozen, though the lands there are full of marshes. That of Gaffele and Nore are often frozen, though near to a river, which may attract in its course the fogs of the marshes through which it traverses.

The fog arising from rivers and rivulets generally secures the corn from frost. They do not experience this disaster during the cloudy nights; yet we sometimes see a field situated on the bank of a river freeze sooner than another. These frosts might be attributed to the north wind, if, in certain districts, the other winds were not more formidable. It may perhaps be said that these fields being sowed every year, the moisture is soon exhausted from a soil naturally barren, and they cannot give sufficient strength to the corn to resist the frost; but the quantity of cattle which the country feeds furnishes sufficient dung to manure the fields every other year. Though the lands for the most part are formed of a bed of sand, by the means of a thin bed of dung, which is spread from

time to time, they afford sufficient nourishment to the corn: I have seen it extremely fine, and adorned with very large leaves.

Thus, in order to discover the secret cause of these frosts, the baron de Cederhielm and myself proposed to M. Elie, inspector of the fishery of pearls, to make continued observations for several years, in different places, on the times and circumstances of this destructive phenomenon, which must certainly be the effect of a concurrence and complication of causes: we advised him to observe the position of the fields, the nature of the soil, the state of the weather preceding these unforeseen frosts, and the wind with which they were accompanied.

While waiting till the source of the evil may be discovered, in order to find a remedy, I am of opinion that it may arise from the vapour of the acid waters which are in the earth. When this vapour rises in fogs, it dissipates, and occasions no injury; but when it cannot exhale with sufficient strength, it is attracted by the corn, stops there, and blights it in a single night.

Near Hellan, where the corn is seldom frozen, the bottom of the soil is of rock, rarely covered with three feet of sand: the moisture of this sand is evaporated during the middle of summer; but elsewhere the sand is deep, and without rich land to bind it.

Near Gafficle, and particularly Nore, the marshes are more elevated than the fields; hence the waters, which are corrupted there, flow from the former to the latter before they evaporate.

In fine, the fields near the mountains, from which the snow-water descends, and insensibly filters through the sands, are more subject to frost than the others.

Perhaps the scarcity occasioned by this calamity also depends on the quality of the grain: they only sow barley at Asehle, on a tract of land from eight to nine miles in length. Would it not be preferable to sow rye? This is what a skilful economist should attempt: not to mention the advantage arising from a corn which makes the best bread, and which keeps better, rye yields more than barley, and especially resists the cold better; it is sowed in autumn; it has time to shoot strong roots during the winter; a moderate degree of heat is sufficient in the summer: this corn ripens early, before the return of the frosts of the month of August. At least a trial should be made, by sowing rye and barley; one crop might supply the failure of the other.

For want of these precautions, the frequent scarcity experienced by Asehle renders the corn very dear. When we passed through it, a cask of barley sold for nearly forty Swedish crowns. On account of this dearness, the inhabitants cannot always eat it; they therefore have recourse to their bark of the fir, dried and moulded; and not to lose the habit, they mix it with barley flour, even in abundant years. Were they to change suddenly from a healthy and light food to the use of this bark, their digestion would be injured, and scarcity would occasion plagues and epidemical disorders. Art and precaution are necessary to the poor inhabitants of the north, in order to accommodate themselves to the wretched food of their climate; as they are to the rich nations of the south, to accustom themselves to the use of the spices and the delicious beverages of Asia and America. But while the tables of our voluptuaries are overloaded with the superfluities of a foreign world, whole nations have not even one of the necessaries which we refuse. The Laplanders and Nordlanders might feed on radishes and potatoes; they could make a bread of them much superior in flavour and digestion to that of bark: these roots would thrive in the sands. The minister Forsberg has produced some radishes with success.

The tree from which they take this rind, which affords food to man, is very common and ancient, particularly in the north. The fir reigns in the sands and cold countries, like the cedar on mount Lebanon. Nordland exhibits some of very great age. At the distance of a quarter of a mile from the church of Asehle, to the south-west, we cut a fir, and we counted the concentric circles of which the trunk was composed, in order to determine the difference between the growth of the side of the tree towards the north, and that of the side towards the south. We found that the bulk of this fir, which was of three thousand circles, and consequently of three hundred years, had been formed nearly in the following manner: From the centre we counted, for the first half century, five hundred and seventy-two parts to the south, and five hundred and nine to the north; for the second half century, three hundred and sixty-eight parts to the south, and three hundred and twenty-seven to the north; for the second century, six hundred and eighty-five parts to the south, six hundred and nine to the north; lastly, for the third century, five hundred and seven parts to the south, and four hundred and fifty to the north. The whole diameter of the trunk of a tree three hundred years old, therefore, contained four thousand and twenty-seven parts of our geometrical scale; that is, twenty geometrical inches and nearly an eighth. The soil of this tree was sandy, and covered with moss, as is the whole of the province of Asehle.

The inhabitants of Asehle are troubled during the summer by a species of fly, which they call Knort: they are small insects, of a fœtid smell, which seem to form a species, or a middle class, between the fly and gnat: they have black and yellow stripes on the back and legs. They are so numerous, and especially in hot weather, and under a serene sky, that the inhabitants are obliged to protect themselves by a kind of pomatum, a mixture of fat and tar, with which they smear the face; but the odour is not less insupportable to men who are not accustomed to it, than to the flies, who always remove from it. The inhabitants also preserve themselves from these insects in their houses, by burning every night pieces of a knotty tree, the smoke of which kills them.

The last church we meet to the north of Asehle is of wood, very badly constructed, and more resembling a barn for beasts, than a fold for a christian flock. It was erected under the reign of Christina, for the conversion of the Laplanders, and cost six thousand crowns of copper. I can affirm that the architect, whoever he was, could not have lost by the undertaking of this edifice.

The province of Asehle is so extensive, and the Laplanders are so far removed from the church, that divine service is only performed once in fifteen days. All the inhabitants assemble together from the Saturday in the evening until the evening of the next day; the Laplanders keep in the huts they have raised about the church, the colonists in the houses they have built there. The mountain Laplanders only repair there on great festival days; yet they are attracted by some human interest, which is always united with motives of piety. At Christmas a fair is held near the church; at this time the taxes are paid, and law suits determined. Commerce, justice, and religion, are in some measure united, to bind men together, and preserve them in peace, under the yoke of society. But the Laplanders who frequent the church during the fair are the most attracted by the charms of drinking strong liquors, and giving themselves up to gross intemperance.

Near this church is a school, where the government pays, lodges, and feeds a master, with six children, who are taught to read, and instructed in religion. The master, whom we saw, told us he would accustom his pupils to eat bread and wear cloth: he is persuaded that this habit, strengthened by time, will familiarize the nation with the Swedes, with whom they will seek commerce; and this is the only method to civilize

the Laplanders, and to divest them of their idolatrous practices. The minister Forsberg, who formerly held this school, is of the same opinion, which appears to have greater foundation, since to the present time the conversion of the Laplanders has only been a scene of fraud and hypocrisy. Infatuated with the customs and opinions of their ancestors, they regard our ceremonies with the same eye that we behold their superstitions. They see no other difference between their idolatry and christianity, than the protection afforded to the gospel by the government. It may justly be concluded, from their manner of life, their aversion to the Swedes, and especially to the ministers, from the fear they testify at speaking of religion, from the habit which they have of agreeing with their superiors on the truths of christianity, still suspending their offerings to the sacred trees, from the secrecy they all preserve, when they commit actions forbidden among christians. It will cost a great deal of trouble to make them renounce their drums of divination. They have innumerable places to conceal them in their woods and deserts, eternal asylums of superstition. The minister Forsberg broke one of these instruments of their pretended magic, but they soon made others, at little expence. It is not the drums which must be broken, nor the books which must be burnt; but it is the human mind which must be insensibly freed from its errors, by reason, and especially by the mild laws of a government, beneficial to the nation which finds itself subdued. When the people are happy, they do not disturb themselves with idle discussions of tenets, they do not become fanatics for their opinions. It is the cruel infatuation of forcing them to admit that which they cannot persuade, of imposing silence by punishment; it is persecution, in a word, which first creates enthusiasts, then martyrs, then sects, then rebels, and finally civil wars.

The Laplanders are surprised when we would forbid their drums, which serve them, they say, to direct the winds; while the Swedes have compasses to direct their course, and mark the progress of time.

Notwithstanding, the Laplanders do not entirely rely on their juggling. They are attracted to the religious festivals by the fairs. Among other merchandise, they bring skins and firs. In exchange for this clothing furnished by nature, they take that which art has manufactured, such as woollen cloths or stuffs. For meats and dried fish they procure tobacco and pipes, salt and pepper. For cords drawn from the roots of trees, they receive hemp, of which they make nets. They sell baskets, and buy kettles, knives, sometimes hatchets, more rarely planes or augers. They prefer, before all these tools, brandy or port wine, which they find excellent when mixed with that strong liquor. The Laplanders are unwilling to be paid in copper money, though it is current in the traffic between the Swedes who come from Oumea and the colonists of Asehle; but they accept, and even seek the silver money. Such is their clownishness, that they have no confidence in a supposed value, which only has the stamp of the prince for guarantee.

At our departure from Asehle, we took some Laplanders as guides, for we had to ascend the river Anghermanna, with its falls. We met with some of great height, which obliged us to convey our boats and crews by land. Sometimes we were compelled to walk two or three miles, to relieve those who rowed, dragged, or forced the boats against the current. The Laplanders reckon the way by journies, and the Nordlanders by miles. From the church of Asehle to the mountains to which we went, the distance is nearly seven miles. During this route, the magnetic needle pointed to the north, north-east, and north-west; but the most part of the time to the north north-east. The river makes a great many windings.

It was about six in the morning when we arrived at Wolksio. At midnight a thick fog arose, which began to dissipate about four in the morning, and was completely dis-

persed by the time we had passed the Forss, or current of Wolksio. We then beheld, on the lake of that name, a kind of rain-bow, a thousand paces from us. The air was calm and serene, the sun brilliant; and the waters so clear, that we could distinctly see the gravel, flints, coarse and fine sand, of a brown and gray colour, at the depth of two fathoms.

At a mile from Wolksio is seen a mountain, separated from the others. It is a singularity, like the phenomenon of the rain-bow seen on the lake in serene weather. We crossed this lake at the width of a quarter of a league, and after travelling for about a mile and a half, we arrived at Telt-Sio-Arne. From the parish of Asehle to this last place there are eighteen currents, falls, or sheets of water to cross, in ascending the Anghermanna. This river rises in the mountains of Koultsiofiall and Biorkfiall. It receives the river of Marsfiall, and many small lakes and rivulets; it even traverses the lakes of Malgomai and Wolksio. It is so increased by the tribute of all these waters, that in many places it is from a quarter of a mile to a league in width. It then glides slowly, and forms, by its dormant waters, what are called Sehles. But in proportion as it grows narrower, it dashes over the obstacles it meets, and falls with so violent a noise, that in calm weather it may be heard at the distance of two miles. What a country is this; merely a desert, where are only beheld mountains without cultivation, without any trace of human industry, nor scarcely of life and sensation; where, even in the season of life, when nature revives, no noise is heard but that of cataracts, which, roaring from afar behind hideous rocks, seem to environ the traveller, whom they threaten, sometimes to approach him, sometimes to follow him! Miserable, indeed, if he were alone; all the horrors of a deluge, all the images of the Styx, with its nine great windings, would assail his trembling soul. Then would he experience those involuntary terrors which gave birth to the spectres of superstition, and as if fantastic beings were necessary to assist him to struggle against nature. Man alone, surrounded by danger and objects of terror, beholds the face of nature in a different view. Every thing then becomes a demon, every thing a deity. He invokes the stone against the roaring torrent; as he approaches the source of his fears, they multiply; his mind is disturbed, his knees totter, his eyes roll, all his senses are disordered; and if he discover not the cause of his fear, his reason for ever sinks into unfathomable obscurity, into everlasting night.

I have seen the peasants of Asehle ascend this river with their boats; when they approached a rock, land, and draw these light skiffs against the current, with all the courage and adroitness which arise from a long habitude. But they are not equal to the Laplanders in this laborious and difficult art.

The Laplanders have boats, the keel of which, one fathom long at bottom, extends to two fathoms upwards. It is large, flat, and equally pointed at both ends. The ribs are very narrow. There are three or four of a tolerable length on each side; they are covered or doubled with fir planks, which have been cut with the hatchet. These planks, two lines thick, are joined with the sinews of the rein-deer, or fastened with ropes from the root of the fir. It will be seen by this description how brittle these little boats are; a man might break them with his hand; if he placed his foot on the sides of the boat, on entering, the timber would crack. A boat only contains the rower seated at one end, and the passenger at the other, to keep it in equilibrium. A bowl, of the bark of the birch-tree, to bale out the water which enters at the joints, cracks, and even the pores of the wood, two oars, and a hatchet, form the whole cargo of the little boat.

But if the boat can only carry two men, one man is sufficient to carry the boat. When a Laplander meets with a water-fall, which he cannot pass by means of his oars, as he does not even possess any idea of sails, he puts the bowl of his little boat on his head, passes the oars into two wickers strongly fastened to the sides of the boat, takes his sack of provisions on his back, and places the boat above the bowl; then, by means of the hatchet, which he fixes to the stern, he preserves his boat in equilibrium, and guides it to the right and left through the trees. When he has passed on land above the level of the fall, he replaces his boat in the water, and continues to row.

However frightful to the eye is the rapidity of one of these little boats descending a fall between the rocks; the great calmness of the Laplanders amidst these perils induced us to attempt these passages with them, and when we had overcome several, we no longer wished to land, as we did, before we had been inured to these dangerous ways.

The lands watered by the Anghermanna are more or less fertile, according to their distance or proximity with respect to the river. But as it overflows its shores every year, at the return of spring, it is difficult to say whether it is more useful to them by its waters, than hurtful by the sands with which it covers them. Yet it may be affirmed that this river is to the country of Asehle, what the Nile is to Egypt. Its inundations, which cover the fields from the month of May, when the sun begins to melt the snow of the north, to the month of July, preserve the plants and corn from those backward frosts, which surprise the crops in the flower, and destroy the harvest before it has arrived at maturity. In like manner, the Nile, by its periodical inundations, secures the plains of Egypt from the ardour of the sun, which would dry up the fruits and cultures of that rich country. But this comparison still admits of as much difference between the objects compared, as nature has made in distance between the tropic and polar circle. Besides, in Egypt, art with all its inventions assists the fertility of a prodigal land. In the northern countries, industry is as limited as nature is sordid.

It might perhaps be imagined, that in the immense forests which overspread Lapland there must be found trees proper for the making of masts; but it would be in vain to seek for them. Nearly the whole of these woods has been destroyed by fires, which have been falsely attributed to thunder, but which only arose from the imprudence of the Laplanders. When they quit an habitation, they often leave fire, through inattention. Sometimes, if they want to warm themselves, they set fire to a tree, to avoid the trouble of cutting it down. Lastly, they set fire to a forest, lest the Swedes should seek for mines in the neighbourhood, and distress the inhabitants, in order to procure iron and copper.

The lake of Wolksio, to the north, receives a great river, which derives its name from the lake Hwoima, whence it proceeds to the distance of six or seven miles, and after great windings discharges itself into a more southern lake. It would appear that lakes in these countries are only large reservoirs, which empty themselves into one another by natural channels, forming as many rivers. These lakes indicate a land rising in platforms, disposed one above another, in amphitheatres. They resemble large terraces, where the rain and snow form themselves basons, the waters of which flow out by water-falls, rivulets, or ponds, according as the declivity of the land is sometimes sudden, sometimes gentle, or interrupted and broken off. The soil of the lake of Wolksio is stony and sandy. Towards the upper extremity of this lake the fir woods become rare, and those of the pine more numerous; so that near the lake Malkomai scarcely any firs are seen. This was the last lake on which we navigated; yet we did

not proceed on it for more than two miles, though it is three and a half in length, with an unequal breadth, varying from a quarter to a whole mile. It stretches from the north-east to the south-west, and empties itself into the Anghermanna towards the south-west. The bed of this lake, and its fishery, are the same as all the others.

Arriving there, we perceived, at the distance of six miles on the western side, the mountains called Akick-fiall. The heights near the mouth of the lake are sufficiently fertile, as is part of the surrounding land. But the woods are nearly all burned. We felled the largest fir we could find in this place. By the number of circles which appeared from its section, it must have been a hundred and sixty-two years old. Its semidiameter contained thirteen hundred and thirty-one parts of the geometrical scale, or about six inches three lines and a fourth. The soil in which this tree had grown was stony. The pines of these environs were of a tolerable height, and covered with moss. In these far removed countries from the sun, nature employs ages to produce little. The inhabitants live to a great age, but what a life! without ever feeling the pleasures of the senses or the imagination, which yield to the soul a lively and solid enjoyment; without experiencing that inward and continual action and re-action, which bind men to every thing in nature, by sensation, desire and enterprise; without any taste, which may attach a being to himself and to those around him. Thus the manners of these people, inclosed by frozen seas and mountains of snow, possess not the least of animation, or of vigour. Society there is dull, monotonous, without passion, without incitement. The inhabitants, like the trees, are almost isolated, though placed by the side of each other. Love has no branches; friendship no name. They are perfect strangers to ideas of protection, assistance, compassion, beneficence and charity. But, ye senseless beings, who glory in these interesting names, do ye know how much they cost to human nature; and that those virtues are created at the expence of the vices, crimes and misfortunes of your fellow creatures?

We left the lake Malgomai, and ascended a small rivulet for half a mile north-west towards Tetsio, where we landed, and left our barks. We were obliged to perform the remainder of our journey on foot, among the highest mountains.

The first district we had to traverse had been set on fire. The soil was sandy, and mixed with stones. We afterwards entered a wood of very small pines, which extended to the top of the mountain, a mile and a half distant. These trees were tolerably fresh; most of their branches lay horizontally. They were lower and smaller than those of Aschle.

The fir will not thrive among pines, it is of too elevated a structure. The small number which is seen of these majestic trees, created to defy the winds of the land and ocean, are of a dwarfish species. But we observed that the smoother and more marshy the country was, the greater number of birch-trees and poplars grew, always small and low, with many branches, and few leaves. The birch-trees appeared of two different species; the one had small leaves, of the ordinary form of this tree: the leaves of the other were larger, thicker, more curled, and, being of greater substance, they formed a medium between the leaves of the birch and those of the gooseberry bush. In these marshy places we also saw some thickets of both the hawthorns, but neither of them having any fruit.

In these marshes there grows a shrub called Myr-riss; that is, Moor's-shrub. The branches are strait, without suckers. The wood is strong. Near the root the bark is gray: towards the summit it is of the brown of young birch-trees. The leaves are arranged three by three, very near the branch, and are roundish, like those of clover.

The soil which produced these woods was partly of rock and partly of stones, covered with moss, between which was perceived a fine sand of a brown colour: the land about the marshes we met with in these woods was also a sand, among which, from time to time, we perceived a black earth, formed by putrified moss. This soil in some places was half a foot thick, in others two feet, and perhaps more; for we were not able to measure it everywhere. The marshes are covered with a prodigious quantity of flies, which they appear to produce. They are in greater numbers in these mountains than in the parish of Asehle, and of a different form. Their body and feet are yellower; their sting is sharper. Their stings pierce through the cowls of crape, with which the inhabitants in vain cover their faces. They are also more venomous, and commonly leave a black spot on the skin, which becomes a tumour.

At the extremity of the wood we found a verdant country, the soil of which was stony. We saw many plants and herbs which were unknown to us; among others, one, the leaves of which resembled those of the lily of the valley. We also saw many junipers, but very small, and without kernel, of a very deep brown, as if they had been burned.

All these observations are not wholly useless, even to the inhabitants of more southern countries. Everywhere we meet with sandy and barren soils, where grow pines and shrubs similar to those which alone nearly cover all Siberia, Lapland, and the most northern countries. By estimating the quality of the soils, and the nature of the productions which are found in such different climates, we might examine if the soil contributes, still more than the sun, to the generation of plants: whether the abode of the waters of the sea, or the internal structure of the earth, do most determine the disposition of the beds on its surface. The sands of Africa, those of the heaths of Spain and France, those of the north of Europe and Asia, are they the same, with respect to grain, colour, thickness, mixture, vegetable substance? Nature has done nothing in vain; her contemplator should observe nothing without reaping benefit.

We at length arrived at the foot of the mountain of Rod-fiall. It occupied us an entire hour to reach its summit. From the lake of Malgomai, whence we had perceived it, it seemed to support the heavens. Nevertheless we found this mountain to be of less altitude than any of the surrounding.

In Lapland a mountain covered with stones is called a fiall. The mountains which are wholly of rock, an uncommon circumstance, have so many gaps, that they may be regarded as a pile of rocks. The latter are sometimes bare, but oftener covered with a little moss, or earth. The mountain of Rod-fiall is curved towards the north, and forms an arch of a circle about the lake of Rodsio. The soil is rich, and overspread with small birch-trees, oziers, and herbs of every kind.

The soil of the hills is a white and fine sand; beneath is a white argil, having no binding earth. If the fountains which issue in great numbers from that mountain did not hinder the corn in the spring from thriving, by the frosts, of which the coolness of the running waters augments the cold, this district might support many inhabitants. It is the best we have seen in the whole of this country. Here we meet with a pure black earth, a foot in thickness, with a little mixture of gravel. The declivity of the land is gentle, and stretches sufficiently far for one to walk upright.

Pursuing our route we passed by a round mountain, encompassed with stones and marshes. The latter are very common. They might be drained, and prepared for culture by manure, suitable to the productions we would familiarise. The most elevated might be turned into fields; the less elevated into meadows. The Laplanders say, that towards Norway similar lands have been peopled and cultivated. Those which

we saw might be tilled, if the Laplanders were made to quit their wandering life of shepherds, for the stationary life of tillers; or if the Swedish colonies were to increase, and extend by degrees to these mountains. It would be imprudent to plant an isolated colony here. The construction of houses would be difficult and too expensive, in a place from which the nearest woods of fir are six miles distant. The necessary advances for two or three years would become burthensome; to transport cattle by water would be difficult; to conduct them by land troublesome. When the colony enlarged, they would perhaps want wood to build new houses, or to inclose fields, or even for firing. Trees, which grow more slowly than men, would not assist the wants of cultivation, and might deprive the colonists of the fruit of their advances and pains. The general maxim for the clearing of land is, to do it by degrees, by advancing from all the inhabited places which surround the untilled country. Men should proceed step by step, like nature. The population and culture of a desert must not be commenced at the centre, but at the circumference. The borders of a heath join to fruitful lands; it is there it should be vivified, by the communication of seeds and the sources of cultivation. Every other method is in vain, and ruinous. The nations of Europe, who were willing to seize on the interior lands of America, have lost their population and their culture. The English, who have only occupied the sea coasts, have gathered strength, increased, and enriched themselves. The colonies of the interior will in the end be invaded by those of the extremities. It is because the former are insulated, while the latter are supported by a free communication with their metropolis.

We travelled two miles more to arrive at the mountain of Kitschewari. Although it was the middle of August, we walked over snow, with a kind of pattens made of green branches. We met with more ice-houses than could be wished for, in this season, in the warmest countries of Europe.

Here the travellers separated, in order to proceed, some towards the north beyond the mountain, the others towards the south, over an extensive and marshy land. It reaches in the form of a circle for two miles to the south one-fourth west. Many hills of various heights are there observed, covered with some pines and bushes. Those who passed beyond the mountain discovered, to the north-east and by east, the western extremity of the lake Malgomai, about three miles from Kitschewari: the two lakes of Lidsio, to the north-east and by north; to the north, a part of the lake of Koultsio, which the Anghermanna crosses; to the north north-east the lake of Marsio, which communicates with that of Malgomai. Lidsio is three miles and a half from the mountain; Koultsio and Marsio are four miles. From the same place are also seen, twelve miles to the north-east, the mountains of Lycksele-fiall; Mars-fiall, five miles to the north north-east; Fiald-fiall, twelve miles north; Biork-fiall, nine miles to the north-west and by north; Arnas-fiall, twelve miles north-west; the mountains of Norway, twenty miles west one-fourth north; Hammardahls-fiall, eight miles to the west south-west; Yemptelands-fiall, twelve miles to the south-west and by south; Block-fiall, four miles to the south-east; and, lastly, Arksio, fourteen miles to the south-west: and many other mountains, which, on account of their smallness, have no name, although it does not secure them from being covered with snow nearly the whole of the year. In the midst of this frightful compass, the traveller feels the superiority of nature over human strength. In other countries we find it yield to the industry of man, which changes the face of the earth. The sea even affords a passage to man through its tempests, and its rocks. But here the mountains forbid him from afar to approach, and their summits, bristled with flakes of ice, oppose to his audacity a barrier, more formidable than the fires which formerly burned on a mountain of Arabia. The feet of volcanoes are inhabited; the mountains of Norway and Lapland

can scarcely be faced. The Alps are crossed; but it is to pass into the beautiful and delightful country of Italy. The north defends itself by the horror of its prospect, and its climate; but mountains of greater height than those of the pole have never arrested the progress of the conquerors, who, for these ten centuries, have disputed the richest country of Europe. Germany, France, and Spain, have ravaged by turns this same Italy, which is now the prey of those nations, of which it was formerly the mistress.

It will no d[illegible]pear surprising, that mountains may be seen which are more than forty leagues [illegible]d, and that consequently objects may be discovered at a greater distance on land than at sea. But it must be observed, that this distance does not lie in a direct line, and that we reckon on the length of the path, which, descending from the summit of the mountains into deep vallies, by sinuosities and inflections, renders it of much greater length than it appears to the sight. Besides, the place from which the eye embraces so vast an horizon is considerably above the level of the sea. The distance is very great from Hernosand, which is on the shore of the gulf of Bothnia, to the mountain of Kittschevari. We proceed from the one to the other, ascending the course of the Anghermanna by cascades, always increasing in height from south to north. Thus the foot of the mountain of Rod-fiall must be half a league higher than Hernosand. It occupies more than an hour to ascend from the foot of Kittschevari to its summit. From the foot of that of Rod-fiall, there are three mountains equally high to ascend. Now, if from the height of a mast, which is only sixty feet, we can see to a much greater distance in the sea than from the deck of a vessel; from the summit of the mountain of Kittschevari, or Rod-fiall, we should see the summit of another mountain, which is at the distance of twenty miles.

Arrived at the mountain of Swans, which constitutes part of that of Kittschevari, we pitched our tent, near a hut of Laplanders. The northern path had a much greater quantity of snow than the southern, and it thence extended a mile farther. Besides the mountains, we saw between the lakes, in the environs of Kittschevari and Mars-fiall, hills overspread with pines.

These hills and mountains form no chains. They are all separated, as if they had arisen from as many different lakes, which had undermined their shores, and flowed out on all sides. On the hills we meet with many springs, and in the vallies with small lakes, or large marshes, from which issue rivulets of considerable size, which discharge themselves into the inferior lakes. It would appear, that in these countries the mountains are the work of the snows, which, tarrying for a length of time, and melting slowly, dig, tear up, and overthrow the surface of the earth, where they have not a free and quick passage. In more southern countries, the rivers carry along to the sea all the waters which fall either in rain or snow. In the north, the blocks of ice break the earth and rocks, where the snow undermines in the end the land which it covers.

Between the gaps of the rocks there is always snow, which the Asehlese call Groubbar, and which no doubt produces the springs that are met with at the summit. The snow fallen in winter melts in the spring, and, filtering between the sand and stones, pierces and flows in rivulets through the clefts of the rocks; so many principles of ruin, which concur to the formation of these isolated mountains.

I have found on the highest some handfuls of black earth, collected here and there between the flints. I confess that I do not see any reason for this phenomenon, unless the snow contains this earth, and leaves it on the surface in filtering through the sands. This conjecture will not appear strange to those, who believe that rain water may even be converted into earth.

The sand of these mountains is white, sometimes as fine as dust; and in humid weather it is of the consistence of argil. The greater part of the rocks are of sand-stone. Those which are found scattered in the country become nearly as hard as flint, no doubt by the action of the air and wind. Some, which appear to have the nature of lime-stone, are not of less hardness than the others. Some appear of alabaster, and are harder than flint. In this hideous country are also seen a species of hematite, or blood-stone, black and gray slate, and many other stones, some of which resemble iron ore, but are only flints and quartz: there are many of these substances among the sand-stones.

The highest mountains of the north do not admit of trees. The snow and ice little accord with verdure. But on the lowest, as well as in the vallies, we here and there meet with firs. We cut down the largest we saw, and by the circles of the vegetation we judged it to be two hundred and forty-six years old. Notwithstanding it was only thirty-two feet in height, its diameter near the root was only eighteen hundred and fifty parts of our geometrical scale, that is, nine inches and three lines. All its branches were bent towards the south, and inclined to the earth. This direction, no doubt, arises from the snow, which the north wind drives towards the south. The top of this tree was pointed, and its trunk unfurnished with branches: we observed that it had grown in spite of the seasons and climate; similar to a vessel disabled, and without rigging, cast upon a desert shore by tempests and currents.

About this wild pine were birch-trees and poplars, small, knotty, and nearly all withered. These trees perish by the excess of cold, as soon as they rise above the height of eighteen feet. They have the fate of the Laplanders, whom nature does not permit to grow to the ordinary height of man. But, in the place of lofty trees, we meet with junipers of a brown colour, and dwarf oziers. The latter are remarkable by a singular difference in the sex. The leaves of the male ozier are green, smooth, and shining; those of the female ozier are gray and rough. If the bark of the male ozier be scraped with a knife, the raspings resemble lint. The Laplanders ornament the cradles of their children with it, and put it into their shoes. But the bark of the female ozier is too hard for such gentle purposes. One would imagine that men deceive themselves, when they give the qualities of their own sex to these female trees. But we observe them with berries, which they bear, when they are planted near a male ozier in an isolated place; while we see no berries on those kinds of trees which are assembled together without order. Monogamy is therefore necessary to oziers for fruitfulness, as it is useful to men.

Although these shrubs are very near the earth, and almost creeping, they increase on the mountain of Swans, and there thrive so well, that it may be said to be their proper country. In the southern districts, the berry of this tree seldom ripens. It grows in great quantity in the fields watered by the Angermanna. This river, no doubt, disperses in its course the berries which fall into it near its spring.

The soil of the hills where the pines grow is nearly every where sandy. A little black earth is sometimes perceived between the stones. Grass is also seen in those parts exposed to the south. The colour of the grass becomes greener as we descend. This district produces in particular wild sorrel and other plants, which the Laplanders eat, or mince and mix with their milk, when they cook it.

When the weather is serene, the mountain of Swans exhales from its summit, and particularly from the fountains which are seen to issue from it, a thick mist, which obscures the sun even in full day, and which is insensibly converted into clouds. But

when the weather is gloomy, this mist only rises from the middle of the declivity, about as high as the place where we were encamped between two Lapland huts. It was so near us, that one of our fellow-travellers walked for a whole night in this mist without being able to get out of it, nor to perceive the fire we had purposely kindled, to serve him as a light-house.

In the time of these mists, which commence in August, the cold is as sharp in this district as it is at Stockholm in the beginning of October. The distance of three or four degrees of latitude should not occasion so great a difference in the effects of the climate. We may therefore attribute the premature rigour of this cold to the northerly wind, which blows from the mountain of Swans.

The most neighbouring summit to this latter appeared very near us, and yet the reindeer which we perceived running seemed so small, that we could scarcely discern a flock of sixty. How should we measure the distance between these two mountains? We had no trigonometrical instrument. The mountain was too steep, to judge of its distance by the number of paces. We could only estimate it by the power of the voice, or sound. I therefore went there, and the baron Cederhielm remained near the tent. This distance appeared to us about two hundred fathoms. From the sight alone, I should have judged it of a hundred and fifty; but the tent appeared to me at a greater distance, than the summit where I was situated appeared to those who observed me from the tent. This is a phenomenon in optics, arising, no doubt from the difference in the projection of light, or in the reflection of the rays. I was not less surprised at the thirst which is experienced on these mountains, while it is not felt in the climate. Nevertheless the waters are very clear, tasteless, and commonly produced from the melting of the snow, which should quench the thirst, unless the salts and the nitre with which they abound produce the contrary effect.

From the lake of Malgomai we had beheld all the country to which cultivation might extend. It appeared to us impossible to be carried farther. Thus we resolved to walk back, after having waited three days in vain for clear weather. The mist, which the little heat remaining occasioned to exhale about these mountains covered with fresh snow, deprived us of the sight of the sun and stars. It was time to return to the abode of light and the living. Nature only offered to our observation the prospect of an eternal winter. It threatened to envelope us in its frosts, if we delayed to resume a route, which even in the summer had caused us great difficulty to pursue. The lakes were about to be covered with ice; the trace of the paths effaced; the Laplanders buried in their huts. Navigators are still happy, when they only behold sky and water; but to wander among snow and clouds, unable to advance, or only to advance to be bewildered; to have rivers to descend by frequent cataracts, between points of rocks, from which are detached flakes of ice sufficient to break a small boat to pieces, or to sink it; this was the situation that awaited us, if we made the smallest delay. We hastened, with the satisfaction of having observed, not lands to conquer, but countries to till, a country sufficiently extensive to people, to cultivate; in fine, to render worthy of the innocence of its inhabitants. A short summary of their manners shall complete the picture of their dreary region.

Such is the weakness of the human mind, that it can only arrive at truth through a croud of errors. It is only by reading the different descriptions which travellers have made of the form and manners of a people, that we can obtain a perfect knowledge. These pictures differ according to the observers. A traveller almost every where measures man by his stature, and judges of his manners by his education. But those

whose understandings are more extended, and their minds more enlarged, are not the most difficult to recognize man in the savage Laplander. Very limited minds alone find in him the brute.

The Laplanders are strong, and of a tolerable stature. Their limbs are coarse, their hair long and thick, face small, their forehead strait, the beard smooth, their breast and shoulders broad, and their legs commonly bent.

The women, on the contrary, have small limbs, hair of little thickness, and narrow breasts. The men are incontinent, without being vicious, and the women extremely licentious; that is to say, that both scarcely know pleasure nor crime in love; and as they almost attach no moral idea to the intercourse of the sexes, they make no virtue of continence. But the Lapland women would be capable of inspiring it, by the infirmities with which nature seems to have armed them against the attempts of aggressors.

The only advantage which they may possess over women of other nations is, of being ignorant of the alteration of fashion in dress; if, however, it is a merit in a weak and slender sex to be free of those frivolous tastes, which give it so much importance. One would say, that they are afraid of pleasing, lest they should have cause to blush at the flight of the conqueror, at the moment of triumph. They pretend to have preserved the attire of ancient times; yet I do not believe it, nor think that the Laplanders have a sufficient resemblance to the Israelites to be descended from them, as some would presuade them. It is more reasonable to think that transmigrations of nations proceed from the frozen zone to the torrid, than from the equator towards the pole.

A nation has scarcely any occasion to borrow its customs from another; at least all the customs which relate to the first wants of life. The Laplanders live and dress as the climate permits. They use no linen cloth; this only accords with warm countries. All their foreign luxury consists in a very coarse woollen cloth. They have caps of it, which they border on all the seams with a lace of a richer or more shining cloth. They make their doublet of it; it is a great coat with long sleeves, wide about the neck, and open at the breast. Yet they cover the skin with a stomacher: in the bad weather of summer, this piece of cloth is covered with an old furred robe; in the winter with a warmer fur. In the severe cold of that long season, they wear caps or cloaks of skin. The Laplanders of the woods in summer wear shoes made of the bark of birch; the Laplanders of the mountains in winter have shoes of rein-deer skin. The trees and the rein-deer are their resource for clothing and food. They have neither in abundance; but they are seldom in dread of want. Careful to provide subsistence for themselves, they do not expect it from public provisions and magazines, which may suddenly raise in price, or totally fail. They are not subject to scarcity or famine, before the granaries or tables of opulence, which overflow with superfluity. They are not seen to wander pale and disheartened in the provinces, about castles and parks, of which the masters make parade at court, or in the capital, of gold, silver, diamonds, and sumptuous dresses of various colours, where the people might reclaim its blood, and the labourer his reward.

The dress of the Lapland women is nearly the same with that of all the savage women of the north, short and tight, differing little from that of the men. Extreme want in respect of clothing makes no distinction of sexes, except by concealment; and if they conceal them in the north, it is because the cold will not suffer nudity. Nevertheless, even in Lapland, the women are willing to distinguish themselves, at least in their head-dress

by a fillet of woollen cloth, for want of ribbons of silk, and a light border of wool, instead of lace.

The dwellings of the Laplanders are no way superior to their cloathing. They are of three kinds, known by the name of Kator. The first is a sort of tent, composed of poles disposed in a circular form; it is covered with branches of the pine, cloth, or hides; so that the rain cannot penetrate. A hole contrived at the top serves at the same time for chimney and window. But the transparency of the skins which inclose the tent compensates for the little day-light afforded by the aperture of the roof. The door is a frame, composed of two upright and six cross bars, to which is attached a square piece of cloth, yet it is so narrow that it can only be passed sideways. But they seldom quit their tents, and never enter in a crowd.

The second species of tent is of a more oblong form, but round. It consists of four poles, a little bent at the top, and joined together by a square frame. In all other respects it resembles the former.

The third kind is the most commodious, and best suits the more sociable Laplanders. Every family builds one of these dwellings. The greater part have them near the church of Asehle, to pass the Sunday. These cabins, or barracks, are formed of four partitions of planks thrust into the earth, six feet in height, covered with a sort of roof, composed of very short poles; supporting green turf and the bark of the birch. The door, also made of planks, is small, and serves for a window. The hearth, always in the middle, consists of a flat and round stone, upon which they place wood, and the smoke arising from it departs through the hole in the roof. In this house all the Laplanders sleep together, men and women, children and fathers, married or single. But the crimes and debauchery which accompany both misery and opulence in civilized countries never enter into these little habitations. The climate prevents the temptation of licentiousness; ignorance and simplicity have not even the idea.

The household utensils consist of pots of brass, and seldom of iron; wooden plates and spoons. Men who do not tarry in one place for more than three weeks should not have many goods to remove. A chain furnished with hooks, where they hang their pots and other kitchen furniture; some chests secured by plates of iron, a flint, boats and nets; these form all the luggage they have to transport on their sledges. With so small a retinue, they do not fear the meeting of robbers, nor the pursuit of creditors, nor the visit of extortioners.

The subsistence and manner of life vary among the Laplanders according to the soil they inhabit. The Laplanders of the woods, such as those of the province of Asehle, who retire in winter to the forests of pine trees, where their rein deer feed on the moss of the trees; these Laplanders mostly live by fishing. The waters of that region, and the river Anghermanna in particular, furnish them with perch, trout, and pike. In the failure of these fish, the lakes have others, and each lake has some which are peculiar to it. In general the fish are finer and fatter, but not so large, in the lakes. Should the goodness of these fish be attributed to the purity of the waters, to the length of the winters during which the fry are not disturbed, to the great number of fisheries, which not permitting the Laplander to travel over them all in a year, the fish are left to increase and fatten? It is besides a custom among the Laplanders and Swedish colonists to pay regard to the time of spawning, and to leave the fisheries at rest, like the lands. Every father of a family has a space allotted for fishing; but this space comprehends so many lakes, that the year is closed before he returns to the first in which he fished. A certain policy finds its way amongst men in the most savage state, whether hunters or

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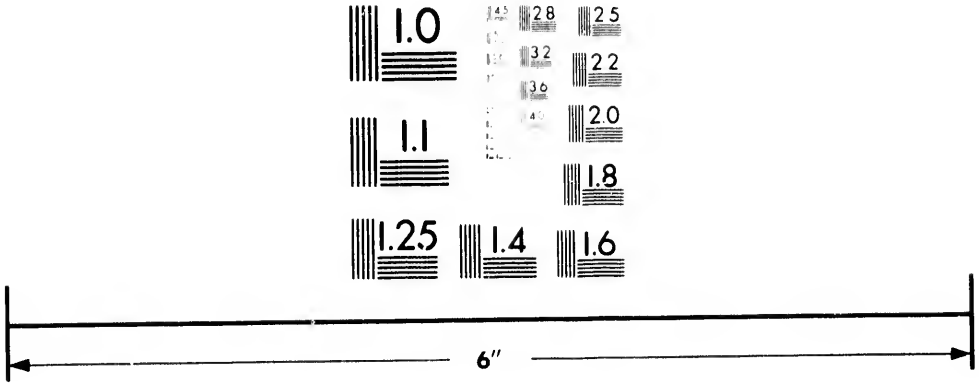

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fisherman. They have no occasion for kings, philosophers, nor pontiffs, in order to live in peace, and to observe those rules of justice, on which depends the safety of individuals. Nature alone dictates to them, and her voice is sufficient.

They commonly make use of nets called Ryssior, which they stretch at the mouth of the rivulets. They have four sorts, which bear the name of four species of fish: the first, which is called a Mort net (a species of Gudgeon) has its meshes two fingers wide; the second, which is the Pike net, has its meshes four fingers wide; the third, which is called a Suk net, has its meshes four inches wide; and the fourth, which is called a Skaft net, nearly resembles the pike net. They have, besides, nets stretched upon poles: they have also nets for winter. The poles or sticks of these first are a little longer and thinner than those of the nets of Stockholm; some are only an inch in diameter, being twelve fathoms in length. The reason of this little thickness is, that the fishermen, being always in small bodies, they would not be able to carry nor manage them, if they were larger. The use of the large net may be said to be unknown in the province of Asehle; they are not necessary in waters so limpid as those of these fisheries.

The Laplanders eat some of these fish as soon as they are taken out of the water, others they dry for the winter, and the remainder they sell, to pay the impost. In the spring they kill a great quantity of birds, which they never dress, but dry, after having stripped them of their feathers: I have eaten of them, and the flavour was not unpleasant.

During the autumn the Laplanders of the woods search for the caves or dens of the bears, and in the winter they hunt them, armed with firelocks and stakes: they have dogs, which they send to rouse the bear from his den. A Laplander will often alone attack a bear, and the animal seldom escapes. When our soldiers or officers shall thus dare to brave a bear in his den, they will only possess the courage of the Laplander. Those people are therefore not so pusillanimous, or perhaps it is only in the chace of men. But it is what they are unacquainted with, and the preparations of a camp under arms or tents, and the regular and measured march of men and horses, covered with gold or steel, plumes of feathers floating in the air, the dust and sweat of war, heaps of ensigns and trophies, and decorations, and pompous and magnificent titles, which only conceal at the bottom carnage, wounds, blood; the shrieks, convulsions, palpitations of ten thousand innocents slaughtered on one another in the space of an hour, by twenty thousand assassins, to appease the jealousy of a man, or the caprice of a woman.

At least the Laplander eats the flesh of the bear he has killed; he sells the skin, if he does not make use of it for clothing himself. This bear is the enemy of the rein-deer of Lapland; and for want of deer he will attack men, if extremely pressed by hunger. Nature has decreed war between the bear and the Laplander; but does she compel entire nations to leave their fields untilled, in order to go and desolate those of a distant country; to put to the sword a neighbouring nation, whose only crime is a wish to enjoy its own rights; to exterminate, as we have lately seen in Servia, thousands of colonists, transplanted at great expence to a desert country, which they had cultivated; to cross two wide seas, in order to spread fire and devastation to the two extremities of Europe?

Whatever be the latter, their fate occasions more horror than the life of the former excites pity. The Laplanders of the woods live on fish; those of the mountains on their rein-deer. The milk of these animals is so rich, that mixed with three-fourths water it is still as thick as the milk of the cow. We preserved some in a bottle for the length of seventy-two hours, and we found it sufficiently sweet to boil and drink. A rein-deer gives each time half a bottle of milk. When they would milk the mothers, they lead the fawns or young to pasturage, where they remain till noon unmuzzled;

they are then led back to the fold, and about five in the afternoon they are re-conducted to pasturage; at night-time they re-enter their habitation, and the young are muzzled, to prevent their exhausting the milk destined for the support of men. These animals are so gentle, that I think they might dispense with shutting them up in folds: they never leave them before the dog of their shepherd, and till they hear the bell of the rein-deer, which is brought before, in order to serve as guide; but then they all rush out together, dispersing themselves in every direction. In very hot summers they graze till midnight, and repose during the excessive heat: they are at that time encompassed with fire, to protect them from the flies: such are the rein-deer of Asehle. In the more northern parts of Lapland they are tamed, and are more difficult to manage.

The Laplanders immediately boil part of the milk they draw: they leave the remainder till it becomes of sufficient consistency, to be preserved as a provision for winter. In that season they eat it boiled in water: the taste, though strong, is not disagreeable; but it requires time to be accustomed to it.

The life of the Laplanders, whether they inhabit the woods in the plains, or encamp on the mountains, is really severe and pitiful; but it is yet preferable to that of the Greenlanders, who have only the choice of the ice of the sea and that of the land; who have not even cattle for their companions, and for support in their misery. It is better than the life of the people of Siberia, who only see the arrival of soldiers to oppress them, or disgraced courtiers, whose fall announces a frightful power, and spreads consternation in the deserts. This needy and wandering life of the Laplanders is no way uneasy or distressing to them: they do not possess the talent of writing; but the liberty of talking remains, for they have only to complain of the evils of nature. All equally subject to her power, and almost equally independent of that of man, they have at least no fear of being punished for their virtues, of being persecuted for their opinions, or being betrayed by their good faith. Society amongst them does not require those discretions, which occasion a public idolatry of the fashionable vices: they are not reduced to the necessity of choosing between clamour and disdain, between obstacles which repel talents, and the oppression which follows obscurity: they do not perceive any trace of that desire to injure, which wearies and disheartens the best intentions. Among them the sentiments of the honest are not stifled by the wants of competency: in a word, they receive all their benefits and all their evils from the hands of nature; and have neither to fear the unforeseen blows of fate, which bring the indigent to punishment, nor the invasions of war, nor the thunderbolt of despotism, which sometimes falls upon opulence: they are only acquainted with the vicissitudes and injuries of seasons, less destructive to man than the vicissitudes and injuries of fortune: in fine, the exemption from our pains indemnifies them with usury for the privation from our pleasures.

They are seldom exposed to absolute want. The Laplanders of the mountains, in particular, find on the heights lakes abounding in fish. They never spread their nets without drawing in them several species of fish, but particularly of red fish, which they call Rodfish. As this species is different in Lapland from many other known elsewhere under the name of red fish, I shall here subjoin a description of it.

They took one in our presence; it was only nine inches long, though it sometimes may be two feet in length. This fish, in general, has the form of the trout. On each side are two broad streaks, very distinct, of a dusky colour, and crossing each other. The first, formed by little points, situated very near one another, and of a dark green, commences near to the head, and proceeds along the back bone, terminating about the middle of the tail. The second streak, commencing at the fore part of the fin, which is situated on the back, extends to below the belly, where it is of the colour

of a lemon : a little beyond is seen a third streak, shorter, and of the same colour, but not so strong. The back is dyed like that of a small marbled perch ; and the belly is of a fire colour, which varies in the two great divisions made on each side, by the two streaks which extend to the right and left along the body. This colour is more dusky on the fore part of the back, and clearer towards the other extremity. The edge near the head is of the same colour as the back ; but it becomes lighter as it approaches the fin, where the colour of the pale fire changes by degrees about the navel into a yellowish colour. This fish, covered with spots like the trout, also resembles it by the form of the head, and the parts composing it : nevertheless, the eyes are larger, and a little more elevated, the bone of the upper jaw shorter, and that of the lower longer. Above the jaw it is of a dusky green.

The palate is of a blood colour ; it is divided into four parts ; of which the first has twenty-two teeth, and each of the others twenty. The colour of the fins is variable, like that of the body of the fish ; they have each fourteen joints.

The prickles of the back are twelve in number, very pointed, and of a dusky green ; the last is double the length of the first. Those beneath the belly are of a bright yellow in front ; towards the middle of a deep brown, the tint of which is singular ; and towards the extremity of a fire colour ; there are nine on each side.

This fish feeds on the dead flies which fall into the water. Near a cascade we saw many little fish seizing on a dead fly ; but I cannot affirm that they were red fish.

For the rest, similar descriptions can only interest professed naturalists, by their instinct, to keep a register of every thing. But when a botanist describes all the leaves of a plant, with an exactness driving his readers to despair, a traveller may be allowed to reckon the spots and fins of a fish. Lapland possesses so few animals and terrestrial plants, that the admirers of natural history are reduced to ichthyology, for the food of their curiosity, as the Laplanders are to fish, for the greatest resource of their sustenance.

Nevertheless they have, besides their fisheries, green plants which they eat, such as clover. Where the cattle feed on moss, the shepherds must be contented with herbs. The rein-deer are so gentle and quiet, that the women guard and lead them. The care of their children and flocks, which they raise and feed at the same time, constitutes their principal occupation. A mother conducts her rein-deer, having her child at her breast : she suckles her children, while making the young fawns graze. These innocent beings can sleep together without danger. The shepherdess sometimes beholds them all skipping and playing together, without dread of accident. If tears flow, they are tears of joy. Her mind is not distressed, nor her heart torn, by the afflicting idea, that she may one day behold this child of her breast torn from her arms, to shed in battle the blood he has drawn from her.

The Laplanders of the mountains subsist more on their rein-deer, and those of the woods more on fish. Though the latter, living nearer to cultivated and populous countries, have less distance to travel than the former to traffic with their provisions, they are nevertheless more indigent. I am inclined to attribute their misery to brandy : for these two years they have purchased it at a great price; and, as I have been informed, a crown was given last summer for a glass of brandy. Perhaps it may have been imagined that this was the means of giving them a dislike to it, but it has only served to impoverish them. When a people are accustomed to things which please their taste and senses, but particularly to strong liquors, they will not renounce them. It is a snare to give them these tastes ; but it is a cruelty to make them pay an exorbitant price, when they have become accustomed to them.

The Laplanders regard the passion they have taken for brandy as a misfortune. But when we represented to them the danger of this custom, and how useless was this foreign liquor to them, they answered, that without brandy they could have no wives. In fact, the first proposition of marriage is made with a glass of brandy in the hand. It is in joy this bargain is concluded; for they sell a woman like a rein-deer, and pay for her from five to nine crowns. This would yet be too much, if the man was a true purchaser. The less a woman costs, the more valuable she becomes: at this rate, a Lapland woman must be an inestimable treasure. But those are ideas taken in a world, where delicacy is an element of select souls. The Laplanders are not sufficiently corrupted to have occasion for these refinements. The sublimity of manners and sentiment supposes a society depraved, where virtue requires heroism to resist contagion; where we are only great, elevated, singular, because all are little, base, and common.

Whether it be a received prejudice, an agreement, or love of preference, it is said that the Laplanders have more dislike than inclination for promiscuousness in the intercourse with their women. They do not unite themselves to one another accidentally, like their flocks: they even respect the degrees of consanguinity, which are so religiously observed among civilised nations, in order to unite again, by the ties of love and blood, families which have been divided by property. If the relations were always to marry among one another, each race, remaining foreign to all the others, would form a distinct society, and discord would arise from this social state. It is necessary for families to intermix, in order that fortunes may circulate, interests unite, and that prejudices and manners may be softened. The Hebrews were commanded to marry in their own tribe; but it was perhaps a means of encouraging them all to population. Twelve tribes among the Jews were more certain of agreeing, than the two classes of plebeians and patricians among the Romans. Between these two factions nothing could bring back the equilibrium; among twelve classes it maintained itself: all with emulation counterbalanced each other, and each was of sufficient weight to prevent the predominance of any one. Thus the circulation of blood from family to family is an infallible guarantee for the peace of states. We do not hate beforehand a family into which we may one day enter. We cease to despise a race to which we may be united. We support without spleen a distinction of rank and honour, from which we are not excluded without hope, especially in those empires where labour leads to fortune, and fortune to honour. In this passage there are only hasty and sudden revolutions, which clash all conditions, when a man finds himself suddenly transported by money or favour from the level of the crowd to the summit of greatness.

Among the Laplanders every one is of the common class, and this natural lowness does not excite the envy of any body: the order of peasants is the only one. There are not sufficient riches in Lapland to establish a large body of nobility, a numerous and powerful clergy, as in Sweden. Their drums of divination do not create much noise, and those of war are almost unknown.

In fine, the little fruitfulness of the Laplanders exempts them from possessing of privileged conditions, supreme honours, burthensome and brilliant titles. They are sufficiently limited to be devoid of ambition, and only know how to defend their life against cold and want, without attacking that of other men. They have few children, and perhaps love them the better. A father rejoices to have a son, because he has not to fear for him those whims, and even virtues, which may equally conduct him to misfortune. He never says to himself, while receiving him from the breast of a mother into his paternal arms, perhaps in my old age I shall expire on the wheel, accused of having assassinated this son, whose misfortunes or superstition shall have armed his hands against his own life.

As soon as a child is born, he is wrapped, without any swaddling clothes, in a piece of woollen cloth, and placed in a sort of wooden case, wide at one extremity and narrow at the other, a cradle much resembling a coffin. The bottom is concave, and the sides are only raised to the level of the child. But to prevent his falling out, two hides are passed over his body, and fastened sufficiently tight. These cradles are suspended in the tents, exposed to the smoke; two cords are attached to rock the children, for they rock them: this custom begins to appear prejudicial to us; but the example of savages instructed by nature seems to justify it. Besides, the hammocks of the Negroes, and the suspended cradles of the Laplanders, have no occasion for the hand of a nurse to lull the children to sleep. The natural oscillation which they have supplies this attention. It is even more gentle and natural than the jolting of a cradle placed on a plane, and which is agitated by a motion too irregular no doubt not to be sometimes hurtful, or pernicious.

In Lapland we may judge of the education of the children from the manners of their fathers. In Europe this would often be a slender inference. The first education of youth differs much more among us, than among the Laplanders, from the remainder of life; and it perhaps is not to our advantage. In the age of innocence we imbibe errors; in the age of knowledge we imbibe vices. Those alone who have no education are nearly equally unhappy in all the stages of life; too enlightened not to feel its evils, too limited to overcome them. It is not thus with the Laplanders.

Before I saw these people, I had pictured them to myself as a stupid race. I have had great reason to be undeceived. They have received from nature the same advantages of body and mind as the rest of men; but to the greater part of the Laplanders these benefits are lost. An excessive love of liberty which they possess, so as not to wish for any empire among themselves, a profound ignorance maintained by the prejudices of their education, remove all idea of a reasonable society. They love better to abide in the misery, in which they are born, than to release themselves from it by labour. To the most delicious dishes they would prefer the liberty of eating the rind of the pine, or clover, to satisfy their appetite. They are not acquainted with fixed hours for repast or sleep. To lie on the hard and dry earth, between thick rushes, and bear or rein-deer skins, better suits their ungovernable character, than a bed of the softest down, which they only enter and leave at times regulated by custom or business. The less soft their bed is, the less they remain attached to it. They have no dread of meeting with the anxiety of watching, or of the next day; the wakefulness which burns and parches; the vapours of high living or of voluptuousness. They forget their hardships, where so many others encounter them.

Independence in their opinion is true happiness. Jealous to excess of every thing which may injure this sovereign wealth of their life, their imagination is very lively and sensible, though in a cold climate. Hence arise the extacies of their pretended magicians, the ability of these people in counterfeiting the sounds of the voice, the gestures and motions of those who speak to them. Equally timid with their rein-deer, and ready to flee at the least noise, their propensity to superstition, their horror at the idea of servitude and constraint, their easily being alarmed, and fainting at the slightest accident, are all indications of a sensibility of organs, not commonly observed among the savages of the north. Perhaps in this respect they resemble certain ferocious animals, who are startled at every thing with which they are unacquainted; as if fear was the first sentiment of every creature that is careful of its preservation.

After the character of the Laplanders, it may be judged impossible to subdue them by rigour, but easy to win them by gentle means. When they are convinced of the

benevolence of those who speak, they willingly listen, and readily conceive. If they were more industrious, their condition would become easier, they would increase their money both for the means of living, and for paying the impost. Though it is so small as not to exceed ten copper crowns for the richest Laplander and all his family, they find it exorbitant. Yet the province of Asehle only contains fifty-three inhabitants subject to the tax. Hence we perceive what revenues Sweden may derive from Lapland.

My fellow traveller, the baron of Cederhielm, has endeavoured to encourage the Laplanders to quit the misery, in which their natural inertness retains them. He had carried half a cask of rye, with the intention of trying whether the corn would thrive in this country, of which he had conceived the most sanguine hopes. But finding the difficulty of attempting the execution himself, and unwilling to quit Lapland, without having contributed at least to some happy trial for its improvement, he searched for a soil proper for the experiment he had at heart. He imagined that he saw some lands of sufficient goodness in the parts where they had established folds of rein-deer and sheep. He therefore had the corn sowed, in his presence, by some Laplanders, to whom he had gratuitously given it, on condition that they should inform him of the success of his experiment. They could very promptly execute every thing which was directed to them, and they set about it with that ardour inspired by a project, the utility of which is conceived. Their docility was not unrewarded, and the baron de Cederhielm has since informed me that these Laplanders, having come to the fair of Koll, had assured him of the good success of his rye.

Industry alone is wanting to this people, in order to render them happy; for they possess few vices, particularly those injurious to society. Compelled for ever to wander, and not always being able to transport the whole of their provisions, they place them in magazines erected in the midst of the woods, with four stakes supporting a roof. These magazines continue open, and, notwithstanding, the provisions there placed, sheltered from the injuries of the weather, are scarcely ever taken away. If urgent necessity do sometimes prompt a Laplander to steal, it is only to appease his hunger; he eats in these magazines whatever he chooses, but never carries any thing away.

In fine, the Laplanders, humane and charitable towards the poor, live together in good understanding. Far from accusing one another of their bad actions, they are careful to conceal faults, and the guilty, in order to save them from the rigour of the laws. This is a consequence of that national spirit, which a people subjected to a foreign dominion nearly always preserves, by a secret revolt against laws, or masters, which are not of their choice.

Here I conclude the relation of my travels into Nordland and Lapland. I have written it as much for my own instruction, as with the intention of acquitting myself to the academy of a duty, which the sentiments of my heart impose. With more leisure I should have added to this work other particulars. But, happily, my occupations have spared my readers from great weariness. If some errors have escaped my attention and my sincerity, I presume to hope that those who are sufficiently enlightened to perceive them will have the indulgence to pardon them.

I shall finish these observations by a reflection, which they have more than once suggested to me. I have not been able to think on the wise constitution of my native country, without feeling how advantageous it would be to it, were its citizens to apply themselves to the knowledge of a country, in the prosperity of which they possess so much interest. Our youth are all inflamed with the desire of travelling into foreign countries. But what do they go to seek? Perhaps vices unknown in theirs: taste and

fancies, which, puerile in themselves, but natural to frivolous and corrupted people, are absurd among a sober nation, to whom its poverty permits the existence of morals. Even those amongst us, whom an idle curiosity does not lead so far away from their native country, and who, willing to retain some traces of the ancient Germans, do not pass into that country where the Franks have entirely degenerated, at least listen with attention to the famous names of the Rhine, the Oder, and the Vistula, rivers that have too long been dyed with our blood. But speak to them of the Anghermanna, the Indal, and the Niouronda, and they seem alarmed, and chilled, merely by the idea of the cold and sterility which they imagine to reign on shores so little frequented. Yet even in Sweden nature possesses her resources and her beauties.

Scarcely would we advance a step to be acquainted with the surface of this kingdom, so fertile in soldiers, in officers, in heroes, who may be said to have given a peace, at least a permament stability to Germany, in preparing by their victories the celebrated treaty of Westphalia. Sweden would have prescribed limits to Turkey and to Russia, if the most warlike of her kings could have restrained himself in the career of his triumphs. But since the deep wounds, which, by the successes and reverses of that monarch, have been inflicted on the heart of the nation, it has never recovered its glory, nor its prosperity. The genuine nerve of the northern powers is wanting in their wishes. What is it? Population. It is only, however, by agriculture, that it can hope to establish this spring of its valour, this support of its fame. The ashes of our fathers repose in the fields of battles which overspread Germany. Let us go to seek successors to them, and children worthy of their ancestors, in Nordland and Bothnia. Let us stimulate this land, and men will arise. Warlike and independent people, remember yourselves; and if it do not accord with your virtue to conquer and subjugate, let it always be the greatest object of your ambition to break the chains, with which your enemies would enslave Europe.

AN ACCOUNT OF THE LAPLANDERS OF FINMARK, THEIR LANGUAGE, MANNERS, AND RELIGION, BY KNUD LEEMS, PROFESSOR OF THE LAPLANDIC, WITH THE NOTES OF GUNNER, BISHOP OF DRONTHEIM: AND A TREATISE, BY JESSEN, ON THE PAGAN RELIGION OF THE FINS AND LAPLANDERS.*

[NEWLY TRANSLATED.]

CHAP. I.....OF THE ORIGIN OF THE LAPLAND NATION.

WHENCE they have drawn the origin of their nation the Laplanders themselves are altogether ignorant; nor is it an easy matter to conjecture whence they are derived. In an island of the government of Sundmoers, called Gidschoe, not very far from the gulf of Aalesunda, is a statue I saw myself, when young, marked with verses of the following import:

"Findus slew his brother, because it was not agreed upon, between them, how they should go into the northern part of the kingdom, where his descendants had multiplied themselves to an immense degree. From him are descended all those Normans, who call themselves Fins."

But admitting, as some historians maintain, it should be ever so clear, that the said Findus had been the great grandfather of that very valiant Norman, so celebrated in the annals of history, Findus, the son of Arno, and of the family of Gidschoe, yet is it hardly probable that the same should be the founder of the Laplanders; for the Laplanders, whom we vulgarly call Fins, differ altogether from the other inhabitants of Norway, and their language is as different from that of the maritime Fins, inhabiting huts, as from the Laplanders, who live in huts on the mountains; and has no more resemblance to the common language of Norway, than the Arabic has to the Latin.

With the ancient Scythians the Laplanders hold some affinity, for what historians relate of them perfectly corresponds, such as clothing themselves from the skins of wild beasts; their inhabiting, without regard to any fixed or settled abode, the wild and rough parts of the country, the fickleness with which they change, with their wives and children, from place to place; their frequent use of animal food, and neglect of the culture of the soil. In all these customs they agree with the Laplanders, using just the same mode of life. So that, if we cannot altogether conclude, yet it is fair to infer, that this nation is a branch of the ancient Scythians. What connection may be between the language of each nation, the learned, read in these matters, may discern. Thunder, which in the Lapland tongue is called Diermes, the Scythians called Tarami.

Between the Laplanders and ancient Israelites a certain similitude is observed. The Jews, in general, have black hair, so have many of the Laplanders. The Jews, like them, are of a low stature, and affix to the extremities of their garments, by divine precept, phylacteries; the Laplanders are accustomed to sew to the borders of theirs certain bandages or fillets, which, in the chapter of the clothing of the Laplanders, I have shewn in many places. Saturday, the Jewish sabbath, the Laplanders, by horrid superstitions, formerly kept holy in solemn rituals. Psalmody, which the Jews attend to in their synagogues, differs little, if you hear the tune, from the modulations of the Laplanders. The Jews polluted the sacrifices of their true God, which the Laplanders did also by

* Copenhagen, 1767, quarto, in the Danish and Latin Languages. The Notes and Treatise are of little consequence.

their offerings to idols, consuming the flesh themselves, and consecrating to their false god the bare bones alone. That the Israelites had formerly erected statues and monuments of stone, and had paid to them divine honour and religious veneration, there is no doubt, for so God himself speaks to them: Make not to yourself idols, nor a graven image, nor place up a figured stone in your land, that you may adore it, because I am the Lord your God; that the Laplanders were formerly guilty of this crime, from the notoriety and abundance of proofs, would be needless to demonstrate. It was impious among the Jews to raise up altars of hewn stones; the stones which the Laplanders consecrated with religious worship were rude, and fashioned by no workmanship. Men performed the offices of cooking among the Jews; the same became a custom among the Laplanders, as is shewn in the chapter on their meat and drink.

Some of the precepts concerning women labouring under monthly infirmities, laid down in the Jewish laws, are observed by the Laplanders, who hold a woman for that time, and in that condition, in a state of impurity. From all these it is sufficiently manifest, that the Laplanders agree in customs with the early Hebrew race, under a variety of comparisons; yet it does not follow that they owe to them their origin.

That the Laplanders had formerly made one people with the Fins of Sweden, or, as otherwise called, Finlands, is a common opinion, and everywhere adopted; and that as well from certain words common to each nation, as from other circumstances not underserving of credit. But when I grant that the Laplanders had of old made one nation with the Finlands, yet it appears fair and just to me, for the purpose of establishing some difference between nations not little disagreeing in language and customs at this day, to call by one common name, Laplanders, those who inhabit on the coast of Finmark and Norland, pasturing their sheep and cows, like the rest of the Norwegians, as well as those who wander with their rein-deer and tents over the mountains, and who constitute, with the inhabitants of the coast, as above mentioned, one and the same nation, agreeing in language, in dress, and customs; especially when this nation, for some ages, had been distinguished by this name. Nor do I ever remember to have heard that any of them ever took this name amiss but the Fins of Sweden, or inhabitants of Finland, who feel themselves hurt by it, if any one happened to call an inhabitant of Finmark a Fin, contending that he should be called a Laplander, and that the name of Fin, as a more honourable appellation, belonged peculiarly to him. Led then by these reasons, I shall call them everywhere in this History Lappones, Laplanders.

CHAP. II.....OF THE LAPLAND LANGUAGE.

The Lapland tongue seems to stand detached and obviously different from all other languages, except the Finnish, with which it holds some affinity and analogy, yet not so much as the Danish idiom holds with the German. This language possesses, as I have already shewn, in the preface of the Lapland Grammar I have published, certain peculiarities in common with the Hebrew, but I dare not be bold enough to assert, that it derives its origin from this language. In the said preface I have quoted also certain words, which seem to be derived from a Greek or Latin origin, but thence it little follows that they were pure Greek and Latin words thus adopted into the language; for they might have been vernacular, not foreign. And though this language contains not a few words akin to the Swedish, Danish, or what may be said, with more truth and propriety, to the Norwegian idiom, yet in most words it so far recedes from these said

languages, that if each, using his own dialect, should speak his own language, the one could not understand the other.

But this language to this day has been rejected to that degree, that it is little known or cultivated by the Norwegians themselves, the neighbours of the Laplanders, to say nothing of other nations more remote, though it is thought not less deserving of cultivation than other languages established through the globe, and such as if duly cultivated would become distinguished by many excellencies, as having the means of recommending itself by its genius, and a certain conciseness of phrase, as a whole period, which in the Danish is expressed by a circuit of words, in the Lapland language is expressed by a single one; for example, my small loaf, in the Lapland, is Laibatzhiam. The note of the diminutive Atz and the pronoun Am, mine, being joined to laibe, a loaf. But the whole genius and character of this language I have so clearly explained and laid down in the Lapland Grammar, lately published by me, that a few examples will be sufficient, I hope, for my present purpose.

In the Lapland language the interchange of consonants takes place between the b and p, b and m, f and v, which are labials; between the palatials g and k; between the dentals s and z; between the linguals d and n, d and t, and between the labial f and the palatial letter k. The letters gn united in one are expressed by a nasal sound. In the pronunciation of many words, a certain aspiration of breath, with a hissing sound, is observed. The letter d is sometimes pronounced with this aspiration, and there are certain dipthongs of difficult pronunciation. The vowel y seldom occurs. As to what belongs to accent or tone, among the innumerable Lapland words I have met with, I have not found one that is marked for an elevation of the voice.

There is not a great number of proverbs in this language! but so numerous are the diminutives, with which it abounds and recommends itself, that I know of none equal to it.

The Danish word Camerat, a companion, in the Lapland is expressed by two words, Passe veelje; for when a Laplander salutes a Norwegian peasant, he speaks to him in these kind words, Passe veelje, that is, my friend, my companion, though in strictness it may be holy brother; if a woman, his manner is usually, Passe Oaabba! literally, holy sister.

The rein-deer that are castrated are in highest estimation among the Laplanders, as surpassing the rest of their kind in size and fatness, and as of the greatest use to their owners. Hence the expression, Haerge Yetz, a castrated rein-deer itself! by which eulogy they do not in common honour any one, unless he is esteemed worthy of the highest praise. A Lapland lictor, or, if it sound better, a tribune of the country people, in Norwegian, Lensmand, whose name was John Peterson, when somewhat puffed up with himself, and disposed to brag, was used to say, Haerge Zhionvga; what a glorious thing is a gelded rein-deer!

On a child-bearing woman near her time, they usually say; Nisson lae kietzhiembeiviin; which, faithfully translated, is, the woman is in the days of inspection: by which form of expression doubtlessly is signified, that the woman is in that condition and time, that she should both carefully look to herself, and that she stood in the greatest need of the attention of others.

Speaking of the adages in use among the Laplanders, I cannot pass by unnoticed an expression familiar to the Norwegian peasants inhabiting Finmark, and chiefly made use of when they profess to lament the condition and misfortunes of others; and if he may be a person of very distinguished rank and of very ample fortune, and of the greatest dignity, whose fall they lament, yet do they not hesitate to testify their grief for him in these words: Beiste staffar; that is, poor beast! by which expression, though

sounding extremely harsh and full of rusticity, yet they mean to express how much they are affected and moved by his unhappy lot and condition

CHAP. III....OF THE GENIUS OF THE LAPLANDERS; THEIR VIRTUES AND VICES.

THE children of the Laplanders are very brawny in the face, as well as in other parts of the body, yet this brawniness decreases with their years. The nation in general is of a dark and swarthy complexion, short hair, large mouth, hollow cheeks, long chin, waterish eyes, the defluxion of which is partly to be ascribed to the nature of their climate, partly to the excessive smoke with which they are infested in their tents and huts, partly to the snow which drifts itself into the eyes of travellers, who pass the mountains about the tempestuous season of their winter, and partly to be ascribed to their looking on entire plains and mountains whitened with snow, whence it seldom happens, on their returning from hunting the rein-deer, that they are not almost deprived of the use of sight for at least some days.

It has been related to us by certain writers, but of no authority, that the Laplanders had coarse rough skins, like wild beasts. Another writer, also of weak credit, has not scrupled to assert that the Laplanders had but one eye, and that placed in the centre of the forehead. Opinions, which, with other ridiculous fables, are most properly exploded. There are others, too, who do not hesitate to affirm, that a certain strong smell is naturally in the Laplanders; and to this assertion, though avowedly false, some have incautiously given their belief. I, on my part, do not deny that the Laplanders smell very strong, but this very strong smell I do not assign to the nature of them, more than to that of other men, when it is obviously clear that that smell is produced from no other cause but from the clothing of this people, stained and greased through by the constant smoke of their huts, and by the oil squeezed from the fat of fish.

The generality of the Laplanders are short of stature, but of amazing strength. A hardy race, capable of fatigue and cold, beyond the belief of any man; in confirmation of which I shall deem it sufficient to relate, that when, I was curate at Alten, in the Western Finmark, a certain Lapland woman, on the fifth day after her lying-in, about Christmas, travelled over those mountains, covered with a constant snow, to me, begging that I would introduce her duly and after the forms of our rites into our church. The Highland Laplanders can bear the greatest extremity of cold; and the maritime along the coast the most intolerable heat, which, in their huts (owing to the fire having no vent, the duct through which the smoke should pass being closed up, burns them almost to death.

And as the Laplanders, by their own nature and habits, are hardy and laborious, so even, as we observed, vulgar medicines, and those elsewhere of no repute, are sufficient to repel diseases and restore health. Though the tribe of doctors may laugh, yet it is so; and the experience of many years, experience that does not deceive, has confirmed it. For all powerful and beneficent Nature has so providently and wisely ordained all things, that what is of no account and common, in the opinion of some men, can furnish the most essential benefit to the indigent and afflicted in those places, where more costly and excellent medicines are not to be had. And for this reason, nothing is more acceptable, nothing more agreeable can happen to a Laplander, than for any person to make him a present of a small bit of the root of nicotian, or a few grains of pepper, or some such trifling thing.

They are furnished with an amazing and extraordinary agility of body, for a very great number of them can be compacted into the smallest space, and one man brought so close upon another, by means of his feet being placed with art under his seat, so that all may sit down closely and compactly together.

They travel over the very highest mountains by the swiftest speed, and faster than thought. By a certain wooden machine, of an oblong figure, fastened to their feet, commonly called wooden sandals, they are carried with such rapidity over the highest mountains, through the steepest hills, making no use of a staff, which, in the midst of their course, they hang carelessly and negligently from their shoulder, that the winds whiz about their ears, and their hair stands an end. Yet, notwithstanding the celerity of their course, should you throw a ball, or any thing else, before the runner, in the midst of his speed, inclining his body, he instantly overtakes it, and picks it up. Infants can no sooner walk, than they make for the hills, and there, on foot, after they have put on their sandals, are borne through the declivities; to this exercise, from their earliest years, they are accustomed.

By their rein-deer they are borne, with an incredible velocity, not only over plains, and open fields, but up acclivities and precipices of mountains, and, while driving, shift the reins with such readiness from side to side of the animal, as scarcely to be perceived. Those who inhabit the sea coast know the management of boats to such a degree of dexterity, that they would not yield to the best and most experienced seamen in this art. This great agility of body, in my opinion, is partly natural to this people, and partly acquired, by the frequent consumption of oil which is got from the fat of the fish, to which from their very cradle they are accustomed.

In wood and horn they have the art of forming, with a common utensil, by the inhabitants named (Taelle Kniv) various figures, and with a certain natural sagacity. Hence a variety of vases, bowls, cups, &c. are made. They fashion their own vehicles, the parts of which are so well adapted to each other, so nicely fitted, as scarcely to suffer a drop of water to pass through them; they make too, from horns, spoons, ornamented with various resemblances of wreaths and flowers. See chapter the fourteenth, concerning the workmanship of the Laplanders.

Among the women are also found some, who are not ignorant of the turning-art, or the the art of chiseling. But the ingenuity of this sex principally is exerted in sewing together belts, and making purses, with tin filiments interwoven in them. As they are also very skilful in throwing the javelin, they formerly made use of the bow and arrow, now they use muskets and bullets, with which they kill birds and beasts. The invention of the said Peter Nicolaus, of whom further in chapter the seventeenth, concerning sports, &c. &c. there is a full account of the Laplanders, in which it has been laid down and argued, how much they excel in the art of throwing the javelin.

Among the virtues of the Laplanders, the knowledge of the true God deservedly holds the first place, which they have obtained to in no small or idle degree.

Before the goverment of the august Frederic the Fourth the Laplanders were inveloped in more than common darkness. He, in addition to his other regal and glorious institutions for promoting the conversion of mankind, by which this most worthy prince acquired for himself immortal praise, instituted a mission, continued and promoted by his son Christian the Sixth, his grandson Frederic the Fifth, and his great grandson Christian the Seventh, our lord and king, with the same happy auspices of the Divine Being, and the glory of his name, and the true felicity of the subjects of his realm, and with a zeal, for which we can never return due praise, but by imploring the Divine good-

ness to bless and shower on his reign continued prosperity. For to say nothing of this state of darkness in the religious adoration of idols, formerly celebrated in this nation, with the greatest superstition, almost all were ignorant, or had very little knowledge of the divine essence, of the benefit and of the will of the true God, united in the blessed Trinity. The knowledge of the letters of the alphabet was one of the distinctions of learning, and he who knew them was considered as eminently learned. As an example of the hardened ignorance under which this miserable nation then laboured, I shall just mention, that when a Laplander from the bay of Porsanger was asked the manner in which Christ ascended into Heaven, he answered, on two stones of marble. The poor miserable fellow happened to hear something of the tables of the decalogue of Mount Sinai, but what they referred to he was ignorant.

But those times of ignorance, praise be to God, the Father of knowledge, and to his august race of kings, who have so powerfully and happily dispelled it, have passed away; and the Laplanders, enlightened by the holy doctrines of the Evangelists, are willing and ready, either with, or even without book, by the aid of memory alone, to answer all, who inquire on the reasonableness of hope, to the utmost of their ability. In the tract in which my mission is described, not a few are to be found, who faithfully retained in memory the whole catechism, a portion of the history of the passion of Jesus Christ, with some of the Psalms of David. There was one who could recite thirty-six whole psalms from memory; and, what may excite admiration, an old man, of the name of Niels Kistrand, whom the Laplanders in their common language called Nikke Kokko-gedde (Niels they express by Nikke, and the place where he lives, the Norwegians by Kistrand, they call Kokko-gedde) above seventy, learned by heart the first three parts of the catechism, when he never knew the form of the alphabet, nor, till then, had ever learned any thing by memory. It is now thirty-eight years since I was missionary among the Laplanders; after so great a lapse of time, a faithful discharge of the duties of a minister of the word of God does not leave me to doubt, when accompanied with so large a portion of Divine goodness, but a much greater progress in the salutary knowledge of the true God is made, especially when the missionaries shall have acquired a knowledge of the language of that nation, which by all means should be done, if they mean to undertake, for the happiness and advantage of the Laplanders, their religious instruction. If they do not, the miserable men, to whom they preach, will hear nothing but empty sound and unmeaning words. For what numbers, among the Laplanders, especially of the female sex, are found, who do not understand a single word of common Norwegian language. And the most of the men, especially such as live along the coast, can manage, from daily intercourse and habit with the Norwegians, the inhabitants of this region, their domestic and secular affairs in a manner in Danish, or Norwegian; yet it by no means follows, that they should succeed in sacred things, and that they therefore comprehend and turn to their benefit the Divine truths, delivered in sermons, in catechetical institutions in the Danish, as they would in their own vernacular language. And hence the people themselves freely and sensibly confess, that they draw much greater instruction from discourses and catechisms in the Lapland language, and that they are more agreeably and more strongly affected, than they are by those discourses which are composed in the Danish.

Whilst among the Laplanders in the office of missionary, it was a custom with me to preach and examine them in the Lapland language; at the same time I gave them chapters of the Evangelists to be learned, explaining to them also hymns, that were to be sung in stated prayers, morning and evening, on the Lord's day, in the said language. Afterwards, by the appointment and indulgence of my most potent sovereign, being

preferred to the office of pastor of a congregation of Alten, in the Western Finmark, which was made up of Norwegian, Lapland, and Swedish auditors, I preached one time in Danish, at another in Lapland, just as the audience seemed to require, addressing the Laplander and the Norwegian each in his own peculiar language. The offices of absolution, betrothings, nuptials, the introduction of women after child-bearing, I administered to the Laplanders, always in their own peculiar language.

And as the Laplanders, as already observed, have made no inconsiderable progress in the knowledge of religion, so do they hold it in the greatest veneration. For notwithstanding the public performance of singing, of preaching, and examination, can seldom be finished in less than three hours, yet all of them, should the cold be as intense as possible, sit attentive, in tents, rent and full of chinks, bare-headed, in the deepest devotion, silence, and veneration, listening to the word of God.

They hold in the highest honour and veneration the professors of religion. They receive their doctor or divine instructor with reverence and great affection, addressing him Buorre Atzhie, that is, good father; they rise to him, and assign the most honourable place in the inn. They place before him the most costly and excellent things they have; as the milk of the rein-deer, hardened into a consistence, cheese, flesh, the tongue and marrow of the said animal. They return their best thanks for any religious office he performs among them, making use of this form, *Kutos ednak ibmel sanest;* that is, thanks for the word of God.

A great many, even in the absence of the missionary, though on their journey, do not neglect a solemn attention to prayer, morning and evening. There are some also, who at private devotion instruct their children and the rest of the family. Nor is it sufficient for them, merely to have learned faithfully the word of God, unless they also exemplify the force and efficacy of it in a life worthy of a Christian. And hence it is, that no oath, no curse, is ever heard among them, but rather the indignation of the Norwegians, execrating those addicted to this crime. Their holy sabbaths seldom or ever do they violate, they are naturally mild in temper, and very fond of peace, so as even hardly ever to come to words and blows. Most continent too in their habits, for during the space of four years, that I discharged the duty of missionary among the Laplanders of the parishes of Kiollefiord and Kielvig, not a single child was born out of wedlock; and for the whole six years of my office at Alten, only one. They refrain with modesty from the marriage of relations; theft is very rarely committed among them. During the whole of my time engaged as missionary among them, I never lost the least thing, but every thing remained without lock and key, packed and untouched. It is a habit with them, not to touch a crumb of food, without devoutly blessing it first in this form, Jesusatzh sivned, that is, O Jesus sanctify!

It is much to the praise of the Lapland nation, that strolling beggars are very seldom seen there. Each pauper keeps himself in his own hut, to be examined and supported by the other inhabitants of the parish: when in the other parts of Norway, and where you would expect better provision from the law in the management of paupers, you find vagrants of this sort, and sometimes in herds together.

The Laplanders, like the rest of mankind, have their faults, but they are few, and seldom occur; among which I name drunkenness, to which some are addicted, and fraud in their dealings, which the following instance shews: In the spring of the year there are found in the rein-deer little worms between the skin, short but thick, called gnormak, which gnaw into and perforate the hide of the animal; and hence it arises that the hides of rein-deer killed about the spring, vitiated by the said worms, yield much in value and price to the hides of the same animal killed in the summer or autumn. To

remedy this defect, and to prevail on the purchaser, the dishonest Laplander, in order to conceal it, cunningly covers over the little holes in the hide that is eaten through.

CHAP. IV.....OF THE CLOTHING OF THE LAPLANDERS.

A CERTAIN writer has related to us, that the Laplanders wore cloathing of gold and silver ornaments. Another writer, of no better faith, confidently asserts, that their apparel consisted of the skins of sea-calves and bears, and that the whole body was covered over from head to heel as with a sack. A third writer has left it upon record, that the women of this nation wear ornaments made from the dried entrails of wild beasts; which accounts, from their very air of romance, refute themselves.

The men wear on their heads tall caps, not unlike a sugar-loaf. Great numbers of this sort are made out of red cloth, called Kersey, consisting of four parts or segments, broad at bottom, but narrowing to a point at top. On every hem where there is a joining, a very thin slip of cloth, kersey, of a yellow colour, is seen in such a manner, that the beholder thinks he sees four yellow fillets, from the lowest rim of the cap to its top: on the top of which is displayed a crest made from pieces of party coloured cloth, with a bordering from the skin of the otter, drawn about the lower part.

In some caps the said bordering before and behind has a narrow form, which kind of covering, Niudne Kapperak, a covering for the nose, is so named in the Lapland language. I remember once to have seen a poor Laplander with a cap made from the dressed skin of a salmon; it was well nigh white coloured, marked with squares, resembling scales of fish which had been thrown off.

The cap in which the men go hunting, or wear in pasturing their tame rein-deer, is called Rivok. A small aperture is in the front, but the breast, shoulders, and part of the back, is covered by it; neither is it fastened over the bosom by belt, button, or any other ligature, but fits close. In the front of the cap is a plate or covering, in Lapland called Zhialbme-raft.

Cravats are very seldom worn by the men, and if worn, so scanty and short are they, that they come round the neck but once; and this is the reason why the neck is usually exposed naked, and without covering, to the inclemency of their cold.

The tunic, or inner garment of the Laplander, called Tork, is made of sheep skin, neither sheared nor dressed, the hairy part being turned in. On the upper part of the tunic is a stiff high collar, made from kersey, or some other cloth, artificially variegated with party-coloured threads. The tunic, as the shirt, is, downwards, an entire and continued piece, but upwards open, where it covers the breast, and if made after the fashion and condition of the nation, is rather elegant and costly; a bordering goes round that opening, of kersey, or some such cloth, the edge of which is trimmed with a fillet made from the skin of the otter. On the left side are slender bandages; but the right is ornamented, especially in the womens garments, with gold and silver tassels. Their sleeves, in like manner, have this edging to them, made from kersey, or some such cloth, on the extremity of which is a fillet from the skin of the otter. The lowest border is tacked round with a fringe, from the same cloth as the fringes on the bosom and on the sleeves; and as the hairy side is always turned in, as observed, it follows that the hair is every where seen to hang below the extremities of their garments.

Shirts are very little worn either by the Laplanders; but the tunic or inner garment, just now described, is next to the body, and supplies the place of the shirt.

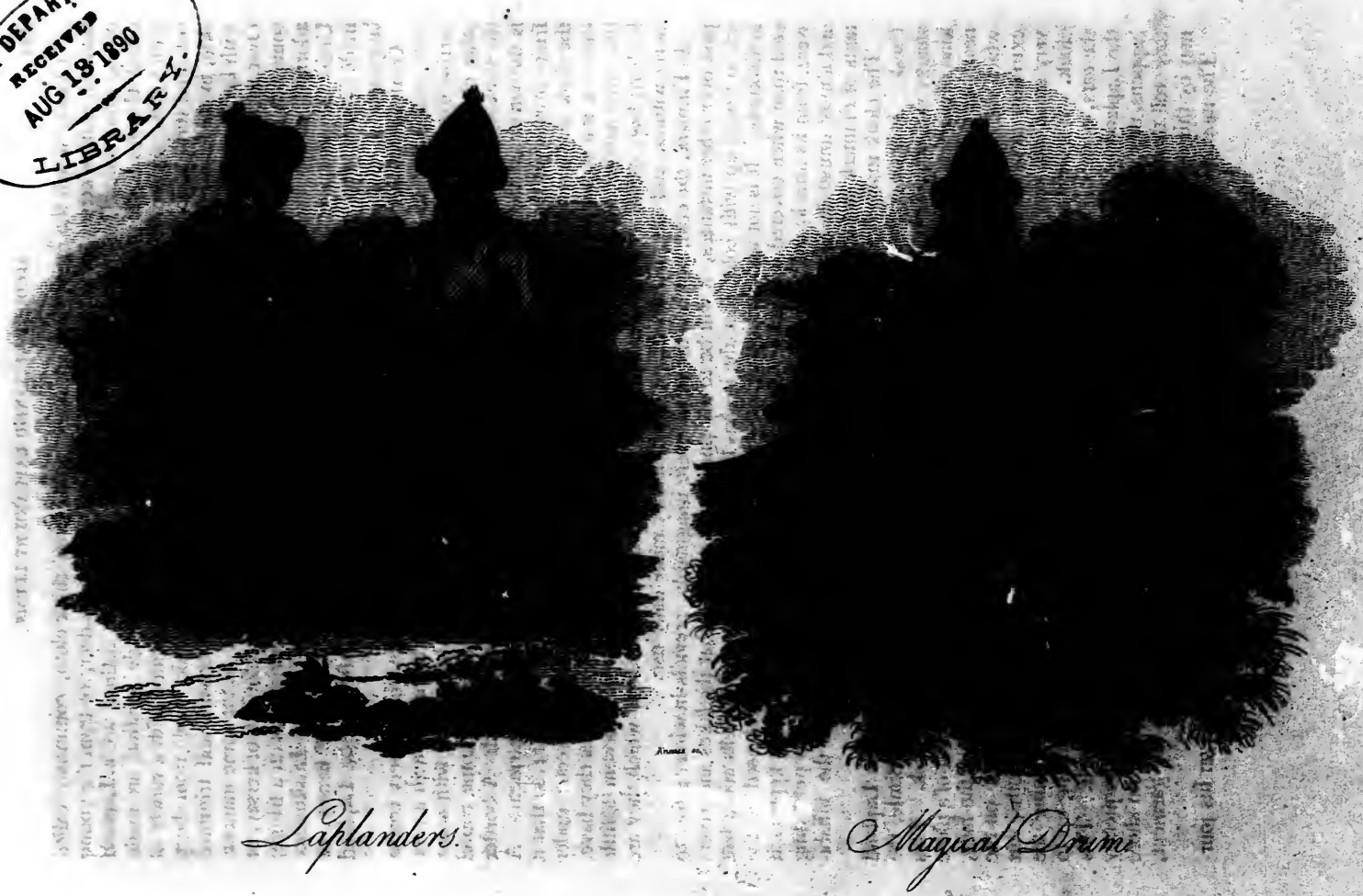
Cloaks, which the men wear, are made either from thick cloth, commonly called Badmel, or from kersey, or of the hides of their full grown rein-deer, or from the young of the same animal, of a gray colour. Cloaks from the cloth badmel are in Lapland called Gagges-Kafte; which also, as the tunics of which I made mention, are made with a stiff collar, covering the whole neck to the shoulders, ornamented with a variety of coloured threads, for the distinction of the wearer. And as the tunic, made from sheep skin, in the form of a shirt, is entire from below, and open in the bosom, and trimmed with kersey, or some such cloth, it does not agree with the cloak in the same manner. Over each shoulder is a slip of cloth, which is either plain or party-coloured, of kersey, or some other cloth of a varied colour. The lower extremity is embellished with a fringe, adorned and diversified with threads of different colours, called in Lapland Luskuldac. Under the neck is a button, to close the aperture of the cloak. Cloaks of kersey, or made even of other cloth, are called Kersey-Kafte and Ladde-Kafte, in the Lapland language.

Garments, of this kind, like the cloak just mentioned, are made from a very coarse cloth, called Badmel; but if entire from the lowest part, open in the breast, with a very narrow fringe coming round that aperture, they are finished with kersey, or with some other cloth different from the colour of the cloak: such like trimmings come round the sleeves, and a stiff collar about the neck, variegated with a twisted thread. A border is thrown round the shoulders, of a colour different from the rest of the garment. A fringe ornaments the lower extremity, of a colour different from the garment; so that if the cloak is of a red colour, the colour of the border is yellow, white, or green: under the neck is a button, which closes the opening. In their cloaks and breeches they have, like other nations, no pockets; in the room of which they carry in their bosom a little leathern bag, called Nivsak-Gierdo, where they put up a tinder-box, which they are never without, and other commodities, of which they make daily use.

In Finmark, the cold, which is the most severe imaginable, prevails in winter; for, to pass over other instances, it will be to my purpose to mention that the lakes and rivers are so frozen up with cold, that the ice has been known to increase two ells and a half in thickness. It is not undeserving of note, that ice of itself is more condensed by the cold than when covered with snow: for from the incumbent height of it, it is kept, as it were, from its attack, and defended against the inclemency of cold. To this pervading and almost unusually felt degree of coldness is to be ascribed the reason of the inhabitants of Finmark clothing themselves with the skins of beasts.

The cloak made from the skin of the rein-deer, when grown, is called in Lapland Paesk. It is made from the skin of the female, which the Norwegians call Simle, the shaggy side being turned out, which gives the cloak a horrid and unsightly look. This kind of garment is not as others open at the bosom, but like a veil, entire and of a piece nearly to the neck. About the neck is a border made from the shaggy part of the hide, which the Laplanders call Paesk-Lok. Besides, a pair of ribbons hang down, on the extremity of which is a small tassel, made up from small shreds of different cloths, cut very small into very little pieces: the ribbons serve for the purpose of lightening the cloak. It is ornamented too, as the above garments, with a high collar, mounting up to the ears, made out of the undressed hide of the rein-deer, as is the cloak itself. This the Laplanders use as a mantle: for if on their maritime excursions, as it frequently happens, they should be sprinkled with the brine of the sea, when they come on shore they roll themselves instantly in the snow, that the salts, so injurious to the garment, may by this means be extracted.

The mountain Laplander, for his comfort, and for keeping off the cold on his jour-



Laplanders. Magical Drum

ney, usually wears a muffler about his neck, made out of the skin of a young fox, duly observing that the tail hangs from his neck on his shoulders. The Swedish merchants, when they have to travel over the mountains, in like manner cover round the neck with the skin of a martin, in order to keep off the cold: and that nothing should be wanting to it, they usually fill up the crevices made in it by the eyes taken out, by new ones cast from silver. The cloak which is made from the hide of the rein-deer, when young, the Laplanders call Moedda, fashioned according to the model of the aforesaid cloak, with this difference, that it has fringes to the sleeves, and it is trimmed below with the skin of a black dog. The furred garments which the Lapland women make, to sell to persons of honourable condition, are made from the skins of young rein-deer, of a gray colour, and are open at the bosom and on each side, with sleeves ornamented with fringes from the skins of otters. A high collar is tacked to them, fringed also with the otter's skin. At the bottom is constantly a border, the hem of which is a very narrow selvage of black dog-skin, ornamented. On each side of the lower border is seen a fillet, in the form of a wedge. But it is to be noticed, that each border of cloth before the breast, about the neck, or in whatever part of the garment it is placed, is ornamented and diversified with twisted threads of tin, drawn in a variety of forms and figures, as the taste of the purchaser may require.

The men sometimes make use of leather gloves, called Rappukak. They are most usually made from the skin that is stripped from the feet of the young rein-deer, the shaggy part being turned outside; and for the better defence against the cold, they put in them hay or long straw, called Sueinek. The Lapland women make up these gloves for persons of condition, which are made at the desire of the purchaser, that the part of the glove which covers the hand itself should be of the skin from the feet of the rein-deer, or of the black fox, with the hairy part put outside. That the sleeve, which covers the wrist, with part of the arm, should be finished with cloth, of variegated threads of tin, and trimmed with otter's skin. There are among the Laplanders men, as well as women, who have the custom of wearing bracelets of mountain-trap, which from a vain superstition they use as a charm against pains of the joints.

The men never wear stockings, but breeches or pantaloons, which fit the legs closely and compactly, going from the hip to the ancles. Breeches of this sort are made from the cloth Badmel, or from the cloth Kersey, or from the dressed leather of animals, or lastly from the hide and the skin from the feet of the rein-deer together. Those made from coarse cloth, Badmel, the Laplanders call Gagges-Busak. Breeches made of cloth Kersey, that they should last longer, they usually strengthen before the knees with a leather guard. Those made of dressed leather are called Sistekak, used principally on maritime business. Those made up of hide and skin taken from the feet of the rein-deer are called Kamas-Busak. The upper part of these is made of hide alone; the lower, coming from the hip to the ankles, of the skin from the feet of the rein-deer. These are usually worn on journies by land, yet in such a manner that they may be drawn over other breeches next to the body, made from cloth of Badmel, or others made of coarse cloth.

The Laplanders fix but one sole to their shoes; and the shoes of some men are so made, as to consist of the hide taken from the skull of the rein-deer for a sole, and that which comes from the feet of this animal for the upper-leather and latchets. The shoe of this kind is called Gallokak, covered over with hair, and very much in use among the mountaineers. And as these shoes are on every side shaggy, it is plain that they are smooth and slippery; and for this reason the ends of the hair on shoes which boys wear are singed, lest walking on the ice with a tottering step they may to their danger tumble

down. Some shoes have soles from the skin of the seal, the upper and other parts being made from dressed leather, or something else of a soft pliant nature. There are some also made from the hide alone, yet in such a manner that the soles are of a leather thicker than the other parts, and this kind is called Zhiazekak. In some the soles are of the undressed hide of the cow, the hair being all outside, the upper-leather and latchet being either from tanned skins, or soft pliant leather. This third kind is very much in use among the seafaring people. The Laplanders fasten their shoes neither with button nor latchet, but putting them on, tie them round the calf of the leg with a thong of leather, or a twisted cord. It is a custom among them to put in hay or bulrushes to their shoes, that they may retain the warmth the better; and since the breeches in use among that nation do not come below the ankles, it follows that the rest of the foot is thrust naked into the shoes. The straw too put in is placed about the shoes, and at evening, when taken off, is taken out to be dried by the fire, that the moisture may be taken out: in the morning, when they are to be put on, the straw is again put in, which, when worn out with long service, is at last rejected, and other straw, fresh and sound, put in its place.

The women make up boots for sale, which, at the will of the purchaser, are so made, that the soles, the upper-leather, and latchets, taken from the hide, the feet of the reindeer, with the shaggy side turned outward; but the other parts, which cover the soles of the feet, the hams, and knees, consist of cloth, ornamented and diversified with threads of tin: they are fastened above the knee with a leather thong, on the end of which hangs a small tassel made from short shreds of cloth. Boots of this kind, which the inhabitants call Sœpokak, end in a crooked and sharpened beak.

The belts which the men gird themselves with are leather, and set with tin. From the fore part is hung a purse, resembling a little satchel. In this purse they put up their tobacco, take it out in small parts, put it in their mouth, and chew it. On the other side is hung a variety of leather thongs, ornamented with tin, tin-tassels, keys, and such things. There is appended to the belt besides, a knife in a sheath, and a variety of rings hanging by a leather thong. The women make up these belts for sale out of cloth, the outside of which is ornamented with tin; the inner is underlaid with leather.

THE CLOTHING OF WOMEN.

THE Lapland women most usually wear linen caps, seldom woollen. The woollen caps are made of kersey, or some such cloth, and consist of two pieces, one of which, reaching to the neck, covers the hinder part and crown of the head, the other part the temples and the rest of it. Along the edge of the sewing, where these parts are joined, a bandage of kersey, or of yellow cloth, is placed. The lowest end of the cap is ornamented with a fillet of gold, or counterfeit silver, or some other shining bandage, or with a strip of cloth, of a different colour from the cap itself, which is bound round with ribbons, with gold, or counterfeit silver, which make a very shining appearance. I remember to have seen a poor woman with one that was bound with a bandage made of the dressed skin of a salmon, of a colour almost white, in every other respect like the ribbons just mentioned. The caps of linen do not differ from woollen but in the trimmings; these being trimmed with ribbons and a bandage of cloth, whereas the linen are ornamented with more elegant fringes.

The Lapland woman, before she puts on her cap, rolls up a certain round ball on the crown of the head, and draws it together under the ball with a thong, by which she gives an appearance to her head covering not unlike the women of Amager in Zealand, and of Opdal in Norway. Concerning the hood, or that covering for the head which

women, either intent on a journey, or occupied in keeping the rein-deer by night, make use of, these observations occur: they put on a certain kind of covering, which reaches from the upper part of it to the neck or chin; but from the lower is stretched over part of the breast, of the arms, and back. This kind of covering is fastened by no buttons or ribbons, as being on each side entire and fitting; it is generally made up of red, green, or blue cloth kersey, adorned at the lower part with a border of cloth, of a colour different from the hood itself. When they have put on this sort of covering, they place a high hood on their head, which rises broad in the shape of a crown, being spread out in the upper part of it. Below, along the left side, is a selvage of cloth, of a different colour from the hood; and such as mean to surpass in dress, make use of a bandage instead of the selvage, made up of gold and counterfeit silver, from which a gilt silver button is pendent. Men as well as women wear tunics and cloaks. The tunics are made from the dressed skins of sheep, resembling the tunics of men, except that behind they fall into a variety of folds, lie closer about the breast, and are longer; for they come down to the hams, when those of the men come only as far as the knees. And as the tunics of sheep skin serve the men instead of shirts, so women make use of no other covering than tunics of this kind, made from the unshorn skins of the sheep, with the shaggy part turned inside. The outward garment of the women, made of badmel, kersey, or any other cloth, is like the cloaks of men in almost every particular, with these few exceptions: the mens' come but to the knees, the womens' to the hams; the men's are ornamented with a stiff collar, the women wear none. The tunics of women, made of sheep skins, have a stiff collar, reaching over the ears and neck; which cloaks, made of cloth Badmel, have not, as just mentioned, and which when worn leave the neck above the tunic exposed. Among the women there is also a certain kind of cloak in use, called Barve, made of kersey, or some other common kind of cloth; but in this differing from others, that it is not entire from the head to the ankles, but cut and sewn again about the belly, and drawn into folds. The cloaks of women made up from the skins of rein-deer, or from their young, differ only in form from the mens'; that these come down to the ankles, whereas the mens' reach but to the knees.

The gloves of women agree in shape with those of the men; those who are desirous of ornament and elegance have hairy gloves, of a very white colour, made from the skin taken from the feet of the white rein-deer, and ornamented on the outside with variegated shreds of a different cloth. And as the men wear breeches made of cloth, kersey, or of some other sort, or skin taken from the feet of the rein-deer, the hairy part being turned outside, from dressed skins or leather, so the women wear them, yet they are very seldom made of leather, but in every other respect they are like the mens'. The shoes of the men and women only differ, that as the soles of mens' shoes are made of the skin which is taken from the skull of the rein-deer, but the upper part and latchets from the feet of the said animal, so the womens' are made up entirely from the skin from the legs of the rein-deer. Those who wish to be distinguished among the mountaineers have shoes covered with hair, of a white colour, from the skins which are taken from the feet of the white rein-deer. The girdles of the women are of leather, or sometimes of cloth, covered on every side with tin plates; under the girdle is seen a button, of a larger size, made of mountain-trap, from which some rings of the same metal for ornament and elegance are hung. Women of condition wear silver girdles. Handkerchiefs, with which the women ornament their necks, are either of stamped linen of Rüssia, or of coloured linen, which is vulgarly called in taverns Cattun; or of common white linen, a covering of which, spread over the cloak, extends over the shoulders and breast. The aprons of the women are narrow, made from the stamped linen of

Russia, or linen Cattun, or of the white common linen, of which the handkerchief just mentioned was made. Such as are white are ornamented with fringes of a more elegant texture.

The women of Russian Lapland wear silver ear-rings; sometimes silver chains coming round the neck, and appending to the ears. As the cloaks of each sex in shape differ so little from one another, it does not rarely happen, a circumstance of which I have been a credible eye-witness, that the husband, without knowing it, puts on the cloak of his wife, as she does in the same manner the cloak of her husband.

All cloathing of this kind, male as well as female, such as furred garments, gloves, shoes of leather, &c. are made by women alone; as, on the other hand, the men are employed in the occupation of women, in preparing food and refreshment.

CHAP. V....OF THE HABITATIONS OF THE LAPLANDERS.

THE hut of a maritime Laplander is call Laume-Guatte; it is built within of timber set upright, and without of the bark of the birch-tree, thatched over with turf. Of these beams four are thicker, called in Lapland Baeljek, bent, and are the principal beams that sustain the bulk of the building. A pair are fixed on each side of the hut, driven at one extremity into the earth, but at the other, towards the gutter, which is always in the middle of the building, upright. When they are fastened in the ground, they are distant from each other by a small interval, but, gradually rising, they keep inclining, to join again near the brink of the gutter. Hence the said four beams or Baeljek, raised in a curved manner, resemble a pair of arches within. Besides those four thick beams used in erecting and consolidating the hut of a maritime Laplander, other four curved rafters, called in Lapland, Zhianmek, are erected with them. A pair of these, separated by a small space in the building, in the inner part of the hut, and a pair also near the door, are set up: they are fastened in the ground at one extremity, but towards the top, arching gradually, they rise towards the gutter of the building.

Between the said beams so often mentioned, Baeljek, erected on each side of the hut, and between the four others described, Zhianmek, placed in the interior part, near the door, which, as I have just now said, are at a small distance asunder, little beams, or broad pieces of wood, are lodged, as well within near the floor, as above towards the roof, whence it is easily understood, that when the four Baeljek and as many Zhianmek rise archways from the ground to the gutter, and that the little beams or broad pieces of wood fitly correspond in situation with the larger timber of the building, the hut resembles, on the inside, a small arch, from the ground to the gutter. This arch, which the hut of the maritime Laplander forms on the inside, is so low, that you cannot stand upright, but before the fire, just under the gutter, where the hut is highest; for if you incline but a little to the sides of the building, your body must necessarily be bent. Where the arch touches the ground, there too are the seats in the hut of a maritime Laplander, for so sunk and low is it, that you must sit on the very ground itself. The hut, when entirely built, and the timber laid in order, is floored within, and to this flooring the beams are fastened with nails. In the hut of the maritime Laplander, near the door, are laid on each side some smooth stones, in Lapland, Juoudok. The floor of the hut is usually round like a circle, with branches of trees on the levelled earth, everywhere paved, except in the middle, where the fire-place is.

The fire-place itself consists of rough stones, in a double row, negligently piled on the bare ground, from the door to that part of the building most fitted for it, in which

Inside of a Hut & Dress of the Laplanders.

inclosure a fire is made. Near each end of the fire two columns are erected, of a moderate thickness, with one end in the ground, and with the other raised up to the gutter. On these two columns two beams, in Lapland, called Balkok, are lodged, on which other poles are laid across, from which are hung wooden hooks, that hold up pots and kettles on the fire.

Whilst the fire is burning on the hearth, a certain ventilator is provided in the house, near the gutter, with this view, lest, while the smoke is ascending through the gutter, the wind, blowing with greater violence, it should be stopped. The ventilator itself is applied to that side of the gutter which is towards the wind, so that if the wind rises in the north, the ventilator is erected on that side of the gutter.

The maritime Laplanders, before they go to bed, extinguish all the logs, which are moved from the hearth by means of a stick filled for that purpose with cold water. Then, letting out all the smoke, they climb up to the roof by means of rafters, named in Lapland Tappaldagak, to shut the gutter. At that end of the fire-place which is opposite the door are placed two trunks of the birch-tree, an ell asunder from each other. Those form, on the floor of the cottage, not far from the door, a long but narrow space, where, whenever the fire is to be lighted, pieces of wood are to be put, which consist of trunks and branches from trees fresh cut. Here too the guest or stranger must stand who shelters himself under their hut, until the father himself of the family, or some other member of it, invites him to a nearer approach.

Near the other end of the fire-place, looking towards the interior side of the cottage, opposite to the gate, are placed likewise two trunks of the birch-tree, on branches at the exact distance of an ell from each other; which, as the former just mentioned, make a long but narrow space, where kettles, plates, and other utensils of this sort, are placed. Here is affixed a brazen vessel filled with snow water, where the Laplanders, whenever need or inclination calls them, quench their thirst.

From what has hitherto been stated it is easily collected, that, from the outside door to the inner side of the hut, things present themselves in this order: first, not far from the entrance, between two logs of the birch-tree, laid on branches, is a space or certain limited dimension; then the fire-place, which is raised in the middle of the floor, from rough stones ranged in two heaps; and next is another space or division, near the interior corner of the hut, made like the first. On each side of the fire-place, and of the said spaces, are two beams on boughs, with which the floor is covered, at the distance of two ells from one another, reaching by one end to the fire, by the other to the wall. These beams form three spaces or measures on each side, one near the door, at the sides of the birch trunks, where the wood for firing is placed; another in the middle of the hut, near the sides of the fire-place; and a third at the sides of those trunks, where their kettles, dishes, &c. &c. are kept. In any one of the said spaces or divisions the hide of a rein-deer is spread along the floor, lest the strewed branches of the trees should incommode them too much, either when they sit or lie down. The hut is inhabited but by one family; the father of the family and his wife occupy the one side for themselves, with its three divisions, leaving the other to the children and servants. But if there are two families, each has its side, with all the divisions belonging to it, so that the one father of the family is placed in the inward division of the side he has got, which is the most honourable in the hut, and is called Bosshio-Kiaezhie, the children in the middle, called Gask-Loido, and the servants in that which is the next to the door, and is the worst of all, called in Lapland Ursa-Kiaezhie. The other father of the family disposes in the same manner as the former the part of the hut which he has duly obtained, assigning to each member of the family its own peculiar portion of it.

He who has obtained the inward or more honoured part of the habitation in the hut, on the arrival of a missionary, comes out, together with his family, and most willingly gives up the place to his welcomed guest, as long as he is pleased to stay with him. And though two families should occupy the hut at once, yet the fire-place, and certain portions of the place, such as are next to the door, adapted for the keeping of wood, as well as those opposite the fire-place, adapted for the purpose of keeping various domestic furniture, are in common use with both.

This nation, which is accounted by many very ignorant of the world, as savage and as brought under no cultivation of humanity, yet make use of the same hut and fire-side with so much friendship and harmony, that no contest, no brawl, except very rarely, is ever excited among them; when yet it is fully and abundantly proved, that numbers, who boast, I know not why, a degree of refinement and elegance of manners, and from whom, on that account, you would reasonably expect better manners, cannot inhabit one and the same city and neighbourhood, without discord and contests.

The maritime Laplander stables his lambs and calves in the same hut with himself, but apart, and in inclosures. How strong the stench of such a sordid lodging must be to the guests is easy to be conjectured. The hut of the maritime Laplander is built with a yard, on the one side of which is the hut itself inhabited by the family, on the other is the stall for cattle, hence men as well as beasts must come by the same door into their habitation.

The hut inhabited by the family, the cow-house, and in the middle between each, the yard, are under one roof, which is first covered with the bark of the birch tree, then with turf from the ground to the top; hence the appearance of the outside is that of a lengthened and gently declining hill. At some paces from the hut is built a depository, called in Lapland Loaave. A building of this kind consists of certain beams set upright, over which others are placed across, with the branches of various trees, in the shape of a house without a roof. To this building the Laplanders bring hay, and bind it together so closely, that each of the poles are covered, except the ends that jut out above the hay; so that you would say that the whole mass was nothing else than three walls of hay. Hay piled and bound up in this manner is kept under the open air during the whole winter very sound from the injury of rain, which very rarely infests this quarter of the world in winter. The outside of the hay-rick can be injured indeed by snow, but the hay nevertheless will be unhurt within. Between the rafters, where the arch is bent, the Laplanders hang their clothes. The space, above the arch, between the three walls of hay just mentioned, is called in Lapland Aske, which word properly means the bosom. Here it is usual to lay up the skins of the rein-deer, baskets, and other vessels of this sort: here sometimes the wearied Laplander takes up his rest by night. The maritime Laplanders, as often as they are in want of food for their cattle, strip the trees of their bark, and give it to them to eat: they carry home too the branches of trees, as provender. When a tree is felled and its branches cut off, the trunk is put aside, and hence, as it happened to myself not seldom, when you come into those parts where the trunks of this kind lie along the hills and plains, they will appear to you as so many putrified carcasses. The herds of the Laplanders feed besides on certain roots, some of which have the figure of a bird, some another, &c. &c. Besides hay, the usual and ordinary fodder, there is another food, so to express myself, prepared for cattle; it is extracted from the heads and bones of fish, from straw, sea-weed, and from the sediment under the oil which is taken from the entrails of fish; which ingredients, when put together, are thrown into a kettle to be boiled, and, when done, are given in a sufficient quantity to cows, as a food they are very fond of. The

Norwegian peasants, called also Normans, inhabiting the eastern Finmark, feed their cows not only with hay, but sea grass, on which the rein-deer usually feed.

The winter cot of a mountain Laplander, with respect to the floor, dimensions, and fire-place, resembles almost in every thing the hut of a maritime one, already described, except that the four beams or columns, which in the hut of a maritime Laplander are erected near each end of the fire-place, are not wanted in the cot of the mountaineer. Between the floor of the cot, which is covered with boughs of trees strewed on the bare ground, and the cot itself, raised on slender poles, driven at their extremities into the snow, and covered with a woollen cloth, a wall of snow, called in Lapland Seine, is made; and since the snow must be removed from the place in which the cot is to be raised, in the form of a round circle, it follows, that the snow must on every side be gathered round the floor, as a solid wall. The cot itself consists of four crooked beams, in Lapland, Baeljek, which make up its principal parts, and as it were its foundation and basis. Two beams of this sort are raised up on each side, but separated by a small distance, driven at their ends into the snow, the other extremity raised towards the gutter; and as it has been observed above, speaking of the huts of the maritime Laplanders, they keep bending as they rise, until, joining at top, they are formed into the shape of a double arch. The arches themselves, lest they should totter, are braced with a small rafter. Between these often mentioned four beams are erected various poles, which are fastened at their lower extremity, as well as the beams themselves, in the wall of snow just now mentioned, but, by gradually rising, effect that the cot on the inside should not materially differ from the shape of a round arch, especially if the said poles are drawn over with a woollen covering. Above, near the roof, another pole is placed across, from which are hung bent iron hooks, by which their kettles and pots are suspended over the fire.

The poles, as said, placed in their situation and order, are covered with woollen blankets, which the Laplanders call Loudagak, not with those which are new and sound, but from such as are the worse for use. The blankets themselves are divided into two greater parts, covering the cot on each side. Each part of the blanket is fastened to the post by the door, or in the inside part of the cot; this forming in Lapland what is called Skarro. And since these blankets are not of sufficient breadth as to cover the whole cot at once, they take care, by a certain supplement, called in Lapland Naalish, and of the same stuff as the covering itself, which covers the gutter, should be provided.

The door of the cot is made of woollen covering, cut in the shape of a pyramid, the inner part of which is stretched with tenter-hooks, with which they usually lay out smoked salmon. Should a door covering want these tenter-hooks, which the Laplanders call Zangak, it could not supply the place of a door. At each side of the door is erected a thin pole, called in Lapland, Bishiamas, to supply the defect of posts. When the wind blows with violence, the door, which is hung only above, and indeed with a thong of leather alone, is fastened to one of the poles, so that on that side where the wind presses it is entirely shut against it, which, was it not so, under a strong wind the fire on the hearth would be tossed about, and the smoke, checked from going up, would fill the whole cot. When the wind does not blow, the door is open, and a free entrance and exit is made for it.

The mountain Laplander usually erects his cot in the middle of the wood, and goes out every day, with the exception of festivals alone, to provide wood. When a tree is felled, he himself draws it through the snow to his cot, where he cuts off the top, and the lesser branches, on a low block or machine, placed behind the door for this purpose. The trunk and thicker branches are cut into larger pieces. The wood, moist and

stiff with the cold snow and ice, as brought from the forest, is laid on the fire, where, taking flame, it oozes out a certain dampness, accompanied with a strong vapour. The Laplanders call this vapour Shiudga, from which, they say, they receive greater annoyance, than even from the smoke, of which the Lapland mountaineer so much complains. When preparing to light the fire, they catch the spark on the bark of the birch-tree, and when caught, feed it from dried leaves and small branches of trees; then, as it lights, larger pieces of wood are put on; when the fire is lighted, the whole cot, from the top to the bottom, is filled with smoke, to that degree, that all who are in it are enveloped in a thick cloud, and are well nigh deprived of the use of sight. As the fire gradually gets up and breaks out into flames, the smoke, but by little and little, decreases; and such is the abundance and force in which it remains, that, though sitting in the cot on the ground, you may yet reach it with the crown of the head. When the winds blow more than common, the smoke is struck back from the gutter, which is always open.

The Lapland mountaineer, on going to bed, does not put out the fire, but lets it burn until it is extinguished of itself. He does not use a lamp with oil and link, contented with that light alone, which the fire on the hearth supplies him with on the mountains.

At the distance of some paces from the cot of the Lapland mountaineer stands a certain vessel, called in Lapland Loaavve, raised on beams set an end, on which cross ones are placed, with the boughs of various trees. The whole of this building, where vessels, rein-deer skins, &c. are put up, is not unlike a house built without a roof.

The summer cot of a Lapland mountaineer is almost the same as the winter cot, as I have shewn, with this difference, that this is covered with woollen, the summer one with thick linen cloth, nor is it defended by a wall of snow, the snow being at this time of the year everywhere almost dissolved.

The little tent which the Lapland mountaineer, when he goes to hunt the rein-deer, or otherwise intent for a longer journey, carries with him, is made of thick linen, in the Lapland Lavvo. In the place where he intends to erect this tent, the snows are carefully cleared away, even to the bare soil, so that what are untouched remain as walls drawn round in a circle. He then strews the floor with branches cut from trees, laid over the bare earth; he makes a fire-place from stones laid along in two heaps; he erects beams, from trees which are at hand in the place, driven at one end into the edge of the wall of snow, but meeting above, and, thus raised, surrounds it with a linen covering, of which there is mention above. The tent built in this manner, the Laplander lights a fire on the hearth, in order to restore his limbs numbed with cold, or prepare his food, for which purpose he usually takes with him a little kettle.

Should the Laplander, intent on a journey by sea, be compelled to put in where, on account of the tempest suddenly coming on, or any other cause, there is no trace of civilization and he has nothing at hand of which he stands in daily use, he instantly builds himself a house: he takes the oars from his little bark, erects on the shore, and, when erected, covers them with a sail, under which roof, as long as he can subsist there, he remains.

Among the Laplanders who inhabit the mountains, as well as the coast, are the cupboards, or little out-houses propped on rails, where it is customary to put up provisions, and little utensils; the cupboards of the maritime Laplander are at no great distance from his hut, the inhabitant of the mountain usually builds them in the forest. See chapter the eleventh, on the journies of the Laplanders. The mountaineers usually build vaults under ground, called Gedde-Borra, cover the bottom with stone, and there put up the flesh of the rein-deer.

Having now finished the description of the habitations of the Laplanders, I think I should add something of the little hovels of the Norwegian and Lapland peasants. The hovel of a Lapland peasant has wooden walls, and them low, and without ceiling. The beams on which the poles, sustaining the turf or thatch, are lodged, are not laid across, but lengthways, and within. There is no gutter, as there is in other huts; nor have they light from windows, but through chinks, which, when the occasion requires, they shut up with a little shutter. Within is an oven, not very unlike those of bakers, over which is piled a large heap of stones. In this oven a great heap of wood every day is lighted, and keeps burning, until the oven and the stones laid on it glow with a very intense degree of heat.

Whilst the oven is heating, the outlets and chinks, as many as are, are thrown open, that the smoke may have a free egress, to be closed again when the fire is out; by which means the heat, which is the greatest possible, is within, and kept up by the heat of the glowing oven and stones, it continues until fresh fuel is brought and lighted up in the oven. When the chinks and outlets are all closed up, it is dark within, and for this reason they light unctuous pieces of the fir-tree, in the place of a candle, and dispel the darkness so far, as to need no other light to complete their usual work. The floor of the hovel of a Norwegian peasant, an inhabitant of Finmark, is paved with hewn stone.

The inner sides of the walls are made of timber set upright, not unlike a piece of floor-work; but without are covered, first with the bark of the birch-tree, then with turf, one lodged upon another, so that the bark of the birch-tree should be between the turf and flooring. There is no distinction of floors throughout the house. The roof rises in a point outside, as with the other peasants, covered with the bark of the birch-tree, and with turf.

Olaus Magnus, a celebrated writer, is of opinion that the boisterous winds and deep snows, which are condensed in Finmark, are the reason that the inhabitants of this tract build for themselves subterraneous habitations; but, in my opinion, the construction and use of these dwellings is to be ascribed to the scarcity of wood, especially in insular situations, where the soil is bare and barren. But as to these habitations of wood tumbling down by the attack of winds, provided they are raised on a firm and solid foundation, is an idle fear. For almost all persons in official situations, appointed by the king for administering the public affairs in this country, as also merchants resident here for purposes of business, it is certain live in wooden houses, and them seldom consisting of two stories; to say nothing that these subterraneous caves are the best adapted for preserving heat.

CHAP. VI....OF THE BEDS, AND BED-CHAMBERS, OF THE LAPLANDERS.

THE bed on which the maritime Laplander reposes in his hut, as the mountaineer when he goes to rest in his cot, is covered and furnished with the skin of the rein-deer laid on the bare branches of trees, which is the flooring, equally of the hut and cot. The clothes which they wear by day serve for a bolster; a coverlet, made of the unshorn yet dressed skin of a sheep, with the hairy part inside, is their blanket. On this blanket is afterwards laid a rough woollen cover. The woollen blanket under which the mountaineer lies in winter is in the shape of a sack, into which he thrusts his feet. The husband, wife, children, and servants, every one, even if the cold is extreme, go naked to bed. The beds have no other separation than a small pole negligently placed from each other. In the inside of the hut (see what is said on the various dimensions of the floor

of a maritime Laplander's hut in the preceding chapter, for in the cot of a mountaineer the same obtains) is a small piece of wood, the inside of which the husband with his wife, on the outside towards the door the children, sleep. A little below, not far from the door, is also another small piece, within which, next to the door. is the servants bed. And though all the beds are separated by this partition piece of wood from each other, yet so near is one to the other, that the parents can touch and handle the children when in bed, as these can their servants.

The mountain Laplander, sleeping in his summer cot under a linen covering, equaling in length and breadth the bed itself, and coming over his body neither tight nor close, but leaving a due space between, goes to rest: for the covering raises itself in the middle like a small oven, touching the earth at the end and on each side. But this covering is bound with thongs to those bent beams, which, as was shewn in chapter the fifth, speaking at length of the habitations of the Laplanders, form within the cot of the mountaineer, to the intent lest when they repose they should be unceasingly annoyed by gnats, with which this country in summer-time abounds.

For the long gnat flies about Finmark every where, and in such swarms, that those who walk between the trees, from the multitude of these insects that get about the face, seem as inveloped in a cloud: they are equally troublesome to man and beast. Those who are stung by them in the face or hands begin soon after to itch, and to swell with certain white ulcers; so that you would believe that persons coming in summer out of the country, with commonly a swoln and deformed face, were infected with the leprosy. The Laplanders, busied in the forests in summer, either in getting in wood, or bark from trees, with difficulty can eat on account of these gnats, who, no sooner is the mouth opened, than in a swarm they fly in. When the winds set in strong, they instantly depart; but when they subside, return again, and fill all places with their accustomed humming.

The recreation which the mind might be disposed to take from the agreeable return of summer, after the long wearisome time from the festival of Michael the Archangel to the month of July of the year following, is disappointed indeed, in a great degree, by these annoying insects. But how rude and immitigable the temperature of heaven is in this quarter of the world may be learned from this, that when on the festival of St. John, and of course in the middle of summer, I had been on a visit with Peter Andius, a provincial judge, who lived in Talvigia, near the shore, I found a great heap of snow lying near the windows of the room I slept in, as yet unthawed.

And as the said insects are so troublesome to men, so do they create no less trouble to the rein-deer and the rest of the cattle; for whenever the herds are returning from pasture, these annoying gnats in a swarm fix themselves on the back of each beast, not to quit him until they have taken their full of blood; for when they are driven off by the hand, drops of blood begin soon after to flow from the back of the animal. It is with difficulty that they endure smoke; and for this reason, when the cattle are brought to the milk pail, the Laplanders burn turf, or some other moistened materials, that will furnish plenty of smoke, to the intent that, the gnats driven off by these means, they may milk the cattle quietly and without disturbance. And though this kind of insect is so feeble and infirm as to perish with the slightest touch of the finger, yet is it able to penetrate with its sting the very hard hide of a horse, thick woollen stockings, and other things of equal hardness.

CHAP. VII....OF THE MEAT AND DRINK OF THE LAPLANDERS.

THERE are certain things on which the Laplanders live, whether you look to the materials, or to the manufacture and manner of preparing them, common with those of the rest of the Norwegian peasants. Concerning these it is not my intention to speak, as I have proposed only to mention something of that kind of food which is peculiar to the Laplanders, from the nature of the materials and manufacture.

They boil the milk of the rein-deer in summer, infusing their liquor called Syre, until, tinctured with the colour of that liquor, it comes to a consistency. The milk which in autumn, especially about the festival of All Saints, is taken from the rein-deer, is poured into casks or other vessels destined for this purpose, where, from the heat still remaining in the air, it grows sour, and soon after, the cold gradually increasing, it is condensed into ice, by which means it can be preserved, and is, the whole winter. The milk, which after the festival of All Saints comes from the rein-deer, mixed with berries of a black colour, which the Norwegians call Kraefebaer, is poured, purged, and clear from filth, into a rein-deer's bladder, where, by the force of the cold, it thickens in a short time. This is their winter nourishment, which, when the Laplanders are going to eat (they eat it during winter once a day, about noon) they cut with an axe a piece from the bladder, to which the milk, mingled with berries, stick, so that the skin of the bladder, milk and berries, thickened with the cold into one consistency, are cut together at once. This mass of milk, mingled with berries, and part of the bladder of the rein-deer, condensed with cold, is afterwards cut into a variety of parts, which as they were cut, stiff and unthawed by the application of heat, are put on plates, to be eaten. Whilst they are eating their teeth gnash with the cold, notwithstanding there cannot be in the milk of the rein-deer, from its natural fatness, so much cold as in the milk of other animals.

The milk which later, and when the winter is farther advanced, is got from the rein-deer, is laid up in bowls, made from stocks of the birch-tree, where, from the extremity of the cold, it is soon changed into ice. The Laplander does not use this congealed milk himself, but keeps it for his missionary and others, whom he is pleased to receive with magnificence and honour. When this milk is ever to be eaten, the bowl, in which it has congealed, inclined a little, is placed near the fire-side, whilst the surface of the congealed milk, turned to the fire, gradually liquifies; which when done, the bowl is taken up, and whatever milk is thawed by the heat of the fire is eaten with a spoon; this is repeated until they are satisfied. Congealed milk of this sort is protected against the wind by a cover, which, if neglected, would lose in a short time its sweetness and whiteness, and, tinged with yellow, would soon become rancid.

The Laplanders make cheese from the rein-deer's milk, and in the making of it observe this form: first, they mingle water with the milk, which otherwise, by reason of its thickness, when the rennet was put in, could not be dissolved nor separated; then they heat it over the fire in a kettle; when heated, the rennet is poured in, by which the milk is instantly dissolved, and the whey, being separated, is formed into cheese. Lastly, they take the cheese out of the kettle, in any shape it takes, or to be pressed and formed in a linen cloth. The cheese itself is fashioned into a circular form, of a moderate thickness. It is eaten at will, either as it is, or boiled in water; sometimes it is roasted, which is done in this manner: the cheese is cut into small parts, which, when pared, are put near the fire to roast; which is repeated at the will of the feeder. So much does this cheese abound with fat, that on being put to the fire it burns as a candle. It is thought also a cure for a kibe on the heel. That rennet, by which rein-deer milk

is turned and made into cheese, consists of a whey, in which the paunch of an ass, or the entrails of a rein-deer, have for some time lain.

Butter is also made from the milk of the rein-deer, of a white colour, but not so rich and well tasted as what is made of cow's; the reason is obvious, that this is made from cream, but that from mere fresh milk.

The maritime Laplanders, whose herds consist of oxen, sheep, and goats, make butter from cream alone. The Lapland woman, occupied in the making of butter, sits on the ground, holding a bowl in her lap filled with cream, which she stirs and works with her finger till it thickens into butter.

The mountain Laplander subsists on the flesh of the rein-deer, fresh killed, through the whole winter; hence not a week passes, during the season, in which he does not kill one or two, if the family is numerous. The flesh is cut up into pieces, which, unwashed and covered with dirt, is put into a kettle. It is dressed at a slow fire, put to the one side of the kettle, that the fat which sticks into the flesh should be the better extracted. From the meat, when sufficiently boiled, the oil which lies above is skimmed off with a ladle, put into a vessel, sprinkled with salt, and put aside. Then each piece, taken rough from the kettle, is put on a dish, while the broth is left to stand. When put on the table, the father of the family, with his whole household, sits down round the dish, which is of a circular shape. Whilst eating, they dip the bits in the oil squeezed from the fat of the flesh, which is put in a vessel; these they take not with a fork, but with the point of a knife. In the kettle where the broth remains, when the meat is taken out, is a little ladle, with which they sup a little of the broth while they are eating. This broth consists of mere water, without any mixture of flour, or such like, and is well tasted from the meat boiled in it alone. It is said by some, that the Laplanders feed on raw flesh, but in all contradiction of truth. The mountain Laplander, besides the flesh, boils the legs of the rein-deer, fresh killed, and, when sufficiently boiled, takes them out for the marrow. A dish of this kind is among this people of any price; certain it is, it is usually set before a missionary, as something peculiar and delicate. The entrails of the rein-deer, which are not boiled in the same kettle with the meat, are food yet for the Laplanders. So economically does he convert every part of the animal he has killed to his use, that not even the bones, in which any fat or marrow may be left, are given to the dogs, but, after he has picked them, he breaks them, and takes care to extract whatever fat may remain, by boiling. While he is engaged in this, he is seated on the ground, and on the rein-deer's hide, which is spread out on his lap, he breaks the bones with a mallet; when broken, boils them, until whatever fat be in them is extracted. The lungs are given to the dogs; for the mountain Laplander, when a rein-deer is killed, usually distributes among the dogs, which he must have to guard and protect the rein-deer. I knew a Laplander who lived on the mountains, named Oluf Nielsen (that is, son of Nicolas) Aujevare, who kept eight of these watch dogs. But they can bear hunger to an incredible degree; for, with the exception of these lungs just mentioned, the miserable famished animals get nothing besides a little broth made from the blood of the animal, called in Lapland Vuorramaelle, which is given to them in the morning, and of the meat in the evening, to be consumed.

The Laplanders, as was said, not only boil the meat, but roast it on a spike, the end of which is fastened in the ground. It is to be observed, that the Laplanders are very fond of every thing roasted, especially of meats. The roasted, of which they are so fond, is not put on spits, but spikes, nor basted with butter. From what is said on this subject, it is plain that the flesh of the rein-deer, fresh, is the ordinary food of the Lap-

lander, and that he makes little or no use of it salted. For it would be unnecessary to sprinkle with salt the flesh of animals which are killed in autumn and winter (for in the summer season the Laplanders rarely kill) as they are best preserved by that very extreme of cold itself.

Yet it sometimes happens that the mountain Laplander, through repetition and languor of the constant use of fresh meat, takes care to smoke, for the sake of variety, some ribs of the rein-deer, and those when raw, which he first stabs with the point of a knife, that the smoke may more easily find entrance. And when this is done, he puts them up between the poles and rafters, of which, in chapter the fifth, speaking of the habitations of Laplanders, we treated. Besides the meat of the rein-deer, which the mountain Laplanders, and the beef and mutton, which the maritime ones use, the flesh of bears, foxes, otters, seals, and such animals, are eatable among them, with the exception of the swine, which is interdicted to the Laplander.

The Laplanders engaged in fishing for salmon cut from this fish, as the Norwegians do from the larger flounder, long slices, called in Norwegian Ravreffling; but though the salmon is a nobler fish than the greater flounder, yet the pieces of this are better tasted. The salmon is cut from head to tail into two equal parts, a variety of cuts being indented in its flesh, and then hung up to dry in the sun.

The Laplanders live on fish that is dried and pounded, without any preparatory dressing, dipping each bit into oil squeezed from the entrails of the fish (oil of this kind is called in Norwegian Tran) and, what you may be more surprised at, the mother gives this food to the infant at her breast. She chews a bit, before dipped in oil, and, when chewed, puts it in the mouth of the infant, who is thus accustomed to this oil from his cradle. And hence it is that oil of this kind to the Laplander, whose natural appetite is changed, is more agreeable and pleasing than butter. But though it is true that the Laplanders are much delighted with this oil, yet it is by no means true, which some author asserts with sufficient confidence, that every Laplander consumes a pint and a half of this very unctuous and rancid liquor at each meal. Nor have I ever observed, what yet the same author seriously contends, that every woman, when brought to bed, drinks in like manner a pint and a half of this said oil, for increasing her strength. I do not yet doubt that a small portion is given to a woman when near her time, which is thought to assist and strengthen her when in labour.

Those who are in distress, through want of dried fish, put on the embers the dried heads and backs of fish, in which there is any meat left, and when done eat it.

Dried fish, the broiled heads and back-bones of them, the marrow of seals, cut into long pieces, which, together with the fish, before put into the pot to be boiled, were some little time put up in the bladder of a seal, that the fat might be the easier extracted; all these collected and mixed they usually boil together. A half hour at least is consumed in the boiling a fish, which, when boiled sufficiently with the other ingredients just mentioned, are eaten together. They dip the fish in a certain liquor, not unlike common oil, which exudates from the marrow in the bladder of the seal.

And as it is customary with the Laplanders to roast their flesh by a fire on spikes, so do they dress fish in the same manner; for instance, in the dressing of the greater codfish they use this method: from this fish, when fresh taken, they first take out the entrails, then the liver, and stuff it, and then put it on the spit to roast by the fire, and, seated on the ground, they place a dish in their lap, and cut out the belly; and, since more time is taken up in dressing the liver than in roasting the fish, they put it, pounded, and not yet fully roasted, on a heated stone, that all rawness being removed by these means from it, they may eat it with the rest of the fish without any illness.

The liver of fish is boiled, and while boiling is stirred with a ladle, until it changes into a sort of a pulse, which is mingled with black berries, called in the Norwegian Krafebaer. Food of this sort is taken with spoons, without bread, which they never, even with the fattest foods, make use of. That the Laplanders should draw on themselves a variety of diseases, from the frequent use of such unwholesome meats, you would easily believe; but that it is otherwise, the experience of many years has enough and more than enough confirmed; that not only the Laplanders, who inhabit this tract of country, but almost all, are men of very great strength, and very healthy. The various kinds of disorders, and whole battalions of fevers, that range the world, are banished from this place; for, during the space of ten years I have been in Finmark, I could not find any trace of dysentery, of leprosy, of malignant fever, and such contagious maladies. The said foods, such as dried, pounded fish, dipped in oil pressed from the liver of the fish, dried heads and back bones done on heated stones, fresh fish boiled with the marrow of seals, and dipped in oil pressed from the entrails of fish; the greater codfish (this the Norwegians call Hyse, or Kolje) stuffed with its liver, and roasted, as also the liver beat up with a spattle, and mingled with a kind of black berry much in use among the maritime Laplanders. The mountain Laplanders contrive to get now and then for themselves a few sea-fish frozen with the ice, which, by reason of the extreme cold raging on the mountain tops for a very long time, can easily preserve them safe through the whole winter. From fish of this kind they acquire a food, which cannot but be to them, so much accustomed to live on rein-deer, as delicious, as it is rare. The maritime Laplander frequently, the mountaineer more rarely, make themselves a broth from water and meal, with which they mingle tallow, to make it more savory. They usually put the tallow into a certain entrail called in Lapland Doggie, which, when stuffed, resembles a long pudding. The tallow itself, before it is mingled with the broth, is beat with the intestine, with which it is so bound up. Besides, pieces of fresh meat and cheese of the rein-deer, cut small, are put into this broth, to render the relish more savory.

Another broth (Vuorra-maelle) is in use among the mountaineers, made from water, blood, pounded tallow, and meal, if in plenty. The blood, which makes up part of this broth, is poured from the bladder of the rein-deer, where it is kept frozen by the cold the whole of the winter. When the broth is ready, a piece of the frozen blood, with part of the skin, is cut from the bladder, and then put into a kettle, to be boiled; they usually dine the whole of the winter on broth of this kind. They sometimes make cakes, from a mixture of water and fine flour, which they bake on burning coals.

There are certain foods prepared by the Laplanders, not so much for the sake of satisfying the natural wants, as for the delight and gratification of the palate: for instance, they scrape or pare off the white covering or bark, with which firs or birch-trees are surrounded, with a knife, which some, in its fresh state, others when dried in smoke, and dipped in oil pressed from the fat of the fish, eat. In the place of apples, nuts, and other productions of this kind, they eat, for their amusement, Angelica, not the root itself, but the herb, and that very frequently in its raw state, and sometimes baked on coals, or boiled in milk. In the early spring, when the snow is giving way, they usually gather berries, which during the winter were covered with snow, for use.

I myself have seen boys chewing the thick weed, which the sea throws upon the shore, which is not unlike a thong of leather, or a whip. The Laplanders are very eager after tobacco, which they one time chew, at another lighted, they draw in smoke through a pipe of clay. While chewing, they spit out also into the hollow of the hand, and the

spittle, tinged with the colour and taste of tobacco, they eagerly snuff, regaling two senses at once, the smell and taste, with one piece of tobacco. They make also a snuff of the same tobacco, with which, if any thing is mingled, it is Castor. And indeed, that they should give the stronger proof of their mad fondness, or rather mad desire, for tobacco, when in want of it, they do not scruple to chew the rollers packed up in the tobacco, and, what you will express greater surprise at, the little dirty leather bags, in which they keep their tobacco, when cut into small bits.

Among the Laplanders, especially the rustics inhabiting, Finmark there is a custom, that, when in a scarcity of tobacco, ten or even more smoke by turns from the same pipe. They so order it; they set down in a circle, then he who is fond of a pipe and tobacco, after a few whiffs, from his seat offers the pipe to him who sets next to him, who, taking also two or three whiffs, passes the pipe to his next man, and thus on, until the owner shall have equally shared it among all his companions; a courtesy of this kind is esteemed very liberal and honourable in that nation, and he who performs it obtains considerable favour among them.

The daily and ordinary drink of the maritime Laplander, as well as mountaineer, is cold water, mingled with snow; for snow, when at hand, is always mingled with their drink; and hence it follows, that the veracity of this author is questionable, who asserts that the Laplanders first heat in a brazen kettle over the fire the water they intend to drink. In the inside of the cot, as well as hut, is a brazen kettle or tub, filled with water. See chapter the fifth, on the houses of the Laplanders, and tub, which filled with water, when they choose, they drink of.

The mountaineer, fearing the want of water, generally builds his cot on marshy grounds; yet sometimes it happens, and that not seldom, that he is obliged to build in dry, where, through want of a spring, he is compelled to drink snow melted over the fire, a bitter and very unpleasant drink, on account of the very bad taste which snow melted in an open kettle contracts, as well from the kettle, as the smoke. Coming into places where the water, by reason of the ice that covers it, or any other cause, cannot be easily got, the Laplanders procure drink for themselves in this manner: they put down at the one end a hollow bone, or an earthern tube, into the water, holding the upper in their mouth, and thus, as by a pump, drink.

The Lapland Mountaineer, riding in winter through the mountains, usually takes his axe in his sledge with him, by which, on his journey over lakes and rivers frozen with cold, he cuts the ice, and inclining a little with his body, sitting in his sledge, he drinks.

And this is sufficient on the meat and drink of the Lapland people. But it deserves to be noticed, that the offices of cook are performed by males, not by females, among them; for it is the father of the family himself that puts the meat and things into the pot to be got ready; while dressing, he sits by them, and takes care, that when boiled and got ready they are laid on the table. The Laplanders rarely wash and clean their pots and kettles. The plates, out of which they eat their pottage, they clean, by licking with their tongue.

CHAP. VIII....OF THE VARIOUS FURNITURE AND UTENSILS OF THE LAPLANDERS.

THE whole economy of the Laplanders is simple and short, so as not to stand in need of much furniture, nor, if filled up with it, could they commodiously make use of it. The Laplanders of the mountain inhabit a small cot, which, here to-day, to-morrow

is taken down, and fixed elsewhere. Nor do the maritime Laplanders fix their abode less compactly, so that an abundance of furniture would be rather an impediment, than use, to him. There are no seats, no tables, to be met with in their habitations. A few pans, kettles, bowls, and wooden dishes, which are made of birch, stocks, flaggons of tin, horn spoons, and other vases of this sort, of little value and account, make up the whole of their household furniture. Some have dishes of tin, and some, who are more opulent, sometimes possess a few silver spoons. The pots in use among the Laplanders are without feet, and can conveniently be so; for as in their habitations, when the flooring consists of mere branches of trees strewed over the bare ground, it could easily happen, that if these pots had feet, when placed on them, they could not stand firm. The hooks, by which these kettles and pots are held over the fire, among the mountaineers, are iron, but among the inhabitants of the coast are made of wood. It is a custom among them to keep salt in the skin of a pigeon. The lamps, which supply the place of candles, in the huts of the maritime Laplanders (the mountaineers use none, contented with the light which the glowing fire furnishes) are fabricated from wood, surrounded with a wooden circle. In the lamp itself is put a shell, which in Norwegian is called Harpe-Skioel, that is, the Harp-shell, filled with oil pressed from the liver of fish, a certain marshy weed, called in Lapland Sinok, being used in the place of a link. For cradles they make use of a hollow trunk (they call it themselves Gieedk.) In this the infant, wrapped in woollen clothes and skins, and fastened with a twisted rope, going often round the cradle, lies. In that part of the trunk which the head of the infant occupies is a certain bending, representing a small arch, formed by a skin expanded over pieces of wood, to cover the head of the child in it. From this arch or bend is a cord drawn along the cradle, lengthwise, to which is annexed a thread with beads, and with this the infant, when loosened, delights to play. This cradle, with the infant in it, the mother, when wishing to hush it, usually puts in her lap; when going to walk, on her back; and to ride, in the vehicle or sledge.

CHAP. IX.....OF THE REIN-DEER, AND THEIR MANAGEMENT BY THE LAPLANDERS.

THE rein-deer couple about the end of autumn, but bring forth in spring. The elder among the male, and superior in powers among the herd, called in the Lapland Aino-valdo, drives off competitors, unequal to him either in years or strength, from the view and contact of the females. It is an opinion with many, that the females of this animal do not produce their young but in the most tempestuous season, clouded with mists of snow and hail, whence the storm, which in spring, after seed-time, arises, is commonly called Rein-Kalve-Rein, the time of bringing forth the young, in the Norwegian language. But this opinion is erroneous, and justly exploded: for it follows of course, and the order of nature requires, that the rein-deer, like other dams, should necessarily, when the time comes, bring forth, nor can they bear the young beyond the appointed time, whatever state of temperature the air may be in. Some bear yearly, called Aldo; others every other year, called Rodno; and some are constantly barren, which they call Stainak. The young soon drop their horns when born, and instantly from their birth take delight in the wonderful swiftness of their legs, in which they are found in a short time to equal their dams. Every dam distinguishes her own from the rest of the herd, by the scent alone.

The young rein-deer (I mean those whose dams are of an ash-colour, for the white generate white) when first born, are red, with a black line running along the back

directly, and are then called Miesse. This colour endures till autumn, when it changes into a brownish and well nigh dark colour, red hairs distinguishing the greatest part, when they are called Zhiermak. The young are generally ash coloured, some white with ash spots between, and some altogether white. Those of an ash colour, when the winter gets advanced, and is drawing to a close, and they are changing their furs, change then their ash colour for a dark gray, but these fresh hairs increasing more and more, become insensibly dark and sleek in the end.

The male by far surpasses the female, called by the Norwegians Simpler, in the size of the body. A great many of these, even some from the females, are distinguished by their high and branching horns; some, but few, are altogether destitute of them. In some a single horn only comes out; these the Laplanders call Abmel. Those who bear horns lose them once a year, in the spring time. When the old are fallen off, new ones in a short time grow up, which at first come out from the forehead, like two dark downy apples; when they have gradually increased, the skin, with which they are covered, puts on an ash colour, but at the approach of autumn, when they have obtained their full growth, shedding their coverings, they come out smooth. Each animal sustains two very large horns, which at the bottom are thicker, but a little above, suppose in each horn, a lesser branch grows out resembling a pointed plate, not unlike the palm of the hand, with its fingers extended. This branch is called in Lapland Aude-Giet. Above the said branches, especially in the males, other small points, or little branches, project, and near to the highest point of each horn is another pointed plate, called in Lapland Liedme or Zhioaarve-Sleddo. At the root of the other horn is extended another pointed plate, called Galb, a little larger, which is sometimes turned downwards to the nose of the animal, and which is usually cut off, lest it should hinder it whilst feeding. The horns of some wild rein-deer are of such magnitude and size as to weigh eighteen pounds. And as, just said, rein-deer carry branching horns, so does it happen, and not rarely, that struggling with each other, they get so entangled, that without the help of man they cannot be sundered and disengaged from each other. The greatest fat of this animal is on his loins, and among the rein-deer are found some who are so fat in these parts, that in the autumn, before they go to the females, they are found to be more than a full span in thickness.

The rein-deer are annoyed the whole summer by certain flies, or insects, which, getting into the nostrils, miserably worry them. This animal is subject to a variety of ills. A certain malady resembling the pox rages among them, by which so great is the havoc, that a Laplander, who had a large range of rein-deer, could perceive that he would be stripped of a very great number, if not all of them, in a short time.

Certain worms that get into the flesh, short and thick, called in Lapland Gurma, near the back of the rein-deer, especially when in their first year, are also generated in the spring time. The Laplanders sometimes dig out worms of this sort, and the rein-deer itself ejects them through the nostrils, with a snorting and neighing. They eat through the skin of the animal, and occasion that the skins which are stripped from the rein-deer in spring-time are esteemed far inferior to others. There is a certain worm, which is called in Lapland Saul, not rarely found under the tongue of the rein-deer. In some the neck is subject to swellings, in others the ears, smelling very strong; sometimes it happens that the joint next the hoof is diseased. The animal when walking is agitated, and brings out a very loud noise.

But the rein-deer is an animal of the greatest speed, because within the shortest space of time an immense journey can be performed, though he is not governed as a horse, with reins, but inclining now on this side, now on that, in his course he makes a

winding and longer track, which is easily collected from the tracks he has left in the snow. Within the space of six hours, and perhaps a shorter time, from the rising to the setting sun, I completed with a single rein-deer, in the month of February, when the sun was scarce three weeks apparent in the horizon, a journey of eight entire Norwegian miles, from the Norwegian chapel of Mazi, which, at the time of the royal mission for the benefit of the Laplanders of the mountains, belonging formerly to the congregation of Alten, was built upon a rising ground, to Koudekeino.

As the rein-deer is fleet in running, so is he not inexpert in swimming; they usually run full of playfulness up and down, for their own pleasure, without any one driving them, and exult as if through joy, as I myself have frequently seen. The Laplanders affirm that the rein-deer, by sporting in playful rounds and gambols, predict a storm at hand. When annoyed by heat and summer, they usually get upon the higher grounds, catching at the cold for refreshment, by striking the ground with their feet.

The principal and most usual food of this animal is the white lichen, which in winter the rein-deer traces out under the snow; and for the getting at it, he removes the snow with his feet till the ground is clear; and hence along those places the herds range in for pasture, frequently, gaps and holes are seen in the snow. Sometimes too it happens that the fields are so hard with ice, or so covered with snow, that it is not in the power of the rein-deer to get with his hoofs at the lichen that lies under. There is no calamity the Laplanders dread more than this; for under this attack there is great risk lest the whole race of rein-deer, the chief strength and greatest care of this nation, should all fail, and doubtlessly would, were not the impending evil averted by Divine Providence. While the rein-deer are straying in the plains and mountains in search of food, it now and then happens that an error carries away some from the rest of the flock, now fed and at rest, into the dreary and uninhabited parts of the country, where they fall instantly a prey and food for the ravenous wolf.

The domestic rein-deer that the Laplanders have live constantly in the open air, never coming under roof, and feed in the summer on grass, and on lichen in winter. But the Norwegian peasants, some of whom dwell near the river of Alten, famous for salmon, use the rein-deer as draft cattle in the place of horses, keep them the whole of winter under shelter, and feed them with white muse, which they gather, not as hay, with a scythe, but with a kind of spade, adapted for the purpose. The rein-deer are very fond of human urine, from the quantity of salt in it; hence no sooner do they see it, than they hasten up in order to drink, and if on the snow, they dig it up, to get at it. They range at large about the plains, searching for mushrooms and mice, in Norwegian called Lemaenner, in Lapland language Godde-Saeppan, a description of which I have given in chapter the twelfth, on the wild beasts of Finmark. They eat off the heads of the mice and greedily devour them, throwing away the rest of them. As the ground is covered with snow, they very seldom drink water, satisfied with the snow alone to quench their thirst. The rein-deer in the sledge inclines his head to the ground to take up a little snow for allaying thirst, which the Laplanders express in their language, Muottagiit Gadzat, that is, to drink snow.

That snares are ever laid for the rein-deer by wolves is evident enough: to keep these off, the Laplanders expose old rags, and beams covered with rags, and other terrors of this kind. But ...ver is the danger greater to the herd, than when the tempest is setting in, for then this most savage animal furiously attacks them; so that the Laplander, if he has fixed his habitation in a place infested by wolves, is compelled, together with his whole family, to be continually on the watch, if he wishes to preserve his herds. The domestics come out by turns, to strike against the sledge with a stick, that the enemy,

terrified by the sound, may be driven from the cattle. And indeed so much constant and superintending care do the miserable rein-deer really stand in need of, who are not only weak, but even stupid, to their own ruin, against their crafty invader, that they present themselves to him as the enemy; for no sooner do they smell the wolf, than all, as many as are, rise up, taking flight, not where the wolf is, but to another quarter, when they would best consult for their safety, did they remain in quiet round the cot; the treacherous invader, as he well remarks it, pursues them as they fly, and miserably kills them. The domestics hearing of the sudden flight of the rein-deer which lie about the cot, and of their being scattered through the plains, easily infer that the wolf is not at a great distance, and readily bring assistance, yet usually too late for the herd, who has already suffered. Should a wolf meet a rein-deer in the meadows, not far from his dwelling, and should perceive that he is making for the hut, he cunningly strives to prevent his reaching it, and forces him to make for the forest, where, at his will, and without the fear of any assistance being brought to him, he invades his prey. The wolf very rarely comes up with the rein-deer flying up the hills; it is when running down the declivities he overtakes him most easily. Should he only lay hold of him by the loins with his gripe, but lose him when wounded, he seldom, and with difficulty, lays hold of him again, escaped from his claws, usually evaded by the swiftness of the wounded rein-deer; but if he does, he choaks him, by laying hold of him by the throat. I myself have seen six rein-deer together, whom, near the cot, the wolf has strangled, but alarmed by the sudden coming up of the men, had not torn; so that when their carcasses lay stretched upon the snow without sign of life, but sound and unhurt in appearance, for the wolf had so artificially killed them, that by intercepting their breath he did not leave the least mark of a mortal wound. The wolves do not devour the carcass in the place it is killed in, but dragged elsewhere; and what is truly surprising, they so place the carcass they are going to devour, that the head should be to the east, and the tail to the west, which position it is manifest, from the remaining skeletons, they never neglect. The crows are attendants, if I may so express myself, on the devouring wolves, who, led by the hope of prey, always and everywhere accompany them; and hence the Laplanders learn from their croaking that the wolf is not far off. The wolves themselves, after they have made a slaughter, and put the carcasses under ground, usually set up a howling. Those of the rein-deer, a little more spirited, boldly oppose themselves to the wolf, and sometimes repel the invader, of which I remember a remarkable instance. A certain Laplander of the mountains, from the bay of Porsanger, by name Mads Pedersen, that is, Matthias, son of Peter, had a male rein-deer without horns: two wolves attacked it in the night, but with little success, for on the next day the marks of the contest were visible in the snow; by which it most clearly appeared that the conquering rein-deer had overthrown both the wolves, and that they had consulted their safety by flight. The rein-deer, though he withdrew from the contest as superior in it, was found, having exhausted his strength, at some little distance from the place of contest, dead. The wolf generally spares the rein-deer, if tied up; but if terrified, he extricates himself from his fastenings, and takes flight, he instantly pursues the fugitive, and, unless through swiftness he escapes the enemy, miserably kills him. But by no probable argument is it proved, though some have with too much confidence affirmed it, that wolves most eagerly thirst after the blood of a pregnant rein-deer, and that they prefer the slaughter of it to that of men: a property of this is ascribed elsewhere to bears, by those who are learned in natural history.

Besides these, in the management of the rein-deer among the Laplanders, the following are to be noticed. The Laplanders impress a mark on the ears of their rein-deer,

that each may be enabled by it to distinguish his own. They take care that the rein-deer, lest they may be scattered, and thus carried out of the way and into pathless places, should be led within the space of every civil day twice to the cot to rest, and twice into the forest to pasture, which they repeat continually night and day, not intermitting it even in the middle of winter, when each night, from the setting sun to day-break, contains at least sixteen hours. Nor is there any one, I think, who is but slightly skilled in the principles of astronomy, to whom it is unknown, that the sun in that climate altogether recedes from the horizon for seven weeks together, and that, lying under the lower hemisphere, leaves for full day but the twilight of a few hours; which yet is not so dark, with a pure and serene air, but you can do without a candle from ten in the morning to one at noon for writing and other business of this sort, even when the days are shortest. And since the sun, as mentioned above, altogether draws off its light from the horizon of that zone at a certain season of the year, it is easily inferred that the lesser stars are visible on the shortest days about noon, and that the moon itself shines not only by night, but all the day. After the space of seven weeks the sun returns, to restore that delightful light to man and beast, as it were with usury; for the day in a short time takes such and so great an increase, at the beginning of April, that the whole darkness of the night begins to disappear. And as the winter's sun withdraws its light for the whole space of seven weeks, and makes the day at its shortest; so the summer's sun, in turn, repairs that loss, the nocturnal and diurnal light lasting for the space of as many weeks: where it is to be well observed, that the nocturnal light of the sun is much more dull and remiss than the diurnal, and that the sun itself by night has a reddish appearance. But I now return to the rein-deer. Led home to rest, they lie down about the cottage, and when down form accurately a full circle. The watch dogs, of which some are named Kiepros, others Gonsak, others by other names, are employed in driving the rein-deer into the woods and meadows, to pasture. They run about in the pastures here and there, removing the snow by their heels, if any, in order to get at the musc that is under; they are under the care of herdsmen, without regard to time and season, whether good or bad. But though the shepherds take the greatest care of their herds, yet it happens sometimes, that when they are sheltering themselves behind large heaps of snow, where, driven by the violence of the tempest, they sometimes retire, when overtaken with sleep, one or two rein-deer straying from the rest of the herd fall the prey of the watching and invading wolf. The care and duty of feeding and guarding the herd properly belongs to the children and servants of the family; yet I have known a married woman, who, not having either servants, or a grown up family, to whom the care of feeding the cattle could be committed, she herself undertook the duty of pasturing, and having a sucking infant at her breast, was obliged to carry it with her into the woods and pathless haunts, whilst the sky was all over darkened with snow and hail as thick as possible. The rein-deer are brought home from pasture by the assistance of dogs; nor could they be otherwise gathered, as, feeding at large through the meadows, they go separated at considerable distances from one another. The watch dogs are so instructed, that they obey the nod alone, the finger of the herdsmen; hence the rein-deer, admonished on the sight of the dogs, instantly will collect themselves in herds: when collected by the help of dogs, they are driven to the cot by the herdsmen. In winter the father of the family, or his wife, examining on this side, and on that, usually surveys the whole herd, now fed, and disposed round the cot to rest, to see if the whole are safe; whether any have strayed, or fallen a prey to the wolf. There are Laplanders who are masters of six hundred, and sometimes of a greater number of rein-deer; to these it is difficult to know whether any one from so great a number has gone astray.

It appears then to be a custom among the Laplanders of the mountains, that the herds of rein-deer are for the whole of the winter season alternately led to pasture and home to rest; but in summer, the castrated deer, together with young steers and heifers, have the range of the woods and mountains free, and without the controul of the herdsmen. During summer certain female rein-deer have the freedom to range at large for some hours with their udders clean and free from filth by the Lapland women, to whom this care is consigned, to the end that the young should have a full opportunity of sucking. Afterwards they are driven into a fold, at the distance of some paces from the cot, which is made from the green branches of trees fresh cut, where the women, whose business it is to besmear the udders of each of them with rein-deer dung, taken out from a little case made from the bark of the birch-tree, which they usually carry under, the girdle; which when done, they come out to pasture again for some hours, [illegible] the fence is opened, when the young is repulsed from sucking, on account of the udder, which is now besmeared with dung. They now again compel the female rein-deer within the said fence for some hours at pasture with swollen udders, and washing off the dung they milk them; which custom for some days is practised with the greatest care. There are young who disregard the besmearing of the udders, whose mouths are gagged, as to take away all power from them of sucking their dams. A Lapland woman, when going to milk a rein-deer, knowing it to be a wild one, and that it would with difficulty come to the milking-pail, keeps at a distance of a few paces from it, and flings the rope, the extremities of which she held in her hand, over its horns, which when the rein-deer perceives she stands still, and lets the milker instantly approach her. Though they do not come up even to goats, in the quantity of milk they yield, yet such is the number of them, that there is neither a deficiency of milk nor cheese.

A wooden log is put on the neck of the rein-deer, to prevent their straying from the flock, by running up and down, and which is an impediment to them in running. He is governed by a rein made from the skin of a seal, so that one end of the rein may be fastened to the head of the animal, but the other may be in the hand of the leader, whom the rein-deer follows, with a little distance between. They are managed by these reins also when drawing the sledge.

The Laplander, when castrating his rein-deer, does not take out the testicles, as is usually done, by cutting open the flesh, but, applying his mouth, bruises them at once. The name of the castrated rein-deer changes with his years; when two years old, it is Vareek, four years, Goddodas, five years, it is Kuoistus-haerge, six years, Makan; but from the seventh year of his age he is called Namma Lapak, that is, completer or finisher of his name, for from that time he no more changes his name.

The Laplander fastens by a rope the rein-deer to a trunk that he is going to kill, which when done, he comes up to him and sticks his breast with the knife, soon after repeating the blow. The rein-deer, struck with the blow of the knife, makes some turns, until he drops on his back on the ground, where, when he has lain for a quarter of an hour, the butcher comes up to strip off the hide. Not a drop of blood comes from the blow of the knife, but the whole mass makes for the entrails, where it is afterwards drawn out, infused and preserved in the paunch of the animal. The hide, when taken off, is stretched on tender hooks, such as we see used in the smoking of salmon.

That part of the skin which goes round the feet of animals, before the body is stripped, is taken off, and stuffed with shavings, that it should the more readily dry.

The mountain Laplander, reduced to distress, delivers up the few rein-deer that remain to him to other mountain Laplanders, to be protected and taken care of; he him-

self, with his whole family, emigrates to the sea-coast, where, mingling with the maritime inhabitants, he gains a livelihood for himself and family by fishing.

From what has been largely mentioned, it is clear that the herds of Laplanders consist of tame rein-deer. It happens but very seldom, that a tame or domestic rein-deer, getting by accident among the wild, contracts the ferocity of this new society; but it is accident, and, as I have just said, very rare. It also happens, especially in the autumn, at the time of year when this animal is most incensed with desires, that a wild rein-deer will mingle with a herd of tame, but that it is usually at the expence of life, for, when seen, the Laplanders beset and shoot him. The wild rein-deer, thus mingled with the tame, now and then gets the opportunity of coupling with the tame female. The fruit of this embrace is called a mongrel, resembling neither sire nor dam in every respect, for he is less in size than the wild, and greater than the tame; for the wild ever exceed the tame in the bulk of their bodies. But those born of parents of unequal sizes are called Baevrek, by the natives.

CHAP. X....OF THE CARRIAGES, AND MANNER OF DRIVING, IN USE AMONG THE LAPLANDERS.

THE more opulent among the Laplanders make use of no other beasts of carriage than castrated rein-deer; but those of poorer condition, whose circumstances are narrow and contracted, are obliged to employ females. The rein-deer destined for this purpose, to be made fit for the yoke and vehicle, is to be well broken in by much practice. At first it presents itself untractable and restive, one time kicking up his heels wantonly, at another obstinately lying on the ground, whence he will not get up, unless beaten, and not slightly, with the whip and club, over the nose. Some are even so indocile, that they will admit of no discipline whatever, for, when yoked to a vehicle, they suffer themselves by no means to be governed, but, turning themselves this way and that way, they make a winding path, not unlike to a bending serpent. There are others which are much more easily broken in, and become so tractable by the discipline they receive, that in the carriage they so slightly bound, as is seen from their track marked in the snow. The Laplanders call the harness that ornaments the head of the rein-deer Baggie. The rein by which he is guided, while driven, is not, as is usual in riding-horses, double, but single, and simple, nor passed through the mouth of the beast, but with one of its extremities fastened to his head, while the driver holds the other in hand.

A large collar surrounds the neck of the animal, in the place of a trace, made up from the rough rein-deer's hide; to the border of this collar is fastened a long thong, twisted, from the skin of the seal or ox, which, running along the belly of the animal, is brought between the fore and hinder legs directly to the yoke of the sledge, where it is fastened to a stick for the purpose, called in Lapland Jukko, and to a small ribbon, called Jukko-Lauvzhie. By means of this twisted thong the rein-deer draws the sledge, which, lest in driving it may fret the legs of the animal, is covered with a hairy skin.

Beside that larger collar, of which I have just now spoken, there is another less in size, called in Lapland Riesegas, for ornamenting sometimes the neck of the rein-deer of carriage; it is made of cloth, or texture of Kersey, ornamented with threads of tin, and bordered with woollen fillets. This kind of collar, which is not used by all, nor at all times, is entire in the upper part and sides, but below, under the collar, it is open, to be closed with a thong when occasion calls for it; from this part too hangs a bell.

The belly of the rein-deer is girt round with a broad belt, called in Lapland Aagotas, the outer part of which, touching the belly of the animal, is leather, but the upper, which comes round each side and the back itself, is of cloth outside, or texture of kersey, adorned with threads of tin, the leather being turned in. The lower part of the belt is ornamented with broad fillets of cloth of kersey, drawn into a variety of bendings or spirals, partly of the colour of the girt itself, and partly of a colour different from it. This girt is an entire piece from the belly to the back, where it is fastened by four small ribbons, on the extremities of which are crests, made from shreds of different coloured cloth, which display themselves, for the greater ornament of the girt. But that these are merely ornamental, and used for that purpose alone, is evident, that, when the king's treasurer, together with his suite, Swedish merchants, and other young Laplanders of quality, wore these, they generally dressed the cattle on which they rode after this manner. Meantime these girts so frequently praised among them are not without their use; for those that gird the middle of the belly have in them small apertures, through which the ropes, by which the rein-deer draw their sledges, pass, with this view, that they may not while drawing stagger, or the vehicle be too much shaken. The Aagotas, or girt of this sort, yet is not much in use; for very frequently they do without it, and the sledge is not jogged more than usual; and the reason is, that the rope by which it is dragged has a free passage between the legs of the animal while drawing. It is usual with women, when driving, to put coverlets over the animals that draw, ornamented with bells laid in order. Besides the said ornaments, with which the Laplanders ornament their cattle employed in carriage, there are also a few more in use, but so small, not sufficiently that we should longer delay ourselves in describing them. The hairy collar by which the neck of the rein-deer is surrounded, the lesser collar, or Riesegas, to which the bell hangs, the girt from the skin of the rein-deer, and the whole remaining harness for vehicles, are made by the women alone.

The rope with which the Laplanders of the Swedish mountains fasten their rein-deer, when they wish them at hand, and sometimes tie them to trees, is twisted from the small roots of trees, if some are to be believed on that subject.

The vehicle, or sledge, in which the mountain Laplanders are drawn, is not unlike to a small boat (our people call Spegl Baad, on account of the shape of the stern resembling, as it were, a mirror) for in the stern of the sledge, to make use of a sea-term, is a seat, in form like a mirror, which falls down to the keel, but, by rising in the part above, props up the back of the driver. The sledge is made of long planks, extending from the stern of it to the prow, a little bent, and put together almost in the same manner as the planks are in the structure of ships, with this difference, that these are fastened with iron spikes, but the others with wooden buttons or fastenings. And that the planks should the more closely and fitly lie together, nor through ill joining, through their joints, let in the water, they draw them together with oziers twisted round and round, with their greatest exertions. The sledge has a keel or bottom, of a span broad, equalling the sledge itself in length. The keel, in its lower extremity, projects a little beyond, in front it is extended to the prow, terminating in a crooked beak. On the outside, along each side of the keel, is drawn a plate. The sledge is bound tight within with a variety of pieces of wood placed across, as is usual in the construction of vessels.

Vehicles, or sledges, in use among the Laplanders are of four sorts; the first is called Giet-Kierres, the second, Raido-Kierres, the third Pulke, the fourth Lok-Kierres, each of which consisting of long beams, a keel, as above mentioned, furnished with a prow and stern. But among these vehicles or sledges there is a difference, though minute. The sledge, which in Lapland is called Giet-Kierres, that is, the hand-sledge, is princi-

pally in use. This above, from the stern to the prow, is quite open, and so slight that it can be carried in hand any where; so short, that the driver can touch at once with his back the stern, and the prow with his feet; so narrow as to squeeze on each side the ribs of him who sits in the fore part of it; so low, that the driver, if he inclines but a little on either side, he may touch the snow with his elbow. He takes care, who drives, to put a skin under him, to sit soft upon. The sledge, which is called Raido-Kierres, is a waggon, fitted for receiving and carrying parcels: it is rather longer, broader, and deeper, and since it is open as well as the other, when laden, it is covered over with skins of rein-deer, or some other covering. The covering, with which the waggon is tight bound, lest the parcels should be injured by rains and snows, is made of a thick yarn, twisted from the fibres in the feet of the rein-deer, and often fastened round, as is usual in coverings braced up tight. No apertures are seen in the sides of the waggon, by which the binding thread is passed, but it is inserted in certain handles in the sides which are added, for this purpose. The sledge called Pulke is fit for exercise, and is besmeared on the outside with pitch, after the manner of a boat. It resembles in every thing the sledge called Giet-Kierres, with the exception, that this is opened behind, before it is covered with the skin of a seal, which goes from the prow to the knees of the driver, but all the rest is open. Another woollen covering is attached to that of the seal skin, which, coming over the lap, the rider keeps the snow heaped in on him whilst driving; but it is drawn together in the same manner as the covering of the sledge Raido-Kierres, of which mention has been made above. He then who sits in this sledge takes care to cover his feet with the skin of the seal, and his lap with the woollen covering drawn tight together with thongs, so that the upper part of the body alone is unsheltered and exposed. Besides, skins to sit on, as I have noted above concerning the sledge called Pulke, are laid under the drivers. The sledge which in Lapland is called Lok-Kierres is besmeared outside with pitch, and serves for carrying provisions. It is a little larger than the above-mentioned Pulke and Giet-Kierres, made from planks fitly joined together, as not to suffer a drop of water to pass through. It has a wooden deck, as in ships, running from the stern to the prow, but which rises a little in the middle, and comes out with a round swelling, whereas the decks, of ships are levelled by rule and plane. A bolt is fixed to the extremity of the deck, at the stern, which, when any thing is wanted out, is opened and shut again. The Laplanders raise up their sledges, beyond their ordinary use, about their cot, in a certain wooden machine called Bildagak, and made for this purpose, (though very frequently they roll them on the snow) that they should serve the purpose of cupboards, for keeping the raw meat of the rein-deer and other necessaries of subsistence.

Concerning the mode of driving and of carriage, and what it is in, among the people of that nation, the following observations come into use. When any one is ready to drive, he first puts on his gloves, with the hairy side turned inside, which when done, sitting on his sledge, he fastens to his right thumb the rein, the other extremity being fastened to the head of the rein-deer, who is quiet, with the rein resting on his left side.

The Laplander sitting in his sledge, and just going to let off the rein-deer, after shaking very swiftly the rein, hits him on each side, on which, starting forward, he dispatches the longest journies with an incredible speed. And as the rein-deer in running does not go in a straight line, but turns this way and that about, there is a necessity that the driver should direct him with the rein, that he should reach the place whither he intended. If he is to turn to the right, the driver hits the rein on that side, and so by turns. Hence it is that the track of a sledge in the snow, on account of the unsteady

gait of the rein-deer who draws the sledge represents the figure of a serpent, winding and rolling into a variety of spirals. When the Laplander is in haste, entering on his journey, he does not idly, as at other times, sit in his sledge, but falls on his knees. If he wants to stop, in driving, the rein is thrown from the right side to the left, and there rests; when done, the rein-deer instantly stops.

Should it happen, that any one is insufficient alone for the management of the animal which draws him, as being too untractable and unmanageable in the course, he then gives the rein to his friend next before him, which he fastens to his sledge, and in this manner he draws the driver together with his rein-deer and sledge after him.

And since the rein-deer who draws, as mentioned above, draws the sledge by a single slender and loose rein, it necessarily follows that the animal, going through declivities, cannot post with such speed, but the sledge, as slippery and full on its way, must be borne with a greater celerity, so that it must either strike on the hinder feet of the rein-deer, or even out-strip him in speed; to remedy this inconvenience, as it sometimes happens, another rein-deer is fastened to the sledge behind, by a rein put over his horns, lest by too much haste it may incommode the animal that draws, who will be retarded by the resistance and efforts of the other.

There are rein-deer who, thus put behind, so far are they from retarding the swiftness of the sledge, willingly following it, aid and incite it as it spontaneously moves on. Others are of such a disposition, so obstinate and perverse, that after the first experiment they are rejected.

Riding through hills that are not so steep, there is no need of this method of checking the sledge, as the driver himself, by a certain motion of his body, and a certain expertness in drawing, can easily direct the sledge in which he sits which way he pleases.

But when he has to travel through places almost steep, and well nigh broken into precipices, it is usual then to join to the sledge a rein-deer, and when thus joined to, negligently fasten him to the hinder part of the sledge, leaving the sledge to its free course, where chance shall carry it.

Parcels in the said sledges, called Raido-kierres, are thus carried: the driver of the sledges sits first in order; another rein-deer follows bearing the second sledge, fastened by a rein to the first: then a third, fourth, and sometimes more, each carrying his own sledge, following in like order. The driver who sits in the first regulates all following in order. Some one rein-deer closes the troop without a sledge, but following for the purpose, that if the occasion should call for it, he should check, by his effort, all the sledges running with too much celerity along the declivities, as mentioned above.

It sometimes, and but sometimes, happens that the snow increases to that height, that the rein-deer cannot break through them, on his way. I have been myself carried through snow, so high, that they have equalled the back of the animal, and not seldom, by which it is easy to be judged, that travelling is at such a time very slow and gradual.

CHAP. XI....OF THE JOURNIES OF THE LAPLANDERS.

THE Laplanders of the coast change their habitations only twice a year, in the spring and autumn. When changing their abode they do not take down their huts, as the mountaineers, but only forsake them for a time, until they may return. The mountaineers on the contrary, just as the ancient Scythians, mentioned in history, have

done, and as the Arabs and Tartars do to this day, are ever changeable, vagrant, and not contented with the same situation and place long together. The mountain Laplander takes himself, together with his whole family, and the herd of rein-deer, to the coasts and borders that lie nearest the sea in the midst of summer.

But when the autumn is coming on, he retreats again with his cot, his rein-deer and family, to the mountains, slowly and by degrees; for getting on his way, and having moved scarcely the distance of a mile, he stops, and going on the next day, he only advances one mile, which he does every day until the winter, now at hand, after passing the creeks a distance of five, six, or about seven miles from the sea, he has penetrated to the very confines of Swedish Lapland; where, when he has at length arrived, he stops, but not so as to prevent his moving with his cot and rein-deer from one wood and hill to another, as necessity should require.

On the approach of spring, he returns in the same manner to the sea coast, but slowly, and, as just said, step by step, until he has arrived with his family in that place, where he has determined to remain the whole summer.

On the sides of the roads, through which he is to travel, he takes care that a number of little offices should be built, in which he puts up his provisions and furniture, which, during winter, he draws out, when he pleases, and when it is necessary, for himself and his family. When the mountain Laplander is preparing for a journey from the coast to the mountains, at the end of the autumn, he usually kills some rein-deer at this season, which are very well fattened, and lays up in his house, which he has for the purpose, the meat, in order, that on his return in spring, by the same road, he may have provision for himself and his family.

The mountain Laplander in the spring, summer, and autumn seasons of the year, when travelling over the plains, now clear and bare from the snows, with his family and rein-deer, travels on foot, having put the cot, with its timber and furniture, and other baggage, on the backs of the rein-deer; if the mother happens to have an infant at her breast, she carries it on her back, put up in a hollow piece of wood, called in Lapland, Gieed'k, which I have described above in chapter the eighth, on the furniture of the Laplanders. The herds of rein-deer, on their way, as at other times, are managed by their keepers.

The mountain Laplander, travelling in the winter season through plains covered with thick snows, before he begins his journey takes down his cot, the planks of which this building chiefly consists, the covering drawn over it, the timber of the floor, the fire stones, he takes with him, with the view, lest the want of materials of this kind should render the place into which he is disposed to emigrate incommodious to him; but he usually flings away the branches with which the floor is covered, cutting down in the place he erects his cot new ones in their place.

The cot, with all its materials, is put into a single sledge, called in Lapland Guatte-Kierres, which by the help of a single rein-deer, an animal neither so great nor robust, is drawn through the thickest snows, whence it is easy to be inferred that the cot itself, with all its furniture, is of small size and consideration.

The mother puts the infant, before the husband enters on his journey, into a hollow piece of wood, Gieed'k, mentioned before, slightly covered with woollen clothes, yet with that precaution, that a small aperture may be open before the mouth of the child, by which he may breathe freely.

Their own baggage is carried also in the sledge. The husband himself goes on first, and leads on the troop. The mother manages the sledge in which the infant is, who,

should it begin to cry much, instantly stops the sledge, and getting at the side of it on her knees, gives her breast to the babe through the aperture I have just mentioned, regardless of the severity of cold or snow.

The children, with the rest of the family, manage and take care of the herds of the rein-deer. In what manner the baggage is carried has been described in chapter the tenth, concerning the kinds of carriage among the Laplanders.

It is wonderful, and scarcely credible, unless one had seen it, that the Laplander, travelling in winter over vast mountains and trackless haunts, especially at that season when all nature is covered and whitened with a constant snow, to a degree that neither the stones nor the least part of the earth can be seen, nor any other trace of human culture, and when the snows, agitated by the winds and whirled in circles, take away all use of sight, can find his way to his destined place, and without mistake. What I am relating I write from experience; for, indeed, it happened to me not rarely, either that through clouds of mist and darkness, with which the snow driven round in a whirlwind darkened my sight, that I could not see the beast by which I was drawn, on which occasion trusting to the Divine guidance, and the faith of the driver, after the manner of the blind, I suffered myself to be carried, not knowing where I was going,

But it appears from experience, that neither enormous heaps of snow, nor the horrid darkness of the night, can obstruct travellers from arriving safe and without error at their place of destination. They usually hang bells from the necks of their rein-deer or carriage, that if they should not distinguish by sight, they might at least know each other from hearing. They follow the wind too, if it is not veering, as a guide, so that if the place they are going to is to the south, and that the wind should arise in this quarter, they begin their journey directly in the teeth of this wind; if it is a south-west wind, they go in such a manner as to have the wind on their right hand; if it is to the east, they contrive to have it on the left. Should they chance to see the stars shining on the way, they direct their course, with confidence, by the northern star. For though the Laplanders have never learned the science of the stars, yet they know the various stars and their situation, and designate them by certain names: for instance the Pleiades in Lapland are called Nieid-Gjerreg, that is, a company of virgins; the fishes in the zodiac Oaaggo, that is, the fisher; the morning star is Guouvso Naste; another star, Sarva, that is, the male rein-deer, others by different names.

As it is assigned to Divine Providence, and to it alone, that a ship in the midst of tempests, among threatening waves, quicksands, and shoals, and darkened clouds, shall be unhurt, so it is no less an argument of the protecting care of the Deity, that a human being shall pass safe, and secure, through pathless haunts, through mountains covered with constant snows, through the perpetual attacks of hail, of snow and whirlwinds, forming themselves as in a troop in the very face of the traveller, and drawing on a darkness thicker than the most darksome night. For those, who are obliged to travel, discover themselves so often surrounded by precipices and high mountains, that if they should err in the least from the way, they would necessarily run into the most imminent danger of their life; a melancholy instance of which truth, we have had not long ago in one Siver Henrikson, of the Lapland youth, then in Porsanger, while I was missionary at the same place, who, when driving, struck his breast against a tree in the way, by turning a little out of the course, which occasioned his sudden death, which followed three days afterwards.

The Laplander is furnished on every journey through winter with utensils for lighting a fire, a steel, a flint, tinder and sulphur, all of which he carries in his bosom, inclosed in a bag, or little box, in order that when there is occasion he may kindle a fire or light his tobacco pipe. For it happens, and that not seldom, what I myself experienced more

than once, that travellers, obstructed either by the thickness of the snows or length of the way, are obliged to pass whole nights under the open air. Whenever this happens, the Lapland traveller erects a small tent, made of very coarse linen, which he always has at hand, on the snow, and lighting a fire refreshes his body. In winter, whenever occupied in religious affairs, or engaged in any other business, they tie the rein-deer that draws them to a tree or trunk not far from them in the wood.

On the maritime excursions of Laplanders nothing occurs which can long detain the curious reader. It is sufficient just to mention, that they always have a tinder-box with them, and when the occasion requires it, they can light a fire and their pipe of nicotiane, or get ready their meat; for they are ever ready, if they happen to catch a fish, immediately to land on the next coast to them, and lighting a fire between two stones, which they choose for this use, and hanging the pot by a pole, with each end propped on each stone the fire place is made of, boil the fish they have caught. In the same manner they prepare meat for themselves from the otter or any other wild beast they might kill on the way.

From what has been hitherto narrated, it is abundantly manifest that the state and condition of this nation is, beyond description, restless and hard; but since the sufferers are accustomed to this kind of life from their childhood, they are held by so great a love of their native soil, that scarce any other nation, enjoying the most happy and munificent bounty, can equal them: in confirmation of this assertion it will be satisfactory to read the following history. When his majesty the king, of most glorious memory, Christian the Sixth, on his journey which he undertook through the kingdom of Norway in the year 1733, had stopped at the gulf of Aalesund, in the division of the province of Sundmoer, he honoured me most humanely, through the favour of Andrew Rosenpalm, admiral of the fleet, and a most worthy gentleman, with an audience on the twenty-ninth of July; which day, as it was to me most propitious and desirable, so shall its remembrance never fall from me. It was agreeable to his most royal majesty to propound various questions concerning the mission to Lapland, on merchandise, and other matters respecting Finmark, and in his goodness, truly royal, to hear my humble answers, and then to mark with his royal hand, which I humbly repeat, the name of his most liege subject in his diary, in sign and token of future promotion, after the ten years ministry in Lapland. His majesty then enjoined on me that I should most humbly take care, that as soon as possible some of the young men of Lapland should be sent to him at court. I obeyed, as I should, the commands of my sovereign; but who could imagine that any person could be found who would refuse so munificent a condition? But all did refuse. At length a young man, whose name was Nicholas Peterson Korsnæs, with some difficulty suffered himself to be prevailed upon to go to Copenhagen. This young man was of a middling stature and figure. There were others who could have recommended themselves by stature and comeliness in a greater degree, among whom was a young man from the gulf of Alten, of no common degree of manly beauty among that people, whom I endeavoured to prevail on, by loading him with promises, to go to Copenhagen, and would have succeeded without doubt, had not his mother opposed it tooth and nail, who, at that time pregnant, came to me, assuring me in form, that it would be a scruple of conscience to me should I rend from her the only and dearly beloved son she had, and that I should suffer for it in the just judgment of God, if any accident had consequently befallen her, and the birth near its time, through grief. But I return to Nicolas Peterson. As soon as he arrived at Copenhagen he was, for his condition, indulgently received, and handsomely entertained by his majesty. He was dressed in costly clothes, whose borders and lower extremities were distinguished by silver trimmings, yet ornamented in the Lapland fashion. The bonnets in common use among the Laplanders are trimmed

with a border from the skin of the otter; but the cap of this youth was ornamented with a fringe of silk velvet, of black colour, with a facing of the same, illustrated with the name of Christian the Sixth, in silver ornament. But this prosperity was not durable; for on the approaching autumn, and the fall of the year, he fell sick, and died on the beginning of the following year. The cause of so sudden a death without doubt is to be sought for in so sudden a change of air and food: for he who at home was used to drink of one spring, and that cold, and subsist on the congealed milk of rein-deer and such food, now regaled abroad with wine and dainties, could not bear this unusual and sudden change without danger of life; according to that very melancholy saying, every sudden change is hurtful. The body was honourably interred at the king's expence, and the clothes his majesty ordered him to be dressed in were sent to Lapland to his parents, that under their wretchedness they should recall the memory and once happy condition of their deceased son to their consolation.

When, as above mentioned, I had to pay my profound respects to his majesty, at the time he happened to come to the gulf of Aalesund, in the province of Sundmoer, I had arrived there, for the purpose of marrying Sophia Aletha Ruberg, three weeks before his majesty. I had at that time in my family a Lapland young man, of the name of Peter Jonsen, who had so recommended himself to the attention of the high admiral, Rosenpalm, that he was disposed to take him to Copenhagen and put him among his rowers: and as the youth had capacity, his highness took care that he should be taught writing and arithmetic: when taught, he sent him to the East Indies, to acquire, under a skilful seaman, a knowledge of nautical affairs; but returning from India he fell sick, and died at Copenhagen.

CHAP. XII.....OF THE WILD BEASTS AND BIRDS OF FINMARK, AND OF THE MODES OF CATCHING THEM, USED AMONG THE LAPLANDERS.

AS many writers, versed in natural history, have long since employed their time as diligently as successfully in investigating and describing the properties of the nature of quadrupeds and birds, it would appear superfluous here to resume the same subject. Postponing that consideration, I propose to mention some of the modes and arts which the Laplanders use in taking them, and also something of the singular qualities of certain quadrupeds and birds, and other matters belonging to them.

Most of the kinds of quadrupeds, of a wild nature, which are found up and down through Norway, Finmark produces in no small number; which advantage of their country the Laplanders know well to turn to their own use. But it is to be particularly noticed, that the inhabitants of the mountains, abounding above the rest in a great quantity of rein-deer, have very seldom leisure for the chace, nor is there need they should, when they are so very much occupied in watching and pasturing their herds; and they can well forego this laborious and unquiet mode of life, furnished as they are besides with an abundance of those things they have use of.

Finmark both produces and breeds a great number of wild rein-deer: these, called Godde by the inhabitants, by far exceed the tame ones in the bulk of the body. The Laplander going out to hunt, in summer and autumn, the rein-deer, takes with him hi well scented and sagacious dog, whom, as a guide that will not deceive him, he follows, hunting by the scent, until he comes up in view to the wild rein-deer. On the sight of the animal he muzzles the dog, lest he should frighten him by barking. Should the bullets he uses, when first shot, not kill him, but only mortally wound him, he drives the dog, now freed from the chain and muzzle, on him as he flies, who stopping now and then in his speed, in order to defend himself with his horns against the dog, is shot at and killed by the Laplander, who makes good use of the opportunity. During au-

tumn, when the rein-deer meet for the purpose of procreation, the Laplander goes with some of his rein-deer, tamed for that intent, where he knows that the wild ones meet, and there fastening some to trees with halters, suffering others to stray at large, he places himself in ambush. The wild rein-deer, scenting the females, instantly flies to them, but falls a prey to the Laplander lying in wait for him. It happens sometimes that two at once come: these, sharply contending for the female, rush in on each other with their horns, with commonly no other termination of their contest, than that each of the competitors should fall under the arms of the Laplander.

The Laplander, when hunting the wild rein-deer in winter, closely follows the traces of the straying animal until he comes up in view of her: on seeing her, he fastens the rein-deer of his sledge to the next tree, instantly on foot to pursue. In some parts of Lapland wild rein-deer are taken in the following manner; the snows being collected in such heaps that the rein-deer cannot get over them, and the outside of these heaps so incrusted with ice as to break under the tread of one of them, but yet able to bear the weight of a man with wooden shoes, the Laplander, furnished with such shoes, goes out to hunt the rein-deer, who, while running over the snow lightly incrusted, and disappointing his steps, gets entangled. In this state he cannot escape the hunter, coming swiftly in his wooden shoes upon him by his accustomed celerity, but, transfixed with the hunting spear, becomes his prey. The taking of the rein-deer is effected in other places by the following method: in places where the said beasts usually range, a certain opening, like a gate, is made, in which a loop is hung, made of the thicker fibres taken from the sinewy parts of the rein-deer; this the animal, straying without caution, and fearing nothing, enters by chance, and instantly falls into the snare. In certain tracts of Lapland the rein-deer were taken wild formerly, in this manner: a very high inclosure was erected from a piling of a great deal of wood, two greater arms or horns alternately projecting themselves, so that a great space should be open between the extremities of each arm, but behind so gradually coming together, as to terminate in a narrow aperture, in the appearance of a narrow gate. When this inclosure was ready, the hunting, when an opportunity offered, was proposed, and in this very manner: the wild rein-deer were compelled into the inclosure by a space lying open between the two arms that were separated, who, the farther they went in by flight, the nearer were they to the inward extremities of the said inclosure, where these separated arms again united in the form of a narrow gate, from whence they neither would nor could easily get back, lest pressed from behind they should fall among the hunters. A way out through the said narrow opening was therefore to be sought by them in this miserable plight, which, when found with difficulty, a stooping hill soon presented itself, along which they ran in a precipitate manner, when a new inclosure again presented itself, which seeing they could not get over, nor, by reason of the steepness of the hill, pass without difficulty, were forced to surrender. This mode of catching rein-deer was formerly in use among the Varangriens, who even from that kind of chace are held to pay a tribute of nine rein-deers, or, in defect of rein-deer, as many fox skins, to the king's governor of the castle of Wardhuis. It was usual also among the Laplanders, formerly, that they should drive the rein-deer they proposed to take into the next nearest lake, having placed men on the farther bank to attack them when swimming over. It is related by some one, that the women of Lapland are not less addicted to hunting than the men; this I never observed, and never even heard a word of.

There are no deer nor elks in Finmark. That an elk, as a certain writer lays down, much yields to the rein-deer in size is very false; for it is sufficiently well known that one elk, of just size, at least equals three full grown rein-deer, and those the largest of their kind, in the bulk of the body.

Hares are bred in great numbers in Finmark. This wild animal is called by some of the inhabitants of Norway Tase, but by the Laplanders Njaamel. Hares found in this tract of country during winter, are of a white colour, but in summer of a gray, as they are elsewhere. Besides the gun, the most usual instrument of killing wild animals, other methods and arts are in use for catching hares. In those places where hares usually haunt, snares, constructed from small sticks and cords artificially put together, are fixed in the ground, in which the hares, straying without caution and freely among the trees, frequently run into the trap, and are taken. They are caught too by a certain iron machine, described in another place. The Russians pay for each hare's skin eight pence. The Swedes are said to make coverlets from these kinds of skins.

In Finmark, not less than through the remaining tracts of Norway, are found bears. The bear in Lapland is called Guouzhia, the word denoting the male and female of this animal. But the Laplanders also distinguish the male and female; the male is Aenak, the female is Aeste; the Norwegians generally say Bingse. The rein-deer easily escape the bears by the fleetness of running; cows, goats and sheep are much more exposed to their cruelty and rapacity. That the Laplanders of Indragria, in Sweden, were compelled to bury the bodies of their deceased friends in certain little islands, scattered in the lake of Indragria, lest they should be a prey to the voracity of bears, has been handed down to us, but for the truth of the relation I cannot answer, relating only what I have heard. The bear is wonderfully delighted with certain blue berries, in Norwegian called Blaabaer, a great abundance of which is found in this country: but he also feeds on grass. The Laplanders in common shoot their bears with grooved guns, which are only in use among them. If the bear does not fall with the first bullet, but is only wounded, he instantly returns, to take vengeance for himself, and often not without effect. But these wild beasts are taken not with shooting alone, but by other modes and stratagems. It is a matter well known and ascertained through the regions of the north, that the bear, during the winter, lies concealed in his den, and that he is there sustained by no other aliment than a certain milky juice, which he sucks from his fore paws with a growling. It not seldom occurs, that the Laplander going to hunt birds, squirrels, and other game in the woods, accidentally falls on the haunt of a bear laid up for the winter, by the assistance and guidance of his hunting dog, standing and barking at the den he has found out by the scent. The Laplander observing this, puts in the bow with which he designs to kill birds (for bows, it appears, are in use as yet in some of the countries of Lapland) to the aperture or door of the den, while the bear is still carelessly at rest, and not attempting to come out. He then cuts off branches from the fir-tree, if at hand, if not, from any others in his way, by which he shuts up the mouth of the den, drawing out first his bow with caution, yet in such a manner that it should not be altogether closed up, as there must be a small aperture for the bear to put his head through. Things thus arranged, the Laplander, armed with an axe, plants himself before the door of the den, in order to irritate the bear by every means and threat in his power, until he, provoked in the extreme, shall rise, prepared to attack the enemy, so wantonly challenging him and provoking him. The bear then thrusting his head fiercely through the narrow aperture that is made, is hit, or, in plain terms, receives a mortal blow from the Laplander with the axe, which, if it has struck the upper part of the face, is almost harmless, but if the lower part, and next the eyes, the blow immediately cuts off the head of the wild beast. The Laplanders pursue a different method in other parts of the country, and in the following manner: When they have found the place where a bear has perhaps killed a wild beast, but, having killed it, has soon quitted, they surround, by a certain inclosure furnished with two doors, made in the form of an opening

gate, and directly opposite to them, the carcass that is killed and just left behind him. Near each aperture or gate of the inclosure are laid various bows, stretched, and furnished with arrows, the height of the bear, as well as can be conjectured, as accurately observed, with this view, that they may directly strike to the heart of the wild beast, entering by the door of the inclosure to his prey. A rope is extended near the ground, on the touch of which the arrows are shot. The bear returning to his prey, enters the enclosure by one of the said gates, and treading on the ropes, falls, pierced by the arrows, provided they strike with exactness. That the said inclosure is furnished with two doors they assign as a reason, partly, that a free passage should be open to the bear, on each side, when he returns to his prey, partly, that if by chance he should escape the arrows placed at the gate by which he entered, he should more certainly fall by those which were placed at the other. They also extend a rope with drawn bows on each side in ambush, on the walks and paths where they know bears stray up and down, with the view that, treading on the rope, and the arrows being shot, he may receive a death wound. The Laplander makes use of the assistance of dogs in the hunting of bears, as well as rein-deer. He thoroughly rubs his limbs, when they exceedingly ache, with bear's grease, which is laid up; the intestines of the animal that is killed are anxiously preserved, with this due observance, that the fat of the male bear may be used for the cure of the males alone, and what is taken from the she bear for the females.

The lynxes, called by the Norwegians Goupe, and by the Laplanders Albos, are not to be met with in Finmark; this defect however is supplied by the great number of wolves. Of these some are yellow, some of a colour inclining to white. This wild animal, according to the different dialects of places, gets different names, such as Barg, Graabeen, Sfrob, Sfrog; the Laplanders call them Kumpi, Stalpe, Seibek, Gaine, Olgobutzh. The Laplanders most usually kill wolves with guns; they take them also with a certain iron machine, of which we shall below give a description. The most useful of these traps hold a wild beast so closely, that should they only catch the nail, yet they can retain him, which from the following account will be manifest: A certain mountain Laplander from the bay of Posanger, called Andrew Jonsen, once caught a wolf in one of those approved machines, which, though only held by a single nail, and running besides with so great swiftness, with the machine that he carried with him, that the Laplander, though carried by his rein-deer, a very swift animal, could scarcely overtake him as he fled, yet so closely did the trap hold him, that he could by no means extricate himself and escape. But whatever more of the nature and habits of this animal could be mentioned occurs in chapter the ninth, on the rein-deer. Wolf-skins are stretched on wooden tenter-hooks, called in Lapland Ratzh.

Foxes are found in great numbers through Finmark. Of these many are red, called in Lapland Ruopsok; others are red, marked with a black cross, whence they are called by the Norwegians Kors-Roeve, that is, red foxes, but by the Laplanders Raude: others are altogether black; others black, with the extremity of the hair on the back shining with a colour like silver. Foxes of this sort, called in Lapland Zhjaeppok, whose skins, as being the best of their kind, were reserved under, the injunction of an edict published on the twenty-fifth of May, in the fifty-second year of the seventeenth century, for his majesty alone; they are now sold without restraint to the Muscovites, who make garments of them for men filling the highest dignities. The Russian women of inferior condition are said to wear caps or hoods trimmed with red fox-skins. Besides the said species, there are white foxes found in Finmark, with black ears and legs, and black hairs in their tail. These in Lapland are called Vjelgok, and are very rarely met with. There are

besides little white foxes, less than those just mentioned, called by the Norwegians Miel Raffer, but by the Laplanders Njal, whose skins are the worst of all. Foxes feed on the eggs of ptarmigans and other birds taken by stratagem, on mice, shell-fish found near the shore, and such like foods. The Laplander, hunting the fox in winter, follows the track of him, until he finds him either sleeping in the open field, or has traced him to his den, where he has concealed himself. Here the hunter halts a little, waiting the opportunity of killing him with a bullet when coming out of his hiding place. He hides also pieces of meat in different places under the snow, to the intent that the foxes should come to them. When he has once smelt the meat, he eagerly flies to it, but, while striving to disperse the snow with his feet, in order to get at the meat that is under it, he is shot by the Laplander lying in wait for him. This kind of hunting is exercised by night, by moonshine, or, in defect of that, by the glimmering light which they call Boreal; for it is sufficiently known, I think, that that which they call the Aurora Borealis is apparent in so great a degree in this quarter of the sky, that it can supply the place of the absent moon. Foxes are sometimes killed running, but they are most usually caught in a machine of iron, which, before it is laid, resembles a semicircle, when laid, the shape of a complete circle. They fix this, rubbed with rosin, fat of the dolphin, or any other unctuous matter, lest the wily fox should smell the rust, and lay it in the snow, in the sand near the shore, or some other commodious place, baited with the flesh of the lamia, which the Norwegians call Haae-Kioerring. The fox, smelling the bait, instantly flies to it, but, while he is endeavouring to remove the snow or the sand with his feet, to reach the hidden food, he incautiously touches the trap, which touched, instantly seizes the neck, the feet, or some other part of the body, and closely holds it. If the snare or trap, which frequently happens, should lay hold of one foot only, the fox, sooner than become a prey to his enemy, eats away his own foot, if there is time for it, and takes to flight with the three remaining ones. This machine is used in other places in Norway, and besides it there is another, called Ritta, in which the Laplanders are used to catch foxes. The Ritta is made in the form of an oblong and low chest, and open at one of its ends. Near that end that is open are two stakes, overtopping the chest itself in height, on which is put a beam across. Before the said stakes, at the extremity of the cover (for the machine has a cover, no less than other necessary parts of a chest) is a small pole, to the extremity of which above is a hook with a button affixed, another pole being put over the beam, whose fore point just touches the button, while a rope is fixed to the other point, passing through the aperture made in the cover of the chest, and drawn to the bait concealed in the lower part of the machine. The snare thus constructed, the fox, invited and allured by the odour of the bait, creeps in through the open part of the trap, where, while he is digging the earth, he touches the rope, which loosens the button, and that being undone, the cover of the chest instantly falls in, and kills the fox by its weight. And since the said machine can contain only the fore part of the fox who has got in, while all the hinder part is outside, it often happens that a wolf falls upon a fox so caught, and tears the part in his own way, that the hunter shall be deprived of the skin, the reward and fruit of all his labour, and which he only looks after, now torn to pieces and broken up. They relate that the Swedes catch bears by a like machine, where it is to be observed, that the trap which is constructed for the destroying of bears is much larger, in proportion to the strength and size of this beast, composed of stronger beams and rafters, and laden with heavy stones, that the cover in its fall, when the button is undone, may fall with the greater weight, and crush him. Foxes are killed too by certain poisened cakes, which the Laplanders call in their tongue, Saeljok. The fox, when going to build his subter-

ranean recess, digs a way to it, not in a direct line, but in one curved and winding, with a variety of turnings, with the intent, it seems, that no one with either spear or any other noxious instrument should reach it; and as it necessarily follows that this den, and the windings to it, cannot be dug without throwing up a great quantity of earth, you will not without reason be surprised, that, in such a den, sometimes of no middling size, no heaps of earth dug up are to be seen, but that every thing is found plain and level. The Lapiander, when going to catch a fox in his den, shuts up the entrance through which it appears he passes, having made a new one in its place, by the help of which he strives to find out those which lead to the den; which, when he has found out and laid open, he attacks the den itself of the fox, where, when he has arrived, he drags him out from it, and kills him. It happens but very seldom, that two foxes are found together in the same den. Fox-skins are stretched on a certain machine called Ratz, as was mentioned above of wolf-skins.

The marten, called by the Laplanders Naette, is found too in Finmark. There are three species of this animal; the first comprehends those, which in the Danish language are called Steen-Maar, that is, marten found among the rocks. The marten of this species is darkish, short hairs, and brownish tail, with ash-coloured spots, sometimes inclining to a black and blue colour, marked under the neck. It takes its name from the mountains and stony grounds it most usually haunts. The second species is the marten, called Birfe-Maar, that is, the marten that delights in places planted with the birch-tree; this is of a dark colour, with a purple coloured tail, and marked with white spots under the neck. To the third class belongs the species of marten called Furr-Marr, used to the haunts of fir-trees. This is of a dark mud colour, with a yellow tail, and a mud coloured spot under the neck, somewhat white. The martens are caught in a trap or iron machine, which I described above.

The glutton, called Bielfras, in Lapland Gjeed'k, is found in Finmark, but rare and seldom. He is strongly furnished with teeth, as well as the sharpest nails. Those of Lapland, who have explored the nature of this animal, and thoroughly examined it, assert, that the glutton, though small in the body, is certainly not to be compared to the rein-deer, yet that it is able to kill one of full age and growth, but not without stratagem, as appears from the following statement: In the woods, where the rein-deer usually stray, the wily glutton gets up a tree; from it he leaps down on the head of the rein-deer as he passes, and so mangles his neck with his greedy bites, that he drops at length lifeless under him. The skins of the glutton, on account of the white shining streak with which this animal is marked along the neck, and which they call in common a looking-glass, are in great estimation. From that part of the skin which is taken from the feet of this animal, the Laplanders make gloves, elegantly adorned and diversified with threads of tin interspersed, as is the custom of the nation. With so great, so insatiable a voracity does this animal hunger, that he is said not sooner to quit the carcass than he has consumed it all. But if he cannot contain the whole of it, he searches out two trees very close to each other, between which he squeezes himself, and by pressing and constraining himself violently, relieves his belly; when he has done this, he hastens again to the carcass, and devours the remainder of it. Impelled by the same greediness, it is usual with him to go to the cupboards of the Laplanders built on the ways, as said, and gnawing and digging through the coverings, gates, and floors of them, the greedy guest, getting in, destroys the meats and whatever foods are there to be found.

The beaver, in Lapland Majeg, is also met with in some districts of Finmark, no where more frequently than in Indiager, a district of Swedish Lapland, and on the banks

of a very large and famous lake, which is said to be twelve miles in circuit. The same lake, as reported, is of an immense and almost unfathomable depth, and in it are many lesser islands. They say the tooth of this animal is reddish, crooked, and almost squared. His tail, by the aid of which he is said to make a house for himself, is broad, rough, and full of scales. The wool, or rather hairs, are sold to the Russians in common, and at a good price; they purchase also the skin for the covering their under garment with. The royal governor of this tract of Sweden, the illustrious Claudius Gagge, ordered, by his majesty's command, Christian the Fourth, of glorious memory, that as many beavers' skins as could be got should be bought for the use of his majesty. The royal mandate, proclaimed on this business, is dated the twenty-eighth of June 1609. The force and efficacy of the beaver or castor oil in various symptoms is wonderful, too well known to practitioners in medicine to be mentioned by me. It is said to be medicinal for the internal diseases of cattle; it is said to be of service in frightening and driving away whales, to whom its very smell alone is insufferable; for which reason fishermen, apprehensive of harm from this great fish, are ever provided with the oil of castor. The beaver, for this reason, is instinctively led to build his house near the banks of lakes and rivers. They saw with their teeth birch-trees, with which the building is constructed. Whichever of the beavers supplies the place of the sledge lies upon his back, with his feet upwards, whilst his companions put the wood between his feet as he lies down, and holding it with his teeth, he drags it along to the place destined for building his habitation, together with the wood laid upon it. In this manner one piece of timber is carried after another, where they choose. Those who supply the place of the sledge are easily known from the rest by the defect of hair, which is rubbed off by constant action all along the back. At the lake or river, where their house is to be built, they lay birch stocks or trunks covered with their bark in the bottom itself, and, forming a foundation, they complete the rest of the building with so much art and ingenuity, as to excite the admiration of the beholders. The house itself is of a round and arched figure, equalling in its circumference the ordinary hut of a Laplander. In this house the floor is, for a bed, covered with branches of trees, not in the very bottom, but a little above, near to the edge of the river or lake; so that between the foundation and the flooring, on which the dwelling is supported, there is formed as it were a cell, filled with water, in which the stocks of the birch-tree are put up; on the bark of this the beaver family who inhabit this mansion feed. If there are more families under one roof, besides the said flooring another resembling the former is built a little above, which you may not improperly name a second story in the building. The roof of the dwelling consists of branches very closely compacted, and projects out far over the water. You have now, reader, a house, consisting and laid out in a cellar, a flooring, a hypocaust, a ceiling, and a roof, raised by a brute animal, altogether destitute of reason and also of the builder's art, with no less ingenuity than commodiousness. This too is an extraordinary instance of the Divine wisdom and goodness, which, in addition to the other instinctive actions of brute animals, straying through their haunts, should more excite and actuate us to the admiration, praise, and adoration of the Divine Being. In the said cell is an aperture, which serves for a door, through which the beavers go in and out. When they are all abroad, the hunters put a kind of a little fastening on that opening or door, in such a manner, that, on the entrance of the first beaver, it should fall and close up the whole aperture, as far as it goes. Thus shut up, the beaver which is within is hindered from going out, and is taken. But as to what is hitherto related concerning the beaver and his manners, I have not attained by my own experience, nor could I learn, because through that whole district where my duty as a missionary lay, this animal never once

came in my way; but what I have heard from Laplanders inhabiting those places resorted by beavers, I faithfully relate.

Otters are found in great quantities through Finmark: this animal is called by some Norwegians Slenter; by Laplanders Zhjevres, a word denoting each sex of this creature. But the male otter, of full age and stature, is called Goaaige; the male young of the otter in his first year, Farro Goaaige; the female of full age and stature, Snaka; a female young just come out of its first year, Farro Snaka; and those that have not attained this tender age, the Laplanders call Varlagges. The otters getting their subsistence in the lakes surpass those that live in the salt water by far, in the sleekness and beauty of their hair. The otters can be as easily made tame as dogs, cats, and other domestic animals; besides, it can make itself agreeable and useful to its master, fetching fish from the sea, and having discharged that duty returns home. There is a kind of otter, an animal of small body, yet can catch the cod and other larger fish: when it catches one, it drags it out to the next shore and eats it: while eating its eyes are always shut, at least very seldom does it open them, which the hunter chiefly attends to; for he comes nearer while the otter's eyes are shut, and halts when open, which he does by turns, until he can conveniently reach him with a ball, and thus commodiously kill him. On every maritime excursion the Laplander is furnished with his gun. If the time permits, he determines his course, not directly where he is going, but approaching the shore, he examines all its bays and creeks, to find out wild animals of all sorts, but chiefly otters, which frequently are found there. This is the nature of the otter kind; that from its amphibious nature it employs one part, resembling a fish, swimming through the sea, through lakes and rivers, in getting its food; the others assigned to rest, which it takes on the dry ground, and in caverns, not such as foxes build for themselves, but choose such as by their very nature are formed from heaps of large stones, disposed in a certain order. The Norwegians call a heap of stones of this kind Uur. When the cavern is found, the hunter lays his snare, from beams and poles artificially joined and laid together, and furnished with very sharp points, in which the otter, either seeking or quitting his den, falls into the snare. Otters are taken in that well known machine spoken of before. The skins are stretched on two poles fit for this purpose: that which is applied to the longer part of the skin is called in Lapland Gidne; the other, which is applied to the shorter, is called Buoggnamor. The Russians sometimes wear clothes trimmed with otters' skins; besides, they export them into Tartary, to be sold, repurchased dear enough by the Laplanders; for a skin, which stands a Danish trader in but one thaler, is bought back from the Russian at not less than two or three thalers.

The seas around Finmark abound in great plenty of seals, of which some are larger, and marked with white spots; of these, such as are male are called in Lapland Dævok; the females are called Aine. Some are of huge bulk, of white colour, which the Laplanders call Jaegees; others of moderate size, marked with black spots, called by the Norwegians Steen Robbe, by the Laplanders Nuorrosh, the Lapland word expressing each sex. But the male is called in Lapland Rokka, the female Afzhio. Others are white, with large black spots, which the Laplanders call Daelja; others also white, with black small spots, called Oaaido; others small, with a long bent beak, in Lapland called Fatne Viudne; others with other colours and other names. Besides the said species of seals, the Morse is sometimes found in some parts of the seas around Finmark. This marine beast the Norwegians call Hual Ros, the Laplanders Morsh. The morse has broad nostrils, thick tongue, huge crooked teeth, especially two, which project far beyond the rest, and with which it is said to lay hold of rocks under water in the sea, at no great distance from the shore, and to keep himself fast by them. The Russians usually make

balls and other artificial things from the teeth of this fish, as equalling ivory in whiteness, as almost to surpass it, though dearer and more valuable by far. The feet of the morse are covered with a very thick hide, almost five fingers in thickness. King Christian the Fourth, of glorious memory, by a decree published at the castle of Bergen on the sixth of July, 1622, ordered that fifteen hides of seals should be yearly bought for him. But the sea-horses that are found in this part of the ocean are short-haired, yet with a maned neck, of an ash colour, different from those found in Iceland of a carnation colour. The morse when attacked makes a furious resistance. The Laplanders generally kill them by muskets that are grooved; sometimes they attack them by clubs or battoons, the blow being inflicted on the muzzle or front of the animal; and winter is the time when this mode of hunting is practised, when the seals get together for the purpose of coupling. The young (which when first born are almost white, yet gradually take the colour of the dam) as weaker, nor able to fly, are in such a contest in the greatest danger. The same fate generally befalls the dams, yet resisting, and with all their might attacking their assailant; whence it oftentimes happens that they fall not unrevenged. In a calm sea one may see the seals sleeping, the head with the lower part of the body being under water, with the back above. The Laplander observing this, on the discharge of his gun, rouses him from his sleep, but so as to overwhelm him with a perpetual sleep, or in plain terms, hits him when sleeping with a ball, and kills him. The seal is among the amphibious, swimming sometimes in the sea, sometimes on dry land resting among the rocks, where, whilst he negligently lies, puts out one of his fore-feet, exhibiting to those who come to see him the appearance of a man stretched on his back, calling some body with his hand to his assistance. When many of them are swimming at the same time in a troop, in order to get possession of the same rock, the one striving to get before the other, by which means tossing and rolling themselves they lash the sea with such violence, that their shouts, while contending, and the noise of the waters, can be heard far off. Those who happen to gain the rock have no slight contest with their associates, who, yet swimming in the sea, endeavour by every exertion to get to the same rock. If the contest is with an inferior, he who holds the rock easily defends the place; but if with a superior, he at length is compelled to yield. In such a conflict they mutually miserably mangle each other, setting up at the time a rude and savage kind of noise. Seals are usually caught by the following artifice: the sea, by means of the tide, increased to its greatest height, the seals climb the rocks, as was said, to remain on them until the sea shall ebb: mean time a strong piece of wood, planted and furnished with very strong hooks and bent irons, is put at the bottom of the rock, to the intent that the seals, rushing down from the rock into the sea, should get entangled in these hooks, which, to succeed the better, a sudden shout is raised by their aggressors; on hearing which the seals with all their might rush into the sea, and by that excessive haste, greater than at any other time, are caught on the hooks set for them. The skins of this animal are stretched usually in the manner in which salmon are dried, except that the tenter-hooks are more in number, longer, and thicker.

The squirrel, in Norwegian, Iforn, in Lapland, Orre, is found in some parts of Finmark. Among the squirrels some are of a gray colour; but in summer all, without distinction, are red. In the woods, where they live, they spring from the top of one tree to another with amazing agility. When passing lakes or rivers, they seat themselves on little pieces of wood or bark, and erecting their tails for sails, they reach the place they intend very commodiously. There were two kinds of bows in use among the Laplanders; the one, called Gietdaugie, or the hand-bow, because it was stretched by the hand alone. This instrument was very simple, consisting of one arch, properly so called, and

a string. The arrow, which was fitted to the hand-bow, was rather long, with a very sharp point, made of bone or iron. The other was called Juolge-daugie, or foot-bow. This, besides the bow and string, was furnished with a wooden handle and button, made from the horn of the rein-deer, on which the string held when the bow was bent. The arrows placed in this bow were without point: but the Giet-daugie was stretched no less by the aid of the feet than the hands, whence it had its name. After the invention of muskets, the use of bows was rarer, though the Giet-daugie, or that bow which is called from the feet, has not grown altogether into disuse among the Indagrians in Sweden; for as there is in that tract of country a great number of squirrels, the hunters are said to make use of bows instead of muskets, lest the skin of this beast should be injured by bullets. Forty skins (which number, when speaking of squirrel skins, is called Tommer) are sold by the Laplanders at the price of one thaler.

There is a vast number of weasels also in Finmark. This little animal in Lapland is called Boaaid, which word expresses each sex; but the male is called Goaaige, the female Gadfe. Weasles during the winter are gray, unless that on the extremity of the tails they have very black hairs, with the exception of a few of them, whose tails as well as the rest of the body is all white; these are called by the Laplanders Seibush. On their haunches is found a kernel, or small piece of flesh, when the skin is removed, of a very bad and almost insufferable smell, which they call themselves Zhjiavra Kuatte. The weasel is most greedy and most eager after eggs. If you fasten a clue of thread to a fish, or any thing else of which the weasel is fond, he will, after dragging the food to his hole, immediately bring back the clue of thread. I relate what I have heard, but from those who have testified that they had often seen the matter themselves. The Alpine weasel is called by Pliny the winter mouse; more truly and fitly named Royse Kat, that is, living among heaps of stones, as it is commonly called by the Norwegians, because it hunts mice no less actively than the tame domestic cat. Weasels are caught in a certain trap, which the Laplanders call Gillar: it is made from a piece of wood of the birch-tree, cleft in two parts, of which the one, which is propped on a stake, falls down on the weasel creeping to the bait through the aperture, which is open in the trap for this purpose, and crushes him to death by its weight. The whole machine is raised by a prop from the ground, lest field mice should get in and destroy the bait. Before the trap is a stump equalling the elevation, which the weasel, on smelling the bait, ascends, that he should creep into the trap more commodiously. When caught in the trap he makes water through fear, which, should it touch the skin, superinduces a yellowish colour, after spoiling the former whiteness of it.

Certain mice, called by the Norwegians Lemaenner, by the Laplanders Godde-Saepan, infest Finmark also. These mice usually lie under stones, and in small cavities, and there have their nests and their young: the young in the beginning are blind, and variegated. Mice of this sort in reality drop from the sky, which I relate on my own authority. Daring by nature, at least they are little afraid; for should any one attack them with a stick, they instantly turn about in a hostile manner, and gnaw it. Whenever they drop from the sky, the Laplanders then augur to themselves, as a remarkable year for the taking of foxes, the following one; for as they are very fond of these creatures, they find them in a great abundance on the mountains in the year there is such a plentiful shower of them; but on the next, when there is as great a dearth, they betake themselves to the shores, with the hope of finding there what they sought in vain for on the mountains. The Laplanders, making the best use of the opportunity, strive to catch, by all arts and means in their power, their visitors. But these mice are no less exposed to the attacks of foxes, than they are liable to be devoured by the crows and rooks.

In some parts of Finmark they proceed in troops, an almost innumerable crowd; nor do they, should they on their march arrive at a lake or river, turn out of the way, or the course they began, but committing themselves boldly to the water, pass directly over the obstructing lake or river; which I find too, not by experience, for I have not seen it, but from report, is the custom also of dormice.

The knowledge, such as it is, of the wild animals of Finmark, and the methods of taking them, being laid down agreeably to the plan of the work, I shall beg leave to mention, with the reader's permission, that in these countries it does not seldom happen, that the ewes produce twins twice a year, and the goats not only twins, but sometimes yean three kids at once. The he-goats usually rut, elsewhere, about the time of St. Bartholomew, as it is called in the kalendar; here later; about the festival of St Michael, they are known to couple. Finmark produces likewise most other wild birds which are found elsewhere throughout Norway. Of these, some are stationary, and some are constant, as the eagle, the falcon, the hawk, the owl, the crow, and raven, the ptarmigan, the cormorant, a peculiar kind of bird, in Norwegian called Aderfuglen, the sea crow, and many others, which are constant here as elsewhere. Others foreign and migrating, which come, in the beginning of spring, to depart again in autumn, which seasons of the year they as well know, and as accurately observe, that men by the aid of stars and kalenders scarce know them better. Among the emigrating are classed the wild goose, in Norwegian Graagaasen; the pigeon, a bird in Norwegian called Bruus Koppen, i. e. crested or tufted. the fig pecker, the field ouzel. This custom of coming and then migrating at a stated season, is observed not only in Finmark, but in other places through Norway, in the said birds.

Finmark abounds in plenty of birds, as well aquatic as terrestrial. White falcons are seldom found. They exceed somewhat the vulgar gray coloured in the bulk of the body: under the belly and wings they are white, on the back gray, with yellow feet and beak. In high and inaccessible rocks, and clifts of quarries, they build, and hatch their young. Of the common kind of falcons, of a gray colour, there is by far the greatest number in these parts, who, of a disposition neither perverse nor intractable, were found with those foreigners who purchased formerly on certain conditions the licence of catching them, from their serene sovereigns the kings of Denmark and Norway.

In the wild haunts of Finmark it has been said, that white owls are found. This bird, they say, is a little larger than common owls, the feathers are white, marked with black spots, the hinder part of the head short, the beak broad, brisk eyes, and hairy feet. It is said to build its nest on high rocks, and there to hatch its young.

A certain bird, in Lapland called Skaite, very much like that sea-bird which is called Rive, to be soon described below, is to be met with on the mountains, seeking its subsistence by the carrying away the eggs which other birds have by chance left in its way.

Here too is found the greatest number of rooks through all Norway, yet no where more numerous to be seen than about the shore, flying and perching in troops. The colds of winter, that chiefly pinch this part of the world, so subdues them, that they not only gather thick about the houses, but even boldly fly into the porches and courtyards. Whenever any servant going to clean vessels from the kitchen shall cast any scourings into the snow, they instantly fly famished to devour the scraps, if any can be found among the cleansings that are thrown out. The linen clothes which in summer are usually washed and cleansed in the sun, unless carefully guarded, they tear with their beaks under the compulsion of hunger, nor would they spare the stalks in autumn

provided the keepers would let them devour them; such, indeed, voracity and malignity is observable in this kind of bird, as is no where else observed throughout Norway.

A great number of crows is found in this tract also. Birds of this kind, which by their nature deserve to be called rapacious and plundering creatures, carry off the very fish, which, according to the custom of this people, is suspended to dry in fish-houses, and also the ptarmigans taken in nets.

The magpye, called in Lapland Ruosh Karanas, in Norwegian, according to the different dialects of the places, Stinur, Stiuul, Stivor, and Stieer, is seen sometimes in Finmark, yet very seldom beyond the parishes of Alten and Hammerfest, in the western Finmark. If it happens, as in Wardoea, an island situated in the eastern Finmark, this garrulous bird should be seen near the place of worship, is taken as an omen, either portending death to the pastor of the congregation, or certainly some change; but if it should appear on the castle, it was thought to presage instant death, or the hopes of a new appointment, to the royal governor resident there.

In Finmark, as in most other tracts of Norway, is a certain wild bird, the male of which is named in Norwegian Tiuur or Tedder, in Lapland Zhiufzia, in Latin the Urogallus major. It is about the size of the eagle, a hoarse and screaching voice, of a pale ash colour, with black and white feathers on the breast and under the belly. It usually swells and struts, with its feathers proudly expanded, like a peacock. The female of this bird, in Norwegian Roy, in Lapland called Goaappel, is less than the male, of a dark colour, interspersed with spots. The flesh of these birds very much resembles the flesh of birds in common, as well in colour as in taste.

A certain bird of extraordinary size, neck and feet of an ell long, called by the Laplanders Guorga, is met with in Finmark; very seldom it is seen.

Finmark abounds in a great number of ptarmigans. Birds of this kind are gray in summer, mixed with a pale yellow, white in the winter, when they sometimes so bury and cover themselves with the snows, that they cannot be seen by the passengers in the place, where for a time they were hid under the snow, which after their departure is yet sufficiently visible. But there are two kinds of the ptarmigan, one of which comprehends those which in Lapland are called Rieusak, in Norwegian Stov Ryper or Lie Ryper, because they frequent the woods and hills; to the other class belong those called in Lapland Giron, in Norwegian Field Ryper or Stare Ryper, that is mountain ptarmigan, because they are found on the summits of the loftiest mountains. These differ a little from the former in the size of the body, which is a little less, and also in the voice. The Laplanders catch the ptarmigan in the following manner; they cut down birch trees, and dispose them when cut in the shape of an inclosure through the plain, different doors opening on this side and that, by which birds of a moderate size can creep in commodiously. At each opening is a loop, in the form of the fingers extended, fixed at each end in the ground. The ptarmigan alighting accidentally on the said inclosure, whilst fleeting freely up and down, they come to the tops of the birch trees, of which this hedge is made for catching them, to the openings where the loops are put, through which, when wishing to get to the nearer side of the inclosure, they are entrapped.

The wood-pigeon is sometimes seen in the eastern Finmark; in the Russian territories, if report is true, much more frequently.

There is a certain bird, which, from the crest it carries, is called in the Norwegian Bruus Kopper, to be met with in some of the tracts of this region. Such of these kind of birds, as are to be found in these countries, are either gray, with white neck, or dark,

with a red one, or variegated with a dark neck; they equal in size the field ouzel or black bird, but with larger feet, they have a sharp beak, of a pale yellow colour. That which is male is red from the beak on to the crown, without feathers; it is adorned with two crests or combs, which form as many flaps, rising on each side of the flesh, without feathers. The male, when going to couple for young, seats himself on some rising hillock by land, and gaily expanding all his plumes, wonderfully displays them, and exhibits such gestures as we before observed in the bird called in Latin Urogallus.

The ouzel or field black-bird, from its elegant colour, and delicious flavour, is much in esteem, known to the neighbourhood of Denmark, and is to be met with in Finmark. These birds come in spring and go in summer. When the time of their flight is approaching, they fly together, and coalesce in a variety of greater flocks. They inhabit marshy grounds, where on the higher hillocks, which are found in the marsh, they build their nests, and lay their variegated eggs under the open air, whence, in some parts of Norway, they are called Heisoner, as if Hedesoner, that is, birds inhabiting marshy grounds. This same bird elsewhere in Norway is called Agerloe, that is husbandman, but in Lapland Bizhiutzh.

To the class of ouzels or field black-bird is referred a bird called in Norway Spove; in Lapland Gusgastak. There are two kinds of this bird, which is not uncommon any more in Finmark than elsewhere through Norway, differing from each other but in the size of the body alone, some surpassing others in magnitude; but all almost agree in their ash colour, inclining somewhat to a dark one, in their feet rather long, long beak, crooked and slender. They are frequently seen on large stones by the sea shore. They lay their eggs in marshy grounds, and the flesh is of a most delicious flavour.

In Finmark, as elsewhere through Norway, a certain bird is to be met with, called in Lapland Maekkastak, but in Norwegian, from the varying dialect of each province, one time is called Rysse Giog, another time Maeffer Giog, and also Myre-hest. It has dark wings, variegated with spots, a beak rather long, a voice not unlike the bleating of a he-goat; it yields a little in the size of the body to the field black-bird, and lives in marshy grounds. As far as I know, this bird is found in Denmark, here known under the name of Myrebut.

There is a certain bird to be met with in Finmark, called in Lapland Sagan, in Norwegian Kield, or Rone Kalv, in Latin Pica Marina, and frequently met with in Finmark. The Pica Marina, or Sea Magpye, is a little larger than the black-bird of the fields, of a saffron beak, the belly and feet somewhat yellow, the breast and part of the wings white, the rest of a very black colour. It is seen in common on the shore, where it lays its eggs, and brings forth its young in a nest which is negligently made among the sea-weeds or bare sea-stones. It is no ungrateful object to the curious eye to observe this bird on the sea-shore, closely treading on the water receding along the sand, and yielding to it on its return: but its ill-timed and extremely unpleasant vociferation, which frightens away the other birds, is not so agreeable to the hunters.

That species too is reckoned among the aquatic birds of Finmark, which the Laplanders, in their language, call Buvadak, but in Norwegian, the inhabitants of the district of Finmark call Strog Kjeld, that is, the chattering magpye. This does not differ from that I have described, but in the stature, which is a little less, and colour, which all over the body is gray. But this bird is known and hated for its clamour and noise, with which it fills the whole neighbourhood, and from this it has its name. In other parts of Norway it is called Strand Kield, from the shore where it lives.

There is met with also in this tract a certain bird, called in Lapland Gaddevierrush, in Norwegian Fjoereptit. This bird, which elsewhere is little known through Norway, exceeds in size the tame sparrow, it has gray feathers on the back, varied by specks of a different colour, white under the belly, breast, and wings, a sharpened beak, a piping voice, and feet rather long. It inhabits that part of the shore, next to the sea, where it flies from one stone covered with weed to another. It is seldom seen alone, but often accompanied with ten or more companions. The flesh of this bird is very delicate and savory.

A certain bird is also found, by the Norwegian inhabitants of this place, called Sandmuling. This bird, whose voice is also piping, is seen sometimes on the shore, sometimes on land, a little removed from the shore, and wherever it goes, it makes use not of its wings, but its feet.

There are found besides in Finmark certain birds, called by the Norwegians of the country Sneefugle, that is, snow-birds, elsewhere through Norway, according to the variety of that dialect, Fieldstaer one time, at another Sneefugle, but in the Lapland language called Alpe. Their colour almost white, dark wings, short beak, their flesh of an exquisite flavour. What is observable in this bird and truly singular and unusual is, that they fatten at the coming in of the tide, and grow lean again on its recess. They are taken in the following manner by the Laplanders; some little sticks are set up on the snow, to which nooses, made from the tails of cows, after the manner of loops by which thrushes are taken, are suspended. The birds, meaning to get through, are caught in the loops in their way. The said birds are visible in certain tracts of Norway, in the beginning of spring, forming themselves into a large troop, but at the end of three weeks, especially in the islands, again disappear, to return, as usual, in the next spring.

The goldfinch of Finmark is of a very elegant colour, and of a most musical note.

The gray linnet is, under the neck, of a pigeon colour, and furnishes no small degree of delight to those who walk through the groves for relaxation, from its very sweet harmony.

Among the singing birds which the groves of Finmark possess is sometimes observed a certain bird, of very sweet song, short beak, black head, ornamented with a variety of spots, green belly, and a tail embellished with red and yellow feathers. It usually lays its eggs in subterraneous places.

Besides the enumerated birds, more kinds of singing birds are found in Finmark, among which is a small bird, of a gray colour, in Lapland called Veige-Zizatzh; others also, of a black colour, distinguished by a white collar round the neck, called in Lapland Gjelavaelgo; another kind also called Lafhol, equalling in size the field black-bird or ouzel, not unlike the colour of the lark, all of which delight the passengers by their delightful melody.

A certain bird, in Norwegian called Laxe-Titing, is sometimes seen near the banks of rivers. In this tract, as elsewhere through Norway, a little bird is found near the cataracts of rivers, of a black colour, with a white collar round its neck, called in Norwegian Elvekald, in the Lapland language Kuoikgarheek.

Among the sea birds of this country the swan too shews itself in certain places. The Laplanders take swans by a certain trap.

Geese, which they call wild, or gray, it appears, fly from the warmer countries in the beginning of spring every year to Norway, and, dwelling there in the little islands in the sea through the whole of summer, hatch their young, but on the turn of the year, when inclining to autumn, and their young are grown up, they return to the

place they came from. I grant that some of the said birds in this journey do not proceed further than Norland, others scarcely beyond the islands of the diocese of Bergen, towards the north; yet equally true and certain is it, that a great number of them do not cease until they have penetrated into Finmark in their flight, where they hatch their young in the islands well known to them, namely, Serden, Ingden, and Rolfsden, in Western Finmark, and Hen-den in the eastern, and procure subsistence for themselves and young as they can, until on the return of autumn they regain, with their young, now grown up, the warmer regions of the south. It is pleasant to observe in this kind of bird, that coming from winter quarters into Norway, at a stated season of the year, they discharge by turns the duties of a captain or leader; for they fly in flocks, the one following the other in order, when he, who was for some time leader or standard bearer, passing his office over to him who is next in order, retires into the rear, and closes the troop. It is still further to be noticed, that on this journey they have certain stations, especially in the narrow angles of the narrow bays, where they put up together at night, and where they remain for many days; and what chiefly raises admiration is, that this bird, which in other respects is accounted an animal so stupid, that the greatest fools, destitute of almost all power judging, are called by way of reproach stupid geese, yet should find his way so accurately through such an immense tract of country, not only to the same region, but even to the same island, where, after the lapse of a year, he had dwelt, and should recognize and claim the nest he had built there. The pilot, who has learned his art by the continued industry of many years, and established it by long practice, scarcely directs his course better to the destined shores, provided with his nautical compass, his hydrographic charts, and other instruments and aids, than do these birds complete their course, aided by instinct alone, to countries hindered by an immense distance, from the cold climates they come out of. One of their number keeps watch while the rest are asleep, which puts the hunter, if he means to kill one of them, on his art and all his circumspection; yet some of them must fall under the rifle barrel guns of the Laplanders. They are caught also with traps covered with turf, instead of a bait. A part also is killed, when they are weak and infirm, on account of their feathers, which fall annually off; at this time they withdraw from the traces and intercourse of men, to places more remote, and therefore more secure.

In eastern Finmark it is said that a certain kind of wild goose is found, different from the rest of his kind, both in the bulk of the body, which is less in these, and in colour. For they are dark on the back, with a white belly, with black spots interspersed between, with a white circle round the eyes, with yellow feet and beak. The flesh of this goose is not of an ungrateful relish, nor do the eggs differ much in goodness from those which tame geese lay.

Ducks are very good in colour and flavour in Finmark; there is seen there a bird of the size of the small duck, of a black colour, inhabiting the salt water, as well as the lakes. The Laplanders call it Skoaarra.

Of the birds which in the Norwegian language are called Aderfugle, an immense number is found through Finmark. So immense, that flocks, even of a thousand of these kinds of birds together, may be seen in some places, chiefly in the bay of Porsanger. That of the male, and which is called in Lapland Likka, has a broad beak, of a green colour; the feathers of the head, breast, and wings, are elegantly diversified with white, black, sky blue, green, and brown. The female is of a dark colour, with a few specks of a different colour. The feathers are of inestimable value, and serve for the stuffing of pillows, instead of wool; this feather being in its nature most excellent and

soft, is esteemed no less by foreigners than natives; it is also known, and very much in vogue, in the courts of princes. This bird lays eggs the size of small goose eggs, of a gray colour, turning to a bluish, the yolks of which, though reddish, are not ill-flavoured. It builds its nest in common among the twigs, sometimes among the sea-weeds that are dry on the shore. So carefully and faithfully does it sit upon its eggs, that at the approach of man it will scarcely desert them; and though it surpasses the crow in size, yet it is not a match for the crow, when plundering the nest and eggs. The flesh of these birds is of a very unsavory taste.

On the shores of Finmark, as on the rest of the Norwegian coast, extending into the sea, is found a bird, which is called in Norwegian Imber, black feathers, with some white, a long and sharp beak, feet turned in, a dismal and terrific voice, by which the vulgar believe that a violent storm of the south wind immediately coming on is portended: it is of a very large size, as weighing eleven pounds, but not of equal goodness and flavour. One may always see this bird, never flying, but swimming on the water, and indeed so deeply sunk, that no part, except the head and neck, appears above it: and as the wings do not correspond to the size of the body, it raises itself with difficulty; whence, at the voice and appearance of man, it secures itself, not by flying, but by diving. You may meet one frequently; seldom or ever see two together. Such is its voracity, that it can devour at once a whole fish of no moderate size.

A bird known through all Norway as far as it extends, called in Norwegian language Loom, in Lapland Gakkor, or Gakatte, is found also in Finmark. It is a little larger than a duck, less than a goose; it has a long and sharp beak, a strange but strong voice; the neck, as well as the rest of the body, is long and graceful; it has not much power in running, but is very strong on the wing: it brings forth its eggs in the little islands and rocks, situated in lakes and on mountains.

The bird which is called in the Norwegian Starv, is called in Latin Corvus Marinus, sea-crow, here, as elsewhere, is seen about the Norwegian coast. It resembles the pigeon, which it surpasses in size, by a long, and sharp beak. The colour of this kind of birds is mostly the same, being black all over the body, with some white spots under the belly, the rest being all black. The nature of sea-crows is this, that they swim by turns in the sea, and take up their rest on the rocks in great numbers, with their wings expanded, that they may be the sooner dried in the sun. When going to fly from the rock where they were, they all precipitate themselves into the sea, with a great noise of the water, to the purpose that when their wings are made wet, they may become fitter for flying. They are incredibly voracious, for they easily swallow down whole fishes, and those of no moderate size, by which the flesh of this bird always tastes of the fish, that is its constant food, and on that account less delicate; for which reason, if it is boiled with peas, remitting a great deal of that bad taste, it is tolerable food. These birds lay their eggs and hatch their young among heaps of stones.

In the sea about Finmark is a bird, called in Norwegian Hav-hest, that is, the sea-horse. It is discerned at a distance from the shore, usually in the open sea; nor does it come to shore but in a cloudy sky, arising in conjunction with a horrid tempest. It is supposed to lay its eggs on the coast of Iceland; in colour and size it resembles a cormorant, except that the colour inclines a little to white, with certain dark feathers interspersed here and there. The beak is divided into certain departments, each department distinguished by a different colour. The voice is shrill, and is brought out with a certain snorting. It smells of the oil got from the fat of fish. It has its wings distended and stiff, when flying. It sleeps in the waters, and is seen sometimes moving through them with an ambling pace, a sign that a storm is shortly coming on; on the

other hand, if the sea is tranquil, it is thought to be a sign of a calm and stillness of the air. Beyond the bay of Drontheim, towards the south, this bird is not seen.

In this part of the northern ocean a certain bird likewise is seen, called in Norwegian Hav-Orre, the marine heath-cock. That which is male equals in size the bird Aeder, just described; on the head it is a grayish colour, green about the eyes, bluish on the beak, distinguished by red, yellow, and black; on the neck white; the feet yellow, but black almost in the parts; but the female is usually of a brownish colour.

A certain kind of bird, of the size of a duck, of a dark colour, is found also in Finmark. They are to be met with in flocks, and are not much afraid of the presence of men who approach them. The Russians are said to bring up at home birds of this kind tame.

The birds the Norwegians call Hav-Aelder are found no less in this tract of country than elsewhere, near the Norwegian shore. The male of these is usually of a red neck, mingled with white, rather long feathers, of a white colour, coming out from the tail. Many of them are seen together, with a constant vociferation, rivaling an articulate voice, redoubling the sound of Kiopangla; hence they are called by the Laplanders Anggalagges, and by the inhabitants of the south of Norway, by way of joke, Angle Magere, that is, hook-smiths, from the vernacular force of the word signifying some such thing. They are said to assemble near lakes, on the mountains, for the purpose of bringing forth their young, and to hatch their young. The flesh of this sort of bird is neither very savory, nor altogether without relish.

The birds which in Norwegian are called Allfer here too are to be seen up and down on the Norwegian coast; as also the Klub-Allfer, which bring forth their young in the clefts of rocks.

This region abounds with great numbers of birds, which the Norwegians call Lunder, and which too are to be met with through Norway. This bird is somewhat less than a duck, has a hooked beak, not much varying from an eagle's, except where it is marked with various specks, different from an eagle's, which is all of one colour. These birds lay their eggs in high and inaccessible rocks, whence they are taken out with long poles. In certain tracts of Norland, dogs are reared and instructed to get into the rocks and bring out the birds themselves. The feathers and down of these birds, above all which Norway produces, are most excellent, and useful in the stuffing of beds and pillows.

In some tracts of this country, such as the island Aeffer Den Sylteviigen, and Sverholts Klub, in the eastern Finmark, in the western, and elsewhere, is a bird, known here and there in different places through Norway, in the common language called Tieste, but in the Lapland Zhiaelkes, a little below the size of a duck, of a chicken voice, black eyes, with a white speck on each wing, the feet being elegantly red. Its eggs are streaked, contain a very full yolk, and red in comparison of that which is found in the eggs of hens; it lays among heaps of stones, or in the clefts of rocks; its nest is negligently prepared on the bare ground, but yet sufficiently adapted for the hatching and nourishing its young. The young in the first year are gray, when, in Lapland, they are called Borgek. This bird, swimming on the water, on the discharge of the gun, plunges itself in the sea, swifter than thought, the instant. Finmark produces cormorants in numbers almost incalculable. Of this kind of bird are various kinds, among which are numbered cormorants of a gray colour, called in Norwegian Sild Maager, that is, cormorants that feed on herrings, the largest of their kind: the greater cormorants, with black wings, yellow feet and beak, in Norwegian called Sortbag, in Lapland Gairo: and the lesser cormorant, of the same colour, in the Lapland called Sobmer; a larger kind, white, with gray eyes, yellow beak and feet, in Norwegian Blaa Maager, in Lapland

called Dalvek. But these lesser cormorants chiefly are to be met with in great numbers, of the same colour with those just mentioned, which are named in Norwegian Saeing, in the Lapland Gaiske, and which surpass all the other species in number, are those lesser cormorants, which, with the exception of black feet, are like the former in colour, called in Norwegian Kroffe, in Lapland Skjerro. Of these whole troops are to be seen in places where they assemble for laying their eggs, and hatching their young. They lay their eggs on high rocks, whence they fly in troops at the approach of man, darkening the whole air as with a thick cloud, and fill all places with their unseasonable clamours. Near the promontory of Sverholt, in eastern Finmark, is seen a high and lofty rock, called in common Sverholts Klub, on the side of which, next to the sea, the Omnipotent Architect of nature has formed in the rock itself certain natural recesses, covered with moss, disposed in a certain beautiful order, and separated from each other by due distances, where the said birds meet every year in flocks, for laying their eggs, and hatching their young. The eggs which are laid in the lower recesses (for of these one is above the other) are easily taken by a spoon fastened on a reed; those which lie above are altogether inaccessible. The eagles usually build their nests in the neighbourhood, the inconvenience and injury of which the young cormorants, to their loss, often feel. The eggs of cormorants that build in the rock are variegated; the yolks, though surpassing in yellowness hens' eggs, yet have a flavour not altogether disagreeable. But it is well to be noticed what qualities, from the colour and names assigned to each species of cormorant, have been mentioned above, should be understood of the adult alone; for the young are all of one ash colour at first, marked with various specks, which colour as long as they keep they are called by the Norwegians Sfaar Unger, but by the Laplanders Skavle; but as soon as they begin to grow white (they begin in the autumn of the year they are hatched) in Lapland they are called Zhjuormalas. The Laplanders, intent on catching cormorants, put down a rope into the sea, to the end of which is fixed a hooked stick; the cormorant, thinking it food, flies to it eagerly, and devouring hook and all, is caught by the wily Laplander, who draws in the rope. By this artifice they take usually great numbers of them, strip their skins off, and expose them for sale.

Certain birds, in Norwegian Taenner, in Lapland called Zhjerrek, are to be met with in Finmark, and these not only common, and to be met with up and down in Norway, but well known by a black head, gray along the back and wings, white under the belly, and a cleft tail; but there are others too, if fame is to be credited, more uncommon, black all over the body, stunning the ears of the passengers by their perpetual clamours and noise. Their early coming to the shores is thought to presage the early coming of salmon, and their entering the rivers.

The bird, called in Norwegian Kive, or Kive Joen, in Lapland called Haskel, is numbered with the rest: it is the same bird that is white under the belly, the rest of the body being dark, a feather rather long coming out from the tail, with sharp talons; in other respects like the lesser cormorants. This bird stays sometimes on shore, and in the marshy grounds, yet adjoining the sea, lays her eggs, and hatches her young. As long as it remains on land, it so shuns the face of man, that it flies waywardly when passing before his eyes. At other times it is seen at sea, where its aversion to him is not so great, where it rather fearlessly flies to the fishermens' boats, gaping at the pieces of cast away liver and other offals of this sort. Flying through the air, it pursues and presses the said cormorants, and also birds called Taenner, mentioned before, until it compels them to discharge themselves, and then, by an amazing agility while flying, receives and devours what it takes.

A little bird besides is found in Finmark, called in Norwegian Smaelle Bot, or Nord Best Fuglen, but by the Laplanders Nuorte Lodde, or Bjeggush. The Norwegian name, Smaelle Bot, it takes from its arrival happening at the season of the year when the inhabitants of Norland, called in Norwegian Smaeller, usually come for the sake of fishing; but it is called Nord vest Fuglen, from the quarter of the world situated towards the north-east, whence it comes by sea to Finmark. This little bird somewhat exceeds in size the tame sparrow; it is white under the belly, dark along the back, marked with various specks, a sharp beak, black colour, rather long feet, of gray colour, in great part cleft; whence it can live as well on land as it can at sea. The fishermen, on the sight of this bird, little doubt of a north-east wind shortly coming on. The Laplanders, in hunting them, use grooved guns, by which they not only usually kill greater birds, such as wild geese, &c. but even small ones, such as these.

Besides the above-mentioned birds, in Finmark are seen the cuckoo, the woodpecker, the black-bird of the field, the swallow, the wagtail, a little bird, called in Norwegian Rendesteens-Snagere, and Ring-Erler, and many others; but the starling, the tame sparrow, and some others, very frequent in other places, are not to be found in Finmark. The magpie, as I mentioned above, is very rare in this country.

CHAP. XIII....OF THE FISHERY.

THE shores of Finmark, all along the coast of Norway, abound in fish. The great number of whales that were taken by the fishermen formerly, as well as the quantity of salmon taken at this day, in that very celebrated river Thana, may be adduced as proof. Of these not a few are exported, by reason of their very exquisite flavour, in comparison of others, so highly esteemed; to say nothing of the great quantity of the various kinds of cod-fish, and of every kind of fish, the seas of Finmark abound in, and for the catching of which the inhabitants of Norland flock to them in the very middle of winter, not without imminent peril of their lives. But the good subjects of this country are not only permitted securely and quietly to enjoy the benefit of fishery and hunting on their annual return, that if a war should break out ever so extensively, between the Danes and neighbouring Swedes, they may pursue in safety, and at their leisure, the usual business of fishing and hunting; but it is further provided, that they should exercise them with that degree of liberty, that each may have full freedom, no one opposing, or presuming to oppose, of going to get wood, of cutting down trees, of stripping bark from birch-trees, for either burning as fire, or building houses (they usually cover the tops of houses with bark) of cutting grass with a bill, of hunting fish, bird or wild beast. For though a certain writer has thought fit to describe Finmark as a country deprived of all the gifts of a kinder nature, and its inhabitants as men more than barbarous, and destitute of all intercourse with other men; and though Saxo himself seems to deplore that vague and unsettled life to which the Laplanders are addicted and exposed; though he writes, among other things, the Finni are the last inhabitants of the north, having embraced a quarter of the world scarcely inhabitable, from either culture or dwelling, an uncertain habitation, and wandering home; yet the Laplanders' fish, venison, and other delicacies, are delightful, which may be sought for in vain in more cultivated parts of the world.

It is not my intention to write on the fishes of the sea about Finmark, tediously to describe the external and internal form of every fish, which by others has been already done. It is sufficient for me, after a description, such as it is, of the external figure of certain fishes, to shew somewhat more fully the method, in part, by which the Laplanders catch them, in part how they are used to manage and turn them to their

use, adding, as the occasion may require, certain circumstances that should be known, and would cast a light over natural history. About the festival of the purification of the Virgin, and therefore about the middle of winter, a great quantity of whales is seen, not only near the shores extending far into the sea, but even in the recesses themselves of the inner bays, which, as if by the express command of Heaven, drive into those places the larger codfish, and other fish in great quantities, where they can be conveniently caught by the fishermen; so that these animals, altogether without the use and guidance of reason, are to be considered as instruments by which the benign goodness of Him administers food to his people, inhabiting a country where they neither sow nor reap. While these whales are driving the fish into the bays and on shoals, they usually set up at the same time a horrid noise, whilst a vapour like smoke rises on each side of them. The inhabitants usually call troops or close bodies of whales of this kind Hval Grin. Experience has shewn it is by no means safe to approach too near a troop of whales driving and hunting the lesser fish, when fishing boats have been not unfrequently overset by their being in the way. Under the canicular heats, when whales meet for the purpose of procreation, it is also equally dangerous to come near them, who take, as it seems, any fishing boat for a mate. To avoid this danger, caster-oil, which is very hateful and intolerable to the whale kind, is thrown into the sea, and, in defect of this, benches, empty tubs, and such things as are at hand and the occasion supplies, with which, while the whale is playing, the fishermen exposed to the danger make good use of the opportunity of getting off. At the time when the whales meet for the purpose of procreating, the spermaceti is found here and there, either floating on the water, or cast upon the shore.

Among the whales which are to be met with in the sea about Finmark the following are the principal: 1st, The whale, which by the natives is called Ror-Hval; 2d, the whale, from the very great size of its body, called Stor-Hval. There are whales of this kind, which drive the fish into the bays and on the shoals. 3dly, The whale, Trold-Hval, a beast of immense bulk, covered with scales. This monster is said to raise a horrid noise from the waters; to him is assigned at the same time a disposition to overturn the boats of the fishermen, wherever he finds them, and the more to be dreaded by the sailors, as he rises seldom from the deep, where he lies hid. 4thly, The whale which is commonly called Nord Kaperen, accustomed to come from the icy mountains at Cape Nord, the last promontory, whence its name also. Whales of this species are incredibly ferocious and untamable, very dreadful and dangerous to fishermen; but they are short in stature, with a thick and short head, whence, in the Norwegian language, they are called Stubben.

There are various figures of whales that present themselves to be found among the writers of natural history, and in a late description of Greenland, engraven on copper so neatly and accurately, that it would be superfluous altogether to repeat them here. As soon as large bodies of whales, as just stated, at a certain season of the year, gather round the promontory of Cape Nord, strangers then frequent for fishing these shores. For pressing the oil from the fat of whales they took up their residence in Kielvigia and the island Sor-Den, in Western Finmark. In process of time the Spaniards also from the province of Biscay made the experiment of fishing in these countries, differing from former fishermen in this respect, that they used to press the oil from the fat, not on the land, but in their ships; whereas the Laplanders formerly, inhabitants of the bay of Porsanger, applied themselves to the taking of whales by instruments of their own invention. It sometimes happens that whales, either mortally wounded by the Greenland fishermen, or killed by marine dogs, are cast on the shores of Finmark. The kings

of Denmark and Norway formerly claimed part of this prize, until Christian the Fifth, of glorious memory, most humanely granted the whole to the people of Finmark, by a royal edict, bearing date the eleventh of August 1688. History suggests to me, writing on whales thrown by accident on the coast, an extraordinary and pretty tale, yet true, which I shall beg leave to relate. Certain fishermen of Finmark fell by chance on a dead whale floating near the shore, which, as they were not able to get to the nearest coast on account of their being few in number, one of the society attempting an unusual and memorable act, descended alone from the boat on the whale, tossed and almost overwhelmed by the waves, whilst his friends ran home to call for further assistance. Meantime this bold fisherman, prodigal of life, was sitting regardless of danger on the floating whale; and, lest he should be shaken off by the constant beating of the waves, into the sea, he scooped a cavity to fix his feet in, with a knife, in the back of the beast, hoisting at the same time an oar, that his returning friends might have a signal by which they should recognize their companion in the open sea. The matter answered expectation; those that departed now returned, and brought safely to the shore their companion with his spoil.

The marine dog, in Norwegian Staalhenning, in Lapland Fakan, is seen also on these shores. It is not very unlike the lesser whale, nine or twelve cubits long; he has a nose ending in a sharp point, tusks in each jaw a finger's length, and a long fin on the back, representing a kind of spear placed on end. Whales have no enemies more destructive to them than these very dogs, by whose savage and saw teeth they are often struck at and killed. For no whale of whatever size or strength ever existed, but must fall shortly a prey to even a few of these dogs; and, though it should make for the shore, to avoid their hostile attacks, yet will these dogs not only follow, but even effect, by repeated blows of the teeth, that it should return and become their prey. A whale, when beset around by the said dogs, is said to set up a horrid savage noise.

A certain kind of fish is also found about Norway and in the sea about Finmark, known under the name of Springere, that is, the leaping fish; they are of a black colour along the back, whitening under the belly, four or five cubits long, and are seen springing up from the sea with a great noise of the waves; from these frequent springs or bounds they have taken their name; nor is it indeed unpleasant to see many of them sporting together in the water. They are commonly to be met with at a distance from the shore in the vast ocean; it sometimes happens, especially in the spring time, that they penetrate into the very recesses of the inner bays, where usually they are taken with casting nets. They differ from other fish in this, that, when shut in by the net, they not only try to escape by getting away, but make towards the shore with all their speed; the consequence is, that they are taken with the greater ease and certainty.*

A certain fish, or rather marine monster, called in Norwegian Brugden, is sometimes seen also in this ocean. It is equal in size to the common whale, has a very dark skin, and a hunch on the back, with which it is said to overturn fishing boats. It presents itself to the view sometimes in a very calm sea, but on the gentlest aspiration of wind regains as quick as possible the bottom of the sea, whence it is plain that even the slightest blast is intolerable to it.

All the seas here and bays are full of the dolphin fish, called in the Norwegian Niser. The manner of this fish, which is to be met with in Denmark as well as Norway, rolling itself on the surface of the sea, is too well known to all to need a mi-

* This seems the Delphinus Delphis of Linnæus, according to Gunner, in his note in this passage.

nute description from me. The dolphin is not unlike the mackerel, certainly not triangular, as it appears, when swimming, to the spectators on first view. Yet it differs from it, as well in the colour as in the size of the body; but the reason of its appearing triangular to the spectators is, that gamboling in the sea, it can turn itself so into folds, one part being under the water and the other above. The Laplanders usually kill them with muskets, where it is to be well observed by the hunter that the bullets should be shot a little before the dolphin rises from the water, otherwise it would from its gambols and turnings easily escape the gun. This fish is frequently met with reposing carelessly on the waters when the sea is calm. The Laplanders, as well as the inhabitants of Norwegian Finmark, are very fond of the flesh and fat of the dolphin.

The large skate (lamia) in Norwegian Haa Skjerding, in Lapland Akkalagges, are not found in any great numbers in this sea. This skate is of an ash-colour along the back, inclining yet to a dark and black; white belly: it is covered with a hard skin, usually has dark round eyes, wide mouth turned downwards, yet it is without bone, in the place of which are cartilages or gristles easy to be dissected. It has a very fat liver, from which is squeezed an abundance of oil, and besides so large that one liver is thought sufficient to fill a whole tun. In some of them are found young; but so great and insatiable is the gullet of this fish, that the larger devour the smaller kind, as it appears from the following narrative. A certain Laplander from the bay of Altan had once taken some skates of different sizes, and had gutted and fastened them by a rope to the stern of the vessel, with a view that, agreeably to the custom of the country, he should prepare from them some pieces, called in Norwegian Rav Rekling; it so happened that, of those he caught and that were floating at the stern, he missed one, but could not account for it; soon after he took one much larger, in whose stomach he found the one he had lately lost. These fish are not only of an immense and insatiable appetite, but even very injurious to fishing nets, and all other piscatory instruments which are used for the taking of the larger flounders, and the various kinds of codfish, and all other fish. They bruise and tear with their rough skin and sharp teeth not less the machines for taking them, than the fish entangled and caught in them. Yet it frequently happens, that these plunderers, the lesser particularly, become themselves, by this means, the booty of the fishermen, entangled in the very nets which they endeavour to tear asunder. The Laplanders catch them by a strong rope of twisted hemp, to the end of which is fastened not only a stone of no small weight, but even an iron chain two cubits long, from which is suspended also an iron hook of extraordinary size, with the bait prepared from the putrid carcasses of dolphins. The fishermen, perceiving the skate has swallowed the hook and bait, suddenly draws in the rope, with his prey that is fast to it, with all his might, which if he did not immediately, the skate would first devour the hook, then the iron chain, soon after the stone, and at length part of the rope also when slackened, and, cutting through the very thick rope with the sharpness of his teeth, having deluded the fisherman, he would make off. But getting him near the boat, they either beat him with a wooden cudgel, or, having a knife at hand, adapted for the purpose, they stab him, or pierce and pull him to death with an iron hook. They then extract the liver, and throw the carcass into the sea or into the boat, and carry it home to be cut up into pieces. In those places where fishing is carried on, the fishermen take care that certain oblong vessels should be let down into the sea, filled with the putrid entrails of salmon or dolphins, and covered with the branches of trees, which, lest they should be washed away by the ebb and flow of the tide and waves, are pressed down with stones. But by reason of these said

vessels being without cover, it is said, that the bait heaped up in them more easily draws the fishes by its scent. This method of taking the skate is also in use in the other parts of Norway. The Laplanders are used to take the same fish with a certain fishing instrument, called Stang-Bad, formed of a long pole, to the end of which are appended thongs, chains, and iron hooks, furnished with bait, and as the mouth of the skate is under the jaw, tney cannot swallow but on their backs, so the fisherman must take care that the hook that is to catch them is to be raised a little above the bottom of the water.

The fish, which in Norwegian is called Haabrand, is also to be met with in this sea. The skate, if you look to the bulk of the body, is less, but in the colour and roughness of the skin it is not much unlike it. It carries on its back certain fins raised up, which the water, while swimming, draws out like a sword. It frequently gnaws through the ropes of the fishermen, yet such is its boldness and greediness, itself frequently is made a prey.

The fish which the Norwegians call Haamer is found here too. It is about three cubits long, while under the belly green, along the back inclining to black, not unlike the fish which in Norwegian is called Springer, in shape and habit of body. The liver with which it abounds is very fat, round in shape; the flesh is tasteless, and altogether useless.

In the sea about Finmark is also found the fish, called in Norwegian Haa. Fish of this sort are generally white under the belly, and have a small horn (after the manner of the Lamia, of which we spoke above) near each fin of the back, which is brought into a point and raised upwards. But this fish is much less than the Lamia, being about one ell in length. The tail as the whole skin is rough, and used for various purposes: the liver fat and abounding with oil; it has spawn in the belly with which the natives make cakes. In the southern parts of the kingdom of Norway the peasants make pottage from the eggs of the Haa, in Norwegian called Haae Dravle, but as the eggs are ill tasted, so are the messes prepared from them. And though this very fish itself tastes ill, yet it can be eat, if it is well dried in the air, or laid up in salt. The manner of catching this fish is the same through all Norway.

There is an abundance of large flounders in the northern seas. The large as well as small of this fish is called in the Norwegian by the common name Ovejte, but in Lapland Baldes. But the Laplanders assign to this fish different names from the difference of its size. The least of all of its kind is called Raejhjek, small, though a little larger than the former, Gad; next in size to this Rad'ke-Guelle, in Norwegian Styving; larger than this Leppadak, and that of a size sufficient to fill up a whole tun or larger vessel they call Oaaivadak. The larger kind bears a very near resemblance, in the smoothness of its skin and fins on each side and all over the body, to the common flounder, but in size, the wider opening of its mouth and in the shape of its tail, is very different from it. The greater flounder is generally of a black colour nearly along the back without specks, and white under the belly; the liver is of no use, but the spawn is the more valuable as the natives usually put it on their bread, and, mixing it with flour, make it into cakes, called Fladbred. They frequently cut the said fish into long pieces, and cut off the fins with a very fat part, calling the one Rav the other Refling or Staarree-Oveite. These pieces are in great esteem, not only through all Norway, but are exported to Denmark, and no doubt to foreign parts, highly valued for their excellent relish. When the Laplander perceives the larger flounder fastened on the hook, he instantly draws in the line, but, finding him violently resisting, he relaxes, which he does by turns, until the fish by yielding and resisting is entirely worn out and weakened,

on which he at once draws in the line and fish upon it, now no longer struggling, and striking it with an iron hook (which the Norwegians call Klaepp) throws it into the boat; this mode of taking flounders is in use through Norway, and made use of particularly in the spring by the Laplanders; but in summer there is another mode, called in Norwegian Cang-Bad, by a line and many hooks placed at due distances from each other. The greater flounders usually keep in the sea, especially where the bottom is covered with a white sand. Near to the island Bug-Den, in Eastern Finmark, flounders are to be met with so differing from the rest of the kind, that not only along the back, but even under the belly and all over they are black, and exceed them far in fatness and taste.

The sea about Finmark produces the lesser species, Flyndrer, excellent in colour and flavour, white under the belly, dark along the back, and interspersed with reddish specks. Flounders of this sort are usually caught with a rope line with many hooks, baited with certain small black worms dug out of the sand, that is covered and extended to the bottom of the sea; or with a plummet line furnished with an iron hook, let down by its own weight on the flounder lying carelessly on the sandy bottom. Besides there are many species of flounders, of whom some are called Culd Flyndrer; others rough skinned, called in Norwegian Sandskraa, in Lapland Guormak.

The speckled cod, or the greater, and its various species, all most excellent in their kind, and a considerable part of the trade of which the commerce of Finmark consists, and by which it flourishes, are found in great abundance in this ocean; certainly no other seas produce better. A certain species come from the open sea into the inner bays in summer, short and round headed, by which they are distinguished from others of their kind, who remain there the whole year, and are leaner. About Christmas, another species of codfish, full of most excellent spawn, approaches the shores; the inhabitants call them Soelhovve-Torsk; there is besides another smaller species, which come from the weedy places they frequent, called in Norwegian Tare-Torsk. These assume, from the place they keep in, one time a dark colour, another time a colour inclining to white. But the Norwegians usually call the cod that is speckled, small, and not full grown, Modd, or Kropping, but the Laplanders Gakran and Rudnok. The time of catching the speckled cod, considering the various situations of Finmark, varies very much. But notwithstanding the said fish come in greater numbers at certain times of the year than others to the shores, yet they never fail altogether. They are caught partly by a rope line and hook, furnished with bait, and let down from the side of the boat to the bottom; partly by a rope line set with many hooks, and extended along the bottom of the sea. Nets, which are very much used elsewhere, particularly by the southern inhabitants of Norway, as instruments of fishing, are not in use among the Laplanders. The larger cod, which are caught in winter, are laid up in certain fish-houses, so constructed with lattice-work, in layers, fresh and raw, so as to be ventilated. Fish frozen by the intenseness of the cold in these houses, which the natives call Skiaae, keep until spring, when the air begins to soften, at which time, lest giving way they should begin to putrify, they are taken out, and are hung to dry in the wind in other houses, called Fiske Cield. Cod, also taken in the spring, when the entrails are taken out, are also hung to dry in the wind in the house called Fiske Cield. Fish of this sort, from the shape they take from being so managed, are usually called Rundfisk or Stokfisk; those taken in summer, unless they are cleft down along the middle, and the entrails and back-bone taken out, by reason of the heat at that time, as also little worms which the flies lay in them, could be by no means preserved from putrefaction. Fish managed so is called Rotskler. But it is to be observed by those unacquainted with these matters, that the

codfish called Stokfisk, if it should harden from cold, becomes spongy, and that if a misty air should lay hold of it while drying, it contracts a certain colour less grateful to the dealers in codfish.

A fish comes also to the shores of Finmark, which the natives call the king of the speckled codfish. It usually has a sort of chubbed head, rising in the shape of a crown, broad forehead, the lower jawbone a little projecting, but resembling the rest of his kind in every other particular. And as the bees have their king, the leader of the whole swarm, so also is this said king of the codfish said to go before them, and point out the way, under the guidance of Providence, tending from the deep to the shores. Hence does it happen very rarely that he is taken but among thick shoals of speckled codfish, which the natives from the number and density call Fiske-Bierg. The fishermen assert, from the worn and battered skin of this fish, that it easily appears that he has been very much vexed and harassed among many. The king of the codfish is dried whole in the air, differently from the rest, the heads of which are usually cut off before they are hung up in the wind. The superstitious common people believe that the fisherman who happens to take the king codfish will be very fortunate from that time, and that he will afterwards enjoy the best and greatest success in fishing.

The long cod are also in Finmark, the best of those are they that are taken near Kiaelvig, and the island Ing-Den. The black cod, commonly called Craasey, the greater as well as the lesser fish very well known through Norway, is very frequent in the sea of Finmark. The larger of this kind of fish is called in Norwegian Seyobs. Besides the common and usual way of catching the black cod elsewhere through Norway, the Laplanders have contrived the following method. Whilst these fish are sporting and rustling in great numbers, as in a troop, in the sea, the wily fisherman stands at the prow of the boat, furnished with a hooked pole, with which he strikes, one after the other, down, and flings them into his smack. It frequently happens, which I myself saw, that a great number fly sporting to the very shore, when the fishermen, who are standing there, not missing the opportunity, and furnished with their hooked poles, kill many, and fling them ashore.

A certain fish, called by the natives Soborting, of a reddish colour under the belly, but silvery through the rest of the body, red flesh, but very delicate, is found too in this sea.

Among other fish of the seas of Finmark is to be found one, known here and there through Norway called, agreeably to the varying dialects of places, one time, Rogn-Kiolse; another time, Rogn-Kiaefse; but in the Lapland, Akkazinzo. This fish is of a dark colour, short and thick in the shape of its body, sharp fins standing out on each side, and exceedingly abundant in spawn. The flesh, the less agreeable to the palate of men, is the more grateful to the other kind, which prefer this fish to all others.

Herrings, and these the most excellent of their kind, are here in immense numbers, which the Laplanders through ignorance neglect catching, unprovided with any means for that purpose. They take just enough, as necessity may require for bait for cod-fish and other fish; for which purpose they usually draw with a boat such as are driven by the birds, or playing carelessly on the tranquil sea.

A certain fish, called by the natives Lodde, is also to be met with, of which there are two kinds, called in Norwegian the one Iern Lodde, the other Sild-Lodde. Those of the kind called Iern Lodde are of a triangular form on the back, green colour, inclining to dark, and under a white belly. These said fishes usually come in immense squadrons to the shores of Finmark, but not annually. On their approaching, they are accompanied by other fish, or they are alone. After some time elapsed, they return to the sandy bottoms

of the sea near the shore, with all the fish they collected round them, to the no small injury of the fishermen. Those called Sild Lodder are less than the others. These as well as the former are seen at the same time in almost incalculable numbers, accompanied not only by great quantities of fish, but even vast crowds of cormorants, and others birds of the sea, filling all places round with their harsh and disagreeable noises and clamours. When they first come, they remain quiet, a little time, in the bottom of the sea, which they chance to find, in order to spawn; of which, the greater cod-fish, as well as other fish being remarkably greedy, swim in crowds to it, and though the said Sild Lodder departs again when it has spawned, yet the other fish stay, kept by the fondness of the spawn. Never is the alertness of the fisherman called more into action, for so great is the supply by this event, that fishing boats, provided fishermen are not wanting on the press of the occasion, can load and unload even seven times the fish that is taken in a short time. There is no better or more desirable bait for catching fish than what is prepared from the Sild Lodder; yet the same is so injurious to the rein-deer and swine, that even the least portion occasions the falling off of the hair, and sometimes even death itself.

On the coasts of Finmark, under the sea weed, is found a certain small and rather long fish, not unlike the conger eel, which the inhabitants of the place, Norwegians, call Tang-sprael, but the Laplanders Stag-gosh, signifying in Lapland a staff or stick.

Besides the above-mentioned fish, there is to be found in Finmark, as elsewhere, near the Norwegian shore, the sturgeon; the ray, in Norwegian Skade; the Redfisk, that is red fish, in Norwegian Uer; Lyr, the lesser cod-fish, in Norwegian Hyse, in Lapland Djukso; the lesser, or white cod-fish Brosmer, and innumerable others. But it is to be observed, that the mackerel, congers, or eels, &c. fishes very well known and very numerous along the Norwegian shores, yet are not to be found in the seas of Finmark; crabs of the rough and testaceous kind, in Lapland Suobbo, and shell-fish are also here; lobsters are found, but no oysters.

The Lapland women on the coast employ themselves, together with their husbands, willingly and faithfully in the fisheries, differing from the peasant women of Norway, to whom these occupations seem too burthensome and tiresome. The mountain Laplanders coming to the coasts, together with their families and herds of rein-deer at a certain period of the year, now and then usually employ themselves in fishing.

And as the above-mentioned kinds of various fish are found in the seas of Finmark, of which each species has been destined to its own proper use by the all-wise Creator, giving some to man for his nourishment, others for their oil; and to serve the purposes of commerce, and the carrying on of trade; some also are turned to bait, with which fish is caught; so also in the same ocean, are to be met various monsters, prodigious in their form and size, wonderful to view, and so furnished, that they seem to give more ample materials for writing, than benefit to mankind. Among those monsters of the deep, which are seen now and then in this part of the Northern Ocean, one in particular, an immense fish, called the Kraken, by the inhabitants of Nordland and Finmark, holds the first rank by right, whose form and magnitude of body is so unusual, that the sea does not produce a similar prodigy. The said fish is very seldom seen above water, as delighting in the depths, where quiet and almost immoveable it is said to hide itself, environed with an incalculable number of every kind of fish. When the fisherman, searching the sea in order to find a fishy bottom, arrives by accident at the place where this monster is skulking in the bottom below, he thinks from the great number of fish he has met there, that he has found a place that is the most fit for fishing; but when the monster that lies hid, touched with the plummet

that is let down, begins to move and gradually get up, which is easily ascertained from the space, that is between the bottom and the boat, becoming gradually less, he finds that it was not a bottom as he believed, but an immense fish that was hid below. Meantime the fisherman is not solicitous about getting away, knowing that this monster is very slow in moving, and advances so slowly, that scarcely within the space of two hours he can rise from the bottom to the surface of the sea. Yet is he not altogether negligent of his situation, finding by the plummet that the monster, gradually emerging, is now at no great distance from the boat. And without delay, the fisherman having just got away, he begins to appear above the water with huge and monstrous claws, of a variety of sizes and shapes, giving the idea of a wood, thick, with different trees, stripped of their bark; at first erect in the air, but soon after complicated. The species of this monster, how horrid it is and deformed, scarcely can those who have seen it express with words. The inhabitants of Finmark and Nordland call this monster Kraken; elsewhere through Norway, especially among those of Carmesund, in the diocese of Christiansand, it is called Brygden, yet from another marine monster of the same name, described by us, it must be carefully distinguished.

The sea of Finmark also generates the snake, or marine serpent, forty paces long, equalling in the size of its head the whale, in form the serpent. This monster has a maned neck, resembling a horse, a back of a gray colour, the belly inclining to white. On the canicular days, when the sea is calm, the marine serpent usually comes up, winding into various spirals, of which some are above, others below the water. The seamen very much dread this monster; nor, while he is coming up, do they easily entrust themselves to the dangers of the deep.

That monster, which the Norwegians commonly call Hav-Mand, and Hav-Frue, many affirm, to whom credit is due, to have been often seen in this ocean. The male, which is called in Norwegian Hav-Manden, is described as a monster resembling a very robust man, of full stature, brown skin, long beard, hair over the shoulders. The female, or Hav-Frue, is said to appear in human shape, long hair, ghastly visage; sometimes they say she is seen under a different likeness. But the inhabitants affirm that these monsters are never accustomed to appear but in a horrid tempest, not only dreadful to seamen, but often fatal, which instantly follows.

And as all seas and bays abound in various kinds of fish, so no lake nor river, however small or ignoble, but in proportion to its capacity, contains fish, either natives of the stream, or brought by rivers from the sea into them, all subservient to the use of man.

Among the fish in the lakes of Finmark is found also the pike, the genus being called in the Lapland, Haug, the species, if a little larger, Golees. It feeds on frogs and toads in common; and devours other fish also, as is well known; nor does it spare its own kind. The perch alone is excepted in the number of those in danger, protected by the benefit of its very sharp fins, with which it is armed. The Laplanders kill the pike in summer, then accustomed to come to the shores, and when basking at its security, to omit other methods, by which this fish is usually taken.

In the lakes of Finmark a certain fish is found, in Norwegian called Lafe, in Lapland Njak; nor unlike the sea-fish Brosmer, described above by us, in shape as well as colour.

In the same place, that kind of fish is to be found in great plenty, called in Lapland Raudo. Fish of this kind are usually red under the belly, dark on the back, and are much recommended by their delicate flavour.

A certain species of fish, of most excellent flavour, called in the Norwegian Blege, is to be found in the same lakes; its skin is very smooth, reddish colour under the belly, the rest of the body white, inclining to a silvery hue.

The perch belong also to the lake fish of Finmark, which the Laplanders call Vuskon; also a certain small fish, white skin, of excellent flavour, called in Norwegian Siik, the fish called by the Laplanders Haerre; as also another furnished with sharp fins, in other respects not unlike the herring; the Laplanders call it Zhjofzhja; to which is also added another, called in Lapland Ruoude-Golmek, small, but furnished with very sharp fins.

Trout, and their various species, all the best of their kind, here are to be met with. The Laplanders usually give them different names, such as Damok, Vaalas, Guuvzhja; and all these the most excellent. I never tasted any equal to them.

In the lakes of Finmark, bordering on Russia, a certain fish is said to be found, not very unlike the carp, either in shape or taste.

In summer the Laplanders fish in the lakes with casting nets, as well as wove nets. Yet in some parts of Lapland it is a custom to fasten various beams at the bottom of lakes, to which rope lines are fixed, furnished with hooks, made from the juniper-tree, on which the bait is put; by which method of fishing they sometimes take a large number of fish.

In the winter, when all places are bound with frost, they catch fish by letting down nets in the ice, and in this manner: they join certain long poles together, connecting the one with the end of the other; nets are fastened to these poles so joined, and a rope fixed at each end of the whole order. Thus prepared, they break the ice with an axe, and opening a way, let down the nets into the lake, to be carried on to another opening formed in the ice from the opposite side, observing this order, that the lower edge of the nets so extended should touch the very bottom, the upper being turned to the ice; and lest the line of nets may be broken by the continual motion of the waters, they take care that each end of the whole chain of them should be fastened with a strong rope to certain stakes erected in the ice, and driven down as far as possible. Fishing nets are commonly done round with a rope from twisted hemp; but the Laplanders, as wanting hemp very much, make use of, in its place, the very thin fibres of trees. In the place of cork, which other fishermen fix to the upper part of their nets, that they should more easily arise, the Laplanders not unusually fix the outward bark of the birchen-tree; with which bark also it is their custom to join little stones to the lower part of the nets, that they may go down to the bottom.

If that part only of the lake adjoining the land is frozen up and covered with ice, the Laplander leans down over the bank to see what fish may be at the bottom, where, should he see any, he rolls down a piece of ice, cut with an axe from the edge of the frozen part, on the fish, with great dexterity, to crush him by the weight of it: this mode of fishing the Laplander can only practice in the shallows of the lakes.

Among the fresh-water fish of Finmark the salmon is by right to be first mentioned. This fish is called by the Laplanders in general Luoos; but the male, Goaaigjem; female Duovve. The salmon with a rough skin is called in Lapland Koms. The Norwegians call the small salmon, in their language, Tart.

The river Thana, flowing through eastern Finmark, is the most distinguished river of those that are abounding in fish, of which there are many. This river takes its rise in the most remote mountains of Lapland, rushing through plains, vallies, and mountains, in a full and free channel, until, increased by various torrents and smaller rivers, it emp-

ties itself into the sea, from the bay of Thana, with a great noise of waters. Among the smaller rivers, by whose course it is increased, that is conspicuous, which flows between Thana and Warunger, formerly abounding in beavers and pearls, as appears from the protocol of a judicial meeting held on the tenth of February of the year 1652, where the special care of this river is specified, as enjoined on the Laplanders. But this river Thana, which you may properly call the principal river of eastern Finmark, though it is distant some miles from the ocean, yet the marks of that great tide, and rapidity with which it flows, especially in spring, when it is swelled with an uncommon thaw, can easily be remarked in the sea at a distance from the shore. The salmon taken in this river differ much from those that come into other rivers, in breadth, shortness, and fatness, and are accounted the very best of their kind. The fishing for them begins in this river in the beginning of spring, and ends again two weeks after the festival of St. John the Baptist.

The river Alten is the most celebrated river of all those that run through the western Finmark. It also has its rise in the remotest mountains of Lapland, running down through woods and mountains in a channel, until getting into the interior recess of the bay of Alten, it rolls itself into the sea. This river carries along its waters so calmly and gently, that from its very mouth, where it empties itself into the sea, to a high and steep rock, over which rolling itself with the great noise of its waters, it makes an immense cataract, it is navigable for a space of six miles for fishing boats and small craft. In this fishy river so large a quantity of most excellent salmon is taken, as would be sufficient for filling a hundred, sometimes two hundred tuns. The salmon which are caught about the festival of St. John, at which time we stated that fishing began in this river, are very fat, and besides of such a size, that a full tun can scarce hold sixteen of them; but those which enter this river when the autumn is approaching are much less than the former, and at the same time lean. Dolphins are sometimes seen in this river, lying in wait for the salmon struggling along the stream. The royal governor of this province, the illustrious Claudius Gagge, is said to be the first who undertook to build weirs on this river, for the catching of salmon. This example was afterwards followed with the greatest success. This happened, it is said, on the eleventh year of the seventeenth century, when the royal house, as it is called, Aar Den, was built on an island of the bay of Alten, on account of the war then carrying on between the Danes and the neighbouring Swedes. There was then, as well as now, an entire free right of fishery on the same river, and free permission granted to each, without any tribute being imposed; but afterwards it was let out on certain conditions, at a yearly return of two hundred thalers; first to the Dutch, then to a society of merchants at Copenhagen; afterwards to certain merchants of Bergen, in Norway, who undertook to erect and preserve weirs on the river at their own expence. Among these the chief were citizens of Bergen, who shut up the river Alten with an expensive and sumptuous work, a number of workmen being hired at a daily stipend, who at a stated time should every year diligently work for fifteen days together. Besides sixteen pounds of fish (valued at fifteen pence of our money) which together with board, and a quantity of brandy, were distributed to each workman as his daily hire, so many pounds of fish being added at the end of each week. Two tons of beer, of Bergen, when the work was finished, were collected for the whole body of the workmen; two quantities of eighteen hundred pounds weight of fish, worth fifty thalers. So great was the expence at which the inhabitants of Bergen stood to the seventy-seventh year of the seventeenth century, at which time laying aside all further expence, they thought it better to purchase salmon from the Laplanders themselves, who dwell by the side of the river. The fishery then

devolving to the Laplanders, who by degrees got the habit of erecting weirs on the river, each claimed that part of the stream which he had from the beginning as his lawful possession, for him and his own for the future, belonging by full right and just title, to the total exclusion of all others from that place. The said fishery is at this day carried on by peculiar regulations, so that it is not permitted to every one to exercise it at will. Thirty-six men are annually chosen, who have the sole right, all others being that year excluded of fishery. The persons chosen are from the common people, Laplanders equally and peasants of the Finnish nation, dwellers on the river. These on each bank of the river throw up mounds, from beams and boughs of trees, fit for the keeping in and taking salmon. These mounds are at due distances from each other; four men, neither more nor less, being appointed to fish within the limits of the said mound. They run out as far as about the middle of the river, to the purpose that the salmon should have full liberty of passing and re-passing the stream; and that those whose mounds are farther off from the mouth of the river should not be defrauded of their just benefit; for if the river was laid over with mounds as with bridges, those only whose mounds were built on the lower part of the stream doubtlessly would enjoy the whole benefit, to the total exclusion of their associates from all hope of gain. The mounds raised and disposed in this manner are at length shut up by a dam, passing from the further to the hither side of the bank, within which whatever salmon is taken is common to the whole society of fishermen. When, on the change of the year towards autumn, all opportunity of fishing has passed by, the fishermen to a man approach the said cataract against the stream, where the salmon that have escaped the lower mounds have penetrated, but who, on account of the cataract being in their way, cannot get further. Here they let down their nets in the river, and drag them slowly all over the bottom of it, as it were by sweeping, to the mouth, where, loaden with a great quantity of salmon, they draw them on shore, to the great amusement of those who are pleased with this kind of fishing. The salmon which are taken in each river, the Thana and Alten, are managed usually in the following manner: when cut through the middle into two equal parts, well washed, they lie sprinkled with a sufficient quantity of salt for some days, afterward they are packed up in oak casks, of a large size, rammed down closely and firmly with certain machines; brine is poured in through an orifice on the cask thus stuffed, fresh and fresh every day, until all the mustiness that floats above is removed entirely, which is the duty enjoined chiefly on the cask-maker. Salt of the very best quality must be used in the salting and preserving salmon, which, unless attended to, foreigners, who usually purchase the greatest part from them, will not buy of them. The kings of Denmark and Norway have given the greatest attention to the promoting of the fishery of Finmark. Christian the Fourth, of most glorious memory, by a royal decree, signed May fourth, 1638, ordered money to be sent into Finmark to promote the fishery. Christian the Fifth, by a decree, April sixteenth, 1687, most humanely decreed, that no one should purchase salmon from the fishermen but in specie. At the close of autumn, when the salmon becomes lean, and is no more saleable to merchants, the maritime Laplanders are accustomed to row out a little from the shore into the deep, to take the salmon who at this time of the year remain immoveable at the bottom of the sea, with an iron-headed spear, called in Lapland Harses. The fishermen employed in this business, lest they should be obstructed by the darkness of the night, keep a light in the prow of the vessel, from pieces of fir-tree and the bark of the birch-tree, which they call Baral. The Laplanders keep the salmon taken in this manner as food for themselves, and lay it up in chests that are arched, and of a larger size, which, if they stand on legs, are called in Lapland Njal, but if not, Buorna.

The Swedes formerly contended that they had a claim to a certain part of the often mentioned rivers the Alten and Thana; for as they imposed a tribute on the maritime Laplanders, as far as the peace of Knorod, in the year 1613, solemnly made between each kingdom, by which it was stipulated, that all kind of tribute and demand on the part of the crown of Sweden should cease in future; so they further demanded that two thirds of every fishery were equally their right, as plainly appears from letters of king Charles of Sweden to the royal treasurer of Finmark, dated October thirtieth, 1596. Meantime the Swedes, by the force of this pretension on the said fisheries, sent often fishermen into Finmark, who, obstructed by the inhabitants, were compelled, without effecting any thing, to return: hence the matter broke out into public complaints. The commissaries of the crown of Sweden remonstrated much on this business; and the governor of Swedish Lapland, the illustrious Balthasar Bech, in the month of November 1607, received not only an order from his sovereign that he should inquire, from the governor of Finmark residing at Wardhuis, the cause, as also true information of the refusal which the fishermen who were sent out from Sweden to Finmark had so improperly met with; but he himself went into Varanger, with labourers and fishermen necessary for the management and dispatch of this business, that he brought with him: he had also a treasurer with him, who was to collect the tribute, and who was to reside in Vasoe, for the purpose of collecting the revenue from the Laplanders of Finmark; and also a priest, who was to reside there and manage the holy affairs of that place, to whom, in consideration of his labour, two thirds of the salary which annually was paid hitherto to the Danish clergyman should be paid to him in future; and all other dues of the district which the treasurer of the province, Bartholomew Henricson, had remitted to the governor of the king, Olaus Peterson, by letters dated February twenty-third, 1608. At the same time, the said-mentioned Balthasar Bech informs the governor of Finmark by letters, grievously complaining of the injury that was committed, as it seemed to him, that when the Swedish labourers were going to erect weirs on the rivers, they were violently hindered by the inhabitants. To this was added a serious remonstrance, exacting that a free right of fishery should be granted, without any tergiversation, to the fishermen daily sent from Sweden into Finmark. On these remonstrances being made by the crown of Sweden, and transmitted most humbly by the governor of the province to the Danish court, a decree of Christian the Fourth, dated December twentieth, 1609, was published, in which it is strictly declared that all Swedes, as many as were to be found in Finmark, must readily depart from the country; that the crown of Sweden had no right over the fisheries, or the other prerogatives and rights of the kings of Denmark and Norway, by any claim whatever; that no Swedish maritime Laplander had a right to fish in the seas of Finmark without permission from the governor, and even then, not unless he would pay a yearly tribute for said licence to the king of Denmark and Norway, as the rightful master of the sea. The Swedes did not even then desist; the said Balthasar Bech sent again other workmen and fishermen, by an order, bearing date April fourteenth, 1609, into Finmark, to follow up the work so strenuously and actively begun, and to build a place of worship on the bay of Alten. But this attempt too of the Swedes was disappointed, the new workmen being hindered, as one may suppose, by the governor of the province, who stript them of their axes, their other tools and working instruments, with which they came to work, as appears by the acts of the judicial assembly, dated May ninth, held in the same year. After a variety of skirmishing, this whole contention was at length adjusted, and terminated by the peace of Knorodske, by which the Swedes renounced all claims upon Finmark. Besides the said named river of Thana, there are also others in the eastern Finmark, distinguished for the abundance and fishery of

salmon; such as above others the river Neida, running by the western side of the bay of Varangria. Its spring is to be looked for in the mountains of Russia, but its mouth in the bay of Kiofiorden, where the island of Kio is situated, in which the Laplanders who dwell on the river Neida usually take up their stations when fishing in the sea, while the time that is fit for taking salmon is approaching. Each bank of this river is shaded with birch-trees, luxuriant with branches. In the upper part is a cataract, nigh which the Laplanders approaching take salmon with a net, and a little higher, in weirs. To keep these weirs in repair, they must not only cross the water, but also go under it as divers. Ten salmon formerly cost one thaler; what they sell for to-day I cannot say.

On the eastern side of the same bay is a river, commonly called Jacobs-Elven, that is, Jacob's river. It is the same which flows from the very celebrated lake Indiager, and contains no small quantity of salmon. The monks, to whom the fishery formerly belonged, took care the salmon should be transported to Cola, a town in Russia, and sold to the Dutch trading there. There are more rivers that flow on the same side of the said bay, not without note for their salmon fishery.

On the other side of the bay of Varanger a variety of rivers flow, which the salmon enter at a stated season of the year, such as, 1. Jacobs Elven, that is, the river of Jacob, near the promontory Finne Naes, which is said to run along the valley, delightful and shaded with an abundance of herbage and branching trees, and to contain a great quantity of salmon. The governors of Finmark formerly shut up this river with weirs, having brought builders fit for this work from Malmis, a city of Russia. 2. Komag Elven, that is, the river Komag, which is said to be at the distance of one mile from Kivergia. 3. Sylteviig-Elven, large and very fishy; also Kongsfiord-Elven, Bersfiord-Elven, Bosfiord-Elven, Sandfiords-Elven, and Langfiord-Elven, all of which, though with some difference, are said to contain salmon. On the same side of Porsanger bay are rivers abounding with a great quantity of trout, as the Bester Botnens Elv, which salmon also visit, but usually small; Biergebne Elven, Thomas Elven, Jabus Elven, Kalnaes Elven, and others, abounding in trout, gilt heads, and other small fish, which the Laplanders call Vaejek. They catch fish of this sort living in streams, in a small loop of slender twisted osier. Besides the river Alten, the principal of western Finmark, other lesser ones are found in the bay of Alten; such as Borse-Jok, Furnaes-Jok, Dakko-Jok, Dalme-Jok, Gaidish-Jok, Gavouna-Jok, Halse-Jok, Rain-Jok, Skirve-Jok, and Falle-Jok; the last six of these rivers contain trout and salmon, but they are small and few. On the first of the said rivers, called Borse-Jok, are two mills built, the one for sawing, the other for grinding corn; on the second also is one, and on the last there are two. But it is to be observed, that the use of mills is new in this part of Finmark; certainly it was altogether unknown a few years back. Wood was cleft in Finmark into pieces or beams formerly, not by sawing mills, but by hatchets only, by which mode of cutting only two pieces or beams were made from any piece of timber, however large and strong, when, by the aid of the saw, even six may be made from the same piece of timber. Almost all corn provision ground into flour was formerly imported by the inhabitants, and is partly obtained so even to this day, yet in such a manner, that no small portion of corn to be ground on the above mills is yearly at the same time brought in. In the bay of western Finmark, commonly called Repper-Fiorden, is a river remarkable for salmon; and another in the bay of Porsanger flowing from the very celebrated lake Leuneje-Jauvre, of which we shall speak hereafter. In this river many salmon are taken, yet more could be taken, if greater care and dexterity were applied.

The knowledge, such as it is, of fish, and the method of catching and managing them, being communicated to the reader, I wish to add something of the manner in which the tythes from the fisheries are collected in Finmark. That tythes were in practice from the earliest times among the Norwegians, I am of opinion, is a thing well known. It appears from the records of the remotest times, that the great Lagebetter, king of Norway, had levied tythes on his subjects from corn and other produce of the country, from the year of Christ 1268; that king Christopher, by a decree published in the year of Christ 1448, had ordained, that tythes should be divided into three equal parts between the church, the bishop, and the pastor of the parish; that king Frederic the First had ordained and had disposed of tythes by various decrees, is well known. And as to what belongs to Finmark, it is to be observed, that tything was introduced there later than elsewhere through Norway; yet in progress of time they were ordained, given, and accepted, until by royal authority and care they were brought into that order, that no where through all Norway were they more justly and equally paid. The payment of tythes from the fisheries, in what manner they were first instituted, and then brought into exact order, may easily be seen from the following decrees.

Since it has been known that certain factors trading through Finmark and Norland exchanged fish, which the peasants had exposed for sale, for injurious and useless wares, such as brandy, bastar, rommenau, and, before a decimation was made, had transferred fraudulently to themselves the advantages, king Frederic the Second, by an edict, published at Esserom, bearing date the seventeenth of April 1562, has forbid such fraud for the future.

Certain Laplanders of the mountains, of the Russian and Swedish territories, having had the boldness to fish in the sea of Finmark, without having either asked or obtained permission, king Christian the Fourth, of glorious memory, has forbid the same, by a decree published at Scanderburg in Jutland, that it should not be lawful for the said Laplanders to fish on the shores of Finmark by any other condition than that obtained with respect from the royal governor, and paying tythes from the quantity of fish that may be taken.

Charles king of Sweden, at the time when he exacted tribute from the maritime Laplanders of Finmark, granted permission of fishing in the sea of Finmark to the citizens of Gottenburg, on the condition of duly paying the tenths from the quantity taken.

The Swedes being compelled to yield, by the peace of Knorodske, 1613, all pretensions on the maritime Laplanders of Finmark, the governor was commanded to exact tythes, by a decree of Christian the Fourth, dated the tenth of June of the next year, from the maritime inhabitants of the district, Laplanders as well as Norwegians, over which he presided, exercising the right of fishery in the sea.

The inhabitants of Finmark petitioning the king, on the iniquity of the governor, on the exaction of tenths, selecting none but the best and largest fish, and rejecting the small, his royal majesty by a rescript to his governor, dated twenty-second April 1617, declares of his goodness, that it is his royal pleasure, that Laplanders as well as Norwegians should contribute for the future, from the first hundred of fishes taken, eight, from the second hundred, nine, without any regard whatever to their size.

Though, from the tenor of the royal decree at Esserom, in the year 1562, tythes were to be paid from fish fresh taken, as well as those that were cured in the wind; yet there were persons who were daring enough to resist the law. Hence it was appointed, that a royal governor, a lawyer, a treasurer, and a secretary or inferior judge, should solemnly meet in 1620, in Skiotnins-bierg, to determine by law, that the portion of tythes due to the king in fish, at the time of the year when they are liable to be spoiled by insects, should be salted; and to make an order, that no one from that time

should buy or sell fish before they had duly paid the tythe, enjoining a fine of eight ortungi (the ortungus is a kind of money) and thirteen marks of silver to those who should do otherwise.

In the year 1646, the twenty-fourth of April, an edict of Christian the Fourth was published, by which those who exercised the trade of fishing in larger boats, commonly called Dogger Skuder or Dogger Baader, on the shores of Finmark, were ordered to pay the tenth part of the fish taken to the king, on the treasurer's returning the price of the salt, that was expended on the fish so tythed, to the fishermen. When the same edict came out on the seventeenth of July of the same year, those were exempted from the obligation of the tythe, who exercise the business in smaller boats, or for the sake of domestic support alone.

The people, as usual, requiring a certain return or bounty out of the tythes they paid, commonly called Tiende Kande, and the petition being judged and rejected by the governor of the district, the king, by an edict, dated the eighth of February, 1639, most humanely transmitted the complaints and requests of the people to the lawful decision of the juridical assembly. All matters then appertaining to this question, duly and agreeably to law being considered and discussed, a sentence was passed in the public assembly held in 1650, by the judge; by which a certain measure of beer was adjudged for every hundred weight of tythed fish. In the juridical assembly held in 1653, in Wardoe, it was determined by the judge, that of a hundred and twenty fish ten should be paid as tythe; of which, in the place of the said Tiende Kande, that is, a decimal measure, three pounds were to be returned to the person who paid the tythes.

With respect of persons receiving tythes, and also of the time and place when and where they were to be paid, it was determined in the juridical assembly, in the year 1661, that tythes, which hitherto were paid at no stated times, and only in small portions, as the parties willed, should henceforth be paid at a stated time yearly, namely, at the time of king Canute the Martyr, and on the festival of All Saints, and also should be collected in greater sums.

But as with respect to tythes, other greater difficulties might yet arise, and really had arisen, a new decree from royal authority was published in 1685, on this business, containing many regulations, in which tything, with respect as well of persons as of places and things, was most justly arranged and decided on; but it was specially determined, that when tythes were to be paid, lest any fraud should be committed on the part of the person who paid, the pastor of the place, certain men in office, as also some selected and sworn from the people themselves, should be present.

Christian the Fifth, of glorious memory, at length put an end to this whole business by a decree of April second, 1687, in which it was constituted and commanded that from every hundred of fish, ten should be contributed, the decimal measure (Tiende Kande) above-mentioned being laid aside. Besides, that the decimation should be made in the very place where the fishes are put on board, for the purpose of dividing them into three equal parts, between the king, the church, and the clergyman. For which business it was expressly given in command to the governor of the district by his sacred majesty, on the ninth of April of the same year, that an exact account should be taken of the fish put on board, as also the tons of oil, called by the natives Tran, according to weight and measure, and that he should exact from every seaman an account of the same, that when an estimate was made of the tenths, a certain rule of tything might be made. Tythes having passed through various regulations and modifications were at last, by several decrees, brought to a fixed and settled rule.

CHAP. XIV.....OF THE WORKMANSHIP OF THE LAPLANDERS.

IT belongs to the women in Lapland to dress skins of various animals, such as foxes, young rein-deer, otters, and other skins, scraping off a membrane that goes round skins of this kind, with a certain iron instrument, which they call Jekko, they thoroughly oil the skin, with oil from the liver of fish, and by means of a certain iron, which is sharp and not unlike a sickle, and fastened to the wall of the habitation, they cut it by moving it up and down. An instrument of this kind is called in Lapland Spierko. The fibres cut out of the feet of the rein-deer they bake, and when done they beat and pound it into various small pieces, until they attain the softness of wool, and when done by rubbing them with the palm of the hand to the cheek, twist them into very small threads. They curiously embellish the belts and head-pieces, with which they usually adorn their rein-deer of carriage, purses and the borders of garments with filaments of tin. The manner they use in the making of elegant works of this sort is curious and much used by the Laplanders in common; though there are not wanting among them women to know and carry this art to greater perfection.

They are acquainted with the art of dying cloth of a yellow and saffron colour, by means of certain herbs, called Idne and Livdnjo. From various party-coloured threads they make knots, whence thongs are afterwards made with an instrument adapted to this purpose from the rein-deer's horn, called in Lapland Njijkom. On this see more in chapter the fourth, on the garments of the Laplanders.

From the unshorn but cleaned skins of sheep they make coverlets, some of which are in the shape of a sack, in which the feet of the person who reposes can be put; others are differently formed. On these see chapter the sixth, on the beds and couches of the Laplanders. The said coverlets when laid on a bed are turned with the hairy side to the body of the person who uses them.

They weave also sheeting, which is so worked, that after it has been in use a little time in covering them, when the bed becomes worn, it is converted to the use of covering for the winter's hut. A great number of these is wove from thick white thread, with dark fringes of black or ash-colour. The loom in which are woven the said sheets is made from out of two thick beams raised an end, on the extremity of which is fixed a loose weaver's beam, extended from the one column to the other: to this they fasten the upper end of the thread, which comes down from the weaving beam straight to the ground; and as the thread is neither thrown with a shuttle, nor pressed together, but worked with the hand whilst it is knocked together with a little beetle on coming back, the other part of the thread is brought together by the flat part of the hand, so that a space should be open for putting in the hand, through the litttle fork, which is sustained from the ends of the two little arms that project out from the columns. Hence it falls first obliquely before it gets directly down. To the lower extremity of the woof are fastened stones, lest, loosened, it may entangle the body of the thread, but by being kept stiff and extended by its weight, it should preserve the whole together. The woof is thus conveyed, and in the above manner, first to the upper part of the beam, and is woven with the hand, whence it is clear that in making sheeting or covering one must begin from the upper end. As weavers cover round, in a weaving machine, the beam at the end gradually with linen, by turning it round, so also the beam of the aforesaid weaving machine is gradually covered over, while turning, with the stuff that is made. They weave gloves from the wool of sheep, mixed with that of hares. This is the manufacture of the women alone.

The men are acquainted with the manufacture of cups, plates, of various kinds for various uses, some of which contain a quarter of a ton, serving for the purpose of keeping the milk of the rein-deer, from the wood of birch-knots, not unlike to the maple-tree. From the plates of horn which project from the end of the horns of the rein-deer they form spoons, from their own fancy, yet artificial enough. The aforesaid plates, some more, some less, contain a certain marrow of an ash-colour, those that contain the least are the smoother, more beautiful, and fitter for use. On utensils of this kind may be seen, variety of forms, representations of flowers of a dark colour, interspersed, made with charcoal, enchased and inlaid. Those which are, in comparison of others, a little more elegantly formed, and figured, are sometimes sent into cities to goldsmiths, that silver spoons may be made to their form.

They have acquired the art of fabricating the handles of knives, artificially adorned with tin, as also the heads of sticks from the thicker part of the rein-deer's horn. They form oval cases with great attention to neatness. Little flaggons are made from the small roots of trees, or from those called Taeger, which they close together in a singular manner. The shape of a big bellied vessel was usually added to a round flaggon with a short neck, and served for keeping salt. They are skilled sufficiently in the construction of sledges of various use and form, and distinguished by various names, as Giet-Kierres, Raido-Kierres, Lok-Kierres, Pulke. On sledges, see chapter the tenth, on the machines of conveyance among the Laplanders. They get glue from the skins of fish, by boiling especially that part which covers the head; they get it also from the horns of the rein-deer, far more excellent than the former; the skin lies boiling for a long time in hot water, from which, when taken out, whatever remains thickened at the bottom is made into glue.

They do not use tongs when for ging iron, but in the place of them a certain wooden instrument called in Lapland Aasser. The Laplanders as well as the Norwegians, inhabitants of Finmark, called by our countrymen, Nordmoend, buy Nordland boats, yet some of the Laplanders themselves make them as well for their own use, as for the use of others. These belong to the marine affairs.

CHAP. XV....ON THE VARIOUS MANNERS OF THE LAPLANDERS.

THE Laplanders, from the time of Saxo, who flourished about the year 1190, and therefore not as yet known by this name, for six whole ages, called before that time Skrit Fins, use various manners peculiar to themselves.

It is a custom received among the eastern nations, to present each other with gifts, especially superiors. The same obtains among the Laplanders. For coming into the presence of the magistrate, the clergyman, or consul, they each bring something with them, a cheese, a hare, a ptarmigan, salt or fresh water fish, a killed lamb, venison of rein deer, the tongue of the same, a round lump of butter, a quantity of down feathers, and other presents of such nature. Neither is the gift received, without a due return; for they are presented with a piece of tobacco, a glass of water and honey, a pot of beer, a little pepper and ginger, and other little things at hand, and which we find to be very acceptable to them. The same custom is to be found among the Russians, for on their arrival in any place, they distinguish him, who is in any degree of dignity, and whom they hold in honour, by a present, which usually consists in brown bread made in a cake, which is brought on a wooden trencher, coloured red, in certain wooden spoons, coloured with a resinous matter from the juniper tree, or gilt ornaments, sometimes in hens' eggs, salt salmon, linen, and such like things.

That they should distinguish the seasons, and festivals, and other periods of time, the Laplanders formerly made use of certain wooden calendars commonly called Priimstave.

The husband frequently discharges the duty of the midwife.

The Laplanders very often take the clergyman of the place, the missionary, the public instructor, and church-warden, as witnesses of the baptism of their infants.

As often as the occasion demands that the whole family, who inhabit the cot, should go out, either to look after the rein-deer that is lost, or to attend to any other business, they tie the children, who by reason of their tender age cannot follow, for their better security, in the cot, lest they should fall into some mischief or the fire when left to themselves. When going over the mountains I usually carried with me, among other baggage, a trunk made fast and secured, to which they often tied the children, lest they should too freely run up and down.

There is no use made of stools among this people; for the Laplander sits on the ground with his feet across under his seat. Should he happen to visit other inhabitants of Norway, in whose habitations there is either a stool or benches, he refuses to use one when offered to him, thinking he can sit more commodiously on the bare ground.

The Laplanders, saluting each other, rush into each others arms in mutual salutation, repeating Buurist, that is, God save you, by this form the little Laplanders saluted me also, taking me for a native, on account of the language and habit of Lapland, which during my residence among them I always used.

The Lapland women shave their heads even to baldness. They kill the vermin that infest the head with a knife.

Should the foot or arm be in extreme pain, they bind that part of the limb where the force of the pain principally is felt, with two ligaments, as tight as they can, and apply to it a burning hot coal, under a persuasion that the pain, as if getting an opportunity from the bursting and opening of the flesh by the force of fire, would break out and go away.

In the whole tract of western Finmark, for I resided there for a whole ten years, two horses were only to be found, one of which belonged to Peter And, the provincial judge; the other was the property of Christian And, prefect of merchandise in the parish of Alten. Hence the peasants of the Norwegian nation, who inhabit this tract, as also the maritime Laplanders, are compelled of themselves to discharge the labour of horses, by carrying hay on their backs in summer, in winter in little carts, and such things, as elsewhere are carried by horses. The condition of the mountain Laplanders is, on this account, the more desirable as abounding in rein-deer, and who make use of their assistance for their own purposes, and for the carrying of burthens. And on account of the great scarcity of horses, all over the part of this country, most of the inhabitants look with astonishment at this animal, as they do at any thing foreign and very strange. One Matthias Peterson furnishes an instance of this: he was a mountain Laplander from Porsanger Bay, who, as he told me himself, came to And, the judge of the place, for the purpose of adjusting some business; in his house he used to sleep, when happening one night to come out from his bed-room, he unexpectedly saw a horse standing at the door, at the sight of which he was as terrified, as if he had seen a huge spectre: he hastily returned to his chamber, where he shut himself close up, after well securing the door.

And as it is well known, in this tract of country there is neither sowing, nor harvest, so does it necessarily follow, the inhabitants want no manure. Hence the dung that is gathered from cows, sheep, goats, as being in itself a thing of no value, they usually on the approach of summer are wont to burn. But certain rustics of Finland, who live on

the river Alten, accustomed to agriculture at home, cultivate a few acres of ground, whence they have, on some years, no despicable crop.

It is the custom of certain Laplanders, whose condition is superior to the rest, to bury their wealth, especially money, so cautiously in the ground, that their heirs should not have the least hope of enjoying it. That these people should do so I am not surprised, if having no lockers, no inclosures to secure it, and where in safety, and without the fear of thieves, they could lay up what treasures they have; but for the maritime Laplander, who has but his hut, and the mountain Laplander but his cot, which he puts up and takes down according to the season, I confess that the reason altogether escapes me, why at the hour of death he does not choose to tell where he has hidden his riches, that the heirs should convert them to their use after the death of their parents. It has been related that a certain very rich Laplander, of the name of Henry Jonson, living in Ozejok, being asked the reason, when near his death, why he so studiously concealed his riches, that his survivors should have no hope of finding them? his answer was, that unless he did so, that he would stand in need of the necessary means of supporting himself after death.

They suspend dogs for the purpose of killing them from a tree, and when strangled, take their skins, from which, if they are black, they make borders and fillets, to be sewn on garments and gloves.

It is a custom with the Lapland peasants of the Finland people, some of whom dwell on the river Alten, to wash themselves often with warm water, and to sprinkle themselves with water tinged with the boughs of trees.

And this is enough for the present on the manners of the nation. To those who wish to know more on this subject, I refer them to the various chapters of this book, where these things are expressly treated of.

CHAP. XVI....OF THE MARRIAGES OF THE LAPLANDERS.

IT very seldom happens that a young man of the Norwegian provinces marries a Lapland young woman, and a young Laplander a Norwegian young woman: in the district I have been missionary in, this never happened while I was engaged in the holy office.

The Laplander, when going to pay his addresses to the girl, takes certain of his relatives united in the next degree to him, one of whom is to be his advocate with the lady for him: the lover provides for himself brandy, to drink to the health of his future spouse, and her parents and friends; besides, he brings a small present for the lady herself, which is a silver belt, a ring, or other things of this kind, as his ability can furnish. When they come to the house in which the lady lives, all come in except the lover, who stays out until invited in. When all are within, the advocate of the young man offers a cup of spirits to the father, which if he refuses, it is a sign that he rejects the terms; but if he accepts it and drinks, that the nuptial condition is not displeasing to him. Then the above-named advocate drinks to the health not only of the father and mother, but of the future spouse, and her friends who are present; which drinking bout goes on step by step, with a request of courtship. This prelude being closed, he approaches the business a little nearer, and courts her under the shape of a lover concealing it yet from the eyes of the world; he now draws out his long formal phrases, especially those of the finest quality. Some time after the lover himself is introduced, and placed in a space which is inside the door, between the two birchen stocks that lie on the floor, and of which we made mention in chapter the fifth. If he obtains the consent of the girl, and of her parents and friends, he gives the present which

he has brought, called Gilhe, to her, and promises new clothes to her parents as a present, which the Laplanders call Biejatas. When this business is completed, the lover, bidding good-bye, departs with his friends. All these ceremonies in the business of courtship, as described, are in use, though not always everywhere, and by all, especially at this day, with the exception of o.. n two sometimes. If the parents have betrothed their daughter to a lover, but afterwards broke their faith, they must make good the expences contracted on the nuptials as far as they proceeded, according to a regulation among the Laplanders; so that not only he should receive the fortune and odd-money, but the expence also made in brandy should be restored to him. During the espousals between two who have pledged their mutual faith to each other, yet going on, the bride visits sometimes the bridegroom: on a journey undertaken for the purpose of meeting her, he delights himself by singing her praises; to this purpose he throws out such expressions as present themselves unpremeditated to his thoughts, and such as his poetic vein may furnish to him. But this custom, that of a lover visiting his mistress, and celebrating her in song, is not observed at this day by all. When they have met at the appointed place, and come into her presence, he presents her with brandy, and a little tobacco, if agreeable to her: she is clothed in that neat nuptial garment, usually for ornament, which is in use among the Lapland women on festival days, with this only exception, that whilst women, married as well as unmarried, at other times almost go with their head covered, she only wears bare curls of hair, which are bound up with party-coloured fillets; yet, if my memory does not deceive me, in certain parts of Finmark a girl on the nuptial days wears fillets, between which and the common fillets that bind the hair of the Lapland women there is no difference. When the nuptial ceremony is finished, the wedding-day is celebrated with frugality; the nuptial guests of better fortunes honour the fair bride with some present, some with money, others with rein-deer skins, and such like things. The nuptials are thus celebrated, without any pomp or ostentation.

Among the people of Alten, among whom I discharged the duties of public instructor, they were celebrated in the following manner: when the union was completed, the bridegroom with his spouse, and a few of his relations, withdrew to the solicitor of Talvig, whose house was adjoining to the church, where (he is called in Norwegian Bonde Lehnsmand) also is held a yearly meeting of the juridical assembly by the governor. Hither the guests being invited, were received at a nuptial feast prepared at the expence of the husband. The dishes that were prepared were few and simple, namely, roast mutton, with a small portion of water and honey, which when taken, the new married pair and the guests retired to their own houses. I myself, by invitation, was present at a nuptial entertainment given by one of these Laplanders, celebrating the nuptials of his son, where there were no delicacies, nor any thing laid but the above-named dishes. The sordid guests, accustomed to no luxuries, were so satisfied with the bare pottage put before them, that without doubt they would have forgot the roast meat, had not the father of the bride, noticing this, called out loudly, 'Roast meat, roast meat! put it before us,' and this placed before them, he himself carved, yet in such a manner, as openly to discover his ignorance in the art of carving.

The nuptial preparations which are in the parish of Kielvig, at the bay of Porsanger, in western Finmark, are yet more simple and frugal. After the usual union, the married pair, with a few of their friends, withdraw to certain small huts scattered in the field, at no great distance from the church of Kistrand, to eat a sheep which is brought for this purpose. When this is eat the company breaks up, and the married pair and their friends return straight home.

From the nuptials and banquets of the Laplanders every kind of entertainment, the dance, and sports of such a kind, incitements to ill, unknown to these people, are banished: and hence neither morrice-dancers, pipers, nor even an instrument of music, is to be found among them.

And as they are altogether unacquainted with instrumental music, so are they equally ignorant of vocal, and not only ignorant, but invincibly so: for during the intervals that I had leisure I tried their docility, which after various experiments I found so great, and to speak as really is, none at all, that they were incapable of learning the very rudiments of the measures of the psalms, or of adapting them to any harmony. The cause of this evil is not in the Laplanders themselves, but is inherent in the very character and genius of their language; for the Laplanders bring out most words, and each syllable of the word, and the pauses, with the acute accent; and hence, it happens that either speaking or singing in Norwegian, they encumber all the words and syllables of their speech with one and the same accent, and thereby utter a hissing and altogether confused sound. And this is the reason that the modulation of the Laplanders is more like to an indigested kind of clamour or howling, than to any thing like singing.

When the nuptial festival is over, the bridegroom often stays with his father-in-law for the space of a whole year, which when ended, he is dismissed with his wife, to find a habitation. Before his departure, if circumstances admit of it, he presents him with rein-deer, with kettles, with pots, furniture for beds, and other domestic utensils.

CHAP. XVII....ON THE HOLIDAYS AND AMUSEMENTS OF THE LAPLANDERS, AND VARIOUS STORIES, PARTLY ENTERTAINING, YET TRUE.

THAT festival-holidays, as they are called, are usually instituted and kept during the Nativity of the Saviour, the Laplanders are altogether ignorant.

Some, but a few, among them play at cards, and that very seldom.

They contend among each other who can most exactly hit a mark. They mark the target, on a white ground, with a black; on a black ground, with a white spot. He who best hits the mark is presented with money, tobacco, and whatever is agreed upon.

They play at ball in this manner: part stand on this side, part on that opposite to them; then one on one side lets off the ball, covered with leather and stuffed with straw, cloth, and other rags, which his next man throws up in the air with a stick or battledore, and then one from the opposite number springs forward to catch it before it falls to the ground; when at the very same time he who struck it up in the air runs to the opposite side, to take the place of him who came from it to catch the ball. If he who aimed at the ball lays hold of it, and with it shall hit him who is striving to resume his place before he has reached it, he is the conqueror.

A certain kind of amusement, called the Goose (Gaase-spil) is in practice among them. On a tablet are drawn certain lines, on which they move up and down counters, to the number of thirteen, to designate so many geese; one of these, a thief, representing the fox lying in wait for the geese on the opposite side of the board. In this game there are two, as it were, champions ready for fight: the one leads on the chess-man, that is, the fox; the other manages the geese. He who is fox does every thing to way-lay and take the geese, which if he succeeds in he comes off conqueror; the other, who undertakes to defend them, stretches the whole force of his genius to avoid cautiously the snares of the wily fox, and when the enemy is on all sides surrounded by the geese, and reduced to an extremity, he carries off the victory.

As a pastime this exercise is received among them: two men hold a stick raised above the ground no great distance, a third on a staff flies up to them, and when he has come as near as possible to them, supported on the staff, he springs over the barrier.

The Laplanders are great wrestlers, this exercise they use partly for amusement, partly for keeping off the cold. I have been an eye-witness more than once of this kind of exercise, especially on journeys which I had to make in their company over the mountains. It then frequently happened that, when the rein-deer stopped and fed on the moss that grew under the snow, their drivers in amusement would repel the force of the cold from them by wrestling.

Two men hold a rope extended on two sticks at a small distance asunder; one of these holds with each hand on one side, both of the ends of the one stick; the other, on the other side, does exactly the same. Each then strives with his whole force to take the stick from the other, and that he should the more easily master his wish, he has one or more friends at hand behind him, who assist him, by plying their shoulders to his exertions. Whoever of these twists the stick from the other carries off the prize, and yields to him what has been agreed upon between them.

They put two sticks into a ball of thread and lay hold of them when in, and in opposition to each other, each drags with all his might to himself, until the ball is broken up in their wrestling. This exercise, which they call Bolokiit Kiaesset, is made as a trial of strength, to ascertain which is stronger than the other.

An exercise has been received among the Laplanders, that two men standing opposite to each other, the one putting his hand on the girdle of the other in order to supplant him, should try their strength. He that oversets the other is the conqueror.

The young men play by throwing sticks with amazing agility from hand to hand; this kind of amusement is called in Lapland Baettom.

They even suffer themselves, after the manner of rein-deer, to be girt and driven for amusement.

Here I shall ask pardon of the benevolent reader for mentioning certain incidents which befel me and others; these are of no great moment, yet, as being uncommon and not known, I shall mention them.

I paid a visit on a certain time to the clergyman of the living of Koudekein, John Junell. That venerable man received me with all imaginable politeness, laying before me what he had at hand, namely, broth made from fresh rein-deer, fish fresh from the river, and, what you may perhaps be surprised at, rein-deer cheese, boiled whole in a pot, sprinkled with much sugar, and placed on a plate in the manner of a tart. But of this clergyman this is remarkable, he being the whole summer almost destitute of cattle; as it appears, that almost all the Laplanders who make up that church, in the parishes of Skiervoe and Carlsoe, situated in the parts of Norland, are accustomed to emigrate in thesummer season to the coasts.

It happened, when on the Chrismas-eve I was lodged in a certain house appointed for receiving the clergyman, going to do duty on the next festival in the church of Kistrand, built at the first time of the mission, that a small portion of fresh milk was given me as a present. From this I was inclined to make some frumety, but was exceedingly disappointed; for the cook to whom I had given this in charge mingled such a quantity of salt in this gruel for me, so imprudently, that I was little inclined to taste it, much less to eat the whole of the mess. The man did it in the simplicity of his mind, but he was attentive even to a fault. Mean time I went to bed, having nothing at hand to appease a hungry appetite with.

During the whole time I was among the Laplanders it always was a duty with me, from the festival of the new year to that time which is between Easter and Whitsuntide, to traverse the mountains in the discharge of the duty of a preacher, first among the mountain Laplanders of Porsanger bay, then among those who inhabit Laxfiord bay. When I performed this troublesome journey, and was preparing to descend again to the bay of Laxfiord, to initiate the maritime Laplanders of this place also, it happened, that the Laplander I first came to (his name was Oluff Erichsen Karsnes) presented me with a small portion of cow's milk, which was fresh, from which I had a mind to make a ptisan, to be divided into two equal parts, one for myself, the other for the host. How great my desire was for it may be inferred from my not either seeing or tasting a drop of new milk for the whole of the winter. But since in this, as in other huts, the sheep occupied a small place for themselves, and that sheepfold was next to me, it so happened, that the sheep, allured by the smell of the fresh milk, jumped through the door, which the Laplander's wife had opened, and overturned my bowl of drink. The host, who had the half of it, had that politeness that he wished to repair my loss by kindly giving me part of his own, which I refused with equal politeness, knowing that ptisan was as grateful to him as new milk was to me.

When going a journey over the mountains, among other vessels for travelling, I carried with me a liquor case filled with brandy, with this intent, that, when seized with cold, I should have the means of restoration. But neither did this succeed to my wishes. For, when walking out in the wood, not far from the cot, the wife of the Laplander where I resided went out to fetch some calf-skins from the storehouse near the cot. It so happened, that, whilst she was taking down the skins, the liquor case, which lay upon them, fell to the ground and was broke in pieces; the brandy also all flowed out on the snow. The master of the cot, by name Juks Anodsten, on scenting the brandy, eagerly fled to it, and, sucking up the very snow which had absorbed the liquor, drank till he was even drunk. On my return from the wood, I found him in a state of inebriation, which excited in me the greater wonder, as I knew the great penury or scarcity of brandy or any strong drink that was in this desart. I felt uneasy too, as the king's mandate had forbidden, under severe penalties, the giving a drop of strong intoxicating liquor to any Laplander whatever. The Laplander then ingenuously confessed the fact to me on my coming home, in the following words: Odne ednak vahag læ shiaddam; that is, a great misfortune has happened this day! At which I was much moved, fearing lest some ill had befallen his family; but, informed of the misfortune, the weight of which he had so aggravated with words, I collected myself, having little regard for the liquor case, which I never had before nor afterwards on my journey. The whole time I was among the Laplanders I drank nothing but cold water, which was more grateful and delicious to me than any wine or any other liquor whatever. And whenever among the clergy, or men of better condition in life, where beer was drunk, I found the thirst was rather excited than quenched by it, certainly that it could not be allayed without water from the spring. But now for my host, who, as he was a man in good circumstances, so was he also a man of courtesy, and made me a full restitution of almost the whole I had lost.

A certain merchant of Bergen, by name Daniel Ravnsberg, of the society who purchased the Finmark trade from the king, came into Finmark while I was discharging the duties of my mission there, in order to attend to some business he had the dispatch of. I travelled with him from Porsanger bay, where he had some little delay. On the voyage the seamen killed an otter, and made for shore as usual to dress it. When dressed, and eat up greedily in our presence, Ravnsberg asked a taste of the boiled part,

which had so much recommended itself by its whiteness. When he had tasted it, and found no illness from it, following the example of my associate, I ate likewise myself a small part without the least injury, and found the flesh of this animal, with the exception of the fishy flavour, sufficiently delicate.

A certain Laplander resided at Porsanger bay, by name Simon Kiaes, so notorious for magic, his fame is yet among his countrymen, and will endure, I think, for ever. His son Simon Peter was in the family of the illustrious Knagenhielm, counsellor of state, and judge of the territory of Bergen. This Simon had once come into the village of Kielvig, which the governor of western Finmak, Trude Nitter, then presided over. The governor was then drinking a cup of tea, but handed to his guest one mingled with much salt in the place of sugar, which he politely received, and artfully concealing his indignation withdrew. After some time the governor came accidentally to the house of the said Laplander. And as in that part of the country where our Simon lived there grew no small quantity of Norwegian blackberries, the governor asked for a quantity of the berries, if convenient to him. The Laplander obeyed, bringing the berries respectfully, but sprinkled with such a quantity of salt, as to yield a most ungrateful taste. The governor, on tasting the berries, disgusting, from their bad taste, reproved the Laplander in severe terms, reproaching him seriously, that the berries, good of themselves, were spoiled by his sprinkling them with two much salt, by which they had lost their natural flavour. The Laplander's excuse was smart, that he thought his highness must be exceedingly fond of saltness, as he had put into the tea which he had given him to drink such an abundance of salt, in the place of sugar.

Another Laplander of the same place was asked, by way of joke, by a sailor of Bergen, whether he could let out the hell fly, or play such other hellish tricks, answered that he would immediately. He no sooner said so, than he brandished a burning log of wood, snatched from the fire, all over the house in which they were, running up and down like a maniac; that the sailor, fearing lest he should be burnt from the sparks, fled instantly with his friends, ceasing to teaze the Laplander any further.

That the Laplanders are easily alarmed and terrified, on the apprehension of danger or war, the following is an instance. At the bay of Langfiord is a place called Laesbesby. A Laplander's wife who lives there went out one day to bring home her sheep who were at pasture. It happened on that day, there was a great fall of snow that covered the face of things, so that the woman scarcely could distinguish one object from another, and took the parts of the trees that rose above the snow for men; and as it is the nature of persons in fear, to fashion to their imaginations what they most dread, she fancied that these men moved and came near to her. Seduced by these phantoms and out of her senses, she had no longer doubt but they were Russians coming on for plunder and booty. Without a minutes's delay she returned home, and filled all places with terror. Credit was given to her report. There happened at this very time to be no small number of persons assembled, for the purpose of divine worship. On this sorrowful news, all are armed for defence; fires are lighted up through the plains; guns let off, and yells raised, that the enemy, deceived by signs such as these that conveyed the idea of numbers, should in alarm run off. At the approach of night three young men were dispatched as scouts, to explore and report; these delaying beyond the usual time are succeeded by three others, who return and report that the enemy is coming up. In this general trepidation each prepares for fight. One from this brave cohort snatches up, for his gloves, which the pinching cold and the ardour of the action

seemed, forsooth, to require, a pair of breeches, which lay in his way. And now the whole is drawn out, some armed with muskets, others with hatchets, and some had bills. A woman of the troop I conversed with on this imaginary fray, had a child on one arm, and a bill hook in the other. And as the numbers thickened through consternation, ignorant of the way, and confused by the darkness of the night, on their march they mistook the path, and fell, fortunately without any harm, into a pit-fall, and when extricated by the next morning exhibited a striking and ridiculous spectacle of the effects of fear on the imagination.

A Laplander of Alten in western Finmark, whose name was Peter Nelson, wagered with a sailor of Bergen, that he would hit with a grooved gun, standing in the hatches of the vessel, the top of the mast with exactness; and performed his engagement.

CHAP. XVIII.....ON THE DISEASES AND DEATHS OF THE LAPLANDERS.

THE small pox, a terrible and contagious kind of disease, is seldom in Finmark, and scarcely once makes its attack within thirty or forty years. Some years back this disorder raged in these countries with such malignity, as to carry off an incalculable number of every age and sex. A young Scotchman brought it to Bergen, whence, the contagion spreading extensively, as it usually does, scattered itself about in all quarters, and tainted with its venom certain persons, residing at Bergen on business, during the summer, from the extremity of Nordland. But from the nature and effects of this disease, epidemically spreading itself, we may know in part, and estimate the inscrutible ways and methods by which the Divine justice proceeds to vindicate itself. And as it is customary among the Norwegian peasants, to count their years from the last war between the Danes and Swedes, so are the Laplanders accustomed to count from the time of this raging malady, reckoning in this manner usually: "I am so many years of age from the last visitation of the small pox."

The Laplanders are afflicted at times with the head-ache, and a few other common illnesses; in other respects, they are a sound and robust people.

They get rid of internal diseases, as they call them, by drinking seal's blood, yet tepid, or the blood of the rein-deer. They cure the tooth-ache, elsewhere a most sharp and almost incurable pain, in like manner by a draught of seal's blood. Formerly, and in times of ignorance, they thought of no remedy against this more immediate than the rubbing the teeth with a stake from a tree struck with lightning. Besides an unusual species of tooth-ache prevails among the Laplanders, if you look especially to the cause of it arising from the bite of a certain kind of worm of a yellowish colour, with a black head, as large as a grain of barley, which gets into the teeth of the Laplanders, and gnaws them with the acutest pain.

They usually cure the eyes, darkened by a film drawn over them, by putting in a small vermin, the louse, to eat through the membrane by its subtle rubbing. Delicacy would have prevented my mentioning this kind of cure, but as it is so uncommon and unusual, that it may be sought for in vain among the medical tribe, you will indulge me in the bare mentioning it. For a kibe on the heel, and other ills contracted from extreme cold, they use oil of rein-deer, with which they rub over the part affected. They soften the sores of wounds by gum from the fir-tree. I have known some Laplanders, who, on fracturing a limb, before they would restore the limb, put out of joint and bruised, by bandaging it up when set right, to have drunk silver, or if they had none, brass when pulverised, affirming solemnly that they had received no small relief from the use of this potable metal.

How they expel pain from the foot or arm, by the means of a hot burning application, has been shewn before.

The nerve which is extended through the hinder feet of the rein-deer to the hoofs, serves for the purpose of binding up the nerves and other parts bruised, and put out of joint, and of restoring them to their former state and place, with this difference, that those of the female serve for the men, those of the male for the women.

The body of a Laplander, when dead, is placed naked on a bier on some shavings. The funeral, conducted with little ceremony, accompanied by a very few of his friends, is conducted to the place of interment. The surviving relatives, if in circumstances, receive the attendants at a supper served up in the simplest manner, the whole consisting of a small portion of water and honey, &c. It was of old a custom in this country, that those who were distinguished for their skill in the bow, or the gun, should be buried in places consecrated to the worship of their idols, others being interred in the wild ways, and such ignoble places. The sepulchre itself had no other ornament than a common sledge, called in Lapland Kierres, in the place of a monument. It was a custom too in time past, to lay on the body the outward bark of the birch-tree, which the Norwegians call, Naever, and use in the place of laths, covered with heaps of stones gathered and raised up for this purpose. The tomb itself, adapted to the body, consisted of smooth and oblong stones, raised and put in order on each side, with a top and bottom made of stones of the same sort and form, and not unlike altogether the common biers in use among us. In the funerals of the rustic Laplanders inhabiting Finmark Proper this singular custom is observed, that the end of the sepulchral linen, while the procession is moving, for greater solemnity and ornament, projects a little from the bier.

Among the manners peculiar to this people it is here deserving of notice, that the Laplanders usually make a present to their children, when born, of a female rein-deer, commonly called Simle, on the condition, that the boy should possess it with all its progeny, in future, and thereby become in process of time the lord of no small herd. When either parent dies, the boy demands, receives, and retains as his legitimate possession, due to him by just title, the said animal with all its produce, separated from the partition of the effects that may be made by the other heirs of the effects of the deceased.

CHAP. XIX....OF THE GODS OF THE LAPLANDERS.

THE Laplanders formerly fashioned to themselves various gods, inhabitants of the mountains, lakes, and other places; whence their frequent forms of exclamation and ejaculation, as Gedge Olmuthz, Passe-Gedge Vækkiet, that is, O man of stone, O holy stone, assist me I conjure thee! also Vaekkiet buorre, Passe Vaerre, dato Mudngij dal haette bodi! that is, holy and good mountain, assist me in my affliction, and other numerous appellations, by which they invoke their gods, in mind and manner altogether heathen. And as they believe their gods could be appeased with sacrifices in those places where they presided, they frequently sacrificed to them after the manner of their country. But this subject will be treated of more diffusedly in the following chapter.

The account of an uncertain author, not long since fell into my hands, which, as containing a history of some of the gods of this nation, I shall transcribe at large for the reader.

A SHORT RELATION OF THE IDOLS OF THE PAGAN LAPLANDERS, AND THEIR IDOLATRY.

The Laplanders fancied for themselves gods residing in various places.

1. They placed some in the heavens, and in the siderial sky.

2. Others in the lower region of the air.
3. Others were, in their opinion, terrestrial.
4. Others subterranean, yet not very far under ground.
5. Others had their habitations in the very bowels of the earth.

Of the gods inhabiting the starry mansions the greatest is Radien; yet it is uncertain, whether he is over every part of the sidereal sky, or whether he governs only some part of it. Be this as it may, I shall be bold to affirm, that the Laplanders never comprehended, under the name of this false god, the true God; which is obvious from this, that some have not scrupled to put the image or likeness of the true God by the side of their Radien, on Runic boxes. This Radien, when especially he is characterized by the name of the Zhioaarve-Radien, is invoked for the prosperity of household affairs, for the increase and the protection of the herds of rein-deer. The business of this false god was to inspire a soul into the fœtus while forming in the womb, which they feign Maderakko, receiving from Radien, gave to his daughter Sarakka, whose duty it was to fit the body to it, whence is produced, as it were, a perfect fœtus. The same Radien receives the dead to him, after they have been some time in the regions below; but those who for a bad life in this world, and therefore hateful to the gods, are cast down into the region of torture, a place in the depths of the earth, foul and squalid, never return to the happy mansions of Radien, damned to eternal imprisonment in the region of torture, or of Pluto.

Ruona-Nieid holds the next honours to Radien in the starry sky, a god, if you believe the Pagan Laplanders, distinguished for virtue and power, the president and keeper of the mountains, when blooming in the spring, and producing fresh herbage for the rein-deer. To him they offer sacrifices in the beginning of the spring, that their rein-deer may be the sooner led out into the fresh pastures.

The gods who have got mansions in the lower regions of the air follow in order.

1. Beive, or the sun; for the Laplanders hold the sun for a god, who with his light cheers the world, makes it fertile, and full of grass for pasturage for the rein-deer. They are employed in rendering him propitious to them, by sacrificing to him on the eve of St. John the Baptist; that, as a Phœbus, he may frequently and cheerfully scatter his light. Sacrifices are offered to him on account of the various ills they are afflicted with, particularly the inflammation of the brain.

2. Horangalis, or thunder. Him the Laplanders dread, as a god inclined to wrath beyond their conception, striking not only mountain tops and trees, but men also, and cattle. To divert his wrath from them, they endeavour to appease him by sacrifices.

3. Gisen-Olmai.

4. Bieg-Olmai, the god of rain, the ocean, and of winds, whom they worship as the subduer of the sea, and of the winds.

5, 6, 7. Three Ailekes Olmak, in whose honour the days of the week, Friday and Sunday, are consecrated; though there are among the Laplanders, who think somewhat different on this part of theology, and contend that Friday is dedicated to Sarakka, Saturday to Radien, and Sunday to the three Ailekes-Olmak, of whom mention is made here. They add besides, that should they happen to violate these said days by profane labour, that they instantly appease their deities by sacrifice.

Of their terrestrial gods the principal are, Leib-Omai, who is worshipped as the god of hunting, and to that intent, that he should deign to favour the use of guns and arrows in the exercise of them. And as it was usual with the Laplanders to venerate their gods at sacrifice, with prayer and genuflexion, so is the same ceremony used morning and evening with the greatest religion in the veneration of this idol. There

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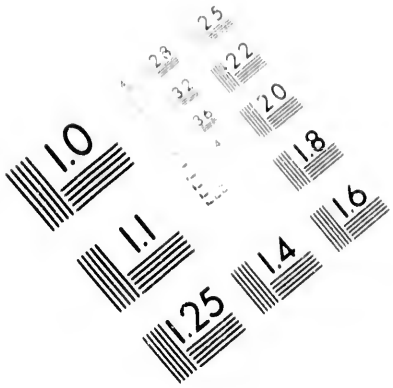

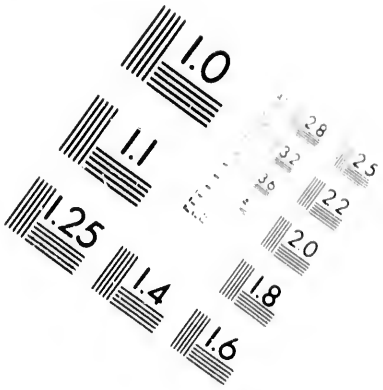

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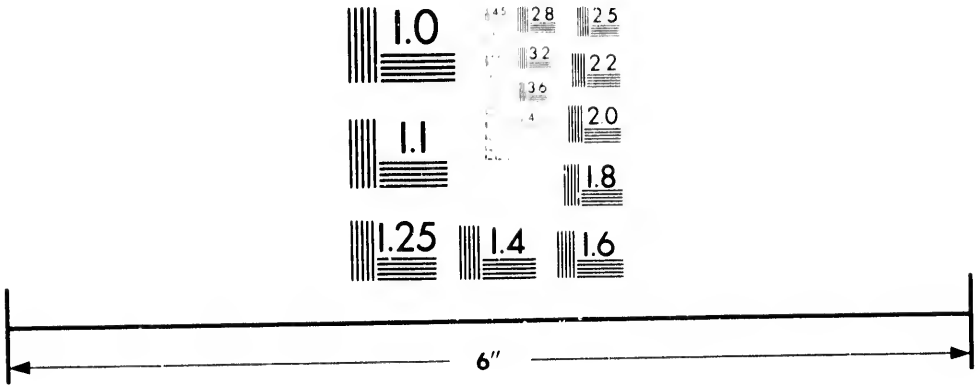

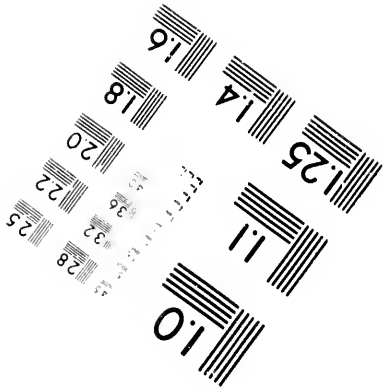

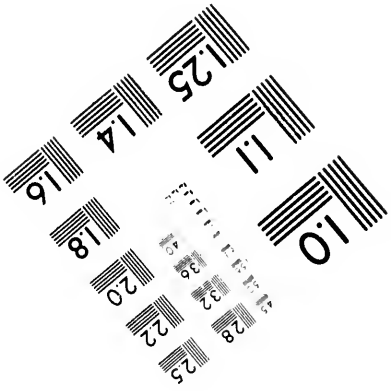

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is also and ode usually recited on his anniversary. Kiose-Olmai is the god of fishing, who, to favour a fortunate and happy capture of fish, receives divine honours.

Maderakko with her three daughters is the goddess, who brings succours to females: her they endeavour to render propitious by religious worship, that she may permit her three daughters to succour women when the occasion calls for it. Some contend that she herself gives the assistance; others deny, and say she does it by promoting the endeavours and labours of her daughters.

The eldest of the daughters of the goddess Maderakko is called Sarakka; this is she who prepares the body for the fœtus in the womb of its mother, when Radien has let down the spirit or soul from Heaven, as just mentioned: she is believed to be the assistant of women in labour, and is sorely affected by their pains as the woman herself. That irreligious and abominable sacrifice, before the use of the Lord's Supper was introduced, is said to be instituted in honour of this goddess; and since the preparation of the body and blood of the embryo in the womb is ascribed to her, the body and blood of Sarakka is said to be eaten and drunk, horrid to relate, in the false sacrament. Others contend that in the said sacrament that the body of Leib Olmai is eaten, but that the blood of Sarakka is drunk; but in so asserting they commit a manifest error, in a matter in every other respect foul and full of blasphemy, in confounding Leib Olmai with Radien, to whom, as contributing to the fœtus in its formation a spirit, this honour, such as it is, is due; whereas Leib Olmai contributes not all to the formation of man. And so it is, or as it is manifest itself from this, that there are Laplanders who confess that they have eaten the body of Radien, and drunk of the blood of Sarakka, in this abominable rite. But this goddess is most religiously worshipped by both sexes, chiefly by the women, and especially when in labour, who, in order to obtain an easy delivery, often drink to her honour a cup of brandy, and offer, in the hope and wish of an easy and happy delivery, a libation of meal, water, and honey.

The next in order of the daughters of Maderakko is called Juks-Akka, the goddess in whose power it lay to convert the female in the womb into the male offspring. This goddess they strive to bind by sacrifices to her, because they prefer a male to a female child, by reason of their life occupied so much in fishing and hunting, to which they are addicted, and for the exercise of which the males are preferable to the females.

They call the third daughter of this goddess Ux-Akka. She undertakes the care of new-born infants, cherishes them, and protects them from all those accidents to which that tender age is exposed. She attends to the monthly ills of the sex, that they should return in good time, and cease also, on account of which she is religiously worshipped.

To this class belong also those named Saivo-Olmak, or mountain gods, who assist all and every one requiring their assistance, or are addicted to those chiefly who buy them for a consideration from other Noaaids, that is, magicians, or procure them by a certain singular skill of the Noaaids, that is, magic art. These are said to give responses to such as consult Saivo Olmak, which the Laplanders contend to be done in various ways; by visions in sleep; by Myran, on Runic tabors; on a girdle in a gun; on stones, on horses' bones, &c. When the magician is exercising his art that he might get some Saivo Olmaik, as a tutelary god with him, he refreshes himself with a draught Saivo-Zhiaze, that is, of mountain water, as a recruit of strength, which he repeats by intervals, especially when he has to enter into a trial of the pre-eminence of strength with other magicians. In this contest these magicians commit their Saivo-Sarva (by which is understood male rein-deer) to fight. The same issue as attends these attends their masters: so that if the rein-deer should lose his horn in the contest, the master of him, by a kind of sympathy, begins to get ill and languish.

The Saivo-Lodde, or mountain bird, is numbered with them: its office is to shew the way to a magician while journeying. The Laplanders say that this bird is frequently sent out by a rival and revengeful magician, to the destruction of magicians and other men.

There is also a certain Saivo-Guelle, by which is understood a mountain fish, destined for preserving the life of a magician when going to depart into Jabme-Aibmo, or the land of the dead, and thence to bring back the spirit of the man sick to death; for an opinion prevailed among the Laplanders formerly that the spirit of sick men, leaving the sick body on earth, passed to the land of the dead, and that the body would quickly hasten after it, unless the spirit, by the aid of a magician, was brought back in good time. From this jocular, and at the same time absurd opinion, the ceremonies for bringing back souls from Jabme-Aibmo into the body, made to the gods, drew their origin.

They even fabulously create a certain Namina-Guelle, or naming fish. They feign that very few can have this, unless on the second baptism of the infant. Mention being made of a mode of anabaptism, it is proper to point out in a few words that that species of baptism, which was formerly among the Pagan Laplanders, was wicked and diabolical; that it was a baptism often reiterated, and that as often as a man fell into any dire illness, that he assumed a name different from the one he had hitherto used; and that it was performed by the sprinkling of water, and in this solemn form: "I baptise thee in the name N. N. in which henceforth prosper." This newly acquired name, the former being abolished, was the consequence of this anabaptism, and is altogether idolatrous, being derived from the grandfather or great-grandfather of him, who happened to have the luck of a naming fish in his family.

Those of the subterranean deities, who do not live deep in the earth, are believed to inhabit the region of Jabme-Aibmo, where Jabme-Akko, or the mother of death, holds her empire. Those who descend to this region hold, when dead, the same degree of dignity, which, when living, they held in this life, clothed in a new body, in the place of that which perished in the grave. To these deities sacrifices are frequently made for the life and safety of man; and that the more religiously, as the Laplanders are thoroughly persuaded that Jabme-Akka, as well as the names, are incited by a strong desire of summoning and dragging daily to their abodes living mortals; and that nothing is more grateful to the dead themselves, than to see some of their relations and children associated with them in these very mansions.

Rota-Aibmo, or the region of torture, is feigned to be the seats of the gods residing in the bowels of the earth. Into this hell are thrust down all those who have led a life impious, wicked, and hateful to the gods, deprived of all possible hope of ever coming to the happy mansions of Radien. This is the mansion of torture or pain, of that false god to whom the Laplanders address their prayers, when in vain they have called others to their aid. The Laplanders fable that this Rota, or god of torture, on whom we are discoursing, infests men as well as cattle frequently with diseases, and that the malady cannot be otherwise averted than by sacrificing to this malignant god; for help would be sought for in vain from the other deities, as inefficient when opposed to him. It has been observed that the Laplanders do not use the same rites in the worship of this god as in their worship of others. Agreeably to the vulgar rite in their profane sacrifices, when the animal destined for the sacrifice was slain, as many of the friends were invited to the feast as were sufficient for the eating of the flesh taken from the head, back, and feet of the animal sacrificed. The blood was sprinkled on a variety of trees, artificially cut and carved according to the custom of the nation, and disposed in order,

in honour of the gods, around altars: certain fragments of the bones, tongue, lungs, heart, head, ears, and tail, being laid also on these altars. When sacrificing to this deity, Rota, they bury a dead horse in the ground, to the intent that pernicious and hateful god should by its aid withdraw as fast as possible to his abode, and cease to molest them any more. It happens, though very seldom, that they sacrifice to this idol by a common and usual rite; in which case they fashion his image to the form of man, and place the bones of the animal they have sacrificed on the altar, yet without any thing on them, to Rota; as also they usually do to their other gods, for the purpose of covering them with flesh. For the Laplanders have this opinion, that their gods are as equally satisfied and contented with the bare bones of the animals sacrificed to them, as if they were covered with flesh and entire. And for the reason that they ascribe to them infinite power as to gods, and say that nothing would be more easy for them than to create flesh, and so, when created, to, put into it bones.

Hitherto this doubtful relation, for the truth of which in every thing I dare not vouch. Certainly Radien, Ruona-Nieid, Maderakko, with her three daughters, Sarakka, Juks-Akka, and Ux-Akka, of whom mention is made, are names totally unknown to the Laplanders of that tract of country where my mission lay; concerning Saivo-Sarva, Jabme-Aibmo, or the land of the dead, when interrogated on these matters, and others which occur in this celebrated history of their deities, they did confess that they had heard something by rumour of them. Yet in most things I agree with the author, who ever he was, little doubting but these things which he related as among the Laplanders of the country of Drontheim and Nordland were so far formerly held as true, that I need but mention for the present this one circumstance, in confirmation that Radien, Bieve, and Rota, or Pluto, and some others, may be seen pictured on their Runic boxes, which place before us a compendium of Lapland heathen theology; and even the names given to the idols agree in part with the offices by which they are described. Scheffer mentions that the Laplanders adored chiefly three idols, namely, Thor, Stoerjunkare, and the sun, and diffusively lays down the rites to be observed in their sacrifices. The two former idols are at this day unknown to the Laplanders of Finmark.

Joulo Gadze were well known to the Laplanders inhabiting Finmark. The Joulo-Gadze, if you believe the Laplanders, were certain evil spirits, to whom formerly they religiously sacrificed on the eve of the Nativity of Christ, old style. The Noaaide-Gadze, or the associates of the Noaaids, or magician, were so called from the information and aid which they were believed to give to the magician. These, together with the Joulo-Gadze, were very well known to the Laplanders, among whom those who were reputed for prudence and belief affirmed with one voice that the Noaaide-Gadze, or associates of the magician, were spirits that usually appeared under the form of children, and in the Lapland dress, in dreams, and even in clear day, to the Laplanders. These recommended their services and attention, pledging their faith that they would effect, if admitted into the family, that their masters should become skilful and handy, and that they should be prosperous in hunting, in fishing, in curing the diseases in men and cattle; and that they should more easily obtain their admission, they added, that before they hired themselves to the parents, that nothing was more equitable than that they should perform for the sons and grandsons the same kind offices, as appertaining to them by hereditary right. If the magician, of his own free will and kindness, admitted these spirits, he obtained at the same time with them also Torvo-Paike, or the caves and mountain abodes, which the Noaaide-Gadze had hitherto possessed as a tutelary retirement; if not, they obtained even by threats that they should afterwards be admitted. When at length admitted, either graciously or without consent, they taught the Noaaids

their whole manner of sacrificing, the mysteries of the magic art, and the Juoige, that is, the art or manner of religiously singing magic hymns. These Noaaide-Gadze, who were, as just mentioned, assistants and coadjutors of the Noaaid, or magician, and whom, for the dispatch of business, he could not do without, with regard to the Laplanders, were separated into two classes: the one forming Buorre-Gadze, that is, good society; the other, Borram-Gadze, that is gluttonous, or bad company. Those who were of the Buorre-Gadze, or good society, dedicated their labours and offices to the Noaaid, or magician, in curing distempers, in expelling flies, if any were stung or injured by them, and to other laudable and good works of this nature.

Others were called Perkel-Gadze, or diabolical society, for the purpose of assisting the Noaaid to injure others, and by the magic art destroy both men and cattle, both as authors and as advisers. They called the same Borram-Gadze, a gluttonous and malignant society, because they were believed to be solely intent in calamities of every kind, and in producing and effecting mischiefs, like a consuming fire. Vuokko is also well known to many of the Laplanders, and described as a bad demon, appearing in the form of a huge and foul bird, from which the Noaaid, or magician, is said to receive those infamous and noxious flies, the cause and means of so many bad effects.

To these I shall add such as the Laplanders have not, as it appears to me plainly, counted among the number of their gods, nor deigned worthy of the honour of religious worship and sacrifices, yet influenced by some superstition in their behalf; such as Stallo, a prodigy equally known to the Laplanders, but seldom appearing; in sable vest, but elegant attire, holding in his hand a stick, and provoking to contest any one he meets.

Concerning this prodigy I shall relate what follows, but ask pardon from the reader for a very ridiculous narration. They relate that the said Simon Kiœs, whom we mentioned before, had killed at a time a Stallo, and some time after that he had killed another, in attempting to revenge the death of his associate that he had slain, having used this stratagem: he made an aperture through the door of his house (the house and door I saw) through which he way-laid and shot him when passing, and he remembered that the Stallo was killed and privately buried by his father; and that the spoils taken from the enemy were, namely a stick, in which was a dagger, and a sabre, out of which he made knives for his son Peter, and son-in-law Nicholas Kiœs. The authority of this story rests on them, the sons of Simon Kiœs, as also several Laplanders from Porsanger, from whom I relate it, and leave it to be examined by the reader. But concerning Stallo, of whom mention is made so often among the Laplanders, what opinion to form on it, I confess myself at a loss to say, and leave it to the judicious reader to determine.

The Laplanders feign also a certain Zhiokkush, or cause of sudden illness; hence frequently among them, when any one is seized with a sudden disorder, they say, Zhiokkush suu pazhji, that is, the Zhiokkush has struck him.

There are besides a kind of spectres, in Norwegian Udboer, but in Lapland called Epparis, or Shjort. This kind of spectre is believed to wander up and down where any infant who had not received a name had been slain. It is feigned to cry out until the infant has a name given him, then to vanish.

The Laplanders adopt an opinion, in common usually with the Norwegians, concerning certain subterraneous beings, commonly called Goveiter, fancying to themselves, I know not how, certain inhabitants who live under ground. Zhiakkalaggak are accounted by many as spectres, usually appearing in the shape of infant children; but, as a certain Laplander has assured me (by name Henry Sarreson, the grandfather of Andrew Porsanger, who, in 1758, sent from the school at Drontheim to the college, now rector of the church which is appropriated to the hospital of the said town, a pious and

honest man) there are living in deep springs, certain animals not very unlike to infants, if you look to their figure, yet smooth, and without hair; he said that their flesh was well relished: that they were to be caught but seldom, and this only by art; by a plate of butter put at the side of the spring where they keep. By the scent of this, the Zhiakkalaggak, allured, immediately come up, and, when rising, are shot by men who lie in wait. If such animals really exist, and that there was an opportunity of getting them, they would be worthy of a place in the king's museum.

There was a certain Laplander dwelling in Porsanger, of the name of Andrew Eskildson, among the Norwegians called Andrew Bredeskalde, that is Andrew Broadfront, commonly so called, who died a little before my coming into this country. He, as the report says, usually prayed to Saint John for women in child-bearing.

CHAP. XX....OF THE IDOLATROUS SACRIFICES OF THE LAPLANDERS.

THE names of the Lapland idols, as well as the rites used in their worship, so vary from the various situations inhabited by Laplanders, that to give an exact description of them would, in this chapter, be extremely difficult; meantime, what I have observed whilst among them, or have learned from the observations of others who were skilled in these matters, I have determined to communicate to the reader.

Animate things chiefly, and among these principally rein-deer and sheep, seals seldom, were sacrificed to the gods. Inanimate, as milk, rice-milk, cheese, and other things of this nature were also sometimes offered.

The rites used in sacrifices were various and manifold. In the sacrifices of living things, either the whole animal, or at least some part, was offered.

Sometimes they boiled the whole animal, and when boiled, devoured it, except the bones, which were left for the god of the place, whom, they little doubted, was able and willing to cover them with new flesh. It was their practice to erect certain long sticks, besmeared with the blood of the victim, in the place where the sacrifices were made. Sticks of this kind were called in Lapland Liet Morak. Sometimes they used to sacrifice the animal at a certain river, into which the blood of the victim was poured; certain sticks stained with the blood being solemnly erected in the place of sacrifice.

If they happened to kill a bear, when the skin was stripped off, and some part of the meat was boiled, the liver was taken out, which, put on a stake and roasted at the fire, as a host or kind of sacramental sacrifice, called in the Lapland Vuodno-bassem. The Laplanders are said to offer certain sacrifices for young children, in this order; for an infant as yet in the womb, a sheep; for the same, when born, a dog, which was buried alive, and, after birth, any animal, dressed in a linen hood.

The method of sacrificing inanimate things was thus: they poured brandy and liquids of such sort on the ground to propitiate the Lares, who were believed to inhabit the hearth or threshold, in that libation which they called Seime-Staebmae. To pour the beestings of a cow, the first time she brings forth young, on the floor of the cow-house, belonged also to the sacred ceremonies. When going to dwell in a different place, they had a custom of pouring milk on the place from whence they were coming, in order to declare a grateful and devoted mind towards the deity of that place, on account of the benefits received during the whole time of their residence it it.

The diseases with which men as well as cattle were at different times affected, hunting and fishing that was unsuccessful, and such incidents, furnished the Laplanders with opportunity and even necessity of appeasing their gods by sacrifices. Victims were

chiefly slain when they were successful in fishing and hunting. This is apparent from the description of a very famous place of sacrifice, Leunje-jauvre suolo, given by me. In the places where they had slain their rein-deer, they usually left behind them some small parts of the beast they had taken, horns, and parts of the flesh which had covered the skull and feet, in token and signification of a mind devoted to the gods.

As to the places in which the Pagan Laplanders had formerly sacrificed, it appears, that they were various sacred high places, Passe Varek, in the bay of Varangar, in the parish of Vaso, in the district of Thana, in the bay of Laxefiord, in the parish of Kiollefiord, in the bay of Porsanger, and many others which they held in religious veneration.

Passe Varek, or sacred high places, which they formerly held in religious veneration in the bay of Varangar, are as follow:

1. Meiske-Vare Passe-Aldo, that is, sacred rein-deer of the mountain of Meiske. That which is called sacred is really so, or is said to be, or to have been very little so. The female rein-deer in the Norwegian is called Simle. Hence whatever high places, called from Passe Aldo, or sacred rein-deer, were formerly consecrated, had their name, no doubt, from the rein-deer which were sacrificed there. The mountain mentioned is said to be situated in the inner recess of Varangar bay; hither is a great concourse of Laplanders. The upper part is a level, the lower is covered with a wood of birchen trees. There is a report that sacrifices were formerly made to the idol Storjunkare in that place, and in proof of the sacrifices which they made there, a number of the bones of the rein-deer a few years hence were seen in that place.

2. Styren-Aldo, that is, rein-deer of the mountain Styre. In this place, the Laplanders formerly worshipped thunder.

3. Nieid-Vare Passe-Aldo, holy rein-deer of the virgin mountain. Here was a sacrifice performed to the Joulo Gadze, or to the society of the Yules.

4. Kalbmen Baste, that is, the cold rock, or rock of cold.

5. A certain stone, called in the Lapland Zhievres-Ibmel, that is, god of the otter. And here the very name is a proof of the idolatry that was formerly exercised in that place.

6. Guuli-Ibmel, that is, god of fishes. For good luck in fishing, it appears, that they had formerly sacrificed at this stone.

7. Muorje Ibmel Passe-Aldo, that is, sacred rein-deer of the God of berries. Even the very name of the divinity given to this mountain sufficiently declares, that it was formerly sacred and religiously worshipped.

8. Juur-Vuodna Passe-Aldo, that is, rein-deer of the bay of Juuren.

9. Raige-Bafte-Aldo, that is, sacred rein-deer of the perforated rock.

10. A certain mountain of immense height, named by the Laplanders Balda-Zhiok, is called the Great Flounder's Head.

Passe-Varek, or sacred rocks, which the Laplanders have religiously adored on the summit of the mountain Neiden, are as follow:

1. Niaekkem-Karg, that is, the mountain of creeping.

2. Ruoude Zhiold, that is, iron summit.

3. Ullo-Vaerre, that is, mountain of wool.

4. Jerge-Jerge, that is, rocky stone. By the way, it is to be observed, that certain Laplanders call a stone Jerge, which others in their dialect call Ged'je.

5. Zhiuodzhio-Akkom, that is, my abiding grandame; meaning grandmother by the father or mother's side, which in no small number of places of Norway is so called.

6. Zaagees-Bafle, that is, rock of foundation.

7. Guuli-basti-vaerre, that is, mountain of the rock of fishing.

Passe-Varek, or sacred mountains which the Laplanders worshipped; beyond Varangar, along the coast, are the following celebrated ones.

1. Raudo-Vaerre, that is, the mountain Raudo; Raudo is a fresh water fish, reddish under the belly, called in the Lapland Raudo, but in the Norwegian Ror.

2. Baelje-Vaerre, that is, mountain of the ear. The meaning of this name, as far as I can conjecture, is, that the wretches who make their supplications to this idol are persuaded that he will graciously lend his ear to their supplications.

3. Ryto-Zhiok, that is, the top of the Pot Mountain. On this mountain is shewn a stone, resembling a man in his natural position and form, clothed in a hood. It seems too very probable that this name was given to the rock for this reason, that the Laplanders boiled there in pots the meat of the sacrifices, which they ate, according to their usual manner of sacrificing, leaving the bones for their gods.

4. Einar-Sieide, that is, oracle of Einar.

5. Sieide Vaek-Aldo, that is, rein-deer endowed with the faculty of an oracle, or of divining.

Passe Varek, or sacred mountains near the river Thana.

1. Golle Vaerre, that is, mountain of gold. Here formerly, on account of the signal success in taking of wild rein-deer, frequent, and, considering the condition of the nation, sumptuous and fat sacrifices were usually offered.

2. Galdo-Oaaive, that is, head of the spring of water; a mountain so called.

Passe Varek, or sacred mountains in the district of Thana, are the following:

1. Sieid, that is, the oracle.
2. Giems Bafte, that is, rock Giems.
3. Stang-Naes.
4. Jokkel Nearg, that is, promontory, or little tongue of land, Jokkel.
5. Kolds Niarg, that is, promontory Kolds.
6. Stoppel Niarg, that is, promontory Stoppel.
7. Horne Bafte, that is, rock of horn.

Passe Varek, or sacred mountains, which the Laplanders have consecrated at Hobs-Eidet, the isthmus of Hobsen, to the worship of idols, are as follow:

1. Vuoide-Ged'ge, that is, the stone of unction; deriving its name from the blood or oil of the victim, with which, at sacrifices, it was anointed.
2. Ravos-Niarg, that is, promontory of fasting.
3. Klem-Niarg, that is, promontory Klem.
4. Sagga-Niarg.
5. Loidosh.

The sacred mountains which were formerly religiously adored in the bay of Laxefiord are the following:

1. Vaddes-Bafte, that is, difficult mountain.
2. Gie-Vuoude-Aldo, that is, rein-deer of the wood of Gien.
3. Ailekes-Vaerre, mountain of holiness.
4. Lieule-Oaaive, head of vapour.

Passe Varek, or sacred mountains in Porsanger bay, are mentioned as the following:

1. Alek-Bafte, that is, sea-green rock.

2. Solfar-Kapper, that is, hood of Solfar. This was the most celebrated of all those places devoted to sacrifices and religious worship by the Laplanders; it was situated in the southern part of the bay, half a mile distant from the sea. The place itself,

which I remember, from curiosity, to have visited, consisted of two very high stones placed opposite each other, the one of which was covered over with moss. Near the stones were laid certain small spits or stakes, called Bassem-Morak, which the Laplanders formerly made use of, when, in honour of their false god, who, they believed, presided over the place, they would indulge their genius in feasts, and would throw to their idol, as above mentioned, the bones of the sacrifice bare and alone. Around these stones various sticks, made from dried fir, which is said to preserve itself against putrefaction as long as possible, were set up crosswise, like the letter X, with the following characters, IIIXXXIII+++IIIXXX, engraved, three being drawn in a right line, and as many on the oblique line. Towards the south stood a long beam, of a square form, marked with the same characters as the aforesaid sticks, with the lower end fixed in the ground, but with the upper inclining towards the south, where it was passed through with an iron spike, formed like that iron one by which the poles of boats and other vessels of this sort are put together; whence the conjecture is not unlikely, that they worshipped the idol Thor, as Scheffer makes mention, in this place, though no such idol as Thor, or Storjunkare, is known at this day by the Laplanders of Finmark.

3. Dierge Niarg.
4. Sieide-Bafte, that is, the rock of the oracle.
5. Naad'd'e-Vaerre, that is, the mountain of labour or burthen.
6. Mikko-Vaerre, that is, the mountain of Michael.
7. Niarkutzh.
8. Gaise-Varatzh, that is, the little rock with a point.
9. Vuorje-Zhiok.
10. Leunje-Jauvre-Suolo, that is, island in the lake of Porsanger river. This island is situated in a certain lake, called Leunje-jauvre, out of which a river, very famous for the produce and catching of salmon of Porsanger bay, flows. On the further side of the said river a great heap of rein-deers' horns is seen, of which most are corrupted and eat through, from the injury of the air, with damp and rottenness, some fallen into the lake, others converted by the Laplanders themselves into spoons and such like utensils. In this island the Laplanders had of old time a temple, to speak so, not without celebrity; who, when they formerly went out to hunt the rein-deer on this lake, in which is the island, while some would compel on one side the wild animal to fly to the lake, others, on the opposite side, would lay hold of him swimming, with their bows and arrows, by which means they now and then enjoyed no small booty. It was their custom to leave the horns in the island, lest they should seem ungrateful towards the deity of the place, as a kind of sacramental offering.
11. Vuolla-Niudne, that is, nose of Vuolla.
12. Smeer-Vuodna-Noaiid, that is, the magician of the bay of butter.
13. Smeer-Vuodna-Niarg, that is, the promontory of the bay of butter.
14. Kokko-Giedde-Niarg, that is, the promontory of Kistnand.
15. A certain rock not far from the shore is seen, in which there is a figure, or rather a certain white spot, bearing likeness to the shape of a man, turning his feet upwards and his head to the ground. The Laplanders formerly, before the darkness of their ignorance was dispelled, used to offer sacrifices to this rock, or what is more true, to this likeness of a man appearing in the rock; for on sailing by the place, as a proof of their devotion to this idol, they gave a small piece of tobacco, if there was nothing else at hand.
16. Daume-Salo-Sieide, that is, oracle of the island of Thamsoe.
17. Snoiba-Niudne, that is, nose of Snoiba.

18. Suolo-Aldo, that is, rein-deer island.

19. Sieide-Niarg, that is, the promontory of the oracle.

20. A certain stone called in Lapland Gameditzh. A certain Laplander from Porsanger Bay, himself being an eye witness, told me, that another Laplander of the same place, whose name was Peter Siverson, as often as he went out to fish, had a custom of calling on the said stone Gameditzh, and to make offering in the name of this stone, and religiously to have offered it a piece of meat, taken from his provision chest, in hope and expectation of a happy capture.

21. In the bay of Kaafiord, near the parish of Kielvig, is said to be a certain mountain, sacred to the worship of idols.

22. So also in a certain island called Mageroe, a certain sacred mountain in the Lapland Serve, that is, community, is celebrated by fame.

23. In the gulf of Hvalesund in the parish of Hammerfest, is said to have been a certain sacred mountain called Akkiestab.

24. A certain place, also consecrated to religious rites, is said to have been in the parish of Alten.

That there have existed formerly in Finmark a still greater number of holy places, though not sufficiently known to me, I do not mean to deny; but those already mentioned abundantly shew the foul idolatry of the country, covered with the shades of ignorance.

The religious and sanctified places of the Laplanders were distinguished by a certain singular and unusual form from the rest: for instance, in the sacrificial place called Solfar-Kapper, of which mention has been lately made, two stones sharpened to a point were seen set upright, and laid near to each other. In the same place, towards the sea, where it was usual to sacrifice with small pieces of tobacco, the figure of a man is to be seen with his face towards the sea.

On a certain promontory in the parish of Kiollefiord, a stone of unusual size is seen, so formed by nature, as to exhibit to those who see it from a distance, the representation of a temple, adorned with a tower, whence it is named also to this day a Lapland temple. That the Laplanders had formerly sacrificed in this place has not been as yet diligently examined into by me, nor why they should make this a place of sacrifice do I see any fit reason, especially when the inconvenient and inaccessible situation of the place seems to oppose it; yet the very name of the place, namely a Lapland temple, seems to indicate that sacrifices were formerly made there. But the poor ignorant inhabitants had taken into their head, superstitiously, that there was something divine in those places, which were distinguished from others by a certain unusual form, and that they ought to be religiously worshipped.

But in what a high degree of estimation these mountains were held by the Laplanders, and how religiously worshipped, can be proved by a variety of proofs, some of which I shall adduce. They approached these sacrificial places clothed in festive garments, and there rolled themselves down at the feet of their idols. They visited them yearly, and though they would not offer fresh sacrifices every time, yet they would by no means touch the bones of the animals that were sacrificed. They would not dwell in the Passe-Varek, or sacred mountains, lest they should disturb the divinity of the place, by the cry of infants or any other noise: it was thought impious to sleep when sailing or riding by the Passe-Vaerre. that is any sacred mountain, lest by this inattention they should seem little to regard their god, either to raise the voice, to kill an animal, though in the way to utter the least noise, were things forbidden, lest in any respect they should be disagreeable and troublesome to their false god. Have they on a sky blue

garment, on passing, they take it off with veneration. Women passed by with averted eyes, and their faces covered. As often as the men were disposed to go to the Passe-Vaerre or sacred mountain for the sake of worship, it was forbidden that they should approach in the garment the woman wore before, lest the sanctity of the place should be violated, and it was further subjoined that they should not wear the shoes, which were made up together with the woman's.

And as the Laplanders, during times of ignorance, worshipped certain mountains as the sacred habitations of their gods by a principal ceremony, so did they perform the same honour also to their rivers and lakes, which from the names, which are annexed to them, Ailekes Jauvre, that is, sacred lake; Passe-Jok, that is, sacred river; is sufficiently clear.

The sacrifices were performed commonly in those places, which the Noaaid, that is, the magician or priest, assigned to them, yet so that they might be offered elsewhere, if the occasion called for it. A certain Laplander from Porsanger bay, by name Melle Olson, a man of character, and well deserving of belief, told me, that a neighbour of his in the same place, very well known to him, had after hunting of seals, on his return, drank of a cold spring, and was seised with so violent a disorder, as to lie dangerously ill for some weeks, but on his recovery, that he had sacrificed an ox in the place where he was seized with illness. The Laplander consumed himself the meat of the ox that was slain, and covering the bones with branches and boughs of wood, he left them, as the custom with them is, carelessly about, for the deity of the place.

In certain places it was formerly received as a custom, that the priest who performed the sacrifice should come to the rite, clothed in a hood, instead of a fillet, and a chaplet of leaves, such as was put on the animal that was sacrificed. The same was obliged to wear a white apron let down over his shoulders, in the act of sacrifice. This ornament differed but little from those used by the ancient Romans, as well as the priests of other nations: for it is well known that the priests of the heathens had always come to the sacrifices bound with fillets and chaplets, and that the victims, especially such as were sacrificed to Saturn and Jupiter, were crowned in the same manner.

Besides that foul and abominable idolatry to which the Laplanders were of old addicted, they wished to seem to worship also the true God of the Trinity, in whose name they were baptised, whose word they heard, whose sacraments they made use of, not unlike the Samaritans of old, who adored conjointly and together the God of Israel, and the feigned gods of the neighbouring nations.

But there is no doubt that the Laplanders, from the most remote times back, had at least some knowledge, though defective and mangled, of the true God in the Trinity. What earnest and solicitous care Louis the Pious had taken for propagating the christian religion through the north is clearly and fully manifested, from his not only baptising Harald Klak, king of Denmark, together with the queen, in the temple of Moguntia, but from his sending also Ansgarius, a monk of Corbey of France, into Denmark, together with Ambertus, the associate of his holy labours, whence afterwards they went into Sweden, publicly to preach the gospel in that kingdom, with permission granted by Biorno the king in 828. Ansgarius, on his return from Denmark and Sweden, that he should be nearer the northern countries, was appointed bishop of Hamburgh by the said emperor Louis the Pious, with injunction that he should carefully see that the knowledge of the true God was not only carefully propagated among the people of the north in general, but also among the Skrit-Fins, that is, the Laplanders. The patent bears date in the year 834.

In succeeding times an opportunity was offered to the Laplanders of acquiring some knowledge, however imperfect, of the Saviour of the World, by the mission of bishop Halvard, in the year of Christ 1051, into Sweden, to the Warmlanders and Skrit-Fins, for the purpose of turning them to the true faith, and afterwards into Norway. It appears from history, that Olaus Trigueson, that great founder of christianity in Norway, had taken care that his subjects should be converted to christianity from Wigia, and from those to Helgeland in Noriand. After him king Olaus Haraldson commanded the gospel to be preached among those living in the inner recesses of the bays, who were Pagans, and as yet unconverted.

Jonas Ramus, an historian, not without celebrity, mentions, among other things, in the description of the kings of Norway published by him, that king Hagen Hagensen, who came to the throne in 1217, had a temple built in the island Tromsoe near Finmark, and that a great number of strangers, who came from Biarmeland, were baptised, and that habitations were assigned to this new set. in the bay of Malanger.

Frederic the First, of glorious memory, as soon as he came to the throne, in a council of the kingdom, held at Odense in 1527, gave in charge to the bishops then present, that each in his diocese should take care that the word of God should be preached in clearness and purity. The same excellent monarch renewed by a decree, in 1529, a full indulgence to the gospel in his kingdom and realms, on the report of the celebrated historian baron Holberg.

Arnas Berentsen of Bergen, in a certain book, named the Fruitful Abundance of Denmark and Norway, printed in the year 1656, mentions that the Laplanders were little acquainted with the true religion, yet in his time, that they were brought to a better knowledge of the true God, and were making daily proficiency in it.

There were scarcely any sacred places for worship or clergymen in Finmark, before the Norwegians, called Normans, coming there, fixed their abodes; what is more, nor even before the time, when the college was established most graciously for promoting the progress of the gospel, which was begun in 1714, was there any place of worship any where in Finmark, in the neighbourhood of the Laplanders, as known to me, unless at Alten, in western Finmark, where the Norwegians and Laplanders congregate in houses sufficiently near. But the Laplanders would make use of the houses of worship, which were in the fishing places, next to the dwellings of the Norwegian peasants, each in the parish in which they were allotted.

Now praise be to God, by the most benevolent establishment of the kings of Denmark of blessed memory, and by the christian and enlightened disposition and care of the most liberal institution for promoting the gospel, and of the bishops of the diocese of Drontheim, they are provided with suitable places of worship, in which, where they before bestowed their duties on male idols, whose altars were reeking with the blood of the victims they had slain, they can worship the Lord God of their fathers, and serve him alone.

CHAP. XXI.....OF THE MAGIC ARTS OF THE LAPLANDERS, EXERCISED BY MEANS OF RUNIC SYMBOLS, FLIES; IN THE CURE OF DISORDERS BY MEANS OF THE JUOIGEN, OR A CERTAIN MAGIC SONG, AND IN THE RESTITUTION OF THINGS TAKEN BY THEFT.

IT is my intention in this chapter, agreeably to its title, to speak of the magic arts of the Laplanders, by means of Runic symbols; yet the reader kindly will pardon me

if I premise, before I enter on it, the various fascinations that have formerly been practised by others.

The Asiatic Odin is said, first of all, to have brought the magic art into the northern regions, which made so rapid a progress afterwards, that many of the nobility are said to have reached a very great degree in this art. The annals of Norway tell us, that the magic or Finnic art was so exercised at king Haldan's board, that the meats at table vanished from before the eyes of the guests while feasting.

Gunner, king of Norway, was so skilled in this art, that whatever attempts were making in Saxony to disturb his dominions, he would not deign to prepare against them in Norway. Eric Vindhuus, king of Sweden, is said to have been a true actor on this scene, for to whatever quarter he turned his bonnet a prosperous gale sprang up in that quarter. Sivald, king of Sweden, who artfully attempted the kingdom of king Haldan, is said to have had seven sons well instructed in this art; and the magic art is attributed to the fair sex of old time. A various assortment of infernal spectres is said to have been shewn to king Haldan by a poor little sorry woman. A witch in Norway, by name Kraka, is said to have prepared a broth for Roller, the little son, by the virtue of which he would become very considerable, celebrated and wise; but the son-in-law, Eric, who afterwards obtained the crown of Sweden, on tasting it, was endowed with great wisdom and eloquence. By the said witch, concealed under the shape of a cow, for the purpose of committing murder, king Frotho is said to have been slain. The daughter of king Helgeland, in order to be instructed in the magic art, is said to have been sent to Motle, king of Finmark. To what extent belief is to be given to numerous reports of this kind is left to the sounder judgment of individuals.

It is known from ancient manuscripts that wizards of various descriptions, especially sorceresses, had lived to an advanced age in Norway; and that it should be known if any person was guilty of the crime of witchcraft or not, that the suspected person, according to the custom received at that time, was thrown into water. If the person did not sink, it was a sure and unerring proof that the culprit was guilty of this crime. Before put into the water he was stripped, shaved, and examined, lest he should have any weight of iron about him that might occasion his sinking.

Witches made various confessions, in themselves absurd and ridiculous, of the manner in which they acquired the magic art. Some asserted that they obtained it from a certain charmed preparation, brought to them by another witch, made from a piece of the greater flounder, a piece of bread spread with butter, from a draft of milk, a piece of cheese, a salt herring, and bread. One confessed that she had obtained the art of fascination from stroking down a cat; another, from putting three eggs into a cask, and filling it with water, said she had got the same magic art; another added, on her part, that it was got from a certain old woman, who gave her a pipe, with this qualification, that on filling it she would bring infection on man and beast of any kind whatever, and that she by this means made herself witness of the art. Many other absurd confessions were in like manner made on witchcraft.

Women, practising these and other such like charms, made trial in various ways, as they themselves confessed, whether they were qualified as witches for the art, and were found capable; by giving as a proof, that a ball of thread when thrown into water would of itself continue to roll through it; that an animal by blowing and spitting on it, in the name of the devil, would burst. On their actions they further made daring and prodigiously wicked confessions; that under the figure of swans, crows, falcons, geese, ducks, seals, dolphins, whales, they had called up tempests and had destroyed vessels at sea.

They further confessed, that while they fastened three knots on a linen towel in the name of the devil, and had spit on them, &c. they called the name of him they doomed to destruction. One confessed that she had raised a tempest, by means of wind she had shut up in a sack; and added, that she destroyed a vessel of Bergen, for which undertaking an immense wave came to her assistance and sunk the ship. Another said that she, with other sorceresses, had raised a tempest on some sailors in this manner: they went to the sea-side in a human figure, and going aboard a small bark, in which were some men, who had a black heifer with them, they trod down with their united force the vessel on the way. Another told a story, how, after she had brought, with another witch, destruction on a small bark and its crew, they threw a piece of spongy wood fastened to a stone into the sea, and openly darted on it. Another added, on her part, that she, blowing into a pipe in the name of the devil, not only overturned a boat, in which were two young men, but, accompanied by three other witches, had brought destruction on a vessel: for which purpose the one assumed the figure of an eagle, the second of a swan, the third of a crow, and she herself of a dove, and all, sitting in the bottom of a tub, were carried over the sea from Vasoe to Domen, a rock so called, distant from Vasoe the space of a few miles, where leaving their ship, or rather the bottom of their tub, they fled aloft, and then untying the knots they exclaimed, Wind, in the name of the devil: when this was done they fled to the sea, and did not stop until they came up with the vessel they doomed to destruction; on which, in the above-mentioned shape, they all perched, one on the helm, two on the hatches, and one in the hold. Another confessed that she had destroyed a vessel that loosed anchor, and put into a creek, on stress of weather; for that on its putting out a little to sea, she approached it in the shape of a sea-dog and overset it. Another related that she, by putting two egg-shells into a cask filled with water, could take away the lives of men; she added, that a boat, in which were sailors, perished on twirling round the shells of the said egg.

As these sorceresses pretended by various methods to call up bad weather, and thereby destroy men at sea, so they spread abroad also that by one superstitious spell or another, instilled into them in their commerce with Satan, and by some fatal contrivance, they could bring on men disorders, that they could maim them, nay more, deprive them of life; one time by a draft of butter-milk mingled with herbs and earth, over which they repeated the Lord's Prayer; another by a draught of beer, in which was an active demon, with whom they were in understanding: now by a charmed piece of cloth of linen interwoven with a black piece of woollen, which they had concealed in a hole in the wall; at another time, by mixing the meat of the person whose destruction they aimed at with a certain matter, not unlike sea-weed; and lastly, by spitting three times on a knife, and anointing the victims with that spittle. A witch confessed that the devil, with whom she was leagued, was gone to Vardoe in the shape of a bird, called Strand-Erle, promising that he would take her to Bergen: that she should kill by her art a man, who lived at Sandvig, whom she hated.

Another woman was accused of witchcraft, practised on a poor girl after this manner: she turned her son into a cat, and made him roll himself before the girl, drawing a sledge of sand. The girl struck him several times when he got in, and killed him at last with the instrument in her hand. On her return she passed by the house of the said woman, when she came out and addressed her in these words: You have killed my son; may it be ill with you. Soon after the girl was distracted, and died.

Witches related various modes of tormenting cattle: one time they sat on the back of the poor animal, saying, Go, get away: giving him a little corn, they said, Eat, and be accursed; another time they brought the poor animal what is called the salt of envy.

Another foolishly related that she had given a little wool to her familiar friend, mixed with corn, to take to a cow, and added, that the cow, on receiving this medicine, burst on the laying on of her hand, and that the wool after her death was found in a large opening in the fleshy part of the thigh, without once hurting the flesh. Another said, that she had got milk from the cows of other people by applying a horn to their belly, and by milking them in another's name; the effect of this was that the cow first gave milk, then blood, and expired.

As sorceresses have feigned that they can injure man and beast by their magic, so also have they asserted that they can restore not only man, by the putting on of their hand three times, by fumigating with a lighted sponge the inside garment of a man, but also that they can restore cattle. And for this purpose, on the Lord's Day, they bring into the church with them some salt, when the herds do not fatten, and run over some reproachful and very ridiculous lines, when the milk fails in the cattle, the argument of which is not worth reciting.

Witches have ascribed to themselves, in their traditions, a variety of other ridiculous facts. One has said, 1. That she gave a spongy piece of wood to a young man, fastened to a stone, with this injunction, that whenever a huge wave attacked him, casting that into the sea, he should invoke her three times by name, and that the wave would bring him no harm. 2. That she had given to certain young men a drink made up of sea-water, of small beer, of whey, of river water, and of ginger, to prevent their dying at sea; that this was not to be drunk, but taken with a spoon, if it was to effect the purpose intended. 3. That she had given to a young man a linen thread, to another a woollen thread, to be fastened to the hook, promising them good fortune in fishing. Another feigned that she had crossed the sea from Vasoe to Kiberg, carried on broomsticks, the other who accompanied her riding on a black sheep. Another said that with other witches, by magic art, she had driven the fishes from the shore. At this inhuman work one exhibited herself in the form of a great fish, called Storje; another, in her own form, was covered with a black plate on the breast, a veil made out of a certain sky-coloured cloth, with a red mitre, adorned with golden tassels, and a white collar, and seated on the sea, and covered with sea-weed; she held one in her hand, called Tare-leg, which approached to the likeness of a horse-whip, by which she drove away the fish. Another said that she, in the likeness of a whale, did the same. Another witch lyingly related that she, walking on the sea, could collect the liver of fish in a bucket, which she held in her hand. Another said that she could transform herself into a cat, for which purpose an evil genius would procure for her the blood of that animal, with which she would besmear herself, and her skin for a covering. Of another it was related, that she had granted a shelter to a cat at her door, in a tub, who brought her whatever she wanted from any place she was sent to. Another was accused of having a green cat, called Smor-Kat, who fetched her from the pantry of others whatever she was in want of.

Even in our times there is a rumour among the common people, that sorceresses had chosen various places destined for their meetings, which they called Bal-Volde; such were Lyderhorn, a mountain so called at Bergen; the Bald-Vold, in Vardoe, in eastern Finmark; the Bald-Vold, in a place called Omgang, in eastern Finmark also, the same mountain, situated in the same region; Domen mountain, and Doffre, the southern part extending to Christiana, and the northern to the diocese of Drontheim, the Mount Hecla, in Iceland. In those places, at certain times of the year, especially on the feast of the Nativity of Christ, and the feast on the eve of St. John, sixty and upwards are said to assemble, in the shape of dogs, cats, wolves, crows, and other animals, when drinking together strong beer, water, and honey, they divert themselves in the dance and in play. What more:

having gone to this degree of folly, they have feigned that the evil genius has one time played upon a lute; another time on an instrument called in Norway, Langspil; then on the flute; then on a tabor; and on an instrument commonly called Luur, which is an instrument of nine inches in length, covered with a thin bark of the linden-tree, which the peasants, on feeding their flocks in summer, are accustomed to play on, as well for their own recreation, as to keep away from their herds the bears and other wild beasts. Nor indeed have they scrupled to assert that Satan himself had danced with them, and played sometimes at cards.

A certain one told that when she and other witches were assembled on the eve of the festival of Christ, the evil spirit had danced with them (what the dance was, Polish or English, I know not) when one of the witches lost her shoe, and the master of the ceremonies, by good fortune, put another in its place. Another said that she, together with other witches, was in hell (a thing horrid and ridiculous) in order to render the scene familiar to them, where an immense boiling lake was to be seen, in which were many men; she added besides, that the devil had an iron pipe, from which he breathed out fire, and that he had drawn out a piece of bacon, put into the same lake, which was dressed in an instant; she insinuated that the said lake was in a valley. Of her accompanying friends she related, that one put on the likeness of a cormorant (commonly called Krykke) another of a marine bird, called Havelde; another of a dove; another of a dark bird, called Skarv; others of jackdaws; and that she herself put on the form of a crow. Another said, that being at a certain place with another witch, called Hildere, they drank from two garters, from the one of water and honey, from the other strong beer.

As those witches related, it seems they could be in an instant of time, from their intimate commerce with the devil, day or night, one hundred miles distant from the place they were in, by his guidance. As a certain one said, that a certain person, living at Bergen, came to her in the shape of a dog, and that she took him to the Bald-Vold, which is in Vardoe, in the eastern Finmark, in an instant of time.

As they related, Satan appeared to them under a variety of unusual and most horrible appearances; one time like a black man, without a head; at another like a tall man, clothed in black, and a horned forehead; now as a rough and horned man, and afterwards as a black man, whose knees were horned, his hands and feet defended with nails, and his hair and beard black: another time he took the shape of a man with large and burning eyes, his hands black and covered with hair, and with a flame of fire coming from his mouth; then in the likeness of a cat, handling them from their feet to their mouth, and counting their teeth; and lastly, in the shape of a dog, a little bird, and a crow.

On their relation, the devil, when they are dedicating themselves to his service, impresses on them a certain sign, as on his slaves; he is said to have laid hold of the arm of one in such a manner that blood would flow from it; to have bitten the left arm of another; to have marked the left thigh with his nails of a third, and to have torn the left knee of a fourth with his talons.

That they should be more ready and easy to enter into league and amity with him, he assigns various innocent and agreeable names, as they say; such as Christian, Christopher, Jacob, Zacharias, Peter, Samuel, Mark, Angel of Light, Dominic, Abraham, Isaac, John, Martin, Olaus, Giermund, Asmodus, Frusius, Peace, and Saclumbus.

It is true that all these and more the witches had confessed on trial, and to this confession they were properly brought at the stake; but their witchcraft for the greatest part consisted, in my opinion, in fancy, in imaginings, and in dreams. It is even pro-

bable that their confession was extorted from them, partly by violence and fear; for it appears from the ancient law-books, or memoirs of Finmark, among which these matters are related by the law-clerks, that some have been put to the torture before they would confess; but that the magic art was formerly exercised I am not disposed to deny, when the devil is so powerful among unbelievers; and who would deny what the sacred page testifies by precept and example? All hitherto related belongs to the witchcraft of the Norwegians. I shall now enter and touch on certain rites of the Laplanders themselves, which they preserve in their practice of the magic art.

As to what relates to their tabors or drums, Runic words, a certain writer has imposed that name upon them, calling to mind that they were struck with a hammer. Runic drums of this sort, as well as I can recollect, resemble a kind of large box, of an oval form, yet differing something in that respect from the shape of common boxes: 1. That underneath they are open, different from those which in the lower part of them are closed and solid; besides, they have within a various assortment of thongs, which hang down, affixed at one of their extremities to the upper part of the drum, and laden with brazen rings and other such like baubles, given the owners by their friends, for the sake of greater ornament, and perhaps that by the sound and jingle of the rings the greater noise should be excited. 2. That as the common boxes are made to open and shut, and are covered with lids that move on hinges, Runic drums are found covered with a very extended skin, after the manner of common drums. On the outside of the parchment are painted various characters, on the bark of the alder-tree, of which some are to signify the deity; some Radien, or chief god, Jupiter, of the Pagan Laplanders; some the angels; some evil spirits; some Noaaide-Gadze, or the associates of the magician; some the sun; some Phosphorus, and the evening star; some temples; some the habitations of the Norwegian people; some Passe-Varek, or sacred mountains, where sacrifices were offered; some the habitations of the Laplanders themselves; some small sheds, propped on pillars, which are usually erected at a distance from cottages in the woods and mountains, adapted for putting up their stores; some the folds, within which the rein-deer in summer are brought to the milk-pail; some birds; some fishes; and others to represent bears and foxes, yet with some difference. Some of these characters are of happy omen, others unlucky and inauspicious; to the one the evil spirit and wolf are usually applied; to the other god the angel, Noaaide-Gadze, the bear, fox, &c.

The Laplanders, preparing for a longer journey, for hunting, and other matters of greater account, before they enter on it, usually consulted their Runic drums, in the following manner: A large ring was put on the skin, by which the upper part of the drum was covered, destined for this very use: the drum was then struck with a small hammer, made from rein-deer's horn, called in the Lapland Ballem, by which blow the ring was moved freely, but fortuitously, to different characters drawn on the surface of the skin, lucky or unlucky; whence an omen of the event of the undertaking was decided on. If the ring, by the blow of the wizard, followed the course of the sun, it augured the favourable event of what was taken in hand; but if it went against the course of the sun, a doubt then arose of the prosperous event of it. Whether a sick man should die or recover, they even imagined they could discover by Runic drums: the tree from which they were made should be at a distance from a place never visited by the rays of the sun, and removed from all other trees as far as possible. Runic drums were not thought sufficiently fit for their uses, unless got by inheritance. The wizard kept his Runic drum, as a secret not to be revealed, covered and rolled up in fillets or bandages, lest it should be exposed to the eyes of every one: the women were not permitted to touch them. Scheffer has given of these drums a tedious description.

Through Norland, and among the Laplanders, who inhabit the Sneaasen mountains, the Overhaldens, the Meragrians, the Tydalens, and other places in the government of Drontheim, Runic drums in great numbers have been found. I have given a kind of one, which a certain Laplander of the mountain of Meragrian, in the parish of Stordal, possessed, delineated and engraved. In Finmark, especially in that tract of country I first went into on my mission, Runic drums, as usually called, were seldom used, as far as I know, as they substituted in their place the covers of boxes and bowl dishes, laid over with various colours.

Yet traces of them in that country have been found; with a Laplander of Finmark one was discovered of the following kind: it was made from fir-tree, like a large hollow crater or bowl; the bottom was bored through with two oval apertures, and at each extremity a fox's claws were fixed, the upper part of it being covered, like a drum, with a skin, which was distinguished with paint from the boiled bark of elm, the colour of which is a light red, by four lines, into five different compartments, in each of which, between the lines, were seen figures expressive each of their own peculiar omen.

IN THE FIRST COMPARTMENT,

1. Was the figure of a man, called Illmaris, who was thought to excite bad weather.

2. The image of a man, called Diermes, which name signifies thunder; he, invoked by prayer, by divine will, as the Laplanders explained it, could produce fair weather and a serene sky.

A kind of animal called Godde, which signifies wild rein-deer. When the Runic was struck on, and the ring did not go to the image of this animal, it was a sign, that he who consulted the instrument on his prosperous success in hunting the rein-deer had lost his time.

ON THE SECOND COMPARTMENT,

1. The circle through which the cross line was drawn, whose name is Beive, which signifies the sun: this was thought to produce fine weather.

2. The image of a man, Ibmel Barne, that is, Son of God; this was thought to free persons from sin.

3. The image Ibmel Atzhie, that is, God the Father; this was believed to punish evil and to procure remission of sins: Christian death and salvation of soul.

4. The image of the sacred place of worship, which they called a cathedral temple, adding, that they there implored the good and salvation of the soul.

5. The image of a man, representing the Holy Spirit, to which the name of angel was put: he was believed to free from sin, to renovate man, that he should turn out a new creature; thus, by these three figures were represented the three persons of the Divinity. By each image, or picture, representing the human form, a stick, Junkar-Sobbe, that is, the stick of a noble youth, was seen painted; the reason of this was, as the rulers of the earth hold in their hand a stick, so the same was a suitable emblem for these.

ON THE THIRD COMPARTMENT,

1. An image of a female was seen, representing the sister of Mary; whom, for that opinion of her, was always consulted for aid and succour by child-bearing women.

2. The image of a woman, Maria Ibmel Aedne, that is, Mary the mother of God; she was principally thought to be subservient to child-bearing women, and the remission of sins.

3. Three images, Joulo-Beive-Herak, that is, the lords of the festival of the Nativity of Christ; first, Vuostes Joulo-Beive Herra, that is, lord of the first feast; secondly, Nubbe Juolo-Beive Herra, that is, lord of the second feast; and thirdly Goaal-Mad

Joulo-Beive Herra, that is, lord of the third feast. It was a belief, that he who profaned these days was punished by the Deity; but if, these days being duly celebrated, any one should ask any thing from the Deity, and during their celebration should put himself before the Deity, that, moved by this supplication, he would hear and assist him.

ON THE FOURTH COMPARTMENT,

1. Was seen the circle Mano, that is, the moon; from it, it was usual to implore fine weather and serene nights.

2. The images of two men, called Munne Olmuk, that is, as to the letter of the expression, men travelling; but, as to the sense or meaning, men going to church.

3. The image of a temple, to represent that which the priest frequents. To it he is represented as confessing that he and others are vowing and offering tapers, money, and other things, that aid and succour may be given to him on one misfortune and another; and that he dedicates those things to the pastor of the said place, which i. expressed by this painted building.

4. The image of a man standing near the temple, to signify, as it was expressed, a man going to the place of worship.

ON THE FIFTH COMPARTMENT,

1. The image of a woman, to denote, as it explains itself, the wife of a bound demon. The name is not known.

2. The image of a man a little below the one placed before it, to signify by interpretation the devil killing men, and is called Disease.

3. The image of another man, which is said to be the devil freely ranging about in hell and the upper air. A foolish opinion is cherished that this devil has escaped from the one that is bound fast, but the name of him is not known.

4. The figure | | | on the skin of the Runic has been interpreted, Helvet-dola, that is, hell fire, in which souls are thought to be burnt.

5. This figure ○ Helvet Tarve-Geune, is said to signify the pitchy cauldron of hell, in which it is thought souls are boiled.

6. This figure □ to signify Helvet-Haude, that is, the sepulchre of hell, into which all believing in Satan are said to be thrown.

7. The figure of a man, from whose neck a line was drawn to the column, to signify a bound devil, of whom mention was made above, to signify that there was an opinion, that from the creation of the world he was held fast in chains by the Deity.

For the purpose of this Runic drum the owner was provided with two Runic hammers, made from the horns of the rein-deer, called Zhioaarve-Vetzhjerak, horn hammers, with the one of which he is said to have struck the drum. Besides he had a small cover made of brass, to the upper part of which was fixed a brazen ring; with this, when going to exercise his art, he covered the skin of the drum, and proceeded thus: After raising up the Runic instrument, he vibrated it on this side and that, and, holding it in one hand, he struck with a hammer he held in the other the skin it was covered with. He then observed if this cover of brass, when the skin was struck with the hammer, should turn against the course of the sun, that fortune would be unfavourable to him in whose behalf the Runic cymbal was struck; and if, in its descent, it should not stop until it had touched one of the figures which were marked below the third line in the third compartment, that the Deity, excessively angry with him for whom it was struck, declared by this sign that he was a great sinner, and that the Deity should be most humbly invoked, if he wished the cover should recede; but should it

follow the course of the sun, it was a sign that he, in whose behalf the drum was struck, enjoyed good fortune.

But he said that he when going to use this drum marked himself and it with the sign of the cross, as an earnest of good success, subjoining the Lord's prayer, and these words: Ibmel Atzhje Barne ja Engel vækjet don, which signify, God the Father, Son, and Holy Ghost, assist me (I never perceived that the Laplanders called the Holy Ghost angel, but in all countries known to me they call it Passe Vuoign.) To these prayers he added more words, and on striking with a hammer the skin of the drum, he set in motion the brass cover on this side and that. In the midst of the work, he broke out into these words; Thou, O God, who hast created the heaven and the earth, the sun, the moon, the stars, and all men, the birds, and fishes of the sea, I am a man liable to error, old, and unworthy; it is better that I should die, than that you should deny your help to him in whose behalf we intreat you; here it is to be observed, that the Laplanders, speaking in the Danish language, use the first person plural, we, for the first person singular, I.

Another Laplander of Finmark gave this explication of his Runic drum. The talons of all animals which that country produces were suspended from it on every side; and on the skin covering the upper part of it, nine lines were painted from elm bark, each having its own omen. He also added, when going to exhibit, that he placed a copper bird surrounded with little bits of brass on the skin of it, and struck it with a horn hammer, covered with beaver's skin. By this impulse, the bird turned itself to the lucky or unlucky figures. He said, if this copper bird, when the skin of the Runic instrument was struck with the hammer, fell from it to the earth, that it was a sign that the same person would soon die. He further added, that when two wizards, called Noaaids, wished to know which excelled the other in the magic, that they painted two rein-deer striking each other with their horns on a Runic drum. The signification was, that he whose rein-deer had the victory was the better wizard.

There were among the magicians or Noaaids, who openly pretended that they were both able and willing to do injury to men and also to cattle. These, as we shall suppose, were dreaded more than dog or serpent. When such a person was going to practise his art, he ate wolves' flesh, or fox's, before he began, from a persuasion that he drew no small degree of strength and power from it.

Others, on the other hand, confessed, that they could cure various diseases, give their fishing and hunting parties signal success, and, of their own free will, confer the greatest possible benefits on those that stood in need of them, whence it is no wonder, that they were held in high estimation by the Laplanders, and celebrated by great praises.

The magician, whenever called to the assistance of a sick person, conducted himself in the following manner, as the Laplanders relate: He thus spoke to the Noaaid-Lodde, or his magic bird, Haette dal Kotzhio duu matkai, that is, necessity compels you to undertake a journey; on which words he solemnly sent the said bird to the Noaaid-Gadze, that is, the partnership of the magician, or certain spirits addicted and bound to the attendance of the magician, when come to him. Two colleges, the one visible the other invisible, were instituted for the Noaaid-Gadze, or society of the magician, assembled by the ministry of the said bird. The council which was called invisible consisted of the magician and two women, adorned with a linen hood and all the rest of a religious dress, except the girdle. These women were called Shjarak. To these members were added others; a man without a hood and girdle, and a girl not as yet adult. The man

in his office was called Mærro- Oaave. The magician had collected all these members in that place where they tried the cure of the sick man. At the invisible assembly (so called, because visible to the magician alone) Aarja presided, the Nouaid-Gadze, the companions of the magician, as well as the two women, which the Aarja added to this invisible college, sitting together with him. Women chosen into this invisible college were called Rudok.

Each college, visible and invisible, duly called and provided, the magician prepared himself for his journey, that will be described more at large by us, who, that he might act agreeably to the rules of his art, after uncovering his head, and loosing his girdle and latchets, covered his face with his hands, and twirled round his whole frame into a variety of circles, with wondrous and strange gestures, adding these words, Valmashstet Haerge! Satzhja let Vaanas! Let the rein-deer be got ready, and prepare the boat, he said, and snatching up an axe, he dragged the burning pieces of fire with his bare hands from the grate, asserting, with confidence, that he had nothing to fear in this state from raging flame. Then, taking no small draught of brandy, he struck his knees, not slightly, with the said axe, and, raising it up with both his hands, he brandished it three times around each of the women Shjarak. During this time no one was permitted to touch him, not even a fly, which they drove off with the greatest care. When he had gone through these ridiculous, and almost furious, gestures and ceremonies, he stretched himself, like a dead man, on the ground, under which desertion of mind or trance, as it seemed, made up of body and mind, he lay; that while his body lay in the cot, to be viewed by all, his mind, if you believe the Laplanders, through some subterranean passage, when all sense for the time was shut up, should view the Passe-Varek, or sacred mountains, with their inhabiting gods, and hear the songs, called in the Lapland Luodiit, which were usually sung in the invisible college in this trance. During this time the aforementioned women, Shjarak, were seated in the tent, adorned with all their dress, discoursing in a low voice (a discourse of this kind was called in Lapland Monataebme) as asking each other what part of the world now held our magician; one part or other of the sacred mountain being constantly mentioned by them. If it happens that the women in their conversation should have fallen on the name of the mountain in which the magician, when the extacy is over, has asserted he has been taken, on the bare mention of it he seemed in the trance, to them, to move his hand or foot. Mean time continuing their discourse, they go on to ask, whether in that place, in which he has been taken up, he either sees or hears? The magician, when at length he returns to himself, utters, in a low voice, the words which he boasts he heard uttered in the sacred college; words such as these the Laplanders call Zaabme. The women, sitting together, finding out that the magician is returned to himself, began, with a clear and loud voice, to sing. These and other such diabolical rites and gestures being completed, the magician, returned to himself, signified, by clear and open expressions, that a sacrifice is to be made, an animal to be slain, at the same time naming the place where it was to be done, and interposing his faith that the sick man would recover within a certain and limited space of time; which sometimes did happen with exactness and order, at another time not. For the whole day before the magician entered on this business he refrained altogether from meat and drink.

But it appears among all by whom the manners of this nation have been inspected and examined, that the said women Shjarak, had ever been present with the magician, when exercising his art in the college called visible, as witnesses of the achievement: it appears also that the magician had used in this act ceremonies and gestures, such as loosen-

ing of his girdle and latchets: his striking his knee with the axe; his taking burning logs from the fire, &c.; and lastly, his prostrating himself on the ground like to a dead man. It is also beyond doubt, that the said women during the act had muttered to one another, and that the magician in his trance had began to move hand and foot a little to their discourse, and soon after the office of his senses returning, that he had uttered in a subdued tone of voice the words Vuolet-Zaabme, and that when at length coming to himself, he had advised and commanded a victim for the restoration of the sick man. All this is so correct and true as to admit of no doubt; but the remaining part I submit to the understandings and belief of the judicious reader.

Passe Varek or sacred mountains will seem wonderful to no one when mentioned on this occasion. That there were such in this country, honoured with divine worship, besides many other places of sacrifice, is plain from the idolatrous worship of the Laplanders, and from the traces to be met with at this day. I myself have been an eye witness of them. That the Pagan Laplanders, and especially their ministers, men inspired, should have in their minds these mountains and their inhabiting gods, is a matter easy to be believed. And it may be easily also inferred that the magician engaged in the cure of the sick should have his mind fixed on these sacred heights, by a certain manner of reason, suiting the thing itself. Moreover, when the objects that occupy our thoughts when we are awake lay hold of them when asleep, it is no wonder, that the magician in this act, which was all done in a deep and profound sleep, procured by the brandy he had drunk, placed beyond the power of all external objects, should see his favourite hills, their gods, and other objects before his senses, and hear them calling for victims for the restoration of the sick. And as all this is the business of magic, and the invention of the devil, it follows, that the wicked spirit is the contriver and adviser of the councils, and that he has the greater share in directing it.

But this has not been the only practice of medicine among them; that others were practised will be manifest from the following account. A certain Laplander from Porsanger bay, by name Mellet Olsen, an honest man, free from guile, told me a story of two other of his countrymen, that, when going to practise medicine, made use of the following method. On the eve of Christmas, they slew a young rein-deer, and boiled the meat, certain small pieces of which, together with a little butter and cheese, and a few cakes, they put in a small skiff fabricated for that use. Having prepared in this manner a sacrifice, they piled up a great heap of wood, on which they placed the said skiff, just mentioned, with the sacrifice itself, in order to remain there during the festival. When the feast was over the skiff was looked for on the pile, but no where found, while Mellet seriously affirmed, that no body knew what had happened or where it was put; yet there is no doubt but the sacrifices placed in the skiff were offered to Joulo-Gadze, or to the company of Yules. The same Mellet Olsen related to me a story of another of his countrymen, an inhabitant of the same bay, that when about to take sick persons under his care he was accustomed to attempt the business in this way. Brought in his boat gradually and slowly near the shore, where there was the most convenient landing, he put in, and getting on the main land, he brought a stone of no moderate size to the boat, and spoke to it, after turning it round and round, often, in words which Mellet apologized to me for suffering to escape his memory. On his return home he brought the said stone with him, and placed it under his pillow, and often addressed it, drawn from under his head, in the same form of words.

The Gan fly is besides numbered among their magic instruments most remarkable, wherever it is known, as an instrument of injuring. The Laplanders contend that they were flies, but you would say that they were evil spirits, under the name of flies.

They add that the sons receive them from their wizard parents, and that the evil spirit, on the failure of these, furnishes new ones, under the appearance of a horrid and deformed bird. They mention too, that they are kept in a certain box commonly called Gan-Eske, to be forth-coming, equally to injure man and beast, at a seasonable moment, and that the manner of exercising this execrable art consists chiefly in this, that when the wizard orders his flies to fly out from his box an injury is done to this or that enemy, by whom he contends an injury has been done at one time or other to him, yet with this due caution, that like be done for like, and that the revenge does not extend a nail's breadth beyond the injury received. The flies, on receiving the order, instantly fly out, and discharging their orders, return again each into his own box.

Should a swelling appear, not unlike the figure of a flounder (called in the Norwegian Flynder) between the flesh and skin as something alive, moving this way and that, it is a sign of the hurt received from the contact of the flies. Such a symptom was formerly not unusual among the Laplanders. Besides, did the belly swell, did blood flow from the mouth and nose, sudden death succeeding, no doubt the remained but that the man, labouring under such symptoms, was seized by poisoned flies. He who was so infected, and was ignorant of the magic art, so as not to be able to recall his former health, implored assistance from another, who was thought able to repel the malady by the same means it was brought on. There was a magician, who was struck by the fly of another, is said to have cured himself. The degree of belief attached to these stories is great with the Laplanders, from whose mouth I relate what I have heard from them.

A certain writer mentions that the Laplanders take vengeance on their enemies by small short leaden arrows, which, infected with poison, they shoot very far, bringing various and dangerous maladies on them by this means, which turn in the arms and legs into cancers and other such ills.

The Juoigen signifies song, which some of the Laplanders usually sing by intervals, but so confused and broken that it bears more likeness to a howling than to an articulate voice. There are Laplanders, who innocently and solely for amusement sing their Juoigen, these are named Maargos; but the Juoigen of others is altogether superstitious, thinking they can keep off the wolves from molesting the cattle by such a song, and that they can drive them away altogether, which can be gathered from the following verse, they are used now and then to sing. Kumpi! don ednak vahag lek dakkam, &c. Wolf begone, author of many ills, here you shall no longer stay: hence begone to the extreme parts of the world, or mean time you shall be transfixed with arrows, or you shall perish by some other means. Some magicians sing as well in the exercise of their art as out of it; others never. These are called Judakas and Juraak in common.

The magician, when called on to recover things stolen from their owners, is said to proceed in this manner. He poured brandy into a bowl; and inspected the liquor, shewing the face of the person who looked into it; calling by name one or another whom he suspected of the theft. And as the liquor returned the countenance as a mirror, the very cunning juggler pretended that he saw the image of the thief in the liquor, and openly charged him with the theft, adding threats that he himself, unless he returned the property stolen, would knock out his eye, or maim some member of his body. On which the thief, dreading the effects, lest he should be deprived of an eye, or mutilated in any of his limbs, restored what he had stolen without delay to its master. The magician, intent on the liquid, usually repeated some solemn hymn.

Those of the Laplanders, who were detected in these nefarious practices, were not admitted to the church, and the participation of sacraments, without previous confession and public absolution, while Von Westen, the vicar, was living; a man who merited the greatest praise from the church, but who has immortalized himself, from his instruction and conversion of the Laplanders.

CHAP. XXII....ON THE VARIOUS SUPERSTITIONS OF THE LAPLANDERS.

That the Laplanders were formerly addicted to a variety of superstitions is sufficiently well known. With some Thursday was kept holy, at least it was thought impious to handle wool on that day. Almost all held Saturday, some Friday, as holidays, calling this latter Fasto-Beive, that is, the day of fasting above the rest.

A maritime Laplander of the name of Peter Peterson, dwelling in one of the bays of west Finmark, and Parish of Kielvig, commmonly called Smorfiord, told me that when he once went out to hunt hares on a Saturday, and was from fatigue seated on the ground, that a spectre with a human visage and dark garment appeared to him, asking him what he did there, and on his answering that he came to hunt hares, which he intended to give to his priest, the spectre replied, what, do you think that hares taken on the Saturday, which should be observed with the greatest veneration, can be acceptable to your priest? And then subjoined in caution, that he should carefully guard against violating Saturday, or any other holy day for the future, by any profane exercise. He added that from this profanation of the ancient festivals, that the wild beasts, birds, and fishes, abhorring and detesting the impiety of irreligious men, quitting their haunts, had fled away, and hastened into other countries. That the same spectre, which hitherto presented itself in ragged garments, had soon after appeared to him in a more sumptuous habit, addressing him in words of this kind: you will sacrifice a cow to me; when this is done, the sea, the air, and earth, will bring forth again fishes, fowl, and beasts. When this conversation was ended, the Laplander, you will suppose in consternation and disorder, returned home, sat a little, but soon drew his knife in a rage, and in the midst of these agitations of mind and body fell like a dying man to the ground. His servants faithfully attended on him under this loss of his understanding and senses, striving now and then to awaken him, by slight blows, but in vain. Meantime the apparition which appeared to him in hunting presented itself to him in his vision, using these words: you will never recover from this disease, unless you sacredly promise, when you get well, that you will, with due rite, sacrifice a cow to me. The unhappy man made this promise, and immediately awoke from his trance, but so weak that he could not walk; and as he fancied even still to see the spectre walking up and down before him, he cried out with a loud voice to those present to help him, and drive off the spectre lest he should rush in upon him. Restored at last to himself, he sincerely laid open all he saw and heard, gravely and severely injoining, that none of his people should attempt to profane the Saturday, or any other day that was sacred and festive. He ended here, and instantly recited the Lord's Prayer, and part of the catechism. On the next day, this said Laplander was visited by a great many who had accidentally heard these matters, to whom he gave a sincere explanation of all that happened to him, and attempted to persuade them to bring back and restore Saturday, and all the other festivals of old, which through time were brought into disuse, and should for that purpose sacrifice lambs in order that the former plenty with which the country abounded should be restored. Some obeyed his monitions, while others took the whole vision for a mere illusion and juggle of the malign spirit.

For my part, what to think of this vision, whether it may be true or false, I leave to persons of reflection to determine. This at least I can suggest, that the Laplander to whom it happened was a simple and honest man, free from fraud of any kind. Besides, when it is remembered that the infernal spirit can change himself into a thousand forms, it was easy for him, who did not scruple to tempt the Son of God, in whom were hidden such treasures of wisdom, thus to attempt and circumvent with his wiles a poor simple man, incredibly weak and helpless in himself, that he might lead him with others out of the true way to his destruction.

It was a custom with them solemnly to keep the Nativity of Christ, and the sacred days of the holy virgin. A Laplander of the coast from a bay in the parish of Alten, called Lerrets-Fiorden, of the name of Andrew Peterson, related that a certain object had presented itself to him, when once he was bringing a load of hay from the shed called Loaawe, on which we treated more at large in another place, as fodder for the cattle, on which according to the old style the Christmas was to be celebrated. The story is thus. When overcome with fatigue, the Laplander had sat down on his way, he heard a hissing noise three times repeated, on which in dismay he exclaimed, O God, come to my assistance I pray you! He rose instantly on this, and laying aside, or dissembling his fears, he hastened home, but on his way was addressed by a clear shrill voice; stop friend, I wish to speak a few words with you; on which he stopped, and turning about he perceived a figure opposite to him of human shape, in a splendid dress, severely reproving him, because on that day, on which the festival of Christ had fallen, he was not ashamed to undertake such a business, seriously affirming himself to be the messenger of God, sent from Heaven for this purpose, to instruct him and others, that the Nativity of Christ, and other holidays old style, were to be kept holy, and that the innovation of violating this, as well as other festivals, was rashly introduced, and that such an institution was merely human, and therefore of no authority and obligation: that Thursday from twelve o'clock to evening, and also Saturday, were to be religiously observed, and that the reason of the distress of grain, and other calamities with which men are afflicted, is chiefly to be found in that irreligious profanation of ancient festivals. He spoke, and instantly disappeared in air. The Laplander hastened home as fast as he could, but before he came there his speech failed him, and he fell as if lifeless to the ground, and no doubt would have died in that situation, had not some persons been at hand, who, seeing the danger of the man, took him home to his cot, after lifting him up just dead in their arms. After remaining some time in this state he awoke, related what happened, and seriously admonished his friends, according to the mandate of the angel who appeared to him, to be observant of all the old festivals, particularly Thursdays and Saturdays, all of which should be sacredly and religiously revered. Let the reader make his own reflections on this story, as on the former.

The day before Christmas the eating of meat was forbidden. A young Laplander told me, that on attempting to eat a piece of meat, that he had taken from off the fire, he was not only reproved by his father, but the meat was taken even out of his mouth by him, after he was severely chastised for attempting to eat it.

The evenings preceding the birth of the Saviour, and the feast of the Virgin Mary old style, were also fasts; the one for the good education of boys, the other in honour of the Joulo-Gadze, or assembly of the Yules, of whom we spoke in chapter the nineteenth, on the gods of the Laplanders. On the birth of Christ it was a custom, that the women should pile up boiled meats of various kinds in their aprons, and should carry them to the cow-house, to be hung up in it for three days, and on the third day to return, solemnly to consume the provisions they had laid up. It was also a custom to set food on the same day before the crows.

For a husband to lie with his wife, under occasional visits of illness, was accounted wicked; neither was he permitted to touch her clothes under such a situation. It was also interdicted to her, while under this illness, to walk over the foot of the husband, which was stretched out, as he sat on the ground; nor was it permitted her either to go over his gun that was on the ground, or to climb to the top of the hut, or to tread on that part of the shore where the fishermen usually exposed their fishes, or to milk the kine. When they recovered, they usually washed their heads in water from the cauldron; which when done, they took care that the cauldron should be cleansed with bran, and that a cake should be afterwards made in it, which women alone were permitted to eat of.

A woman when with child looks to a certain star which is next to the moon, judging, from its nearness or remoteness, whether the young she carries in her womb should yield to fate, or be born under a happy omen.

To put a handle to an axe in the house of a lying-in woman was impious. The Laplanders cautiously provided against any thing twisted or knotty in the garments of a person under such a situation, led by a vain imagination that such knots would render the birth of the woman more difficult. The garments with which she was clothed when in her labour she soon put aside, never to put on or wear again. She was kept to that part of the hut where she lay in, nor was she permitted to change until she rose in a state of health.

The Lapland women, for the most part, suckle their own children, some two years and upwards. They were of opinion, during their ignorance, that the children would enjoy a greater degree of felicity the greater number of fasts they were suckled from the teat.

It was customary with the Laplanders to name their children according to their dreams.

Besides the names common to the Laplanders with the rest of the people of Norway, and given them by the priest at the time of their baptism, as Nicholas, Olaus, Peter, &c. which according to the genius of the Lapland language are differently written and pronounced; as Anders in the Lapland sounds Anda, or Adda; Svend, that is, Sveno, Spein; Jens, that is, Janus, Junthe; Joseph, Juks; Lars, that is, Laurentius, Lalla; Nicolaus, Nikke, &c. Some had names given them from a kind of baptismal fount at home; as Utze Beivatzh, that is, Little Sun: Quive, Mielze, Akkie, Guia, Nokke, and others of this class. For it has been a custom formerly, which is even retained to this day, of which I have been an eye-witness, that infants, from the day of their birth to a confirmed age, should be daily washed in a warm cauldron; which practice, as it is undertaken solely for their health and strength of body, has nothing hurtful in it. If the child is to have any other name than its first genuine one, that is given in the first washing, when the navel-string is loosed from it, in this form of words: De mon baasam duu dam Nabmi N. N. ja dam nabmi bunurist kalkak aellet, I wash thee in the name of N. N. in which you will thrive. During this time some one name, either of the aforesaid, or taken from its ancestors, is given to the infant: the holy water was boiled together with the bark of the alder-tree, and sprinkled on the infant. When afterwards the child falls ill, or cries more than it should, it is imputed to no other cause than because a just and genuine name was not given it; and also asserted, that there was an ancestor by whose name he could be more properly and fitly called. A new washing was undertaken when a new name was acquired, taken from one of his ancestors; and this is the reason why you meet with Laplanders frequently that have two or three names, one of which is given in baptism, the rest in private washings. But it would be an easy matter to prove by instances that there are Laplanders, who, besides the family name given by the

priest in baptism in the usual manner, had also other names: one example will be sufficient. When at a place at Porsanger bay, called in the Norwegian Horrigen, in the Lapland Vueppe, there were two young men, one named Nicholas, the other Gunner: whenever these spoke together, by a custom received in Norway, they addressed each other as if named alike, using this form, Gaimazhjam, that is, my dear namesake. This seemed strange to me at first, well knowing the one was named Gunner, and the other Nicholas. The circumstance explained itself, when, in addition to the baptismal name, I learned that another, and a different one from it, was given to each in the domestic washing, namely, Quive, by which they were each double named and namesakes.

When the ceremony of washing was over, a certain meat and drink, called in Lapland Noaaide Borromush and Noaade-Jukkamush, that is, magic meat and drink, was prepared for the child, to the intent that he should take in with these feasts the magic art, and that he should be solemnly initiated in them. Then a solemn feast was made for the sake of him, which, when it was ended, they took care that he should be instructed in the Juoigen, or that very celebrated song, so familiar to and so much used by the Laplanders, so that the boy before he could speak distinctly had mastered the elements of this rude melody, or, if it pleases better, this howling. They further taught him, as he advanced in years and understanding, the mysteries of the nefarious and diabolic art, and the whole method of idol sacrifice and worship. It was a custom with them to put a piece of steel, as a charm against any ill, with infants in the cradle.

It was customary too among them to offer vows up in the temples for the recovery of the sick, which act was called in the Lapland Kirkoi Zhjuorvot, to invoke the temple. Some Laplanders, discharging this duty, usually rowed out into the open sea, and in boats, which they turned round three times with the course of the sun, made their supplications on their bent knees. They declined being numbered in the registers, or telling the amount, lest a computation of this kind should portend and entail on them the destruction and death of their friends. In the coffins of the deceased it was their custom to put up food, that they may have wherewith to subsist on. A deceased person was laid in the porch of the temple of Alten, on account of the cold, which was at the time extreme, and prevented it from being then buried, in order that it should be taken to the grave, when the weather would admit. Meantime it happened that some curious person removing the lid, and looking into the coffin, perceived a spoon and a cake of meal baked, lying by the side of the corpse. They are also said to put up the bow and arrow they usually used when hunting in the coffin with them. The rein-deer which drew the deceased to the grave was slain as a victim, and, when eaten, the bones were interred. When the body was buried, it was usual to cover with a stone that part of the cot where the body lay before sepulture: and as often as any of the family died, they instantly quitted the place and went elsewhere to live.

It was a practice among some to hang up a sheep's bone, wrapt up in hay and wool, in a hay-loft, to protect the cattle, as they superstitiously feigned, against the injury and severity of a cold March. To mark the cattle with the sign of the cross; to hang on a cow, near the time of parturition, a piece of steel to hit against, and give good luck to the young, and to mark also their front, when just born, with the sign of the cross, after sprinkling equally the dam and the young with flour, was customary among the Laplanders. It was counted impious in the males to feed on the beestings of a cow that had just calved, unless they were sprinkled with meal.

It sometimes happens that the rein-deer are suddenly carried off by death, for which reason the Laplanders, in possession to-day of large herds, have in a little time few of them left. They impute such a calamity to the place, and for that reason not only quit

it, going to another at a considerable distance from it, but burn all the excrement of the animal before they depart. Women are not permitted to eat the flesh of the head of the rein-deer. It is not permitted to males or females to eat of the limb of any animal, when they have felt a like pain with it in their own; so that should a Laplander happen to be ill in his eyes or back, he should religiously abstain from the eating of the eyes and back of the animal.

The Laplanders to a man refrain most obstinately from eating swine's flesh. If you inquire the cause of this abstinence, they tell you that swine are the magicians' horses. That they are averse to it in reality I am convinced; but the true cause it has not been in my power ever to ascertain, nor will any one easily be led to think that they themselves assign the true reason. But they call the swine Tazhja-Guouzhja, that is, the Norman, or Norwegian, bear, doubtlessly for this reason, that this animal, whose flesh the Norwegians so eagerly eat, is not much unlike the bear in form.

They have a fancy that beasts, birds, and fish, are averse to the places where sacred buildings have been raised, and for this reason very seldom attempt hunting in places of this kind, by reason of their distrust of success. Whenever any of the family went out to fish, those who remained at home thought it impious to put a brand in a vessel filled with water to extinguish it, lest an injury should happen to the fishermen. On their return they did not like to spread their fish on that part of the shore which the women frequented, thinking if they did that their success would be baulked by it. Whenever a Laplander took a greater flounder, as called, he usually marked it with the sign of the cross, when he took out the hook. It was accounted impious to put the water in which this fish was boiled before a she-goat to drink, lest the abundance and catching should derive any detriment from it.

They are not very willing to call a bear by his proper and genuine name, Guouzhja, fearing lest so doing the savage beast would tear their herds more mercilessly; they call him then, suppressing the name Moedda-Aigja, the old man with the fur garment.

Bears when killed have been brought home in a kind of triumph. On their return they erected a cot near that in which they resided, into which they did not enter until they had at first stript off their clothes, considering it as impious to enter it in the clothes in which they had killed the bear. The males stayed three days here, but the women during that time inhabited the cot: in the mean time no one was permitted to enter the dwelling of another. In the newly erected cot the males cooked the bear's flesh; on which occasion they did not use the accustomed term Vuoshjam, cook, but Guordestam in its place. When cooked the men regaled themselves with it, giving part of it to the women, with special care that they should not have any part of the haunch, nor that it should be given them through the usual door, but put in through a rent made in the covering of the cot, in the place where the pots and kettles were put, mentioned in chapter the fifth. Through this place, by which bear's as well as rein-deer's flesh was put in, neither entrance nor outlet was permitted to the women. When the bear's flesh was consumed, the bones were laid in the earth; and after three days that they lived separately, a mutual intercourse was then opened for them. He who had the good fortune of killing the bear, from that time took it ill if any one passed behind him.

Scheffer tediously describes a great number of superstitious ceremonies used in bear-hunting, the truth of all I cannot vouch for, neither from what I actually know, or hear from others; for in that part of the country in which I discharged the function of a missionary a bear was seldom killed; and to the whole of this account of his on this part of the subject I agree; nor is there any thing in it that exceeds an ordinary belief, in my opinion.

When discharging leaden balls from their muskets they make use of obscene expressions, and were of an opinion that the wolf had the power of fascinating their pieces, and could prevent their hitting the mark.

A certain bird, of black colour, with a white streak going round the neck, a constant inhabitant of the cataracts, called in Lapland Knoik-Garheek, in Norwegian Elve-Kald, was counted lucky; could any one catch such a bird, he kept it carefully, and had it in great estimation. A certain Laplander of the mountains, by name John Jonsen, by the Laplanders called Hano, a man of wealth, living at Ozejok, a place then belonging to Swedish Lapland, was said to have taken a bird of this sort, and to have kept it alive as a thing of sacred and inestimable value, in a white shoe, or Kamag, and would not fling it away when dead, but preserved it as an object of great value, little doubting that fortune would be propitious to him while he kept this bird. On this man see more in chapter the fifteenth, on the manners of the Laplanders.

If any man happened to come under a tree where the cuckoo kept, and it raised its note before it fled, he thought it a happy omen for him. To have found the eggs of this bird was regarded as a happy omen; the head of the person who eat the eggs of such a bird was to be covered with a kettle. To kill a cuckoo was always thought ill luck. And if any one heard him when fasting, in the beginning of spring, this was deemed an unlucky omen, that he would be on bad terms all the next year with his neighbour. To avert this bad omen he forthwith tore the bark from the first tree that presented itself to eat, after going three times round it.

If any one in the beginning of spring had heard the cry of the Lom, a kind of large bird, when fasting, he persuaded himself that all that year's produce of milk could not be curdled, or turned into cream, but would be like whey. They had a superstition too, that if they played with fire, even in jest, that the young of the rein-deer would be blind. It was a custom also to mark the doors with the sign of the cross.

It is apparent that the sun in Lapland, in the winter, for the space of seven weeks, is below the plane of the horizon, and under the lower hemisphere; and that the same does not set in summer for the said space of time; and hence a custom, that on its return after seven weeks darkness they anoint their doors.

They have a foolish belief that stones, which are weightier than their size and outward figure seem to require, had in them something preternatural and uncommon.

They believed that thunder struck their wizards with horror, even killed them. With this persuasion not a small number of Norwegians was impressed. Hence the proverb, That if thunder did not exist, wizards would destroy the universe. They say, that on the sight of lightning, they run up and down the woods, struck with horror, until they find a hollow tree to conceal themselves in, which was just blasted with lightning.

There is no doubt but that the Laplanders cherished many more superstitions, but to dwell longer on them would be tedious, having already adduced examples enough to prove to demonstration the errors of this most miserable people.

CHAP. XXIII....ON THE LAPLAND MISSION.

A certain distinguished bishop of Drontheim, named Eric Bredal, who filled the episcopal see from the year 1643 to 1672, exerted himself with the greatest industry in the instruction of the Laplanders in divine knowledge. He not only made learned masters, but even in his own house took care that the children of the Laplanders should be instructed, as also at the houses of many of the clergy in the country. Those

who had attained a due knowledge of the divine truths were dispersed here and there through the mountains, by the command of the bishop, among the Laplanders to be yet instructed in their duty. Yet this distribution did not produce, from a variety of obstacles that occurred, that instruction and conversion of the Laplanders to the extent that was wished for. But the royal mission, which was most graciously instituted in the year 1714, has brought the Laplanders to that degree of Christian knowledge, surrounded before with thick clouds of error, that the light of the divine evangelists and the glory of the Lord now shines on them, which, as being the singular blessing of the ever adored and Almighty God, united with the unwearied and christian endeavours of the Danish kings, the whole band of Christian princes should follow with gratitude. This mission extended through all the governments under the Danish sceptre, and of course through three provinces, namely, Finmark, Norland, and no small part of the province of Drontheim.

This pious and glorious work was begun in the following manner: Frederick the Fourth, of blessed memory, when he came to the throne, sent a certain expert and able man (for he had long before turned over this mission in his mind) named Paul Resen, to the northern countries and Finmark; who, on examining these countries, should bring in an exact report of them to his serene and royal majesty. This Paul Resen, who was afterwards commissary and camp master at Bergen, reported his knowledge on this matter in the year 1707. When this was done, his majesty issued his mandate to Doctor Peter Krog, bishop of the diocese of Drontheim, for the purpose of selecting capable men for discharging the duty of the mission in the northern countries, and in Finmark. In the year 1714 a strong hand was put to this work, as mentioned above, yet it is as yet reserved for the glorious undertaking of their serene majesties of Denmark. A college was therefore erected at Copenhagen, for promoting the progress of evangelical learning, by the father of his country and of the church, in the seat of empire, who, that he might the more easily compass his object, joined his counsels with men of considerable knowledge, and such as were zealous for the extension of the church of Christ, natives as well as foreigners, concerning the completion of this pious and glorious work. This plan made for the conversion of the Gentiles, containing thirty-one articles, he took care should be printed on the nineteenth of January 1715, in Danish and German, which, by a circular letter, signed on the ninth of March of the same year, he sent not only to all the governors of the provinces and the bishops, in Denmark and Norway, commanding that they should publish it in their own provinces, but sent it also to others, natives as well as foreigners, particularly, in a letter written in Latin, to the Society at London for propagating the knowledge of the Christian religion. When this was done, promises of aid and counsels for supporting this work came from all quarters. Seven very learned men and divines of the kingdom peculiarly zealous for the propagation in the diocese of Drontheim composed this glorious counsel: these were Janus Juul, pastor of the church and president of the Nordmaern presidency: Amund Barhorv, pastor of the church of Quernaes, in the same prefecture. Thomas Von Westen, then pastor of the congregation in the presidency of Romsdal, afterwards reader of theology at Drontheim, and vicar of the college of mission, &c. &c. &c.

After these had successfully discharged the duties of their trust, three pious and worthy missionaries were sent into Finmark, in three divisions; the first into Waranger and Thana, in the east; the second into Laxefiord bay, in the east, and to the bay of Porsanger; the third to Halsund, and the district of the bay of Alten, in the western Finmark.

But the great inconveniences that the Lapland missionary has to struggle with may be easily judged, from the reception he meets with in the hut of the maritime inhabitant where he puts up; from his living among his cattle; annoyed with their nastiness; the disagreeable and offensive smells excited from it. What this is may be easily inferred by those, who, from their early days, have not been used to this situation.

Nor is he better off with the mountain Laplander. His habitation is no better than a small boughed cot, full of rents, which are not even in the middle of winter stopped up.

He is ever annoyed with thick black smoke: from the instant the fire is lighted the whole cot is filled, from the vent-hole in the roof to the bottom, with an abundance of the foulest smoke, that the eyes can scarcely be opened without injury. As the fire kindles up it decreases a little, that, should a traveller sit even on the ground, yet he cannot get out of the sphere of it; but never is he more plagued than when the wind vehemently blows all over the cot; then it rages with all its fury; that, enveloped in a thick mist of it, he is surrounded, not without a signal injury to his eyes.

To this is added the further molestation, equal to the former, namely, the vapour that ascends from the wood fresh cut and moist, when laid on the fire. The foul vapour of this is sometimes even worse than the smoke itself.

To the other incommodities is added, and with reason, that insufferable cold, which attacks this quarter of the world beyond the conception of any man, and even penetrates with ease into the open tents of the Laplanders. For it often happened to myself while among the mountaineers, that, on walking in the morning, I could perceive, under the blanket of skins that covered me, my breath turned to a hoar frost. When sitting to write on the floor of the cot, on the desk placed between my legs, though the inkstand was placed near the hearth, heated with a constant fire, yet it has happened more than once that the ink froze, while writing, in the pen. When I took a place at the fire to warm myself, my feet, as turned to the hearth, were warmed even to scorching, while my back, which was from the fire, trembled almost through cold. But the excess of the cold in winter, how great it is in the Lapland mountains will appear from this account of mine from experience. A fire is kept continually burning, as is the custom of this people, piled up in the middle of the tent, recruited with fresh fuel perpetually put on it. The covering is at the distance of three ells from the fire-place. This when stated, who could imagine that a blazing fire, and bursting out into high flames, could not prevent its freezing within, or at least that it would thaw, and prevent the cold from hardening frost in the tent? But the very contrary is the effect. For, when sitting before the fire, I well remember, what exceeds belief, I found that part of the wall which, by reason of the shade of my body did not receive the heat of the fire, frozen, and retain on its surface as it were my likeness painted in white.

Nor was there a small inconvenience from the want of good and wholesome beverage: for whether in the tent of a mountain or maritime Laplander, there was nothing to quench the thirst but cold water, sometimes mingled with snow; and on failure of this, the snow alone was melted in a kettle over the fire.

Nor must a missionary expect, in hospitable receptions of this sort, a soft and downy bed, in whose place is substituted a rough rein-deer's hide, on the bare ground, or at least on a few planed pieces of wood, with the traveller's clothes placed under his head as a pillow. When laid down to repose, he well nigh touches the snow with his head, removed at least from it by a palm's space; for he lies on the ground, his feet toward the fire, and his head against the wall, which, as observed above, is on the extremity surrounded with perpetual snows, and intrenched as if by a rampart.

In addition to all these incommodities which gather round a missionary in this part of the world, that inquietude, painful enough, arising from being necessarily constrained to the cot of the Laplanders family, is still in the rear. When at leisure for study and meditation, the mind looks for retirement and tranquility. But the missionary must meditate in the cot itself, in the midst of the occupations and talk of the servants, the crying of infants in their cradle; or he must walk out in the open air, where the cold and falling snows in no small degree disturb his mind, intent on study and meditation. All these evils I have experienced, not ignorant that you my brethren will have to struggle, appointed to the same office, as I formerly have been, with all the incommodities and molestations I have just described.

It sometimes happens that a missionary traversing the mountains in winter, in discharge of his duty, comes to the tent of a Laplander, at the time when he is preparing to go to another quarter, on account of a deficiency of moss, which the rein-deer have eat up in the place he has. He takes with him his tent, his family, and his whole herd of rein-deer, now in need of subsistence. In this case he is obliged to follow the Laplander, as he wanders, regardless of air, of cold or snows, finding no rest until the Laplander, after he has found a place fit for himself and his rein-deer, now wanting to be fed, has pitched and fully furnished the cot, clearing away the snow, and fitted it up with all its props and appendages.

It happens also that the missionary together with his fellow guide, which they call themselves Oaoppes, when travelling through the mountains, meets with a great fall of snow directly in his eyes and face, that he is under the necessity of veiling both, lest he should be altogether overpowered by the excessive heaps which are whirled about by the wind in circles. He who is in this predicament is so buried by the falling and agitated snow, as if in an excessive thick mist, as scarcely to be able to see the rein-deer that draws him, a circumstance that often befel me when passing over the mountains. And since the traveller is almost deprived of all use of sight by this misfortune, it follows, that there is danger, lest getting out of the right path, on account of the various and opposing precipices, he should fall into the greatest risque of his life; and doubtlessly many would have perished, did not the God of Israel, who governs the universe by his Providence, protect them under the covering of his wings.

Another inconvenience arises from the ice, when the cold is very severe, and much snow is falling, fastening on the cheeks of the travellers, which like a plate covering the face, is afterwards torn off, and from icicles sticking to the eye brows, which occasion much painful trouble to those who are not, from their early years, accustomed to these ills. Even when you have got over these incommodities and dangers, you are arrived in a cot filled with the foulest smoke, a circumstance which creates no small degree of molestation to the traveller, and to pass over the other ills, it is sufficient to mention this one alone, that if his stay is many days in the cot, this smoke causes his face to inflame, and swell up with a variety of pustules.

Should it ever happen, which in reality happened to a missionary in passing over the mountains, either that the length of the way, or the heap of snows falling, or for any other reason whatever, night now pressing on, you cannot reach any one inn, you must then remain under the open sky without covering, keeping off the cold and snows, in the sledge through the whole night, or if the place happens to be woody you must remain under the covering of some trees, cut down from the highest wood, driven into the ground and covered over with a thick linen canopy, which the traveller takes with him for this purpose, until the break of day. This shelter, vile and broken as it is, is better than being in the open air; each mode of passing the night from experience is known

to me. And to comprehend all in a few words, so many inconveniences and distresses surround and exercise a Lapland missionary, so many labours to undergo, whether you look to the cold of the climate, which in its season is almost insufferable, or reflect on the reception you meet with in a small and smoky cot, or the sustenance of it, such as congealed rein-deer's milk, spring water, and that sometimes excessively cold, and mingled with snow, &c. with other innumerable ills, in recounting which I am scarce able to conclude, that it must be attributed to the special providence of God, and to him alone, that men not accustomed to the climate and manners of this people, from their earliest years, do not sink under these ills; and especially those who do not enjoy a good state of health, such as myself, but are able to encounter and conquer all these evils without the loss of their health or their lives. But here, as often elsewhere, the Divine power, wisely dispensing all things in a manner that is above the reach of human capacity, manifestly displays itself.

During the term of my mission, whatever severities and distresses I had to contend with I bore with equanimity and cheerfulness, resigned and happy in the condition Providence had placed me; should you ask and inquire the reason, it is this; that the Laplanders are of a disposition so gentle, mild, and tractable, that in their intercourse with other nations so much more polished, in their own opinion as well as in the opinion of others, they seldom offend a liberal, just or equitable mind, and provoke it to anger and indignation. He who resides among them has no cause of fear from them. The spring of fresh water has for them a more lively relish than wine; that alone can allay their thirst.

AN ACCOUNT OF A VOYAGE FROM ARCHANGEL, IN RUSSIA, IN THE YEAR 1697, BY THOMAS ALLISON, COMMANDER OF THE SHIP.*

I SAILED over the bar of Archangel on the eighth of October 1697, about four in the afternoon, in the ship called the Ann, of Yarmouth (burthen 250 tons) and bound for London; by that time it grew dark I came to an anchor, to get all things fast for the sea, the wind S. S. W. close weather.

The ninth (being Saturday) by the first light of the morning, I weighed anchor, and made the best of my way; at six in the evening I got the length of the land of Catts-nose, the wind S. S. E. fine weather.

Sunday the tenth, at break of day, we were the length of Cross Island: just as it was dark I got through the narrow thwart Cape Loganness, the wind then at S. S. W. and good weather.

Monday the eleventh, as soon as it was light, I found myself even with the island of Lambasco; and at four in the afternoon the high land of Swetnose bore S. from us, distance fifteen miles; from whence I took my departure; the wind was then at S. E. handsome weather.

Tuesday the twelfth, proved very fair, and almost stark calm, so that I made my way W. N. W. but twenty-six miles distant from the place whence I began my reckoning the day before, to the noon-tide of this; thence forward being computed as part of the day ensuing.

Wednesday the thirteenth, continued so calm all the twenty-four hours, that I made my way N. not above thirteen miles; the breezes we had were at N. W. and W.

Thursday the fourteenth, began fair, with somewhat more wind, first at N. N. E. afterward at N. W. with squalls:† my way was W. by N. distant forty miles.

Friday the fifteenth, the whole twenty four-hours the wind kept shifting from N. and W. N. W. and in the night little: my way exceeded not sixteen miles N. W.

Saturday the sixteenth, for the first twelve hours the wind continued to shift to and fro, between the W. N. W. and the N. N. E. with uncertain weather. At eight in the morning it came to the S. W. and began to blow hard, and we had a very great sea out of the W.

Sunday the seventeenth, till midnight, we had frequent squalls, and in the morning it began to blow from the S. W. so as to oblige us to take in two reefs of our top-sails, and a great sea came rolling out of the W. notwithstanding I made my way good N. W. half W. distant sixty-nine miles. This day I had an observation, and found myself in latitude 70° 15′.

Monday the eighteenth, towards night, it proved a sore storm, but it came down gradually, first putting us past carrying our topsails, then our foresail; at length, being under a main course, by four in the morning our main-tack broke. Afterward I lay under a mizen during the fret of wind, till it was fair day, and then I set my mainsail. I made my way that twenty-four hours N. W. half W. fifty miles, the wind shifting from S. W.

Tuesday the nineteenth, at two in the afternoon, the wind came to the S. E. by E. and held calm all night: by six in the morning it was E. still little wind; but at ten

* London, 1699, octavo. This journal, which is rare, and has escaped the collectors, is annexed, as a curiosity, to the account of Lapland.

† A squall is a sudden shower of rain, or fall of snow, attended with wind.

we had such a gale, that I was forced to hand our fore-sail, and out of the N. W. came the fiercest of it, freezing hard withal. Howbeit, in the twenty-four hours, I made my way W. N. W. twenty-five miles.

Wednesday the twentieth, it continued very bad weather, the wind at N. W. but at six in the morning the wind eased, and we set our fore-sail: then it came to the N. and to N. E. and so to E. I made my way S. W. by W. four miles.

Thursday the twenty-first, by twelve at noon, the wind was at S. S. E. handsome weather; by two I found it in the S. S. W. corner, with a sky so fair and clear, that I plainly discerned Terry-berry, to the S. S. E. eighteen miles off. All this twenty-four hours there came a great sea out of the W. against which I made my way forty-two miles.

Friday the twenty-second, it continued a hard gale of wind at W. which put us under our main-sail and mizen till two in the morning; then the wind coming northerly, I tacked, and made way N. N. W. ten miles.

Saturday the twenty-third, at eight in the morning, I saw the North Kyne, distant twenty-one miles, to the S. by W. and the wind being S. I made the best of my way to the westward.

At ten it came to W. S. W. and presently after to W. N. W. blowing so hard, as to put me under three courses reift, standing to the northward till twelve at night. Then I tacked to the westward, but the wind in two hours after came to the N. W. by W. whereupon I tacked to the northward again, under three courses reift; but at eight in the morning I went about to the westward, having made my way this twenty-four hours W. by N. twenty-seven miles.

Sunday the twenty-fourth, by twelve at noon, the wind was at N. by W. and N. N. W. but by three in the afternoon it came to N. W. by N. with so much wind, that I durst not tack the ship, for fear of losing our main-sail, and yet I could carry none but that and a mizen; so I charged a good looking out, deeming ourselves near land.

Monday the twenty-fifth, at four in the morning, being moon-light, we saw the land of the North Cape, two points under our lee-bow: then we loosed the fore-sail, and stood to the eastward, under three courses reift: we likewise set our mizen stay-sail: but such was the stress of wind, that it immediately flew out of the bolt-rope. As soon as it was day, we plainly perceived we could not weather the land of North Kyne, it continuing very squally.

After I had well considered our condition, I called my men together and told them my resolution, which was to run up the wide Fuel* (that was then before us) while the gale lasted; reasoning with them, that to spend the day in tacking before it was to disable ourselves, and perhaps split our sails, and when night came on, to drive upon the rocks, would be to the hazard of our lives, ship, and goods.

Thereupon, in hopes of more security under some point, island, &c. or in some bay to anchor, I put the helm a-weather, and ran for the Fuel, which I judged might be seven or eight miles wide.

Accordingly I hauled up my fore-sail, that I might see before me while the squalls of snow fell; which after they were past I set again, using all diligence that could be in search of some shelter from land, or place of anchorage.

At one in the afternoon I discovered an island which had a small breach off it; but the men in the tops, and on the yards, said the opening next the main was so large, that no security could be under it. Then I steered my course to the east side of the Fuel (for the island aforesaid lay on the west) and running up S. E. I saw something like a

* Fuel is an opening between two head lands, having no bottom in sight, but a seeming inlet into land.

bay; but the hills seemed so steep that I was loth to shoot myself into it, for fear of having no anchor-ground. For it is generally observed by us in such countries, if the hills be very high near the water, there are commonly great depths at little distance: so that looking further a-head I espied a shore, as I thought, with a handsome descent, and concluding such places more likely for my purpose, I set my fore-topsail and mainsail. Then came on a sore squall, which forced me to hand my fore-topsail, and haul up my mainsail; but before the squall was over I was got past that bay: yet then I saw another point, and our water smoothed much. For that I made way and ran close to it, still finding no ground with our lead; but on the other side of the point went in a great bay. With keeping the lead I came about the point, and found twenty-five fathoms water, soft ground: then I let go my anchor, and got my skiff out, to carry a haulser ashore; which was no sooner done, but the eddy winds came off the hills upon the point, and swung the ship's stern somewhat too near the shore.

But the squall being over, the wind eased, and blowing more into the bay (which by its looks promised well) I hove up my anchor, and drove further into the depth of forty fathom, letting it then drop again. By this time it grew dark, so we gave her a whole cable, and rode in sixteen fathom. Then after all things were stowed, and we thought ourselves very well, and went to supper, I felt the ship to rub on the ground. I immediately commanded the lead to be heaved over the poop, and found there was not above two fathom water. Then I caused two fakes of the cable to be taken in, and we rode with our stern in seven fathom. Whereupon I got a small anchor and haulser into my boat and rowed into the flat bay, in sixteen fathom; by which means I heaved the ship further into the depth aforesaid, with very good ground. At the same time I ordered the boat to sound round the ship, and found the place where I rubbed on the ground to be a point of rocks lying from the main on the south side, but all over the bay else to be good ground; so we lay all night.

Tuesday the twenty-sixth, by day-light, I sent a boat with a mate to see how things were about us; who reported that in the bottom of the bay run in a good harbour, and likewise that some houses were in sight; but upon my re-sending the boat, they were found without inhabitants.

By that time these searches had been made, night came on. (Note that we accounted so much light to make day as was sufficient to read by, or wherewith we were able to discern a boat at half a mile's distance; for though the sun might be at that time about three degrees high upon the meridian, we, being under high land, could not perceive his whole body.) The rest of our men on board were fitting the ship, by mending the rigging and sails; the wind at N. W. moderate weather, with some snow. That night I was much troubled with consideration of the place where we lay, that if the wind should come to the N. E. with any gale, we might blow off the bank, and then into more hazardous, because more unknown, places.

Wednesday the twenty-seventh, at break of day, I got my best bow-anchor aboard, and warped further into the bay, where I rid, having withal two haulsers fastened to a rock on shore. We continued to fit the ship for the sea, when it should please God to give us an opportunity. The wind was yet northerly, clear weather, so that we saw land on the west side over against us, which we saw not the day of our first coming in, and I judged it might be eight miles off.

Thursday the twenty-eighth. This day proved very bad weather, with much snow, and the wind shifting, sometime at N. E. at N. and N. W. so that we could not but acknowledge the Providence of God in directing us to move where we were; for had it not been done, we must have been blown from our former place. Then I went myself

to search, and sounded the bay and harbour all over, and made what discovery I could of things about us, finding a good watering-place, and plenty of wood near at hand. At my return, upon complaint of some of our mens' embezzling and stealing our bread, I ordered it to be locked up; for it began to look with little hopes of getting out till the light moon came. We got a boat's load of wood and one of water that night on board; and began to consider further as to our safety in that place, should the wind wester, and break our haulser ashore.

Friday the twenty-ninth, at break of day, I went and sounded from my bow-anchor to the eastern shore, and found forty fathom a little from it, still depthening towards the said shore. Whereupon arguing with myself, that after removal of the ship further in I might set sail and come out as easily, and yet in the mean time be secure in the worst weather, I removed farther into the harbour, even to the place where we lay all winter. This we had scarce done, and made our ship fast, but it began to blow right in, and soon after it proved such a storm at N. W. that had we kept our late station we had in all likelihood been lost. Here again our men were made sensible of the goodness of God towards us by a fresh instance. Then having account that our peas were unreasonably wasted, I ordered a barrel of them, with two great bags of bread, of two hundred and a half each, to be brought up into the round-house, with all small provisions, as butter, and cheese, and fruit, to secure them there; and reduced our men to half allowance, that we might have sufficient wherewith to go to sea; for here we abode as necessity drove us, and not with any intent of residence as yet. I observed at this time the days to shorten exceedingly, being now not above seven hours, according to the explained meaning of day in the paragraph aforegoing.

Saturday the thirtieth, I moored the ship with two bowers to the offen, along the bank, that is to say, one to the S. E. and the other to the N. W. and carried both the kedge anchor and warp anchor ashore, and placed them together, each with one flook in the dry shore, burying them with stones, for the better holding. To one of these my kedge haulser, to the other my stream cable, was fastened, likewise a new tow-line to a great stone, lying all as one to the W. S. W. so between all these she swung by the head. Take notice, the harbour was in fashion like an oven, lying S. E. and N. W. being a mile from the mouth to the bottom, and two cables length, viz. four hundred yards in breadth or wideness: lying thus we shut the oven's mouth, that is, we could not, so lying, see into the wide Fuel. My best bower lay in twenty-one fathom, and my small bower in nineteen; the middle of the harbour being of that depth, both upward and downward, but shoaling toward either side, with good clay ground.

It blew hard all day, with much snow, and some small rain; so I spread a sail over my main deck, the weather being so sharp, there was no standing upon the same without it.

Sunday the thirty-first, it blew a storm all day at N. W. insomuch that we could not continue the covering aforesaid, but were forced to take it down, and put the sail together again.

Monday November the first, I sent all hands ashore to get firing; for the snow increasing, we feared our wood would all be buried under it. Our ordinary manner of wooding was to go in the long-boat, with sixteen or eighteen men, to the shore upon which the trees grew almost from the beach half way up the hills: they were birch mostly, with some small trees like willows, the biggest of either not exceeding a middling man's thigh, and the appearance of them above the snow not above three yards. We cut them as the depth of the snow suffered us, some nearer, some further from the root; for the plenty we had eased us from digging much. Besides, unless the snow was newly

fallen, the surface of it was so hard crusted by the frost as to bear; notwithstanding, some accidentally plunged in now and then, but recoverably. The dragging of the trees thereby was no less easy, being upon a descent: and we lopped them near the shore, for convenient putting on board and stowage. We got that day a long-boat full, that is, about a cart load, as I judged, or more.

Tuseday the second, I got two boats full of wood more. Much snow fell this day in squalls, with hard blasts from the N. W. till towards night.

Wednesday the third, it being fair weather, I sent my skiff with hooks and lines to take fish; but in the Fuel they could find no ground with a hundred fathom of line; yet they made some trial nearer the shore, without perceiving any to bite. There were but four men employed in this expedition, the rest went with the long boat a wooding as before, but with greater toil and labour, occasioned from light snow fallen the former night. This night also added more, it freezing hard withal, and the wind northerly.

Thursday the fourth, it proved fair over head, the wind N. E. and moderate. This day we got a boat's load of water, consisting of four hogsheads full: at the same time two of our men got up to the tops of the hills to the S. W. side, to see what they could discover; and brought word they had met with the prints of deers' hoofs, producing a piece of an old horn they had found as a testimony; likewise of bears, wolves, and foxes: these three are easily distinguished; the impression of the bear being flat and long, and like that of a human foot; those of foxes and wolves are like dogs, the latter bigger. They saw small creatures too running and playing, which they believed were foxes. The watering crew also said they saw the steps of deer where they had been.

Friday the fifth, the wind was at S. E. but with such a storm, that we could not think of loosing our ship for the sea. However, I sent six men armed ashore, for discovery, or what they could get; but the wind and snow was so severe upon their faces, that they could not proceed farther than the first hill; so they returned, and only reported they saw a river on the east side of the hill that was frozen fast.

Saturday the sixth, I got a boat load of wood. It froze extreme hard, the wind at N. E. turning to the N. W. towards night, and began to blow.

Sunday the seventh, it proved a fresh of wind, at N. W. all day, freezing hard.

Monday the eighth, it blew so hard at S. S. W. that it broke all our shore fasts, pulled home our small bow anchor, and drove the ship on the N. E. shore, with her stern aground; but by good hap our best bow anchor brought her up, and swung the ship into deep water; so we rode between our bow anchor, it proving moderate weather towards midnight.

Tuesday the ninth, I got my anchor on board, and moored the ship in her old place, by laying the best bower to the N. W. the sheet anchor to the S. E. and small bower to the N. E. and carried all haulsers and tow-lines to the anchors on the dry shore, to the W. S. W. of us. This we did as out of hopes of getting to sea this light moon; for our rudder-head was wrung in pieces by a blow given against the ground the day before, and somewhat damaged in the lower part. I then made the ship as snug as I could, by taking down our mizen-topmast, crotched-yard, and spritsail yard, with our low yards, fore and aft; but our sails we could not unbend, being so hard frozen. The wind came N. W. which forwarded us in fastening our ship, and that was both our day and night's work.

Wednesday the tenth, I got two haulsers more ashore, it blowing a hard gale at S. E. till ten at night. Then the wind altered and became fair. About this time the hawks we had on board all died, within a few hours one of another. We had likewise three foxes to have been brought over, one of which our men eat some days before

unknown to me; and this day they roasted another, which I saw, the flesh looking black like a hare; but upon taste, I liked no such rank venison. The third ran down into the hold, and could not be presently found; but a month after, having played the thief with a piece of our beef, he was knocked on the head, and being too lean for food was thrown overboard.

Thursday the eleventh, it snowed much but thawed as it fell; the wind at N. W. with a strong gale. I made all haste possible to get our rudder head mended, by fixing a piece of plank on the one side of it. It being bad weather, that was all we could do in a day's space, which exceeded not six hours, and no better than twilight. Neither could our men endure the air at such work longer than a quarter of an hour, without coming in to warm themselves.

Friday the twelfth, I got another piece of plank on the other side of the rudder head, it proving handsome weather, and very clear; whereby we perceived something in the lower part of the rudder as broken, but upon trial with our poles and boat hooks found only a small piece of the head bruised, with damage inconsiderable.

Saturday the thirteenth, it proved fair, but with some snow. I took the boat and rowed into the bay, on the other side of the point, and at the bottom of it I found a river running in, but so frozen as to hinder further discovery of it; but by sounding the entrance, we found twelve foot water at half tide. Going ashore on the N. side, I saw a great run of water falling into the bay thereby near the shore, along a woody valley. Not far from this place, I observed the snow to lie in ridges (such as we make upon land, where we sow our winter corn) its surface being hard crusted with ice, with something appearing above it like straw. There were little more than the bare ears without any grain in them, four or five inches long: so that thereby I had hold enough with my hand to pull up the whole stalk, which was about three feet in length.

I was under full belief that this was barley, but I could not satisfy myself that any had been reaped off there, seeing the snow covered the stubble. To the unbelieving reader I have only this to offer, to evince the possibility of it, viz. that the soil was good, as appeared by the plenty of wood near it, the ouzy shore, and clayed bottom of the bay; the place lying open to the S. and defended against the N. E. by the mountains. Withal it must be considered that the sun is here about six weeks above the horizon, and the days before and after much longer than with us in England at those times. That the bringing of this grain to perfection requires not above fourteen weeks after seed time, in more southern regions. At Narva, in Livonia, I myself have known the same corn in the ear, within a month or five weeks after it appeared above ground.

Hereabout I found an anchoring place, but so steep, that whoever uses it must trust chiefly to the fasts he makes on shore. There was another also at the bottom of the bay a mile in; but the hasty departure of light made our discovery incomplete. So we returned all of us on board miserably cold. I could not but observe that as we went and came by the Fuel the wind was at N. W. but where the ship rode, our men on board had it all day easterly.

Sunday the fourteenth, it blew a hard storm at N. W. pulling home our best bow-anchor, until such time as the small bower and haulsers ashore assisted; and then by all three she rode, till the gale was over, which was not before nine at night.

Monday the fifteenth, the wind was at N. fair; and we hauled our sheet anchor farther into the bay.

Tuesday the sixteenth, we had a hard gale at E. N. E. so that it pulled home our sheet anchor. There was much snow all day and night; the wind after some time

coming to the N. N. E. with somewhat more moderate weather. At this time two of our company were mightily for fitting up a house upon land, and putting provisions therein for subsistence, in case we should be forced ashore and wrecked. But I could not comply with such advice; knowing the ship to be warmer than any thing we could build ashore, with the materials, time, and light we had to do it. Withal I imagined, that if we had had a place to our wish upon Terra Firma, I could not have persuaded them to do what they did; but that the only way of preserving ourselves, and all we had about us, was by keeping it together, and making the ship the sole place of retreat and refuge. Besides, I ever spurred them up to action, expressing daily the hopes I had of getting out; foreseeing that by their sitting altogether by the fire, they might grow diseased and unfit for service: on the contrary, that exercise, and the exposing themselves to the air frequently, would render them more hardy and healthy.

Wednesday the seventeenth, 'twas handsome weather of wind, and that at N. W. but with much snow, yet we hauled out our sheet anchor again.

Thursday the eighteenth, for wind as before. I began now to consider, that the frost might render our iron anchors so brittle, as to make our dependence on them not secure. Thereupon taking with me some men ashore with iron crows and shovels, I endeavoured to break ground; which when I found possible, I ordered the carpenter to cut a new mizen mast I had on board, not yet used. Of the biggest end I took twelve foot, and (after a hole of seven foot deep had been digged, with no small labour) I placed it, filling the hole with earth, stones and water, which being frozen, might the better fix it, as a post for a cable to be fastened to. But that night I forebore using it, being not willing to shake it, before it was fully established. The little light we had was not above five hours continuance.

Friday the nineteenth, it blew strongly from the S. S. E. and held very clear. As soon as it was light, I got my best bower cable hauled up; I took also a piece of a junk cable about twenty fathoms long, and made it fast to the stake above-mentioned (which stood off to the S. and by W.) and seased an eye at the other end. Then I took one end of my best bower cable (the other being fast to the anchor) and after I had made an eye on that also, with two luff tackles, I brought both as near as I could together, which was within three fathoms, and seased them.

This I had scarce done, but there came down so much wind at S. S. E. that we feared all would have been pulled to pieces: but every thing holding so well, our men could not but acknowledge the hand of Divine Providence in what had been done that day: for hereby we were preserved, not only then, but all the winter.

Saturday the twentieth, by the first light of our slender day, we perceived our skiff full of water at our stern, which we hoisted on board to mend again. You must note we could keep no right watch: our men not being able to walk the deck half an hour for cold.

I now made strict inquiry into the quantity we had of peas left, getting a barrel out, and measuring them. Of these afterwards I delivered out four quarts a day for all our ship's company, being twenty-four men and boys, and this I did four days in a week. I likewise made search into our other provisions, and found we had five hundred and thirty pieces of beef, of four pounds each. Of fish we had but six days left; allowing four North-sea cods a day: nine days flour and cheese; allowing two pounds of cheese a day, for four men, with a kettle of hasty pudding, for the whole ship's company; that being the best way of using my flour. Seeing now little hopes of getting home before March at the soonest, we considered, that store must be kept for the sea, when

it should please God to send us thither; nor had we reasonable expectation of getting relief in this place.

Sunday the twenty-first, one of our boys complained of his feet being sore; our surgeon, immediately viewing them, found the effect of the frost there up to his ancles; especially one very dangerously; but by his skill and diligence he recovered them in ten days.

Monday the twenty-second, it proving fair, we fetched a boat of wood, great quantities of which we burnt every day. And here it will not be amiss to mention our manner of keeping fire. I caused the iron hearth in the fore-castle to be brought into the steerage, and ordered the carpenter to make a hearth as big as conveniently could stand in the fore-castle which was five feet nine inches square every way. Then I sent ashore for as much clay, and as many stones as filled it up: this was sufficient to accommodate sixteen men sitting close about it at once. Moreover I directed the cooper for making a chimney to the steerage, in the manner following, viz. by staving an empty butt, or pipe, and reducing the staves at one end to the breadth of two inches each, so that being hooped again, it exceeded not the wideness of a firkin at the top, keeping the former breadth or capacity in the middle, still enlarging or standing more open at the bottom. The distances or interstices there between the staves we filled with pieces of wood, and made all tight with clay and stones, which, when we had so finished, we placed upon the grating. This made the steerage very warm; but in all the time we kept fire there, we were obliged to keep the door open for admittance of wind, to give the smoke vent.

About eight this night the wind came to the S. S. E. with snow and hard frost; but at two in the morning there was clear good weather.

Tuesday the twenty-third, we had no foul weather, but so close, that we could scarce call that light we had day. However we made shift to get a boat of wood, being in great fear of losing the day wholly.

At eight at night it blew from the S. S. E. but towards midnight the wind came more to the eastward, with handsome weather.

Wednesday the twenty-fourth, it proved fair and clear, the wind southerly. We cleared the deck of snow and ice, which was grown a foot thick near the scuppers. 'Twas sometimes squally, but at eventide I saw the northern glance: that is, a stream of light enlightening all the hemisphere, so as one may read very well with it. 'Tis of a pale yellow or buff colour, like the inmost circle of the rain-bow, appearing for a quarter of an hour, then vanishing and renewing itself again, by intervals, during the space of five or six hours. Sometimes this meteor seems a bright nimble-moving cloud; at another time two of them, rushing and encountering one another, like armies engaged, and now and then I have thought with a grumbling noise akin to thunder. We reckon the frost to occasion them, and whatever reflects or emits the light in that manner cannot be far from the eye, being so plainly to be discerned, and so exceeding swift.

Thursday the twenty-fifth, it being fair, I endeavoured to clear the hawse, but there was so much ice upon the cables, I could not do it. This day two of my men went up the hills, but wanted light to make a discovery.

Friday the twenty-sixth, still fair and clear, and by the light we had, I brought my best bower cable to the stake on shore, and served it well with old ropes, to prevent its chafing: the wind at E. N. E. and freezing hard.

Saturday the twenty-seventh, it proved fair and calm, with some little snow. I got a boat load of water, and served all our cables, to prevent chafing, both ashore and at the hawse.

I had complaint made me, that some had stolen fish and broiled it; but, upon strict inquiry, I found such a thing could not be done privately, by reason our men sat constantly round the hearth in the fore-castle, from six or seven in the morning till eight at night; at which hour, or soon after, I ever caused the fire to be put out, fearing the continual keeping it might endanger the ship, or occasion other disorders. Nevertheless I caused the fish that hung overboard for watering to be hauled in, and viewing it well, by the manner of it, I judged that the pieces diminished were not cut off with a knife, but rather seemed bitten by some living creature, which I supposed might be a seal, that I had seen sometimes about the ship. So I put the salt fish into a bag, and by a line hung it over the ship for freshening: and in the mean time I got a great shark-hook and baited it with a piece of the same; hanging it a foot under water, in a place where the seal used to show himself. I stood upon the watch; and just as it was dark the seal came and took it, making a bustling at the side of the ship. I presently took hold of the rope, to which it was fastened, and found it too heavy for me, which made me call for help; but before it came he got loose, and I saw him set his feet to the ship's side, and fling himself off: after this we saw him no more in the bay.

Sunday the twenty-eighth, it was still calm, but with more snow and close weather.

Monday the twenty-ninth, I hauled my sheet anchor further out, the wind at W. S. W. blowing fresh with snow, but at four at night it began to thaw considerably. I then shared all the bread in the bread-room, being but five pounds and a half for each man.

Tuesday the thirtieth, it froze hard again, even our beer between decks; so that our men could get nothing but water to drink, which had not stood above twelve hours, but became all ice. I considered, that for them to drink warm water might not be so good for their stomachs, and to stave our casks would be of ill consequence for us, when we should have occasion for them at our going to sea. I then brought up a cask of my own honey, of which I distributed about two pounds and a quarter to each man, for them to boil in their water, to make a kind of mead withal. This they drank, and were not offended with the ice in their mouths, as before. The wind all this day at S. S. E. and the frost so excessive, that we feared the spring heads would ere long fail us, so that we bestirred ourselves for a boat-load of water.

Wednesday December the first, it proved fair, which encouraged me to send my mate in the boat up the Fuel, even before it was light; chiefly to see if there were any anchoring places for us to make use of, in case we should put out and not be able to regain our harbour. He returned, and brought word that he saw only two islands on the W. side, and that the Fuel ran up a great way very wide, where they had much wind; but where the ship lay we found little all day.

Thursday the second, 'twas fair weather of wind out of the S. E. corner, but frozen hard all day, with some snow. You must know, our brightest time now at noon exceeded not the light that comes an hour before sun rise, in an equinoctial day in England.

Friday the third, the wind as before, and pretty calm still, but freezing exceeding hard. Howbeit we went ashore for wood, of which we got not above two thirds of a boat full; so short was our day, and this especially so very close, that we could not discern the tops of the hills all that light.

Saturday the fourth, the wind kept at S. E. fair, and freezing hard, but towards night some snow. It was light now about but three hours and a half; as I observed by my watch, which in my warm pocket went well, and (to my great comfort) kept its integrity in the worst of times.

Sunday the fifth, we had some weather of wind with some snow, and about three at night a small thaw.

Monday the sixth, being moderate weather (but close and freezing) we fetched a boat of water. All our men went ashore; some with guns, and among them they shot a white partridge, which was very good meat: the rest employed themselves in gathering muscles, perriwinkles, and dills. These dills are dark brown weeds, growing and hanging upon the rocks, and to be come at while low water: a sort of sea plant or herb, common enough in the north of England, but more frequent in Scotland. There, I am told, they are eaten raw; but by boiling they become soft, and look greener, tasting not much unlike a colewort. Our way of dressing them was, first, to boil them in fresh water, which took away the saltness natural to them; and after that boiling them again in our beef broth, they supplied the place of a salad, to eat with our beef.

By some Scottish men on board we were happily instructed in the use of these.

Tuesday the seventh, it proved fair above head, the wind S. S. E. but freezing very hard. We got some empty casks from between decks to fill them, fearing more and more to depend upon the springs. For our men were lately at a great loss for them, and found it difficult digging in the ice. Their way was, when they went for water, to observe the drains upon the shore, and so along the sunken or depressed places in the snow, which were formed from the springs of the upper grounds joining in their descent, and making gutters, some with streams large enough to turn a little mill. The channels were covered with ice like a ceiling, under which the waters ran freely, but to come at it, they were forced to dig through snow, and break through ice, to dip in their bowls and fill their pails; which when full they carried to the boat, where the hogsheads stood with open heads to receive them. And nothwithstanding they made all possible haste aboard, and had not above a furlong to row, by that time they got to the ship, the water would be covered with a pretty thick ice. The pails too thereby were so frozen both within and without, as to weigh much more, and hold much less; and we were forced to thaw them continually, for a new day's service.

Wednesday the eighth, we had it fair and clear, with a small thaw, the wind westerly. We filled some water, and put it down into the hold.

Thursday the ninth, we had very fair weather, and so warm as to make a considerable thaw; the wind W. S. W.

Friday the tenth, it was fair over head, but froze exceeding hard; we fetched a boat-load of water. Our men thought it good news, when I told them this was the shortest day, and now we should make ourselves ready for the sea as fast as possibly we could. In order thereto, I gave my chief mate directions for rowing up the Fuel on the morrow, to take a full view of the first bay we came by. This was matter of encouragement to them, and kept them in action, though I did it with little hopes of sudden benefit thereby.

Saturday the eleventh, it proving fair, I sent the boat into the outermost bay, to view it, and get acquainted with some place of shelter, that we might make use of, in case we should not be able to regain the harbour, or proceed at our first putting out. They returned, and brought me word there was a good road within an island that lay in the bay; which made me resolve, if the weather held open, that we could work, to make out for the sea by moonlight.

Sunday the twelfth, was a fair day, the wind at S. W.

Monday the thirteenth, it continuing fair weather, we got up our sprit-sail-yard and fore-yard cross again; filled a boat-load of water, and got two wouldens on our rudder-head; the wind easterly.

Tuesday the fourteenth, so close all day as to be scarce good twilight. A young man in our company took a Bible of a small print, to try if he could read in it, but could not discern his letters at twelve at noon. However I got up both my top-masts and main-yard cross, hoisted my mizen-yard, and hauled aboard one of my hausers. The wind at W. S. W.

Wednesday the fifteenth, we had as little light this day as the day before, with uncertain weather, sometimes blowing fresh and sometimes calm; but the scud came very swift out of the W. S. W. all day: we got but half a boat's load of wood. At nine at night it blew a storm at N. W. with much snow, that we were forced to strike our yards and top-masts as fast as we could.

Thursday the sixteenth, it continued blowing hard at W. N. W. snowing much and freezing at so extravagant a rate, that every thing became ice that was capable of being made so.

Friday the seventeenth, it blew hard at S. S. E. with more snow; and, at three at night, or in the after part of the day (as you will please to call it) it proved a storm out of the same point.

Saturday the eighteeenth, the wind was all southerly, blowing hard, and freezing severely, but dry over head. Bad as it was, we fetched a boat-load of wood, and some went ashore in the skiff and got perriwinkles. It was strange how these little creatures could live and endure so much frost: for as soon as the water was gone from them, they would soon be covered with ice, but the returning tide melted it. These we took off the shore at low water, and brought them on board, where we boiled them in the shells, and picked out the snail, or that part that was meat.

Sunday the nineteenth, it blew hard at S. S. W. with much snow and hard frost.

Monday the twentieth, it blew desperately hard at N. E. with much snow and severe frost. Our day at this time was not four hours and a half long.

Tuesday the twenty-first, in the morning, the wind was at N. W. at noon all northerly; at night N. E. with little snow, but continued frost. About this time I observed the scooping or emptying of the boat was a thing of too great labour for the boys to do, so I ordered the men to take their turns; this was very grievous to them; for in a night's time it would be half full of snow, and the water in the bottom frozen pretty thick; so that they must first throw out the snow, then break a hole in the ice, and by that scoop out the water, and at last take away the ice with shovels. The stern of the boat too would in that time be covered four or five inches thick with ice, and about the edge of the water also, which we were forced to break off with mauls or wooden beetles. During this our people suffered so exceedingly, as to come aboard with their limbs almost stiff with cold, and their hair so frozen as to hang with large icicles in the fashion of great tags.

Wednesday the twenty-second, close snowy weather all day, and the wind westerly; but by that time it was quite dark it came to the N. E. blowing fresh. Here I think it proper to set down my constant observation of the sky towards the north pole, which I had made daily for four weeks last past: viz. that even during that time of light we called day, it continued always black, as if it were a dark cloud forerunning a squall. It reached from N. W. to N. E. in the form of a rainbow, the arch elevated 15° or 20°, which made me conclude, that something farther to the N. there must be a continual night all that while.

Thursday the twenty-third, the morning was fair, but by noon the air was thick, with snow. I got a boat-load of water and some wood, and gave every man two pounds and a quarter of honey to make drink against Christmas. I find no notice of wind

taken this day, and likewise of some few before; but I am assured it was too dark to think of stirring. We could not see to eat our meat at noon without candles, of which we consumed plenty, bringing about five hundred weight from Russia: for though we kept two lamps burning day and night, we yet used candles upon frequent and moving occasions.

Friday the twenty-fourth, it proved fair and clear, the frost not excessive; so that we cleaned our decks from snow and ice. The wind was northerly all day, but towards night it came to the E. Our men being very melancholy, to think of their friends at home providing good cheer, I told them they should not pinch on the day following; and accordingly ordered every mess should have full allowance. This put an end to that kind of discourse, and they seemed pleased with the expectation of such a feast; but though not of hauling sharp* for [illegible]wards.

Saturday the twenty-fifth, being Christ[illegible]s-day, in the former part of the day we had good weather, the wind at S. W. but for the latter part it blowed and snowed. After dinner, I spared out of my own store, to every two men, a bottle of strong beer, which they took thankfully, and made their hearts truly glad. About six at night, as I was walking upon deck, I observed it so bright for a quarter of an hour, that we had it no lighter for some days at noon, since our being here. This must be from some northern glance; the more remarkable then, as unusual in close weather.

Sunday the twenty-sixth, it proved indifferent fair, with small snow, like rain; that is becoming drops of water, upon its alighting or falling upon the deck; the wind at S. W.

Monday the twenty-seventh, I fetched a boat of water, the weather being fair and calm. This day I took up a hogshead of the merchant's honey, and shared it equally, giving each man his part, to make mead as formerly.

Tuesday the twenty-eighth, the last night was warm, and a small thaw we had; the day held fair, and the night ensuing continued calm.

Wednesday the twenty-ninth, still over head fair enough, but it froze again excessive hard; the wind at N. E. The day was now five hours long, and at noon time we saw it was perfect day.

Thursday the thirtieth, it blew hard at W. S. W. with some snow. I sent the long-boat a-wooding, and three hands in the skiff for water; and the latter I accompanied, in order to visit the inside of those houses that were just by us, which our men discovered soon after our coming into this bay or cove. Here were dwelling-houses for three families, as near as I could guess, each having another for cattle adjoining, and one for drying of fish, which was open like a cage, with poles lying across. I carried things with me for clearing the way to the doors from snow; and, approaching them, I found the dwelling-houses were built above five feet from the ground, and twelve feet broad, in form round. The walls were made of stones and moss between them, instead of mortar, and roofed with the same, by the help of rafters or split trees, their lower ends resting upon the wall, and their upper joining at the top against a hollow stone, which served both for chimney and window. And for a hearth there was a flat stone, laid somewhat above the ground; and on one side a cabin big enough for two people to lie in, with some straw in it there left, which I guessed was all their bedding. In one of them I found a barrel of rye-meal, but so bad as not to be used for food. We met there with a piece of a printed book, with the form of prayer therein, of the Danish language, as one of our men told us, who understood it, being by birth of that nation.

* Sea term for pinching the belly.

In the houses for cattle were stalls and partitions of sticks crossing one another, as hurdles are made, such as are in gentlemens' stables to part their stone-horses, with boards too at the bottom. They were so small as to contain nothing bigger than sheep or goats; the latter being more frequent in the neighbouring countries. The doors of these folds or houses were not above three feet and a half high, and two in breadth; they were half full of snow, so that no dung could be observed. To one house was an inclosure like a yard, with a pond of water, but frozen. Likewise there was a place discernible, where they hauled their boat upon land, when they had been a-fishing.

Friday the thirty-first, in the morning, it blew hard at S. W. but the latter part of the day was very warm, and it fell a raining, and thawed very much. This made us wish for a light moon to be going with.

Saturday January the first, it blew hard at W. but warm to admiration, so as to make a very great thaw; even the tops of several small hills, that laid under the higher ones, became bare and clear of snow. Withal a great deal of snow that lay upon many parts of the ship was melted off. At the same time came a great sea into the bay where we lay, breaking very high at the harbour's mouth; but towards night the wind was at W. N. W.

Sunday the second, the wind was at S. W. blowing hard. It continued still thawing all this twenty-four hours.

Monday the third, we had a warm, fair, and dry day, with little wind, and that at S. W. This was the first day we could open any sail since we came in here: so we opened our mainsail to air it, and found no harm done to it, notwithstanding it had continued so long furled up, which we greatly feared before. We got a boat of water too.

Tuesday the fourth, still fair over head, and moderate as to wind, which was at the S. S. W. but the frost had made its return. I sent the boat into the Fuel, to see if they could take any fish; but they got none. One hogshead of water more they got filled, and put between decks.

Wednesday the fifth, it blew fresh northerly, with some small snow, and froze hard again. I sent my men a-wooding, where they could not but observe what alteration the late open weather had made upon the trees, disposing them to flourish, by moistening their bark, and opening their buds considerably; which the returning cold had nipt again. Likewise upon the hills that were bare by the thaw, they found plenty of green juniper, of which they gathered and brought on board a great many branches. Withal they peeled off the tender bark of the willow-like tree, and bound it up in several bundles, to hang near the fire and dry, for an intended use. This over and above their load of wood, which they made good.

Thursday the sixth, it was very fair over head, but blowing pretty hard at S. S. W. the frost too increasing. Yet they made shift to get a boat of wood, with more juniper, and a quantity of bark, as before.

Friday the seventh, it proved very bad weather, the wind high at N. W. and much snow again. This day's confinement gave our people leisure to advance a new project, and make trial of what they had got to supply the want of tobacco; with which, had they been sufficiently stocked, it would have been a great relief to them, and a choice entertainment. For my own part, I had just enough to allow myself three or four pipes in a day, and could not find in my heart to spare any to my best friend: though it could not but grieve my spirits to see one smoaking, instead of it, mere rags of fustian torn from a coat pocket. But this was before they found out the use of something more like it, being parts of dried plants: I mean the tops of juniper before men-

tioned, and the willow-bark dried. These they now began to shred small with a knife, and mix together in proportions according to each man's fancy, and to fill their pipes therewith. All that take tobacco know these have no agreement with the other as to virtue and effects; nor yield the like pleasure nor benefit: but the smoke, I am sure, was not ungrateful, and possibly not unwholesome, both for the takers and company; and, in my opinion, it was no mean invention, in such extreme necessity.

Saturday the eighth, the weather as bad as the day before, both of wind and snow, and freezing hard. However, we cleared our decks of snow and ice, and stowed what wood we could spare out of the forecastle and steerage, to make fit for the sea, having hopes that it would please God to give us opportunity by this light moon.

Sunday the ninth, the night past was very stormy, blowing hard still in the morning at S. S. E. with excessive frost and some snow; but towards noon the weather mended in all respects.

Monday the tenth, we had a storm out of the N. W. violent and furious, and, I think, with the most wind that ever I observed in my life, though I have used the sea these thirty-eight years. It snowed very hard withal, and froze at a great rate, insomuch that the forepart of the ship, by the dashing of the water against her, and the mounting of the foam by the tempest, had nothing but what was covered with ice.

Tuesday the eleventh, it continued blowing hard at N. W. with snow and hard frost. The night past we lost thirteen pieces of beef, as they hung a-watering; which was a great mortification to us. For our way was to put our beef into a wicker hamper, and hang it by a rope at the ship's side two feet under water; now the rope gathering a quantity of ice, and the excessive wind giving the ship some motion, it was thereby chafed asunder, and the beef let drop. It is to be observed, that we could not freshen our meat after the usual manner at sea, by putting the same into a tub of sea-water; for that would have been all ice in a few hours, and the flesh still as hard and salt as before: the wicker hamper too was to preserve it from voracious fishes, as the seal before spoken of.

Wednesday the twelfth, it blew fresh at S. S. W. and froze smartly. We got our warp anchor and two hausers on board, and made four pair of graplines or creepers, with which we went to try if we could hank the hamper, and recover the beef we lost two nights before; but we were not so lucky as to light upon it.

But my mate in holding the line, while he was creeping or searching for the hamper, got the frost in his fingers, insomuch that the next morning he found blisters risen upon them, and his thumbs as if they had been scalded. And after the water was let out by opening them, his hands were so raw, as to make him incapable of going a-wooding.

Thursday the thirteenth, the wind was at S. E. and moderate enough, but the cold as rigorous as at any time before, and this day with a considerable rime frost. However we got a boat-load of wood; but when our men came aboard, they complained much of the frost being got into their feet and hands; some only blistered, others turned black, and without feeling. Our chirurgeon opened the blisters, and by fomentations and other applications he recovered them; and where it was turned black, he cut off the dead and senseless part, and healed them after some time: wherein he manifested himself to have a good understanding in his business, by the success he had; seeing none had any loss of an entire part or joint, but purely of what flesh or skin was mortified before he saw it: and they all became serviceable by that time I got home, or soon after. In justice and gratitude I am obliged to mention his name, William Brown, of Great Yarmouth, and educated there under his father, of the same profession.

Friday the fourteenth, fair and clear weather we had, but it froze so vehemently that I durst not let any man go out of the ship, or do any work that day: cherishing and giving rest to the disabled, and reserving the sound.

Saturday the fifteenth, still clear as the day before, but freezing exceeding hard: the wind in the morning at N. E. but at night S. E. with a violent storm. At noon we reckoned the sun made his first bodily appearance in our part of the world for the year ensuing: the day eight hours and a half long.

Sunday the sixteenth, it blew hard at N. W. in the morning: at noon the wind was at N. N. E. and freezing; but not so hard as before.

Monday the seventeenth, we had much wind at N. W. with some snow; the frost too we looked upon as less vehement than formerly.

Tuesday the eighteenth, the morning was blustering and cloudy; the wind at N. W. At noon it cleared, and we saw the sun-beams gilding the tops of several hills, to our great joy and comfort; for we had not seen sun shine before in ten weeks. After noon the wind came to the N. E; fine weather; we got a boat-load of wood and two hogsheads of water. The latter was difficult to come at, the springs being all frozen up, only the run of the great spring we found gliding under the full sea-mark.

Wednesday the nineteenth, it was calm and good weather: I caused the decks and scuppers to be cleared of ice and snow; in doing which, we were forced to heat crows of iron red hot, and so by degrees melt a way through the scupper-holes, and free them from ice. And, with the same instruments and axes, cut through and raise up the ice upon the decks, and to heave overboard. Notwithstanding it froze extremely hard at this time, yet we had warm hopes of getting to sea, the wind being at S. E.

Thursday the twentieth, the wind was at W. S. W. and moderate: neither was it so cold as the day before; freezing no harder than it does in a hard frost in England. We hauled the ship about twice, to clear the hawse; and in the afternoon went and got perriwinkles, muscles, and dills.

Friday the twenty-first, it blew hard at N. N. W. but was very warm, so as to cause a small thaw. We got a boat-load of wood and another of water; and at the edge of the shore our men saw eggs, one of which they pulled upon land, with a long bent stick, and brought it on board. These are likewise called sea-urchins, having somewhat growing upon the shells like thorns, or the bristles upon the land hedge-hog. The shape is round and flattish, the shell thin, and the bristles easily rub off; for a further description, I must refer the reader to authors that treat of such things. It was good news for me to hear of them, knowing what benefit they might be to us; and therefore I caused a piece of iron hoop to be fixed to the end of a pole, and made a net like a fisherman's lead net against the next day.

Saturday the twenty-second, the wind was at W. S. W. the weather fair too, and indifferent warm. We first cleared the deck of the wood brought in the day before, and stowed it down into the hold for a sea store. Afterward some went ashore with the pole and net aforesaid, and got store of eggs; while others went a gunning, who shot only a small fowl, called a Greenland pigeon. I do not remember, for the first two months and more after I came in here, I ever saw any but two birds or fowls flying, and they were two crows of a dun colour, not different from ours so called; and by some Royston crows. These flew often near the ship, and at length were so tame as to light upon our deck; one of which our men shot, poor and lean as he was, and nothing but skin, bone, and feathers. But before I came away I saw several of the Greenland doves aforesaid, and fowls like what we call kitties, pick up things at low water, which I guessed might be perriwinkles, and sea eggs especially. For one day

(though I have not set it down punctually, I bear it in mind, I went myself ashore, and a furlong up the hills I found the shells of sea-eggs, which I judged might have been carried up by such birds. They are special good food, and I doubt not but the birds suck out all their inwards, though we eat only the yellow part like an egg's yolk, and throw away the other white or jelly part; that we take and put into a sauce-pan, and pour to it some beef broth, which, with a little pepper strewed upon it, and stewed together, makes a very good dish.

Sunday the twenty-third, we had it fair and clear all day, the wind southerly, and the frost very moderate.

Monday the twenty-fourth, still fair and clear, the wind southerly. We got our kedge anchor on board, but much trouble had we to come at it: we were forced to dig through a great deal of ice, and the ground itself, frozen deep, under which one flook had been long buried. We shifted one of our small haulsers too, at the stake where the cable was fast; got both our top-masts up, hoisted our mizen-yard, and got our fore-yards up, with an intent to be jogging; but before night it began to blow at S. S. W.

Tuesday the twenty-fifth, it blew very hard, insomuch that I was forced to strike both top-masts, and lower all down again; besides, it froze extremely hard all this twenty-four hours. Thus were we fatally baulked, and our design of stirring put a stop to, when we had provision enough left to go to sea with; I can't say without great hazard of want, and danger of weather, could we have held on our purpose.

Wednesday the twenty-sixth, it continued still blowing, and the wind all southerly; so that at certain times, when the blasts came violently off the hills, notwithstanding the hawse was very foul and thick frozen, yet the cable would be pulled stark out of the water. The haulser too at the stake on shore, having a great weight of ice upon it, would nevertheless be stiff strained above the water, as level as that of a rope-dancer, when it is made fit to walk upon; it being to admiration that the stake, cable, and haulsers, should hold.

Thursday the twenty-seventh, the wind and weather still the same as the day before, blowing fiercely, but clear over head, and freezing at a great rate.

Friday the twenty-eighth, the wind kept its place, but grew more moderate, the frost still excessive: however I got a boat-load of water, and another of wood.

Saturday the twenty-ninth, it blew smartly out of the S. and froze so extraordinary hard, that the water we brought on board the day before was a solid body of ice. For having occasion to brew that morning (it being late before the water came on board over night) I caused one of the hogsheads to be digged into, to see if any water could be found in the cask; and in the midst there might be the quantity of about two gallons lying a in hole of the depth of fourteen inches, and three inches width: of that I made mead, which proved excellent good, and some of the very sort I brought with me to England.

Sunday the thirtieth, it blew a hard gale at S. by E. freezing withal, but not so hard as two days before.

Monday the thirty-first, we had as much wind as the day before, and from the same point, but dry over head, and freezing to extremity. There was a hogshead that stood on end upon the deck full of water, with its head open, which froze gradually downward, so as to force the bottom out, and raise the cask three inches from the place it stood on, and became a whole column or solid body of ice: another, at the same time, that laid along with its bung open, froze in the like manner, bursting open the undermost stave upon which it rested. I leave the reader to assign the natural reason of this, only taking along with him this remark, that it lay upon a pretty thick ice that covered

the deck. How long they had been both filled I cannot say punctually: the first might be one of them brought on board the Friday before: the other possibly had lain longer, as designed for a sea-store. This brings into consideration the daily toil our cook had, with an iron crow, to break asunder lumps of ice to put into the pot. In doing which he was obliged to arm his hands with fur gloves and mittens, otherwise the iron would have cleaved to his fingers, and carried the skin along with it. The same clothing or defence our men constantly used, not only abroad in wooding and watering, but also in their work aboard, as handling the ropes, or whatever else they touched or moved. Over and above, when they went in the boat upon frequent expeditions, whether for carrying out or weighing of anchors, or going ashore for the many purposes before cited, they put on their Russia boots, which were wide like those worn by fishermen, and lined with bear-skin: these they were all furnished with, but two or three, who were glad to supply the want of them by tying old pieces of canvas about their legs, and over their feet.

Tuesday the first of February, it continued still blowing hard at S. by E. clear withal; and about noon we saw the sun shine into the mouth of the harbour: he might shew the whole of his face, but little of his power; for it froze so excessively this day, that the ice hung upon the ship in some places full two feet thick, and at the edge of the water it was of a great breadth; so that the ship, having a small motion, made such a noise, that the night before we could not sleep for it. To prevent which we hauled the long boat about the sides, and with two great beetles or mauls broke it off; and sometimes a piece of half a ton weight would drop at once.

Wednesday the second, it blew hard at S. with clear weather, but froze so very hard, that now all the cables were past handling; which mightily discouraged us, and almost stifled all thoughts of going. To mention all the discourses our people had at times, upon several occurrences, would fill a bigger volume; and a great many more I had set down, had it not been so great a trouble to write. 'Twas vexatious enough to get my ink ready for use, and no less to keep it so, a boy being forced to thaw it as oft as I had occasion to dip my pen.

Thursday the third, all the night past stormy, and the wind southerly, but it froze not so hard as the day before; we got a boat-load of wood, and another of water. As moderate as the weather was for cold, possibly on such a day we might get the water on board in the hogsheads with little or no ice on the surface of it; but after standing half an hour upon deck, we should have it thick enough to bear an empty pipe. This was a warm day comparatively, I say, and cherished our dying hopes of getting from this place, and towards night we got up our fore top-masts, fore-yard, and mizen-yard, to be in readiness for the sea.

Friday the fourth, in the morning, it blew a hard storm at S. so that I was compelled once more to strike our yards and top-masts; but towards night the wind eased, and we got our stream cable on board, leaving a piece of twenty fathom behind us, so deep buried under the ice on shore as not to be got out.

Saturday the fifth. This day began with fine weather, the wind at S. S. W. Our men discovered scallop-shells near the ship, but they lay in deep water. I caused a broad flat piece of iron to be bent, like a dredge to fish for oysters with, and ordered a bag to be made to it of rope yarn; and that night we went a-dragging and got sixteen scallops, which were very good victuals. I brought home with me some of these, and several other shells, which I carelessly disposed of, or lost the most part; but when I waited upon that ingenious and worthy person, Mr. James Petiver, apothecary, in Aldersgate-street, and fellow of the Royal Society, to present him with those few I had remaining,

from them, and others he shewed me, I remembered they were almost all of such kinds as are found about England: and by him I was further informed, that the general English names I had given to them were not improper; more distinctly he told me they were perriwinkles, wilks, Scarborough couvins, limpets, muscles, cockles, sea-eggs, &c. Oyster-shells too I saw here and there, but not one whole, with the inwards or meat in it. I left with him likewise a piece or two of coral, got when we dragged for these shell animals, having saved greater variety of the same, which an unlucky boy threw overboard. Moreover some slate-like stones, and these I observed there of various colours, which, when we held against the grindstone, tinged the water (it turned in) strongly of the same colour. And in some colour-shops, where I exposed them here in London, they concluded them fit for painters' use, and of good value; so that this wretched country was not destitute of all human food or commodity; and had I been there in a season when the snow was gone, much more might have been observed; or even then, had I made it more my business to discover what was odd or rare. Towards night the wind came to the N. N. W. blowing hard, and snowing.

Sunday the sixth, it proved fair and clear till three in the afternoon; then the wind shifted from the N. W. to S. and began to blow and overcast.

Monday the seventh, it blew hard in the morning at N. N. W. and from thence the wind shifted to W. S. W. I took now into further consideration the quantity of provision I had left, and finding not above two hundred and three pieces of beef, and peas proportionable, and seeing no likelihood of getting any other relief while we stayed here than what we had met with, I put my men to straiter allowance, viz. six men to a piece of beef a day, and a pint of peas for four men. And to prevent all discontent and murmuring, I kept myself, as I had done all along, upon the level with them, giving them leave to take the first piece in choice, and I the second for my own mess. Withal I encouraged them daily to get what provision of sustenance they could from shore; having finished our drag, and fixed two nets for catching sea-eggs, of which we got this day three bushels. These were the means of tempering, as well as sparing, our salt flesh, which we should have more need of at sea, where we should be bereaved of the helps this harbour afforded us. Alas! had we but store of proper and cherishing food, our sufferings from the cold would have been easily borne, by so many hardy and lusty men as I had then on board, with the plenty of firing we met with. Nay, had I been so lucky as to have brought, what I usually did in former voyages, quantities of Russia hams and neats' tongues, they would have afforded great support under such woeful distresses. But to heighten the misfortune, I was basely disappointed at my coming away of a thousand weight of stock-fish, which I had agreed for, to take with me as ship provision. Strong Russia beer too (not to mention high wines and brandy) had been comfortable drinks in cold days, as I found by that little I had in bottles, which I kept buried up in straw, and preserved mostly from the frost thereby; howbeit now and then the boy fetching a bottle would bring the neck in one hand, and the bottom in the other, without spilling any, perhaps one of the uppermost, and not well covered. And I cannot forget, what I have more than once taken notice of, that a bottle of beer standing behind us, while we sat before the fire, would contract ice in the time we were drinking it.

Tuesday the eighth, the weather was fair, and something warmer, the wind being at the S. W. I got my sheet-anchor and best bower on board, and made all clear for the sea, riding only by our small bower and one cable ashore. In the evening our men dragged, and used their nets, getting some scallops and two bushels of eggs, to our great relief. This day we first pumped the ship, having in her about nine inches of water;

neither had we occasion to do it afterward, which was a happiness, by reason we could not have kept our pumps clear without a good supply of hot water; besides, the doing it often would have fatigued our men.

Wednesday the ninth, in the morning, it blew a stout gale of wind at W. by N. with snow; but at noon the wind was at W. S. W. with squalls of snow. We got a boat of wood and water, and carried a shank of lines, with twenty hooks, out into the Fuel, and left them all night, to see if we could take any fish therewith.

Thursday the tenth, we had fair weather in the morning, and little wind; so we fetched on board our lines, with the baits entire, and no fish. Before noon it blew a storm out of the W. with abundance of snow, which obliged me to let go my best bower under foot: it continued to blow till midnight, and then the wind eased.

Friday the eleventh, in the morning, it was fair and the wind southerly: towards noon it fell a snowing, and blew very hard at S. S. W.; in the evening it froze smartly, with abatement of wind, inducing me to heave up my best bow-anchor again; but a great snow followed, and bad weather all night.

Saturday the twelfth, it continued blowing very hard at W. with much snow in squalls; so I was forced to let drop my sheet-anchor under foot. We had two cats on board, whose lives we endeavoured to preserve by giving them fresh meat of sea-eggs, and muscles, &c. but they grew weaker as the cold continued, and died of the cold, starved, one now, and the other a week after, even at our feet, and before the fire.

Sunday the thirteenth, it continued blowing very hard, the wind at W. N. W. and N. W. with much snow, and violent gusts of wind.

Monday the fourteenth, we had not so much wind on this as the last two days, yet it was far enough from being calm. I heaved up my sheet-anchor and brought it on board; got a boat-load of wood, and another of water.

Tuesday the fifteenth, the good weather in the morning invited our men ashore to gather perriwinkles and dills; but by ten o'clock it began to blow a storm at N. W. by W. so that they could scarce get aboard again. At three in the afternoon one of our men departed this life: he was under thirty years of age, and taken first sick at Archangel, of a distemper like an ague, continuing ill ever since we came away from thence, and declining till this time. Neither can it be said he died of the cold merely, such as do so (as I have been told) going off sleeping; whereas he expired gradually and sensibly, as I have seen others breathing their last; could we have got home in good time, he might possibly have recovered. The continuance of the storm made us let fall our best bow-anchor.

Wednesday the sixteenth, the morning was fair, so we heaved up our sheet-anchor, and buried our deceased man at low water mark; for higher up on the dry shore the ground was so hard frozen, that we could not dig it. We got a boat of wood and water, and put the dead man's clothes to sale at the mast; so our custom is at sea in the like case. In the evening the wind came to the S. blowing and freezing extraordinary hard, with squalls of snow; afterwards it shifted to N. N. E. continuing stormy all night.

Thursday the seventeenth, it grew calmer towards the morning, but it snowed much, and froze very hard all day, the wind cotinuing at N. N. E. till midnight, and then came to the W. and in the morning following to N. N. W.

Friday the eighteenth, the weather moderate enough as to wind, but snowing and freezing so prodigiously, that our men, who went ashore to get perriwinkles and dills, were forced aboard in a short time, being not able to endure the weather abroad; and some of them were so benumbed with the cold, as to be incapable of helping themselves to climb the ship's side, so that others were forced to help or hand them up: but soon

after they got aboard they recovered, the ship being hot like a stove, compared with the open air. I remember for several days I could not bear the sharpness of the air, walking upon the deck, but was glad to clap my handkerchief double over my mouth and nose for a defence. You must know that for these four months past, since we came in here, we suffered our beards to grow at length for warmness, which would be often full of icicles, from our breath congealed, after the exposing ourselves for a little while upon deck; but approaching the fire they came off easily, whereas to have pulled them off before, had been to bring hair and all.

Saturday the nineteenth, we had little wind this day, and that at N. W. but much snow, and frost so excessive, that it was impossible for a man to look to windward. In the mornings, after such bitter nights as we had at this time, the glass windows of my round-house, where I lay, would have ice upon them of the thickness of a crown-piece; so that we were forced to scrape it off with a knife to let in the light. The great cabin windows we kept shut up with boards nailed without, as well for the preservation of them against weather, as warmth for the ten men I lodged there constantly. The round-house I reserved to myself, though much colder; but I kept that in regard to the provision I had stowed therein. And to make known to them that I had shared the sufferings with 'em, I shewed them my bed, which was frozen to the boards on each side, that I durst not allow the boy to stir it, for fear of tearing; thus for five months I left it, and went to it morning and night, not pulling off my clothes save for shifting, only putting on my fur gown at my arising, and plucking it off when I laid down, to throw over me, together with the rugs and blankets. And long since finding the inconveniency of going from the fire in the steerage, where I resided by day, to my lodging at night, by reason of the snow that laid on the quarter-deck, I ordered the carpenter to caulk up the round-house door; so I made my passage by a scuttle, or sally-port, down into the great cabin, and by that means observed the order they kept below me. As I lay in my bed I could distinguish and tell every nail in the ceiling or elsewhere, either head or point having a piece of ice like enamel upon it; I suppose from my moist breath condensed and froze. My books too, that stood upon a shelf over my head, had upon their edges and corners the same ornament; a sight I cannot say whether more pleasant or dismal.

Sunday the twentieth, 'twas calm, with much snow falling, and continued frost; notwithstanding I got up our fore-yard and mizen-yard in the evening, in hopes of an E. wind; but by night it came to W. continuing fair.

Monday the twenty-first, this morning was calm and fair, after a serene and sharp freezing night; so that we could not but observe the surface of the water in the bay about us to be covered with a hard scum or thin ice, which made us fear being locked up; but immediately the wind arising at W. broke it all away. We got a hogshead of water, and knocked off the ice round the ship at the edge of the water; and in the evening our men went ashore for recruiting their fresh provision; and towards night it blew so hard, that I was forced to lower our yards down again.

Tuesday the twenty-second, the day began with good weather enough as to wind, only we had some squalls of snow; it froze too, but very moderately. We got a boat of wood; and our men going up the hill a great height a-wooding, saw the body of the sun, reporting it when they came aboard with great joy; and indeed it was a sight for them to rejoice at, having never seen it since they came into this harbour. For it must be considered we lay low in the water, that we had less light for that reason; yet was the want of that compensated by a more benign temperature of the air as to cold, than we should have found upon any part of the shore. For I am persuaded that no house

we might have made there could, with the same manner of warming it that we made use of in the ship, have preserved us so well. Besides a coldness perhaps from the earth itself, I am sure a small height in the atmosphere makes a sensible variation as to heat and cold in the same place not to offer at any reason, but our men found it so by daily experience, when they made but small ascents in wooding and watering. And the mountains, or greater hills which lay about us, being, as near as I could guess, above three hundred fathom higher than the surface of the water in the bay, seemed to have endured the utmost force of the frost, having crowns or caps of ice, three or four fathom thick in some places, and over-hanging like a pent-house or precipice, with a horrid prospect at a distance.

We took two turns off the hawse, cleaned the ship's deck of snow and ice, and cleared the scuppers. At midnight it began to blow a storm at S. W. but towards morning the wind came to the N. W. by W. the storm continuing, so that I was forced to let fall my sheet-anchor.

Wednesday the twenty-third, the wind held hard at W. N. W. with much snow; about ten in the forenoon the wind came to N. E. by N. continuing to snow. At noon we heaved up our sheet-anchor, the wind easing; but in the evening it came more out of the bay. This day as I was walking upon the deck, came a fox upon a small hill over against the ship, and stood awhile looking upon us, but soon ran away at a little noise we made.

Thursday the twenty-fourth, we had the wind at S. E. in the morning, with a gentle gale, but freezing extraordinary hard; howbeit we got a boat of water, and cleared our decks, from snow and ice. At noon the sun shewed itself upon our masts; I got my fore-top-mast up, with my mizen-yard and fore-yard, and towards night the wind southed. I then made a strict survey of all our provision, shifting it out of one cask into another, that I might be certain how much there was, and found but one hundred and fifty-four pieces of beef on board. I gave to each of our men a pound and a quarter of honey, for the use so often mentioned before. Some of them had been ashore this afternoon to get dills and perriwinkles; but the weather was too cold to be endured, and they were forced to return on board presently.

Friday the twenty-fifth, by break of day, the wind being easterly, I got all my yards and top-masts up, and the men went ashore to cast off the cable, with a full resolution for sea; but before they could clear the ice, and come to cast it off, the wind came to S. W. and W. S. W. beginning to blow and snow. Before night I was forced to strike both my top-masts, and lower all down again snug; and at ten the storm was so furious, that our men were contented to abide here, notwithstanding their late earnestness to be going, acknowledging it a mercy from heaven to be detained.

Saturday the twenty-sixth, the wind was grown moderate by the morning, and at noon 'twas quite calm: we took two turns off our hawse; and in the afternoon got a boat-load of wood; the skiff too went a-dragging, getting but fifteen scallops. This mild day gave us opportunity to observe that the sluices or drains of water that fell into the bay were so considerable, as to make a small motion toward the sea at low water.

It is to be noted, we had no river running into this harbour, or any which we call back waters, but the fore-mentioned drains, all of them not being sufficient to supply a current. It flowed S. W. at a full and new moon, rising and falling at neap-tides about eight feet, and at spring tides about twelve or fourteen. How it was in the Fuel we can give no positive account; but by my observations upon some points, the tide did seem to move indifferently strong; for when I was out with the boat I perceived some riplings, and our men in searching fell in with pretty strong tides, but could not

inform me distinctly. Above all things I well remember, the whole Finnish people, when they came aboard our ship, told me there was never a rock or dangerous shoal in the whole Fuel. And I have taken care to have the depth of water and anchoring places marked in the chart faithfully, according to the several discoveries made by me and my mate, and the distances of places computed with the best of my judgment; to which I refer the reader. Towards night the wind southered, blowing and freezing hard.

Sunday the twenty-seventh, we had a small snow falling all day, but so very mild withal, that it melted as it fell, and likewise that which laid before upon the ship; and toward night it turned to rain, with the wind at S. W.

Monday the twenty-eighth, the morning was stormy, the wind at W. so that I was necessitated to let go my sheet-anchor; but toward noon the wind eased, and I heaved it up again. I called all my company together, and told them that the time had spent so much of our provisions, that we could not venture to sea with what we had remaining, where we should be bereaved of all the little comforts and helps we had from the shore. And therefore, while we had any thing left, we must go and make search for people, whereby to get provision, to carry us out of this place, and to our much desired homes.

That since Almighty God had wonderfully preserved us till this time, when the weather was grown more moderate, and the days of a brave length, we ought not only to express our thanks in words to that Being of all goodness, for our preservation past, but to be active and industrious for the future, shewing ourselves thereby more reasonable creatures.

And finding such discourse to have some effect upon them, I ordered the long boat to be immediately hoisted in and guawked, and other things done, that might be for the safety and convenience of the men in her. It proved a fair day and thawed, whereby we got one side graved in a few hours, fitted her sails, and put many things in readiness.

Tuesday March the first, the month and day began with fair weather; and after we had made an end of trimming the long boat, and got her out, we went all hands ashore, to get what we could for the belly: and towards night got our yards and top-masts up, resolving to keep in a moving posture.

Wednesday the second, it began to blow hard at W. S. W. and so came to S. a violent storm; insomuch, that we were forced to strike both yards and top-masts down again: but towards night the wind eased, and it froze at an excessive rate. This day the sun shined on board the ship over the hills; it being the first time of my seeing the same since I came in here, being seventeen weeks. Note, that though the sun at this time did not remain above the horizon quite so long as it does in England, and its meridian altitude but little, yet this day was even as long, considering the more early day-break, and the more lasting twilight in the evening. And who knows not, that upon the tenth of this month, the days and nights are equal all the world over.

Thursday the third, it proved a very fair day, with much sun-shine and little wind; we had not seen the like before in this place. This put such life in our men, that they got up our top-mast at once, and loosed the sails for drying them, they having continued still folded up now for some time; and according to our expectation they were found well, here being no fear of their getting heat to rot them. In the afternoon our men went on shore to get dills and perriwinkles, some dragged in the long-boat and got scallops, and others in the skiff with their nets made good purchase of sea eggs. When night came on, I could not but observe our people as busy as they are usually in

a cook's shop, about the Exchange of London, between the hours of twelve and two; only with this difference, that every man was there both guest and servant. This with a kettle, that a saucepan, and the other a dish or platter; some dressing dills, some scallops, muscles, and perriwinkles, and others boiling sea-eggs in broth; and some were brewing of mead; so that at both hearths there was scarce room enough for one to get in between to light a pipe, I can't say of tobacco, for there was none but what I had; what the men smoked for such, they took as much pains to prepare, as to cook a dish of meat.

Friday the fourth, in the morning the wind was at W. S. W. a strong gale, with clear weather, but at noon it snowed: however, we got a boat-load of wood. Toward night fell little wind, and that at N. N. W.

Saturday the fifth, it proved a hard storm southerly, so that I was forced to strike our yards and top-masts, and let fall our sheet-anchor; it freezing very hard all day, with clear weather over head.

Sunday the sixth, we heaved up our sheet-anchor again, the day beginning with little wind, and continued handsome weather till eight at night, when the wind came to S. S. W. and it fell a snowing.

Monday the seventh, it blew hard in the morning at W. S. W. and a great sea came tumbling in, which obliged us to let fall our anchor again. At noon it abated, and came more westerly; at eight at night we had a storm at N. N. W. but blowing dry and indifferently warm.

Tuesday the eighth, the day broke with little wind, but that running from E. to S. and S. W. and to W. S. W. and then a fresh gale, but dry and warm. We got a load of wood, and filled a cask of mead, for the men that were to go in the boat. At this time I found all of our men complaining of pains in their bones, which my chirurgeon did conclude were the effects of the frost in their limbs; generally remarkable upon the abatement of the weather: which we found true, observing upon the return of extreme frost we were without ailment, but upon a thaw we felt the same pains again. The like indisposition I experienced in myself, at such times.

Wednesday the ninth, the fairness and calmness of the weather gave us an opportunity of getting two turns off our hawse, heaving up our sheet-anchor, drying our top-sails, and fetching three hogsheads of water; we likewise fixed a fire-hearth in our long boat, which we made two days before, and fitted a sail to spread over the same, if they should be forced to lie in her; and got all things ready to set her forth at half an hour's warning. The wind came to S. S. W. the sky looking squally, but proved very fair.

Thursday the tenth, we had good weather in the morning, and a southerly wind. I caused all my men but four (who were sick or unsound) to cast lots who should go in the boat, and they fell to six as able as I could have picked out: howbeit, two of them bought it off with two others, for ten shillings each, to be paid them, when they should receive their respective wages, at the end of the voyage. My mates drew by themselves, and the lot fell to my second mate; a man fit enough for the business. I immediately sent them away with money, linen-cloth, and other things which I judged might be fit for traffic with the inhabitants, if they should find any.

Towards noon the wind came westerly with much snow, withal freezing hard, but handsome weather of wind: and at eight at night it came to the N. N. W. and brought back our boat again, having made little discovery.

Friday the eleventh, the wind was southerly, and the morning fair; so I sent the long boat away again on her former errand. With those I had on board, I got a skiff

of wood; I mean the soundest of them, for the rest had the frost in their feet or hands. The wind continued in the same quarter all the afternoon, but at night blew very hard.

Saturday the twelfth, it blew hard at S. S. E. and froze sharply all day.

Sunday the thirteenth, it blew fresh at S. by E. all day, but dry over head, with a hard frost.

Monday the fourteenth, the weather was very uncertain, sometimes squally, now high wind, and then fair and clear. While it was so, all that were aboard and able went ashore, gathering dills and perriwinkles, and such as they could get for the belly.

Tuesday the fifteenth, in the morning it proved fair and clear, so that some of our folks went ashore to seek for provision, and others continued in the skiff, dragging for shell fish. Those upon land happened to espy two boats coming into the bay, and rowing towards the ship. They presently imagined them to be some of their company sent out four days before, and fell a hallooing to their fellows in the skiff; which so affrighted the people in the boats, that they immediately turned about and made away. And though I called to the skiff with all speed to come aboard, and sent a man to the point to see for them, yet such haste they made, as to be out of sight before he came. Soon after some of them appeared upon the point and continued looking upon the ship a good while. In the mean time I sent a man up one of the hills, to discover which way they went, but he returned without being able to give any account of them. So we lost that opportunity of commerce with them, who then, if they had not been unluckily scared by noise, would doubtless have come on board us of their own accord; for the ship lay, in a manner, between them and our men in the skiff and ashore; and I guessed they were wholly taken up with the sight of the ship, where, by my order, we lay silent and hid; and for the future I commanded every one to be so, upon the like occasion. These people, we suppose, were coming to take their summer habitation in the houses we described before: for to me it seemed as if there were cattle and children in the boat, but I could not, by all the inquiry I made of those whom I saw afterwards, learn who they were, or whether I guesed right of their intentions. In the afternoon it blew fresh at S. S. E. however we filled three hogsheads of water.

Wednesday the sixteenth, all the forenoon was calm and fair, which our men spent in dragging for scallops and sea eggs, and gathering dills and perriwinkles, at low water.

At noon I took boat and rowed out to a hill, lying at the mouth of the harbour, and went up as high as I durst venture, to look about the Fuel. And S. of us I thought I saw several islands, but could not discern the bottom of the Fuel, which ran in very far and wide.

Thursday the seventeenth, it continued fair, and our men went on shore a-wooding, but had not been gone above two hours, before they discovered a yawl coming towards the ship; and according to the order given before, we let them come aboard us very silently, expecting it was one of the boats we saw two days before. But it proved to be a yawl that came from the North Cape, with four of our own men in her, and one Finlander, sent by my mate to satisfy me how things stood there with the long-boat. And indeed it was high time to release me from the fears I was in about them. He sent in her a barrel of beef, a barrel of rye-meal, forty pounds of oat-meal, eighty pounds of stock-fish, with other provisions of fish, viz. mutton, pork, and venison, all dried; and a small cask of beer. They likewise brought us the news of a peace concluded between England, the rest of the confederates, and France: and gave me the following account of what happened to them from the time of their departure. "After we had sailed to

the other side of the Fuel, we got sight of a little yawl, and gave her chace, having the wind of her, and it blowing fresh. They made for the shore, and just as they landed we fell in with them. There were but three men in the boat, who got out and ran for it upon the snow, two of which our men could in no wise overtake, but the other they caught: he was an old man, and they were his sons. Our crew treated him civilly, and having two Danish men born in the company, they fell to discourse him, and soon settled a right understanding between one another, that he immediately called the young men, that stood a loof off, to see what would become of their father. They readily obeyed, and parlying with them all together, our men offered them two dollars, if they would conduct us to a priest's house, or some town, where we might get provision for money or goods. So they came to an agreement; the old man and one of his sons forthwith stepping into our boat. But we having a brisk gale, in towing the yawl after us, pulled her stern in pieces, and so were forced to cast her off; the old man bidding his son that was in her to go ashore, and directed us to keep on our way. This we did till we came to the outermost point, where he went ashore, finding there some houses, and about four families; the hamlet or village being called by the name of Swetwel. In this place we took up our lodging all night, and the day following being stormy, we durst not put to sea. All this time we received kind entertainment from the inhabitants, and our company likewise were as free of what they had to them. The day after being Sunday, we parted from them, and with all speed made for the town of Colwitch upon the cape, where we arrived by two in the afternoon, the people being at church. After sermon they came all, and made much of us, hearing our story, and admired that we were able to live on board, in so extraordinary hard a winter; for so it was accounted with them. They seemed very kind to us, till the minister and the merchant fell out about selling our provision. For one said it belonged to him, and the other as much; but between them both, we were furnished at their own rates, being glad to get it any way. It happened at this time, there was one from the governor of Wardhouse, who came to look after the salvage of a Dutch fly-boat, that was lost in the same storm that drove us in," &c. and from him they had the good news of a peace.

That night I dispatched away the same boat again (which was a yawl belonging to some of the town, of whom our people had hired it for four dollars) and sent her to the same place upon the cape, with more goods and money for purchasing more provision; with order for my own long-boat to return on board with all convenient speed. Yet as I understood afterward, they were in great danger of being lost, had not one of the inhabitants coming along with them, and knowing the coasts well, happily directed them to a place of safety, during the storm they met with.

Friday the eighteenth, in the morning it blew a storm at S. S. E. but towards noon it abated, yet snowing much till five in the afternoon; becoming then fair and clear, with little wind, and that shifting to W. S. W

Saturday the nineteenth, we got a boat's loading of wood, it continuing calm and fair till five in the afternoon; from which time it snowed till eight at night; but all the while moderate as to wind.

Sunday the twentieth, in the morning came a yawl from the minister's house, that lived fifteen miles from us, towards the North Kyne; and in her a clerk or secretary of the governor's that resides at Wardhouse. This person was the same that our men before had told me of, who came now on purpose to see me, after he had crossed over the Fuel, to make his returns; his way being then all over land, and that upon the snow. He told me, that he boggled neither at mountain or valley, but could go in fourteen hours time sixteen Danish miles, which make sixty-four of ours. And ac-

cordingly shewed me how he was fitted for such a journey, having with him a leathern canoe in the fashion of a weaver's shuttle, only turned up more at the ends. This was carried in his boat, when he went by water, but at land it served as a sledge does in Holland when the rivers are frozen, having three iron keels at the bottom, and being drawn by a rein-deer. It had a covering like a deck, with a hole in the middle, coming close about his waist; so that with a fur coat over the upper part of his body, and other clothing beneath, he was well provided against the worst of weather. In his hand he carried a paddle or small oar, to keep him from overturning. In his way are no inns, but he makes his night's lodging at some minister's house, where he still finds free quarter.

He informed me of two Dutch ships that were forced into the harbour of Wardhouse by the same storm that forced me in where I then lay: that he supposed they were now going to sea, their men having laid on board in order thereto three days before he came from thence. I thought that might very well be, considering the great advantage they had of me, being at the principal town of the whole country, even where the governor himself lived; where they could want for little, but had good Danish houses with stoves in them to keep them warm. And one thing this gentleman told me, too considerable to omit; viz. that from Wardhouse aforesaid there went a post to Copenhagen every fortnight. So that if any ship be forced in there or there abouts by stress of weather, finding a minister's house, they may send to the town, and from thence to any part of Europe.

In this boat came the minister's son, who brought both dry and new fish, and pretty good store, with several presents from his father; as a calf new killed, with cheese and milk for my men; also dried mutton, and hams of bacon, venison, and partridge.

Monday the twenty-first, it blew fresh at S. all day; notwithstanding, there came a Finnish boat on board me, and brought me store of fish and dried mutton, with a small parcel of fresh butter and cheese. I bought all they had, but some venison and partridge, which, at their going away, they presented me with, I giving them in gratuity such as I had; viz. a few raisins (a great rarity with them) and some mead. Their venison was lean and horridly black, but the partridges were dainty, being fresh killed, and fat.

Tuesday the twenty-second, it proved a storm; the wind all southerly, withal freezing hard, but dry over head.

Wednesday the twenty-third, it was so fair and calm, that we cleared our hawse. This day came another boat on board, and brought us fish of several kinds, both dry and wet; viz. cod, ling, and turbot; some butter and cheese, with dried flesh of the sorts aforesaid. Note. That this meat was not salted, but prepared thus for keeping, by being hung up in their chimnies. It had little of goodness or nourishment, and scarce appeared to swell by boiling. But I took all they had, in truck for cloth, and clothes made up; and some I bought with money. The boat they came in was of the fashion of a Norway yawl, big enough for six rowers, and so many they had: but some others had but four, being less; and likewise there were for two only. The people are low of stature, of limbs well set, fresh coloured in the face, though of a dirty hue, and an ill smell attending them. But whether it is from their lying in their clothes, or their natural savour, perhaps derived from their constant diet upon fish, I could not determine with myself. Their hair is generally light coloured and lank, cut like the Danes: they wear their beards of a full growth, young and old; their habit too is like the Norwegians, viz. close breeches, short coats, both made of coarse cloth, with caps of the same, furred. Their shoes are pulled up half way on their legs like boots,

with toes turning up like the tip of a half moon painted, and furred within. One thing peculiar in this peoples' garb I observed, and that was, they every one carried a small powder horn, hanging under their chins by a string, about their necks, for what use or purpose I could not learn, though I asked them as well as I could, but could not explain their answers; for my Dane that remained on board was then, as I thought, at the point of death; that is, so weak as not to do the work of an interpreter. The governor's man too could not speak Dutch enough to be intelligible to me, when I inquired into the same thing three days before, though I understood he was a German born.

Thursday the twenty-fourth, it proved fair, the wind at S. W. We got a boat of wood. Towards night it westered, and about eight our long-boat returned on board, and brought with them a barrel of beef, a barrel of rye meal, and three hundred weight of stock fish, with other provisions which we wanted; viz. some dried mutton, pork, and some bread also, with butter and cheese, to our great comfort; we being therewith sufficiently stored for the sea. And from them I took this following relation: That the town of Colwitch on the cape consisted of about fourteen houses, with as many families and one church. The houses are built after the Norway fashion, of wood, with stoves placed in the middle, or so as to warm the rooms without the sight of fire; they being a kind of ovens, and are heated after the same manner. Their houses have windows of glass, but with wooden shutters, both inward and outward, which they make close in the winter, by stopping or caulking them with moss. So they keep up several weeks in the dark and cold season, burning great tallow candles continually; some of which our men saw. The church was of the same materials with their houses, being one room, able to contain about thirty persons. Four or five of these churches or chapels are served by one teacher about three times in the year; (for it is to be supposed they only congregate in the summer.) They are usually placed about five or six miles off each other, or nearer, according as the country is more or less populous. But one pastor lives generally fifteen miles from another, who is maintained by every tenth fish; and where he resides not, he empowers one to gather the tithe, as they take them. By this means they are furnished with merchandise, which they sell or exchange, for other things they want, with ships that come yearly to their port town to fetch them, and bring goods accordingly. Hence they come to be the most wealthy and considerable of the people. They are lawyers, justices of the peace, and customarily sole in authority. For their education is the most liberal, being, as I was informed, in a school or petty university in Norway, near Drontheim. They too observe the greatest hospitality; all travellers being entertained by them, and furnished with sleds or rein-deer from one to another: the like also was I told by the governor's man before, when he informed me of their way of travelling. They breed cattle of a small kind, with goats and sheep, and swine also. The former are fed in the summer with grass, of which they have plenty at that time; but in the winter they gather rock-weeds at low water, and boil them in coppers made for the purpose, to take the salt out, and then give them to their beasts to eat. They have horses too of very mean stature, who have the same food; but the hogs, I guess, are nourished by fish, by reason the dry pork they brought me had a strong taste of it. Their customs and manners are much like those of the Danes, under whose dominion they are; and every man from fifteen to sixty is taxed at two dollars each, which they pay yearly, either in fish or money, to the king of Denmark's collectors: and for that they have a seeming protection, and a liberty of living where they please; which in summer is up and down the country; but in winter they retire to their joint habi-

tations fitted up suitably. Their religion too is Danish, being of the Reformed Lutheran church, in belief and discipline; their sermons being preached, and their divine services performed, in the same language. So that, though they have another language ancient and native in the country, yet they understand and use the Danish mostly. As to their women I can say but little, not seeing any myself, nor did the men I sent pretend to give any account of their behaviour, or how they managed their families. They only told me, that their habit was like the Danish womens'; but I could not but believe the better sort of them love fine clothes, as well as our English dames. For sending a piece of wrought silk of seven or eight yards, the minister's wife at the cape bought it readily: and, to shew how much she was pleased with her bargain, over and above the price she agreed to and paid, she sent me a dozen of partridges and a cheese. Her husband too made me a present of a small cask of beer. Nor was the merchant behind him in civility, sending me a fresh leg of beef, but killed a month before, and without any salt preserved by the frost; and some dry mutton withal. And truly they might well enough afford it, considering how dearly I paid for my provision.

Friday the twenty-fifth, it held fair, with little wind at S. S. E. betimes in the morning I called all hands up, and heaved up our sheet-anchor, which we carried out before the long-boat went away, and got our yards and top-masts up, clearing our decks and scuppers from snow and ice, and making, that night, all fit for the sea; having a longing expectation, and great hopes it might be on the morrow.

Saturday the twenty-sixth, there was but little wind stirring this morning, all we had was from the S. E. notwithstanding, to get out, we unmoored, and got a part of our small bower and our cable aboard, leaving only a towling ashore to cast the ship. By that time our men had got their breakfast (which was a high word with us then, and we began to speak it cheerfully) it proved a fair gale at S. W. we heaved up our anchor, and cast off our hawse, and got out to the Fuel, where we found the wind fair and southerly; but espying a boat rowing towards us, we laid to and took her up. In it was the same person that came before with the governor's man, viz. the minister's son, a young man about thirty years of age. By him his father sent me tokens highly acceptable, that is to say, a whole calf ready roasted, a rarity, but not a wonder, because entire; seeing it was not much bigger than one of our hares ready dressed in England. Also a runlet of beer, with a kid or wooden vessel of milk, containing above three gallons; which was very sweet and good. A small quantity of curds too, fresh and tender; with a couple of little thick cheeses, well tasted, but a little strong of the runnet; over and above, a ham of their choice bacon. I had much ado to force a present upon him, his father having charged him not to take any thing of me, that I should want in my passage home. At length I persuaded him to carry his mother a pound of white sugar, and a pot of honey, and a parcel of raisins, and presented himself with two silk handkerchiefs: so we parted, he for his home, and I made the best of my way for sea.

We sailed in the middle of the Fuel for safety, so that we could make no nice observation of the land; besides we were mightily disabled for distant views by the smoke of our green wood fires, which we had endured so long. Howbeit we discerned the shore to lie high on either side, with wood upon it in some places; but in none so much as where we lay; as we had been told before by the people of the country. So that we happened well into a place, so plentifully supplied with what we could not have lived without.

At four in the afternoon we got out of the Fuel; by eight at night we were the length of the easternmost part of the cape. It blew hard at S. S. W. so that I was forced to hand both my sails

Sunday the twenty-seventh, the wind shifted from S. W. to W. blowing so hard as to put me by both my top-sails. At twelve at noon we reckoned the North Cape to bear S. E. half E. distant forty-two miles. I made my way this twenty-four hours N. W. half W. distance forty-nine miles.

Monday the twenty-eighth, by ten at night the wind eased, and we set our main-top-sail; at two in the morning we set our fore-top-sail, it being handsome weather; at six in the morning we set our main-stay-sail and mizen-stay-sail. All this time the wind continued shifting between S. W. by S. and W. I made my way N. W. three degrees W. distance forty-seven miles.

Tuesday the twenty-ninth, we had moderate weather as to wind, and that shifting between S. and S. W. by W. I made my way this twenty-four hours N. N. W. distance forty-seven miles, it being almost stark calm between times.

Wednesday the thirtieth, it blew a stout of wind till five in the morning, when it began to abate, and fell a snowing, and freezing very hard withal. I tacked to the southward. By twelve at noon it grew calm. I made my way this twenty four hours W. by N. half northerly, distance sixty-eight miles. This day I got an observation, and found myself to be in latitude 73° 25′.

Thursday the thirty-first, it proved very fair weather, but very cold, the wind holding between the S. by W. and S. E. with a moderate gale; and towards noon we had it mighty calm, with a smooth sea. I made my way S. W. half W. distance sixty-seven miles.

Friday the first of April, it blew hard, the wind shifting between the S. S. E. and W. the sea going very high: I made my way W. S. W. three degrees W. distance fifty-seven miles.

Saturday the second, it continued to blow as the day before, snowing at an excessive rate, and froze so exceeding hard, that all the water that flew into the ship became ice in a small time; insomuch that the ship itself, both within and without, was completely lined and covered with ice, and nothing about us was fit to be handled. The wind came to the N. so we made shift to get our main-sail hauled up, and bound together as well as we could, and stood away with our fore-sail, it looking dreadfully a-stern of us; but toward noon the face of things was altered, and I got another observation, finding myself thereby in latitude 71° 46′.

Then we set our main-sail again, but there was no spreading it, it was so hard frozen; and to pull it down, we were forced to bring the tackle to our tacks and sheets, straining them as hard as we durst, for fear of pulling the sail in pieces; after all, we could not get it above half spread: we set our sprit-sail too, but all the watch, which were ten men, were two hours in getting it loose. In the afternoon I went about setting my fore-top-sail, but could not get it out of the top by all the ways we could devise: I made my way S. W. three degrees W. distance thirty-five miles.

Sunday the third, it was moderate enough as to wind, and that between the N. and E. but it froze excessively. This day, with great toil and labour, I got both my top-sails set, loosing the sails by degrees, and letting them dry, and bringing the sheets to the windlass with loof tackles, I got them spread: I made my way S. W. by S. distance seventy-three miles.

Monday the fourth, we had mild weather this day, the wind shifting round, and now and then it snowed: I made my way W. S. W. one degree W. distance fifty-four miles.

Tuesday the fifth, the wind came to S. and so to W. blowing hard, that we were forced to take in our top-sails, and at last our fore-sail. At ten in the forenoon we reefed our fore-sail and mizen, and tacked to the southward; so that I made my way W. by N. distance about thirty-four miles.

Wednesday the sixth, little wind had we all this day, and that running round the compass, but the frost fixed and severe: the way I made was S. S. E. one degree E. distance but nineteen miles.

Thursday the seventh, not much wind to-day, but shifting between the S. and W. S. W. with close weather; notwithstanding, I made my way S. by E. distance twenty-two miles.

Friday the eighth, the former part of the day it blew very hard, obliging us to hand both our top-sails; but in the after-part proved so moderate, that we set them again, the wind shifting from S. to S. W. by S. we made our way W. half southerly, distance sixty-three miles.

Saturday the ninth, it proved squally, but indifferent as to wind. We handed our fore-top-sail twice, and set him again as often; the wind shifting between S. and S. W. I held my course for fifty-one miles W. half southerly.

Sunday the tenth, we met with hard gales, first at S. and then coming to W. which put us under a main course: I held on my way S. W. five degrees southerly, distance sixty-five miles.

Monday the eleventh, it remained stormy weather, attended with abundance of snow falling, and exceeding hard frost. I was forced to reef my main-sail as well as we could, but in a sorry manner, stubborn as it was, and so much snow lodged in it: the wind was at S. E. so I made my way W. forty-two miles.

Tuesday the twelfth, the wind came to the E. S. E. and so about to N. by W. with a great deal of snow, and freezing extraordinary hard: I made my way good to the S. ninety-two miles.

Wednesday the thirteenth, good weather enough as to wind, but the snow fell very thick. At midnight it blew from the N. W. towards day from the E. and by S. little wind. At break of day it fell quite calm, freezing very hard. I made my way S. distance ninety-four miles.

Thursday the fourteenth, the wind came to N. E. and then to N. W. blowing so very hard, that I could carry nothing but a fore-course: we had a great sea out of the S. but in the morning I set my main-sail again, after the best manner I could; so hard frozen was it, that I could not get it above half spread, though I lowered my main-yard above three feet down: I made my way S. distance one hundred and seventeen miles.

Friday the fifteenth, we had a brave wind from the W. and by N. which made us strive hard to bring our fore-top-sail to be serviceable, getting it off the top, and by mere strength forced open some part of it, and so stood away with it for four hours; after which time it relented, enlarged, and became more useful: by which means I made my way S. distance one hundred and twenty-three miles.

Saturday the sixteenth, it blew a stout of wind at N. N. W. so that I had made my way S. by W. distance one hundred and forty-two miles. By twelve at noon we saw Fowley island to the E. S. E. of us, distant eighteen miles. We had brave moderate weather at this time; and now we heard rats about the ship, who began to be intense and vexatious to us, in seizing upon our new stock-fish. It is manifest they kept close all the cold season; but our sick men who lay below, with my surgeon and carpenter (who was an old man, and kept constantly a lamp burning by him) never saw any of them, or perceived them in the least to stir: how they lived so long on board we guessed afterward, when we found they had eaten holes in our masts, and made themselves places to lie in; and for drink, they could get none but by licking the ice casks, though nobody saw such a thing done by them.

Sunday the seventeenth, it continued fair, the wind at W. At sun-rising I saw Shetland, and the isles of Fair and Fowley all together, it being very clear so early. At ten I discerned Orkney; and at twelve at noon I took my departure from Fair Isle, which then bore N. from us, distant thirty miles, being very fair weather.

Monday the eighteenth, the weather held as before, but the wind was shifting between the W. and S. W. I made my way S. S. E. distance eighty-two miles.

Tuesday the nineteenth, the day began with a fresh wind at W. N. W. and a little before noon we saw three ships steering towards us: whereupon, as not depending upon what the governor of Wardhouse his secretary had told us, or giving entire credit of his news of a peace with France, I caused a clear ship to be made, and put ourselves in as good a posture of defence as we were able.

I furled my small sails and main-sail, and by that time one of them came within shot of my weather-bow: I fired a shot for him to come leeward of me; which he very honestly did, and confirmed the news of a peace, to the great joy of our hearts; for, God knows, we were but in a bad condition for managing our guns in a way of fighting. This ship was a Flemish fly-boat, bound to Greenland for whale-fishing. We presently after saw more ships bound to the same place, and two fisherboats also; but being now out of fear for ships, we took no notice of the rest. I made my way this twenty-four hours S. half W. distance one hundred and thirteen miles.

Wednesday the twentieth, the wind turned to the S. W. by W. so that I could not seas in with our north course, but was forced to stretch it away to the southward.

Thursday the twenty-first, the wind returned to the N. N. E. and to the N. E. At four in the afternoon we had the sight of Fulness to the S. and by E. off us: and no small surprise was it to us to see all the land covered with snow at this time of the year. A prospect of one's own country had been agreeable no doubt to any of us after so long an absence by constraint and misfortune, but much more had she had the usual garb of the season. Soon after the wind came to the E. and obliged me to tack to the norward; in the night we had much snow, and a fresh gale shifting N. E. and by N. and E. N. E.

Friday the twenty-second, in the morning, with a N. N. E. wind, I came into Yarmouth-road, and, thanks be to God, gave my owners a sight of their ship; one of them, as I was told, but three hours before, having proffered his part for three guineas, which was now worth one hundred and fifty pounds.

The wind holding in the same point, and a fair tide with me, I made no stop, but put through the road, and ran that night into Aldborough bay, where the wind coming westerly brought me to an anchor; so I rid all night.

Saturday the twenty-third, by day-light, perceiving some colliers coming out of the Nesse, I hoisted out my long boat, and got some fresh provision among them, to our great comfort: that afternoon I got out sled way, the wind still at W.

Sunday the twenty-fourth, the wind coming to the N. W. I got up the buoy off the middle of Lee. It was calm and very warm, which brought our men into many complaints, as pain in their limbs, &c. so that the next day I thought fit to send two of them up the river. I took notice of one of our company that went well to his cabin, but when we called him out to heave up the anchor, he was so swollen, that we feared he would burst: but then being got above Gravesend, I hired a wherry, and sent him up with three more; supplying their places with some fresh and able men to bring up the ship.

I and all the rest perceived ourselves manifestly the worse for the warm weather, as we called it; but 'tis well enough known almost to every one living, that such a temper of air in England, both then and for some time after, was scarce ever observed when the year was so far advanced.

A NEW ACCOUNT OF SAMOIEDIA, AND THE SAMOIEDES.

FROM THE HIST. GEN. DES VOYAGES, XXIV. 66.

THE account which we now publish, says the author,* deserves to be distinguished from the mass of writings which so frequently appear, for the novelty, the singularity, and truth, which are united in it.

The person to whom we are indebted for it is very well acquainted, although a stranger, with the vast empire of Russia. He is a man of sense, for a long time employed in that country; formerly in military, and at present in civil, affairs.

To much acquired knowledge he joins all the qualities which constitute a good observer; an ardent curiosity after all the productions of nature, much attention, and great sagacity. The reading of his memoirs will be sufficient for the conviction of such an eulogium not being excessive, but a still greater number of proofs may be found in the Supplement which the same writer has composed for the Dictionnaire de Savary, relative to the articles concerning Russia, if, as it is to be wished, he determined on presenting them to the public. The truth and precision which characterize all the works from his pen give them an incontestible superiority over every thing which has yet appeared on the same subject.

This collection of observations formed a part of the Memoirs sent to M. de Voltaire, for his Histoire de l'Empire de la Russie sous Pierre le Grand; but that illustrious author made only a superficial use of it, any more than of the documents which his excellency the chamberlain Iwan Iwanowitch de Schuwatow had furnished him with, by direction of his court; this is at least what Dr. Busching, so well known by the important services he has rendered to geography, reproaches him with, in the preface to his German translation of the History of Peter the Great by Mr. Voltaire.

The merit of this Memoir would induce us willingly to give it purely and simply as published; but we have thought, on one side, it were our duty to add some observations to it not foreign to the subject, and, on the other, to retrench what relates to the Laplanders, to make use of hereafter, when we shall treat of those people, in an extract from an excellent history published in German some years ago by professor Hoegstroeng.

Among the number of histories of voyages with which the public have been deluged, few are to be found, in which the characters and manners of the several barbarous nations dispersed over the different parts of the globe have been laid down in a satisfactory manner; and where those which we possess have been sufficiently explicit in respect to any nation of barbarians, they agree so ill the one with the other on facts, that the reader who is anxious for instruction, after perusal of them, can only doubt, and keep his judgment suspended.

Some represent these people as a species of animals of human shape, to whom they concede a favour in allowing them to resemble man in figure: and they are spared, when the possession of that good sense natural to mankind is not disputed, on account of a difference existing between their manners and our own, from the habitude of observing foreigners only through the veil of those prejudices, which men have in general in favour of their own nation and their own particular customs.

Other relations again present these savages as differing from us in too slight a degree, and disguised only by a mask somewhat whimsical and novel to us. From a singular

* Memoire sur les Samoiedes, Konigsberg in Prussia, 1762.

J. Swyncop sc.

Samoieds.

attachment to that favourite and commonly received principle, that men are every where the same; the ideas, the virtues, and the vices, which are met with in polished society, and which, like speech, are conceived inherent in the human species, are granted them. Observers of too short sight to distinguish the distance between man in an uncultivated and savage state, bordering on the primitive condition of nature, and man in a civilized state, who diverges from the former in proportion to the civilization and cultivation which he has experienced, they confound together two various beings, and exhibit to us at the extremity of the globe, in midst of the most horrid deserts, the image of themselves, a prey to all the passions by which they are consumed.

It would nevertheless be very important for the natural history of man, to have some more precise information respecting all those individuals, who as yet retain some original features of man issuing from the hands of nature; by examination it would afford us the means of ascertaining what has been gained or lost by society and education. But how can we expect to obtain such intelligence, while all we know of these people is derived from the accounts of navigators and merchants, occupied by views of a different nature, or by their interest alone?

That which remains then, as the best we can do to supply this defalcation, is to fathom, as often as occasion may offer, the truth of the narratives we meet with respecting distant nations, to rectify the errors they may contain, and by such means to enable the learned to form just and well grounded ideas, so as at least to spare them the unpleasantness of seeing their system melt away, from its being founded on chimerical and false circumstances, taken from narratives little to be depended on, or totally untrue.

What has been generally observed of the imperfect knowledge we possess of the greater part of the barbarous nations is found to be fully true in respect of the Samoiedes and the Laplanders, subjects of the empire of Russia.

Scarcely a century has past since the name of a Samoiede was unknown in Europe. Since then Olearius, Ysbrand Ydes, the celebrated Witzen, and Cornelius de Bruyn, have applied themselves to the study of the manners and genius of these people; and they have given to the public the result of their inquiries; but their accounts are very defective and erroneous, and their errors, confirmed by observations on the Samoiedes, published at Petersburg in 1732, have become established, for want of better information. It is not then astonishing, that every thing which has successively appeared on the same subject should as well be stamped with the seal of ignorance and falsehood, since it has been merely the copy of what has appeared from travellers themselves but badly informed.

It falling to my lot to reside for some time at Archangel in the neighbourhood of the Samoiedes, I considered that a part of my leisure could not be better employed than in a close examination into their customs and manners. After having perused whatever has been published on this subject, I have made an abridged collection of the circumstances which I met with that were interesting, taking care to separate the true from the false, and adding the particular ideas which I formed of the character and nature of these barbarous nations, after contemplating them with an impartial and attentive eye.

Without assumption to the title of a skilful observer, I shall congratulate myself upon having accomplished my design, if I should succeed in undeceiving the public for once upon the uncertainty and falsehood of what has heretofore been related; and shall meet with a most flattering reward in the satisfaction I shall experience, at having contributed what was in my power to the developing of some historical truths.

When I speak of the town of Archangel, as of a place in the neighbourhood of these people, I do not pretend to give credit to what is recounted in the greater part of the relations of voyages in Russia; that is to say, that the first establishments of the Samoiede colonies are met with in the neighbourhood of that town. It is certain that they are not met with nearer to it than three or four hundred wersts. When at times Samoiedes have been met with at Archangel it has been in winter, and their object in coming has been no other than to bring, by means of their rein-deer, fish-oil and other articles of trade, on account of certain merchants or country people, who carefully entertain both them and their rein-deer.

The origin of this error has been in the circumstance of there having been formerly, and even so late as the beginning of the present century, some families of Samoiedes hired by the inhabitants of Archangel, which according to the custom of these people encamped in the environs of this town, for finding pasture for their deer. Some travellers having seen them on this spot, and particularly Cornelius le Bruyn, who on this matter has written at large; they have positively assured that Samoiedia, and the establishments of the Samoiedes, began in the neighbourhood of Archangel. But for thirty years back and more, there has been no family of Samoiedes established in that quarter; it is further a certain fact, that this people have never inhabited the coasts of the White Sea, nor ever have been employed by the Russians in the fishery for sea-dogs, sea-calves, and other animals from which oil is extracted, as has been told.

The real spot where the habitations of the Samoiedes begin, if any case be pointed out among a people which is continually changing residence, is in the district of Mozine, beyond the river of that name, three or four hundred wersts from Archangel.

The colony which is actually met with there, and which lives dispersed according to the usage of those people, each family by itself, without forming villages or communities, does not consist of more than three hundred families or thereabouts; which are all descended from two different tribes, the one called Laghe, and the other Wanoute; distinctions carefully regarded by them.

This colony is called Objendiu; another contiguous to it nearer to Petzora is named Tihijondire; that is near to Poustozer, opposite to Weigats Straits, commonly entitled Gougorskoi, is known among themselves by the name of Guaritzi.

This savage nation occupies the extent of more than thirty degrees along the coasts of the North Sea, and the frozen ocean, between sixty-six and seventy degrees of northern latitude, reckoning from the river Mozine towards the east, beyond the Oby, as far as Jenesu, and perhaps farther, as we are yet unacquainted with the limits of their habitations.

All these Samoiedes dispersed through deserts of such vast extent have indisputably a common origin, which is evidently shewn from the resemblance of their physiognomy, their manners, their mode of living, and even their language; although divided into different families or tribes, more or less distant from the Russian dwellings.

I am far from adopting the sentiment of those who imagine the Laplanders and Samoiedes to be descended from one and the same nation: M. de Buffon, who stands justly eminent in the republic of letters, is evidently mistaken, when he affirms in so positive a manner in his Histoire Naturelle, that the Laplanders, the Zemblians, the Borandians, the Samoiedes, and all the Tartars of the North, are people descending from the same race. It must however be observed by the way, that when he speaks of Zemblians he speaks of an imaginary people, since it is a certain fact that Nova Zembla or Zemla, which signifies in the Russian language New Land, is not inhabited. In what he states respecting the Borandians he is equally wrong, that name is not even

known throughout the North, and indeed, from the description he gives of them, they could be recognized but with great difficulty. He even advances a bold assertion, when he states the Laplanders, the Samoiedes, and the people of Northern Tartary, to form but one nation; since it requires no more than an attention to the difference of their features, their manners, and their language, to be convinced they are of a different race, as will in the sequel be shewn.

Let me be permitted to make a short digression on the subject of Nova Zembla, of which I have mentioned some interesting particulars will be found in it, which I have received from well informed persons, and which will throw some light on what may have made it be presumed to be inhabited.

As the Russians inhabiting Mozine and the neighbourhood of Archangel have for many years been accustomed to fish for walrases, or sea-calves, on the coasts of Nova Zemla, and have even passed the winter there, all the shores are well known to them. From the uniform account of all those who have landed on the island, it is established that the strait of Weigats separates it from the continent; that it begins in latitude 71°, and extends in a direct line towards the north, as far as latitude 75° 4′ N. and that on the other hand it comprizes 7° from west to east. Precisely in the middle of this island, or to speak with more exactitude under the 73° of latitude, on the eastern side, a channel or strait is met with, which traversing the whole island, and turning towards the N.W. falls into the North Sea, on the western side, in latitude 73° 3′, cutting the island nearly into two equal parts.

It is not known whether this strait be navigable; it has certainly been always found covered with ice, and on this account it could never be well examined.

The course from Archangel, or the coast of Mozine, to Nova Zemla is not attended with much risque by passing by Kandanvoes and the island of Kalgnew. Little informed as the persons who undertake this voyage are in the art of navigation, they know enough not to miss the bays, which are upon the coasts of this country; and which already they are well acquainted with. There is as well always to be met with a sufficient number of people ready to undertake this fishery, notwithstanding the profit that is derived from it be very moderate.

These voyages are made in small vessels built in the old fashion of their country; the complement of which usually consists of ten or twelve men, who receive no other pay than the portions of the produce of the fishery which are allotted them, after deducting the expences of the equipment, and the major part reserved for the proprietor of the ship.

This country, at least as much of it as is at present known, is a desert entirely barren. It produces very little herbage; neither trees nor bushes are to be met with, so that those who resort there for the fishery are obliged to provide themselves with wood for firing.

It is true of all those who have landed in the island, none have penetrated further than fifty or sixty wersts into the interior, which may give room for conceiving that in the centre of the island there may possibly be some lands more fertile, and even some inhabitants. However, as the shores have been frequented for a long time all round the island, by a number of people attracted there by the fishery, without the least vestige of inhabitants being discovered; and besides, as no other animals have been met with but such as feed on moss or fish, such as white bears, white foxes, and rein-deer; and not even one of the description which are supported by berries, herbage, roots, or shoots of shrubs; it is highly probable that this island contains no inhabitants, and that its interior is as destitute of wood as the shores.

As well there is great probability that those who have been taken for natural inhabitants of the country were the crews of some Russian vessels; the more so, from its being customary for the fishermen on these voyages to dress themselves in the manner of the Samoiedes. Nevertheless, the cold here is not so intense as might be imagined. Navigators who have wintered several times in Nova Zemla, and in Spitzbergen, have assured me that the cold of Nova Zemla is very tolerable in comparison to that of Spitzbergen; which as well is nearer to the pole by several degrees.

In this last island during the winter there is no twilight. It is only by the position of the stars which are continually visible that the day is distinguishable from the night; whereas in Nova Zemla the day is always marked by a feeble light which appears about noon, even when the sun is not visible.

The person who related to me these particulars eight or nine years ago lost twenty-four men, of the crews of some vessels which he had sent to Nova Zemla to pass the winter; they were all found dead on the spot where they had established themselves. This misfortune frequently befalls those who remain there too late in the season; but we must not be too hazardous in ascribing it to the cold. Their death is to be attributed to the thick and noxious fogs, occasioned generally by the putrefaction of the weeds and moss on the sea shore. When the frost is late in making its appearance, these pestilential vapours poison and suffocate those who breathe them. What confirms this fact is, the circumstance of a colony from Misine being there at the same time, composed of twenty men, who had constructed their huts a hundred wersts from that of the others; none of which died. They all returned the succeeding years in perfect health, but declared that they had suffered greatly from the fogs, and had all of them been ill.

The foul smell of these fogs, according to the report of those who have frequented Nova Zemla, is so disgusting, so insupportable, as cannot be described. Their effect is the more dangerous when they happen at the time of a thaw, with the sea wind blowing towards the dwellings where the fishermen winter.

From ancient tradition it is known, that under the reign of the Czar Iwan Wasilowitz, at the time of the destruction of Nowogerod, some Russian families took refuge and established themselves in Nova Zemla. A countryman who had withdrawn himself from the domination of Strogaroff as well retired there with his wife and children. Many Russians know as yet the places inhabited by these fugitives, and designate them by their names; but the descendants of these unfortunate men perished altogether, in all probability from these putiferous effluvia.

A mine of silver is stated to have been found in Nova Zemla, and the spot on that account was called Serebronka, a name it bears to this day. The person who related to me the circumstance relative to the mine, and several others, informed me, at the same time, that he had not been able to ascertain if these traditions were to be relied on, although careful of seeking the truth in all his researches of this nature.

The existence of this mine of silver, supposing it to be true, would have nothing extraordinary in it; since it is considered a fact in Russia, that under the reign of the empress Ann, in a little desert island of the White Sea, some rocks were found encrusted almost entirely with silver ore, of the richest quality that ever was seen, as was acknowledged at Petersburg; to which place large bars of it were sent. Considerable riches were expected from this fortunate discovery; but on piercing the rock, they perceived that the interior did not contain the least trace of the ore; and that it was simply an incrustation, possibly as ancient as the globe; or which may be referred to the deluge, that solves so many problems.

To return to the Samoiedes, from whom we have somewhat wandered. These men are of lower stature than the middle size: I never saw any that were less than four feet high, although that be the greatest height ascribed to them in general, as a succession of the fable of the pygmies, of which some will have that they establish the reality. Some of them were above the middle size, nay even more than six feet high. They are sturdy and nervous, broad and square built, with short legs, and small feet; the neck very short, and the head large in proportion to the body, a flat face, black and tolerably open eyes; the nose so much flattened, that the end is nearly upon the level with the bone of the upper jaw, which is very strong, and greatly elevated, a large mouth, and thin lips. Their hair, which is as black as jet, but extremely hard and strong, hangs from their shoulders, and is very sleek: their complexion is of a yellow brown, their ears large, and elevated.

The men have little or no beard, and their head, as well as that of the women, is the only part of the body which produces hair. There remains to examine if it be a natural defect, a particular quality incident to their race, or only the effect of a prejudice, inducing them to attach an idea of deformity to the hair of the body, which may cause them to root it out whenever it may make its appearance. However it may be, it becomes the interest of the women, above all, not to suffer hair to grow on their body, should it be natural to them, since according to the usage of their people a husband has a right to return the girl to her parents whom he might have taken to wife, and cause whatever he had purchased her for to be returned him, provided any hair were found about her, except upon her head. A similar case, it is true, must be very rare, even allowing them to be subject to this natural vegetation, which they apparently consider as a great imperfection, seeing that a man marries generally a girl when but ten years of age. As well it is common among these people to see mothers of children no more than eleven or twelve years old; but, in equivalent, these forward mothers cease to bear children after thirty years of age. May not this practice of marrying their girls before the customary period of maturity, as well as the licence which the men possess of buying as many wives as they can pay for, be the physical cause of the little fecundity of the Samoiedes, and probably of their diminutiveness?

The physiognomy of the women exactly resembles that of the men, excepting that their features are rather more delicate, with their body more slender, the leg shorter, and the foot still less; otherwise it is difficult to distinguish the sexes by the exterior, or by their dress, which is very nearly the same.

Both men and women, as among all the barbarous nations of the northern countries, wear dresses made of rein-deers' skins, with the hair outermost, and sewed together, which makes them a clothing all of one piece, and fits and covers their body extremely well. This dress is so well calculated for their occasions in the rude climate which they inhabit, that the Russians, and other nations who are under necessity of travelling in their country, wear the same habiliments. The only distinction observable in the clothing of the women consists in some scraps of cloth, of different colours, with which their skins are trimmed; and the youngest among them sometimes take the pains of separating their hair in two or three tresses, which hang down behind.

Those who have pretended that the Samoiede women were not subject to periodical evacuations are mistaken: this is a circumstance on which I received very exact information; but it is true their purgations of this nature are very slight.

Another physical peculiarity of the Samoiede women, which appeared to me very curious, and of which my inquiries on the subject as completely satisfied me of the truth,

is their having all of them their teats flat, small, and soft at all times, even when virgins, with the end of them as black as coal. It might be conceived that this accident were the result of their premature marriages, if it were not certain that this attribute is common to the Laplanders, notwithstanding the latter never marry earlier than at fifteen years. Some other reason therefore must be sought, either in the natural constitution, or the food of these people.

Their tents, composed of pieces of the bark of trees sewed together, and covered with rein-deer skins, are constructed in a pyramidal shape, on poles of a moderate thickness. An opening is contrived at the top of this tent, for the purpose of leaving a passage for the smoke, which when closed increases the warmth. From this it is plain that the tales of their subterranean dwellings are fabulous. As the folding up of these tents is to them an easy matter, they transport them from place to place by means of their rein-deer: this manner of constructing an habitation is incontrovertibly the most suitable to the wandering life which they are obliged to follow; for the ground producing absolutely nothing fit for their sustenance, they are obliged to change their abode frequently, in search of the wood they have occasion for, and to find moss for their rein-deer.

This as well is one of the reasons which, joined to their interest in hunting, restrains them from remaining together in any great number; for seldom will more than two or three tents be found in the same neighbourhood, and as their deserts are of an immense extent, they can change their residence as frequently as their necessities require, without injuring one another.

In summer they prefer the neighbourhood of rivers, to profit from the fishery with more facility; but they always keep at a great distance from each other, without ever forming a society.

After providing food, which is a care the men are charged with in every family, while the women are employed in sewing clothes together, keeping the fire, and looking after the children, there is nothing farther that they feel interest in; they vegetate in tranquility, amusing themselves after their manner, stretched on rein-deers' skins spread round the fire in their tents. The sweets of idleness supply the place of the passions among these people, and necessity alone has power to rouse them to activity. This love of idleness is one of the principal features by which the uninformed man, left to nature alone, is recognized.

Hunting in winter, and in summer fishing, furnish them plenteously with food. They are equally skilled in both these exercises; and as the rein-deer forms all their wealth, they endeavour to take and keep as many of them as they can. These animals are the better suited to the natural laziness of these people, from their requiring no care for their fodder, which they find themselves in moss under the snow. Further, whatever animal they meet with in hunting they deem proper for food, not disdaining even the carcasses of such as they find dead. However revolting this taste of the Samoiedes may appear to us, in this matter they are not much behindhand with the Chinese, who, civilized as they are, it is well known feed on carrion.

The Samoiedes however refrain from eating dogs, cats, ermines, and the squirrel, without my being able to learn the cause of their exceptions. As for the flesh of the rein-deer they eat it always raw: it is with them a luxury to drink the blood of these animals quite warm: they even pretend that this drink serves as a preservative against the scurvy; but they are unacquainted with the practice of milking them, as many writers have affirmed, without foundation.

They eat their fish also quite raw, of whatever description it may be, but other kinds of food they prefer cooking; and as they have no fixed hours for their meals, they have

always a boiler containing meat on the fire, which they keep in the middle of their tents, in order that any of them who compose the family may eat whenever he pleases.

With respect to the name of Samoiede, there is some dispute on its etymology. Some imagine the name synonymous with anthropophagi, anciently given to these people, on account of their having been seen to eat raw flesh, which was taken for human; whence it was inferred that they devoured the dead bodies of their neighbours, as well as of their enemies, after the fashion of the cannibals. But they have been freed from any such conception with respect to them for some time; it is even known from the traditions of these people, that no such barbarous custom ever existed among them.

Others pretend the word Samoye signifies, in the language of these people, an inhabitant of the country, and that their denomination is deduced therefrom. This origin would appear sufficiently natural, if the supposition which is the base of it was not destitute of proof. But as in their language there is no word to be found resembling Samoye, and as in their dialect they give themselves the names of Minez and Chasowo, it is clear this latter etymology is purely chimerical, like many other derivations adopted without discussion.

It will therefore be proper to seek for a word in the language of the neighbouring nations, which may have affinity thereto. Now as it is well known that the Fins formerly inhabited the greater part of the countries of the north, the word Sooma, which signifies in the Finnish language a marsh, may very well have served as an origin for the name Samoiede: it is also very likely the root of the name Samalantsch, which the Laplanders give themselves in their own tongue, and that of Somaemayes, which the Carelians call themselves by.

In the Russian chancellary the Samoiedes are designated by the title of Sirogneszi, eaters of raw meat. This is all I have been able to obtain of least uncertain respecting these people.

As to what regards the period of the Samoiedes passing under the Russian dominion, almost all historains agree in fixing the period in the reign of the Czar Feodor Iwanowitz. It is in this reign that the relations made by a person of the name of Onecko, who carried on a very lucrative trade in this country, as it is said, gave birth to the design of subjugating it. It is added, the conquest of the country was not completed until under the reign of his successor, the Czar Boris, and that it was effected by the building of forts, and even some towns. However, I am induced to think there is some error in this; for I have seen the ordonnances published in the first years of the emperor Peter the First, concerning the means to be taken for collecting the tribute of the Samoiedes, where mention is expressly made of letters patent having been granted to these people more than sixty years before the reign of the Czar Feodor Iwanowitz; and by which permission was granted them to collect of themselves the tribute in peltry which they had to pay. Add to which, it is certain it never was in contemplation even to build any town or fort among the Samoiedes, for the purpose of subjugating them; and actually there is none in existence throughout their country. Their tribute, called jeslak, is received in small towns situated in the vicinity of their country, inhabited by Russian colonists: it consists in a skin of the value of twenty-five copecs annually for every man who can draw the bow; and every species of peltry is valued at a certain rate. But as we are now speaking of a fact, in contradiction to the statement of all who have written on the subject, and as the curious may see with pleasure an original composition, in the stile of that time, I have thought it right to translate one of the ordonnances of which I have spoken: the original is preserved in the archives of the chancellary of Pustoser.

"On the part of the czars and grand princes, John Alexiowitz and Peter Alexiowitz, sovereigns of all the Russias, the great, the less, and the white, to our stolnik and governor of Pustoser, John Matweowitz Kastire. A request has been presented to our high lordships from the Samoiedes, Gongorski and Petschersky, in which these people inform us that they are in possession of letters patent, granted to them by our ancestors at a distant period, when these people in 7033 (which corresponds to the year 1525 of the common era) requested to be taken under the dominion of that great lordly czar and grand prince, Wasili Iwanowitz, sovereign of all the Russias, of happy memory; in which it was [illegible]ed that they were to be received by our powerful hand in quality of subjects, and be protected from any foreign insult, in consideration of their paying their tribute in peltry at Petchora and Pustoser. In course of time, namely, in 7105 (1597) our great-grandfather, the great lordly czar and grand prince Feodor Iwanowitz, sovereign of all the Russias, of happy memory, granted to them that they should pay their tribute only in conformity to the ancient registers at Pustoser, and that they should have allowance to collect this tribute among themselves. And whereas, according to the complaints they make, these tributes are demanded of them at Beresowa and in Mesen, without giving them quittances for what is received, and are made to pay this tribute again at Pustoser; they intreat that, in conformity to the letters patent in existence, it be enjoined that they may be proceeded with in a manner conformable to the preceding ordonnances; that they may have the permission of collecting the tribute of skins among themselves at one spot, namely, Pustoser, and that it may be forbidden they should be required to pay a second time at Beresowa and Mesen, or that any violence be offered them, in order that they may not be obliged to disperse and abandon the country, which would cause the sovereign to lose his tribute. It has as well been represented to us that the Karatscheskoi Samoiedes, and the families depending on them, in a petition signed with the marks common among these people, every year deliver a great number of skins as their tribute to our receiver at Beresowa, and not knowing whether the said tribute be forwarded entire to our high lordships at Moscow, they have given a specification, signed with their usual marks, of the surplus which they annually pay to our receiver at Pustoser, the soldier Stainka Wolouquenin. Now, in consequence of these petitions, we ordain that immediately after receiving these present letters, thou mayest take measures for hindering the said Samoiedes, Gongorski and Petscherski, from being any longer obliged to pay any other tribute than that imposed upon them by our ancestors; and farther, that they have the permission of collecting this tribute by themselves, in conformity to their petition, according to the ancient registers; and that there be granted to them for receiver of the said tribute whichsoever of the people in our service they may themselves select; that thou take as well especial care that the said receivers of tribute offer no violence to these Samoiede people, by requiring or extorting from them, for their individual advantage, any thing beyond what is imposed on them; and that the whole being collected together be carried to Pustoser, as before. And after these people shall become accustomed to pay their tribute at Pustoser, thou shalt send to us the said tribute regularly every year, without suffering any deduction, and this by the receiver, accompanied by any Samoiede which they may choose for this purpose, and cause him to be brought directly before our high lordships at Moscow, in the chancellary or pricasie of Novogorod. Let no tribute be a second time required of these Samoiedes, Gongorski and Petscherski, at Beresowa, or in Mesen: Let them be protected from all foreign insult, and have particular care that no violence be done them. And after

having read these present letters and taken a copy thereof with thine own hand, thou hast to deliver the original of these letters patent to these Samoiedes, in order that they may be of service to them, with respect to the other waywodes or officers who may succeed thee in the employ wherewith thou art invested." Given at Moscow, in the year 7192, (1684) the ninth of July. The original is signed by the hand of the *Diack Procophei Wosnizin, and collated by the Sub-diack Alexei Ferfanow.

In regard to † Pustoser, of which in this ordonnance mention is made, it must be observed, that in conformity to information extracted from the archives of the chancellary of that town, the nation, the descendants of which inhabit that country at present, before it embraced Christianity (two or three hundred years ago, according to the tradition of the country) bore the name of Tshudi, which in the Russian language signifies Fins.

The Samoiedes who lived in the marshes or neighbouring deserts giving some inquietude to the Russian colonies, they built the small town of Pustoser, for the purpose of placing themselves in a state of defence against strangers who might land from the sea on that side, according to their old traditions. For the same purpose in 7156 (that is to say 1648) fifty soldiers were established there with their wives and children, sent from Cholmoger, in the neighbourhood of Archangel. At present there is always a company of soldiers there from the garrison of Archangel itself. And in spite of the barrenness of the country, and the small number and wretchedness of the inhabitants, the industry of these people renders the post of waywode of the Pustoser a very lucrative appointment for the officers invested therewith.

Pustoser, the only place in the country of the Samoiedes to which the name of a town is given, although properly speaking it be no more than a village, is situated a hundred wersts or thereabouts from the frozen ocean, a short distance from the straits of Weigatz. The air in this quarter is so cold, and the ground so poor, that it produces no sort of grain, or fruit; but the lake whence it takes its name abounds in fish. This is the sum of what is remarkable in this country, unknown to the rest of the earth.

The religion of the Samoiedes is very simple. Those who pretend that the light of human reason is sufficient of itself to form a system of religion are obliged to allow, that a similar system, conceived and arranged by men in a pure state of nature, such as that of the Samoiedes, could be no other than very obscure, and very imperfect. Accordingly, their belief is reducible to the small number of following articles.

They admit the existence of a Supreme Being, Creator of all things, eminently good and beneficent: a quality which, according to their mode of thinking, dispenses them from any adoration of him, or addressing their prayers to him, because they suppose this Being takes no interest in mundane affairs, and consequently does not exact nor need the worship of men. They join to this idea, that of a Being eternal and invisible, very powerful, although subordinate to the first, and disposed to evil; it is to this Being that they ascribe all the misfortunes which befall them in this life. Nevertheless, they do not worship, although much in fear of him. If they place any reliance in the counsels of Koedisnicks or Tadebes, it is only on account of the connection which they esteem these people to have with this evil Being; otherwise, they submit themselves with perfect apathy to all the misfortunes which can befall them, for want of knowing the means of avoiding them.

* Dignity which, according to the usage of that time, answered to that of Chancellor or Secretary of State.

† Pustoser is derived from the Russian word Pusto a desert, and Osero a lake.

The sun and moon as well hold the place of subaltern Deities; it is by their intervention they imagine that the Supreme Being dispenses his favours; but they worship them as little as the idols or fitches which they carry about them, according to the recommendation of their Koedisnicks. They appear to care very little about these idols, and if they wear them, it is only owing to the attachment which they appear to have to the traditions of their ancestors, of which the Koedisnicks are the depositaries and the interpreters.

Among them some ideas of the immortality of the soul prevail, and a state of retribution in another life; but all this refers simply to a species of metempsycosis. This sentiment, obscure as it is, seems to indicate that these people descend from some Asiatic nation, formerly inhabiting the vicinity of India.

It is in consequence of their opinion of the transmigration of souls, that they are accustomed to inter with him the dresses of the deceased, his bow, his arrows, and whatever belongs to him, because they say the defunct may need them in another world, considering it unjust for any individual to appropriate to himself what belongs to another. By this it is visible, that if the doctrine of the immortality of the soul form a part of their religion, it is only as a simple probability, respecting which they have their doubts.

Lastly, among them none of those religious ceremonies in use among other nations, in particular circumstances of life, are met with. Their Koedisnicks are not to be considered in this light, any more than the ceremony of their marriage, the birth of their children, or burial of their dead: the whole administration of this kind of priests is limited to their giving them advice, and idols of their making, when they are more than commonly unfortunate in hunting, or any sickness occurs. It would be very difficult to introduce christianity among these people, on account of their understanding being too much confined to enable them to conceive things beyond the evidence of their senses; as well as that they deem their condition too happy, to be desirous of any change.

The Samoiedes are as simple in their morals as in their dogmas. Unacquainted with any law, they are without terms even for* vice or virtue. If they abstain from wrong, it is by a simple instinct of nature.† It is true, they are accustomed to preserve their wives each to themselves, and carefully to avoid all degrees of consanguinity in marrying, to such a degree, that a man never marries a girl descended from the same family with himself, however distant the affinity. Although the contrary be advanced by several writers, the fact may be relied on. They provide for their children till such time as they arrive at the period of being able to help themselves.

All these customs religiously observed among them are no other than the fruits of tradition handed down to them by their ancestors, and this tradition with some reason may be looked upon as law. But it does not appear that they are forbidden to assassinate, to steal, or to take possession by means of violence of the wives, or daughters, belonging to others. Notwithstanding, if credit be given to these good people, who seem too simple to disguise any thing, few indeed are the examples of such crimes committed among them. When the cause of such forbearance is required of them, as, from their own confession, they know of no principle which should deter them from such actions, they reply with simplicity: It is very easy for every one to supply his

* All the nations of the earth without exception have very possibly been the same; it is thus Justin represents the Scythians. Book II. Chap. ii. "The ignorance of vice effected more with these people than the knowledge of virtue among others."

‡ Justice, not law, was respected by the people. Ibid.

wants, and it is not right to take what belongs to another. As for murder, they have no conception how a man can be induced to kill his fellow-creature. With respect to women, they imagine that the one which they are enabled to purchase for a trifle may satisfy their appetite as well as another, more suitable to their fancy, but which might not be acquirable unless by violence.

From all that has been said, it will be seen that they know no other wants than those of simple nature; namely, food, the enjoyment of woman, and rest.

As they are of a taste no ways delicate, and easy of satisfaction, the perfect indifference which they contract in respect of their choice of women stands instead of principle, and makes them act accordingly, without attending to it.

Their senses and their faculties are in just relation to their being and mode of life. They have a piercing eye, very delicate hearing, and a steady hand; they shoot an arrow with the greatest exactitude, and are exceeding swift in running. All these qualities, which are natural to them, and absolutely necessary for supplying their necessities, have been perfected by continual exercise. They have, on the other hand, a gross taste, weak smell, and dull feeling; arising from the circumstance of the objects about them not being of a quality to produce on their senses any delicate impression.

It is easy to conceive that ambition and interest, those two great springs which put mankind in motion, and which in society are the motives of all good and bad actions, as well as of the vices which are the consequences of them, such as envy, dissimulation, intrigues, injuries, meditated vengeance, slander, calumny, and falsehood, have no admission in the moral system of these people: on the contrary, their want of terms to express these different vices, which cause such ravages in civilized society, sufficiently shews their ignorance of them.

It will be comprehended without difficulty, that the manner of living of these people must be in conformity to the simplicity of their notions, and the sterility of their country. Although many authors affirm that the Samoiedes have princes, judges, or masters, which they obey with great submission, it is certain that they never knew of any such, nor at present have any. They pay, without repugnance, the tribute imposed on them in peltry, without knowing of any other subjection towards the sovereign: they willingly submit to this payment, because they saw their fathers before them do so, and because they know that, if refused, it could be enforced.

In other respects, they are perfectly independent one of another; and if they pay any deference, it is only to the senior of every family, and to the Koedisnicks, whose counsels they sometimes attend to, without obligation to submit to them.

When it is said that the rein-deer are the only riches of the Samoiedes, it must needs be conceived that they are unacquainted with the use of money and the difference in the price and value of metals, with the exception of some few in the neighbourhood of the Russians, from whom they may have learnt this distinction. They make use of their rein-deer for the purchase of girls for wives; but although, upon agreeing with the fathers on the price of them, they may take as many wives as they will, they rarely take more than five, and the greater part content themselves with two. There are some girls for whom a hundred, or a hundred and fifty rein-deer are given; but the purchaser is allowed to return them to their parents, and take back what was given for them, when dissatisfied with them. As their wives are accustomed to produce children almost without any pain, they are suspected of infidelity, and of having had commerce with some stranger, when the contrary happens. It is on such occasions principally that they beat and ill treat them, to make them confess their fault: if the woman confesses, she is sent back to her parents, and her purchase price returned. Although the direct contrary be affirmed, even by

recent authors, these facts are not the less certain. M. de Buffon declares as an authenticated matter, that not only are the husbands not jealous, but that they offer their wives and daughters to the first comers. This skilful naturalist took information from very bad memoirs. The women of the Samoiedes have so much modesty, that it is necessary to make use of artifice to induce them to expose any part of their body; although it be difficult to comprehend wherefore they should attach an idea of shame to the discovery of any thing bare. Both sexes are ignorant of the use of baths, and never wash their body; they are consequently very dirty, and of very disagreeable savour.

This miserable mode of life would doubtless horrify any person born and brought up in society: notwithstanding, these people are continually gay, exempt from grief, and well satisfied with their fate. I have known some Samoiedes who had seen the towns of Moscow and Petersburg, and who consequently had been enabled to remark the advantages and convenience enjoyed by civilized people; but who appeared little moved thereby. They have constantly preferred their mode of living to all they saw more attractive and voluptuous among the Russians; so much antipathy have they to servitude, dependence, and whatsoever tends to disturb their quiet, or natural inclination for idleness.

They are fond of smoking tobacco and drinking strong liquors when they meet with them among strangers; but they readily, and without the least mark of regret, forego the use of them. This stupid insensibility is so natural to them, that no object, however new to them, strikes them any otherwise than slightly. It may excite their attention for an instant, but to a certainty cannot inflame their desires.

I made an experiment on their apathy. I caused several Samoiedes of both sexes to be assembled one day in a chamber, to examine them the more minutely. But although I left on the table money, fruit, strong liquors, which I had previously let them taste; and although I used every imaginable expedient to irritate their desires; notwithstanding I had sent all my domestics away, and withdrew myself to a corner, where I could see them without being perceived, they did not lose their indifference; they kept quietly seated on the ground, with their legs across, without touching any thing. Nothing but the looking-glasses caused any surprise in them for an instant; again a moment, and this ceased to draw their attention.

A SHORT JOURNAL OF SEVEN SEAMEN, WHO, BEING LEFT IN 1634 AT SPITZBERGEN TO PASS THE WINTER THERE, DIED THERE IN 1635.

[FROM CHURCHILL'S COLLECTION, VOL. II. P. 399.]

IN the year 1633 seven persons being left, much at the same time, as well at Spitzbergen as in the isle of St. Maurice, the ships that were sent thither in 1634 had orders from the Greenland company to release those that had staid there, and to leave in their room seven others, who should offer their service for that purpose. Accordingly the following seven were (with their consent) appointed to remain the next following winter at Spitzbergen: Andrew Johnson of Middleburgh, Cornelius Thysse of Rotterdam, Jerome Carcoen of Delfts Haven, Tiebke Jellis of Friseland, Nicholas Florison of Hoom, Adrian Johnson of Delft, Fettje Otters of Friseland.

These being provided with all manner of necessaries, as meat, drink, physical preparations, herbs, &c. were left ashore, to continue all the winter there; during which time, they kept a journal of all remarkable circumstances; the chief heads whereof I thought only fit to insert here, leaving out the more unnecessary observations, such as of the wind and weather, &c. to avoid prolixity. The eleventh of September 1634, the ships being sailed thence for Holland, they got sight of abundance of whales, at whom they discharged their guns, but could not take any; they went also in search for green herbs, foxes and bears, but met with none. The twentieth or twenty-first of October they had no more sight of the sun. The twenty-fourth of November, the scurvy beginning to appear among them, they searched very earnestly after green herbs, bears and foxes, but to their great grief could find neither of them; so they comforted one another with hopes that God would provide for them something or other for their refreshment. The second of December Nicholas Florison took a dose of a scorbutic potion, and they set some traps to catch foxes. The eleventh, Jerome Carcoen took such another potion: and they resolved for the future every one to eat separately from the other, some being not so much afflicted with the scurvy as the rest. They went often in quest after some refreshments, but meeting with none, they recommended themselves to God's providence. The twelfth, Cornelius Thysse did likewise take a medicinal potion against the scurvy. The twenty-third, as the cook was throwing out some water, he saw a bear just by the hut, but he ran away at the noise, before they could come at their guns. The twenty-fourth, they discovered another bear; three of them advancing towards him, he rose upon his hindermost legs, and being shot through the body by one of our guns, he began to bleed and to roar, and to bite one of our halberts with a great deal of fierceness; but, finding us too hard for him, he betook to his legs; being excessive eager after some fresh meat (of which we stood in great need for the recovery of our health) we pursued him with lanthorns and candles a great way, but to our sorrow could not overtake him; which made us say to one another, that in case we were not supplied by God's peculiar providence with some refreshment speedily, the pain we endured must needs kill us before the return of our ships; but God's will be done. The twenty-fifth, Cornelius Thysse took another potion against the scurvy, being in a deplorable condition. The fourteenth of January Adrian Johnson of Delft died, being the first of the seven, though the other six were full of pain and very ill. The fifteenth, Fettje Otters died likewise; and on the seventeenth, Cornelius Thysse, being the man of all the rest in whom they had most hopes, went to God. The remaining four were very weak, and had scarcely strength left to stand upon their legs, yet they made shift to make coffins for these three, and put their bodies

into them. The twenty-eighth they saw the first fox, but could not take him. The seventh of February they had the good fortune to take a fox, to their no small satisfaction, though in effect they were too far gone to receive any benefit thereby.

They saw many bears, three or four, nay sometimes six or ten together, but had not strength enough to manage their guns; or if they had had, they could not have pursued them, being not in a condition to set one foot before another, nay not even to bite their biscuits, for they were seized with most cruel pains, especially in their loins and belly, which generally increased with the cold; one did spit blood, and another was afflicted with the bloody flux. Jerome Carcoen was still something better than the rest, being still able to fetch them some fuel for firing. The twenty-third, they began to be so weak, that they kept close in their cabins, recommending themselves to God's mercy. The twenty-fourth they saw the sun again, which they had not seen since October twentieth or twenty-first, in the preceding year. The twenty-sixth, being the last day (as we guess) they were able to write, and lived not long after; they left this following memorial behind them: "Four of us that are still alive lie flat upon the ground in our huts; we believe we could still feed, were there but one among us that could stir out of his hut to get us some fuel, but nobody is able to stir for pain; we spend our time in constant prayers, to implore God's mercy to deliver us out of this misery, being ready whenever he pleases to call us; we are certainly not in a condition to live thus long, without food or fire, and cannot assist one another in our mutual afflictions, but every one must bear our own burthen."

When the ships from Holland arrived there in 1635, they found them all dead, shut up close in their tent, to secure their dead bodies against the bears and other ravenous creatures. This being the tent of Midleburgh, a baker who got ashore first happened to come to the back-door, which he broke open, and, running up stairs, found there upon the floor part of a dead dog that was laid there to dry; but making the best of his way down again, he trod upon the carcass of another dead dog (for they had two) at the stair foot in the buttery. From hence, passing through another door towards the fore-door, in order to open it, he stumbled in the dark over the dead bodies of the men, whom they saw (after the door was opened) all together in the same place, viz. three in coffins, Nicholas Florison, and another, each in a cabin, the other two upon some sails spread upon the floor, with their knees drawn up to their chins. Coffins being ordered to be made for the four that had none, they were buried with the other three under the snow, till the ground becoming more penetrable, they were buried one by another, and certain stones laid upon their graves, to hinder the ravenous beasts from digging up their carcasses: these were the last that pretended to pass the winter at Spitzbergen.

A SHORT AND TRUE ACCOUNT OF FORTY-TWO PERSONS WHO PERISHED BY SHIPWRECK NEAR SPITSBERGEN, IN THE YEAR 1646.

[FROM CHURCHILL'S COLLECTION, VOL. II. P. 301.]

JOHN CORNELIUS, of Muniken, being ordered to Spitsbergen to catch whales, set sail from the Texel, in a galliot, the sixth of May 1646, and arrived the third of June following near Spitsbergen, with an intention to anchor in the bay, but was by the vast floats of ice-shoals forced to keep out at sea. After having in vain cruized up and down among the ice-shoals, they got into the bay; but perceiving two whales farther at sea, they sent out their sloop in pursuit of the whales.

While they were rowing up and down to watch the motions of these creatures, they discovered at a distance a great ice-shoal, with something white upon it, which at first sight they imagined to be bears (they being generally white here) but one Ellert Johnson (who was in the sloop to manage the harpcock or iron wherewith they strike the whale) judging by the motion that it was something else, persuaded them to row that way; which being done accordingly, they not long after perceived the same to be a piece of a rope belonging to the sails of a ship, which was held up by a man as a signal of their utmost distress; so they rowed up to it with all the oars they had, and on coming near them found (to their great surprise) four living men, and one dead one (all Englishmen) upon the ice-shoal, who upon their bended knees expressed their joy and thankfulness for so unexpected a deliverance from the jaws of death. They were taken into the sloop, and carried into the bay on board the ship.

They had cut a great hole, in the nature of a subterraneous cave, into the ice, and round the entrance thereof had placed the pieces of ice that were cut out of the concavity, to defend themselves against the violence of the winds and waves. In this hole they had spent fourteen days (it being so long since they had lost their ship.)

At first there were in all forty-two of them, and they had saved some victuals and tools with their sloop. The commander, perceiving after a little while that it was impossible for them to hold out long upon the ice-shoal, resolved to go ashore in the sloop with seventeen of his men, if he could, and to send them word afterwards how matters stood there. This was done accordingly; but it blowing very hard, and they having not heard the least tidings of them since, they were afraid that they were drowned before they reached the shore.

There were then twenty-four left upon the ice-shoal; but the want of provisions increasing daily among them, and they being reduced to a starving condition, and expecting nothing but present death, resolved to divide themselves, and to get upon several other ice-shoals, in hopes by some chance or other to come near to the shore; but whether some of them got ashore, or whether they were taken up by some ship or other, or whether they were swallowed up by the merciless waves, they were not able to tell.

Certain it is that we found four of them (the miserable remnants of forty-two) sitting together upon this ice-shoal, overwhelmed with affliction, without any hopes of being saved, from the last extremity they were reduced to by frost and hunger, before we came in full sight of them with our sloop, having had nothing to feed upon for some time but a leather belt (belonging to one of them) which they divided and eat, share and share alike, till all was consumed.

After they were brought to our ship, our surgeon took all imaginable care for their recovery, notwithstanding which three of them died in a few days after; so that of forty-two wherewith their ship was manned, no more than one escaped with life, who arriving in September 1646, in the galliot the Delft, upon the Meuse, from thence returned to his native country in England.

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JOHN CORNELIUS, of Muniken, being ordered to Spitsbergen to catch whales, set sail from the Texel, in a galliot, the sixth of May 1646, and arrived the third of June following near Spitsbergen, with an intention to anchor in the bay, but was by the vast floats of ice-shoals forced to keep out at sea. After having in vain cruized up and down among the ice-shoals, they got into the bay; but perceiving two whales farther at sea, they sent out their sloop in pursuit of the whales.

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A VOYAGE TOWARDS THE NORTH POLE, UNDERTAKEN BY HIS MAJESTY'S COMMAND, IN 1773, BY CONSTANTINE JOHN PHIPPS.

INTRODUCTION.

THE idea of a passage to the East Indies by the North Pole was suggested as early as the year 1527, by Robert Thorne, merchant, of Bristol, as appears from two papers preserved by Hackluit; the one addressed to king Henry the Eighth; the other to Dr. Ley, the king's ambassador to Charles the Fifth. In that addressed to the king he says, "I know it to be my bounden duty to manifest this secret to your grace, which hitherto, I suppose, has been hid." This secret appears to be the honour and advantage which would be derived from the discovery of a passage by the North Pole. He represents in the strongest terms the glory which the kings of Spain and Portugal had obtained by their discoveries east and west, and exhorts the king to emulate their fame by undertaking discoveries towards the north. He states in a very masterly style the reputation that must attend the attempt, and the great benefits, should it be crowned with success, likely to accrue to the subjects of this country, from their advantageous situation; which, he observes, seems to make the exploring this, the only hitherto undiscovered part, the king's peculiar duty.

To remove any objection to the undertaking which might be drawn from the supposed danger, he insists upon "the great advantages of constant day-light in seas, that, men say, without great danger, difficulty, and peril, yea, rather, it is impossible to pass; for they being past this little way which they named so dangerous (which may be two or three leagues before they come to the pole, and as much more after they pass the pole) it is clear from thenceforth the seas and lands are as temperate as in these parts."

In the paper addressed to Dr. Ley he enters more minutely into the advantages and practicability of the undertaking. Amongst many other arguments to prove the value of the discovery, he urges, that by sailing northward and passing the pole the navigation from England to the Spice Islands would be shorter, by more than two thousand leagues, than either from Spain by the Straits of Magellan, or Portugal by the Cape of Good Hope; and to shew the likelihood of success in the enterprise he says, it is as probable that the cosmographers should be mistaken in the opinion they entertain of the polar regions being impassable from extreme cold, as it has been found they were, in supposing the countries under the Line to be uninhabitable from excessive heat. With all the spirit of a man convinced of the glory to be gained, and the probability of success in the undertaking, he adds, "God knoweth, that though by it I should have no great interest, yet I have had, and still have, no little mind of this business; so that if I had faculty to my will, it should be the first thing that I would understand, even to attempt, if our seas northward be navigable to the pole or no." Notwithstanding the many good arguments with which he supported his proposition, and the offer of his own services, it does not appear that he prevailed so far as to procure an attempt to be made.

Borne, in his Regiment of the Sea, written about the year 1577, mentions this as one of the five ways to Cathay, and dwells chiefly on the mildness of climate which he imagines must be found near the Pole, from the constant presence of the sun during the summer. These arguments, however, were soon after controverted by Blundeville, in his treatise on Universal Maps.

In 1578, George Best, a gentleman who had been with Sir Martin Frobisher in all his voyages for the discovery of a north-west passage, wrote a very ingenious discourse, to prove all parts of the world habitable.

No voyage, however, appears to have been undertaken to explore the circumpolar seas till the year 1607, when "Henry Hudson was sent forth, at the charge of certain worshipful merchants of London, to discover a passage by the North Pole to Japan and China." He sailed from Gravesend on the first of May, in a ship called the Hopewell, having with him ten men and a boy. I have taken great pains to find his original journal, as well as those of some others of the adventurers who followed him, but without success: the only account I have seen is an imperfect abridgement in Purchas, by which it is not possible to lay down his track; from which, however, I have drawn the following particulars: He fell in with the land to the Westward in latitude 73°, on the twenty-first of June, which he named Hold-with-Hope. The twenty-seventh, he fell in with Spitsbergen, and met with much ice; he got to 80° 23′, which was the northernmost latitude he observed in. Giving an account of the conclusion of his discoveries, he says, "On the sixteenth of August I saw land, by reason of the clearness of the weather, stretching far into 82°, and, by the bowing and shewing of the sky, much further; which when I first saw, I hoped to have had a free sea between the land and the ice, and meant to have compassed this land by the North; but now finding it was impossible, by means of the abundance of ice compassing us about by the North, and joining to the land, and seeing God did bless us with a wind, we returned, bearing up the helm." He afterwards adds: "And this I can assure at this present, that between 78° and an half, an 82°, by this way there is no passage." In consequence of this opinion, he was the next year employed on the north-east discovery.

In March 1609, old style, "A voyage was set forth by the right worshipful Sir Thomas Smith, and the rest of the Muscovy Company, to Cherry Island, and for a further discovery to be made towards the North Pole, for the likelihood of a trade or a passage that way, in the ship called the Amity, of burthen seventy tons, in which Jonas Poole was master, having fourteen men and one boy." He weighed from Blackwall, March the first old style; and after great severity of weather, and much difficulty from the ice, he made the south part of Spitsbergen on the sixteenth of May. He sailed along and sounded the coast, giving names to several places, and making many very accurate observations. On the twenty-sixth, being near Fair Foreland, he sent his mate on shore; and speaking of the account he gave at his return, says, "Moreover, I was certified that all the ponds and lakes were unfrozen, they being fresh water; which putteth me in hope of a mild summer here, after so sharp a beginning as I have had; and my opinion is such, and I assure myself it is so, that a passage may be soon attained this way by the Pole, as any unknown way whatsoever, by reason the sun doth give a great heat in this climate, and the ice (I mean that freezeth here) is nothing so huge as I have seen in seventy-three degrees."

These hopes, however, he was soon obliged to relinquish for that year, having twice attempted in vain to get beyond 79° 50′. On the twenty-first of June, he stood to the southward, to get a loading of fish, and arrived in London the last of August. He was employed the following year (1611) in a small bark called the Elizabeth, of fifty tons. The instructions for this voyage, which may be found at length in Purchas, are excellently drawn up: they direct him, after having attended the fishery for some time, to attempt discoveries to the North Pole as long as the season will permit; with a discretionary clause, to act in unforeseen cases as shall appear to him most for the advancement of the discovery, and interest of his employers. This however proved an unfortunate voyage: for having staid in Cross Road till the sixteenth of June, on account of the bad weather, and great quantity of ice, he sailed from thence on that day, and steered W. by N. fourteen leagues, where he found a bank of ice: he returned to Cross Road; from

whence he sailed, he found the ice to lie close to the land about the latitude of 80°, and that it was impossibe to pass that way; and the strong tides making it dangerous to deal with the ice, he determined to stand along it to the southward, to try if he could find the sea more open that way, and so get to the westward, and proceed on his voyage. He found the ice to lie nearest S. W. and S. W. by S. and ran along it about an hundred and twenty leagues. He had no ground near the ice at 160, 180, or 200 fathoms: perceiving the ice still to trend to the southward, he determined to return to Spitsbergen for the fishery, where he lost his ship.

In the year 1614, another voyage was undertaken, in which Baffin and Fotherby were employed. With much difficulty, and after repeated attempts in vain with the ship, they got with their boats to the firm ice, which joined to Red-Beach; they walked over the ice to that place, in hopes of finding whale-fins, &c. in which they were disappointed. Fotherby adds, in his account: "thus, as we could not find what we desired to see, so did we behold that which we wished had not been there to be seen; which was great abundance of ice, that lay close to the shore, and also off at sea, as far as we could discern." On the eleventh of August they sailed from Fair-Haven, to try if the ice would let them pass to the northward, or north-east-ward; they steered from Cape-Barren, or Vogel Sang, N. E. by E. eight leagues, where they met with the ice, which lay E. by S. and W. by N. The fifteenth of August they saw ice frozen in the sea of above the thickness of an half-crown.

Fotherby was again fitted out the next year in a pinnace of twenty tons, called the Richard, with ten men. In this voyage he was prevented by the ice from getting farther than in his last. He refers to a chart, in which he had traced the ship's course on every traverse, to shew how far the state of that sea was discovered between 80° and 71° of latitude, and for 26° of longitude, from Hackluit's headland. He concludes the account of his voyage in the following manner.

"Now, if any demand my opinion concerning hope of a passage to be found in those seas, I answer; that it is true, that I both hoped and much desired to have passed further than I did, but was hindered with ice; wherein, although I have not attained my desire, yet forasmuch as it appears not yet to the contrary, but that there is a spacious sea betwixt Groinland and King James his new land (Spitsbergen) although much pestered with ice, I will not seem to dissuade this worshipful company from the yearly adventuring of 150 or 200 pounds at the most, till some further discovery be made of the said seas and lands adjacent." It appears that the Russia company, either satisfied with his endeavours and despairing of further success, or tired of the expence of the undertaking, never employed any more ships on this discovery.

All these voyages having been fitted out by private adventurers, for the double purpose of discovery and present advantage, it was natural to suppose, that the attention of the navigators had been diverted from pursuing the more remote and less profitable object of the two, with all the attention that could have been wished. I am happy, however, in an opportunity of doing justice to the memory of these men; which, without having traced their steps, and experienced their difficulties, it would have been impossible to have done. They appear to have encountered dangers, which at that period must have been particularly alarming, from their novelty, with the greatest fortitude and perseverance; as well as to have shewn a degree of diligence and skill, not only in the ordinary and practical, but more scientific parts of their profession, which might have done honour to modern seamen, with all their advantages of later improvements. This, when compared with the accounts given of the state of navigation, even within these forty years, by the most eminent foreign authors, affords the most flattering and satis-

factory proof of the very early existence of that decided superiority in naval affairs, which has carried the power of this country to the height it has now attained.

This great point of geography, perhaps the most important in its consequences to a commercial nation and maritime power; but the only one which had never yet been the object of royal attention, was suffered to remain without further investigation, from the year 1615 till 1773, when the earl of Sandwich, in consequence of an application which had been made to him by the Royal Society, laid before his majesty, about the beginning of February, a proposal for an expedition to try how far navigation was practicable towards the North Pole; which his majesty was pleased to direct should be immediately undertaken, with every encouragement that could countenance such an enterprize, and every assistance that could contribute to its success.

As soon as I heard of the design, I offered myself, and had the honour of being entrusted with the conduct of this undertaking. The nature of the voyage requiring particular care in the choice and equipment of the ships, the Racehorse and Carcass bombs were fixed upon as the strongest, and therefore properest for the purpose. The probability that such an expedition could not be carried on without meeting with much ice made some additional strength necessary; they were therefore immediately taken into dock, and fitted in the most complete manner for the service. The complement for the Racehorse was fixed at ninety men, and the ordinary establishment departed from, by appointing an additional number of officers, and entering effective men instead of the usual number of boys.

I was allowed to recommend the officers; and was very happy to find, during the course of the voyage, by the great assistance I received on many occasions from their abilities and experience, that I had not been mistaken in the characters of those upon whom so much depended in the performance of this service. Two masters of Greenlandmen were employed as pilots for each ship. The Racehorse was also furnished with the new chain-pumps made by Mr. Cole, according to captain Bentinck's improvements, which were found to answer perfectly well. We also made use of Dr. Irving's apparatus for distilling fresh water from the sea, with the greatest success. Some small but useful alterations were made in the species of provisions usually supplied in the navy; an additional quantity of spirits was allowed for each ship, to be issued at the discretion of the commanders, when extraordinary fatigue or severity of weather might make it expedient. A quantity of wine was also allotted for the use of the sick. Additional clothing, adapted to the rigour of the climate, which from the relations of former navigators we were taught to expect, was ordered to be put on board, to be given to the seamen when we arrived in the high latitudes. It was foreseen that one or both of the ships might be sacrificed in the prosecution of this undertaking; the boats for each ship were therefore calculated, in number and size, to be fit, on any emergency, to transport the whole crew. In short, every thing which could tend to promote the success of the undertaking, or contribute to the security, health, and convenience, of the ship's companies was granted.

The board of Longitude agreed with Mr. Israel Lyons to embark in this voyage, to make astronomical observations. His reputation for mathematical knowledge was too well established to receive any addition, from the few opportunities which a voyage in such unfavourable climates could afford. The same Board supplied him with such instruments as they imagined might be useful for making observations and experiments. The Royal Society favoured me with such information as they judged might serve to direct my inquiries, whenever the circumstances of the voyage should afford me leisure and opportunity for making observations. Besides these learned bodies, I was obliged

to many individuals for hints; amongst whom it is with pleasure I mention Monsieur D'Alembert, who communicated to me a short paper, which, from the conciseness and elegance with which it was drawn up, as well as from the number of interesting objects that it recommended to my attention, would have done honour to any person, whose reputation was not already established upon so solid a foundation as that learned philosopher's. To Mr. Banks I was indebted for very full instructions in the branch of natural history, as I have since been for his assistance in drawing up the account of the productions of that country; which I acknowledge with peculiar satisfaction, as instances of a very long friendship which I am happy in an opportunity of mentioning.

As a voyage of this kind would probably afford many opportunities of making experiments and observations in matters relative to navigation, I took care to provide myself with all the best instruments hitherto in use, as well as others which had been imperfectly, or never, tried.

The length of the second pendulum, in so high a latitude as I was likely to reach, appearing to me an experiment too interesting to be neglected, I desired Mr. Cumming to make me such an instrument as he thought would best answer the purpose. That modesty and candour which always attend real merit induced him to lend me the identical pendulum with which Mr. Graham had made his experiments, rather than furnish me with one of his own construction; but the judgment as well as skill with which the apparatus joined to it was contrived and executed, notwithstanding the shortness of the time, will, I am sure, do him credit.

The Board of Longitude sent two watch machines for keeping the longitude by difference of time: one constructed by Mr. Kendal, on Mr. Harrison's principles; the other by Mr. Arnold. I had also a pocket watch constructed by Mr. Arnold, by which I kept the longitude to a degree of exactitude much beyond what I could have expected; the watch having varied from its rate of going only 2′ 40″ in one hundred and twenty-eight days.

In the Journal which follows, I mean to confine myself to the occurrences of the voyage as they succeeded in order of time, which, for the convenience of the generality of readers, I have reduced from the nautical to the civil computation: to this I shall add, by way of Appendix, an account of all the experiments and observations under their respective heads, that those who interest themselves in any particular branch may find whatever they want, unmixed with foreign matters; while those who may wish only to trace the the whole progress of the voyage, as well as those who may be satisfied with the general results of the experiments, will find the account unincumbered with that detail which I wish to submit to others, who may choose to examine more minutely, and compare the facts with the conclusions.

A voyage of a few months to an uninhabited extremity of the world, the great object of which was to ascertain a very interesting point in geography, cannot be supposed to afford much matter for the gratification of mere curiosity. The experiments and observations may possibly from their novelty, and the peculiar circumstances of the climate in which they were made, afford some entertainment to philosophers; and might perhaps have been more numerous and satisfactory, if the pursuit of the great object of the voyage had not rendered them, however interesting in themselves, but a secondary consideration.

JOURNAL.

April the nineteenth, 1773, I received my commission for the Racehorse, with an order to get her fitted with the greatest dispatch for a voyage of discovery towards the North Pole, and to proceed to the Nore for further orders.

The twenty-third, the ship was hauled out of dock.

May the twenty-first, the ship being manned and rigged, and having got in all the provisions and stores, except the gunner's, we fell down to Galleons.

The twenty-second, we received on board the powder, with eight six-pounders, and all the gunner's stores. Lord Sandwich gave us the last mark of the obliging attention he had shewn during the whole progress of the equipment, by coming on board to satisfy himself, before our departure, that the whole had been completed to the wish of those who were embarked in the expedition. The easterly winds prevented our going down the river till the twenty-sixth, when I received my instructions for the voyage, dated the twenty-fifth, directing me to fall down to the Nore in the Racehorse, and there taking under my command the Carcass, to make the best of my way to the northward, and proceed up to the North Pole, or as far towards it as possible, and as nearly upon a meridian as the ice or other obstructions might admit; and, during the course of the voyage, to make such observations of every kind as might be useful to navigation, or tend to the promotion of natural knowledge: in case of arriving at the Pole, and even finding free navigation on the opposite meridian, not to proceed any farther: and at all events to secure my return to the Nore before the winter should set in. There was also a clause authorising me to proceed, in unforeseen cases, according to my own discretion; and another clause directing me to prosecute the voyage on board the Carcass, in case the Racehorse should be lost or disabled.

The twenty-seventh, I anchored at the Nore, and was joined by captain Lutwidge, in the Carcass, on the thirtieth: her equipment was to have been in all respects the same as that of the Racehorse; but when fitted, captain Lutwidge finding her too deep in the water to proceed to sea with safety, obtained leave of the admiralty to put six more guns on shore, to reduce the complement to eighty men, and return a quantity of provisions proportionable to that reduction. The officers were recommended by captain Lutwidge, and did justice to his penetration by their conduct in the course of the voyage. During our stay here, Mr. Lyons landed with the astronomical quadrant at Sheerness fort, and found the latitude to be 51° 31′ 30″, longitude 0° 30′ east. The easterly winds prevented our moving this day and the following.

The second of June, having the wind to the westward of north, at five in the morning I made the signal to weigh; but in less than half an hour the wind shifting to the eastward and blowing fresh I furled the topsails. The wind came in the afternoon to N. by E. we weighed, but did not get far, the tide of flood making against us.

The third, the wind blowing fresh all day easterly, we did not move.

The fourth, the wind coming round to the westward at six in the morning, I weighed immediately, and sent the boat for captain Lutwidge, to deliver him his orders. At ten A. M. longitude by the watch 56′ E. At eight in the evening we had got as far as Balsey cliff, between Orford and Harwich. Little wind at night.

The fifth, anchored in Hosely Bay at half past seven in the evening, in five and an half fathom water. Orford castle N. E. by N.

	W	
Angle between Aldborough church and Orford light-house,	7°	38′
Light-house and Orford church,	18	16
Orford church and castle,	2	20
Castle and Hosely church,	100	59
Hosely and Balsey church,	35	27

The sixth, at five in the morning, the wind at S. S. W. weighed, and stood out to sea, finding I might lose two tides by going through Yarmouth Roads. Examined the

log-line, which was marked forty-nine feet; the glass was found, by comparing it with the time-keeper, to run thirty seconds: at noon latitude observed 52° 16′ 54″, longitude by the watch 1° 30′ 15″ E.

Angle between Southwold and Walderswick,	10°	39′
Walderswick and Dunwich,	20	21
Dunwich and [illegible]rough,	46	53

Southwold N. W. [illegible]. supposed distance three leagues. We concluded the latitude of Southwold to be 52° 22′, and longitude 1° 18′ 15′ E. The dip was 73° 22′.

The seventh, the wind was northerly all day, and blew fresh in the morning. We had stood far out in the night and the day before, to clear the Lemon and Ower.

The eighth, little wind most part of the day, with a very heavy swell. Stood in for the land. At half past ten longitude by the watch 0° 41′ 15′ E. At noon the latitude was 53° 38′ 37′. We saw the high land near the Spurn, in the evening.

The ninth, about noon Flamborough head bore N. W. by N. distant about six miles: we were by observation in latitude 54° 4′ 54′, longitude 0° 27′ 15′ E. which makes Flamborough Head in latitude 54° 9′, longitude 0° 19′ 15′ E. In the afternoon we were off Scarborough. Almost calm in the evening.

The tenth, anchored in the morning for the tide in Robin Hood's Bay, with little wind at N. W: worked up to Whitby Road next tide, and anchored there at four in the afternoon, in fifteen fathom, with very little wind.

The eleventh, calm in the morning; completed our water, live stock, and vegetables. At nine in the morning longitude observed by the watch 1° 55′ 30″ W. Whitby abbey bore S. half W. Weighed with the wind at S. E. and steered N. E. by N. to get so far into the mid-channel as to make the wind fair easterly or westerly, without being too near either shore, before we were clear of Shetland and the coast of Norway.

The twelfth, the wind at S. E. and the ship well advanced, I ordered the allowance of liquor to be altered, serving the ship's company one fourth of their allowance in beer, and the other three fourths in brandy; by which means the beer was made to last the whole voyage, and the water considerably saved. One half of this allowance was served immediately after dinner and the other half in the evening. It was now light enough all night to read upon deck.

The thirteenth, the weather still fine, but considerably less wind than the day before, and in the afternoon more northerly. The longitude at ten in the morning was found by my watch 0° 6′ W. We took three observations of the moon and sun for the longitude; the extremes differed from one another near two degrees: the mean of the three gave the longitude 1° 37′ E. At noon the latitude observed was 59 32′ 31″. We found a difference of 36′ between the latitude by dead reckoning and observation, the ship being so much more northerly than the reckoning. The distance by this log was too short by forty-three miles. A log marked forty-five feet, according to the old method, would have agreed with the observation within two miles in the two days' run. The circumstance of steering upon a meridian, which afforded me such frequent opportunities of detecting the errors of the log, induced me to observe with care the comparative accuracy of the different methods of dividing the line, recommended by mathematicians, or practised by seamen. In the afternoon I went on board the Carcass, to compare the time-keepers by my watch. At six in the evening the longitude by my watch 0° 4′ E. This evening the sun set at twenty-four minutes past nine, and

bore about N. N. W. by the compass. The clouds made a beautiful appearance long after to the northward, from the reflection of the sun below the horizon. It was quite light all night: the Carcass made the signal for seeing the land in the evening.

The fourteenth, little wind, or calm, all day; but very clear and fine weather. Made several different observations by the sun and moon, and by my watch. The longitude of the ship was found by my watch, at ten in the morning, to be 1° 11′ 45″ W. The longitude by the lunar observations differed near two degrees from one another. By the mean of them the ship was in longitude 2° 57′ 45″ W. Some Shetland boats came on board with fish. At noon the latitude by observation was 60° 16′ 45″. At one in the afternoon the dip was observed to be 73° 30′; and at eight, 75° 18′: the evening calm, and very fine; the appearance of the sky to the northward very beautiful. Variation, by the mean of several observations, 22° 25′ W.

The fifteenth, by an observation at eight in the morning, the longitude of the ship was by the watch 0° 39′ W.: dip 74° 52′. At half past ten in the morning, the longitude, from several observations of the sun and moon, was 0° 17′ W.; at noon, being in latitude 60° 19′ 8′, by observation, I took the distance between the two ships by the megameter; and from that base determined the position of Hangcliff, which had never before been ascertained, though it is a very remarkable point, and frequently made by ships. According to these observations it is in latitude 60° 9′, and longitude 0° 56′ 30″ W. In the Appendix I shall give an account of the manner of taking surveys by this instrument, which I believe never to have been practised before. At one, observed the dip to be 75°. A thick fog came on in the afternoon, with a flat calm; we could not see the Carcass, but heard her answer the signals for keeping company. Variation, from the mean of several observations, 25° 1′ W.

The sixteenth, a very thick fog in the morning; latitude observed at noon 60° 29′ 17″; the dip was observed at nine in the evening to be 76° 45′. In the afternoon, the weather clear, and the wind fair, steered N. N. E: sent captain Lutwidge his further orders and places of rendezvous.

The seventeenth, wind fair, and blowing fresh at S. S. W. continued the course N. N. E: ordered the people a part of the additional clothing: saw an English sloop, but had no opportunity of sending letters on board, the sea running high. At ten in the morning, longitude by the watch 0° 19′ 45″ W.; at noon, the latitude observed was 62° 59′ 27″. The ship had outrun the reckoning eleven miles. I tried Bouguer's log twice this day, and found it give more than the common log. Variation 19° 22′ W.

The eighteenth, little wind all day, but fair, from S. S. W. to S. E.: still steering N. N. E.: latitude observed at noon 65° 18′ 17″. At three in the afternoon, sounded with three hundred fathom of line, but got no ground. Longitude by the watch 1° 0′ 30″ W.

The nineteenth, wind to the N. W. Took the meridian observation at midnight for the first time: the sun's lower limb 0° 37′ 30″ above the horizon; from which the latitude was found 66° 54′ 39′ N.: at four in the afternoon, longitude by the watch 0° 58′ 45″ W.: at six the variation 19° 11′ W.

The twentieth, almost calm all day. The water being perfectly smooth, I took this opportunity of trying to get soundings at much greater depths than I believe had ever been attempted before. I sounded with a very heavy lead the depth of seven hundred and eighty fathom, without getting ground; and by a thermometer invented by lord Charles Cavendish for this purpose, found the temperature of the water at

that depth to be 26° of Fahrenheit's thermometer; the temperature of the air being 48° and a half.

We began this day to make use of doctor Irving's apparatus for distilling fresh water from the sea: repeated trials gave us the most satisfactory proof of its utility: the water produced from it was perfectly free from salt, and wholesome, being used for boiling the ship's provisions; which convenience would alone be a desirable object in all voyages, independent of the benefit of so useful a resource in case of distress for water. The quantity produced every day varied from accidental circumstances, but was generally from thirty-four to forty gallons, without any great addition of fuel. Twice indeed the quantity produced was only twenty-three gallons on each distillation: this amounts to more than a quart for each man, which, though not a plentiful allowance, is much more than what is necessary for subsistence. In cases of real necessity I have no reason to doubt that a much greater quantity might be produced, without an inconvenient expence of fuel.

The twenty-first, a fresh gale at S. E. all day; steered N. N. E. At four in the morning we spoke with a snow from the seal fishery, bound to Hamburg, by which we sent some letters. At six in the morning the variation, by the mean of several observations, was 23° 18′ W. Longitude by the watch at nine was 0° 34′ 30″ W. Latitude observed at noon 68° 5′.

The twenty-second, calm most part of the day; rainy and rather cold in the evening. At noon observed the dip to be 77° 52′.

The twenty-third, very foggy all day; the wind fair; altered the course, and steered N. E. and E. N. E. to get more into the mid channel, and to avoid falling in with the western ice, which, from the increasing coldness of the weather, we concluded to be near. At seven o'clock in the morning, being by our reckoning to the northward of 72°, we saw a piece of drift wood, and a small bird called a Red-poll. Dip observed at nine in the evening to be 81° 30′.

The twenty-fourth, very foggy all the morning; the wind came round to the northward. The dip observed at noon was 80° 35′. In the afternoon, the air much colder than we had hitherto felt it; the thermometer at 34°. A fire made in the cabin for the first time, in latitude 73° 40′.

The wind northerly, with a great swell; some snow, but in general clear. At eight in the morning, the longitude observed by the watch was 7° 15′ E. Made several observations on the variation, which we found, by those taken at seven in the morning, to be 17° 9′ W. by others, at three in the afternoon, only 7° 47′ W. I could not account for this very sudden and extraordinary decrease, as there were several different observations taken both in the morning and evening, which agreed perfectly well with each other, without any apparent cause which could produce an error affecting all the observations of either set. At eight in the evening the longitude by the moon was 12° 57′ 30″ E. which differed 2° 35′ from that by the watch. Little wind at night.

The twenty-sixth, little wind all day; the weather very fine and moderate. The latitude observed at noon was 74° 25′. The thermometer exposed to the sun, which shone very bright, rose from 41° to 61° in twenty minutes. By each of two lunar observations which I took with a sextant of four inches radius, at half past one, the longitude was 9° 7′ 30″ E, which agreed within thirty-seven minutes with an observation made by the watch at half an hour after three, when the longitude was 8° 52′ 30″ E. Dip 79° 22′.

The twenty-seventh, at midnight the latitude observed was 74° 26′. The wind came to the S. W. and continued so all day, with a little rain and snow. The cold did not increase. We steered N. by E. At seven in the morning the variation, by a mean of several observations, was found to be 20° 38′ W. We were in the evening, by all our reckonings, in the latitude of the south part of Spitsbergen, without any appearance of ice or sight of land, and with a fair wind.

The twenty-eighth, less wind in the morning than the day before, with rain and sleet: continued steering to the northward. At five in the afternoon picked up a piece of drift wood, which was fir, and not worm eaten: sounded in two hundred and ninety fathom; no ground. At six the longitude by the watch was 7° 50′ E. Between ten and eleven at night, saw the land to the eastward, at ten or twelve leagues distance. At midnight, dip 81° 7′.

The twenty-ninth, the wind northerly: stood close in with the land. The coast appeared to be neither habitable nor accessible; for it was formed by high, barren, black rocks, without the least marks of vegetation; in many places bare and pointed, in other parts covered with snow, appearing even above the clouds: the vallies between the high cliffs were filled with snow or ice. This prospect would have suggested the idea of perpetual winter, had not the mildness of the weather, the smooth water, bright sunshine, and constant day-light, given a cheerfulness and novelty to the whole of this striking and romantic scene.

I had an opportunity of making many observations near the Black Point. Latitude observed at noon 77° 59′ 11″. The difference of latitude, from the last observation on the twenty-seventh at midnight to this day at noon, would, according to the old method of marking the log, have been two hundred and thirteen miles; which agrees exactly with the observation. At three in the afternoon brought to, and sounded one hundred and ten fathoms; soft muddy ground: hoisted the boat and tried the stream; found it both by the common and Bouguer's log (which agreed exactly) to run half a knot north, Black Point bearing E. N. E. At four the longitude by the watch was 9° 31′ E. at eight the variation, by the mean of nineteen observations, 11° 53′ W. I could not account from any apparent cause for this great change in the variation: the weather was fine, the water smooth, and every precaution we could think of used, to make the observations accurate. The dip was 80° 26′. Plying to the northward.

The thirtieth, at midnight, the latitude by observation was 78° 0′ 50″. At four in the morning, by lord Charles Cavendish's thermometer, the temperature of the water at the depth of a hundred and eighteen fathoms was 31° of Fahrenheit's; that of the air was at the same time 40° and a half. At nine in the morning we saw a ship in the N. W. standing in for the land. Having little wind this morning, and that northerly, I stood in for the land, with an intention to have watered the ship, and got out immediately, but was prevented by the calm which followed. At noon the latitude observed was 78° 8′; the dip 79° 30′. At two in the afternoon we sounded in a hundred and fifteen fathoms; muddy bottom: at the same time we sent down lord Charles Cavendish's thermometer, by which we found the temperature of the water at that depth to be 33°; that of the water at the surface was at the same time 40°, and in the air 44° and three fourths. Fahrenheit's thermometer plunged in water brought up from the same depth stood at 38° and a half. This evening the master of a Greenland ship came on board, who told me, that he was just come out of the ice which lay to the westward about sixteen leagues off, and that three ships had been lost this year, two English, and one Dutch. The weather fine, and rather warm. At six in the evening the longitude by my watch was 9° 28′ 45″ E.

July the first, little wind northerly, or calm, all day: the weather very fine, and so warm that we sat without a fire, and with one of the ports open in the cabin. At noon the latitude observed was 78° 13′ 36″; Black Point bearing S. 78° E. which makes the latitude of that point nearly the same as that of the ship, and agrees very well with the chart of this coast in Purchas.

The second, little wind, and calms, all day; the weather very fine. At six in the morning five sail of Greenlandmen in sight. At noon the latitude observed was 78° 22′ 41″. I took a survey of the coast, as far as we could see: I took also with the megameter the altitudes of several of the mountains: but as there is nothing particularly interesting to navigators in this part of the coast, I shall only mention the height of one mountain, which was fifteen hundred and three yards. This may serve to give some idea of the appearance and scale of the coast. At half past six the longitude by the watch was 9° 8′ 30″ E. variation 14° 55′ W.

The third, latitude at midnight 78° 23′ 46″; dip. 80° 45′. The weather fine, and the wind fair all day. Running along by the coast of Spitsbergen all day: several Greenlandmen in sight. Between nine and ten in the evening we were abreast of the North Foreland, bearing E. by S. half S. distance one mile and a half. Sounded in twenty fathom; rocky ground.

The fourth, very little wind in the morning. At noon the latitude by observation was 79° 31′, Magdalena Hook bore N. 39° E. distant four miles; which gives the latitude of that place 79° 34′; the same as Fotherby observed it to be in 1614. Stood into a small bay to the southward of Magdalena and Hamburgher's Bay: anchored with the stream anchor, and sent the boat for water. About three in the afternoon, when the boat was sent on shore, it appeared to be high water, and ebbed about three feet. This makes high water full and change at half an hour past one, or with a S. S. W. moon, which agrees exactly with Baffin's observation in 1613. The flood comes from the southward. Went ashore with the astronomer, and instruments, to observe the variation. A thick fog came on before we had completed the observations. The ship driving, I weighed and stood out to sea under an easy sail, firing guns frequently, to shew the Carcass where we were; and in less than two hours joined her. Soon after (about four in the morning of the fifth) the Rockingham Greenland Ship ran under our stern, and the master told me he had just spoke with some ships, from which he learnt that the ice was within ten leagues of Hacluit's Head Land, to the northwest. In consequence of this intelligence, I gave orders for steering in towards the Head Land; and if it should clear up, to steer directly for it; intending to go north from thence, till some circumstance should oblige me to alter my course.

The fifth, at five the officer informed me that we were very near some islands off Danc's Gat, and that the pilot wished to stand farther out; I ordered the ship to be kept N. by W. and hauled farther in, when clear of the islands. At noon I steered North, seeing nothing of the land: soon after I was told that they saw the ice: I went upon deck, and perceived something white upon the bow, and heard a noise like the surf upon the shore: I hauled down the studding sails, and hailed the Carcass to let them know that I should stand for it to make what it was, having all hands upon deck ready to haul up at a moment's warning: I desired that they would keep close to us, the fog being so thick, and have every body up ready to follow our motions instantaneously, determining to stand on under such sail as should enable us to keep the ships under command, and not risk parting company. Soon after two small pieces of ice not above three feet square passed us, which we supposed to have floated from the shore. It was not long before we saw something on the bow, part black and part

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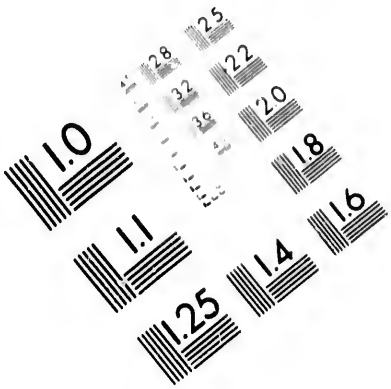

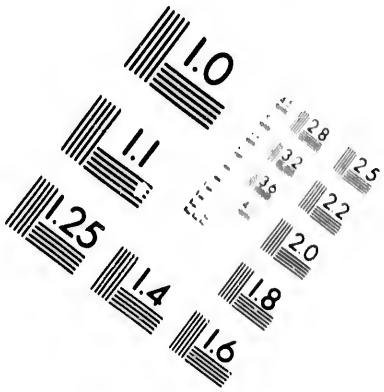

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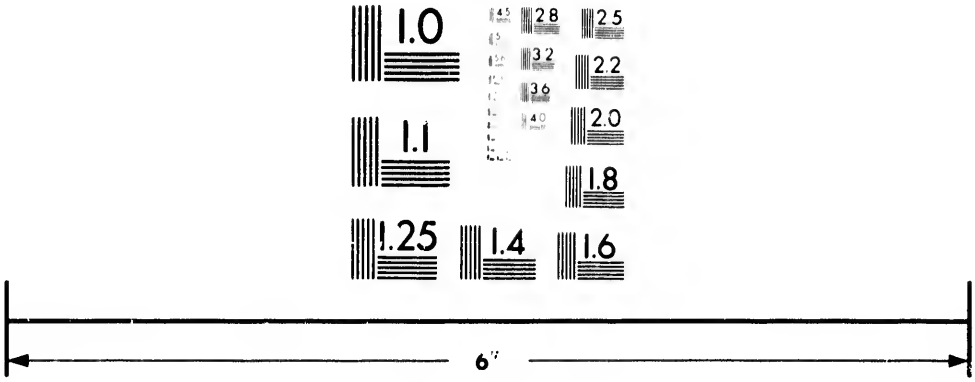

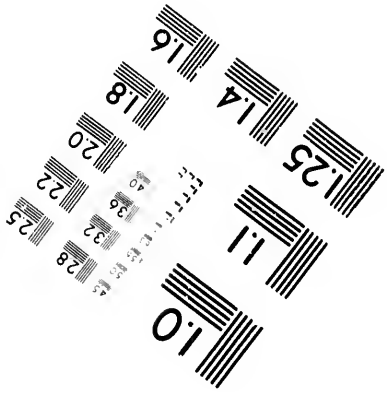

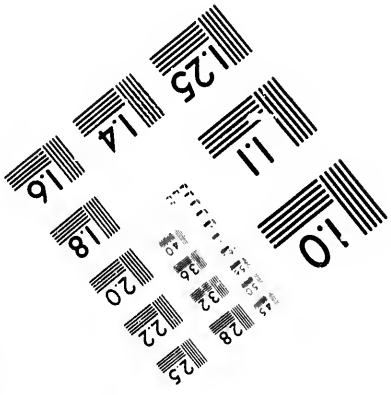

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allowed for extraordinary occasions; as well as the additional cloathing furnished by the Admiralty. Notwithstanding every attention, several of the men were confined with colds, which affected them with pains in their bones; but, from the careful attendance given them, few continued in the sick list above two days at a time. At nine in the morning, when it cleared a little, we saw the Carcass much to the southward of us. I took the opportunity of the clear weather to run to the westward, and found the ice quite solid there: I then stood through every opening to the northward, but there also soon got to the edge of the solid ice. I was forced to haul up, to weather a point which ran out from it. After I had weathered that, the ice closing fast upon me, obliged me to set the foresail, which, with the fresh wind and smooth water, gave the ship such way as to force through it with a violent stroke. At one in the afternooon, immediately on getting out into the open sea, we found a heavy swell setting to the northward; though amongst the ice, the minute before, the water had been as smooth as a mill-pond. The wind blew strong at S. S. W. The ice, as far as we could see from the mast head, lay E. N. E. We steered that course close to it, to look for an opening to the northward. I now began to conceive that the ice was one compact impenetrable body, having run along it from east to west above 10°. I purposed however to stand over to the eastward, in order to ascertain whether the body of ice joined to Spitsbergen. This the quantity of loose ice had before rendered impracticable; but thinking the westerly winds might probably by this time have packed it all that way, I flattered myself with the hopes of meeting with no obstruction till I should come to where it joined the land; and in case of an opening, however small, I was determined at all events to push through it. The weather clearer, and the land in sight.

The eleventh, at half past four in the morning the longitude by the lunar observation was 9° 42′ E. And at the same time by my watch 9° 2′ E. Cloven Cliff S. S. F. distant eight miles. This would make the longitude of Cloven Cliff 9° 38′ E. which is within twenty minutes of what it was determined by the observations and survey taken in Fair Haven. At noon the latitude observed was 80° 4′; Vogel Sang W. S. W. Little wind and a great swell in the morning. Calm most part of the day.

The twelfth, calm all day, with a great swell from the S. W. and the weather remarkably mild. At eight in the evening longitude by the watch 10° 54′ 30″ E. Cloven Cliff S. W. by S. The Carcass drove with the current so near the main body of the ice, as to be obliged to anchor; she came to in twenty-six fathom water.

The thirteenth, calm till noon, the ship driving to the westward with the current, which we observed to be very irregular, the Carcass being driven at the same time to the eastward. Near the main body of the ice the detached pieces probably affect the currents, and occasion the great irregularity which we remarked. We had found an heavy swell from the S. W. these two days. At two in the afternooon it came on very suddenly to blow fresh from that quarter, with foggy weather: we worked into Vogel Sang, and anchored with the best bower in eleven fathoms, soft clay.

The place where we anchored is a good road-stead, open from the N. E. to the N. W. The north-easternmost point is the Cloven Cliff, a bare rock, so called from the top of it resembling a cloven hoof, which appearance it has always worn, having been named by some of the first Dutch navigators who frequented these seas. This rock being entirely detached from the other mountains, and joined to the rest of the island by a low narrow isthmus, preserves in all situations the same form; and being nearly perpendicular, it is never disguised by snow. These circumstances render it one of the most remarkable points on the coast. The north-westernmost land is an high bluff point, called by

the Dutch, Vogel Sang. This sound, though open to the northward, is not liable to any inconvenience from that circumstance, the main body of the ice lying so near as to prevent any great sea; nor are ships in any danger from the loose ice setting in, as this road communicates with several others formed by different islands, between all which there are safe passages. To all the sounds and harbours formed by this knot of islands, the old English navigators had given the general name of Fair Haven; of which Fotherby took a plat in 1614: that in which the Racehorse and Carcass lay at this time they called the North Harbour; the harbour of Smeerenberg, distant about eleven miles (in which we anchored in August) they named the South Harbour. Besides these, there are several others; particularly two, called Cook's Hole, and the Norways, in both which several Dutch ships were lying at this time. Here the shore being steep to, we completed our water with great ease, from the streams which fall in many places down the sides of the rocks, and are produced by the melting of the snow. I fixed upon a small flat island, or rock, about three miles from the ship, and almost in the centre of those islands which form the many good roads here, as the properest place for erecting a tent, and making observations. The foggy weather on the fourteenth prevented us from using the instruments that day. I regretted this circumstance much, fearing it would deprive me of the only probable opportunity of making observations on shore in those high latitudes, as our water was nearly recruited; however, having little wind, with the weather very fair from the fifteenth to the eighteenth in the morning, I made the best use of that time. Even in the clearest weather here, the sky was never free from clouds, which prevented our seeing the moon during the whole of our stay, or even being sure of our solar observations, Mr. Lyons never having been able to get equal altitudes for settling the rates of going of the time-keepers. Once indeed we were fortunate enough to observe a revolution of the sun, of which I availed myself to determine the going of the pendulum adjusted to vibrate seconds at London. During the course of this experiment, a particular and constant attention was paid to the state of the thermometer, which I was surprised to find differ so little about noon and midnight; its greatest height was 58° and a half, at eleven in the forenoon; at midnight it was 51°.

On the sixteenth, at noon, the weather was remarkably fine and clear. The thermometer in the shade being at 49°, when exposed to the sun rose in a few minutes to 89° and a half, and remained so for some time, till a small breeze springing up, made it fall 10° almost instantly. The weather at this time was rather hot; so that I imagine, if a thermometer was to be graduated according to the feelings of people in these latitudes, the point of temperature would be about the forty-fourth degree of Fahrenheit's scale. From this island I took a survey, to ascertain the situation of all the points and openings, and the height of the most remarkable mountains: the longest base the island would afford was only six hundred and eighteen feet, which I determined by a cross base, as well as actual measurement, and found the results not to differ above three feet. To try how far the accuracy of this survey might be depended upon, I took in a boat, with a small Hadley's sextant, the angles between seven objects, which intersected exactly when laid down upon the plan. I had a farther proof of its accuracy some days after, by taking the bearings of Vogel Sang and Hachuit's Head Land in one, which corresponded exactly with their position on my chart.

On the seventeenth, the weather being very clear, I went up one of the hills, from which I could see several leagues to the N. E.: the ice appeared uniform and compact, as far as my view extended. During our stay here, we found the latitude of the island on which the observations were made, to be 79° 50′; longitude 10° 2′ 30″ E.; variation 20° 38′ W.; dip 82° 7′: latitude of Cloven Cliff 79° 53′; longitude 9° 59′ 30″ E.

Hacluit's Head Land 79° 47′; longitude 9° 11′ 30″ E. The tide rose about four feet, and flowed at half an hour after one, full and change. The tide set irregularly, from the number of islands between which it passed; but the flood appeared to come from the southward.

The eighteenth, the calm weather since the fourteenth had given us full time to finish the observations, and complete our water: a breeze springing up in the morning, I went ashore to get the instruments on board. Between one and two we weighed, with the wind westerly, and stood to the northward. Between eleven and twelve at night, having run about eight leagues, we were prevented by the ice from getting farther. We stood along the edge of it to the southward. At two in the morning, being embayed by the ice, I tacked, and left orders to stand to the eastward along the edge of the ice, as soon as we could weather the point; hoping, if there should be no opening between the land and the ice, that I should at least be able to ascertain where they joined, and perhaps to discover from the land, whether there was any prospect of a passage that way: at that time the ice was all solid as far as we could see, without the least appearance of water to the northward.

The nineteenth, at six in the morning, we had got to the eastward among the loose ice, which lay very thick in shore, the main body to the northward and eastward: the land near Deer Field not four miles off, and the water shoaled to twenty fathoms. Here we found ourselves nearly in the same place where we had twice been stopped, the ice situated as before, locked with the land, without any passage either to the eastward or northward: I therefore stood back to the westward. At noon the northernmost part of Vogel Sang bore S. W. by S. distant about seven leagues. The weather being very fine, and the wind to the eastward, we were enabled to coast along the ice to the westward, hauling into all the bays, going round every point of ice in search of an opening, and standing close along by the main body all day, generally within a ship's length.

The twentieth, at half after three in the morning, the land was out of sight, and we imagined ourselves in rather more than eighty degrees and a half; some of the openings being near two leagues deep, had flattered us with hopes of getting to the northward; but these openings proved to be no more than bays in the main body of the ice. About one in the afternoon we were by our reckoning in about 80° 34′, nearly in the same place where we had been on the ninth. About three we bore away, for what appeared like an opening to the S. W. we found the ice run far to the southward.

The twenty-first we still continued to run along the edge of the ice, which trended to the southward. At noon we were in the latitude of 79° 26′, by observation, which was twenty-five miles to the southward of our reckoning. Finding that the direction of the ice led us to the southward, and that the current set the same way, I stood to the northward and westward close along the ice, to try whether the sea was opened to the northward by the wind from that quarter. At nine in the evening we had no ground with two hundred fathoms of line. At ten we got into a stream of loose ice. The weather fine, but cool all day, and sometimes foggy.

The twenty-second, at two in the morning, we bore away to the N. E. for the main body of the ice; the weather became foggy soon afterwards. At six we saw the ice: and the weather being still foggy, we hauled up to the S. S. E. to avoid being embayed in it: the air very cold.

The twenty-third, at midnight, tacked for the body of the ice. Latitude observed 80° 13′ 38″. Rainy in the morning; fair in the afternoon: still working up to the northward and eastward, with the wind easterly. At six in the evening, the Cloven Cliff bearing south about six leagues, sounded in two hundred fathoms, muddy ground; the lead appeared to have sunk one third of its length in the mud. At two in the morn-

ing, with little wind, and a swell from the south-west, I stood to the northward amongst the loose ice: at half past two the main body of the ice a cable's length off, and the loose ice so close that we wore ship, not having way or room enough to tack; struck very hard against the ice in getting the ship round, and got upon one piece, which lifted her in the water for near a minute, before her weight broke it. The ships had been so well strengthened, that they received no damage from these strokes; and I could with the more confidence push through the loose ice to try for openings. Hacluit's Head Land bore S. 50° W. distant about seven leagues.

The twenty-fourth, by this situation of the ice we were disappointed of getting directly to the northward, without any prospect, after so many fruitless attempts, of being able to succeed to the westward; nor indeed could I, with an easterly wind and a heavy swell, attempt it, as the wind from that quarter would not only pack the loose ice close to the westward, but by setting the sea on it, make it as improper to be approached as a rocky lee-shore. To the eastward, on the contrary, it would make smooth water, and detach all the loose ice from the edges; perhaps break a stream open, and give us a fair trial to the northward; at all events, with an easterly wind we could run out again, if we did not find it practicable to proceed. Finding the ice so fast to the northward and westward, it became a desirable object to ascertain how far it was possible to get to the eastward, and by that means pursue the voyage to the northward. These considerations determined me to ply to the eastward, and make another push to get through where I had been three times repulsed. In working to the eastward, we kept as near the body of the ice as possible. At noon the Cloven Cliff bore S. W. by S. about seven leagues. At six we were working to the N. E. and at nine we steered to the S. E. the ice appearing more open that way: we had fresh gales and cloudy weather. The ship struck very hard in endeavouring to force through the loose ice. At midnight the wind freshened, and we double reefed the topsails. It was probably owing to the fresh gales this day, as well as to the summer being more advanced, that we were enabled to get farther than in any of our former attempts this way. We continued coasting the ice, and at two in the morning the north part of Vogel Sang and Hacluit's Head Land in one bore S. 65° W. Cloven Cliff S. 52° W. the nearest part of the shore about three leagues off. When I left the deck, at four in the morning, we were very near the spot where the ships had been fast in the ice on the seventh in the evening, but rather farther to the eastward; we had passed over the same shoal water we had met with that day, and were now in twenty fathom, rocky ground; still amongst loose ice, but not so close as we had hitherto found it.

The twenty-fifth, at seven in the morning, we had deepened our water to fifty-five fathom, and were still amongst the loose ice. At noon we had deepened our water to seventy fathom, with muddy bottom, at the distance of about three miles from the nearest land. By two in the afternoon we had passed Deer Field, which we had so often before attempted without success; and finding the sea open to the N. E. had the most flattering prospect of getting to the northward. From this part, all the way to the eastward, the coast wears a different face; the mountains, though high, are neither so steep or sharp-pointed, nor of so black a colour, as to the westward. It was probably owing to this remarkable difference in the appearance of the shore, that the old navigators gave to places hereabouts the names of Red Beach, Red Hill, and Red Cliff. One of them, speaking of this part, has described the whole country in a few words: "Here (says he) I saw a more natural earth and clay than any that I have seen in all the country, but nothing growing thereupon more than in other places." At two in the afternoon we had little wind, and were in sight of Moffen island, which is very low and flat.

The Carcass being becalmed very near the island in the evening, captain Lutwidge took that opportunity of obtaining the following exact account of its extent, which he communicated to me:

"At ten P. M. the body of Moffen island bearing E. by S. distant two miles, sounded thirteen fathoms, rocky ground, with light brown mud, and broken shells. Sent the master on shore, who found the island to be nearly of a round form, about two miles in diameter, with a lake or large pond of water in the middle, all frozen over, except thirty or forty yards round the edge of it, which was water, with loose pieces of broken ice, and so shallow, they walked through it, and went over upon the firm solid ice. The ground between the sea and the pond is from half a cable's length to a quarter of a mile broad, and the whole island covered with gravel and small stones, without the least verdure or vegetation of any kind. They saw only one piece of drift wood (about three fathom long, with a root on it, and as thick as the Carcass's mizen mast) which had been thrown up over the high part of the land, and lay upon the declivity towards the pond. They saw three bears, and a number of wild ducks, geese, and other sea-fowls, with birds' nests all over the island. There was an inscription over the grave of a Dutchman, who was buried there in July 1771. It was low water at eleven o'clock when the boat landed, and the tide appeared to flow eight or nine feet; at that time we found a current carrying the ship to the N. W. from the island, which before carried us to the S. E. (at the rate of a mile an hour) towards it. On the west side is a fine white sandy bottom, from two fathoms, at a ship's length from the beach, to five fathoms, at half a mile's distance off."

The soundings all about this island, and to the eastward, seem to partake of the nature of the coast. To the westward the rocks were high, and the shores bold and steep too; here the land shelved more, and the soundings were shoal, from thirty to ten fathom. It appears extraordinary that none of the old navigators, who are so accurate and minute in their descriptions of the coast, have taken any notice of this island, so remarkable and different from every thing they had seen on the western coast; unless we should suppose that it did not then exist, and that the streams from the great ocean up the west side of Spitsbergen, and through the Waygat's Straits, meeting here, have raised this bank, and occasioned the quantity of ice that generally blocks up the coast hereabouts. At four in the afternoon hoisted out the boat, and tried the current, which set N. E. by E. at the rate of three quarters of a mile an hour. At midnight Moffen island bore from S. E. by S. to S. by W. distant about five miles.

The twenty-sixth, about two in the morning, we had little wind, with fog; made the signals to the Carcass for keeping company. At half an hour after three in the afternoon, we were in longitude 12° 20′ 45″ E. variation, by mean of five azimuths, 12° 47′ W. At nine we saw land to the eastward; steering to the northward with little wind, and no ice in sight, except what we had passed.

The twenty-seventh, working still to the N. E. we met with some loose ice: however, from the openness of the sea hitherto, since we had passed Deer Field, I had great hopes of getting far to the northward; but about noon, being in the latitude of eighty and forty-eight, by our reckoning, we were stopped by the main body of the ice, which we found lying in a line, nearly east and west, quite solid. Having tacked, I brought to, and sounded close to the edge of the ice, in seventy-nine fathom, muddy bottom.

The wind being still easterly, I worked up close to the edge of the ice, coasting it all the way. At six in the evening we were in longitude 14° 59′ 30″ E. by observation.

The twenty-eighth, at midnight, the latitude observed was 80° 37′. The main body of the ice still lying in the same direction, we continued working to the eastward, and

found several openings to the northward, of two or three miles deep; into every one of which we ran, forcing the ship, wherever we could, by a press of sail, amongst the loose ice, which we found here in much larger pieces than to the westward. At six in the morning the variation, by the mean of six azimuths, was 11° 56′ W. the horizon remarkably clear. At noon, being close to the main body of the ice, the latitude by observation was 80° 36′: we sounded in one hundred and one fathom, muddy ground. In the afternoon the wind blew fresh at N. E. with a thick fog; the ice hung much about the rigging. The loose ice being thick and close, we found ourselves so much engaged in it, as to be obliged to run back a considerable distance to the westward and southward, before we could extricate ourselves: we afterwards had both the sea and the weather clear, and worked up to the north-eastward. At half past five the longitude of the ship was 15° 16′ 45″ E. At seven the easternmost land bore E. half N. distant about seven or eight leagues, appearing like deep bays and islands, probably those called in the Dutch charts the Seven Islands; they seemed to be surrounded with ice. I stood to the southward, in hopes of getting to the south-east-ward round the ice, and between it and the land, where the water appeared more open.

The twenty-ninth, at midnight, the latitude by observation was 80° 21′. At four tacked close to the ice, hauled up the fore-sail, and backed the mizen-top-sail, having too much way amongst the loose ice. At noon, latitude observed 80° 24′ 56″. An opening, which we supposed to be the entrance of Waygat's Straits, bore south; the northernmost land N. E. by E. the nearest shore distant about four miles. In the afternoon the officer from the deck came down, to tell me we were very near a small rock, even with the water's edge: on going up, I saw it within little more than a ship's length on the lee-bow, and put the helm down: before the ship got round we were close to it, and perceived it to be a very small piece of ice, covered with gravel. In the evening, seeing the northern part of the islands only over the ice, I was anxious to get round it, in hopes of finding an opening under the land. Being near a low flat island, opposite the Waygat's Straits, not higher, but much larger than Moffen island, we had an heavy swell from the southward, with little wind, and from ten to twenty fathoms: having got past this island, approaching to the high land to the eastward, we deepened our water very suddenly to one hundred and seventeen fathoms. Having little wind, and the weather very clear, two of the officers went with a boat in pursuit of some sea-horses, and afterwards to the low island. At midnight we found by observation the latitude 80° 27′ 3″, and the dip 82° 2′ 30″. At four in the morning I found, by Bouguer's log, that the current set two fathom to the eastward. At six in the morning the officers returned from the island; in their way back they had fired at and wounded a sea-horse, which dived immediately, and brought up with it a number of others. They all joined in an attack upon the boat, wrested an oar from one of the men, and were with difficulty prevented from staving or oversetting her; but a boat from the Carcass joining ours, they dispersed. One of that ship's boats had before been attacked in the same manner off Moffen island. From Dr. Irving, who went on this party, I had the following account of the low island.

"We found several large fir-trees lying on the shore, sixteen or eighteen feet above the level of the sea; some of these trees were seventy feet long, and had been torn up by the roots; others cut down by the axe, and notched for twelve feet lengths: this timber was no ways decayed, or the strokes of the hatchet in the least effaced. There were likewise some pipe staves, and wood fashioned for use. The beach was formed of old timber, sand, and whale bones.

"The island is about seven miles long, flat, and formed chiefly of stones from eighteen to thirty inches over, many of them hexagons, and commodiously placed for walking on: the middle of the island is covered with moss, scurvy-grass, sorrel, and a few ranunculuses then in flower. Two rein-deer were feeding on the moss; one we killed, and found it fat, and of high flavour. We saw a light gray-coloured fox; and a creature somewhat larger than a weasel, with short ears, long tail, and skin spotted white and black. The island abounds with small snipes, similar to the jack-snipe in England. The ducks were now hatching their eggs, and many wild geese feeding by the water-side."

When I left the deck at six in the morning, the weather was remarkably clear, and quite calm. To the N. E. amongst the islands, I saw much ice, but also much water between the pieces; which gave me hopes that, when a breeze sprung up, I should be able to get to the northward by that way.

The thirtieth, little winds, and calm all day; we got something to the northward and eastward. At noon we were by observation in latitude 80° 31′. At three in the afternoon we were in longitude 18° 48′ E. being amongst the islands, and in the ice, with no appearance of an opening for the ship. Between eleven and twelve at night I sent the master, Mr. Crane, in the four-oared boat, amongst the ice, to try whether he could get the boat through, and find any opening for the ship, which might give us a prospect of getting farther; with directions, if he could reach the shore, to go up one of the mountains, in order to discover the state of the ice to the eastward and northward. At five in the morning, the ice being all round us, we got out our ice-anchors, and moored along-side a field. The master returned between seven and eight, and with him captain Lutwidge, who had joined him on shore. They had ascended an high mountain, from whence they commanded a prospect extending to the east and north-east ten or twelve leagues, over one continued plain of smooth unbroken ice, bounded only by the horizon: they also saw land stretching to the S. E. laid down in the Dutch charts as islands. The main body of the ice, which we had traced from west to east, they now perceived to join to these islands, and from them to what is called the North-East-Land. In returning, the ice having closed much since they went, they were frequently forced to haul the boat over it to other openings. The weather exceedingly fine and mild, and unusually clear. The scene was beautiful and picturesque; the two ships becalmed in a large bay, with three apparent openings between the islands which formed it, but every where surrounded with ice as far as we could see, with some streams of water; not a breath of air; the water perfectly smooth; the ice covered with snow, low and even, except a few broken pieces near the edges: the pools of water in the middle of the pieces were frozen over with young ice.

The thirty-first, at nine in the morning, having a light breeze to the eastward, we cast off, and endeavoured to force through the ice. At noon the ice was so close, that being unable to proceed, we moored again to a field. In the afternoon we filled our cask with fresh water from the ice, which we found very pure and soft. The Carcass moved, and made fast to the same field with us. The ice measured eight yards ten inches in thickness at one end, and seven yards eleven inches at the other. At four in the afternoon the variation was 12° 24′ W. at the same time the longitude 19° 0′ 15″ E. by which we found that we had hardly moved to the eastward since the day before. Calm most part of the day; the weather very fine; the ice closed fast, and was all round the ships; no opening to be seen any where, except an hole of about a mile and a half, where the ships lay fast to the ice with ice-anchors. We completed the water,

The ship's company were playing on the ice all day. The pilots being much farther than they had ever been, and the season advancing, seemed alarmed at being beset.

The first of August, the ice pressed in fast; there was not now the smallest opening; the two ships were within less than two lengths of each other, separated by ice, and neither having room to turn. The ice, which had been all flat the day before, and almost level with the water's edge, was now in many places forced higher than the main-yard, by the pieces squeezing together. Our latitude this day at noon, by the double altitude, was 80° 37′.

The second, thick foggy wet weather, blowing fresh to the westward; the ice immediately about the ships rather looser than the day before, but yet hourly setting in so fast upon us, that there seemed to be no probability of getting the ships out again without a strong east or north-east wind. There was not the smallest appearance of open water, except a little towards the west point of the north-east land. The seven islands and north-east land, with the frozen sea, formed almost a bason, leaving but about four points opening for the ice to drift out, in case of a change of wind.

The third, the weather very fine, clear, and calm; we perceived that the ships had been driven far to the eastward; the ice was much closer than before, and the passage by which we had come in from the westward closed up, no open water being in sight, either in that or any other quarter. The pilots having expressed a wish to get if possible farther out, the ships' companies were set to work at five in the morning, to cut a passage through the ice, and warp through the small openings to the westward. We found the ice very deep, having sawed sometimes through pieces twelve feet thick. This labour was continued the whole day, but without any success; our utmost efforts not having moved the ships above three hundred yards to the westward through the ice, at the same time that they had been driven (together with the ice itself, to which they were fast) far to the N. E. and eastward by the current; which had also forced the loose ice from the westward between the islands, where it became packed, and as firm as the main body.

The fourth, quite calm till evening, when we were flattered with a light air to the eastward, which did not last long, and had no favourable effect. The wind was now at N. W. with a very thick fog, the ship driving to the eastward. The pilots seemed to apprehend that the ice extended very far to the southward and westward.

The fifth, the probability of getting the ships out appearing every hour less, and the season being already far advanced, some speedy resolution became necessary as to the steps to be taken for the preservation of the people. As the situation of the ships prevented us from seeing the state of the ice to the westward, by which our future proceedings must in a great measure be determined, I sent Mr. Walden, one of the midshipmen, with two pilots, to an island about twelve miles off, which I have distinguished in the charts by the name of Walden's Island, to see where the open water lay.

The sixth, Mr. Walden and the pilots, who were sent the day before to examine the state of the ice from the island, returned this morning, with an account that the ice, though close all about us, was open to the westward, round the point by which we came in. They also told me, that when upon the island they had the wind very fresh to the eastward, though where the ships lay it had been almost calm all day. This circumstance considerably lessened the hopes we had hitherto entertained of the immediate effect of an easterly wind in clearing the bay. We had but one alternative; either patiently to wait the event of the weather upon the ships, in hopes of getting them out, or to betake ourselves to the boats. The ships had driven into shoal water, having but

fourteen fathoms. Should they, or the ice to which they were fast, take the ground, they must be inevitably lost, and probably overset. The hopes of getting the ships out was not hastily to be relinquished, nor obstinately adhered to, till all other means of retreat were cut off. Having no harbour to lodge them in, it would be impossible to winter them here, with any probability of their being again serviceable; our provisions would be very short for such an undertaking, were it otherwise feasible; and supposing what appeared impossible, that we could get to the nearest rocks, and make some conveniences for wintering, being now in an unfrequented part, where ships never even attempt to come, we should have the same difficulties to encounter the next year, without the same resources; the remains of the ship's company, in all probability, not in health; no provisions; and the sea not so open, this year having certainly been uncommonly clear. Indeed, it could not have been expected that more than a very small part should survive the hardships of such a winter with every advantage; much less in our present situation. On the other hand, the undertaking to move so large a body for so considerable a distance, by boats, was not without very serious difficulties. Should we remain much longer here, the bad weather must be expected to set in. The stay of the Dutchmen to the northward is very doubtful: if the northern harbours keep clear, they stay till the beginning of September; but when the loose ice sets in, they quit them immediately. I thought it proper to send for the officers of both ships, and informed them of my intention of preparing the boats for going away. I immediately hoisted out the boats, and took every precaution in my power to make them secure and comfortable: the fitting would necessarily take up some days. The water shoaling, and the ships driving fast towards the rocks to the N. E. I ordered canvas bread-bags to be made, in case it should be necessary very suddenly to betake ourselves to the boats: I also sent a man with a lead and line to the northward, and another from the Carcass to the eastward, to sound wherever they found cracks in the ice, that we might have notice before either the ships, or the ice to which they were fast, took the ground; as in that case, they must instantly have been crushed or overset. The weather bad; most part of the day foggy, and rather cold.

The seventh, in the morning, I set out with the launch over the ice; she hauled much easier than I could have expected; we got her about two miles. I then returned with the people for their dinner. Finding the ice rather more open near the ships, I was encouraged to attempt moving them. The wind being easterly, though but little of it, we set the sails, and got the ships about a mile to the westward. They moved, indeed, but very slowly, and were not now by a great deal so far to the westward as where they were beset. However, I kept all the sail upon them, to force through whenever the ice slacked the least. The people behaved very well in hauling the boat; they seemed reconciled to the idea of quitting the ships, and to have the fullest confidence in their officers. The boats could not with the greatest diligence be got to the water-side before the fourteenth; if the situation of the ships did not alter by that time, I should not be justified in staying longer by them. In the mean time I resolved to carry on both attempts together, moving the boats constantly, but without omitting any opportunity of getting the ships through.

The eighth, at half past four, sent two pilots with three men to see the state of the ice to the westward, that I might judge of the probability of getting the ships out. At nine they returned, and reported the ice to be very heavy and close, consisting chiefly of large fields. Between nine and ten this morning, I set out with the people, and got the launch above three miles. The weather being foggy, and the people having worked hard, I thought it best to return on board between six and seven. The ships

had in the mean time moved something through the ice, and the ice itself had drifted still more to the westward. At night there was little wind, and a thick fog, so that I could not judge precisely of the advantage we had gained; but I still feared that, however flattering, it was not such as to justify my giving up the idea of moving the boats, the season advancing so fast, the preservation of the ships being so uncertain, and the situation of the people so critical.

The ninth, a thick fog in the morning, we moved the ship a little through some very small openings. In the afternoon, upon its clearing up, we were agreeably surprised to find the ships had driven much more than we could have expected to the westward. We worked hard all day, and got them something more to the westward through the ice: but nothing in comparison to what the ice itself had drifted. We got past the launches: I sent a number of men for them, and got them on board. Between three and four in the morning the wind was westerly, and it snowed fast. The people having been much fatigued, we were obliged to desist from working for a few hours. The progress which the ships had made through the ice was, however, a very favourable event: the drift of the ice was an advantage that might be as suddenly lost, as it had been unexpectedly gained by a change in the current: we had experienced the inefficacy of an easterly wind when far in the bay, and under the high land; but having now got through so much of the ice, we began again to conceive hopes that a brisk gale from that quarter would soon effectually clear us.

The tenth, the wind springing up to the N. N. E. in the morning, we set all the sail we could upon the ship, and forced her through a great deal of very heavy ice: she struck often very hard, and with one stroke broke the shank of the best bower anchor. About noon we had got her through all the ice, and out to sea. I stood to the N. W. to make the ice, and found the main body just where we left it. At three in the morning, with a good breeze easterly, we were standing to the westward, between the land and the ice, both in sight, the weather hazy.

The eleventh, came to an anchor in the harbour of Smeerenberg, to refresh the people after their fatigues. We found here four of the Dutch ships, which we had left in the Norways when we sailed from Vogel Sang, and upon which I had depended for carrying the people home, in case we had been obliged to quit the ships. In this sound there is good anchorage in thirteen fathom, sandy bottom, not far from the shore: it is well sheltered from all winds. The island close to which we lay is called Amsterdam Island, the Westernmost point of which is Hacluit's Head Land: here the Dutch used formerly to boil their whale-oil, and the remains of some conveniences erected by them for that purpose are still visible. Once they attempted to make an establishment, and left some people to winter here, who all perished. The Dutch ships still resort to this place for the latter season of the whale fishery.

The twelfth, got the instruments on shore, and the tent pitched; but could not make any observations this day or the next, from the badness of the weather.

The thirteenth, rain, and blowing hard: two of the Dutch ships sailed for Holland.

The fourteenth, the weather being fine, and little wind, we began our observations.

The eighteenth, completed the observations. Calm all the day. During our stay, I again set up the pendulum, but was not so fortunate as before, never having been able to get an observation of a revolution of the sun, or even equal altitudes for the time. We had an opportunity of determining the refraction at midnight, which answered within a few seconds to the calculation in Dr. Bradley's table, allowing for the barometer and thermometer. Being within sight of Cloven Cliff, I took a survey of this part of Fair Haven, to connect it with the plan of the other part. Dr. Irving climbed up a moun-

tain, to take its height with the barometer, which I determined at the same time geometrically with great care. By repeated observations here we found the latitude to be 79° 44′, which by the survey corresponded exactly with the latitude of Cloven Cliff, determined before; the longitude 9° 50′ 45″ E.; dip 82° 8′ and three fourths: variation 18° 57′ W.; which agrees also with the observation made on shore in July. The tide flowed here half past one, the same as in Vogel Sang harbour.

Opposite to the place where the instruments stood, was one of the most remarkable icebergs in this country. Icebergs are large bodies of ice filling the vallies between the high mountains; the face towards the sea is nearly perpendicular, and of a very lively light green colour. That represented in the engraving, from a sketch by Mr. D'Auvergne upon the spot, was about three hundred feet high, with a cascade of water issuing out of it. The black mountains, white snow, and beautiful colour of the ice, make a very romantic and uncommon picture. Large pieces frequently break off from the icebergs, and fall with great noise into the water: we observed one piece which had floated out into the bay, and grounded in twenty-four fathom; it was fifty feet high above the surface of the water, and of the same beautiful colour as the iceberg.

A particular description of all the plants and animals will have a place in the Appendix. I shall here mention such general observations as my short stay enabled me to make. The stone we found was chiefly a kind of marble, which dissolved easily in the marine acid. We perceived no marks of minerals of any kind, nor the least appearance of present, or remains of former, volcanoes. Neither did we meet with insects, or any species of reptiles; not even the common earth-worm. We saw no springs or rivers, the water, which we found in great plenty, being all produced by the melting of the snow from the mountains. During the whole time we were in these latitudes, there was no thunder or lightning. I must also add, that I never found what is mentioned by Marten (who is generally accurate in his observations, and faithful in his account) of the sun at midnight resembling in appearance the moon; I saw no difference in clear weather between the sun at midnight and any other time, but what arose from a different degree of altitude; the brightness of the light appearing there, as well as elsewhere, to depend upon the obliquity of his rays. The sky was in general loaded with hard white clouds; so that I do not remember to have ever seen the sun and the horizon both free from them even in the clearest weather. We could always perceive when we were approaching the ice, long before we saw it, by a bright appearance near the horizon, which the two pilots called the blink of the ice. Hudson remarked, that the sea where he met with ice was blue; but the green sea was free from it. I was particularly attentive to observe this difference, but could never discern it.

The driftwood in these seas has given rise to various opinions and conjectures, both as to its nature and the place of its growth. All that which we saw (except the pipe-staves taken notice of by Dr. Irving on the low island) was fir, and not worm-eaten. The place of its growth I had no opportunity of ascertaining.

The nature of the ice was a principal object of attention in this climate. We found always a great swell near the edge of it; but whenever we got within the loose ice, the water was constantly smooth. The loose fields and flaws, as well as the interior part of the fixed ice, were flat and low: with the wind blowing on the ice, the loose parts were always, to use the phrase of the Greenlandmen, packed; the ice at the edges appearing rough, and piled up; this roughness and height I imagine to proceed from the smaller pieces being thrown up by the force of the sea on the solid part. During the

time that we were fast amongst the seven islands, we had frequent opportunities of observing the irresistible force of the large bodies of floating ice. We have often seen a piece of several acres square lifted up between two much larger pieces, and as it were becoming one with them; and afterwards this piece so formed acting in the same manner upon a second and a third; which would probably have continued to be the effect, till the whole bay had been so filled with ice that the different pieces could have had no motion, had not the stream taken an unexpected turn, and set the ice out of the bay.

The nineteenth, weighed in the morning with the wind at N. N. E. Before we got out of the bay it fell calm. I observed for these three or four days, about eleven in the evening, an appearance of dusk.

The twentieth, at midnight, being exactly in the latitude of Cloven Cliff, Mr. Harvey took an observation for the refraction; which we found agreeable with the tables. The wind southerly all day, blowing fresh in the afternoon. About noon fell in with a stream of loose ice, and about four made the main ice near us. We stood to the W. N. W. along it at night, and found it in the same situation as when we saw it before; the wind freshened and the weather grew thick, so that we lost sight of it, and could not venture to stand nearer, the wind being S. S. W.

The twenty-first, at two in the morning we were close in with the body of the west ice, and obliged to tack for it; blowing fresh, with a very heavy sea from the southward. The wind abated in the afternoon, but the swell continued, with a thick fog.

The twenty-second, the wind sprung up northerly, with a thick fog; about noon moderate and clearer; but coming on to blow fresh again in the evening, with a great sea, and thick fog, I was forced to haul more to the eastward, lest we should be embayed, or run upon lee ice.

The season was so very far advanced, and fogs as well as gales of wind so much to be expected, that nothing more could now have been done, had any thing been left untried. The summer appears to have been uncommonly favourable for our purpose, and afforded us the fullest opportunity of ascertaining repeatedly the situation of that wall of ice, extending for more than 20° between the latitudes of 80° and 81°, without the smallest appearance of any opening.

I should here conclude the account of the voyage, had not some observations and experiments occurred on the passage home.

In steering to the southward we soon found the weather grow more mild, or rather to our feelings warm. August the twenty-fourth we saw Jupiter: the sight of a star was now become almost as extraordinary a phenomenon, as the sun at midnight when we first got within the Arctic circle. The weather was very fine for some part of the voyage; on the fourth of September, the water being perfectly smooth with a dead calm, I repeated with success the attempt I had made to get soundings in the main ocean at great depths, and struck ground in six hundred and eighty-three fathoms, with circumstances (which will be mentioned in the Appendix) that convince me I was not mistaken in the depth; the bottom was a fine soft blue clay. From the seventh of September, when we were off Shetland, till the twenty-fourth, when we made Orfordness, we had very hard gales of wind, with little intermission, which were constantly indicated several hours before they came on, by the fall of the barometer, and rise of the manometer: this proved to me the utility of those instruments at sea. In one of these gales, the hardest, I think, I ever was in, and with the greatest sea, we lost three of our boats, and were obliged to heave two of our guns overboard and bear away for some time, though near a lee-shore, to clear the ship of water. I cannot omit this opportunity of repeating, that I had the greatest reason on this, as well as every other critical occasion, to be satisfied with the

behaviour both of the officers and seamen. In one of these gales, on the twelfth of September, Dr. Irving tried the temperature of the sea in that state of agitation, and found it considerably warmer than that of the atmosphere. This observation is the more interesting, as it agrees with a passage in Plutarch's Natural Questions, not, I believe, before taken notice of, or confirmed by experiment, in which he remarks, "that the sea becomes warmer by being agitated in waves."

The frequent and very heavy gales at the latter end of the year confirmed me in the opinion, that the time of our sailing from England was the properest that could have been chosen. These gales are as common in the spring as in autumn: there is every reason to suppose, therefore, that at an early season we should have met with the same bad weather in going out as we did on our return. The unavoidable necessity of carrying a quantity of additional stores and provisions rendered the ships so deep in the water, that in heavy gales the boats, with many of the stores, must probably have been thrown overboard; as we experienced on our way home, though the ships were then much lightened by the consumption of provisions, and expenditure of stores. Such accidents in the outset must have defeated the voyage. At the time we sailed, added to the fine weather, we had the further advantage of nearly reaching the latitude of eighty without seeing ice, which the Greenlandmen generally fall in with in the latitude of seventy-three or seventy-four. There was also most probability, if ever navigation should be practicable to the Pole, of finding the sea open to the northward after the solstice; the sun having then exerted the full influence of his rays, though there was enough of the summer still remaining for the purpose of exploring the seas to the northward and westward of Spitsbergen.

APPENDIX.....OBSERVATIONS ON DIFFERENT METHODS OF MEASURING A SHIP'S WAY.

THE degree of accuracy with which the distance run by a ship can be measured is a thing of great importance, but unfortunately not easily to be ascertained, from the great variety of circumstances which may occasion errors in the reckoning, and which, though not depending upon the measure of the ship's way, may in voyages not nearly upon a meridian be confounded with those that do. The circumstances of the present voyage gave me the fairest opportunity of trying this experiment, the weather being fine, and the course very nearly upon a meridian; so that an error of one point could not make more than the difference of one mile in fifty in the distance. When the difference of latitude is the same as the distance, it gives frequent opportunities of comparing the reckoning with the observation, and whatever error is found must be attributed to the imperfections in the manner of measuring the distance. Most of the writers on this subject have attributed the errors to a faulty division of the log line.

Before Norwood measured a degree, the length of a minute had been erroneously supposed five thousand feet: in consequence of which, the log-line, from the first use of that instrument about the year 1570, was invariably marked forty-two feet to thirty seconds. Norwood, when he published his Seaman's Practice, stated the true measure to be fifty-one feet to thirty seconds; but as the ship would really run more than is given by the log, and it is right to have the reckoning ahead of the ship, he recommended marking the log-line fifty three feet to thirty seconds. It does not appear at what time an alteration either in the marking the log, or the length of the glass, took place in consequence of these observations: Sir Jonas Moore in his navigation which was published in the reign of Charles Second mentions, that the seamen, having found the old log not to answer, had shortened the glass to twenty-five seconds, which was equal to a line marked fifty

feet with a glass of thirty seconds; but he rather recommends restoring the half minute glass, and making the correction on the line. Since that time the seamen, whether from finding the allowance of one foot in fifty not a sufficient compensation for the accidental errors to which the log is subject, or from a preference of a measure nearly equal to the statute mile, have used a line of forty-five feet to thirty seconds, or a glass of twenty-eight seconds to forty-two feet.

All the writers I have met with, who have treated of the log, except Wilson, have complained of the seamen not having adhered to Norwood's measure. Norwood himself, however, seems to have been aware of the necessity of submitting to the test of experiment the advantages of a new measurement derived from theory. In the preface to his Seaman's Practice he says, "Because I am persuaded we have at this day as many excellent navigators in this kingdom, and as great voyages performed, as from any other place in the world, I should be glad to hear of the experimental resolution of this problem by some of them, though it were but running eight or ten degrees near the meridian: for so I doubt not but what I have here written thereof would receive further confirmation and better entertainment than haply it will now, being so much different from the common opinion."

Had the errors in the distance arrisen only from a fault in marking the line, nothing would have been more easy than to have removed that difficulty, by comparing carefully the different measures with the observations, and adhering to that which had been found to correspond best with them. But the distance measured by the log being rendered uncertain by many accidental circumstances, it becomes difficult, or rather impossible, to find any length of line which will shew invariably the distance run by the ship, or even to ascertain with precision that measure which will at all times come nearest the truth. Some of these circumstances are:

1. The effects of currents.

2. The yawing of the ship going with the wind aft, or upon the quarter, when she is seldom steered within a point each way: this I mention as an error in the distance, and not in the course; since, though the ship by being yawed equally each way may make the intended course good upon the whole, yet the distance will be shortened as the versed sine of the angle between the line intended and that steered upon.

3. By the ship being driven on by the swell, or the log during the time of heaving being thrown up nearer the ship.

4. By the log coming home, or being drawn after the ship, by the friction of the reel and the lightness of the log. Norwood mentions these two last, and says, "For these causes, it is like, there may sometimes be allowed three fathoms or more than is veered out; but this (as a thing mutable and uncertain) being sometimes more, sometimes less, cannot be brought to any certain rule, but such allowance may be made as a man in his experience and discretion finds fit."

5. By the log being only a mean taken every hour, and consequently liable to error from the variations in the force of the wind during the intervals, for which an arbitrary correction is made by the officer of the watch; and though men of skill and experience come near the truth, yet this allowance must, from its nature, be inaccurate.

These circumstances did not escape M. Bouguer's attention, and his ingenuity suggested to him an improvement of the common log, which would correct the errors likely to arise from the most material of these circumstances: a description of this improvement he published at large in the Memoirs of the Academy of Sciences for the year 1747; it has since been abridged in the edition of his Navigation by De la Caille. It appears extraordinary that this log should never have been made use of by others;

the great reputation of the author, as well as the very good reasons he offers in favour of his improvement, were sufficient inducements to me to try the experiment.

In the log which I made use of,

The length of the cone was - - - - -	12 inches.
The diameter of the base - - - - -	$5\frac{1}{10}$.
The weight of the cone - - - - -	25 ounces.
The diagonal length of the diver - - - -	14 inches.
The length of each side - - - - -	$9\frac{3}{4}$.
The weight of the diver - - - - -	$26\frac{1}{2}$ ounces.

The length of line from the diver to the cone, 50 feet: the log line 51 feet to a knot.

Whether M. Bouguer's log will (as he expected) correct the errors arising from currents in the common log, I had no opportunity in discovering in this voyage.

The second error, which no log will correct, cannot be attended with any bad effect, as it must make the reckoning, in whatever degree it takes place, ahead of the ship.

By observing M. Bouguer's rules in comparing it with the common log, which for that purpose must be reckoned at fifty-one feet, it will, I think, very fully correct the third and fourth, which are the most material errors, as the agitation of the sea from winds does not exceed the depth to which the diver is let down, and the weight of the whole machine prevents the friction of the reel from having an effect in any degree equal to that which it has on the common log.

The fifth arises from the imperfection it has in common with the log generally used.

At first, on the passage out, I contented myself with heaving Bouguer's log occasionally, to observe what precautions were necessary to be taken to prevent errors, as well as to find whether its variations from the common log were on the same side as the meridian observation required. I found that it was necessary to take care that the diver should be of such a weight as to let only the top of the cone swim; but not heavy enough to sink it, as in that case it would be liable to an error in excess, by measuring the depth that the diver would sink in addition to the ship's way. It was necessary to put a weight of lead to the bottom of the diver, to sink it down to its place before the stray line was out. The line between the diver and the cone should not be more than fifty feet, that being as great a depth as it will sink to whilst the stray line is running off the reel, when the ship has much way through the water.

On the passage out, the longest period of my trying this log between two observations was from the twenty-fifth to the thirtieth; in which time the ship had run four degrees, and the rekoning by Bouguer's log was eighteen miles astern of the ship: but as it appears that the ship on the twenty-sixth, with the wind northerly, and making barely an east course, was found by the observation to be twenty miles to the northward of her reckoning, that distance must be attributed to a current; therefore, if that current had not taken place, Bouguer's log would have been, instead of eighteen miles astern, two miles ahead of the ship.

On the passage home it was tried from the latitude of eighty degrees eleven minutes, to sixty-eight degrees eleven minutes; in which distance, though the ship was much yawed from the sea being frequently upon the quarter, this log was only thirty-one miles ahead of the ship, which might be owing entirely to that circumstance, without any other cause.

The state of the common log on the passage out, when the weather was remarkably fine, and water in general smooth, was, from the latitude of sixty degrees thirty-seven minutes to seventy-eight degrees eight minutes, with the line marked fifty-one feet to thirty seconds, one degree fifty-eight minutes astern of the ship, with the line marked forty-

five feet to thirty seconds, four miles ahead of the ship. On the passage home the log at fifty-one feet to thirty seconds, thirty-five miles astern of the ship; at forty-five to thirty seconds, one degree seven minutes ahead of the ship. As far therefore as the experience of this voyage extends, it appears that the errors of the log marked forty-five feet are always on the safe side, and that those of the longer marked line are always short of the run; but that Bouguer's is much more accurate than either.

It is not to be expected that the observations of a single voyage can be sufficient to determine the merit of any instrument, particularly one of so much consequence as the log. I thought it right, however, to give an account of the trial I made of the different methods, and of such remarks as occurred to me.*

I also tried two perpetual logs; one invented by Mr. Russell, the other by Foxon, both constructed upon this principle, that a spiral, in proceeding its own length in the direction of its axis through a resisting medium, makes one revolution round the axis; if therefore the revolutions of the spiral are registered, the number of times it has gone its own length through the water will be known. In both these the motion of the spiral in the water is communicated to the clock-work within board, by means of a small line fastened at one end to the spiral, which tows it after the ship, and at the other to a spindle, which sets the clock-work in motion. That invented by Mr. Russell has a half spiral of two threads, made of copper, and a small dial with clock-work, to register the number of turns of the spiral. Foxon's has a whole spiral of wood with one thread, and a larger piece of clock-work, with three dials, two of them to mark the distance, and the other divided into knots and fathoms, to shew the rate by the half-minute glass, for the convenience of comparing it with the log.

This log, like all others, is liable to the first error, as well as to the second. The third it partakes of in a very small degree, only affecting the reckoning by that quantity which the spiral is thrown towards the ship; whereas in the log the same circumstance affects the whole rate for the hour. The fourth it is entirely free from, as well as the fifth. It will have the advantage of every other in smooth water and moderate weather, when it is necessary to stand on one course for any particular distance, especially in the night, or a fog, as it measures exactly the distance run. It will also be very useful in finding the trim of a ship when alone; as well as in surveying a coast in a single ship, or in measuring distances in a boat between headlands or shoals, when a base is not otherwise to be obtained; both which it will do with the greatest accuracy in smooth water, with a large wind, and no tide or current. But notwithstanding these advantages, which will make it very useful and worth having, I doubt much whether it might ever be substituted entirely in the room of the common log. Machines easily repaired or replaced have advantages at sea, which should not lightly be given up for others more specious.

OBSERVATIONS ON THE USE OF THE MEGAMETER IN MARINE SURVEYING.

The greatest difficulty in marine surveying is that of obtaining an accurate base, from the extremities of which the angles may be taken with precision, for ascertaining the bearings and distance of headlands and shoals, when either want of time or other circumstances make it impracticable to land and measure a base. The usual way is, to estimate the distance by the log, and to take the angles by the compass. This method is liable to many errors, and affords no means of correcting or discovering them. The megameter, constructed upon the principles of the object-glass micrometer, described by M. de Charniere, and applied by him to find the longitude at sea, I thought might be usefully applied to marine surveying. That which I used was made by Ramsden, with

* The table and others are omitted, as only interesting to nautical readers.

some improvements. The advantages I imagined might be derived from this instrument were, a more correct and expeditious manner of determining the position of coasts, and the distance of shoals or the ship from headlands. This instrument being divided to ten seconds, an angle may be taken by it with great accuracy to five seconds. The height of a ship's mast-head above the water being known, it is easy to find with this instrument, by a single observation, the distance between two ships, and consequently to determine a base. The angles being taken with an Hadley's quadrant from each of the ships, to the objects whose situations are designed to be ascertained, the distance may be found, and consequently their relative situations. If there is a megameter in each ship, the altitudes taken from both ships at one instant, and the angles of the different parts of the coast intended to be surveyed observed with an Hadley's quadrant at the same time, will give the situation with more accuracy and expedition than any method of surveying from ships hitherto practised; with the farther advantage of the certain means of detecting any error in the observation, so as to judge whether it is of sufficient importance to be attended to. The only precautions necessary are; to make the observations at the same instant, to prevent their being affected by any alteration in the relative position of the ships, as a very small one there would occasion a considerable error in the distance; and to be careful in choosing objects sufficiently defined and remarkable. This method of surveying has the further advantage of giving the scale of a coast: seamen, though they judge very accurately of their distance from places upon coasts well known to them, are very often mistaken when they fall in with land they have never seen before; of which we had at first some instances in this voyage, the height of the mountains, before we knew the scale of the coast, making us always think ourselves nearer the land than we really were. Where the coast is at all high, the megameter affords a very accurate and expeditious method of determining the height of all the points, when their distances are found; and thence, the heights being known, of ascertaining immediately, by a single observation, the situation of the ship, or the latitude of any point by the bearings, at the time of a meridian observation: the direction and rate of currents or tides may also be found in this manner with great accuracy. I made several observations during this voyage with the megameter, some of which I shall give as examples; they were sufficient to prove to me the great accuracy that may be attained with this instrument after some practice. The utility of such a method of obtaining a survey on an enemy's or undescribed coast, as well as that of being able to prove the truth of charts by a single observation, is obvious.

June the fifteenth, the ship being in latitude 60° 19′, longitude 0° 39′ W. Hangcliff bore S. 63° 00′ W. variation 23° W.

The altitude of the Carcass's mast, by the megameter, was 35′ 48″; height of the mast, 102, 75 feet; hence the distance between the Racehorse and Carcass was 9861 feet: angle between the Carcass and Hangcliff, 85° 48′; between the Racehorse and Hangcliff, 87° 00′; from whence the difference of latitude was found 10′ S. difference of longitude 17′ W. therefore the latitude of Hangcliff is 60° 9′; longitude 0° 56 W.

July the second, to try how far the megameter could be depended upon, I observed the altitude of the Carcass's mast 2° 23′ 48″; the angle between the main-yard and main-topsail-yard, 0° 44′ 26″; hence the distance between the main-yard and main-topsail came out - - - - - - - - - - 31, 750 feet.

By measurement it was found - - - - - - -	34, 125 feet.
Difference - - - - - - - - - -	2, 375 feet.

The distance between the two ships, deduced from the altitude of the mast, was - - - - - -	2457 feet.
By the angle of the main and main topsail-yard, the distance between them being 34,125 feet - - - -	2640 feet.
Difference	183 feet.

Which is not more than the ships might have changed their position in the time of reading off and setting down the first observation, before taking the second.

An error of ten seconds in the observation of the angle subtended by the mast at this distance would make an error of two feet and three quarters in the distance. At the distance of a nautical mile it would produce an error of sixteen feet. At other distances the error decreases as the squares of the distances decrease; and at other heights it decreases as the heights decrease.

Whenever the distance of the object, whose angle is taken by the megameter, does not exceed that of the visible horizon, the very small portion of the earth's surface intercepted between the object and observer may be considered as a plane, to which the object is perpendicular, and the distance may be concluded by resolving the right-angled triangle, formed by the upright object, and lines drawn from the observer's station to the top and bottom of it.

OBSERVATIONS ON THE VARIATION.

The variation of the compass, always an interesting object to navigators and philosophers, became peculiarly so in this voyage from the near approach to the pole. Many of the theories that had been proposed on this subject were to be brought to the test of observation made in high latitudes, by which alone their fallacy or utility could be discovered. They of course engaged much of my attention, and gave me the fullest opportunity of experiencing, with regret, the many imperfections of what is called the Azimuth compass. This instrument, though sufficiently accurate to enable us to observe the variations so as to steer the ship without any material error, with the precaution of always using the same compass by which they are taken, is far from being of such a construction as to give the variation with that degree of precision, which should attend experiments on which a theory is to be founded, or by which it is to be tried. The observations taken in this voyage will fully evince this by their great variations from one another in very short intervals of time; nor is this disagreement of successive observations peculiar to the higher latitudes, and to be imputed to a near approach to the pole, as I found it to take place even upon the English coast.

As to the observations themselves, they were taken with the greatest care, and the most scrupulous attention to remove every circumstance which might be supposed to create an accidental error; the observations being taken sometimes by different people with the same compass, in the same and different places; sometimes with different compasses, changing the places and the observers repeatedly, to try whether there was error to be imputed to local attraction, or the different mode of observation by different persons. I have since my return tried the compasses by a meridian, as well as by taking azimuths, and find them to agree with one another, though the same compass sometimes differs from itself a degree in successive observations.

That every person may (as far as is possible without having been present at the time) be enabled to judge of the degree of accuracy to be expected in such observations, as

well as the degree of attention paid to those made by us, I have set down every circumstance that I thought material, giving every part of each observation, with each separate result, and the mean of every set, with the weather at the time. Whenever I mention its blowing fresh, it was only comparatively with respect to the rest of the voyage, no observation having been made in any weather which might not, generally speaking, be called fine.

Having said so much of the inaccuracy of the instrument, I must add, that I think some general and rather curious inferences may safely be drawn from these observations. One is, that the variation near the latitude of eighty, if it alters at all with time, does not alter in any degree as it does in these latitudes: the variation having been found by Poole in 1610 to be 22° 30′ W. in latitude 78° 37′; 18° 16′ W. in Cross Road in latitude 79° 15′ N.; and 17° 00′ within the foreland in latitude 78° 24′. By Baffin in 1613, in Horne Sound, latitude 76° 55″, the variation from the meridian was 12° 14′ W.; but by his compass 17°: his compass "was touched 5° and a half easterly," that being the variation in London at that time: in Green Harbour, latitude 77° 40′, he observed the variation 13° 11′ W. Fotherby in 1614 made the variation in Magdalena Bay, latitude 79° 34′ N. 25° 00′ W.; and in latitude 79° 8′ two points. Neither Poole nor Fotherby mention whether their variations are reckoned from the meridian, or whether their compasses, like Baffin's, were fitted to the variation at that time in London. If Fotherby's were taken with a compass in which a correction was made for the variation at London, his observation agrees exactly with those made by me in Vogel Sang and Smeerenberg; and those of Poole and Baffin differ so little from mine, that the difference need not be regarded. But the variation in London now differs from what it was at that time above twenty-six degrees.

The other inference is, that in going to the eastward, in the latitude of eighty, the westerly variation decreases very considerably from a difference in the longitude.

ACCOUNT OF THE INSTRUMENTS MADE USE OF FOR KEEPING THE METEOROLOGICAL JOURNAL.

The marine barometer was made by Mr. Nairne, from whom I received the following description:

"The bore of the upper part of the glass tube of this barometer is about three tenths of an inch in diameter, and four inches long. To this is joined a glass tube, with a bore about one twentieth of an inch in diameter. The two glass tubes being joined together form the tube of this barometer; and, being filled with mercury, and inverted into a cistern of the same, the mercury falls down in the tube till it is counterbalanced by the atmosphere.

"In a common barometer, the motion of the mercury up and down in the tube is so great at sea, that it is not possible to measure its perpendicular height; consequently cannot shew any alteration in the weight of the atmosphere: but in this marine barometer, that defect is remedied. The instrument is fixed in gimmals, and kept in a perpendicular position by a weight fastened to the bottom of it.

"The perpendicular rising or falling of the mercury is measured by divisions, on a plate divided into inches and tenths, and by a vernier division into hundredths of an inch, which is fixed to the side of the tube."

THE HYGROMETER I WAS FAVOURED WITH BY M. DE LUC; AND THE FOLLOWING ACCOUNT IS A LITERAL TRANSLATION OF THAT WHICH HE GAVE ME IN FRENCH.

The part of M. De Luc's Hygrometer, which is affected by the impressions of the moisture of the air, is a hollow cylinder of ivory, two inches eight lines long, and in-

ternally two lines and a half in diameter. It is open only at one end; and the thickness of its sides, for the length of two inches six lines from the bottom, is but three sixteenths of a line. It is this thin part which does the office of an hygrometer; the remaining part of the cylinder towards its orifice must be kept a little thicker, being destined for joining it to a tube of glass, thirteen or fourteen inches long. This junction is effected by means of a piece of brass, and the whole is cemented together with gum lac.

M. De Luc's reason for choosing ivory as the hygrometer is, that this matter appeared to him more proper than any other for receiving the impressions of the moisture of the air, without suffering thereby any essential change. The cylinder made of it becomes more capacious, in proportion as it grows moister. This is the fundamental principle of the instrument. M. De Luc has since found, that, upon letting this cylinder lie some time in water of an uniform temperature, it swells to a certain point, after which it dilates no further. This circumstance furnished him with a maximum of humidity; and, consequently, with one point of comparison in the scale of the hygrometer; and this point he has fixed at the temperature of melting ice. For measuring the differences in the capacity of this ivory cylinder, and thereby discovering its different degrees of moisture, M. De Luc makes use of quicksilver, with which he fills the cylinder, and a part of the communicating glass tube. The more capacious this cylinder is, or, which is the same, the moister it is, the lower does the mercury stand in the glass tube; and vice versa. Now M. De Luc has found, that the lowest point to which it can sink is that where it stands when the ivory cylinder is soaked in melting ice: he therefore names this point zero, in the scale of his hygrometer; and, consequently, the degrees of this scale are degrees of dryness, counted from below upwards, as the quicksilver rises in the glass tube.

To give these degrees a determinate length, and thus render the hygrometers capable of being compared with each other, M. De Luc employs in constructing them such glass tubes as have been previously prepared, by being made into thermometers, and filled with mercury, so as to ascertain upon them the points of melting ice and boiling water, and to take exactly the distance between those points by any scale at pleasure. That done, the bulb of this preparatory thermometer must be broken, and the quicksilver it contains exactly weighed. It is by knowing the weight of this, together with the distance between the fixed points of the thermometer, that the scale of the hygrometer is determined. For instance, let the weight of the quicksilver be one ounce, and the distance between the two above mentioned points one thousand parts of a certain scale: then suppose that the quicksilver in the hygrometer, to which this tube is to be applied, weighs only half an ounce; this will give a fundamental line, consisting of five hundred parts of the same scale. The fundamental line thus found is applied to the scale of the hygrometer, beginning at zero, and measuring it off about four times over, that the whole variation of the instrument may be comprehended. Each of those spaces being afterwards divided into forty equal parts, gives such degrees as M. De Luc has found most convenient. In general terms, the length of the fundamental line of the hygrometer must be to the interval between the two fixed points of the preparatory thermometer, as the weight of the quicksilver in the hygrometer is to the weight of the quicksilver in that thermometer.

This proportion between the scale of the hygrometer and that of the preparatory thermometer, furnishes an easy method of correcting in this instrument the effects of heat upon the mercury it contains.

It will easily be conceived, from the construction of the scale of this hygrometer, that if its cylinder of ivory was suddenly changed into glass the instrument would be-

come a true thermometer, in which the interval between the points, answering to melting ice and boiling water, would be divided into forty parts. If, therefore, a thermometer, with a scale similarly divided into forty parts between the fixed points, be placed near the hygrometer, it will shew immediately the correction to be made on that instrument for its variation as a thermometer; with some restrictions, however, of which M. De Luc has given an account in the paper he sent to the Royal Society on the subject of this hygrometer.

That part of the frame of the instrument on which the scale is marked is moveable; so that, before observing the points at which the mercury stands, it may be pushed upwards or downwards, according as the thermometer has risen or fallen with respect to the point of melting ice: and thus the indications of the hygrometer can at once be freed from the errors which would arise from the difference in the volume of the quicksilver, on account of the different degrees of heat.

DESCRIPTION OF THE MANOMETER, CONSTRUCTED BY MR. RAMSDEN.

The manometer used in this voyage was composed of a tube of a small bore, with a ball at the end; the barometer being at 29, 7, a small quantity of quicksilver was put into the tube, to take off the communication between the external air and that confined in the ball and the part of the tube below this quicksilver. A scale is placed on the side of the tube, which marks the degrees of dilatation arising from the increase of heat in this state of the weight of the air, and has the same graduation as that of Fahrenheit's thermometer, the point of freezing being marked 32. In this state therefore it will shew the degrees of heat in the same manner as a thermometer. But if the air becomes lighter, the bubble inclosed in the ball, being less compressed, will dilate itself, and take up a space as much larger as the compressing force is less; therefore the changes arising from the increase of heat will be proportionably larger; and the instrument will shew the differences in the density of the air, arising from the changes in its weight and heat. Mr. Ramsden found, that a heat, equal to that of boiling water, increased the magnitude of the air from what it was at the freezing point $\frac{404}{1000}$ of the whole. From this it follows, that the ball and the part of the tube below the beginning of the scale is of a magnitude equal to almost 414 degrees of the scale.

If we have the height of both the manometer and thermometer, the height of the barometer may be thence deduced by this rule; as the height of the manometer increased by 414 is to the height of the thermometer increased by 414; so is 29,7 to the height of the barometer.

This instrument, though far from complete, having been constructed in a hurry for the purpose of a first experiment, and liable to some inaccuracies in the observations, from not having the thermometer with which it was compared attached to it, seldom differed from the marine barometer $\frac{1}{10}$ of an inch. Should it be improved to that degree of accuracy of which it seems capable, it will be of great use in determining refractions for astronomical observations, as well as indicating an approaching gale of wind at sea.

MISCELLANEOUS OBSERVATIONS.

OBSERVATIONS FOR DETERMINING THE REFRACTION IN HIGH LATITUDES.

JUNE the thirtieth, at midnight, the distance of the two opposite horizons, taken by me with Ramsden's sextant, was 179° 54′; the height of the eye being sixteen feet above the level of the sea.

August the fifteenth, at midnight, by the astronomical quadrant, the altitude of the

sun's upper limb	4°	16′	55″	lower limb	3°	46′	0
Error of the quadrant	—	—	32		—	—	32
	4	16	23		3	45	28
Semidiameter	—	15	51		+	15	51
App. Alt. Sun's center	4	0	32		4	1	19
Co. Declin.	75	56	13		75	56	13
App. Lat.	79	56	45		79	57	32
True Lat.	79	44	3		79	44	3
Refraction		12	42			13	29
By Dr. Bradley's tables		11	18			12	27
Allowing for the therm.		11	53			13	2

Barometer, 29, 6 Thermometer, 37°

August the twentieth, at midnight, the sun's meridian altitude by

Mr. Harvey,	2°	25′	00″
Dip	—	3	49
	2	21	11
Semidiameter	+	15	52
Altitude of the Sun's center	2	37	3
Co. Declin.	77	31	26
App. Latitude	80	8	29
Refr. by the tables		16	44
True Latitude	79	51	45
Hacluit's Head-land			S. by E.
Cloven Cliff			E. by S. ½ S.
Variation			19° 30′ S.

It may not be improper to mention here that Baffin, in 1613, made an observation of the refraction when the sun was in the horizon, in latitude 78° 46′, which also agrees exactly with Dr. Bradley's tables. It may therefore be presumed that the refractions in the higher latitudes follow the same law as in these.

SPECIFIC GRAVITY OF ICE, TRIED BY DR. IRVING.

A PIECE of the most dense ice he could find being immersed in snow water, thermometer thirty-four degrees, fourteen fifteenth parts sunk under the surface of the water. In brandy just proof it barely floated: in rectified spirits of wine it fell to the bottom at once, and dissolved immediately.

September the fourth, at two in the afternoon, we sounded with all the lines, above eight hundred fathoms. Some time before the last line was out, we perceived a slack, and that it did not run off near so quick as before. When we got the lines in again, the first coil came in very easily, and twenty fathoms of the next, after which it took a great strain to move the lead; a mark was put on at the place where the weight was perceived, and the line measured, by which the depth was found to be six hundred and eighty-three fathoms. The lead weighed above one hundred and fifty pounds, and had sunk, as appeared by the line, near ten feet into the ground, which was a very fine blue soft clay. A bottle fitted properly by Dr. Irving (none of those sent out having given satisfaction) was let down, fastened to the line, about two fathoms from the lead. A thermometer plunged into the water from the bottom stood at forty degrees; in water from the surface at fifty-five degrees; in the shade, the heat of the air was sixty-six degrees.

Experiments to find the Temperature of the Water at different Depths, made with lord Charles Cavendish's Thermometer.

Day of the Month.	Depth in Fathoms to which it was sunk.	Temperature of the Water, as shewn by the Instrument.	Correction for Compression and unequal Expansion of Spirits.	Temperature of the Sea at the greatest Depth to which it was sunk, corrected for Compression and Expansion.	Heat of the Air.
		°	°	°	°
June 20	780	15	11	26	48½
30 A. M.	118	30	1	31	40½
P. M.	115	33	0	33	44¾
August 31	673	22	10	32	59¼

It appears from the experiment of the first of July, in which the Instrument was compared with Fahrenheit's thermometer at different heats, that the experiment cannot be depended on to less than two or three degrees, as the results drawn from the different comparisons would differ by about five degrees.

Experiments to determine the Temperature of the Water at different Depths of the Sea, and quantity of salt it contains; made with the Bottle fitted by Dr. Irving. A measure, containing twenty-nine ounces fifty-nine grains of pure snow-water, was used as a Standard; Thermometer 59°, Barometer 30,06.

Day of the Month.	Weight of the Water.	Depth in Fathoms	Thermometer at the Surface.	Thermometer in Water from the Bottom.	Thermometer in the air.	Weight of the Salt.	Latitude, &c.
			°	°	°		° ′
1773	Oz. Grs.					Grs.	
June 1	29 404				59	393	51 31 Nore.
						500	54 8 Off Flamborough Head.
9	30 2						
11		32	51	49	55		
12	29 440	Surface	50		50	490	60 Off Shetland.
	29 442	65		44		490	
26	29 462				36	496	74 At Sea.
July 3	29 454		40		44	500	78.
19	29 369				44	476	80 Near the ice.
Aug. 4	30 15	60	36	39	32	510	80 30 Under the ice.
31	12 360	80	51		48	220	
Sept. 4	12 365	683	55	40	66½	192	75 At Sea.
	12 365					216	
7		56	57	50	60		60 14

Sea-water, taken up at the back of Yarmouth Sands, was in the following ratio to distilled water:

	oz.	dwts.	grs.	
Sea-water - - - -	21	16	13,7	Thermometer 53°;
Distilled water - - -	21	4	16	

which is, as 10192: 10477,7; or, as 1: 1,02803.

The quantity of dry salt produced from the above water was 13 dwts. 15 grs.; it appears, therefore, that sea-water contains more air than distilled water.

The results of the experiments made with lord Charles Cavendish's thermometer, and those with the bottle fitted by Dr. Irving, differ materially as to the temperature of the sea at great depths; I shall give an account, therefore, of the precautions used by Dr. Irving to prevent the temperature from being altered, as well as of the allowance made by Mr. Cavendish for compression, as they communicated them to me.

The following is the account of the precautions taken by Dr. Irving to prevent the temperature of the water being changed in bringing up from the bottom:

"The bottle had a coating of wool, three inches thick, which was wrapped up in an oiled skin, and let into a leather purse, and the whole inclosed in a well-pitched canvas-bag, firmly tied to the mouth of the bottle, so that not a drop of water could penetrate to its surface. A bit of lead shaped like a cone, with its base downwards and a cord fixed to its small end, was put into the bottle; and a piece of valve leather, with half a dozen slips of thin bladder, were strung on the cord, which, when pulled, effectually corked the bottle in the inside."

The following is Mr. Cavendish's account of the corrections to be made for lord Charles Cavendish's thermometer:

"The thermometer used in these experiments is fully described in the Philosophical Transactions, vol. l. p. 308; so that I imagine it is unnecessary to mention it here. But since the publication of that volume, the late Mr. Canton discovered that spirits of wine and other fluids are compressible; which must make the thermometer appear to have been colder than it really was, and renders a correction necessary on that account. There is another smaller correction necessary, owing to the expansion of spirits of wine by any given number of degrees of Fahrenheit's thermometer being greater in the higher degrees than the lower. As the method of computing these two corrections is not explained in that paper, it may be proper just to mention the rule which was made use of in doing it.

"In adjusting the degrees on the scale of this thermometer, the tube was entirely full of mercury, or the mercury stood at no degrees on the scale, when its real heat was 65° of Fahrenheit. Let the bulk of the mercury contained at that time in the cylinder be called M, and that of the spirits S; let the expansion of spirits of wine by 1° of Fahrenheit, about the heat of 65°, be to its whole bulk at that heat, as s to 1; and let its expansion by one degree at any other heat, as $65° - x$, be to its bulk at 65°, as $s + \overline{1 - d\,x}$ to 1; let the expansion of mercury by one degree of heat be to its bulk; at 65°, as m to 1 and let $\frac{S\,s + M\,m}{S\,s}$ be called G; let the compression of spirits of wine by the pressure of an hundred fathom of sea-water, when the heat of the spirits is nearly the same as that of the sea at the depth to which the thermometer was let down, be to its bulk at 65°, as C to 1; the compression of the mercury is so small that it may be neglected; let the thermometer be let down N hundred fathom, and when brought up and put into water of 65°—F degrees of heat, let the mercury in the tube stand at E degrees; consequently the heat, as shewn by the thermometer, is 65°—F—E: and let the real heat of the sea at the depth to which it was sunk be $65 - x$ degrees; then $65° - x = 65° - F - E + \frac{CN}{sG} - \frac{E\,d \times \overline{E+F+x}}{2G} + \frac{CN\,d \times \overline{F+x}}{2\,s\,G\,2}$. In this thermometer S=1160; M=97; the expansion of the spirits used in making it by 1° at the heat of 65°, was found to be $\frac{1}{1786}$ of their bulk at that heat; that is $s = \frac{1}{1786}$; $m = \frac{1}{11500}$; therefore G = 1,013. From M. De Luc's experiments* it appears, that the expansion of spirits of wine by 1° at any degree of heat, as $65° - x$, is to its expansion by 1° at 65°, nearly as $1 - \frac{x}{315}$ to 1: therefore, $d = \frac{1}{315}$. The compressibility of the spirits used for this thermometer, at the heat of 58°, was found to be exactly the same as Mr. Canton determines it to be at that heat; and therefore its compressibility at all other degrees of heat is supposed to be the same as he makes it. According to his experiments,† the compression of spirits of wine by the pressure of 29¼ inches of mercury at the heat of 32°, *id est*, nearly the heat of the sea in these experiments, is 59¼ millionth parts of its bulk at that heat; therefore $\frac{C}{sG} = 1,9$ and $65 - x = 65\,F - E + N \times 1,9 - \frac{E \times E + F + x}{638} + \frac{N \times 1,9 \times \overline{F + x}}{638.}$"

* Modifications de l'Atmosphere, vol. i. page 252. † Philosophical Transactions, vol. liv. page 261.

OBSERVATIONS MADE BY DR. IRVING OF THE HEAT OF THE SEA AGITATED BY A GALE OF WIND, AND THAT OF THE ATMOSPHERE.

SEPTEMBER, the twelfth the thermometer plunged into a wave of the sea rose to 62°; the heat of the atmosphere 50°.

This experiment was frequently repeated during the gale, and it gave nearly the same difference. At night, when the weather became moderate, the heat of water thirty fathoms below the surface was 55°; the surface and the atmosphere were 54°.

September the twenty-second, the sea-water was 60°; the atmosphere 59°: the wind at S. W. a fresh gale.

OBSERVATIONS FOR DETERMINING THE HEIGHT OF A MOUNTAIN IN LATITUDE 79 DEGREES 44 MINUTES, BY THE BAROMETER, AND GEOMETRICAL MEASUREMENT.

OBSERVATIONS TAKEN BY THE BAROMETER BY DR. IRVING.

	Inches.
AUGUST the eighteenth, the day remarkably clear.	
At six in the morning, the barometer by the sea-side stood at - -	30,040
The thermometer 50°.	
On the summit of the mountain, about an hour and three quarters later than the first observation below, - - - - - -	28,266
Thermometer 42°.	
At about an hour later at the same place, - - - - - -	28,258
Thermometer 42°.	
By the sea-side, where the first observation was made, and about three hours later, - - - - - - -	30,032
Thermometer 44°.	
Height of the mountain, calculated by M. De Luc from the -	feet.
first observation - - - - - - -	1585
From the second observation - - - - - -	1592
Mean - - - - - - - - - -	1588½

MEANS USED TO ASCERTAIN THE HEIGHT OF THE MOUNTAIN GEOMETRICALLY.

A POINT was fixed upon, in the most convenient place the ground would admit of between the summit of the mountain (a well-defined object) and the sea-side; from hence, in a right line from the mountain, a staff was placed at the sea-side, by a theodolite made by Ramsden, with two telescopes and double Vernier divisions. The instrument was carefully adjusted; first, by levelling the stand with a circular level, and afterwards the whole instrument by the cross levels. From hence (A) at right angles to the station at the sea-side (C) and the top of the mountain (E) a base was measured each way to (B) and (D) of eight lines of seventeen fathom each; in all, five hundred and forty-four yards. The divisions of both the Verniers were carefully examined, both at setting off the station by the sea-side, and those at the extremities of each base, the fixed telescope being kept directed to the summit of the mountain, and the moveable one directed at right angles each way, both divisions of the Vernier coinciding exactly. Station staves were fixed perpendicular by the vertical hair of the telescope. The

altitude of the mountain was then taken with the vertical arch, as a means of detecting any error in the observation, and was found to be 8° 50′. The distance not enabling me to take the depression of any particular part of the staff by the sea-side under the land on the other side accurately, I sent a man to stand close before it, and took the depression nearly to his eye, which was found to be 1° 54′. The instrument was then removed to the station on the right (B). The instrument being adjusted with the same precautions as before, and the fixed telescope pointing to the center station (A); the angle to the mountain was 84° 58′, the angle to the station by the water-side (C) 294° 44′. The instrument was then removed to the station by the sea-side (C) the same precautions used in adjusting, and the fixed telescope pointing to the center (A) in one with the mountain, the angle to the staff on the right (B) was 24° 44′. Intending to make the triangle BCD isosceles, and imagining there migh be some little error from the unevenness of the ground, I set off on the theodolite an angle equal to the last, having a person ready with a staff on the base line to fix it where that angle should intersect, on looking through the telescope; I found it cut exactly at the staff D 335° 16′, and from thence concluded the measure of the base to be exact. I then took the altitude of the mountain by the vertical arch 7° 44′. I then removed the instrument to the station (D) to take the third angle; but from the badness of the ground, I could not place the instrument exactly over the spot where the staff stood; from hence I took the third angle of the triangle; the fixed telescope pointing to (A) and the same precautions of adjustment being observed, the angle to C came out 65° 15′; less by one minute than it should have been. I then took from the same place the angle to the mountain (E) 275° 1′; more by one minute than the corresponding angle at the opposite station (B): but the errors correcting each other, the whole angle CDE = 150° 14′ = the whole angle CBE.

By the triangle ABC, AC comes out 1771,4 feet.
By the triangle ABE, AE comes out 9265,0 feet:
Therefore the distance CE is - 11036,4 feet.
Angle of the mountain's elevation seen from C 7° 44′:
Height of the mountain above C - 1498,8 feet:
+ height of C above the water's edge 5:
Height of the mountain above the water's edge 1503,8 feet.

I prefer this observation to the others, because the three angles of the triangle ABC came out exactly 180 degrees by the observation. The distance AC, found by the computation, differed only four feet from that by the measure; but, the ground being uneven, I did not depend upon the measure, but took it merely as a check upon the operation, to detect an error, in case of any great difference.

The distance found by the similar triangles BCE and CDE comes out 11037 feet;
The angle of the mountain's elevation seen from A was 8° 50′;
Hence the height of the mountain above A was found - - 1439,8 feet:
Depression of C seen from A was - 1° 54′;
Hence the height of A above C is - - - - 58,7 feet;
Height of the mountain above C - - - - 1498,5 feet:
+ height of C above water's edge - - - - 5;
Height of mountain above the level of the sea - - 1503,5 feet;
which differs from that found by the single angle three-tenths of a foot.

I cannot account for the great difference between the geometrical measure and the barometrical one, according to M. De Luc's calculation, which amounts to 84,7 feet. I have no reason to doubt the accuracy of Dr. Irving's observations, which were taken with great care. As to the geometrical measure, the agreement of so many triangles,

each of which must have detected even the smallest error, is the most satisfactory proof of its correctness. Since my return, I have tried both the theodolite and barometer, to discover whether there was any fault in either, and find them upon trial, as I had always done before, very accurate.

NATURAL HISTORY.

THOUGH the shortness of my stay at Spitsbergen, and the multiplicity of occupations in which I was necessarily employed, during the greatest part of that time, rendered it impossible for me to make many observations on its natural productions; yet as there are among those few some which have not before been made public, I am in hopes that this article will not be found wholly unprofitable. The following catalogue, imperfect as it is, may serve to give a general idea of the sparing productions of that inhospitable climate.

As modern naturalists have formed the technical terms of their science out of the Latin, it becomes necessary to make some use of that language, in order to render the descriptions of such things as are new intelligible to those for whose use they are intended: I shall always, however, annex English names to the scientifick ones, when such are to be found.

MAMMALIA....Trichechus Rosmarus. Linn. Syst. Nat. 49. 1.
Arctick Walrus. Penn. Syn. Quadr. p. 335.

This animal, which is called by the Russians Morse, from thence by our seamen corruptly Sea-Horse, and in the Gulf of St. Lawrence Sea-Cow, is found everywhere about the coast of Spitsbergen, and generally wherever there is ice, though at a distance from the land. It is a gregarious animal, not inclined to attack, but dangerous, if attacked, as the whole herd join their forces to revenge any injury received by an individual.

Phoca Vitulina. Linn. Syst. Nat. 56. 3.
Common Seal. Penn. Syn. Quadr. p. 339.

Found on the coast of Spitsbergen.

Canis Lagopus. Linn. Syst. Nat. 95. 63.
Arctick Fox. Penn. Syn. Quadr. p. 155.

Found on the main land of Spitsbergen and islands adjacent, though not in any abundance. It differs from our fox, besides its colour, in having its ears much more rounded. It smells very little. We ate of the flesh of one, and found it good meat.

Ursus Maritimus. Linn. Syst. Nat. 70. 1.
Polar Bear. Penn. Syn. Quadr. p. 192. t. 20. f. 1.

Found in great numbers on the main land of Spitsbergen; as also on the islands and ice-fields adjacent. We killed several with our muskets, and the seamen ate of their flesh, though exceeding coarse. This animal is much larger than the black bear; the dimensions of one were as follows:

	Feet.	Inches.
Length from the snout to the tail,	7	1
Length from the snout to the shoulder-bone	2	3
Height at the shoulder,	4	3
Circumference near the fore-legs,	7	0
Circumference of the neck close to the ear,	2	1
Breadth of the fore paw,	0	7

Weight of the carcass, without head, skin, or entrails, 610 lb.

Cervus Tarandus. Linn. Syst. Nat. 93. 4.
Rein-Deer. Penn. Syn. Quadr. p. 46. t. 8. f. 1.

Found everywhere on Spitsbergen. We ate the flesh of one which we killed, and found it excellent venison.

Balæna Mysticetus. Linn. Syst. Nat. 105. 1.
Common Whale. Penn. Brit. Zool. p. 85.

This species, which is sought after by the fishermen in preference to all other whales, is generally found near the ice. We saw but few of them during our stay.

Balæna Physalus. Linn. Syst. Nat. 106. 2.
Fin Fish. Penn. Brit. Zool. p. 41.

Found in the ocean near Spitsbergen.

Aves....Anas mollissima. Linn. Syst. Nat. 198. 15.
Eider Duck. Penn. Brit. Zool. p. 454.

Found on the coast of Spitsbergen.

Alca arctica. Linn. Syst. Nat. 211. 4.
The Puffin. Penn. Brit. Zool. p. 405.

Found on the coast of Spitsbergen.

Alca Alle. Linn. Syst. Nat. 211. 5.

Found on the coast of Spitsbergen in great abundance.

Procellaria glacialis. Linn. Syst. Nat. 213. 3.
The Fulmar. Penn. Brit. Zool. p. 431.

Found on the coast of Spitsbergen.

Colymbus Grylle. Linn. Syst. Nat. 220. 1.

Found on the coast of Spitsbergen.

Colymbus Troile. Linn. Syst. Nat. 220. 2.

Found on the coast of Spitsbergen.

Colymbus glacialis. Linn. Syst. Nat. 221. 5.
The great Northern Diver. Penn. Brit. Zool. p. 413.

Found on the coast of Spitsbergen.

Larus Rissa. Linn. Syst. Nat. 224. 1.

Found on the coast of Spitsbergen.

Larus Parasiticus. Linn. Syst. Nat. 226. 10.
The Arctick Gull. Penn. Brit. Zool. p. 420.

Found on the coast of Spitsbergen.

Larus Eburneus, niveus, immaculatus, pedibus plumbeo-cinereis.

Found on the coast of Spitsbergen.

This beautiful bird is not described by Linnæus, nor, I believe, by any other author; it is nearly related indeed to the rathsher, described by Marten in his voyage to Spitsbergen (see page 77 of the English translation) but, unless that author is much mistaken in his description, differs essentially from it. Its place in the Systema Naturæ seems to be next after the Larus nævius, where the specifick difference given above, which will distinguish it from all the species described by Linnæus, may be inserted.

Description....Tota avis (quoad pennas) nivea, immaculata.
Rostrum plumbeum.
Orbitæ oculorum croceæ.
Pedes cinereo-plumbei. Ungues nigri.
Digitus Posticus articulatus, unguiculatus.
Alæ cauda longiores.

Cauda æqualis, pedibus longior.

Longitudo totius avis, ab apice rostri ad finem caudæ	-	Uncias 16
Longitudo inter apices alarum expansarum	- - -	37
————Rostri	- - -	2

Sterna Hirundo. Linn. Syst. Nat. 227. 2.
The greater Tern. Penn. Brit. Zool. p. 428.

Found on the coast of Spitsbergen.

Emberiza nivalis. Linn. Syst. Nat. 308. 1.
The greater Brambling. Penn. Brit. Zool. 321.

Found not only on the land of Spitsbergen, but also upon the ice adjacent to it, in large flocks: what its food can be is difficult to determine; to all appearance it is a granivorous bird, and the only one of that kind found in these climates, but how that one can procure food, in a country which produces so few vegetables, is not easy to guess.

Amphibia....Cyclopterus liparis. Linn. Syst. Nat. 414. 3.
Sea Snail. Penn. Brit. Zool. iii. p. 105.

Two only of these were taken in a trawl near Seven Island Bay.

Pisces....Gadus Carbonarius. Linn. Syst. Nat. 438. 9.
The Coal Fish. Penn. Brit. Zool. iii. p. 152.

Though we trawled several times on the north side of Spitsbergen, and the seamen frequently tried their hooks and lines, yet nothing was taken, except a few individuals of this and the foregoing species.

Insecta....Cancer Squilla. Linn. Syst. Nat. 1051. 66.
The Prawn. Merr. Pinn. 192.

Found in the stomach of a seal, caught near the coast of Spitsbergen.

Cancer Boreas, macrourus, thorace carinato aculeato, manibus lævibus, pollice subulato incurvo.

This singular species of crab, which has not before been described, was found with the former in the stomach of a seal; its place in the Systema Naturæ seems to be next after Cancer Norwegicus.

Description....Thorax ovatus, tricarinatus: carinæ laterales tuberculosæ, antice spina acuta terminatæ; carina dorsalis spinis tribus vel quatuor validis armata; antice producta in rostrum porrectum, acutum, breve, thorace quintuplo brevius; præter spinas carinarum, anguli laterales thoracis antice in spinas terminantur.

Antennæ duæ, thorace fere triplo breviores, bifidæ: ramulus superior crassiusculus, filiformis, obtusus; inferior gracilis, subulatus.

Palpi duo, duplicati; ramus superior foliatus, seu explanatus in laminam ovalem, obtusam, longitudine antennarum, intus et antice villis ciliatam; ramus interior antenniformis, subulatus, multiarticulatus, antennis triplo longior.

Parastatides decem, anteriores parvi; postremi magni, pediformes articulo ultimo explanato in laminam ovali-oblongam.

Pedes decem, duo primores cheliferi, carpis incrassatis, reliqui simplices; pares secundi at tertii filiformes, graciles; quarti et quinti crassiusculi.

Cauda thorace longior, sexarticulata; articulis quinque anterioribus carinatis, carinis spina antrorsum vergente armatis; articulus sextus supra bicarinatus, muticus, terminatus foliolis quinque, articulis caudæ longioribus; intermedio lanceolato, acuto, porrecto, crasso, supra planiusculo, quadricarinato carinis interioribus obsoletis, subtus concavo; lateralibus ovali-oblongis, obtusis.

Neusteri decem (nulli sub articulo ultimo) duplicati; foliolis lanceolatis, ciliatis.

Obs....Specimina magnitudine variant, alia triuncialia, alia septem uncias longa.

Cancer Ampulla, macrourus, articularis, corpore ovali, pedibus quatuordecim simplicibus, laminis femorum postici paris ovato-subrotundis.

This singular animal was also taken out of the stomach of the same seal in which the two former were found. Its place in the Systema Naturæ is next to Cancer Pulex.

Description....Insectum ex ovali-oblongum, glabrum, punctulatum, articulis quatuordecim compositum, quorum primus capitis est, septem thoracem mentiuntur, et sex caudam tegunt.

Capitis clypeus antice inter antennas in processum conicum, acutum descendit.

Antennæ quatuor, subulatæ, articulatæ, simplices, corpore decuplo breviores.

Pedes quatuordecim, simplices, unguiculati; femora postremi paris postice acuta, lamina dimidiato-subrotunda, integra, magna, quatuor lineas longa.

Cauda foliata, foliolo unico brevi bifido: laciniæ lanceolatæ, acutæ.

Neusteri duodecim, duplicati, subulati, pilis longis ciliati, posteriores retrorsum porrecti.

Obs....Specimina magnitudine variant, uncialia et biuncialia erant.

Cancer nugax, macrourus, articularis, pedibus quatuordecim simplicibus, laminis femorum sex posteriorum dilatatis subrotundo-cordatis.

This animal, which has not before been described, should be inserted in the Systema Naturæ near Cancer Pulex; it was taken in the trawl near Moffen Island.

Description....Insectum oblongum, compressum, dorso rotundatum, glabrum, sesquiunciale, articulis quatuordecim compositum, quorum primus capitis est, septem thoracem mentiuntur, et sex caudam efficiunt.

Capitis clypeus sinu obtuso antice pro antennis emarginatus.

Antennæ quatuor, subulatæ, multiarticulatæ; superiores corpore sextuplo breviores, bifidæ: articulo baseos communi, magno; ramulus interior exteriori duplo brevior.

Inferiores simplices, superioribus duplo longiores.

Pedes quatuordecim, simplices, unguiculati, unguibus parum incurvis. Femora sex posteriora postice aucta.

Lamina foliacea, subrotundo-cordata, dimidiata, margine integra, magna (tres lineas longa.)

Cauda apice foliata. Foliolis duobus, oblongis, obtusis, parvis.

Neusteri duodecim, duplicati, lineari-lanceolati, posteriores retrorsum porrecti, ut facile pro appendicibus caudæ sumantur.

Cancer Pulex. Linn. Syst. Nat. p. 1055. 81.

Taken up in the trawl along with the former.

Vermes....Sipunculus Lendix, corpore nudo cylindraceo, apertura subterminali.

Found adhering, by its small snout, to the inside of the intestines of an Eider duck. Mr. Hunter, who at my request dissected it, informed me that he had seen the same species of animal adhering to the intestines of whales.

Description....Corpus croceum, subcylindraceum, tres lineas longum, crassitie pennæ passerinæ, utraque extremitate parum attenuatum, apice terminatum in rostrum angustum corpore quintuplo brevius, quo tunicis internis intestinorum sese affigit; prope ulteram extremitatem apertura simplex, pro lubitu extensibilis.

Ascidia gelatinosa. Linn. Syst. Nat. 1087. 2.

Taken up in the trawl, on the north side of Spitsbergen.

Ascidia rustica. Linn. Syst. Nat. 1087. 5.

Taken up likewise in the trawl, on the north side of Spitsbergen.

Lerna branchialis. Linn. Syst. Nat. 1092. 1.

Found in the gills of the sea-snail mentioned before.

Clio helicina nuda corpore spirali.

Marten's Spitsbergen English, p. 141. t. Q. fig. e. Snail slime fish.

Found in innumerable quantities throughout the arctic seas.

Description....Corpus magnitudine pisi, in spiram ad instar helicis involutum.

Alæ ovatæ, obtusæ expansæ, corpore majores.

Clio limacina nuda, corpore obconico.

The Sea May Fly. Marten's Spitsbergen English, p. 169. Tab. P. f. 5.

This little animal is found where the last is, in equal abundance, peopling as it were this almost uninhabited ocean. Marten says that they are the chief food of the whalebone whale; and our fishermen, who call them by the name of whale food, are of the same opinion.

Medusa capillata. Linn. Syst. Nat. 1097. 6.

Sea Blubber.

Taken up on the passage home, about the latitude 65°.

Asterias papposa. Linn. Syst. Nat. 1098. 2.

Taken up on the north side of Spitsbergen.

Asterias rubens. Linn. Syst. Nat. 1099. 3.

Sea Star.

Also taken up in the trawl, on the north side of Spitsbergen.

Asterias Ophiura. Linn. Syst. Nat. 1100. 11.

We likewise took this up in the trawl, on the north side of Spitsbergen.

Asterias pectinata. Linn. Syst. Nat. 1101. 14.

This, as well as all the rest of this genus, was taken up in the trawl, on the north side of Spitsbergen.

Chiton ruber. Linn. Syst. Nat. 1107. 7.

Coat of Mail Shell.

Taken in the trawl, on the north side of Spitsbergen.

Lepas Tintinnabulum. Linn. Syst. Nat. 1168. 12.

Acorn Shell.

Was picked up on the beach of Smeerenberg harbour; but as it is much worn and broken, it is impossible to be certain, whether it is a native of those seas, or has been brought there by accident.

Mya truncata. Linn. Syst. Nat. 1112. 26.

Likewise found on the beach in Smeerenberg harbour.

Mytilus rugosus. Linn. Syst. Nat. 1156. 249.

Was found with the former on the beach at Smeerenberg.

Buccinum carinatum, testa oblongo-conica transversim striata; anfractibus superioribus oblique obtuseque multangulis; inferioribus unicarinatis.

Found on the beach at Smeerenberg harbour.

Turbo helicinus, testa umbilicata convexa obtusa: anfractibus quatuor lævibus.

Taken up in the trawl, on the north side of Spitsbergen.

Serpula spiroribus. Linn. Syst. Nat. 1265. 794.

Found in plenty sticking to the stones and dead shells in Smeerenberg harbour.

Serpula triquetra. Linn. Syst. Nat. 1265. 795.
Found with the last, adhering to dead shells.

Sabella frustulosa, testa solitaria libera simplici curvata: fragmentis conchaceis sabulosisque.

Taken up in the trawl, on the North side of Spitsbergen.

Description....Vagina spithamea vel longior, crassitie pennæ anserinæ, undique tecta fragmentis conchaceis sæpe magnitudine unguis, et sabulis magnitudine seminum cannabis.

Millepora polymorpha. Linn. Syst. Nat. 1285. 53.
Varietas rubra.

Found thrown up on the beach at Smeerenberg harbour.

Cellepora pumicosa. Linn. Syst. Nat. 1286. 56.
Found on the beach at Smeerenberg.

Synoicum turgens.
Taken up in the trawl, on the north side of Spitsbergen.

This animal is quite new to the natural historians, and so different from the zoophytes which have been hitherto described, that it may be considered as a distinct genus, whose characters are the following:

Animalia nonnulla, ex apice singuli stirpis sese aperientia.

Stirpes plures, radicatæ, carnoso-stuposæ, e basi communi erectæ, cylindraceæ, apice regulariter pro animalibus pertusæ.

It should be inserted next to the alcyonium, with which it in some particulars agrees, but differs from it materially in having the openings for the animals only at the top, and the animals themselves not exserted like polypes (hydra) which is the case in the alcyonium.

Description....Stirpes plures, radicatæ, carnoso-stuposæ, digitiformes cylindraceæ, superne paulo crassiores, obtusæ, magnititudine digiti infantis, suberectæ, apice orificiis nonnullis perforatæ, inferne dilatatæ seu explanatæ in basin communem lapidibus adhærentem.

Orificia sex ad novem, ordine circulari plerumque disposita; sub singulo orificio cavitas longitudinalis, forsitan singulo animali propria, in qua,

1. Faux angusta, brevis.

2. Intestinum instar stomachi dilatatum, oblongo-ovatum, inferne foraminibus duobus pertusum; inter illa foramina aliud descendit intestinum, valde angustum, filiforme, arcum brevem formans.

Cavitas, quæ per totam stirpem longitudinaliter pro singulo animali deorsum tendit, superne ab intestinis vix distincta, infra illa autem cylindrum exhibet granulis parvis (forfitan ovulis) repletam.

Flustra pilosa. Linn. Syst. Nat. 1301. 3.
Found adhering to stones in Smeerenberg harbour.

Flustra membranacea. Linn. Syst. Nat. 1301. 5.
Found with the last mentioned species.

Plantæ....Agrostis algida panicula mutica contracta, calycibus brevissimis inæqualibus.

This small grass, which has not before been known to botanists, may be inserted among the species of agrostis, next to the minima.

Description....Gramen in cæspitibus nascens.

Radix fibrosa perennis.

Folia plurima radicalia, paucissima caulina, glabra, latiuscula, longitudine culmi, patula, basi dilatata in vaginas laxas.

Culmi adscendentes glabri, sesquiunciales.

Panicula lineari-oblonga, contracta, stricta, multiflora.

Calycis Glumæ membranaceæ, albidæ, glabræ, muticæ, inæquales: exterior minutissima, ovata, obtusa; interior oblonga, acuta, corolla quintuplo brevior.

Corollæ Glumæ, oblongæ, acutæ, carinatæ, muticæ, glabræ, semilineares: exterior paulo longior.

Stamina tria.

Stigmata duo.

Semen unicum, oblongum, utrinque acuminatum, a corolla liberum.

Tillæa aquatica. Linn. Spec. Plant. 186. 2.

Juncus campestris. Linn Spec. Plant. 468. 17.

Saxifraga oppositifolia. Linn Spec. Plant. 575. 18.

Saxifraga cernua. Linn. Spec. Plant. 577. 26.

Saxifraga rivularis. Linn. Spec. Plant. 577. 28.

Saxifraga cæspitosa. Linn. Spec. Plant. 578. 34.

Cerastium alpinum. Linn. Spec. Plant. 628. 8.

Ranunculus sulphureus, calycibus hirsutis, caule sub-bifloro, petalis rotundatis, integerrimis, foliis inferioribus sublobatis, supremis multipartitis.

Ranunculus quartus. Mart. Spitz Engl. p. 58. t. t. f. d.

Obs....Primo intuitu ranunculo glaciali simillimus, differt autem, quod petala rotundata, integerrima, intense lutea, fulgida; et folia minus subdivisa; superiora fissa, lacinis oblongo-lanceolatis integerrimis; inferiora caulina lata, plana, leviter triloba vel quadriloba.

This new plant should be inserted next to ranunculus glacialis.

Cochlearia Danica. Linn. Spec. Plant. 903. 3.

Cochlearia Groenlandica. Linn. Spec. Plant. 904. 4.

Salix herbacea. Linn. Spec. Plant. 1445. 16.

Polytrichum commune. Linn. Spec. Plant. 1573. 1.

Bryum Hypnoides. Linn. Spec. Plant. 1584. 21.

Besides these, there were two other kinds of bryum, the species of which could not be determined, for want of the fructification; the one resembled bryum trichoides læte virens, &c. Dill. Musc. 391. t. 50. f. 61.; and the other bryum hypnoides pendulum. Dill. Musc. 394. t. 50. f. 64. C.

Hypnum aduncum. Linn. Spec. Plant. 1592. 23.

Jungermannia julacea. Linn. Spec. Plant. 1601 20.

Another species of jungermannia was also found, but without fructification; it is not much unlike lichenastrum ramosius foliis trifidis. Dill. Musc. 489. t. 70. f. 15.

Lichen ericetorum. Linn. Spec. Plant. 1608. 12.

Lichen Islandicus. Linn. Spec. Plant. 1611. 29.

Lichen nivalis. Linn. Spec. Plant. 1612. 30.

Lichen caninus. Linn. Spec. Plant. 1616. 48.

Lichen polyrrhizos. Linn. Spec. Plant. 1618 57.

Lichen pyxidatus. Linn. Spec. Plant. 1619. 60.

Lichen cornutus. Linn. Spec. Plant. 1620. 64.
Lichen rangiferinus. Linn. Spec. Plant. 1620. 66.
Lichen globiferus. Linn. Mant. 133.
Lichen paschalis. Linn. Spec. Plant. 1621. 69.
Lichen chalybeiformis. Linn. Spec. Plant. 1623. 77.

ACCOUNT OF DR. IRVING'S METHOD OF OBTAINING FRESH WATER FROM THE SEA BY DISTILLATION.

As the method of rendering salt water fresh by distillation, introduced by Doctor Irving into the Royal Navy in the year 1770, and practised in this voyage, is an object of the highest importance to all navigators, and has not hitherto been generally known, I have added the following very full account of its principles, apparatus, and advantages, with which I was favoured by Doctor Irving himself.

"Previous to an account of this method of rendering sea water fresh by distillation, it may not be improper to give a short detail of the experiments which have been formerly made by others on this subject; pointing out at the same time the several disadvantages attending their processes, and the general causes which obstructed the desired success.

Without entering into an account of the earlier experiments, it will be sufficient to take a view of such as have been prosecuted with most attention, for the last forty years.

"The first of these was the process of Mr. Appleby, published by order of the lords of the admiralty, in the Gazette of June 22d, 1734. By the account of that process it appears, that Mr. Appleby mixed with the sea water to be distilled a considerable quantity of the lapis infernalis and calcined bones. The highly unpalatable taste of the water, however, exclusive of the extreme difficulty, if not impossibility, of reducing the process into practice, prevented the further prosecution of this method.

"Another process for procuring fresh water at sea was afterwards published by Doctor Butler. Instead of the lapis infernalis and calcined bones, he proposed the use of soap leys; but though the ingredients were somewhat varied, the water was liable to the same objections as in the preceding experiment. Doctor Stephen Hales used powdered chalk; and introduced ventilation, by blowing showers of air up through the distilling water, by means of a double pair of bellows. It was found by this method that the quantity of fresh water obtained in a given time was somewhat greater than what had been procured by the process of Mr. Appleby. This invention, however, was subject to several disadvantages. The air box which lay on the bottom of the still, as well as the chalk, much obstructed the action of the fire upon the water, at the same time that the boiling heat of the latter was diminished by the ventilation: so that more than double the usual quantity of fuel was necessary to produce the same effect. Besides, this method by no means improved the taste of the water.

"The next who attempted any improvement was the learned Doctor Lind, of Portsmouth. He distilled sea water without the addition of any ingredients; but as the experiment he made was performed in a vessel containing only two quarts, with a glass receiver, in his study, nothing conclusive can be drawn from it for the use of shipping. Indeed, experiments of the like kind had been made by the chemists in their laboratories, for at least a century before.

"In the year 1765, Mr. Hoffman introduced a still of a new construction, with a secret ingredient; but the large space which this machine occupied, being seven feet five inches by five feet eight inches, and, with its apparatus, six feet seven inches high, made it extremely inconvenient: at the same time that, on account of its shallow form,

the use of it was impracticable during any considerable motion of the ship. The water obtained, likewise, possessed all the disadvantages common to the preceding methods.

"About the same time experiments were made with a still of the common construction, and Mr. Dove's ingredient. This method was attended with no advantage over any that had been formerly used; the distilled was most unpalatable; and the enormous size of the apparatus, which occupied a space of thirteen feet seven inches by six feet one inch, and six feet five inches in height, rendered it impracticable on board ships. An experiment was immediately afterwards made with the same still without any ingredient; the result, however, was uniformly a most unpalatable taste of the water.

"About this period, also, M. Poissonnier of Paris introduced into the French marine a still, three feet six inches long, two feet wide, and eighteen inches deep. A portion of the chimney passed through the upper part of the still, much in the same manner as that of Mr. Hoffman: these gentlemen supposed that by this means they should save fuel. The mouth of M. Poissonnier's still was thirteen inches wide, on which he placed a tin plate, pierced like a cullender, with thirty-seven holes of six lines diameter each; to these were fixed tin pipes, of the same bore, and seven inches long, terminating within the still-head. The intention of this contrivance is to prevent any of the water in the still from passing over into the worm, while the ship is in considerable motion.

"In every other respect M. Poissonnier employs a still-head, worm-pipe, and worm-tub, with all its usual apparatus; and he directs six ounces of fossil alkali to be mixed with the sea water at each distillation, to prevent the acid of the magnesia salt from rising with the vapour, when salt begins to form on the bottom of the still. It is probable that in M. Poissonnier's still, which was even more shallow in its form than Mr. Hoffman's, some of the water might be thrown up toward the worm; in which case the pierced plate with pipes might be of some service in breaking the direction of the water. But by Doctor Irving's tube this inconvenience is entirely prevented, as experience fully evinces, viz. in a voyage to Falkland's Islands, where it has been used in distillation every day; in several voyages to the East Indies; and in this voyage, as is mentioned in the journal.

"M. Poissonnier, in correcting this error in the construction of his still, has introduced another, of the most capital nature in distillation. For by means of the pipe-cullender, the vapour will meet with the greatest resistance to its ascent, which will retard the progress of distillation in a very high degree, and increase the Empyreuma.

From all the experiments above-mentioned, it is evident that no method had hitherto been invented of making sea water fresh, which was not attended with such inconveniences as rendered the several processes of scarce any utility. The defects of the various methods above enumerated may be reduced to the following heads:

"1. The small quantity of water produced by the ordinary methods of distillation with a still-head, and worm, could never be adequate to the purposes of shipping, though the apparatus should be kept in constant use; and at the same time, this mode of distillation required a quantity of fuel, which would occupy greater space than might be sufficient for the stowage of water.

"2. A still-burnt taste, which always accompanies this method of distillation, and renders the water extremely unpalatable, exciting heat and thirst, if drank when recently distilled.

"3. A total ignorance with respect to the proper time of stopping the distillation, whereby salt was permitted to form on the bottom of the boiler; which burning, and corroding the copper, decomposed the selenitic and magnesia salts, causing their acids to

ascend with the vapour, and act on the still-head and worm pipe, impregnating the water with metallic salts of the most pernicious quality.

"4. The space occupied by the still, still-head, and worm-tub, renders the use of them in most cases totally impracticable on board ships. Add to this, their wearing out so fast on account of the causes above mentioned, the great expence of the apparatus, with the hazard of the still-head being blown off, and the inconveniences thence arising.

"5. The use of ingredients, which though omitted in some experiments in small, were nevertheless erroneously considered as essential to the making sea water sweet and palatable by distillation.

"6. The inconvenience of a cumbersome apparatus, calculated only to be eventually useful in unexpected distress for water, but constantly occupying a great deal of room in a ship, too necessary for the ordinary purposes to be spared for that object.

"Having specified the principal defects of the several methods hitherto proposed for making sea water fresh, it will be proper, before stating the advantages of Doctor Irving's method, to consider briefly the principles of distillation in general, and the chemical analysis of sea water.

"Water, in an exhausted receiver, rises in vapour more copiously at 180° of Fahrenheit's thermometer, than in the open air at 212°, which may be considered as its boiling point.

"It therefore follows, that any compression upon the boiling fluid checks the vapour in rising, and consequently diminishes the quantity of water obtained. This is clearly exemplified in the steam-engine, where the consumption of water in the boiler is very inconsiderable, in comparison to what would happen, if the compression arising from the throat pipe and valve of that machine was taken off, and the pressure of the atmosphere only admitted. But by the restraint of that valve, the vapour becomes hotter, and increases in rarity and elasticity; qualities essential to the purposes of the engine, although the reverse of those which ought to take place in common distillation. For the columns of vapour should be removed from the boiling fluid as fast as they ascend, without suffering any other resistance than that of the atmosphere, which, in the ordinary business of distillation, cannot be prevented.

"The impropriety of the common process of distillation will appear evident, by comparing it with the above principles and facts.

"In the common method of distillation, the whole column of vapour from a still of whatever size, after ascending to the still-head, must not only find its passage through a pipe of scarce an inch and a half diameter, but descend, contrary to its specific gravity, through air which is fifteen times its weight, in spiral convolutions: a course so extremely ill adapted to the progress of an elastic vapour, that frequently the still-head is blown off with incredible violence, owing to the increased heat and elasticity of the vapour confined by this construction. In the mean time the external surface of the pipe communicates heat to the water in contact with it, which, instead of being entirely carried off, mixes the surrounding fluid, and heats the whole, rendering it unfit for condensing the vapour within; especially when it is considered that the substance of the pipe is at least a quarter of an inch thick.

"From what has been said, it is plain, that the quantity of distilled water will be lessened in proportion to the resistance made to the ascent of the vapour, while the difficulty of condensation will be greatly augmented, in consequence of the increased heat and elasticity of the vapour. But these disadvantages, however great, respecting the mode of distillation, give rise to another evil of a still more important nature, as affecting the distilled fluid with a noxious burnt taste, or empyreuma, occasioned by the vapour,

highly heated, passing over so much surface of metal, viz. the still-head, crane-neck, and a pipe of six or seven feet in length, before it reaches the water in the worm tub.

"Having discussed the subject of distillation, we come now to treat of the chemical analysis of sea water.

"Sea water contains chiefly a neutral salt, composed of fossil alkali and marine acid. It likewise contains a salt which has magnesia for its basis, and the same acid. These two salts are blended together in our common salt in England, which is prepared by quick boiling down sea water. But when the process is carried on by the sun, or a slow heat, they may be collected separately; that which has the fossil alkali for its basis crystalizing first; and this is of a vastly superior quality for preserving meat, and for the other culinary purposes. The mother liquor now remaining, being evaporated, affords a vitriolic magnesia salt, which in England is manufactured in large quantities, under the name of Epsom salt.

"Besides the salts, which are objects of trade, sea water contains a selenitic salt, a little true Glauber's salt, often a little nitre, and always a quantity of gypseous earth suspended by means of fixed air.

"The specific gravity of sea water to that of pure distilled water is, at the Nore, as 1000 to 1024,6; in the North sea, as 1000 to 1028,02.

"The quantity of salt obtained by boiling sea water in different latitudes, from 51° 30′ to 80° 43′ N. L. appears from a table in the original work.

"Sea water, when boiled down to a strong brine, admits with difficulty the separation of fresh water from it; the distillation becoming slower as the strength of the brine increases, so that a greater quantity of fuel is consumed in procuring a smaller portion of water, and this likewise of a bad quality. From this essential circumstance arises the necessity of letting out the brine by the cock of the boiler, when the distillation is advanced to a certain degree; and of adding more sea water to continue the process, if required.

"The defects of the several schemes formerly proposed for rendering sea water fresh being pointed out, the general principles of distillation explained, and the component parts of sea water analytically examined; the advantages of the method invented by Doctor Irving remain to be stated, which may be reduced to the following:

"1. The abolishing all stills, still-heads, worm-pipes, and their tubs, which occupy so much space as to render them totally incompatible with the necessary business of the ship; and using, in the room of these, the ship's kettle or boiler, to the top whereof may occasionally be applied a simple tube, which can be easily made on board a vessel at sea, of iron plate, stove funnel, or tin sheet; so that no situation can prevent a ship from being completely supplied with the means of distilling sea water.

"2. In consequence of the principles of distillation being fully ascertained, the contrivance of the simplest means of obtaining the greatest quantity of distilled water, by making the tube sufficiently large to receive the whole column of vapour, and placing it nearly in a horizontal direction to prevent any compression of the fluid, which takes place so much with the common worm.

"3. The adopting the simplest and most efficacious means of condensing vapour; for nothing more is required in the distillation but keeping the surface of the tube always wet; which is done by having some sea-water at hand, and a person to dip a mop or swab into this water, and pass it along the upper surface of the tube. By this operation the vapour contained in the tube will be entirely condensed with the greatest rapidity imaginable; for by the application of the wet mop thin sheets of water are uniformly spread, and mechanically pressed upon the surface of the hot tube; which, being con-

verted into vapour, make way for a succession of fresh sheets; and thus, both by the evaporation and close contact of the cold water constantly repeated, the heat is carried off more effectually than by any other method yet known.

"4. The carrying on the distillation without any addition, a correct chemical analysis of sea water having evinced the futility of mixing ingredients with it, either to prevent an acid from rising with the vapour, or to destroy any bituminous oil supposed to exist in sea water, and to contaminate the distilled water, giving it that fiery unpalatable taste inseparable from the former processes.

"5. The ascertaining the proper quantity of sea water that ought to be distilled, whereby the fresh water is prevented from contracting a noxious impregnation of metallic salts, and the vessel from being corroded and otherwise damaged by the salts caking on the bottom of it.

"6 The producing a quantity of sweet and wholesome water, perfectly agreeable to the taste, and sufficient for all the purposes of shipping.

"7. The taking advantage of the dressing the ship's provisions, so as to distil a very considerable quantity of water from the vapour, which would otherwise be lost, without any addition of fuel.

"To sum up the merits of this method in a few words:

"The use of a simple tube, of the most easy construction, applicable to any ship's kettle. The rejecting all ingredients; ascertaining the proportion of water to be distilled, with every advantage of quality, saving of fuel, and preservation of boilers. The obtaining fresh water, wholesome, palatable, and in sufficient quantities. Taking the advantage of the vapour which ascends in the kettle, while the ship's provisions are boiling.

"All these advantages are obtained by the above-mentioned simple addition to the common ship's kettles. But Doctor Irving proposes to introduce two further improvements.

"The first is a hearth, or stove so constructed, that the fire which is kept up the whole day for the common business of the ship serves likewise for distillation; whereby a sufficient quantity of water for all the œconomical purposes of the ship may be obtained, with a very inconsiderable addition to the expence of fuel.

"The other improvement is that of substituting, even in the largest ships, cast-iron boilers, of a new construction, in the place of coppers."

DIRECTIONS FOR DISTILLING SEA WATER

"As soon as sea water is put into the boiler, the tube is to be fitted either into the top or lid, round which, if necessary, a bit of wet linen may be applied, to make it fit close to the mouth of the vessel; there will be no occasion for luting, as the tube acts like a funnel in carrying off the vapour.

"When the water begins to boil, the vapour should be allowed to pass freely for a minute, which will effectually clean the tube and upper part of the boiler. The tube is afterwards to be kept constantly wet, by passing a mop or swab, dipped in sea water, along its upper surface. The waste water running from the mop may be carried off by means of a board made like a spout, and placed beneath the tube.

"The distillation may be continued till three fourths of the water be drawn off, and no further. This may be ascertained either by a gauge-rod put into the boiler, or by measuring the water distilled. The brine is then to be let out.

"Water may be distilled in the same manner while the provisions are boiling.

"When the tube is made on shore, the best substance for the purpose is thin copper well tinned, this being more durable in long voyages than tin plates.

"Instead of mopping, the tube, if required, may have a case made also of copper, so much larger in diameter as to admit a thin sheet of water to circulate between them, by means of a spiral copper thread, with a pipe of an inch diameter at each end of the case; the lower for receiving cold water, and the upper for carrying it off when heated.

"When only a very small portion of room can be conveniently allowed for distillation, the machine, which is only twenty-seven inches long, may be substituted; as was done in this voyage. The principal intention of this machine, however, is to distil rum and other liquors; for which purpose it has been employed, with extraordinary success, in preventing an empyreuma, or fiery taste."

ACCOUNT OF THE ASTRONOMICAL OBSERVATIONS AND TIME-KEEPERS, BY MR. LYONS.

"The observations for finding the time at sea were taken with a brass Hadley's sextant of eighteen inches radius, made by Dollond; and sometimes by captain Phipps, with a smaller of four inches radius, made by Ramsden, which commonly agreed with the other within a minute. The error of the sextant was generally found by observing the diameter of the sun; which, if the same as double the semidiameter set down in the Nautical Almanac, shewed that the instrument was perfectly adjusted; if it differed, the difference was the error of the sextant. It was necessary to know this error of adjustment very exactly, and therefore I generally repeated the observation of the sun's diameter several times, and from the mean of the result found the error of the sextant. This error will equally affect all the observations taken near the same time, and therefore cannot be discovered from the comparison of several observations. Under the equator, an error of one minute in altitude, near the prime vertical, will only produce an error of four seconds in the apparent time; but in the latitude of eighty degrees it will cause an error of twenty-three seconds. As we generally took several successive observations, any error in the observation itself will be generally independent of the rest; and as I have calculated each separately, the conclusions will shew which are erroneous, by their differing much from the mean of all, which cannot but be very near the truth.

"In calculating these observations, I found by the logboard how much we had altered our latitude since the last observation; and sometimes, when we had an observation the noon following the observation for the time, the latitude of the ship at the time the altitudes were taken was inferred from it. As most of our altitudes were observed when the sun was near the prime vertical, a small error in the latitude will not produce any considerable change in the time; indeed, if it is exactly in the prime vertical, it will not make any change at all.

"To find the longitude from these observations: to the apparent time found by calculation, apply the equation of time according to its sign, which will give the mean time; the difference between which and that marked by the watch will shew how it is too slow or too fast for mean time.

"Captain Phipps's pocket watch, made by Mr. Arnold, when compared with the regulator at Greenwich, May 26th, was twenty-four seconds too slow; it was there found to lose twelve seconds and a quarter a day on mean time. From this it is easy to find what time it is at Greenwich at any moment shewn by the watch.

"The watch was compared every day about noon with the two time-keepers made by Mess. Arnold and Kendal; and from this comparison, and their rates of going previously settled at Greenwich, together with knowing how much they differed from mean time at Greenwich before we set out, was calculated the table, which shews what the mean time is at Greenwich according to each time-keeper, when the watch is at twelve hours.

"By the help of this table, we may easily find the longitude of the ship, as deduced from the going of each time-keeper. Having found how much the watch is too fast or too slow for mean time at the ship, we know what the mean time is at the ship when the watch is at twelve hours; and by the table we can find what is the mean time at Greenwich at the same time, supposing each time-keeper had kept at the same rate of going as it had before our departure: the difference of these mean times will give the longitude of the ship.

"For example, June nineteenth, in the afternoon, the watch was 1′ 24″ too slow for mean time at the place where we observed; therefore, when the watch shews twelve hours, the mean time at this place was 12° 1′ 24″. At this time I find by the table, that, according to Kendal's time-keeper, the mean time at Greenwich was 12° 2′ 7″: from this subtracting 12° 1′ 24″, the mean time at the ship, the remainder, 0′ 43″, is the difference of meridians; which, converted into parts of a degree, gives 0° 10′ 45″ for the longitude of the ship, according to Kendal, which is to the westward, because the mean time at the ship is less than that at Greenwich.

"When we were on shore, the observations were made with an astronomical quadrant, divided by Mr. Ramsden, of eighteen inches radius, which was placed on a solid rock of marble; the error of the line of collimation was found by inverting the quadrant, which was adjusted by a spirit level. The weather did not permit us to take corresponding altitudes of the sun, so that we determined the apparent time by computation from altitudes of the sun's limb; having before settled the latitude of the place of observation from meridian altitudes of the sun's limbs, taken with the same instrument.

"The latitudes of the ship were determined most commonly by the meridian altitude of the sun's lower limb; in a few instances, by that of his upper limb, when the lower was not so distinct, or was hid by the clouds. The height of the eye above the level of the sea, in all these observations, was sixteen feet. When we could not get a meridian observation, we made use of the method described in the Nautical Almanac for 1771, from two altitudes taken about noon, and at a little distance from it.

"It sometimes happens that we can only take some altitudes very near the time of noon. If we have observed any altitudes of the sun near the prime vertical, we may thence determine how much the watch is too fast or too slow for apparent time; and, consequently, how much the time when the altitudes were taken, is distant from noon; it therefore remains now to find how much these altitudes are different from the meridian altitude. This may easily be found by the following rule:

"To the logarithm of the rising, taken out of the tables in Nautical Almanac for 1771, add the complement arithmetical of the logarithmic cosine of the supposed meridian altitude; from the sum (the index being increased by five) subtract the logarithm ratio (found by the rules in the above mentioned Ephemeris) the remainder is the logarithmic sine of the change in altitude.

"EXAMPLE I....June the twenty-first, the altitude of the sun's center was observed to be 46° 6′ at 16′ 45″ after apparent noon; the latitude by account was 67° 17′; the sun's declination being then 23° 28′ N. the supposed meridian altitude 46° 11′.

			5.
"Supposed latitude 67° 17′ Co. Ar. Cos.	0,41322.	Rising 16′ 45″ - -	2,42643
Sun's declination 23 28 Co. Ar. Cos.	0,03749.	Supposed Mer. Alt. Ar. Co. Cos. -	0,15967
			7,58610
Log. ratio - - -	0,45071	- - - - - -	0,45071
The change in altitude is - -	+0° 5′	- - - - - - -	Sine 7,13539
Observed altitude - - -	46 6		
Meridian altitude - - -	46 11		
Declination - - - -	23 28		
Altitude of the Equator - -	22 43		
Latitude - - - - - -	67 17 N		

"As the altitudes for determining how much the watch differs from apparent time were taken near the prime vertical, a great error in the supposed latitude will make a very insensible change in the apparent time; nor will it create any great difference in the variation of altitude near noon in a given time, as will appear by the following computation:

"Suppose the latitude by account was 68° 17′, a degree greater than before.

			5.
"Supposed latitude 68° 17′ Cos. Co. Ar.	0,43178	Rising 16′ 45″ - - - -	2,42643
Declination - 23 28 ———	0,03749	Supposed Mer. Alt. 45. 11. Cos. Co. Ar.	0,15191
			7,57834
Log. ratio - - -	0,46927	- - - - -	0,46927
The change in the sun's altitude is - - -		0° 4′ 25″ - - -	Sine 7,10907
Observed altitude - - - -		46 6	
Meridian altitude - - - - -		46 10 25	
Declination - - - - -		23 28	
Altitude of the Equator - - - -		22 42 25	
Latitude - - - - -		67 17 35 which only differes thirty-five seconds	

from the true latitude we found before.

"EXAMPLE II.... June the twentieth, the altitude of the sun's center was observed 0° 28′ 38″ after midnight, to be 1° 13′, the latitude by account being 67° 40′ N.

			5.
"Supposed latitude 67° 40′ Cos. Co. Ar.	0,42022	Rising 28′ 38″ - - - -	2,89380
Declination - 23 28 ———	0,03749	Supposed Mer. Alt. 1° 8′ Cos. Co.	0,00001
			7,89381
Log. ratio - - - - -	0,45771	- - - -	0,45771
Change in the altitude - - -	—0° 9′	- - -	Sine 7,43610
Observed altitude - - -	1 13		
Meridian altitude - - - -	1 4		
Co-declination - - -	66 32		
Latitude - - - -	67 36 N.		

"There were two time-keepers sent out for trial by the Board of Longitude: one made by Mr. Kendal, after Mr. Harrison's principles; the other, by Mr. Arnold: this last was suspended in gimmals, but Mr. Kendal's was laid between two cushions, which quite filled up the box. They were both kept in boxes screwed down to the shelves of the cabin, and had each three locks; the key of one of which was kept by the captain, of another by the first lieutenant, and of the third by myself; they were wound up each day soon after noon, and compared with each other and with captain Phipps's watch. They stopped twice in the voyage, owing to their being run down; they were set a-going again, and as they had been daily compared together, it was easy to know how long each had stopped, from the others that were still going; this time is allowed for in the table of the mean time at Greenwich by each time-keeper.

"When we were on shore at the island where we observed July fifteenth, we found how much the watch was too slow for mean time. When we returned from the ice to Smeerenberg, and again compared the watch with the mean time, allowing the small difference of longitude between the island and Smeerenberg, we found that it went very nearly at the same rate as it did when tried at Greenwich: so that its rate of going was nearly the same in our run from England to the island, from thence to the ice and back again to Smeerenberg, and in our voyage from thence to England, as we found on our return. By this means we were induced to give the preference to the watch, and to conclude that the longitude found by it was not very different from the truth.

"The principles on which this watch is constructed, as I am informed by the maker, Mr. Arnold, are these: the balance is unconnected with the wheel-work, except at the time it receives the impulse to make it continue its motion, which is only while it vibrates 10° out of 380°, which is the whole vibration; and during this small interval it has little or no friction, but what is on the pivots, which work in ruby holes on diamonds: it has but one pallet, which is a plane surface formed out of a ruby, and has no oil on it.

"Watches of this construction go whilst they are wound up; they keep the same rate of going in every position, and are not affected by the different forces of the spring: the compensation for heat and cold is absolutely adjustable.

"Time-keepers of this size are more convenient than larger, on several accounts; they are equally portable with a pocket watch, and, by being kept nearly in the same degree of heat, suffer very little or no change from the vicissitudes of the weather.

"This watch was exceedingly useful to us in our observations on land, as the other time-keepers could not safely be moved: and indeed, in the present voyage, where they were on trial, it was contrary to the intent for which they were put on board, and might have been attended with accidents, by which the rate of their going might have been greatly affected.

"The longitudes by Mr. Arnold's larger time-keeper are very different from those by the watch in our voyage back from Spitsbergen to England; owing, probably, to the balance-spring being rusted, as we found when it was opened at the royal observatory at Greenwich, on our return.

The longitudes found by the moon are deduced from distances of the moon from the sun's limbs, or from stars, taken with the sextant; whilst the altitudes of the moon and sun, or star, were taken by two other observers.

"In one instance (June the twenty-sixth) the observations were all made by captain Phipps with the small sextant successively; and the altitudes of the moon and sun at the very instant the distances were observed are deduced from the changes in these altitudes during the interval of observation.

"I have calculated the longitude from each set of observations separately, to shew how near they agree with each other, and what degree of precision one may expect in similar cases.

"Observations of the distances of the moon and sun, or stars, may be useful to inform us if the time-keepers have suffered any considerable change in their rate of going. For if the longitude deduced from the moon differs above two degrees from that found by the watches, it is reasonable to imagine that this difference is owing to some fault in the watch, as the longitude found by lunar observations can hardly vary this quantity from the truth; but if the difference is much less, as about half a degree, it is more probable that the watch is right, since a small error in the distance will produce this difference.

"The distances of the moon from Jupiter were observed, because Jupiter is a very bright object; and the observations are easier and less fallacious, particularly that of the altitude, than those of a fixed star, whose light is much fainter. This method, however, requires a different form of calculation from that of the observed distance of the moon from a fixed star, whose distances are computed for every three hours, in the Nautical Almanac. The principal difficulty in the calculation is to find the moon's longitude from the observation of the distance. This I have endeavoured to facilitate by the following problem, which may be applied to any zodiacal star, and will be of use when the star set down in the ephemeris cannot be observed.

"Problem....Having given the distance of two objects near the ecliptic, with their latitudes, to find their difference of longitude.

"Solution....Find an arc A, whose logarithmic sine is the sum of the logarithms of the sines of the two latitudes and the logarithmic tangent of half the distance, rejecting twenty from the index of the sum.

"Find an arc B, whose logarithmic sine is the sum of the logarithmic versed sine of the difference of latitude, and the logarithmic cotangent of the distance, rejecting ten from the index of the sum.

"Then A added to the observed distance, and B subtracted from the sum, leaves the difference of longitude.

"If one of the latitudes is south, and the other north, the sum of the two arcs A and B, subtracted from the distance, leaves the difference of longitude.

Example....August the thirty-first, the observed distance of the moon's center from Jupiter, cleared of refraction and parallax, was 32° 35′ 52″, the moon's latitude being 1° 47′ N. and that of Jupiter 1° 36′ S.

"Latitude ☽	1° 47′	Sine 8,4930	Difference of latitude,	3° 23′	Vers. Sin. 7,2413
Lat. ♃	1 36	Sine 8,4459			
Half Distance	16 18	Tang. 9,4660	Distance	32 36	Cotang. 10,1941
Arc. A.	0′ 52″	Sine 26,4049	Arc B	9′ 25″ - - -	Sine 17,4354
The sum of these arcs		—10′ 17″	Subtracted from		
The distance -		32° 35 52			
	Leaves	32 25 35	the difference of longitude between the Moon and Jupiter.		

"Knowing the longitude of Jupiter from the ephemeris, and the difference between it and that of the moon, we may infer the longitude of the moon by observation: and from the longitudes set down for noon and midnight of each day, in the Nautical Almanac, find the apparent time at Greenwich when the moon had that longitude, which, compared with the apparent time at the ship, will give the difference of meridians."

NARRATIVE OF THE ADVENTURES OF FOUR RUSSIAN SAILORS, WHO WERE CAST IN A STORM UPON THE UNCULTIVATED ISLAND OF EAST SPITSBERGEN, ON WHICH THEY LIVED FOR SIX YEARS AND THREE MONTHS.

[Translated from the German of Professor P. L. Le Roy, Member of the Imperial Academy Der Wissenschaften, at Petersburg.*]

"Inventrix consiliorum omnium necessitas." Heliodorus, lib. vii.

TRAVELS of older standing, and particularly those by sea, have often been the source of exaggerated relations, such sometimes as greatly exceed the bounds of probability. As highly as we esteem those authors who have given us just accounts of adventures of this nature, as much do we hesitate to give credit to those whose narratives, abandoning likelihood, are obnoxious to our judgment. Among these it has more than once occurred, that writers charged with fallacies have in after time been found to have related truths in what have been looked upon as idle tales. It were useless to instance here examples of this description.

The adventures which I purpose to relate, in as few words as possible, may be placed among the learned researches of individuals into the globe; they will, it is not unlikely, be worked upon with little regard to probability, and the matters related (in some degree wonderful of themselves) be enlarged with different variations. I must certainly own that I knew not at first what opinion I ought to form of them myself, when M. Venezobre, director of the offices of the pitch merchants, gave me the first information respecting them from Archangel. The sailors, whose history I write, were dependants in a degree on Count Peter Iwanowitz Schuwalow, to whom the empress Elizabeth had granted the privilege of fishing for whales. I begged this nobleman to give an order that these sailors should be permitted to come over from Archangel, that I might have conversation with them as I wished. The count had the goodness to comply with my request; he was himself anxious to see and speak to them. Accordingly they were wrote for, and two of them were sent to Petersburg; the boatswain, called Alexis Himkoff, fifty years of age, and a sailor, who was his godson, and who bore the name of Iwan Himkoff. They arrived in this city at the beginning of the year 1750, and the first discourse I held with them was on the eighth of January. They brought with them different articles of their workmanship, which I shall notice as I proceed, to present to count Schuwalow. I had full opportunity to question them on every point which I could think of, and reiterated my inquiries at different periods; from which I had no doubt of their veracity. I believe also that I do not assume too much in saying, that nothing of what I am about to relate can with any reason be called in question.

Now a ground of certainty is furnished which will establish the truth of these adventures. At the time of the arrival of these unfortunate sailors at Archangel, M. Von Klingstadt, sub-auditor of the admiralty of that town, caused them to be brought before him; he was the first to interrogate them on what had befallen them, put down their answers in writing, and decided on publishing the statement. Shortly after he came to Petersburg, and saw the narrative which I had written; he told me he found it to coincide exactly with that which he had sketched, and gave up his intention of publishing his own. He had the civility to compare his draught with mine, in order to discover if

* Riga, 1768, octavo.

I had omitted to question the men on any separate matters which he had learnt from them. The two accounts did not differ in the smallest degree in the answers given to the various questions put to them. This is an incontestible evidence of the truth of their narrative, since in different places, and at different times, they uniformly stated the same.

In the year 1743 Jeremias Ottamkoff, an inhabitant of Mesen, in Jergovia, a part of the government of Archangel, bethought himself of sending out a vessel with fourteen hands to Spitsbergen, to fish for whales and sea-calves, called by the Russians Morgi; in which line he carried on a considerable trade. For eight days together this vessel had a favourable wind, but on the ninth it changed. Instead of proceeding to the western side of Spitsbergen, to which the Dutch and other nations annually resort for the whale fishery; they were desirous of sailing to the eastern side, and shortly reached an island which is called East Spitsbergen, known to the Russians by the name of Maloy Brown, which signifies Little Brown; Spitsbergen Proper being called by them Bolschoy Brown that is, Great Brown. They were within three wersts of shore (two English miles) when suddenly the vessel was inclosed by ice: this gave them great uneasiness. They held a council among themselves on what to do, when the boatswain recollected to have heard that some inhabitants of Mesen had once resolved upon wintering on this island: they had also taken with them the materials of a hut, in ready fitted timber, on board their ship; and this hut had been judged to be certainly at some distance from the sea-shore. This information of the boatswain induced them to resolve on spending the winter there themselves, should the hut remain as they hoped; considering that they should run great danger in any case, if they hazarded remaining at sea. They deputed four persons to seek for and endeavour to find the hut, and any other medium of assistance; that is to say, the boatswain, Alexis Himloff, and three sailors, Iwan Himkoff, Stephen Sharapoff, and Fœdor Weregin.

They had to land on a desert island. These unfortunate men were therefore, of course, to be supplied with arms, and plenty of provision. On the other hand, they had to proceed the distance of a mile over fragments of ice, now lifted up by the waves, and now driven against each other by the wind, which made the way as perilous as laborious, and consequently enforced the circumspection of not overloading themselves, lest they should sink, and not arrive.

They provided themselves for this expedition with a musquet, a powder-horn, containing twelve charges of powder, a quantity of lead, an axe, a small kettle, a stove, a piece of touchwood, a knife, a tin-box full of tobacco, and each his pipe; with these few articles and provisions did these four unfortunate sailors reach the island.

They overcame all their difficulties, and quickly discovered the hut they were in search of: it was erected about a quarter of a mile from the sea. It was about six fathoms long; its breadth and its height were each three fathoms. It had a small entrance-hall, which might be two fathoms broad, and consequently had two doors, the one opening into the hall, the other into the chamber. This served very well to preserve the warmth of the room when it was heated. To conclude, there was found in this apartment a clay-fire place, set up in the Russian manner, i. e. a stove without a chimney, serving the double purpose of cooking the victuals and heating the room, and also for men to place themselves upon: this is a common practice among the country people when they are cold.

I have observed that they were without a chimney in this room, and this can excite but little astonish ment: the Russian peasantry seldom building their houses in any other manner. As for the smoke with which the whole chamber is filled when a fire is made

in the stove, to give it vent the door is opened, and three or four windows, which are a foot long, and half a foot broad, made in the planks of which the house is constructed: these windows can be shut when desired very closely, in frames purposely contrived, in which they are moved. When a fire is kindled, the smoke never sinks lower than these small windows which I have noticed, so that a person may remain seated without being subject to much inconvenience from it, and when the apartment has been cleansed, whether by the door or the windows, they can be drawn to. Without being told, one may easily conceive that the upper part of the room down to the windows must be as black as though built of ebony; on the other hand, from the windows to the floor is comparatively clean, and preserves the appearance of the natural wood, of which the house was built.

Satisfied with having found this hut, which shortly they improved, by expelling from it the damp and necessarily foul air, they managed to pass the night in it as well as they could. Early in the morning of the following day, they hied themselves back to the sea shore, to inform their companions of their good fortune, and bring from the ship provisions, and necessary arms; in short, whatsoever it contained which could be useful to them for passing the winter on this island.

It were a more easy task to conceive the anguish of these unfortunate beings than to express it, when, upon treading back their steps to the place where they landed, they perceived nothing but an open sea, entirely free from the ice, with which it was covered on the preceding day, and to their heavy misfortune no ship in sight. A terrible storm which happened during the night had occasioned this dreadful calamity. And whether the pieces of ice with which it was enclosed had broke, and dashing against the vessel with violence had crushed it; whether it had foundered at sea, an accident which often occurs in those parts; or whatsoever other distress it had encountered; it never more was seen; and as no intelligence respecting its company was ever after obtained, it is highly probable they met with some mischance. From this circumstance, these unfortunate men saw plainly that they had no hope remaining of getting from the island; and with heavy hearts they returned to the hut from which they came.

Their first care and attention turned, as may be naturally imagined, upon their support and shelter. The twelve charges of powder which they had, in a little time, produced them as many rein-deer, which luckily for them abounded on the island.

As the rein-deer is met with in the North of Europe, in Lapland, and in Asia, in similar latitudes, I conceive I shall not be departing widely from my subject in giving a description of it.

The rein-deer resembles the stag, and the eland; it is for the most part of an ash gray, although some are met with of a reddish colour. It is more stout and larger than the stag, but its feet are shorter, and proportionably thicker. Its antlers are whitish and plain, and are more branching than those of the stag; those of the eland are more like them. When the rein-deer runs, the joints of its feet make a clicking, which of itself is sufficient to distinguish it from the stag. The Laplander, the Samoiede, and the inhabitants of a part of Tungusi, break in the rein-deer, which is called by them as well as in Russia by the name of Olen, and train it to draw them in their sledges; the Tungusians call it Oleni. The rein-deer serves all the purposes of a horse, is tolerably strong, and possesses an incredible swiftness. Its food is moss, which is found in abundance in all the Northern Countries. Its provender is everywhere to be met with, and costs its master nothing, it even helps itself, digging through the snow with its feet to get to its fodder. It has been affirmed that the rein-deer cannot subsist away from

its native country; but I can prove this assertion to be groundless. At Moscow, in the year 1731, I saw a dozen of them which were running by the side of the house of count Von Goloskin, at that time grand chancellor, which were kept in his grounds: they were of a reddish white colour. In the year 1752, count Peter Iwanowitch Von Schuwaloff sent for two from Archangel; a male, and female. They were fed on moss. The female was a young one, which throve to admiration, and down to the year 1754 was in perfect health. These are matters to which I was an eye witness at Moscow. I cannot tell however what length of time she lived, as I returned the same year to Petersburg. Having finished this short digression, I return to my narrative.

The injuries which the hut so luckily discovered by the sailors had received were very trivial: the planks of which it was built had separated in different places, and requiring to have the chinks filled with moss, the wind had a free passage afforded it. This however was an evil easy to be remedied, as they had an axe, and the planks were not decayed. It is well known that in these cold climates wood keeps entire for many years, and is not subject to be worm eaten. It cost them but little trouble to join the planks together again, and with the moss, which was found in abundance on the island, they readily filled up every crevice; this practice is generally followed in completing houses constructed of wood. These men relieved themselves from this inconvenience without embarrassment, the more so from its being the custom, as is well known, for the Russian peasants to build their own dwellings: they are consequently expert in the use of the axe.

The cold in these climates is insupportable, and the earth itself produces no trees; not even the smallest bush. This want of wood our unfortunate adventurers had remarked on looking round the island on their arrival, and they were under apprehension of perishing of cold. Their good fortune however favoured them; the pieces of a ship which had been wrecked were thrown on the coasts of this island; an accident which furnished them with wood enough to carry them through their first winter.

Nearly the same assistance was to be sent them the following year, this affording them no more than an advantageous variation: the waves of the sea continually throwing on shore entire trees with their roots, without their being able to divine from what country they were brought. This circumstance will not appear incredible to those, who have taken the pains to inform themselves of what different writers have related on this subject; who notice its frequency, whether on our wintering at Nova Zemla, (not Zembla, as we shall prove) or in lands of other latitudes farther towards the North.

I break in on my narrative to observe that it should be called, not Nova Zembla, but Novoia or Nova Zemla, which signifies new earth, or new land, the Russian term conveying both these meanings; and under this name, when spoken of, it is known in Russia.

Nothing assisted these sailors during the first year of their exile so much as a board, to which was fixed a long iron hook, and a nail four or five inches long, and proportionately thick; as well another board, to which was fastened different old iron work, the sad remains of some vessel which had been lost in this wide extended sea. This unexpected aid arrived at a time when they had nearly expended their powder; when the flesh of the rein-deer which they had shot was almost all consumed; and they had no other prospect than that of perishing with hunger. A second piece of good fortune befell them, little less valuable than the first: they found on the sea shore the root of a fir tree, which was nearly in the shape of a bow.

Necessity was ever the mother of invention. They took for granted, that, by the means of their knife, they should be enabled to fashion this root into a complete bow; and effectively they compassed their purpose.

But the difficulty was to find a cord to string it, and arrows to shoot with. They deliberated on this circumstance, and concluded upon making two iron headed spears, for defending themselves from the white bears, which are more fierce than the generality of their species, an attack from them being the only molestation they had to apprehend: the making of arrows and contriving a cord to string their bow were put off to a future period. To make a hammer for working the iron into lances and arrows, was no great achievement for them; every one knows they might find a way to effect this purpose, and furnish themselves with the tool.

The iron hook which I have noticed they found fastened to the board thrown on shore had a pretty considerable hole in it, about two or three inches from the end opposite to the head. The head was round and thick, such as in similar hooks is commonly made for their protection. They contrived to heat red hot the end which had an orifice, and enlarged it by forcing into it the nail which they had met with: this they effected with a few strokes of the axe on the part, about five inches from the hole, which was to be made larger; by another blow they drove in the hot hook a piece of rounded wood, which served for a handle, and thus became possessed of a hammer. To complete their forge, they pitched upon a large stone for their anvil, which they had to remove from its place: on this occasion, two rein-deers' horns or antlers served them for slings. With these tools they forged themselves two lances' heads, which they polished and pointed sharp with stones; these they bound as firmly as possible by the exertion of all their might, with thongs made from the skin of the rein-deer, to stocks of the thickness of one's arm, made of the branches of trees, which they found cast on shore by the sea. When a man has resolution, he may with such a spear (you may call it a pike or halbert if you will) attack a white bear, although he runs imminent danger of being killed. As soon as they had made themselves masters of one of these frightful beasts, they made its flesh serve them for food; and they found it much more agreeable to the taste than that of the rein-deer; the truth of this circumstance I have been assured of by many with whom I have spoken on this subject.

Upon examining the nerves and fibres of this bear they remarked, with indescribable delight, that they were divisible with the least trouble into threads as thick or as fine as they pleased. I have myself made this experiment, which I shall hereafter notice. This discovery was one of the most happy events that could have befallen them; besides other advantages which they might derive from it at a future period, it furnished them immediately with a cord for their bow. With this they killed all the rein-deer, and blue and white foxes, they had occasion for during the whole time of their stay upon the island; these served them for food, for medicine, and for raiment, protecting them from the insupportable cold which reigns in these latitudes, so contiguous to the pole.

The great success which our islanders met with from the use of their lances enlivened them much, and induced them without delay to forge four iron heads for arrows: these were completed, but made smaller than the first: they heated and sharpened them as they had done the former, and bound them with thin threads made of the nerves of the bear to shafts of fir, through slits in which they inserted feathers which they found, fastening them with very fine fibres. Their ingenuity profited them so far, that in the course of the time of their remaining on the island, by means of these arrows, they killed two hundred and fifty rein-deer, besides a considerable number of

blue and white foxes. The latter are called Pestzi in Russia, on account of their strong resemblance to a kind of Iceland dog, which the German shepherds usually have for guarding their sheep: the word pes signifying a dog, in the Russian tongue.

When they ventured themselves against the white bear, of which in all they killed ten, they ran great risk of their life. These wild animals are possessed of uncommon strength, and defend themselves with extraordinary obstinacy; so that, excepting the first which I have mentioned, they never designedly encountered them: the nine others were killed in their own defence, when attacked by them: several of these had even proceeded as far as into the entrance of the hut, to tear them in pieces. It is true, all these wild animals did not shew the same courage, if I may so express myself, whether from being less excited by hunger, or less furious by nature; some of them running away at the cries which the men made while preparing themselves to drive them back. Nevertheless, their different attempts occasioned these poor men unspeakable inquietude: they never ventured to any distance alone, nor without being armed with their lances, to protect them from the violence of the bears; being continually under apprehension of being devoured by them. These three descriptions of wild animals were the only food of our islanders during the whole of their stay in that desert country.

Men do not reflect upon all their means at once: it is commonly the need of a thing which opens their eyes, and impels them to think of expedients, which otherwise would not have been conceived. The justness of this observation was more than once experienced by our sailors. During a long period they were under the necessity of eating their meat almost raw, without salt, the want of which they felt severely, and without bread. The immoderate cold of these climates, and the few conveniencies they possessed, did not allow them to cook their victuals in a proper manner: in their hut they only found a stove of the Russian fashion, and consequently of a description which could not serve for making a kettle boil. On the other hand, wood was much too precious to them to keep up two fires, and were they to kindle one without the house, it would not serve to warm them, a matter of the highest importance in such a rigid clime. Finally, the continual dread of exposing themselves to the white bears hindered them from cooking in the open air. I shall now make one remark. Allowing that in spite of the before mentioned impediments they should have attempted this measure, it would yet have been impracticable throughout a great part of the year: and certainly the excessive cold, which almost always reigns in these regions, the long absence of the sun, which leaves them for months enveloped in complete darkness, the inconceivable falls of snow, which take place at certain periods, and the long duration of the rainy season at others; these circumstances must have soon obliged them to change their intention, even should they have resolved upon it.

How then were they to remedy the inconvenience of being obliged to eat their meat almost raw? Their ingenuity pointed out the place to them of suspending it from the roof of the hut. In the description of it, I have observed that every day it was filled with smoke from the height of a sitting person to the top. Now this was actually a smoking chamber; then they hung their meat on wooden pegs, fastened on the outside of the upper part of the roof of their hut, so that their foes, the bears, could not reach them: there they left it the whole summer through, exposed to the fresh air, and the wind: it dried extremely well, and served them in lieu of bread, making them relish their other meat which was but half cooked. After they had made this experiment, and it had succeeded so much to their comfort as to satisfy their fullest wishes, they ever after continued the practice of it, and increased their stock of provision as much as they were able.

It may be inquired how came they by this idea? The answer is easy. There are few countries in which it is not usual to smoke hams, and geese, as well as different sorts of fish, and in Russia the practice is common of drying salmon, sturgeon, and other of similar kind, in the sun; which on fast days, and during the great fast, are served up on table without the least preparation.

After speaking of their meat, I must now give a short account of their beverage. The water which they obtained from the rivulets that streamed plenteously from the rocks of this island quenched their thirst in summer; and the ice and the snow, which they melted during the winter, served them for drink through that part of the year when they were confined to their hut. I must not however forget to notice, that their little kettle was the vessel in which they fetched their water, and out of which they drank.

The scurvy is a malady to which seamen are commonly subject, and is more dangerous in proportion to an approximity to the pole, whether the cause be attributable to the cold, or to any other unknown circumstance. Let that be as it will: these unfortunate men, should they be attacked by this disorder, were without assistance, they therefore bethought themselves of a means, which ought not to pass unnoticed, reputedly a sovereign preventative of this disagreeable complaint. It was Iwan Himkoff, who had passed the winter several times on the western coast of Spitsbergen, that made his companions acquainted with this remedy. He instructed them to eat raw and frozen meat cut into small pieces, and drink the warm blood of the rein-deer, extracted from the animal as soon as killed, and that as often as the carcasses could be obtained; and, lastly, to eat as much as possible of cochlearia (scurvy grass) the only grass which grew on the island, and that but sparingly. It is for the faculty to determine, if these small pieces of raw and frozen flesh, and this warm blood of the rein-deer, be fit for the cure of the scurvy. Might not exercise be concerned, where this prescription was followed by those who were threatened with this disorder, or upon whom it had made its appearance? Again, no one is ignorant that cochleria is a powerful antidote against the scurvy. However, be this as it may experience, in this instance, illustrated the powerful influence of the prescriptions administered: three of the sailors who made use of this regimen were kept entirely from this complaint. As often as they hunted down a rein-deer or a fox, as constantly they drank its blood. Iwan Himkoff, the youngest of them, had acquired such swiftness of foot at this exercise, that he could leave the fastest horse behind, a circumstance to which I have been an eye-witness. The fourth, called Feodor Weregin, had at all times an unconquerable aversion to the blood of rein-deer, he was very heavy and very idle, and returning to the hut as soon as possible when obliged to make excursions. From his first arrival upon this island he was menaced with this calamity, and in course of time the malady had made such progress, that he was subject to a dreadful weakness, accompanied by cruel sufferings. During the last year of his life he was bed-ridden, without strength enough to raise himself up, and without the power of moving his hand to his mouth; the companions of his misfortunes being obliged to nurse him the same as a new-born child.*

* Although I have my doubts as to the efficacious operation of pieces of frozen and raw flesh cut small, and the drinking of the warm blood of newly killed rein-deer, as a remedy for the scurvy, it yet appears to me that these things are worthy of notice. I certainly have found in the first volume of a book, entitled "Voyages and Discoveries of the Russians along the shores of the Frozen Ocean and the Eastern Sea, as well as towards Japan and America, published by Muller," that the inhabitants of northern Siberia make use of frozen fish, which is eaten raw, as a remedy for that shocking disorder, and that it is effectual." Vide pages 194, 195. "Our men dug out their residence for the winter at the mouth of the river Chotuschtach. Here the scurvy began to affect our ship's crew; but they were benefitted by using a decoction

In the beginning of my narrative I have observed, that our sailors brought a small sack of meal, about twenty pounds weight, with them to the island, I shall now notice the use to which it was put.

Soon after their arrival they abandoned the use of this food, desisting when they had cooked the flesh of the rein-deer which they had killed; preserving thus about the half of it. This remaining quantity they put to a service at least as necessary as that to which the former part had been applied. I shall proceed to describe it.

They readily saw that, while in so cold a climate, they must continually keep up a fire, they would have very few means for kindling it, after those should be consumed which they possessed; it is true, they had store of fire-wood, but little touchwood or tinder. The barbarous nations in the wilds of America have discovered a method of lighting a fire whenever they will: it consists in the friction of a square piece of hard wood against two pieces of softer wood, which are fastened to it; while the two soft pieces are pressed between the knees, the middle hard piece is milled by the hands with great velocity, so that by the friction a heat is occasioned, which shortly causes smoke, and quickly succeeding flame is excited.*

Our ingenious sailors had little knowledge of this American custom; but they kne that when two pieces of dry wood, one of which being soft, and the other hard,

of cedar shoots, which tree grows here to a small height, and after the manner of the country by taking raw and frozen fish, which they powdered and ate. By these means, and by keeping continually at work and in hourly exercise, most of them got relieved and restored to health.

"Possibly the cure of these sick men is ascribable alone to their exercise and the balsam contained in the cedar shoots; this is nothing other than a turpentine, serving to purify the blood: however it appears from this that these nations make use of raw and frozen fish, as a remedy for this complaint, and I mean to observe this alone."

The author noticed before speaks of blood as an antiscorbutic (see page 205 to 206.) "On such an occasion" (that of preventing and healing the scurvy) he says, "we may take a precedent from the Russians of Archangel, some of whom pass almost every year the winter in Nova Zemla without being incommoded with this disorder; imitating the Samoiedes in drinking frequently the blood of the fresh killed rein-deer."

Now, one remark. Upon my reading this narrative to Mr. S. Batigne, before I gave it to the public, he on this occasion observed, that he gave credit to the efficacy of the blood of animals being drunk while warm, as well for preventing as even for remedying this disorder; its volatile nature being calculated to hinder the juices of the body from becoming clammy and thick, and to correct them when in that disposition, in such as would make the trial. This malady proceeds from a want of due circulation of the fluids, which when disordered communicate their bane to the whole mass of blood. He grounded his opinion, as well as on other circumstances, upon the practice so common in voyages to America, in which, when the crew of a vessel is attacked by the scurvy, they make for one of the Turtle Islands, called so from the number of these animals found upon them, when the sick eat plenteously of that food, which, from the quantity of blood it contains, and that of a balsamic nature, is the most preferable of all remedies. On this subject I shall myself remark a custom which prevails in the neighbourhood of the Alps, and in other places. When persons are afflicted with pleurisies, or other complaints arising from the want of the proper circulation of the fluids, they are accustomed to drink the blood of the mountain goats. Although this blood be of a hot nature, it yet produces favourable consequences, from the volatility of its parts; exciting remarkable transpiration, and promoting sweat.

* See what Father Labat says in his new voyages to the American Islands on this subject, when treating of the Caribbees.

"I must observe in addition, that this is not the only mode of kindling fire which is practised by the Americans: some among them have a particular instrument appropriate to this service. It is to me an object of surprise, that the inhabitants of Kamschatka use the same instrument." (Vide the before-cited work of Müller, page 257.) The learned author then observed another place, where some Americans were taking their dinner, but who fled on his approach. He found, on proceeding to the spot, an arrow, and an instrument for kindling fire, fashioned in the same manner as those used in Kamschatka. In his remarks, he says, "It is a board with several holes, with a stick, one end of which a man thrusts into one of these holes, while he mills the other end between his hands; and from the quickness of the motion causes fire. They then apply the sparks to any kind of matter of quick combustion."

violently rubbed against each other, the latter takes fire. This as well being the mode in which the Russian country people produce fire when they are in the woods, and a holy ceremony practised throughout all the villages wherein there is a church, they could not consequently be ignorant of. Probably it may not be unacceptable to those who have never heard a description of it, my giving an account of this ceremony.

The eighteenth of August, old stile, is called by the Russians Frol y Lavior; these are the names of two martyrs inserted in the Romish kalendar, Florus and Laurus; on the twenty-ninth of the same month last year, on which day is kept the fast of the beheading of St. John the Baptist. On this day the Russians lead their horses round the church of their village, beside which on the foregoing evening they dig a hole with two mouths. Each horse has a bridle made of the bark of the linden-tree. The horses go through this hole one after the other, opposite to one of the mouths of which the priest stands with a sprinkler in his hand, with which he sprinkles them. As soon as the horses have passed by their bridles are taken off, and they are made to go between two fires that they kindle, called by the Russians Givoy Agon, that is to say, living fires, of which I shall give an account. I shall before remark, that the Russian peasantry throw the bridles of their horses into one of these fires to be consumed. This is the manner of their lighting these givoy agon, or living fires. Some men hold the ends of a stick made of the plane-tree, very dry, and about a fathom long. This stick they hold firmly over one of birch, perfectly dry, and rub with violence and quickly against the former; the birch, which is somewhat softer than the plane, in a short time inflames, and serves them to light both the fires I have described.

To return to our islanders. It is incontestible that they were acquainted with the givoy agon, and of the means for making it; but why did they not adopt the same plan? They had no other wood than fir, a moist wood of itself, and that moreover furnished them by the sea. What were they to do, if once their fire became extinguished? One readily sees a remedy should be provided. In walking through the island they had remarked that in the middle there was some fat earth or clay. They conceived the idea of making themselves a vessel of it, that might serve for a lamp, which they might supply with the fat of the rein-deer they had killed, and with that of those they should kill in future. This was certainly the most reasonable measure they could adopt. What could they have done without light during the winter, which in this latitude has one night of some months duration? They procured therefore some clay, and made a sort of a lamp therewith; this they filled with rein-deer's fat, and stuck a piece of twisted linen in it to serve as a wick; but they perceived with grief that the fat penetrated the vessel as soon as it melted, and dropt from it on every side. They had now to seek a remedy for this misfortune, arising from the pores of the vessel being too large. This they quickly found. They made themselves for this purpose a new one, which first they suffered to dry well in the open air, and afterwards heating it red hot in a glowing fire, they cooled it in the kettle wherein was a quantity of meal they were about to cook, so that it received consistency from the thin starch. As soon as the lamp had cooled, and they had filled it with melted fat, to their great joy they perceived that it did not leak; but for their greater security they dipped some rags of the linen of their shirts in the before-mentioned soddened meal, and placed them round their lamp. From the success of this essay, they resolved on being careful of the remainder of their meal. As they were very fearful lest some unlucky accident might befall their lamp, they had the foresight to construct another, that at no time they should be in want from any casualty happening.

Possibly it may be asked, where did they find wicks for trimming their lamps? The answer is at hand. On the wreck of the ship, which they had collected with much labour for warming them in winter, was some cordage found, and a small quantity of hemp, the produce of old ropes, used on board ship for caulking, or forcing with strength between the planks, to prevent leakage. When this was expended, they substituted, what they but seldom wore, the linen of their shirts and drawers. All who are acquainted with the Russian costume know that there are few among them but what wear drawers; few of the country people wear any other hose. With this hemp, and this part of their clothing, which among the common people is of a very coarse quality, did they twist wicks; and from the time of their completing their first lamp, to the instant of their going on ship-board again, to return to their native land, they were never without this light burning in their apartment.

The necessity in which they found themselves, of appropriating such an essential part of their clothing as their shirts and drawers to this purpose, was reparable by their employing the skins of the deer which they had killed in the stead, sufficiently adequate in itself as a substitute, had they no other clothing, a case which happened shortly to be theirs. Without mentioning other things which they were in need of, they saw their shoes and boots were worn out, and had no more: they were now but little removed from the violent cold of winter, and must again have recourse to that ingenuity, which seldom leaves men when necessity calls for its being employed. They possessed a quantity of skins of the rein-deer and the fox, which served them for bedding and clothing, and contrived to dress them. This is the method in which they manufactured them.

They soaked these skins in soft water, and left them remaining in it for a day; afterwards, with very little pains, they scraped off the hair, and rubbed the leather, now moistened through, between their hands, until almost dry; they then smeared this over with the melted fat of the rein-deer: they repeated this, rubbing it as before. This contrivance made the leather soft, pliant, and, in short, so flexible, as to be fit for any use to which they might choose to apply it. As for those skins laid aside for the purpose of making themselves pelisses, they were satisfied with letting them soften for one day only in manufacturing them, proceeding afterwards in the same manner as I have before described, excepting their not tearing off the hair. Thus they saw themselves at once possessed of all the materials necessary for clothing themselves from top to toe.

Yet, however, one great difficulty remained to be overcome. They had neither awl to make their shoes and boots with, nor needle to sew their clothing; but they had iron, as we have noticed, and found out means very soon of remedying this need: in short, they forged as useful an awl and needle as those which are used by workmen in these lines of business. It was in the beginning difficult for them to contrive how to make the requisite hole in the needle, although at last it was compassed by the means of the point of their knife, which for this purpose they sharpened and made proper, after having previously forged a sort of wire for a needle, and heated it red hot. I have had an opportunity of convincing myself of the truth of all I have said on this matter. I have attentively examined, through a common magnifying-glass, the eye of this needle. The mode they used of rounding, polishing, and pointing it, so as to be very sharp, was by rubbing it on stones, of which there was an abundance: the only fault that it had was, in that the eye not being so uniform and even as it should be, it was liable to cut the nerves with which it was threaded; but this was a failing they could not remedy.

Although unfurnished with sheers, for the purpose of cutting the hides, yet were they not without a substitute, perfectly sufficient for this use, in the knife which they had so

well sharpened. Thus, although they should not have been tailors nor shoemakers, it appears that these unfortunate men must have become such in this incomprehensible state of embarrassment; since they manufactured hose, shirts, waistcoats, cloaks, or pelisses, boots, shoes, in short, every description of clothing of which they had occasion, whether for winter or for summer. Then they had, which accounts for it, patterns of all these things, the pelisses excepted, before them: with these, industrious and ingenious as they were (which will easily be allowed of them from what has gone before) they had little difficulty in sewing together the skins and hides according to measure; a practice to which they were accustomed. With respect to thread for sewing the skins together, they had to provide for this, and quickly accomplished the means; the nerves or sinews of the rein-deer and bears were divided into thin or thicker threads, as they found most to their advantage; and with this last contrivance they completed all that was necessary for putting them in condition of withstanding the inclemency of the weather.

In summer they were clad in slight undressed skins: in winter they were drest like the Samoiedes and Laplanders, with long pelisses of the untanned skins of rein-deer and foxes. These pelisses had a hood somewhat like that of the capuchins, but protecting more the neck and head: it was all of one piece, with an opening before for the face, remaining uncovered; so that the pelisses mentioned being entire, on laying them aside, they were obliged to draw them over the head like a sack. Separate from the discontent which this lonesome life engenders, and particularly when constrained, and were it not for the reflection which each of them could not refrain from making, of the possibility of his surviving his companions, and consequently starving to death, they possest comforts sufficient to content them, the pilot or boatswain however excepted, who had a wife and three children: he thought (as he himself has confessed to me) every day on his return to them, and bewailed continually the distance which separated him from his family. It is fit, however, that I should now begin the description of the island itself, and recount what this unfortunate inhabitant related to me respecting it.

This island, laid down by Gerard Van Keulin, and by John Peter Stuurman, in his corrected chart of the northern part of Europe, by reference, will be seen to lie between latitude 77° 25′ and 78° 45′ N. under the name of East Spitsbergen, called by the Russians, Maloy Broun; and, consequently, partly in the thirteenth, and partly in the fourteenth* Climate: whence it follows that the greatest length of day-light in the year will be of four months continuance, that is to say on the side of the island opposite to that inhabited by our adventurers. In the before cited chart the island is laid down as describing a pentagon. Its greatest length from East to West being twenty-three German miles, and its breadth from North to South twenty-two. As I had forgotten to question our islanders themselves upon the size of the island, I was obliged in

* The author alluded to in any such division of the globe, as should make the space lying between latitude 77° 25′ and latitude 78° 45′ to fall in the ulterior part of the thirteenth, and beginning of the fourteenth climate, does not appear The table computed by Ricciolus, which is that in highest esteem, divides the globe into twenty climates N. and as many S. that is to say, seven from the Equator to 48° 15′ each having the day in northern latitudes half an hour longer than the preceding; seven from latitude 48° 15′ to 65° 54′, each having the day one hour longer than the preceding (in this latitude, from the refractions of its rays which are computed in the table of Ricciolus, the sun is seen on the twenty-first of June without setting, forming its circuit above the horizon, which circumstance, but for this refraction, would not be visible more South than latitude 66° 30′;) and six climates, in each the day of one month's longer duration than in the preceding, beginning at latitude 65° 54′, and finishing at the pole. By this table the eighteenth climate begins in latitude 78° 6′, that of the center of the Island according to the above noticed latitudes, and the longest day in that latitude is composed by him of one hundred and twenty-four days continuance, the longest night of one hundred and seventeen days length....*Translator.*

order to be able to speak with certainty of it, to avail myself of the chart which was laid before them, after their return to their native country: they found out of themselves their place of exile, pointed out the spot on which their hut had been erected, and marked it with a stroke of a pen upon the map, which was returned to me at Archangel.

A proof that they had not deceived themselves from a knowledge of this island is evident from what Mr. Vernezobre, mentioned already in the beginning of my narrative, writes to me. He says, in his letter of fifteenth of November, 1750. "The captain of a galliot called the Nicholas and Andrew, belonging to count Peter Iwanowitch Von Schuwaloff, passed the winter of 1749 on Maloy Broun. He landed shortly after the departure of our sailors, and discovered the hut which had served them for a dwelling, and noticed on a wooden cross, erected before the door by the pilot Alexis Himkof, an inscription, giving the name to the Island of Alexeyiewskoi Ostrow, that is to say, Alexis Island." I must now remark a circumstance contained in this letter, which shews that the island must be of tolerable extent: "Certain Samoiedes hearing of the adventures of our sailors, and this country being suitable to them above all others, requested to speak with Mr. Vernezobre; they wished to be permitted to inhabit it, and to be transported thither without reward, themselves with their wives, their children, and their rein-deer."

Before I enter into a detail on the the nature of this island, it may perhaps not be out of place to make the following remark. Some authors have advanced that the country known by the name of Nova Zemla is not properly speaking an island, or, as others maintain, a part of our continent, but only a heap of ice, held up and collected together in the lapse of time, which travellers have represented as an island. The ground on which they build their assumption is this among others: when (they say) men dig to the depth of one or two feet through the stratum of earth, which the wind has blown over here from the coast of Asia, nothing but ice is found below.

I cannot undertake to decide in this matter: this has no relation to my subject: I have not read the authors who have published their sentiments in support of, or in opposition to, this hypothesis. I am content with observing simply that the island East Spitsbergen, of which I am treating, must be looked upon indisputably as real land, according to the representations made to me by these sailors.

They found, as they told me, many mountains and craggy rocks of an astonishing height, continually covered with ice and snow. They did not meet with the smallest tree, nor even the most diminutive bush, the Cochlearia excepted, which was very sparingly found. No grass grew, on the other hand moss was seen in abundance every where. In the middle of the island they discovered some fat earth or clay, whence it is probable that some persons have conceived that there were ice mines in this place, or that this itself was formerly nothing else: it is not impossible, were they to go and dig there, that they would shortly get to the ice. They certainly had no rivers, although they never wanted water: but a number of streams flowed at all times from the mountains and rock, supplied from abundant sources. Besides flint stones, which were common, the island furnished a kind of stone proper for burning for lime. This stone produced here on the surface of the ground, in other countries is usually dug from quarries: (it is customary in Russia to burn lime, and lay the floors of their houses with it.) I should have taken the stone to have been hewn, were it not for the circumstance of its splitting like slate after long exposure to the air, and being separable like slate into scales. This kind of stone is called, by the Russians, plit. To conclude, at the sea side of the island the shore is covered with sand and gravel, which continues some little distance towards the interior.

I had the precaution to learn from the sailors whatever I have yet described. It was natural as well that I should be curious enough to question them respecting the length of continuance of the shining of the sun, and its absence; as also concerning the temperature of the air, and the different changes in it which they had remarked: in short, I inquired of them respecting all the phenomena observed by them, during their unpleasant stay on this island.

Upon my putting to them the question, at what time the sun began to appear above the horizon? They answered me: it appeared the beginning of the great fast.* This answer did not however designate any particular day: the time of the fast changing always according to Easter's falling early or late. Simple country people, unacquainted with the mode of computing for Easter, and who possibly had never remarked the circumstance of this feast happening sometimes earlier, sometimes later, such were not consequently competent to satisfy me on this point.

The day they began to perceive the sun shew itself, revolving entirely above the horizon, was the feast of St. Athanasius, which happens on the second of May, old stile, or the twenty-first of April, according to the Gregorian Kalendar.† They told me farther that it circulated thus to their observation for ten or eleven weeks. If the

* As it appears in the course of the narrative, that the sailors by some means kept such good reckoning of time as to err only in two days, or owing to their having omitted the additional ones in the two leap years which occurred, say four days, is it unreasonable to imagine that they would bear in mind the period at which Easter was kept in the year of their departure from Archangel, and consider it as fixed on the same day in the succeeding year? If we grant this, as Easter-day in the year 1743, fell upon our third of April, according to the Julian Computation for Easter, Lent would consequently begin on the twentieth of February, and if that day be the one on which the sun was seen to emerge first from below the horizon, it will differ from the table of Ricciolus, which calculates, for the refraction of light, by only two days; the time it should be first seen according to that, in this latitude, being the eighteenth of February, and it may fairly be presumed that unacquainted with the length to which their wintry night would extend, and keeping in their hut as much as possible during the severe cold of that season, they might have missed the first actual appearance of the sun, and that for the two days which make the whole difference. ..*Translator.*

† The date here described, at which the sun was seen to complete its revolution above the horizon, is as near correct as could be expected. By computation of Ricciolus, before adverted to, it should happen on the twentieth of April. As to the period of its ceasing to shine, the account of its being but ten or eleven weeks is incorrect. It would have appeared for as great a length of time above the horizon after the solstitial day as before, and consequently would have shone for nearly eighteen weeks, instead of ten or eleven, viz. from the twentieth of April until the twenty-second of August, N. S. The calculation of the person to whom M. Le Roy referred for information is also incorrect. The refraction of the rays of the sun by the atmosphere causes it to be visible above the horizon before it be actually risen, and makes it appear some time after its setting; so much so, as to make a material difference in the length of its appearance in a latitude so much to the north, a matter not calculated by him. The computation afforded to M. Le Roy, and that of Ricciolus, which is considered correct, I have given below.

	Length of appearance.	Length of disappearance.
By M. Le Roy's friend	119	111
By Ricciolus	124	117

Respecting the time of the first appearance of the sun above the horizon, it is possible, from its being so much desired, it would have impressed itself upon their minds. The novelty of its revolution above the horizon, or rather a curiosity of ascertaining how long it happened before the time such an occurrence takes place at Archangel, might have made them more particular in noticing this date; the day of its discontinuing to revolve wholly visible being of minor interest, since it yet had to shine for a great part of the twenty-four hours for a long while, was not so carefully attended to. The real time at which, from computation, it would cease wholly to be visible, would be the twenty-fourth of October. They state this to have been the case on the twenty-sixth of October, O. S. which is the fifteenth, according to our kalendar. May not their ceasing to see the sun so long as nine days before the time at which it should have been wholly invisible to them have been occasioned by the great fogs, which in the autumn so constantly prevail in these latitudes, according to the various accounts of all those who have proceeded so high towards the north? With these allowances made, and this doubt granted in their favour, they will appear to have been as correct as men in their circumstances of life could possibly be expected to have been.... *Translator.*

latter period of time be taken, which from the situation of the island must be the nearest to truth, the time of its beginning to set will thus be fixed, according to them, upon the seventh of July. From these the sun began to set every day, until the feast of St. Demetrius: On that day it ceased to shine entirely.

This account of our Islanders is not correct. Upon consulting a person well informed on these matters, I was given to understand, that provided the island upon which they were had been situated in the 77½° of latitude, as it is described on the chart, the sun would have been seen for the first time upon the fourth of February, would revolve above the horizon from the eleventh of April until the eighth of August, and would entirely disappear upon the sixteenth of October.

It is possible these poor fellows may have erred, as well with respect to the duration of the sun's appearance and disappearing, as to the time of its revolution above our horizon, from their being desirous of ascertaining them by the feast days of the church; and, as will be gathered from what follows, they were as well greatly in error in regard to the date of their return from this island.

It was the fifteenth of August, old stile, the feast of the Holy Virgin Mary, when the vessel, which brought them back to their native country, arrived at this island. But our worthy sailors, who had made preparations in as good a manner as they were able to keep this high holiday, reckoned the feast two days later, and consequently esteemed that day to be the thirteenth of August. A mistake of small consequence, which might arise from accountable causes, seeing that they for four months together had the sun revolving above the horizon during the summer, and in winter spent nearly an equal time in utter night and darkness: besides the weather being so gloomy and cloudy at times; and the rainy and snowy seasons depriving them of the sight of the stars. It is natural for the reader to inquire, how these men, who had neither clock nor watch, neither sun nor moon dial, could reckon the natural days while the sun continually shone, and more particularly at that time when it was no longer visible? I did not neglect to interrogate them on this subject. The boatswain, hurt at my question, answered me with some emotion, "What sort of a pilot should I be, if I were ignorant of the method of taking an altitude of the sun, when that planet were visible? Or if I knew not how to tell by the course of the stars, in the absence of the sun, what were the fit hours for bed time, out of the twenty-four? I had made myself for this use a proper sort of staff, similar to that which I had left on board our ship, and which served me to take my observations by." I conceive the instrument which he mentioned to me on this occasion was what is called a Jacob's staff, or one somewhat resembling it.

The moon is visible, as they informed me, in this country during the winter for nearly two months together, and rises higher in proportion to the days becoming shorter. I leave to astronomers the task of criticising this appearance, contenting myself with relating simply their deposition."*

* A similar example of the revolutions of the moon above the horizon in the absence of the sun, remarked by the Dutch in 1576, who wintered at Nova Zemla, in 76° of latitude, may be seen in the third voyage of the Dutch to the North, pages 66, 67.

"On the first of November, during the twilight, we saw the moon rise in the east, the sun being yet perceived tolerably high above the horizon. On the second, the sun was seen to rise in the S. S. E. and set nearly in the S. S. W.; but the whole of its globe did not show itself, being observed only in the horizon with a part beneath. On the third, it rose in the S. E. by S. but rather nearer to the S.; and declined somewhat to the S. of S. W. by S.; the upper part of its globe appearing from the spot where its height was taken, about as high as the tops of the vessel, which laid in that direction. On the fourth, it was seen no more, the weather yet remaining very fine."

In winter they frequently were spectators of that phenomenon called by naturalists the northern lights. This contributed greatly for a time to diminish the dismay, which the thick darkness in which the hemisphere is enveloped in this climate during so long a night is calculated to impress on the mind of man.

One would imagine a country so near the pole, and in which the heat of summer is very tolerable, notwithstanding the continual shining of the sun for some months together, would be subject to excessive and insupportable cold, as long as winter lasted: nevertheless, it has a different peculiarity. For about seven weeks, namely, from the middle of November until the beginning of January, reckoned by these good men according to holidays, viz. from the beginning from that of St. Philip, which falls on the fifteenth of November, until the day of consecrating the water, called the Holy Three Kings, and which is on the sixth of January; for these seven weeks it rained for the most part abundantly, and without ceasing, on this island, the weather being pretty mild, and the cold very supportable; however, after this period, that is to say, when the land winds blew; and more particularly the south, the cold became insufferable.

This may indeed occasion some surprise, since the south wind is generally warm in all countries, and the north commonly cold: but we must take into consideration, that the south wind in respect to our islanders blew over all Europe, in winter covered with snow; and particularly over the northern part, where the cold is extreme: but the north wind sweeping an open sea, instead of cold, brought exhalations, yet somewhat fresh in themselves, as they always bore along some snow with them: most men will have noticed when in harbour, that the land breeze is at all times colder than that from sea. What confirms this account is, that all those who have been upon the Riphæan mountains or chain, called the Poias Semnoy, and which separates Russia in Europe from Siberia, give a similar description with our mariners of the quality of the north and south winds.

As for snow, such an astonishing quantity fell on this island, that their hut in winter was commonly entirely enclosed by it, so that they were left without any other means of getting out, than by an opening which they contrived in the roof of their entry room.

In reply to my inquiries respecting tempests, these sailors informed me, that they did not once hear it thunder during their residence on the island.

If we except white bears, rein-deer and foxes, which, as I have before noticed, were found in great plenty on the island, it is destitute of all four footed animals, as well as of men. It is true some wild fowl were seen in summer; but they were only geese, ducks, and other water fowl.

The sea likewise round about the island is destitute of every kind of fish. Our sailors, in other respects very strict in their religion, contrary to the custom of this description of people, could not therefore observe either the great or the single fasts. Nay, had there been a superabundance of fish upon the coast, these unfortunate men could have derived no benefit from the circumstance; since, as they had neither tackle nor nets, they could not have caught them: the choice of meat might in such a case however have suggested to them, to employ their ingenuity in constructing tackle; this they probably would have effected in the end, yet at any rate not without great difficulty.

Few whales were perceived nigh the shore, but sea dogs and sea calves in very considerable numbers. It must not therefore be wondered at that the Russians should have

" When the sun left rising, the moon assumed its place, and shone day and night without setting, as it was then in its highest quarter." See Recueil des Voyages qui ont servi a l'etablissement et aux progrês de la Compagnie des Indes Orientales formée dans les Paya Bas.

sometimes wintered here; with the skins, the teeth, and the oil, of these animals, and particularly of the last mentioned, they carry on a considerable trade: what rather should excite astonishment is, the circumstance of no ship's arriving at the island during the whole time of our sailors' residing there. Hence I suspect that the advantage derivable from the fishery in this quarter is not equal to that upon the western coast of Spitsbergen, to which ships commonly sail.

They told me it frequently happened that they met with teeth of sea calves upon the shore, and sometimes jaws of those animals, but never entire carcasses. This can excite no wonder. It does not admit a doubt, that if they died on the shore, they would be devoured by the white bears, and probably by the foxes as well.

The great number of teeth and jaws with which the shores are bestrewed makes me suspect, with great probability, that these carnivorous beasts frequently surprise the sea calves when asleep, and devour them. I am led to this suspicion, from a knowledge of its being common for the bears to feed on the dead whales, which are frequently seen floating on the sea, or are cast upon the shores of these islands contiguous to the pole. We have before observed, that the rein-deer are supported by the moss, which grows plenteously in these uninhabited and desart regions; but what feeds the foxes that are met with? It is well known that this animal is carnivorous, and lives on the continent upon fowl, and hares, which it surprises: it is also probable that in this country its food is those animals which the bear has killed, and which, not having power itself to attack, have yet fallen an easy prey to that stronger beast.

Before I proceed to mention the lucky and unhoped-for deliverance of our sailors from their lonesome situation, a situation in which they expected to pass their days, I must now relate an incident which I had omitted before, and which is well worthy of remark: as long as they remained upon this island, they had been free both from lice and fleas; and it was not till their return to their native country, that these vermin made their appearance again upon them.

Most writers of voyages have remarked that upon crossing the equinoctial line, sailors, who are much subject to be lousy, and the clothes which they wear, that is to say, their checked shirts, become immediately clear of them: as soon however as they recross the line, they are pestered with these vermin again as much as before. These two similar incidents occasion me a reflection reasonable enough in itself; it is, that since the passing of the line and the passing of the polar circle produces a similar effect, there must needs be between the one and the other a connection, into which it would be well that naturalists should examine.

Our unfortunates had now been nearly six years in this dismal situation, when Feodor Werigin died, reduced to a skeleton; so much had he suffered from his dreadful illness. Released it is true from the cares of attending and feeding him, and from the grief of seeing him suffer, without the power of affording him relief, they did not yet see his death without emotion; they saw their number now diminished, and there were but three remaining. As his decease took place in the winter, they made a hole in the snow as deep as possible, and laid his corpse in it, covering it in the best manner they could, that the white bears might not get to and devour it.

To conclude, at a time when every one was reflecting upon this last duty paid to their companion, and under apprehension that it would be his lot to lay by his side, contrary to all expectation, a Russian vessel appeared in sight, on the fifteenth of August 1749.

On board the ship was a merchant of a certain sect, called by its professors Stara vieva, or the ancient faith, a good and worthy character The ship was originally in-

tended to winter in Nova Zemla, by its principal; however, fortunately for our sailors, M. Vernezobre proposed to this merchant, to change that destination for Spitsbergen; which proposal, after many excuses, and much demurring, was complied with.

The wind being contrary on the voyage, the ship was not able to reach the intended station; they therefore directed her course towards East Spitsbergen, directly opposite to the spot inhabited by our adventurers. They perceived the vessel, and made haste to kindle different fires upon the hills in the neighbourhood of their dwelling; they hoisted as well as a flag staff upon the shore, a rein-deer's skin, which they fastened to it, serving them for a signal in lieu of colours. Those on board the ship observed these signals, and concluding that they were made by people who intreated their assistance, they came to anchor.

It would be useless for me to attempt to describe the joy with which these unfortunate men were filled, at seeing so nigh the instant of their unexpected deliverance. They treated with the commander of the vessel, entered his service, and agreed with him for the transport of themselves, and all their effects, to their native land, for which they were to pay him eighty rubles. They put on board the vessel fifty pood, or two thousand pounds of rein-deer's fat, and a number of hides of these animals, as well as blue and white fox skins, and those of the ten bears which they had killed: they did not forget their bow, their arrows, their spears, or lances, their axe, almost worn to the handle, and nearly used up knife, their awl, their needle, which were inclosed in a bone box very ingeniously worked with their knife, the nerves or fibres of the white bears and rein-deer, in short, whatever they possest.

These different articles which I have described were sent by M. Vernezobre to count Von Schuwaloff, and by him were confided to my care: I had full leisure to examine them, and to lay them before the unsated curiosity of several persons; among other different professors of the Imperial Academy, Dr. Wissenschaften, in whom they excited astonishment. In company of these latter gentlemen, I conversed with the pilot Alexis Himkoff, and his godson the sailor, Iwan Himkoff, and questioned them at different times on their adventures.

I must be allowed in proceeding to mention a trifling circumstance, relative to the little box which these men had made for holding their needle.

I shewed this box to certain virtuosi, and informed them that the sailors had made it with a knife, and solemnly assured me of it; these gentlemen did not believe that they told the truth; they would have that it was turned, and that these men had deceived me, in giving out that it was their workmanship; whence they concluded, that, as they had told a falsity on this occasion, there was left room for doubting of what they had related respecting the events on the island which they had inhabited.

By chance it happened that while we were in conversation on the subject M. Homann, a very ingenious turner, came into my apartment. As soon as I saw him, I observed to the company, you see that man, he is certainly the fittest person that can be to decide this matter. I stept towards him, and gave the question a different turn, in order that it might not be suspected that M. Homann should answer me with more courtesy than truth. You must decide, sir, said I, on the point I have to question you between this gentleman and me: I maintain that this box is turned: this gentleman the contrary. After Homann had taken and examined it, he answered me, this gentleman is in the right: this never was made with a turning lathe: it is a bone, which has been rounded by shaving it. This answer silenced the company. It was now my turn to speak: I observed, that since on this occasion these sailors had told truth, in what we had heard decided, there is no room left for doubting the remainder of what was related by them.

I come now to the return of our mariners: they arrived safe at Archangel the twenty-eighth of September 1749, after, as I have before noticed, having passed six years and three months in this dreadful seclusion.

The instant of meeting of the pilot and his wife was threatened with a melancholy catastrophe. She was standing on the bridge as the vessel arrived: she recognized her husband; she loved him most sincerely; she had so long bewailed him as dead; but now, inconsiderate, without patience to wait till the ship came to the pier, she threw herself forward to clasp him in her arms, she fell into the water, and with difficulty was saved from perishing.

I must now in conclusion remark, that these men, who had lived so long without bread, ate it now with reluctance. They complain of its puffing them out. The same objection in short they make to all sorts of drink, and now make rain-water alone their beverage.

APPENDIX.

The learned man, which I mentioned in my narrative I had consulted respecting the reckoning of our islanders, concerning the rising and setting of the sun, and whatever related to the course of that planet, was Professor D. Krazzenstein, member of the Imperial Academy of Wissencshaften, at Petersburg. This is the translation of the letter which he wrote to me on this subject.

"I have to apologise to you for having so long delayed to send my opinion on the questions respecting which you wrote to me: the time which the calculations required, and the long continuance of the rains, have prevented my doing so before.

"After considering the matter with great attention, I find that the circumstance which Professor Grischon adduces as a proof of the exactitude of the reckoning of our islanders, namely, the two days later reckoning than that of the mariners who brought them from the island, has a direct contrary tendency.

"Let any reckon the twenty-ninth of February in a leap-year, this day will be reckoned by those who have no knowledge of the interpolation of a day as the first of March; and after two such years, what by one will be counted the twenty-ninth of February, will by the other be esteemed the second of March; hence it follows, that if our islanders had neglected to attend to the bissextiles, 1744 and 1748, they would consequently have reckoned that the seventeenth of August, which their deliverers called the fifteenth. It is also evident, that, if they paid attention to the leap-years, they made a mistake of two days, and if they did not allow for them, they erred in computation by four days: this can appear but trifling, if we consider the dark and cloudy season of winter, where they were without means of estimating the regular day. Furthermore, in that year when they noticed the entire disappearance of the sun on the twenty-sixth of October, they must have erred in their time, by being ten days in advance, or we must necessarily presuppose that they were in latitude 74° 41′, which can hardly be imagined. Bears' Island is in that latitude, where they must in such case have been, which is not probable.

"If their place of residence was in latitude 77° and a half, as laid down upon the chart, the sun would then shine for the first time the fourth of February: from the eleventh of April to the eighth of August it would be continually above the horizon, and finally, on the sixteenth of October it would wholly disappear.

"Had they been on Bears' Island, they would have seen the sun the first time on the twenty-eighth of January: the shining of the sun above the horizon would have continued from the twentieth of April until the thirty-first of July, and on the twenty-third of October it would have disappeared entirely.

"From the remarks of our islanders, it would appear more likely that they were on the last mentioned island; but the duskiness of the atmosphere at the horizon, a circumstance attendant on northern climates, may be the cause of their having perceived the circulation and absence of the sun almost ten days later and ten days earlier than computation will shew.

"If the beginning of the revolution of the sun above the horizon be placed on the second of May, the end of this revolution above the horizon must happen on the nineteenth of July, and in this case they must have been in 71° and a half of latitude; which is not possible.

"I wish we had the relation in the possession of M. Von Klingstadt of Archangel, that we might add it to yours. Probably, by this means, what is wanting might be supplied, particularly the exact time of these sailors arriving from the island. I have no doubt, were you to communicate the wish, that he would take a pleasure in gratifying you; he fills the station of Sub-auditor of the Admiralty, and dwells with M. Vernezobre. I am, Sir, &c."

At the close of this Narrative I must add two things: the result of the illustration of M. Von Klingstadt, and the reflexions with which M. Vernezobre terminates the first letter he wrote to me respecting these sailors, and the account of their adventures.

One of these men, says M. Von Klingstadt, is called Alexis Himkoff, and is fifty years of age; another is named Stephen Scharapoff, forty-two years old; the third, by name Iwan Himkoff, is in his thirty-sixth year. All these, on their arrival, were in sound and perfect health: I myself had occasion to remark it, upon questioning them on the particulars of such an extraordinary residence, attended by such a wonderful preservation.

These are the reflexions of M. Vernezobre. The English have a fabulous history of Robinson Crusoe; this history however is certainly true. The first is represented in a warm climate; but our sailors were in 77° and a half of latitude. The Englishman was enabled to make a kind of punch with the raisins which grew on the island; but our hardy and sturdy Russians were under the necessity of contenting themselves with water. Robinson had lost almost all knowledge of Christianity; but our adventurers at all times, as I am assured, preserved their faith, and unceasingly placed their confidence in God.

ACCOUNT OF A VOYAGE TO SPITSBERGEN IN THE YEAR 1780, BY S. BACSTROM, M. D.

COMMUNICATED BY THE AUTHOR.

(PHIL. MAG. JULY 1799.)

SIR,

HAVING received much gratification from a perusal of your Magazine, I send you a few particulars respecting a voyage which I made to Spitsbergen in the year 1780, extracted from a journal I kept at the time; which you may lay before your readers, if you think they can contribute either to their information or amusement. I am, &c.

To the Editor of the Philosophical Magazine. } S. BACSTROM.

A VOYAGE to Greenland, as it is called, though in fact to the island of Spitsbergen, for the purpose of killing the black whale fish, is one of the healthiest that can be undertaken, and furnishes so much curious matter for amusement to persons of an inquisitive turn of mind, that even a second will hardly satisfy such, if they have been fortunate enough to sail with a good commander, and in a vessel well appointed. In both these respects I was very fortunate, which is rather uncommon, the masters or commanders in the Greenland trade being generally men of little or no education, and consequently void of those liberal sentiments necessary to render the situation of those who accompany them comfortable. If a regularly educated surgeon, from a desire of visiting such northern regions, goes in a vessel under such a person as I have described, he is generally sickened the first voyage; a barber is perhaps his successor, and when any illness or accident happens on board, if the patient escapes with his life, he is often rendered a cripple. I have seen some instances of this kind.

The unsociable disposition of the master is not, however, the only circumstance that often deters from a second voyage. I have known vessels well stored by the owners with every necessary and useful article, and even a liberal supply of what some would call luxuries, and yet every comfort withheld from those on board; the master literally starving himself and officers, and not allowing a bit of fire in the cabin, in these cold latitudes, that he might save a few coals, some dozens of hams and tongues, a quantity of cheese, butter, flour, wine, porter, &c. to send home to his own family at the end of the voyage: a paltry theft, at the expence of the health and frost-bitten limbs of those on board.

When the reader is informed, that such has been my passion to visit foreign climes that I have been no less than fifteen voyages, one of them round the world, he will not be surprised that I should wish to gratify my curiosity by visiting the frozen regions, even though I knew something of the inconveniences before described, to which those who undertake the voyage are often exposed. My business was to guard against them as well as possible, by proper inquiries respecting the character and disposition of the master, and I succeeded to my wish in two voyages to these parts: the first was in the Sea Horse, in the year 1779, which yielded me much satisfaction; but I was more completely gratified by the second, which is the one I mean to describe.

I engaged myself as surgeon on board the Rising Sun, William Souter, master. A well appointed stout ship, of four hundred tons burthen, in the employ of Mr. William Ward. The vessel carried about ninety men, and had twenty nine-pounders mounted on the main deck, with nine whale-boats, some of them hung in the tackles over the sides, and others stowed and lashed on the deck.

We sailed from London in the latter end of March 1780, and, as is usual with Greenlandmen, called at the town of Larwick, the capital of the Shetland isles, where we found a most hospitable reception. A Mr. Innes, the most opulent inhabitant of that country, kept an open table for every master of a vessel and his surgeon; and no language can convey a proper idea of the kind and disinterested manner in which he received and entertained his guests. We lay there fourteen days wind bound. The country has a bleak barren appearance, the surface being generally rocky, or covered with turf, which is the fuel employed there; but the benevolence and hospitality of the more opulent, and the decency, sobriety, and good conduct of all the inhabitants, even those of the lowest class, more than compensate for the barrenness of the soil.

Provisions of every kind, the finer vegetables and fruit excepted, are very abundant here, and extremely reasonable. The price of a good fowl was three pence, of a dozen of new-laid eggs one penny; and as much excellent fish, cod, haddock, hallibut, mackerel, &c. could be bought for one shilling, as would cost at least ten pounds at Billingsgate, or as used to dine our whole ship's company and the cabin. Potatoes, turnips, &c. are not more common there than peaches and apricots in England. Wheat flour is also a rare article, but the inhabitants in general prefer bread made of oatmeal.

The town of Larwick consists of about two hundred houses, of one, or at most of two stories, which form a narrow crooked lane on the sea side, badly paved with flat stones. All the houses are built of quarry stone: those of the rich are roomy, strong, convenient, and well furnished; those of the poor are small, and very smoky, for want of a proper arrangement of the chimnies.

Though the place lies in 60° north latitude, the winters are not severe; they are, however, wet and stormy. The harbour is very capacious and safe, and the anchoring ground good. About twenty or more English Greenlandmen were lying here at anchor, and several Dutch herring busses. Having filled our empty water-casks, and laid in a stock of fowls, eggs, geneva, &c. we took leave of our kind friends on shore, and, the wind being southerly, hove up our anchor, and set sail for the ice.

As we advanced to the northward the night became shorter till we came near North Cape in latitude 71° 10′ when we had no night at all. We were overtaken in that latitude by a most tremendous gale of wind from the north-east, which lasted three days and nights. Our ship lay more than once on her beam ends, and every one on board thought she could never right again; but providentially we weathered the gale. A storm in those high latitudes is so intensely cold, when it blows from the north and north-east, that it is impossible to look in the wind's eye, as the cold is such as literally to tear the skin off the face.

In about 76° northern latitude we meet with ice floating in small round cakes, by the sailors called pancakes: you sail through this ice in perfectly smooth water; which, from being of a green colour in the North Sea, blue to the Northward of Shetland and Ferro, grows gradually of a darker colour, and looks now of a deep black dye. We sailed several days through these floating ice-cakes. When in a still higher latitude, an open black-looking water re-appears, and when you reach about 77° or 78° you pass through large masses of floating ice, twenty or thirty fathoms thick, and some of them five or six times bigger than your own vessel. Great care is taken to avoid striking against those masses, which sometimes are so close, that there remains only a narrow channel for the ship to sail through. I have seen this continue for twenty-four hours or longer. When this is the case, the commander stands in the main or fore-top, and sometimes higher, and calls down to the men at the wheel how to steer. This navigation is attended with great danger, as the ice projects under water sometimes two or three fathoms.

After navigating through those floating masses, we saw the land of Spitsbergen east from us. It is seen at an almost incredible distance, sometimes at thirty leagues; a proof of its immense height. It generally appears amazingly bright, of the colour of the full moon, while the sky above it looks white and cold.

In 79° and 80° you are prevented from going further to the northward by a solid continent of ice, or a collection of ice-fields, as they are called; some of which are many miles in extent. You make the ship fast there with an ice-anchor, and look out for whales, having two or three boats on the watch constantly.

No ship could ever possibly navigate through the huge masses of ice, which must necessarily be passed before it can reach this high latitude, but for a circumstance which would on first view be little expected....the sea there is always as perfectly smooth as the river Thames: the irregularly disposed masses of ice prevent the water from ever acquiring, by the impulse of the wind, those regular undulations, if I may use the term, which, by long continuance of the same impulse, would otherwise at last raise it in billows.

As soon as we got into smooth water, perhaps forty or fifty leagues from the land, the severe climate and intense cold we had experienced on the passage in a more southern latitude, before we made the ice, changed into a much milder one; and when it was fine weather it was quite warm, so that the icicles that hung from the large masses of ice dissolved and kept dropping till a return of cold weather. Among the fields of ice, but more so in the harbours, it is considerably warmer than on the passage near North Cape.

In the month of June we killed seven large whale fish, and went with them into Magdalena bay, to cut the blubber up into small bits to fill the blubber-butts; which business is called making off. As the killing of the whales has been very well described by Zorgdrager and others, I need not describe it.

When you approach a harbour on the coast of Spitsbergen, and, judging by the eye, expect to get in and come to anchor in three or four hours time, you are perhaps not less than ten or twelve leagues from it. This deception is owing to the immense heights of the rocky mountains covered with snow, and bordered with ice towards the sea-side, which make very large harbours appear like small basons, and the largest ships, when close under them, like a boat on the Thames. Magdalena Bay, in 79° north, is capacious enough to hold the whole British navy; but, on account of the immense mountains which surround it, appears like a very small inlet. We came to anchor in this bay, where we lay three weeks. While the people were making off, the masters, surgeons, &c. of the different vessels then there visited each other, and diverted themselves in the best way they were able. Such visits last sometimes twenty-four hours, for there is no night to interrupt the entertainment.

The first thing that strikes a curious mind here is that solemn silence which reigns around; sometimes interrupted with a noise, like thunder heard at a distance, occasioned by huge fragments of ice and rocks rolling down from the immense steeps into the sea.

I attempted to ascend one of these mountains called Roche Hill. I got up about half way, which took several hours hard labour. At that height I found the rocks covered with birds' eggs, of different sizes.

There are several rivulets and waterfalls of excellent water supplied by the melting of the snow. I met frequently with scurvy-grass, wild celery, endive, water-cresses, and a few other plants and flowers; though the general vegetation which covers the rocks consists in various kinds of mosses and ferns. There are white bears, of an enormous

size, white foxes, deer, and elks, and above twenty different sorts of water and land birds; such as wild geese, wild ducks, sea-parrots, roches, sea-guils, mallemooks, as the sailors call them, whose quills make the best drawing-pens I ever met with, wild pigeons, the white duck with a beautiful scarlet head and yellow legs, and the snow-bird, whose note is as pleasing as that of the bullfinch or nightingale.

This season was the finest ever remembered in those high latitudes, and we had almost constant fine weather. As we had room yet on board, and the season was not too far advanced, in hopes of killing a fish or two more, we left Magdalena Bay, and steered north. When we arrived in 80° we found a perfectly clear ocean, free from ice, but saw no whales.

We continued pushing to the northward with fine southerly breezes and most beautiful weather, and could, with a good telescope, discover no ice to the northward, from the main-top-mast head, but a solid continent of ice east and west; so that we were in a kind of channel of perhaps three or four leagues wide. We kept pushing on, the captain and I joking together about passing through the pole.

Both captain Souter and myself found ourselves at length some minutes north of 82°, where perhaps no man before us had ever been, nor since. The high snowy mountains of North Bank, or North Foreland, appeared very luminous, and bore south on the compass.

We had a strong inclination to push still further north; but the danger of the east and west ice, now to the southward of us as well as to the northward, moving and locking us in, in which case we must have been beset and inevitably lost, created a prudent fear, and induced the master to put about ship for North Foreland. The wind shifted at the same time to the northward, and in a couple of days we came to anchor on North Bank, called Smeerenburg's Harbour. We saw now plenty of fin-fish or finners, white whales, and unicorns; which is a sign that the season is over for killing the black whale, which then retires to the northward. As all these animals are well known and described, I forbear saying any thing respecting them.

One of our men having been at the habitation of the Russians in North Bank the year before, and assuring us that he could find the way to their hut, captain Souter, a man of an inquisitive mind, proposed to me to pay them a visit. We took ten or twelve men with us, a compass, a few bottles of wine, bread, cheese, &c. and some good trade-knives, with a small keg of gun-powder, to make a present of to the Russians.

We landed at the bottom of the harbour to the eastward, where we found a large valley, several miles in breadth, surrounded with immense high mountains, mostly covered with snow; but as the sun had melted a part, the brown and black rock appeared, and rivulets of clear water ran down, forming little waterfalls.

The ground was turf and clay, and not bad to walk on: we had several small rivulets to cross, of two or three feet wide, but very shallow: near them we found scurvy-grass, water-cresses, endive, wild-celery, and a few small flowers, and saw a number of land birds flying up at our approach. We crossed a piece of ground where the Dutch had formerly buried their dead: three or four of the coffins were open, with human skeletons lying in them. Some inscriptions on boards, of which above twenty were erected over the graves, had the years 1630, 1640, &c. affixed to them. We also saw the ruins of some brickwork, which had been a furnace, as the Dutch used to boil their oil here in the last century, and for that reason called it Smeerenburg's Haven, or the Harbour of the Fat Borough. We had above six miles to walk to the northward, and were very much fatigued, on account of the unevenness of the ground and the heat, when we discovered

the hut of the Russians at a distance. They perceived our approach, and sent two or three people to meet and welcome us.

The common men made a strange appearance: they looked very much like some Jews in Rag-fair or Rosemary-lane: they wore long beards, fur caps on their heads, brown sheep-skin jackets with the wool outside, boots, and long knives at their sides, by way of hangers. When we arrived at the hut, we were presented to the caravelsk or commander, and to the surgeon, who both received us very politely, and invited us into the house, where we sat down to rest and refresh ourselves. Our people were introduced to their people in an outer room, and were entertained with meat and brandy. It happened fortunately that the surgeon was a German, a native of Berlin, of the name of Iderich Pochenthal, consequently I could converse with him; and we both acted as interpreters between his and our commander.

Captain Souter began with offering to the Russian commander (who was also dressed in furs, only of a finer sort, and wore his beard and whiskers like the common men) the keg of gunpowder, and half a dozen of good table knives and forks: the Russian captain accepted them with a great deal of joy, and made us a present in return, consisting of half a dozen of white fox skins, two brown loaves of rye-bread, six smoked rein-deer tongues, and two rib-pieces of smoked deer, for which we kindly thanked him. They turned out to be most excellent eating, and of a finer flavour than any English smoked tongues, or hung beef.

We placed our wine on the table, our bread and cheese, and the Russian captain ordered boiled smoked rein-deer tongues, new rye-bread, and good brandy and water, to be brought in. We all made a hearty, sociable meal; the tongues, and the rye-bread, which was new and savoury, were a rarity to us: the Russian officers relished our Cheshire cheese and ship's biscuit as a very high treat. We drank the empress of Russia's and king George's health. The Russian commander was an elderly man, of very agreeable manners; the surgeon extremely so, and very intelligent.

The hut consisted of two large rooms, each about thirty feet square, but so low, that I touched the ceiling with my fur cap. In the middle of the front room was a circular erection of brick-work, which served as an oven to bake their bread, and bake or boil their meat, and at the same time performed the office of a stove to warm the room. The fuel employed was wood, which drives on shore plentifully in whole trees stripped of their branches. A chimney carried the smoke out of the roof of the hut; but when they wished it, they could, by means of a flue, convey the smoke into the back room, for the purpose of smoking and curing their rein-deer flesh and tongues, bears' hams, &c. Round three sides of the front room was raised an elevated place of about three feet wide, covered with white bear skins, which served for bedsteads. The captain's bedclothes were made of white fox skins sewed together; the surgeon's was the same; the boatswain, cook, carpenter, and the men, had sheep skins. The walls inside the room were very smooth, and white-washed; and the ceiling was made of stout deal-boards planed smooth, and white-washed.

The rooms had a sufficient number of small glass windows, of about two feet square, to afford light: the floor was hard clay, perfectly smooth: the whole hut was nearly sixty feet in length, and thirty-four wide outside; and was constructed of heavy beams cut square, of about twelve inches thick, laid horizontally one upon the other, joined at the four corners by a kind of dove-tailing, caulked with dry moss, and payed over with tar and pitch, so that not a breath of air can penetrate: the roof consisted of thin ribs laid across the beam-walls, and three-inch deal nailed over them, so that you could

walk on the top of the house: the roof was caulked and tarred, and perfectly tight. This is the manner of building houses in the country in Russia, particularly about Archangel.

The surgeon gave me the following account of this Russian colony in Smeerenburg's Harbour:

Some associated merchants at Archangel fit out a crabbla, or vessel, every year, of about one hundred tons, with a commander, mate, surgeon, boatswain, carpenter, cook, and about fifteen hands, well provided with muskets, powder and shot, good large knives, and all kinds of utensils for killing whales, unicorns, rein-deer, bears, and foxes.

With a sufficient stock of rye-flour, brandy, clothing, snow-shoes, deal-boards, carpenters' tools, &c. this vessel sails every year in the month of May from Archangel, goes round the North Cape of Norway, and arrives in June or July at Smeerenburg's Harbour, where the new colony is left on shore. The vessel stays two or three weeks in the harbour to refit, and carries the old colony with their cargo (consisting of whales blubber, blades or so called whalebone, white bear skins, white fox skins, eiderdown, and feathers, unicorns' trunks, which is an ivory that never turns yellow, and smoked rein-deers' tongues) home to Archangel. The colonists have no wages, but receive thousandth shares for what they bring home: the captain has fifty shares, the mate and surgeon thirty each; the carpenter, boatswain, and cook, ten each; and each common man or boy has one share. The surgeon told me that the captain had above one thousand rubles due to him, and he himself about six hundred, and each common man perhaps fifty or sixty: that when they returned safe home, the common men would be able to live a whole year upon their money, and the officers much longer, as the necessaries of life were very cheap at Archangel; and for the company it had hitherto answered extremely well.

He told me this was his second trip, so well had it answered his expectations. "During the so called long nights," said he, "it seldom or never is so dark that you cannot see before you, nor is it so dreadfully cold as it is at Petersburg every winter. When a snow storm happens, we cannot go out of the house; but when it is serene, and no wind, it is not too cold to go out and walk many miles. With the moonlight, the uncommon brilliancy of the stars in these high latitudes, and the reflection of the northern lights, or aurora borealis, we have so much light, that we can see to read a book or to write.

"In winter time the black whales come into the harbour and play close within shore, where we kill now and then one with harpoons fired out of a swivel. We kill white bears, foxes, rein-deer, and birds, as many as we can before the night season, which commences in September, when all the land animals leave us and walk over the ice into Nova Zembla and Siberia: the land birds leave us in the same manner. Unicorns we also kill in the harbour, for the sake of their ivory trunks, which are afterwards sent to Germany and France."

The surgeon and I had a race on snow shoes, which are a kind of skates, of about two feet in length, for skating over the snow and ice. As I was in former years a good skater, I could use them as well as he did. We ran six or seven miles with them in an hour without fatiguing ourselves: they have no irons.

Before we left our Russian host, he informed us that a few weeks before they had, coming home from a shooting party, found an English captain and nine or ten men overhauling their property in the hut. The captain, finding that his chest had been broke open, and that his rubles were diminished considerably, reproached the English commander with the robbery, and a battle ensued. "The English fired upon us," said the sur-

geon, who acted all along as interpreter, "and killed one of our men on the spot. We returned the fire, and wounded some of his men, and caused them to retreat precipitately. When the English were gone, our captain counted his rubles, and found that there were six hundred missing." He intended to send a statement of the affair to the Russian government.

After having staid above twelve hours with the Russians, highly entertained, we invited them to come to see us on board, and took our leave, returning the same way by the compass, and arrived safe on board, after having been absent almost eighteen hours.

We now prepared for the voyage home; and after having filled our empty casks with good water from the shore, and made a clear ship, we set sail with a fine north-easterly breeze in the middle of July 1780. We sailed again through a great quantity of floating ice, and, our ship being a good sailer, passed several full ships bound homewards.

The first pleasing change we experienced was, to have some night, and to be obliged to light a candle in the cabin. O what a luxury! When you have no darkness for a considerable time (during May, June, and July) light becomes tedious at last; and the first time you see a candle burning in the cabin, and a dark night, the pleasure is indescribable. Before we came into this more southern latitude, I used to observe the setting of the sun, resting, as it were, on the horizon, appearing of a very large size, surrounded with most beautiful and glorious colours of various tints, and then the rising of it shortly after, in full majesty. Language cannot convey an idea of the scene.

We came to anchor at Larwick towards the end of July, and were received in the kindest manner by Mr. Innes and all our friends in the place.

After three weeks stay we took leave of our Shetland friends, and sailed in company with a number of full ships for England. When we came on the coast of Northumberland and Yorkshire, the breeze and weather being favourable, we were delighted with the smell of the hay from the shore, and the sight of the pretty little towns and villages built on the sea side, and refreshed with excellent fresh cod and haddock, which the Yorkshire cobles (a kind of fishing boats) bring on board; in return for which they prefer taking a piece of beef or pork to money: they bring sometimes eggs, potatoes, &c. We had an uncommonly pleasant voyage home, and constant fine weather, accompanied with northerly breezes.

We arrived about the latter end of August safe in Greenland-dock, after having been out five months.

Captain Souter kept an excellent table in the cabin, and a constant fire in the stove: his study was to make every person on board comfortable. In the fifteen voyages I have been to sea, I have only twice had the good fortune to sail with men of equal worth; Mr. Charles Paterson, of the Sea Horse, and Mr. William Alder, now a lieutenant in the British navy.

LETTERS ON ICELAND,

CONTAINING OBSERVATIONS ON THE CIVIL, LITERARY, ECCLESIASTICAL, AND NATURAL HISTORY; ANTIQUITIES, VOLCANOES, BASALTES, HOT SPRINGS; CUSTOMS, DRESS, MANNERS OF THE INHABITANTS, &c. &c. MADE DURING A VOYAGE UNDERTAKEN IN THE YEAR 1772, BY JOSEPH BANKS, ESQ. F. R. S. ASSISTED BY DR SOLANDER, F. R. S DR. J. LIND, F. R. S. DR. UNO VON TROIL, AND SEVERAL OTHER LITERARY AND INGENIOUS GENTLEMEN.

WRITTEN BY UNO VON TROIL, D. D.

First chaplain to his Swedish majesty, almoner of the Swedish orders of knighthood, and member of the academy of sciences at Stockholm.

TO WHICH ARE ADDED,

The Letters of Dr. Ihre and Dr. Bach to the Author, concerning the Edda and the Elephantiasis of Iceland: also, Professor Bergman's curious Observations and Chemical Examination of the Lava and other Substances produced on the Island.

INTRODUCTION.

THE accounts of Iceland, which have hitherto made their appearance in the English language, are of such a nature, that it would betray ignorance or partiality to recommend them to the public as satisfactory and faithful.

The first writer of any known history of Iceland in the present century was John Andersson, afterwards burgomaster of Hamburgh, who undertook a voyage to this not much-frequented island in a Greenland ship; but the authenticity of his performance is far from being such as may be relied on with confidence.

Niels Horrebow, a Danish astronomer, was sent to Iceland by the court of Denmark, on purpose to contradict Andersson's account: he published some observations on Iceland, but, from too great a desire to please his employers, he fell into the opposite error, and paints all his objects with a glow of colouring, that does not exactly correspond with the truth.

In Richer's Continuation of Rollin's History is a history of Iceland, a most pitiful compilation, and full of the grossest errors that ever disgraced the historical page.

Under the authority of the Royal Society of Sciences at Copenhagen, Eggert Olafsen and Biarne Povelsen, two men of learning, natives of Iceland, and residing in the country, travelled all over that island, and gave, in two volumes in quarto, a faithful and ample account of all that deserves the attention of the learned and curious, illustrated by numerous engravings; but though the performance is accurate and circumstantial, yet it is unfortunately clogged with repetitions, and the facts are recounted in so tedious and uninteresting a manner, that it requires a most phlegmatic temper, and a large fund of patience, to go through the whole of this work, for it is filled with a long and dull recital of events, methodized in the most formal manner possible. It can therefore by no means be thought superfluous, that Dr. Von Troil has favoured the literary world with his interesting Letters on Iceland; a work which, on account of its varied matter, and the great learning displayed everywhere, for the instruction of the curious reader, deserves the warmest approbation of the public.

Men of talents and learning will, we flatter ourselves, think highly of this present performance by Dr. Von Troil, though perhaps it may be sometimes a little deficient in point of language.

The present translation has been made from the last German edition, published by Messrs. Troil and Bergman, with numerous additions and corrections; and though it is not ostentatiously recommended to the public for any elegance or accuracy of style, it may however be safely stated as a faithful translation from the original, and a work of real merit and utility.

We leave it to the unprejudiced reader to form a judgment of this performance, which is replete with variety of matter, treated on in an instructive and satisfactory manner; and likewise on the great learning relative to natural history, historical, antiquarian, and philological subjects, which are everywhere blended in the context of the following letters; and we are of opinion, that in respect to these points this work requires no apology for offering it to the impartial public.

As to its utility, it will not be unnecessary to prefix a few observations on the importance of Icelandic literature.

The English language was originally so nearly related to that of Iceland, that we need only cast our eyes on a glossary, to see the affinity of both languages, and the great light the one receives from the other.

The Normans and Danes, who were during a considerable time masters of England, introduced into it many customs, laws, and manners, which would remain inexplicable; but the Icelanders, being originally descended from the same Normans, and living on an island which has very little intercourse with the rest of the world, have preserved their language, manners, and laws, in their primitive simplicity: nay, all the historical accounts of the North are contained in the historical sayings (sagas) of the Icelanders, which are very numerous, and would be of very important service in the investigation of the origin of the language, manners, and laws of England. Nor can it be advanced that this kind of study could not be pursued amongst us, for want of these historical monuments of the Icelanders; since, by the known indefatigable zeal for the promotion of all branches of literature, and the most disinterested generosity of Joseph Banks, Esq. P. R. S. one hundred and sixty-two Icelandic manuscripts have been presented to and are deposited in the British Museum.

The history of the northern nations, their divinities, religion, principles, and tenets, together with their poetry, present the philosophic reader with subjects worthy of his speculation; they at the same time account for many historical events, and for many a curious custom, preserved by some one or other of the nations descended from the same root with these inhabitants of the north.

The subject of volcanoes, and of the origin of certain kinds of stones and fossils, have of late attracted the attention of philosophers; but, in my opinion, they are no where treated with so much candour, truth, and philosophical precision, as in those remarks which the Chevalier Torbern Bergman sent to our author in form of a letter, and which he has here communicated to the public.

The whole island of Iceland is a chain of volcanoes, the soil almost everywhere formed of decayed cinders, lava, and flags; and the numerous hot springs, especially that called Geyser, give full scope to the most curious remarks on these subjects, since they are here obvious in so many varied shapes, and for that reason become instructive. Lava and some other productions of nature have not been hitherto subjected to chemical processes: professor Bergman therefore deserves the thanks of the public for his excellent letter, giving a very interesting account of his experiments on all the various fossils and natural productions of Iceland. The origin of basaltic pillars, such as form the Giant's Causeway in Ireland, the whole island of Staffa, and more especially Fingal's Cave, has of late been much spoken of by travellers and learned mineralogists. Some

ascribe their regular configuration to crystalization: others pretend the subterraneous fire to be the cause of their regular columnar shape; but the ingenious Chevalier Torbern Bergman proves, by the most solid arguments, that the basalt pillars are no lava, or any ways related to volcanic substances, and that their regular columnar shape, he suggests, is owing to another cause, and by his reasoning renders it highly probable.

We are at the same time presented with a view of the primitive earths, that originally compound all earthy and stony bodies hitherto discovered on the surface of our globe; and their characters are here also set forth in the most easy and obvious manner by experiments.

This great and interesting circumstance alone would be sufficient to recommend the present performance to the perusal of chemists, mineralogists, and philosophers.

The letter of the Archiater Bach to Dr. Troil, on the diseases of Iceland, contains the most curious and interesting observations for the use of medical gentlemen. In short, there is scarcely a class of readers, who will not find instruction and entertainment in the ingenious performance of Dr. Uno Von Troil, the author of this book.

He is a Swede by birth, and descended of a noble family: his father, Samuel Von Troil, was archbishop of Upsal.

After having studied divinity, the oriental and northern languages and antiquities, together with the various branches of natural philosophy, he travelled, and visited Germany, France, England, and Holland.

During his stay in England he was introduced to Mr. Banks, who was then returned from his voyage round the world, and preparing to go on a second; but that not taking place, he was prompted to make a short excursion towards the Western Islands and Iceland, and easily prevailed upon Dr. Von Troil to accompany him on this literary voyage.

After the return of Dr. Von Troil, he wrote letters to several learned men in his own country, eminent in the various professions and branches of literature and science, on the different matters he had observed in Iceland during his voyage; they were at first only intended to satisfy the solicitations and curiosity of his friends, who wished to be made acquainted with whatever he had discovered worthy the notice of a literary man, and that might likewise bid fair to afford amusement.

The senator Charles Count Schetfer, a man of a benevolent character, and who patronizes learning in all its branches, together with its professors, solicited our author to communicate them to the public: in compliance with which they were published at Upsal in 1777, in octavo; and the next year after they appeared at the same place translated into German, very much enlarged with additions of the author, and also of Chevalier Bergman.

Dr. Von Troil has, for his talents, learning, and character, been promoted in his native country to several places of honour and emolument, so that he may now be considered as the first man in Sweden in point of eminence in the ecclesiastical line, and in point of learning inferior to none: he has taken his degree of doctor of divinity, is principal chaplain to the king, president of the consistory, rector of the great church of Stockholm, and prelate of all the Swedish orders of knighthood.

These cursory hints were thought necessary for ushering his letters on Iceland into the literary world; the public will, no doubt, be curious to know the particular observations made by a learned man on an island, that Mr. Banks, one of the first characters of this country, thought deserving a nearer inspection, by a voyage he undertook at a great expence, accompanied by several learned and ingenious men.

For the information of those who wish to be acquainted with all the publications that have appeared, to treat either at large of Iceland, or examine some of its particular objects, we have here subjoined a very curious and complete catalogue of them.

CATALOGUE OF WRITERS ON ICELAND.

1 Joachim Leo wrote some verses on Iceland in the German language, full of errors. There are four editions of them. Arngrim Jonæ, in his Commentario de Islandia, quotes the edition of 1561.
2 Jacobi Ziegleri Scondia seu Descriptio Groenlandiæ, Islandiæ, Norvegiæ, Sueciæ. Francofurti, 1575.
3 Jonsbogen (i. e. Jonsbook, an old book of laws) Hoolum (in Iceland) 1578, octavo, and several editions subsequent to it.
4 Arngrim Jonæ brevis commentarius de Islandia. Hoolum, 1592, octavo, and Hafn. 1593, octavo.
5 Ejusd. Crymogæa seu rerum Islandicarum libri tres. Hamburg, 1609, 1610, 1614, 1618, 1620, and 1630.
6 Blefhenii Islandia s. populorum et mirabilium, quæ in ea insula reperiuntur, accurata descriptio. Ludg. Batav. 1607, octavo.
7 Angrim Jonæ Anatome Blefkeniana. Hoolum, 1612, octavo, and Hamburg, 1613, quarto.
8 Dan Fabritius de Islandia et Groenlandia. Rostock, 1616, octavo.
9 Arngrim Jonæ epistola pro patria defensoria. Hamburg, 1618, quarto, written in opposition to the preceding book.
10 Arngrim Jonæ Apotribe caulmniæ. Hamburg, 1622.
11 De regno Daniæ et Norvegiæ insulisque adjacentibus, tractatus varii collecti a Stephano Stephanio. Ludg. Batav. 1629, duodecimo, from whence the part concerning Iceland is taken out, and printed separately with the title.
12 Islandicæ Gentis primordia et vetus republica. Ludg. Bat. 1629, duodecimo.
13 Arngrim Jonæ Athanasia Gudbrandiana. Hamburgh, 1630.
14 Peder Clausson's Norriges og omliggende oars Beskrifvelse. Kiob. 1632, quarto, and Kiob. 1637, octavo.
15 Arngrim Jonæ specimen Islandiæ hist. et magna ex parte chorographicum. Amst. 1643.
16 La Peyrere Relation de l'Islande, in a letter to Mr. de la Motte Vayer, dated Dec. 18, 1644. Is inserted in the Receuil des Voyages au Nord, tom. i. Amst. 1715, octavo.
17 Wolfii Norrigia illustrata. Hafn. 1651, octavo and quarto.
18 Wolfii Norriges, Islands og Gronlands Beskrifvelse. Kiobhafn. 1651, quarto.
19 Hieronym. Megiseri Septentrio Nov-antiquus, sive die neue Nord-welt Island, Groenland, &c. Leipz. 1653, duodecimo.
20 Edda Islandorum A. C. 1215, per Snorronem Sturlæ Islandice conscripta, Islandice, Danice, et Latine edita, opera P. J. Resenii. Hafn. 1665, quarto, together with
21 Philosophia antiquissima Norvego-danica dicta Voluspa, quæ est pars Eddæ Sæmundi, primum publici juris facta a P. J. Resenio. Hafn. 1665, together with
22 Ethica Odini, pars Eddæ Sæmundi, vocata Haaramal, edita per P. J. Resenium. Hafn. 1665.
23 Theod. Thorlacci diss. chorographica historica de Islandia, præs. Ægid. Strauch; Wittent 1666 and 1670, quarto, idem, 1690, quarto.

24 Erici Bartholini experimenta Christalli Islandici disdiaclastici. Hafn. 1699, quarto.
25 Voluspa. Kiobenhavn. 1673, quarto.
26 Martiniere neue Reise in die nordischen Landschaften. Hamb. 1675, quarto. Translated from the English. There is likewise a French edition. Paris 1682.
27 Aræ Multistii Schedæ. Skalholt 1688, quarto, Oxford 1696. Kiob. 1733, quarto.
28 Landnama Bok. Skalholt 1688, quarto. Is likewise published at Copenhagen, with a Latin translation, notes, and several indexes. Islands Landnama-Bok, h. e. Liber originum Islandiæ. Editio novissima, ex manuscriptis Magnœanis sumptibus perill. Suhmii. Havn. 1774, quarto.
29 Gahm de ratione anni solaris apud veteres Islandos. This memoir is printed at the end of Aræ Schedæ in the Copenhagen edition.
30 Thordi Thorlaks Diss. de ultimo montis Hecklæ in Islandia incendio. Hafn. 1694.
31 Gahm de prima religionis Islandia fundatione. Hafn. 1696.
32 Description du Nord. 1698, duodecimo.
33 Niewe beschryvinge van Spitsbergen, Island, Groenland end de beygelegen Eylanden.
34 Einar Thorst. vita. Hafn. 1700.
35 Reise nach Norden, worinneu die sitten, Lebensarten and Aberglauben der Norwegen———and Islander accurat beschriebèn werden. Leipz. 1711, duodecimo.
36 Blefkenii Historie van Lap-and Finland, hier is bygevoegt de beschryving van Isen Groenland. Leuvarden 1716, octavo.
37 Vettersten de Poesi Scaldorum Septentrionalium. Upsal. 1717, octavo.
38 Relation om det foerskrekkelige Vandfall og exundation af Bierget Katlegiaa paa Island 1721. Copenhagen 1727, quarto.
39 Kort berættelse on berget Krabla paa Island, samt andre Derness intil grantsande Berg, Hwilka nyligen begynt at inspruta eld och brinna. This account of the burning of the mount Krabla was printed probably in the year 1727, at Stockholm, in four pages in octavo.
40 Benedict Thorstenson efterrettning om den jordbrand som 1724 og folgende Aar i Bierget Krafla og de dar omkring liggende Herreder har grasseret. Kiobenhafn 1726, octavo.
41 Olavi O. Nording Diss. de Eddis Islandicis. Upsal. 1735, quarto. Mr. Oelrichs at Bremen has reprinted this Diss. in his Opusculis Daniæ et Sueciæ litteratæ, tom i. 1774.
42 Joh. Dav. Koehler prolusio de Scaldis seu poetis gentium arctoarum. Altdorf 1738, quarto.
43 Er. Jul. Biorner, Inledning til de Hfwerborna Goeters gamla Hafder sar deles gotiska sprakets Forman och Sagornas Kanned om. seu, Introductio in Antiquitates Hyperboreo-Gothicas. Stockholm 1738, folio.
44 Ejusd. tractatus de Varegis heroibus Scandianis. Stockholm 1743, quarto.
45 Lakmannus de computatione annorum per hyemes priscis gentibus hyperboreis usitata. Kiel 1744, quarto.
46 De Yfverborna Atlingars Lara——Hyperboreorum Atlandiorum seu Suiogotorum et Nordmandorum Edda, hoc est Atavia, seu fons gentilis illorum et Theologiæ et Philosophiæ. Jam demum versione Suinonica donata accedente latina—ad MS. quod possidet Bibliotheca Upsaliensis—opera Joh. Gorsson. Ups. 1746, quarto. This edition of the Edda was not finished.
47 Islanska taxan. Hoolum 1746, quarto.
48 John Andersson Nachrichten von Island, Groenanland, und der Strasse David. Hamb. 1746. It likewise appeared translated into the Danish language. Copenh.

1748. A French translation has likewise been published by Mr. Sellius, 1751, duodecimo, two vols.

49 Octroy foer det Islandske Societet. Kiob. 1747, octavo.

50 Avertissement om Anderssons Tractat om Island. Kiob. 1748, octavo.

51 Joh. Thorkelssons tillgift til Andorsson om Island. Kiob. 1748, octavo.

52 Eggerhard Olavius Enarrationes historicæ de Islandiæ natura et constitutione. Hafn. 1749, octavo.

53 Ejusd. Diss. de ortu et progressu circa ignem Islandiæ subterraneum. Hafn. 1749, quarto.

54 Biarni Pauli Observationes de alga saccharifera maris Islandici. Hafn. 1749, octavo.

55 Arnae Oddes. vita, inserted in the Nova litteraria. Hafn. anni 1750.

56 De Gamla Normanners Patriarkaliska Lara pa Swenska och Lat. af Joh. Gooransson. Stockholm 1750, quarto.

57 Olai Wormii Epistolæ. Hafn. 1751, two vols. octavo.

58 Tilforladeliga efterretningar om Island med ett nytt Landkort, og 2 Aars metereologiska Observationer af Niels Horrebow. Kiob. 1750, octavo. This performance is likewise translated into German, 1752, octavo, and into English.

59 Specimen Islandiæ non barbaræ, in nouvellis literariis Hafniensibus, 1752.

60 Nachrichten von Island, a short abstract of Horrebow's book inserted in a periodical paper, called Betraygen zum Nutzen und Vergnugen. Griefswald 1753, quarto.

61 Erici tentamen de nominibus et cognominibus Septentrionalium. Hafn. 1753, octavo.

62 Th. Nicolai de commeatu Islandorum navali. 1753, octavo.

63 Svein Solvesen Tyro Juris Islandicus. Kiob. 1754, octavo.

64 Vidalins Bref til Jon Arnesen de jure patronatus Islandorum, translated into Danish, and published by Magnus Ketilson.

65 Dissertatiuncula de montibus Islandiæ crystallinis, auct. Theodr Torkelli I. Vidalino, scholæ Skalholtensis eo tempore Rectore. Translated from the Latin MS. into German, and published in the Hamburg Magazine, vol. xiii. nos. i. and ii. 1754. octavo.

66 Disquisitiones duæ historicæ antiquariæ. Prior de veterum Septentrionalium, imprimis Islandorum peregrinationibus; posterior de Phillippia seu amoris equini apud priscos boreales causis——per Joh. Erici. Lips. 1755, octavo. The first is translated into German, and inserted into Schlozer's Northern History. 1771, p. 566.

67 Ejusd. Specimen Observationum ad antiquitates Septentrional.

68 Ejusd. Commentarius de expositione infantum ad veteres Septentrionales.

69 Introduction à l'Histoire de Dannemark, par Mr. Mallet à Copenh. 1755, quarto, to which a translation of the Edda is prefixed. The same is translated into English. two vols. octavo, and into German. Griefswald 1765, quarto.

70 Joh. Snorronis de Agricultura Islandorum. Hafn. 1757, octavo.

71 Hald. Jacobsens efterreningar om de i. Island ildsprudende Bierge. Kiob, 1757, octavo.

72 Ol. Eigilson's Berettnelse om de tyrkiske Soerovere i. Island. Kioeb. 1757, octavo.

73 Nic. Pet. Sibbern idea historiæ litterariæ Islandorum in Dreyer's Monument-anecdota. 1 Tom. Lubecæ 1760, quarto.

74 Balle oekonomiska Tanker ofwer Island til hoyere betankning. Kiob. 1760, 1761, two vols. octavo.

75 Joh. Finnæus tentamen historico-philologicum circua Norvegiæ jus ecclesiasticum priscum, and

76 Ejusd. Curæ posteriores in hoc jus. Hafn. 1762, and 1765, quarto.

77 Thorsten Nicol. de commeatu veterum Islandorum restituendo. Hafn. 1762, octavo.

78 Joh. Arneson Inledning til den gamle og nya Islandske Rattegaang, udgiven af I. Erichsen. Kiob. 1762, quarto.
79 Ioach. Stechau de fide historica monumentor. Islandic. Lund. 1763.
80 Five pieces of Runic poetry, translated from the Icelandic language. London 1763, octavo.
81 M. Olafsen's foersoeg til Landrasenets forbedring i Island. Kiob. 1765, octavo.
82 Ejusd. Anmarkningar til Jons boks Danska ofwersattelse. Kiob. 1765, octavo.
83 Egil Thorhalsens forswar for sin ofwersattelse. Kiob. 1765, octavo.
84 H. Finnsen efterettning om tilgragelserne vid Bierget Hekla udi Islasd i April og foljende manader. Kioeb. 1767.
85 Olavii Syntagma de Baptismo veterum. Hafn. 1769, quarto.
86 Breve om Agerdyrknings muelghed i Island fra Hans Finnsen, 1769 and 1772.
87 Joh. Petersen om den saa Kallade Islandske skiorbiugg. Soroe 1769, octavo.
88 Erichsen om Islands up Komst. Kioebenhhafn 1770, quarto.
89 Skuli Magnusson um thann Islenska Garnspuna. Kiob, octavo.
90 Ol. Olafsens Islansk Urtagaards bok. Kioeb 1770, octavo.
91 Thor Oddesons tanker om akurdyrkin paa Island. Kiob. 1771, octavo.
92 Iuel Norrlands Trompet.
93 Martefeld om Islands Huusholding med fedhe vahre og Hamborgs Kiodrogning. Kiob. 1771, octavo.
94 Ol. Olson um fiski-veidar og fiski-nettan. Kiob. 1771, duodecimo.
95 Upartiske tanker om det Islandske Handels-Kompagnie og dets farende Kiobmand. Kiob. 1771.
96 Anmerkningar oever Compagniets Handel paa Island. Kiob. 1771.
97 Lud. Harboe Tuende ofhandlingar om reformationem i Island.
98 Ejusd. History of the Islandic translation of the Bible.
99 Finnei Johannæi Episcopi Diocesecos Skalholtinæ in Islandia, Historia Ecclesiastica Islandiæ. T. i. ii. iii. Hafn. 1772 & 1775.
100 Ion Olsson om den Islandske Handel. Kiob. 1772, octavo.
101 Bref til Hr. Cancellie Radet Lagerbring rorande then Islandsk Edda (by Cevalier Ihre.) Stock. 1772, octavo.
102 Relation d'un Voyage dans la Mer du Nord par de Kerguelen de Tremarec. Amsterdam 1772, quarto.
103 Eggert Olafsens og Biarne Povelsens Reise igienem Island, two vols. Soroe 1772. quarto. It appeared likewise translated into German. Leipz. 1774 and 1775, quarto, two vols.
104 Steph. Thorasens de homicidis secundum leges Islandorum antiquas. P. I. Hafn. 1773.
105 Kristni Saga, S. Historia Religionis Christianæ in Islandiam introductæ, nec non: Thattr af Isleif Biskupi, s. narratio de Isleifo Episcopo—cum interpretatione Latina, notis, &c. Hafn. 1773, octavo.
106 Islandische Literatur und Geschichete. Erster Theil. Goettingen 1773, octavo. The ingenious Prof. Schlozer at Gottingen is the author.
107 Islandische Zeitungen. These newspapers were published in Iceland in the year 1775.
108 Bualagen. Hrappsej. 1775.
109 Biorn a Skardzaa Annalar Hrappsej. 1774 and 1775, quarto, two vols. These annals contain the history from 1400 to 1645; and are published with a Latin trans-

lation: Annales Biornis a Skardsa. Ex manuscriptis inter se collatis cum interpretatione Latina, variantibus lectionibus, notis et indice.

110 Kristin-rettr hinn gamli—Jus Ecclesiasticum vetus s. Thorlacco-Kettilianum constitutum, A. C. 1123, Islandice et Latine, edit Grimus Joh. Thorkelin. Hafn. 1775.

111 Berattelse om den Islandske farskiotseln, upsatt af Theod. Thoroddi. These observations appeared, translated into Swedish by Mr. Barchaus, in the Journal of husbandry 1776, the month of November. Stockh.

112 Vorlaufender Bericht und zugleich die Vorrede von der alten und raren Islandischen Edda, so uber 700 Jahr und daruber in Norden bisher unerklarbar versteckt gelegen. Stettin 1776, quarto. Its author is Mr. Schimmelmann of Stettin, who likewise had printed, in 1774, Abhandlung abgefasst in einem Schreiben an einem Gelehrten von der alten Islandischen Edda, quarto.

113 Sven Solvesen Islandiske Jus criminale. Kiob. 1776, octavo.

114 Islandische Merkwurdigkeiten, in a periodical paper called Mannichfaltigkeiten, first year second quarter, Berlin 1777, octavo.

115 Sciagraphia Historiæ litterariæ Islandiæ, auctorum et scriptorum tum editorum tum ineditorum indicem exhibens, cuivis delineandæ periculum fecit Haldanus Einari, Ph. Mag. et Rector Scholæ Cathedr. Holensis. Holmiæ 1777, octavo.

116 Modern History of the Polar Regions. The first part is to be met with in Richer's Modern History, or Continuation to Rollin's Ancient history, vol. xxvii. Berlin 1778, octavo.

117 Diss. inauguralis de Lichene Islandico, Præs. Trommsdorff. Resp. Reisse. Erfurth. 1778.

118 Die Islandische Edda. Das ist: die geheime Gotteslehre der æltesten Hyperboraerim Jahr. 1070—1075, aus alten runisthen Schriften edirt von Samund Froden, hiernæchst im Jahr 1664, durch Resen, und nun in die hochtentsche Sprache mit einem Versuch zur rechten Erklarung ubersezt und edirt von J. Schimmelmann. Stettin, 1778, quarto.

119 Bref rærande en Resa til Island 1772. Upsala, 1777, octavo, and translated into German by Joh. George Pet. Moelle. Upsala and Leipz. 1779, octavo. The work which is now here appears translated into English.

120 Joh. Theod. Phil. Christ. Ebeling de Quassia et Lichene Islandico. Glasgoæ, 1779, octavo.

This Catalogue contains all the writers of any consequence on Iceland, or on matters relative to, or concerning, that country.

LETTER I....TO PROFESSOR BERGMAN.*

ON THE EFFECTS OF FIRE IN ICELAND.

SIR,

SINCE I am happily returned from a very pleasant summer's excursion through the western islands of Scotland, to Iceland and the Orkneys, it is with peculiar pleasure that I take this opportunity of assuring you of my esteem and friendship. It is probably

* This letter was first published in the year 1773, in the Upsala newspapers, No. 3, 4, 6, and 8.

not unknown to you, that Mr. Banks and Dr. Solander have been disagreeably disappointed, when they were on the point of setting out on a new voyage round the world last summer. However, in or order to keep together and employ the draughtsmen and other persons whom they had engaged for their voyage to the South Sea, they resolved upon another excursion. It was impossible to choose a better one than that to Iceland; and you may easily conceive, sir, that though I was ready to set out on my return to Sweden, I did not hesitate a moment in accepting their offer to accompany them. To say the truth, I was glad to visit a country, where I could not alone hope to find many remains of our ancient language, but where I was certain to see nature in a new point of view.

I have not been disappointed in either of my expectations; and I could never have found a happier opportunity than that of making this voyage in the company of Mr. Banks and Dr. Solander, of whom it would be unnecessary to say one word more, as they are both known so well to you, and to the learned and ingenious throughout Europe.

I know, sir, that every information will be welcome to you, which concerns those objects that attracted my attention there; and there is no one who would communicate this information to you with more pleasure than myself; but as it would require too much prolixity to mention every thing, I shall only in this letter speak of the principal operations of fire in Iceland, a subject, which, I am convinced, is one of the most important.

On our arrival in Iceland on the twenty-eighth of August 1772, we directly saw a prospect before us, which, though not pleasing, was uncommon and surprising. Whatever presented itself to our view bore the marks of devastation; and our eyes, accustomed to behold the pleasing coasts of England, now saw nothing but the vestiges of the operation of a fire, Heaven knows how ancient!

The description of a country, where quite close to the sea you perceive almost nothing but sharp cliffs vitrified by fire, and where the eye loses itself in high rocky mountains, covered with eternal snow, cannot possibly produce such emotions as at first sight might entirely prepossess the thinking spectator. It is true, beauty is pleasing both to our eyes and our thoughts; but gigantic nature often makes the most lasting impressions.

We cast anchor not far from Bessestedr, the dwelling-place of the celebrated Steurleson, where we found two tracts of lava, called Gorde and Hualeyre-Hraun (for what we and the Italians call Lava is called in Iceland Hraun, from Hrinna, to flow) of which particularly the last was remarkable, since we found there besides a whole field covered with lava, which must have been liquid in the highest degree, and whole mountains of turf. Chance had directed us exactly to a spot on which we could, better than on any other part of Iceland, consider the operations of a fire which had laid waste a stretch of ten or twelve miles.* We spent several days here, in examining every thing with so much the more pleasure, since we found ourselves, as it were, in a new world.

We had now seen almost all the effects of a volcano, except the crater, from which the fire had proceeded: in order therefore to examine this likewise, we undertook a journey of twelve days to mount Heckla itself; we travelled fifty or sixty miles† over an uninterrupted track of lava, and had at last the pleasure of being the first who ever reached the summit of this celebrated volcano. The cause that no one has been there

* The miles mentioned by Dr. Troil are always Swedish, ten and an half of which are equal to a degree on one of the great circles of the globe; and therefore one Swedish mile is nearly equal to six English statute miles Ten or twelve miles are sixty or seventy-two English miles.

† Three hundred or three hundred and sixty English miles.

before is partly founded in superstition, and partly in the extreme difficulty of the ascent, before the last discharge of fire. There was not one in our company who did not wish to have his clothes a little singed, only for the sake of seeing Heckla in a blaze; and we almost flattered ourselves with this hope, since the bishop of Skalholt had informed us by letter, in the night between the fifth and sixth of September, the day before our arrival, flames had proceeded from it; but now the mountain was more quiet than we wished. We however passed our time very agreeably, from one o'clock in the night till two next day, in visiting the mountain. We were even so happy, that the clouds which covered the greatest part of it dispersed towards evening, and procured us the most extensive prospect imaginable. The mountain is somewhat above five thousand feet high, and separates at the top into three points, of which that in the middle is the highest. The most inconsiderable part of the mountain consists of lava, the rest are ashes, with hard solid stones thrown from the craters, together with some pumice-stones, of which we found only a small piece, with a little native sulphur. A description of the various kinds of stones that are to be found here would be too prolix, and partly unintelligible; and I so much the more willingly omit it, as I hope to satisfy your curiosity, as soon as the collection I made of them arrives in Sweden.

Amongst many other openings, four were peculiarly remarkable; the first, the lava of which had taken the form of chimney-stacks half broken down; another, from which water had streamed; a third, all the stones of which were red as brick; and lastly, one from which the lava had burst forth in a stream, which was divided at some distance into three arms. I have said before, that we were not so happy to see Heckla throw up fire; but there were sufficient traces of its burning inwardly; for on the upper half of it, covered over with four or five inches deep of snow, we frequently observed spots without any snow; and on the highest point, where Fahrenheit's thermometer was at 24° in the air, it rose to 153° when it was set down on the ground; and in some little holes it was so hot, that we could no longer observe the heat with a small pocket thermometer. It is not known whether, since the year 1693, Heckla has been burning till 1766, when it began to throw up flames on the first of April, and was burning for a long while, and destroyed the country many miles around. Last December some flames likewise proceeded from it; and the people in the neighbourhood believe it will begin to burn again very soon, as they pretend to have observed that the rivers thereabouts are drying up. It is believed that this proceeds from the mountain's attracting the water, and is considered as a certain sign of an impending eruption. Besides this, the mountains of Mayvatn and Kattlegia are known in this century, on account of the violent inflammations of the former between the years 1730 and 1740, and the latter in 1756.

But permit me, sir, to omit a farther account of the volcano at this time,* in order to speak of another effect of the fire, which is much finer, and as wonderful as the first, and so must be the more remarkable, as there is not in any part of the known world any thing which resembles it: I mean the hot springs of water which abound in Iceland.†

They have different degrees of warmth, and are on that account divided by the inhabitants themselves into laugar, warm baths, and huerer, or jets d'eaux; the first are found in several other parts of Europe, though I do not believe that they are ever employed to the same purposes in any other place; that is to say, the inhabitants do not

* Dr. Troil treats more at large of the Icelandic volcanoes in his 18th and 19th Letters; and in the 20th he speaks more paricularly of Mount Heckla.

† The 21st Letter treats more fully of the hot springs in Iceland.

bathe in them here merely for their health, but they are likewise the occasion for a scene of gallantry. Poverty prevents here the lover from making presents to his fair one, and nature presents no flowers, of which elsewhere garlands are made: it is therefore customary, that, instead of all this, the swain perfectly cleanses one of these baths, which is afterwards honoured with the visits of his bride. The other kind of springs mentioned above deserves more attention. I have seen a great number of them; but will only say something of three of the most remarkable. Near Laugervatn, a small lake of about a mile in circumference, which is about two days journey distant from Heckla, I saw the first hot jet d'eau; and I must confess that it was one of the most beautiful sights I ever beheld. The morning was uncommonly clear, and the sun had already begun to guild the top of the neighbouring mountains; it was so perfect a calm, that the lake on which some swans were swimming was as smooth as a looking-glass; and round about it arose, in eight different places, the steam of the hot springs, which lost itself high in the air.

Water was spouting from all these springs; but one in particular continually threw up a column from eighteen to twenty-four feet high, and from six to eight feet diameter, the water was extremely hot. A piece of mutton and some salmon trouts we boiled in it; as likewise a ptarmigan, which was almost boiled to pieces in six minutes, and tasted excellently. I wish it was in my power, sir, to give you such a description of this place as it deserves; but I fear mine would always remain inferior in point of expression. So much is certain, at least, nature never drew from any one a more cheerful homage to her great Creator than I here paid him.

At Reikum was another spout of the same sort, the water of which, I was assured, rose to sixty or seventy feet perpendicular height some years ago; but a fall of earth having almost covered the whole opening, it now only spouted between fifty-four and sixty feet sideways. We found a great many petrified leaves in this place, as likewise some native sulphur, of which too the water had a much stronger taste than any where else.

I have reserved the most remarkable water-spout for the end, the description of which will appear as incredible to you as it did to me, could I not assure you that it is all perfectly true, as I would not aver any thing but what I have seen myself. At Geyser, not far from Skalholt, one of the episcopal sees in Iceland, a most extraordinary large jet d'eau is to be seen, with which the celebrated water-works at Marly and St. Cloud, and at Gassel, and Herrenhausen, near Hanover, can hardly be compared. One sees here, within the circumference of half a mile,* forty or fifty boiling springs together, which, I believe, all proceed from one and the same reservoir. In some the water is perfectly clear, in others thick and clayey; in some, where it passes through a fine ochre, it is tinged red as scarlet; and in others, where it flows over a paler clay, it is white as milk.

The water spouts up from all, from some continually, from others only at intervals. The largest spring, which is in the middle, engaged our attention particularly the whole day, which we spent here from six in the morning till seven at night. The aperture through which the water arose, and the depth of which I cannot determine, was nineteen feet in diameter; round the top of it is a bason, which together with the pipe, has the form of a cauldron; the margin of the bason is upwards of nine feet one inch higher than the conduit, and its diameter is of fifty-six feet. Here the water does not spout continually, but only by intervals several times a day; and as I was informed by the people in the neighbourhood, in bad rainy weather higher than at other times.

* About three English miles.

On the day that we were there the water spouted at ten different times, from six in the morning till eleven, A. M. each time, to the height of between five and ten fathoms; till then the water had not risen above the margin of the pipe, but now it began by degrees to fill the upper bason, and at last ran over. The people who were with us told us, that the water would soon spout up much higher than it had till then done, and this appeared very credible to us. To determine its height, therefore, with the utmost accuracy, Dr. Lind, who had accompanied us on this voyage in the capacity of an astronomer, set up his quadrant.

Soon after four o'clock we observed that the earth began to tremble in three different places, as likewise the top of a mountain, which was about three hundred fathoms distant from the mouth of the spring. We also frequently heard a subterraneous noise like the discharge of a cannon; and immediately after a column of water spouted from the opening, which at a great height divided itself into several rays, and according to the observations made with the quadrant was ninety-two feet high. Our great surprise at this uncommon force of the air and fire was yet increased, when many stones, which we had thrown into the aperture, were thrown up with the spouting water. You can easily conceive, sir, with how much pleasure we spent the day here; and indeed I am not much surprised that a people so much inclined to superstition as the Icelanders are imagine this to be the entrance of hell; for this reason they seldom pass one of these openings without spitting into it; and, as they say, uti fandens mun, into the devil's mouth.

But I think it is time to finish my long letter, and I will only try your patience with one thing more, which likewise deserves to be better known. Natural historians have always observed those large remarkable pillars, which the hand of nature has prepared in Iceland, and in some other places, with the greatest attention. The Giant's Causeway has, till now, been considered as the largest and most regular assemblage of these columns; but we have discovered one on our expedition through the western islands of Scotland, which infinitely surpasses it. The whole island of Staffa* consists almost entirely of these pillars, which are as regular as can be imagined; they seem to be of the same substance as the Irish ones, and have from three to seven sides; each pillar is surrounded by others, that join so closely to it as to have a very small space between them, which is frequently filled up with a crystalized incrustation. In most places the pillars are perpendicular; in others they are a little inclined; and yet in others they have the configuration of the timber-work in the inside of a ship. The highest pillar was fifty-five feet one inch long, and each joint from one to two feet. There is a cavern here which consists entirely of these pillars; it is 367 feet long, 53,7 broad, and 117,6 high. There are three fathoms of water in it, so that is easy to enter into it with a boat.

It is difficult to determine the question, how these pillars have been formed; but it is more than probable, nay almost certain, that they are the remains of an ancient volcano, many indisputable tracts of which are found in many parts of Scotland. You must not in this place apply to me the story Helvetius tells of a clergyman and a fine lady, who together observed the spots in the moon, which the former took for church steeples, and the latter for a pair of happy lovers. I know that we frequently imagine to have really found what we most think of, or most wish for; but I sincerely assure you, that I do

* See the account of Staffa, by Joseph Banks, esq. inserted in Pennant's Tour in Scotland, and Voyage to the Hebrides, 1772, page 299, 309, and the fine representations of these basalts, executed after the accurate drawings executed by Mr. John Frederick Miller, employed by Mr. Banks, and communicated by the last mentioned gentleman, for the adorning of Mr. Pennant's Scots Tour.

not speak of such fires without the most decisive opinions. I will, however, reserve a further account of these extraordinary productions till my return home, when I flatter myself I shall be able to give you entire satisfaction.

LETTER II....TO THE ROYAL LIBRARIAN MR. GJORWELL.

OF ICELAND IN GENERAL.

SIR, Utrecht, Jan. 22, 1773.

You are, no doubt, informed of the voyage Mr. Banks and Dr. Solander undertook last summer to Iceland, as well as my having accompanied these gentlemen on that expedition. I need not tell you what reasons determined me to become one of their company. You can easily conceive how many different circumstances might have persuaded a curious Swede to visit a country remarkable in so many respects. I am perfectly satisfied with my voyage, and can easily convince you of it, by communicating to you some little account of what principally attracted our attention during its course.

We set sail from London on the twelfth of July last in a ship, for which one hundred pounds sterling were paid every month. Besides Mr. Banks, Dr. Solander, and myself, we had on board an astronomer,* a lieutenant in the navy (a very worthy man, his name is Gore, and deserves to be mentioned, as he is, as far as we know, the first who has sailed three times round the world)† together with a lieutenant, three draughtsmen, and two writers, who, with the seamen and servants, made about forty people.

We first landed on the Isle of Wight, which is a little paradise, where we spent two days. Nature seems to have spared none of her favours in embellishing it; and I know no place in it which does not present a pleasing view to the observer. The inhabitants resemble their island; they live in a little community among themselves; they are not very rich, neither have they any beggars. They are generally cheerful, cleanly, and obliging; and there are but few instances among them of any one marrying a person who did not at that time reside or afterwards settle on the island.

From thence we sailed to Plymouth, where we saw the docks, magazines, and every thing belonging to them, worthy of notice, and then proceeded towards St. George's Channel.

We had intended to land on the Isle of Man, as it is one of the few places where the Runic characters have been brought by the Danes, and the only one, except the north, where some of our old Runic stones are found; but at sea we cannot always act according to our pleasure: the wind obliged us to leave the Isle of Man on our right, and to continue our course to the western islands of Scotland.

It is exceedingly pleasant to sail among these islands, though not very safe, without a good wind and expert pilots: for in the first case you must depend upon the ebb and flood; and in the second you are in continual danger, on account of the great number of rocks.

The nature of the country is such, that I do not wonder at its having given birth to a Fingal, and an Ossian. It is not the only place where we have seen heroes pro-

* Dr. James Lind, of Edinburgh, who is well known by many memoirs inserted in the Philosophical Transactions, and other ingenious publications.

† Captain Dampier did it a long time before Mr. Gore, viz. Cowley and Dampier, 1683, 1684; Dampier and Funnel, 1689, 1691; Woodes, Rogers, and Dampier, 1708, 1711. If lieutenant Gore and captain Charles Clark return safe home from the voyage they are now engaged in, they both will have sailed four times round the world.

duced among the mountains; and what can be more calculated to form a poet, than wild romantic and enchanting scenes of nature, which are here so pleasingly blended.

It would be tedious to enumerate all the isles we have visited. The most remarkable are Oransay and Columskill, on account of their antiquities; Scarba, for its known water drain (Vatta-drag) and Staffa, on account of its natural pillars, which hitherto have been little known, and surpass whatever has been observed before of the kind.

You know, sir, that the inhabitants of these isles, as well as in the Highlands of Scotland, have a language of their own, which they call Erse, and which is a remnant of the Celtic. In this language Ossian wrote his admirable poems; and though the inhabitants cannot at present produce any thing comparable to them, yet I hope, on my return home, to give you proofs of their being able to write both with elegance and sentimental feelings. As it is very extraordinary that this language should have preserved itself here so long,* it will perhaps not be disagreeable to you to be more particularly acquainted of the limits within which it is confined. I will readily sketch them out to you, being able to do it with so much the more certainty, having received my information from Mr. Macpherson, the only man in England who has particularly studied this language.

It begins to be spoken on the eastern side at Nairn, and extends from thence through the whole country, and all the western isles. In the north its limits are at Caithness, where Erse is only spoken in four parishes out of ten; in the other six, better English is spoken than in any other part of Scotland. There is in Ireland another dialect of it, as well as in Wales and Britany; however, they are not so different, but a man born in either of these provinces, may make himself understood in the others. Had I been acquainted with the language of the Dalecarlians, I should have had an opportunity of examining how far that similarity is founded, which, as it appeared to my ear, subsists between these two languages.

The country abounds with northern antiquities, such as castles, strong-holds, burying places, and monuments, (Bautasteinar); and the people, who are obliging and extremely hospitable, have a number of customs resembling those observed by our country-people, such as the celebration of the first of May,† and many others.

We now left these islands, and continuing our voyage arrived at last, on the twenty-eighth of August, at Iceland, where we cast anchor at Bessestedr, formerly the dwelling-

* The very little connection which the ancient inhabitants of the Scots Highlands and of the Hebrides had with other nations (especially before the Union, which has in every respect been beneficial to them) is the true cause that the Erse language has so long been preserved among them. Besides these reasons, there is another, which accounts almost for them all; the poverty of the soil and inclemency of climate admit of very little cultivation, so that these parts have very few natural productions which might tempt foreigners to visit them: some few gifts of nature are, no doubt, lodged in the bosom of the Scots rocks; but hitherto indolence and want of industry in the natives have neglected these riches: within a few years only it is that commerce has begun to raise its head, which alone induces other nations to frequent this or any country. It is therefore not so very extraordinary, that in a mountainous country the remains of ancient nations should be found, who long preserve their language. In the Caucasus are still existing the posterity of several nations, who crossed these mountains in their attempt to conquer Asia and Europe, and within a small compass more than five or six different languages are spoken.

† It is called in Sweden *war Fruday; le jour de notre Dame*, our Lady's Day. The witches are supposed to take, in the night preceding that day, their flight to Blakulla, a famous mountain; but it was formerly believed in Germany, that the witches travelled to the Bloxberg, or Brocken, a high mountain contiguous to the Hartz forest. In Sweden the spring comes on about this time, and of consequence the hard labour of ploughing, mowing, and reaping, follow one another from that time, and require the best exertion of the strength of the husbandmen, to which they prepare themselves on this day by frequent libations of their strong ale, and they usually say, Masle man dricka marg i benen; You must drink marrow in your bones.

place of the famous Sturleson. We seemed here to be in another world; instead of the fine prospects with which we had fed our eyes, we now only saw the horrid remains of many devastations. Imagine to yourself a country, which from one end to the other presents to your view only barren mountains, whose summits are covered with eternal snow, and between them fields divided by vitrified cliffs, whose high and sharp points seem to vie with each other, to deprive you of the sight of a little grass, which scantily springs up among them. The same dreary rocks likewise conceal the few scattered habitations of the natives; and no where a single tree appears, which might afford shelter to friendship and innocence. I suppose, sir, this will not inspire you with any great inclination of becoming an inhabitant of Iceland; and indeed at first sight of such a country one is tempted to believe that it is impossible it should be inhabited by any human creature, if one did not see the sea, near the shores, everywhere covered with boats.

Though there is scarcely any country so little favoured by nature, and where she appears throughout in so dreadful a form, yet Iceland contains about sixty thousand people, who cannot properly be called unhappy, though they are unacquainted with what in other places constitutes happiness. I spent there above six weeks with the greatest pleasure, partly in studying one of the most extraordinary situations of nature, and partly in collecting information from the natives, concerning their language, manners, &c. &c. As to the former, I have treated of it in a letter to professor Bergman, which I doubt not he will communicate to you with pleasure, if you desire it. Of the latter I will here mention some particulars.

You know, sir, that Iceland first began to be cultivated in the eleventh century by a Norwegian colony, among which were many Swedes. They remained perfectly free in this corner of the world for a long time; but were, however, at last obliged to submit to the Norwegian kings, and afterwards became subject, together with Norway, to the kings of Denmark. They were at first governed by an admiral, who was sent thither every year to make the necessary regulations; but that mode has been changed many years, and a governor* appointed, who constantly resides in the country. This post is, at present, occupied by Mr. Larr Thodal, who has formerly been Danish plenipotentiary in the commission for settling the limits between Sweden and Norway, and has spent several years at Stockholm.

The Icelanders are of a good honest disposition; but they are, at the same time, so serious and sullen, that I hardly remember to have seen any one of them laugh: they are by no means so strong as might be supposed, and much less handsome. Their chief amusement, in their leisure hours, is to recount to one another the history of former times; so that to this day you do not meet with an Icelander who is not well acquainted with the history of his own country: they also play at cards.

Their houses are built of lava, thatched with turf, and so small, that you find hardly room to turn yourself in them. They have no floors; and their windows, instead of glass, are composed of thin membranes of certain animals. They make no use of chimnies, as they never light a fire, except to dress their victuals, when they only lay the turf on the ground. You will not therefore think it strange, when I inform you that we saw no houses, except shops and warehouses; and on our journey to Heckla we were obliged to take up our lodgings in the churches.

Their food principally consists of dried fish, sour butter, which they consider as a great dainty, milk mixed with water and whey, and a little meat. They receive so

Stiftsamtmann.

little bread from the Danish company, that there is hardly any peasant who eats it above three or four months in the year. They likewise boil groats, of a kind of moss (Lichen Islandicus) which has an agreeable taste. The principal occupation of the men is fishing, which they follow both winter and summer. The women take care of the cattle, knit stockings, &c. They likewise dress, gut, and dry the fishes brought home by the men, and otherwise assist in preparing this staple commodity of the country.

Besides this, the company, who yearly send fifteen or twenty ships hither, and who possess a monopoly which is very burthensome to the country, export from hence some meat, eider-down, and some falcons, which are sold in the country for seven, ten, and fifteen rix-dollars a-piece. Money is very rare, which is the reason that all the trade is carried on by fishes and ells of coarse unshorn cloth, called here Wadmal; one ell of wadmal is worth two fishes; and forty-eight fishes are worth a rix-dollar in specie. With gold they were better acquainted at our departure, than on our arrival.

They are well provided with cattle, which are generally without horns: they have likewise sheep, and very good horses: both the last are the whole winter in the fields: dogs and cats they have in abundance. Of wild and undomesticated animals they have only rats and foxes, and some bears,* which come every year from Greenland with the floating ice: these, however, are killed as soon as they appear, partly on account of the reward of ten dollars, which the king pays for every bear, and partly to prevent them from destroying their cattle. The present governor has introduced rein-deer into the island; but out of thirteen, ten died on their passage, the other three are alive with their young.

It is extraordinary that no wood grows successfully in Iceland; nay, there is scarcely a single tree to be found on the whole island, though there are certain proofs of wood having formerly grown there in great abundance. Corn cannot be cultivated here to any advantage; though I have met with cabbages, parsley, turnips, peas, &c. &c. in five or six gardens, which were the only ones in the whole island.

I must now beg leave to add a few words about the Icelandic literature. Four or five centuries ago the Icelanders were celebrated on account of their poetry and knowledge in history. I could name many of their poets, who celebrated in songs the warlike deeds of the northern kings; and the famous Snorre Sturleson is the man, to whom even the Swedes are indebted for the first illustration of their history. We, for this reason, set so high a value upon the ancient Icelandic records and writings, that they have almost all been drawn out of the country: so exceedingly scarce they are become, that, notwithstanding the pains I took during the whole time of my stay there, I got a sight of only four or five Icelandic manuscripts. In the inland parts of the country, our old language has been preserved almost quite pure; but on the coasts, where the natives have an intercourse with the Danish merchants, it has been somewhat altered. Some speak the Danish language very well; but those who did not, could sooner make themselves intelligible to us Swedes, than to the Danes. We likewise found three or four Runic inscriptions, but they were all modern, and consequently of no value. I have said before that the Icelanders took pleasure in listening to their old traditional sayings and stories; and this is almost the only thing that remains among them of the spirit of their ancestors; for they have at present but few poets; and their clergy know little besides some Latin, which they pick up in the schools established in the episcopal sees at Skalholt and Hoolum. Some of them, however, have studied

* The bears here mentioned are the white polar or arctic carnivorous bears, absolutely forming a species widely distinct from our brown and black bears; though the celebrated Linnæus only suspected them to be a new species, not having seen and examined any of these animals.

at the university of Copenhagen; and I became acquainted with three men of great learning among them, who were particularly well versed in the northern antiquities. One of them is the bishop of Skalholt, Finnur Jonson, who is compiling an ecclesiastical history of Iceland; the two others are the provost Gunnar Paulson, and Halfdan Ginarson, rector at Hoolum.

That there is a printing-office in Iceland cannot be unknown, as we are acquainted with the rare editions of Olof Tryggwassons, Landnama, Greenland, and Christendoms Sagas, or Traditions, printed at Skalholt; but I did not expect to find the art of printing so ancient here as it was represented to be. A Swede, whose name was John Mathieson, brought hither the first printing-press, between the years 1520 and 1530; and published in the year 1531 the Breviarium Nidarosiense. I have collected as many Icelandic books as I have been able to discover; among the rarest is the Icelandic bible, printed in folio at Hoolum in the year 1584. I hope, likewise, that fifteen (till now unknown) traditional histories, or sagas, will be no unwelcome acquisition.

You may judge, sir, how agreeably I spent my time here in these occupations, which I applied to with so much the more pleasure, as they all related to objects entirely new: added to which, I was in society with Mr. Banks and Dr. Solander, the latter of whom is a most worthy disciple of our Linnæus, and unites a lively temper to the most excellent heart; and the former is a young gentleman of an unbounded thirst after knowledge, resolute and indefatigable in all his pursuits, frank, fond of social conversation, and at the same time a friend of the fine arts and literature: in such company you will confess it was impossible I should have the least reason for regretting the time spent in this voyage.

I had almost flattered myself with the hopes of seeing Mr. Banks and Dr. Solander in Sweden; but I learn that they will be detained in England for some time. I much fear Dr. Solander will be for ever lost to his native country, as well on account of the universal esteem in which he is held in England, as of his being preferred to a more beneficial place at the British Museum than that which he formerly possessed.

Their voyage to the South Seas will probably make its appearance in April or May next. They have already begun to engrave the collections of animals and plants they have made on their voyage, which will employ them several years, as they must consist, I should apprehend, of near two thousand plates.

It would be writing a natural history, were I to attempt to give a proper description of these admirable collections. They have alone above three thousand fishes and other animals preserved in spirits, most of which are new. Linnæus might find among their plants, of which they have several sets (one of which, I flatter myself, will find its way into Sweden) subjects for a new mantissa.

I propose, when I have seen Holland, to make a litle excursion to Germany, to see Mr. Michaelis, and soon afterwards return to my native country, where I shall have the honour of assuring you personally of the affectionate regard, &c. &c.

LETTER III....TO CHEVALIER IHRE.

ON THE PHYSICAL CONSTITUTION OF THE COUNTRY.

SIR, Stockholm, June 20, 1773.

THERE is no duty more agreeable to me, than that of obeying your commands, in transmitting to you some account of Iceland, its antiquities, and what else relates to it. As I have happily had an occasion of seeing the country myself, it may with

justice be required of me, that I should willingly communicate to others the informations I have been able to procure; and it would give me peculiar pleasure, if they enabled me satisfactorily to answer those questions which you kindly proposed to me.

Iceland is justly reckoned amongst the largest islands in the known world. It is sixty miles in length, and its breadth exceeds forty Swedish miles.*

The most useful among many maps of this country is that which has been made by Messrs. Erickssen and Schoonning in the year 1771, though it might be further improved.

Bessestedr, in the southern part of the island, not far from Hafnefiord, lies, according to Horrebow's account of Iceland, in 64 degrees 6 minutes of north latitude, and in 41 degrees of longitude, from the meridian of Stockholm; so that it is almost in the latitude of Hernosand.†

The country does not afford a pleasing prospect to the eye of the traveller, though it presents him with objects worthy of attention in many respects: for besides innumerable ridges of mountains that cross it in several directions, and some of which, on account of their height, are covered with continual ice and snow, you only see barren fields between them, entirely destitute of wood, and covered with lava for the space of many miles. This is certainly as incapable of giving the eye pleasure, as it is unfit for any other use. On the other side, however, it causes the greatest surprise in the attentive spectator, to see so many speaking proofs of the dreadful effects of volcanoes.

Though the coasts are better inhabited, the inland parts of the country do not lie waste and neglected; and one finds everywhere, sometimes close together, and sometimes at greater distances, farms with some land belonging to them, which generally consists of meadow-land, and sometimes of hills thick spread with low shrubs and bushes, and which they honour with the appellation of Woods.

In the whole island there are no towns, nor even villages; nothing but single farms are to be seen, some of which, however, consist of several dwelling-houses, destined for the owner of the farm and his tenants (hiâ leygumann) who procure from the proprietor a house and pasture for as many cows, horses, and sheep, as they choose to agree for. On the estates of some peasants who are better circumstanced, there are even sometimes dwellings for labourers (huusman) who work for daily hire. All these farms belong either to the king, the church, or the peasants themselves. ‡ I will mark the price of two of these farms, which were sold a little before our arrival, that you may judge of their value. The one farm, whereon ten cows, ten horses, and four hundred sheep, might be kept, was sold for one hundred and twenty rix-dollars; and the other, which had sufficient pasture for twelve cows, eighteen heads of young cattle, above a year old, that had not yet calved (ungnot) eight oxen, fourteen horses, and three hundred sheep, for one hundred and sixty dollars.

In some few places they have small fenced spots near their houses, in which they cultivate cabbage, parsley, spinach, turnips, patientia, potatoes, and some other roots and vegetables, together with flax and hemp. Fruit trees are looked for in vain, which is not to be wondered at, since storms and hurricanes are here very frequent. These have given rise to the name of (Wedrakista) Storm-coast, which has been given to some places in Iceland.

* About 360 British sea miles in length, and about 240 in breadth. † A town in Sweden.

‡ In order to shew at once in what proportion the farms are distributed between the king, the church, and the farmers, I will here annex an abstract, taken from the Icelandic Villarium, or Land-book of the year 1695, which came into my possession.

ABSTRACT FROM THE ICELANDIC LAND-BOOK OF 1695.

Of these farms in each syssel belong.	Jullbrings.	Kiosar.	Borgarfiords.	Snefiallsnes.	Hunnepsdals.	Dals.	Barudastrands.	Isafiords.	Strandes.	Hunavatns.	Skagafiords.	Vadle.	Thingey.	Mule.	Skaftafalls.	Rangervalls.	Arne.	Names of the church or diocese.	Number of farms.
To the king.	90	40	10	22	28	2	6	21	21	85	40	52	51	45	102	6	4		718
To the bishop's see of Skalholt.	6	2	37				4		3				1	4	13	32	202		304
To the bishop's see of Hoolum.										30	196	61	49						345
Church glebe.	14	9	67	44	18	24	28	64	29	46	14	33	55	61	8	64	2		640
Glebe of clergy.	3	2	9	4	2	3	4	10	3	14	10	13	14	23	6	6	14		140
Glebe of superannuated clergy.	1	2	4	2		2	3	1	3		1			12	4	7	3		48
For maintaining the poor.	1		1	1				2		1	1		2	5	2				16
For maintaining hospitals.				1								1			1		1		184
To farmers.	11	36	216	59	23	149	132	161	66	143	104	133	134	187	47	183	91		47
Total sum.	126	91	344	199	68	180	187	259	123	329	366	323	306	357	183	268	347		4048

They have likewise prevented the growth of fir-trees, and Norway pitch-firs,* which governor Thodal had planted here, whose tops seemed to wither as soon as they were about two feet high, when they then ceased growing.

That wood has formerly grown in Iceland can be proved from the Sagas, or tradition stories of Landnama, Kialnesinga, Svafdala, and Egill Skallagrimsonare. It is likewise proved by pieces which are frequently dug up in marshes and fens, where not a single bush is to be seen at present. The substance, called by the natives suturbrand, is likewise a clear proof of it.

This suturbrand is evidently wood, not quite petrified, but indurated, which drops asunder as soon as it comes into the air, but keeps well in water, and never rots: it gives a bright though weak flame, and a great deal of heat, and yields a sourish though not unwholesome smell. The smith's prefer it to sea-coal, because it does not so soon waste the iron. The Icelanders make a powder of it, which they make use of to preserve their clothes from moths; they likewise apply it externally against the cholick. I have seen tea-cups, plates, &c. in Copenhagen made of suturbrand, which takes a fine polish. It is found in many parts of Iceland, generally in the mountains in horizontal beds; sometimes more than one is to be met with, as in themountain of Lack in Bardestrand, where four strata of suturbrand are found alternately with different kinds of stone.

I have brought a large piece of it with me to Sweden, in which there are evident marks of branches, the circles of the annual growth of the wood, leaves and bark, in the surrounding clay; and there is some reason to believe, that these trees have been mixed in the thrown-up lava in some eruption of fire, or an earthquake.

I am almost inclined to believe that some streams of lava, which at the depth of fifteen feet, according to observations that have been made, can advance twelve thou-

* Pinus picea, Linn. and pinus abies, Linn.

sand Swedish ells, of two feet each, in eight hours, by a declivity of forty-five degrees, have swept away these trees, which seem to have been of a considerable size, and buried them; and this is so much the more probable, as the suturbrand frequently has the appearance of coal. But as I do not know whether this opinion has ever been advanced before, and having had no opportunity of making sufficient observations upon this conjecture, and as there is even some reason to suppose that a tree would in so violent a fire directly be consumed to ashes, though the contrary may also be possible, when it is in the same instant overturned, covered, and in a moment smothered; yet I will not even venture to offer this opinion as a probable conception.

There is still another probable supposition. The trees may have been overturned by an earthquake, and then covered beneath the hot ashes of a volcano, in the same manner as happened at Herculaneum, and other places, where whole towns have shared the same fate.

That there have been formerly considerable woods in Iceland can scarcely be doubted; nay, there are at this time some small spots covered with trees, as at Hallarmstad, Hunsefeld, and Aa, and in several other places. However, there are no fir nor pine-trees; and the birch-trees now existing never exceed the height of eight or twelve feet, and are not above three or four inches thick, which is partly owning to bad management, partly by the devastations caused by fire or hurricanes, and the Greenland floating ice; the last is the cause that at Stadar-hrauns, Eyry, and Kiolfield, whole spots of land are seen covered with withered birch-trees. But these being found insufficient to supply the inhabitants with fuel, they likewise make use of turf, fern, juniper, and black crow-berry bushes (empetrum nigrum); in other places they burn the bones of cattle killed for butchers' meat, and fishes moistened with train-oil; also dried cow-dung that has been the whole winter in the meadow; and last of all floating wood. This floating wood is obtained in great abundance every year, particularly at Langanas on the N. E. coast, at Hornstrand on the N. W. side, and every where on the northern coast of the country.* There are several different kinds of wood among it, the greatest part is Norway pitch fir;† but besides this, one finds common fir, linder, willow,‡ cork-wood, and two sorts of red-wood, which are

* The immense quantity of wood floating down the Mississippi, the St. Lawrence, and other rivers of North America, are probably those which are carried to the northern regions. From the gulph of Mexico a strong current sets across the Atlantic in a south-west to north-east direction, or nearly, and carries many tropical fruits on the coast of Norway, the Ferois, and Iceland; which remarkable circumstance has been noticed by that curious observer and delineator of nature George Edwards. But the wood coming down the Mississippi is remarked by Bossu, in his Travels through North America, vol. i. p. 19. The coast of Greenland is benefitted by drift-wood, in the same manner as Iceland. See Crantz's History of Greenland, vol. i. p. 37. The northern coast of Siberia is often covered with wood in a most astonishing manner. See John George Emelen's Travels through Siberia, vol. ii. p. 415. Nor is the coast of Kamtschatka destitute of floating wood. See J. F. Miller's Collection of Russian Transactions, vol. iii. p. 67. The great rivers of Siberia, such as the Lena, Kolyma, Yenisea, and others, carry chiefly in spring many wood trees along with their waters into the ocean, where it is often floating in various directions, set by winds and currents, and checked by the immense masses of ice, till after many months and years it is thrown up, and left on the coast, for the benefit of the inhabitants of these frigid regions, which are too cold for the growth of trees. Iceland receives its drift-wood by strong westerly and north-westerly gales, varying with southerly winds, which seems to confirm the opinion, that the drift-wood comes from North America: it consists chiefly of pinus, abies, picea limbra, and larix, tilia, europea, betula alba, and salix caprea, and some unknown kinds of wood: and according to Catesby's Natural History of Carolina, great quantities of these enumerated woods are floating down the rivers of Virginia and Carolina; and another part seems to come round the north of Europe from the Siberian rivers.

† Pinus abies, Linn. ‡ Salix capres, Linn.

called rauda grene and staffalejk in Iceland, and on account of their colour and hardness are employed in various kinds of neat work. It comes most probably from the northern parts of Tartary, and partly from Virginia and Carolina. As to what relates to agriculture, it may be discovered, by many passages of the ancient Icelandic accounts, that corn formerly grew in Iceland. In later times several trials have been made with it, but they have been attended with little success.

Governor Thodal sowed a little barley in 1772, which grew very briskly; but a short time before it was to be reaped, a violent storm so utterly destroyed it, that only a few grains were found scattered about.

If we consider, besides these strong winds, or rather hurricanes, the frosts which frequently set in during May and June, we shall discover a number of difficulties which check the rise and growth of agriculture in Iceland. If, notwithstanding these obstacles, it can ever be brought to a thriving condition, it must certainly be under the present indefatigable governor, who has the welfare of the country much at heart, and, in conjunction with the government, studies every possible means to promote it.

I consider these violent winds, and the Greenland floating ice, which every year does great damage to the country, as the chief cause of the diminution of the growth of wood, as well as of the ill success in the late attempts for introducing agriculture.

This ice comes on by degrees, always with an easterly wind, and frequently in such quantities as to fill up all the gulfs on the north-west side of the island, and even covers the sea as far as the eye can reach; it also sometimes drives to other shores. It generally comes in January, and goes away in March. Sometimes it only reaches the land in April, and, remaining there a long time, does an incredible deal of mischief. It consists partly of mountains of ice (fiall-jaka) which are sometimes sixty fathoms high above water, and announce their arrival by a great noise, and partly of field-ice (hellu-is) of the depth of one or even two fathoms. Of this last some parts soon melt, and other parts remain undissolved many months, often producing very dangerous effects to the country.*

The ice caused so violent a cold in 1753 and 1754, that horses and sheep dropped down dead on account of it, as well as for want of food; horses were observed to feed upon dead cattle, and the sheep eat of each other's wool. In the year 1755, towards the end of the month of May, in one night the ice froze half an inch and five lines thick. In the year 1756, on the twenty-sixth of June, snow fell to the depth of a yard, and continued falling through the whole months of July and August. In the year following, it froze very hard towards the end of May and the beginning of June in the south part of the island, which occasioned a great scarcity of grass, insomuch that the inhabitants had

* The immense masses of ice, which are so dreadful, affecting the climate of the country along the northern and north-west coast of Iceland, arrive commonly with a N. W. or N. N. W. wind from Greenland. Field-ice is of two or three fathoms thickness, and is separated by the winds, and less dreaded than the rock or mountain-ice, which is often seen fifty and more feet above water, and is at least nine times the same height below water. These immense masses of ice are frequently left in shoal water, fixed, as it were, to the ground, and in that state remain many months, nay years, undissolved, chilling all the ambient part of the atmosphere for many miles round. When many such lofty and bulky ice-masses are floating together, the wood, which is often drifting along between them, is so much chafed, and pressed with such violence together, that it takes fire; which circumstance has occasioned fabulous accounts of the ice being in flames: of the bulk of such ice-masses, see Forster's Observations made during a voyage round the world, page 69, 1773 and 1774.

little or no fodder the ensuing winter for their cattle: these frosts are generally followed by a famine, many examples of which are to be found in the Icelandic chronicles.*

Besides these calamities, a number of bears yearly arrive with the ice, which commit great ravages, particularly among the sheep. The Icelanders attempt to destroy these intruders as soon as they get sight of them; and sometimes they assemble together, and drive them back to the ice, with which they often float off again. For want of fire-arms, they are obliged to make use of spears on these occasions. The government itself takes every possible method to encourage the natives to destroy these animals, by paying a premium of ten dollars for every bear that is killed, and by purchasing the skin of him who killed it. These skins are a prerogative of the king, and are not allowed to be sold to any other person.

It is as absurd to suppose that this floating ice consists principally of salt-petre, as that it might be employed in making gun-powder; and yet there are some persons who pretend to support this opinion, but they are certainly undeserving the trouble of refutation.

I must mention two other inconveniences to which Iceland is subject, the Skrida and Snioflodi: the name of the first imports large pieces of a mountain tumbling down, and destroying the lands and houses which lie at the foot of it. This happened in 1554, when the whole farm of Skidestedr in Vatndal was ruined, and thirteen people buried alive. The other word signifies the effects of a prodigious quantity of snow, which covers the tops of the mountains, rolling down in immense masses, and doing a great deal of damage. There was an instance of this in the year 1699, during the night, when two farms, in the syssel of Kiosar, were buried in the snow, with all their inhabitants and cattle.†

The climate is not unwholesome, as the usual heat is not extreme, nor the cold in general very rigorous. However, there are examples of the mercury in Fahrenheit's thermometer falling quite down into the bulb, which is twenty-four degrees under the freezing point; when at other times it has rose to one hundred and four degrees.

It cannot be determined with any degree of certainty how much the cold has increased or decreased prior to 1749, the year when Horrebow began his observations on the weather; which were afterwards continued by the provost Gudlaug Thorgeirsson to the year 1769: since which period observations have been made by Mr. Eyolfs Jonson, who was formerly assistant at the Round Tower at Copenhagen, and receives a salary as first observer in Iceland.‡ His observatory is at Arnarhol, near Reykarwick; and,

* The cold seems to have become more intense in Iceland since the time when these here-before-mentioned fir-trees were growing, and before the ocean was so very much covered with floating ice.

These facts seem to confirm very much the opinion of count Buffon, in his Epoques de la Nature; in consequence of which he believes that the country towards the poles was formerly more habitable than it is at present: he is of opinion, that the skeletons of elephants found far north in Siberia are almost irrefragable proofs of the formerly milder temperature of the air; since they could scarcely be found in Siberia in such numbers, unless they had existed there. Buffon Epoques de la Nature, p. 165, & seq. The eastern shores of Greenland were formerly inhabited by a colony of Norwegians, and they had there a bishop's see, called Gardar, to which belonged farms, woods, pastures for cattle, granges, and tillage-land. See Crantz's History of Greenland, vol. i. p. 245, which evidently proves the mildness of these now inhospitable regions. Ships sailed formerly to the eastern coast; whereas for a great number of years past it has been inaccessible, on account of the immense masses of ice found there. Are Frode in Scheda de Islandia, Oxon. 1716, cap. 2. p. 10, says, that at the first landing of the Norwegian colonists, Iceland was covered with woods and forests in the space between the shores and mountains.

† Snioflod, or Snowflood, is a very expressive word for this dreadful accident, which is not uncommon in all alpine countries, especially Switzerland. The Italians call such a rolling down of masses of snow, Lavine; the French, Laivaches; and the Germans, Lauihnen.

‡ This ingenious gentleman died in 1775, not many months since the writing of this letter.

what is remarkable, he makes use of a telescope of his own construction, made of the black Iceland agate, instead of coloured glass.

Lightning and thunder storms are rare, and both in summer and winter seldom happen any where else but in the neighbourhood of volcanoes. Northern lights frequently appear uncommonly strong.* Sometimes a kind of the ignis fatuus is observed (Snoelios and hrævas-eldur) which attaches itself to men and beasts.

Amongst other ærial phænomena, the lunar halo (rosabaugu) which prognosticates bad weather, likewise deserves a place here, as well as parhelions (hiasolar) which appear sometimes from one to nine in number.† Fire-balls (called Viga Knottur) are likewise observed, and when they are oval are named Wiigabrandur; and last of all comets, or Halestiernor, which are often mentioned in their chronicles.

The ebb and flood here, which the Icelanders call flod and fiara, are perfectly the same as at other places; they are stronger during the new and full moon than at other times, and strongest of all about the equinoxes.

As I am here speaking of the nature of the country, I cannot pass over in silence the earthquakes, which often happen, particularly before volcanic eruptions. In September, in the year 1755, fifteen violent shocks were observed within a few days; and it is not uncommon to see whole farms overturned by them, and large mountains burst asunder, as will be remarked hereafter, in the letter which treats of the conflagrations in Iceland.

In so mountainous a country, where there is no agriculture, and no commerce, except that carried on by bartering of the various commodities on the arrival of the Danish ships, no good roads can be expected: they therefore make use of neither carts nor sledges; and there are many places in which it is both difficult and dangerous even to ride on horseback, which have caused the names of Ofoerur, Halsavegur, Hofdabrecka, Illaxlif, to be given to some roads. Their length is not reckoned by the number of miles, but that of thingmanna-leid, that is, as far as a man, who is travelling to a place where justice is administered, can go in one day, which is about three and a half Swedish, or four Icelandic miles.‡ Formerly houses were built in some particular places for the use of travellers, which were called Thiodbrautar-skaala; but now the churches are every where made use of for this purpose.

When the Icelanders travel to sea-ports, to exchange their fish, &c. they have twenty, thirty, and sometimes a greater number of horses with them, which carry a load of three hundred or four hundred pounds weight each; but they have always some spare horses along with them, to relieve those that are fatigued: this cavalcade is called Lest; and the man who guides them is called Lestamadur: he rides on before, accompanied with a dog, that, by uttering a certain word, drives the strayed or straggling horses into the right road. They never carry any food for their horses, as pasture is plenty every where.

* The northern lights appear in Iceland in all the different quarters of the compass, especially on the southerly horizon, where a dark segment appears, from whence strong columns of light dart forth. They are most frequently seen in dry weather, though there are instances of their appearance before, during, and after a shower of rain. The lights are often seen tinged with yellow, green, and purple. See Oggert Olafsen's and Biarne Paulsen's Travels through Iceland, sec. 855.

† The parhelions are observed in Iceland chiefly at the approach of the Greenland ice, when an intense degree of cold is produced, and the frozen vapours fill the air: there are many instances, proving, that under such circumstances the sun never appears without shewing one or several parhelions, and often a rainbow on the opposite side.

‡ About twenty-one or twenty English miles.

The number of the inhabitants is by no means adequate to the extent of the country. It has been much larger in former times; but besides what is called the Digerdeath, and other contagious diseases, among which the plague carried off great numbers from 1402 to 1404, many places have been entirely depopulated by famine. In the years 1707 and 1708, the small-pox destroyed sixteen thousand persons; so that the number of inhabitants cannot exceed sixty thousand.

LETTER IV....TO CHEVALIER IHRE.

OF THE ARRIVAL OF THE NORWEGIANS, THE GOVERNMENT, AND LAWS IN ICELAND.

SIR, Stockholm, June 13, 1774.

As I have treated in my former letter of the nature of the country in Iceland, an inquiry how, and when, it was first peopled might not perhaps be disagreeable to you.

We know little or nothing of the first inhabitants of Iceland, who possessed the country when the Norwegians first arrived there. We are informed by some, that they were Christians, who, according to the most probable conjectures, arrived there from England and Ireland, and were called Papa by the Norwegians.* They pretend to affirm with the greatest certainty, that this English colony settled there in the beginning of the fifth century; but I look upon it as the safest way not to enter at all upon an affair wrapped up in such obscurity. There is notwithstanding reason to suppose that the English and Irish were acquainted with this country, under another name, long before the arrival of the Norwegians; for the celebrated Beda in his time pretty accurately describes it. But I will not dwell upon these ancient inhabitants of Iceland, but proceed to examine how the Norwegians came to settle there. Of this we have several accounts in the Icelandic Sagas.† I shall now particularly follow Landnama Bok, which treats of the arrival of these new colonists.

Naddoddr, a famous pirate, was driven by the winds on the coast of Iceland, on his return from Norway to the Ferro Gales, in 861, and named the country Snio-land (Snow-land) on account of the great quantity of snow with which he saw the mountains covered. He did not remain there long; but however extolled the country so much after his return, that one Gardar Suafarfon, an enterprising Swede, was encou-

* The ancient Norwegians, who first landed in Iceland, found there inhabitants who were Christians, and were called by the Norwegians Papas, which is conjectured to signify priests. This is confirmed by the preface of the Landnama Bok, or Book of Colonization, written by various authors, the first of whom was Are Frode, born 1068; and he expressly says, in the first chapter of the book, that Iceland was settled by the Norwegians in the time of Alfred king of England, and of Edward his son. The same preface mentions, that Beda speaks of Iceland, under the name of Thyle, more than a hundred years before the arrival of the Norwegians in Iceland: and that the Norwegians found there Irish books, bells, and crosiers, which proved that these people came from the west. And it is added, that the English books mention an intercourse of navigation between those lands about those times. King Alfred certainly mentions in his translation of Orosius the utmost land to the N. W. of Iceland, called Thila; and that it is known to few on account of its great distance. See Alfred's Orosius, p. 31. The Landnama Bok was published at Copenhagen, 1774, in quarto. The circumstance of the Irish books left in Iceland is likewise mentioned by the same Are Frode, in Ara Multiscii Shedis de Islandia, Oxoniæ, 1716, octavo, cap. ii. pag. 10. who says they chose not to live with the heathens, and for that reason went away, leaving behind Irish books, bells, and crosiers.

† The word Saga signifies the ancient historical monuments in Iceland; some of them are the historical relations, others are fabulous stories in the style of the Arabian Nights. The distinction between them requires a nice critical judgment. As the word occurs often, we once for all explain it here.

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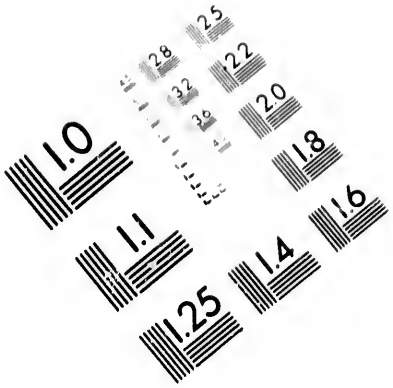

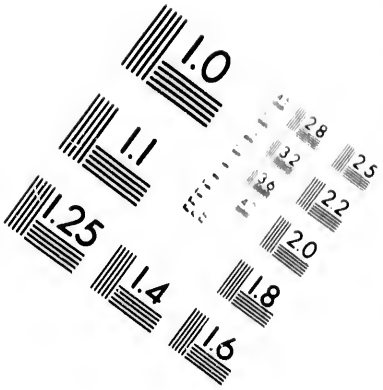

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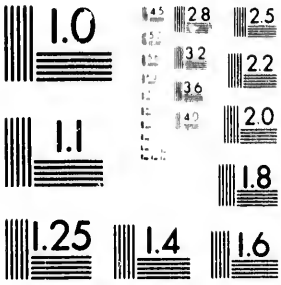

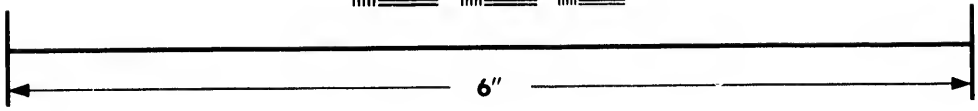

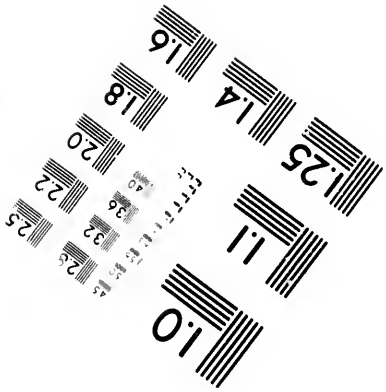

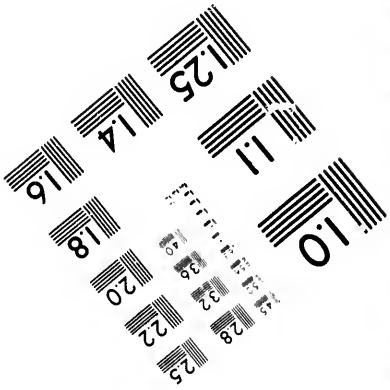

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raged by his account to go in search of it in 864. He sailed quite round the island, and then called it Gardarsholmur (Gardar's Island.) He remained the whole winter in Iceland, and in spring returned to Norway, where he described the new-discovered island as a pleasant, well-wooded country. This excited a desire in Floke, another Swede, and the greatest navigator of his time, to undertake a voyage thither. As the compass (in Icelandic Leitharstein*) was not then known, he took three ravens on board, to employ them on the discovery. By the way he visited his friends at Ferro; and after having sailed farther to the northward, he let fly one of his ravens, which returned to Ferro. Some time after he dismissed the second, which returned to the ship again, as he could find no land. The last trial proved more successful, since the third raven took his flight to Iceland; soon after they discovered land, and in a few days really arrived there. Floke stayed here the whole winter with his company; and because he found a great deal of floating ice on the north side, he gave the name of Iceland to the country, which it has ever since retained.

When they returned to Norway in the following spring, Floke, and those that had been with him, made a very different description of the country. If, on the one side, Floke described it as a wretched place, Thorulfr (one of his companions in the voyage) on the other side, so highly praised it, that he affirmed butter dropped from every plant, which gained him the nick-name of Thorulfr Smior, or Butter Thorulfr.†

After what I have related, there are no traces of any voyage to Iceland, till Ingolfr and his friend Leifr undertook one in 874. They found on their arrival that the country had not been misrepresented; and resolved, after having spent the winter on the island, to settle there entirely for the future. Ingolfr returned to Norway, to provide whatever might be necessary to accomplish a new and comfortable establishment in an unfertilized and dreary country; and Leifr in the meanwhile went to assist in the war in England. After an interval of four years, they met again in Iceland, the one bringing with him a considerable number of people, with the necessary tools and implements for making the country habitable; and the other imported his acquired treasures. Since this period many people went there to settle, and in sixty years time the whole island was inhabited; and king Harold, who did not contribute a little towards it by his tyrannical treatment of the petty kings and lords in Normandy, was at last obliged to issue an order, that no one should sail from Norway to Iceland, without paying four ounces of fine silver to the king, in order to put a stop, in some measure, to those continual emigrations, which weakened his kingdom.

Though the greatest part of the inhabitants came from Norway, there are however many Danes and Swedes among them. Of the latter I will only mention the following, from that edition of Landnama Bok, which was printed at Skalholt. Ingimundur, an earl in the Gothic empire, one of the descendants of Bore, Gore's brother, p. 90; with his friends Jorundr, Ejvindr, Sorkver, Asmundr, and Hvatefridleifr; and his slaves Fridmundr, Bodvar, Thorer Refskegg, and Ulfkell, p. 90: Thordur, descended by the father's side in the fifth degree from Ragnor Lodbrock, p. 102: Thordur Knappur,

* The word Leitharstein is certainly equivalent to the English word loadstone, and probably has the same origin. The Anglo-Saxon word Lædan signifies to lead; and the magnet being the leader of the navigator, it is very evident that the loadstone is the leading stone of the ship. The history of the three ravens is most evidently copied from the history of the deluge in Genesis. However, it proves an uncommon sagacity in the navigator who made use of birds for the first discovery of land.

† The expression which Thorulfr made use of in describing the fertility and richness of the country characterizes the genius and manners of the age he lived in, and is therefore not to be overlooked in this account. These minute strokes paint the character and simplicity of the age, and, when compared with our manners, set them off in the fairest point of view.

natural son of Biorns of Haga; and Nafar Helge, p. 104: Bruni Hin Hviti, son of Hareks, earl of Upland, p. 104: Thormodur Hin Rami, p. 105: Biorn Rolfsson of the blood royal, p. 105: Helgi Hin Magri, p. 107: Thorir Snepill, a son of Joruns, daughter of the Lagman Thorgnys, p. 117: and Gardar Suafarson. Besides these, Are Frode mentions one of the name of Olafr, who was of the same family as king Harold; another of the name of Hrollangur, brother of Rolfs, first duke of Normandy, who drew his origin from the Swedish king Gore, grandfather of Gylfe.

Torfæus mentions one Bodvar, a Swede, who settled in Iceland, and was a descendant of the princess Goja, sister of Gore: Floke, who gave to the island its present name of Iceland, was descended from the same family. Dalin, in his preface to the first volume of his Swedish history, likewise mentions, out of Peringskold and Bjorner, the following: Snobjorn, Bjorn Ostrane, Grim, Orm Wedorm, Bjorn, and Grimkill, with their mother Helga, daughter of Harold, Barder Snefallsas, Barder Wiking, Brimle, Hjelm, Gote, Skolder Svenske, Glamer, Wafur Helge, and Slåttubjorn.

As often as a new colony arrived there, the principal person in the company appropriated to himself as large a part of the country as he was able to occupy, and gave up as much of it as he thought fit to his companions, whose chief he was, bearing the title of Godi. But in a period when robberies and violence, by sea and land, were considered as valour and merit, peace could not long subsist between the neighbouring leaders. There are everywhere instances to be met with, in the Icelandic, Sagas of battles between the new and original settlers. To prevent these conflicts in future, a person was chosen in the year 928, with the title of Laug-saugumadur, and great power and dignity conferred upon him. This man was the speaker in all their public deliberations, pronounced sentence in difficult and intricate cases, decided all disputes, and published new laws, after they had been received and approved of by the people at large: but he had no power to make laws without the approbation and consent of the rest. He therefore assembled the chiefs whenever the circumstances seemed to require it; and after they had deliberated among themselves, he represented the opinion of the majority to the people, whose assent was necessary before it could be considered as a law. His authority among the chiefs and leaders was however inconsiderable, as he was chosen by them, and retained his place no longer than whilst he had the good fortune to preserve their confidence.

Their first form of government was consequently a mixture of aristocracy and democracy: but all the regulations made by it were insufficient to maintain order among so many chiefs, who, though all of the same rank, were differently inclined, and unequal in power. Nothing was therefore more frequent than rapine and violation of the laws. They openly made war against one another, examples of which are to be met with in the Sturlunga Saga, where it is said twenty vessels, carrying one thousand three hundred men, had a bloody engagement, which so weakened the contending parties, that their whole power at last became an easy prey to a few arbitrary and enterprising men, who, as is too generally the case, wantonly abused it, to the oppression of their countrymen, and the disgrace of humanity.*

Notwithstanding all these intestine troubles, they remained entirely free from the Norwegian yoke; though the kings of that country, since the time of Harold Harfagers, viewed this new and powerful republic with envious eyes, which, though now separated, owed its origin to them; but at last they experienced that fate, which is almost always

* The account of the origin of the Icelandic republic is a curious and interesting circumstance for the history of humanity; the same must be said of the intestine feuds, which gave an opportunity to the Norwegian kings to establish their authority over this once free nation.

inevitable, wherever liberty degenerates into licentiousness, and public spirit into selfish views; that is, they were obliged to submit to one chief. The greatest part of the inhabitants, in 1261, put themselves under the protection of king Hakans, and promised to pay tribute to him on certain conditions agreed upon between them, and the rest followed their example in 1264. Afterwards Iceland, together with Norway, became subject to the crown of Denmark, which intrusted the care of it to a governor, who commonly went there only once a year to examine every thing, though, according to his instructions, he ought to have resided there. As the country suffered incredibly through the absence of its commanders, it was resolved a few years ago, that the governor should reside there continually, and have his seat at Bessestedr, one of the royal domains, where old Snorre Sturleson formerly dwelt. He has under him a bailiff, two laymen, a sheriff, and twenty-one sysselmen.* Formerly the country was divided into quarters (Fiordungar) each having its own court of justice, of which one was formed of their public assemblies, under the denomination of Fiordungs-doeme.† But as the public security seemed to require a superior court of judicature, to which the suffering party might appeal, a Fintar-doeme was established, soon after the introduction of the Christian religion, which tribunal consisted of the four above-mentioned courts, and some clergymen.

At present all causes are first decided at the Hærads-thing, or county court, from which the parties concerned may appeal to the Al-thing, or common court of justice, which is kept every year on the eighth of July at Thingvalla. Here there are two courts, the one, before which the cause in appeal is first brought, and consists entirely of lagmen;‡ the other, to which recourse may be had for a new hearing the following year, and more accurate examination; and this is composed of the governor, who presides, and twelve assessors, who are the most respectable men in the country, mostly lagmen and sysselmen. From this court the parties may again appeal to the supreme court of judicature at Copenhagen, which is final.

The Norwegians, on their first arrival in Iceland, made their own laws; but these proving insufficient, when the number of people increased, Ulfliotr undertook, in the year 987, a voyage to Norway, and composed an accurate code of laws from the regulations established there. He made use of the Gulothing law on this occasion, and returned to his native country after an absence of three years.

In 1118, the Gragas, a famous ancient code of laws, was received there; and in 1280, that called the Jonsbok,§ according to which sentence is still pronounced in some

* The place of Amtman is here translated Bailiff, and is to be taken in the sense in which the French receive the word Bailif, i. e. the head of a Bailiwick. The word Lagmann signifies properly a Lawman; i. e a person who administers justice, and might be translated Judge or Justice. The Landvogt is the person who administers the executive power of justice and the criminal law; and he may be compared to a sheriff. The Sysselmen are the magistrates of the smaller districts in Iceland (called the Syssel) who not only act as justices of the peace, but also as receivers of the land-tax. The governor is called in Iceland Stiftsamtmann, which is the same as a bailiff of the episcopal diocese; i. e. the chief magistrate of the island. This place was occupied in 1772 by Mr. Thodal, counsellor of justice, who had been employed in the final adjustment of the limits between Sweden and Norway; his salary amounts to 1500 rix-dollars. Travellers praise his abilities, patriotism, and hospitality. The bailiff, at the time of our arrival in Iceland, was Mr. Olafr Stephansson, a native of Iceland, whose parts and abilities we admired, and whose hospitality we experienced: his salary is 400 rix-dollars; and the same appointment is given to the sheriff (Landvogt) Mr. Skule Magnusen, who is said to deserve well of his country by his patriotism and eminent services.

† The words Fiordungs-doeme and Fimtar-doeme are still in part preserved in the language. For Dooms-day is the day of judgment, from the Gothic word Doem, to judge, with which the English word Doom corresponds.

‡ At the same time and at the same place the spiritual court called Presta-stefna is held, wherein the governor and bishop preside: the priests are the assessors.

§ The Jonsbook was received in 1272, according to an Icelandic Chronicle, published by Langebeck, in the second volume of the Scriptores Hist. Dan.

cases; but at present most matters are decided after the Danish law, and some more recent regulations.

LETTER V....TO CHEVALIER IHRE.

CONCERNING ECCLESIASTICAL AFFAIRS IN ICELAND.

SIR, Stockholm, June 22, 1772.

It is known from Landnama Bok, and the Shedæ of Are, that the Norwegians found some traces of Christianity on their arrival in Iceland. There were also some few Christians among these new colonists, who, however, soon apostatised to the heathen religion, so that it became general there. It is not known whether any attempts had been made to introduce the Christian religion before the year 981, when a certain bishop Friedric arrived there from Saxony, and was obliged to return, after a stay of five years, without having made any great progress.

However, a church was built in 984, by Thorvard Bodvarson, and some persons received baptism; but others, though they had no objection to the Christian doctrine, could not be prevailed upon to suffer themselves to be baptised, as they pretended it would be indecent to go naked into the water like little boys to receive baptism, which, according to the custom of those times, could only be done by submersion. Some, however, to shew their detestation of paganism, suffered themselves to be signed with the cross, which they called Primsigning. These were not considered either as Christians or heathens; however, they were allowed to eat with the former, and to be buried close to the church-yard.

Olof Tryggvasson afterwards sent them Stefr Thorgilsson, and after him his chaplain Thangbrand, a German by birth; but they were both received with stones and abusive language, as they attempted to convert them, which happened to be at the very spot where the common court of justice was held: nor were they spared by the poets of the country, who, being bribed for the purpose, poured forth in their poetical productions the keenest invectives and satire upon these champions of the Christian religion.

However, the Icelanders obtained some knowledge of the Christian doctrine, which by degrees operated upon their minds. Some of them refused to contribute any more towards the idolatrous sacrifices, and wished to enjoy more circumstantial and certain instruction in the Christian religion; so that on the arrival of Gissur and Hvalti in the year one thousand, the whole country was converted without bloodshed, though not without opposition. They also obtained a jus canonicum* from bishop Grimkell, drawn up by himself, which was as valid as a law till 1123, when it was again revised by bishops Thorlak and Ketill.†

After this time monks and convents abounded in the country. Many monks of the order of St. Benedict and St. Austin settled there, and the people paid a tribute to the Roman see, as well as other European nations, which consisted in one nagli, ten of which were equal to one ell of two feet.‡

That Rome did not lose sight of Iceland, though ever so distant, can be proved by the bishop of Skalholt, Arne Therlakson, keeping his own agent, Sighvatr Lande, canon of Drontheim, at the second council of Lyons, which was convened by Gregory the First

* See Kristnis Saga, printed at Copenhagen, 1776, in octavo, p. 57.

† The canon law was printed at Copenhagen, 1776, in octavo.

‡ The value of all things is settled in Iceland by ells of wadmal, which is a coarse woollen stuff of their own manufacturing: the see of Rome taxed every man in Iceland as high as the value of ten ells of wadmal

in the year 1274; and that the Icelanders did not yield in zeal to their fellow-christians, appears by the willingness with which they contributed both men and money to the crusades, which were then in fashion.

Amongst other saints, the bishop of Hoolum, John Ogmundsson, and the bishop of Skalholt, Thorlax Thorhallsson, were worshipped: the last died in 1193, and though he was not canonized by any pope, yet he found worshippers in Iceland,* Denmark, Norway, England, Scotland, the Orkneys, the Ferro Islands, and in Greenland, and even had a church dedicated to him in Constantinople. His Saga is full of miracles, said to have been wrought by him. It was unanimously agreed that the tenth of Januanuary, the day on which he died, and the third of July, when he was elected bishop, should both be annually celebrated. His body was taken out of the grave on the thirteenth of August 1198, and put into a coffin plated with gold and silver; and it was resolved to keep this day also as a festival. The protestant bishop Giffur Ejnarsson, afterwards, from a mistaken zeal, caused the precious ornaments with which the box was adorned to be broken off, and had it covered with brass, gilt, which is still preserved in the church of Skalholt, as a piece of antiquity. In the year 1715, bishop John Widalin ordered the pretended relique to be buried, and only a bit of his skull is shewn, which, however, if closely examined, will be found to be neither more nor less than a piece of cocoa-shell. Arcimboldus, so famous in the north for his sale of indulgences, was much too attentive to his interest to have neglected Iceland. In 1517 he had his own agent there, who was, however, more coldly received by bishop Stephen Jonsson than he expected.

The Icelanders first received their own bishops in the year 1057 at Skalholt, and at Hoolum in 1107. They were originally under the jurisdiction of the archbishop of Bremen and Hamborough; but in the year 1103 or 4, they became subordinate to Azerus,† first archbishop of Lund in Scania, and in 1152 to the bishop of Drontheim. The Icelanders preserve the memory of their prelates, both in their annual registers, and in their sagas, which particularly deserve attention, since the actions of many worthy men are found recorded therein. I shall mention the deplorable end of one of their bishops, John Jerechini,‡ by birth a Dane, who was provost and electus of Westeras, and was appointed archbishop of Upsala, by king Ericus Pomeranus. In this exalted situation he behaved so ill, that he was obliged to fly to Denmark in 1419; from whence, according to the account of the Icelandic registers, he made the best of his way to England, and from thence took his passage for Iceland, where he did not arrive till the year 1430. He was received by the inhabitants with open arms, and appointed to the see of Skalholt, which had been vacant eleven years. Here he discovered so much pride and selfishness, that some of the principal persons in the country entered into a conspiracy, and when he was celebrating mass in the cathedral church, on the thirteenth of August 1433, in commemoration of St. Thorlak, they took him by force from the altar, stripped him of all his episcopal ornaments, and putting him into a sack, with a large stone round his neck, threw him into the river Bruar, which flows past Skalholt, from whence his body was afterwards drawn, and buried in the cathedral church.§

* Bishop Finnsen in his ecclesiastical history mentions, vol. i. p. 298, note b, that bishop Thorlax had been likewise worshipped as a saint in Sweden, but there are no vestiges of this found in the old Swedish Calendaria. The tenth of January is consecrated to Paulus Eremita, and August the thirteenth to Hippolitus and Lociis Martii.

† In the Iscelandic annals he is commonly called *Aussur*.

‡ The Icelandic annals call him Jon Gierrecksson.

§ This account will serve to correct what is erroneous in Rhyzelii Episcoposcopia, where the typographical faults in Peringskold's Monumenta Uplandica, vol. i. p. 155, have been copied. Vide Finn. Hist. Eccl. Islan. vol. ii. p. 471.

king Christian the third began to introduce the Lutheran religion in the year 1540; but the zeal with which the bishops (who were then very powerful) opposed him, prevented him from succeeding till the year 1551.

Since that period, the church of Iceland has enjoyed a happy tranquility, every seed of discord being suppressed in its rise, though some attempts were made to disseminate the evil.

Iceland is divided into one hundred and eighty-nine parishes, of which one hundred and twenty-seven belong to the see of Skalholt, and sixty-two to that of Hoolum. All the ministers are native Icelanders, and receive a yearly salary of four hundred or five hundred rix-dollars from the king, exclusive of what they have from their congregation.

LETTER VI....TO CHEVALIER IHRE.

OF THE CHARACTER AND MANNER OF LIFE OF THE ICELANDERS.

Stockolm, September 1, 1774.

In a former letter I treated of the arrival of the Norwegians in Iceland, of their first form of government, and the changes they experienced, through their own mismanagement and the vicissitudes of time: give me leave, sir, to draw your attention to their character and way of life.

In like manner as their ancestors only lived by war, piracy, the chace, and agriculture, so our new Icelandic colonists were strangers to any fame but that acquired by the strength of their arm, and knew no exercises but such as a hardened body was able to support.

To go to war, to plunder, burn and destroy, and surmount every obstacle which opposed their designs, they deemed the surest path to immortality; even their games gave them an opportunity of exercising both their strength and agility of body.

Glimu-list, or the art of wrestling, was general among them; though it is mentioned in their old histories, that their heroes sometimes made use of an artifice which was called Lause-tôk, and is the same as what we call tripping up one's heels. Skylmest, or the art of fencing, was still more common; for though they treated one another pretty roughly on these occasions, yet those rules of art were wanting, which a weaker arm may at present apply to his advantage upon occasion.

The manjasnadur was held in the highest esteem: a man, dextrous in that exercise, was held in the utmost veneration by them, and was celebrated even in their songs. This was a kind of single combat, to which a man might challenge any one who was desirous to be recorded in the annals of fame. Life or death was alike indifferent to these gladiators; and it was deemed a noble art to understand well how to sharpen the instruments of death, as may be seen by Rigsthulu.

The situation in which the Icelanders were in regard to the kings of Norway, who always kept a watchful eye over them, and sought every opportunity to subjugate them, obliged them to have recourse to other states for a knowledge in government and literature; for this purpose they often sailed to Norway, Denmark, Sweden, England, and Scotland. The travellers, at their return, were obliged to give an account to their chiefs of the state of those kingdoms through which they passed. For this reason history, and what related to science, was held in high repute, as long as the republican form of government lasted; and the great number of sagas and histories which are to be met with in the country, if not all equally important, shew at least the desire they had of being instructed.

During this time Greenland was discovered by an Icelander, Eyrek Rauda, in 932; and America in 1001, by Bidrn Herjulfsson and Leif Erichsson.

To secure themselves, therefore, against their powerful neighbours, they were obliged to enlarge their historical knowledge; they likewise took great pains in studying perfectly their own laws, for the maintenance and protection of their internal security. Thus Iceland, at a time when ignorance and obscurity pervaded the rest of Europe, was enabled to produce a considerable number of poets and historians. When the Christian religion was introduced there, more were found conversant in the law than could have been expected, considering the extent of the country, and the number of its inhabitants. Fishing was followed among them; but they devoted their attention considerably more to agriculture,* which has since entirely ceased.

Two things have principally contributed towards producing a great change both in their character and way of life, viz. the progress of the Christian religion under Olof Tryggwasson, and the loss of their liberty under king Harold. For if religion, on one side, commanded them to desist from their ravages and warlike expeditions; the secular power, on the other, deprived them of the necessary forces for the execution of them: since this time, we find no farther traces of their heroic deeds, except those which are preserved in their histories. Our present Icelanders give the preference to fishing, and the care of their cattle, to war.

The Icelanders are middle-sized and well made, though not very strong; and the women are in general ill-featured. The men have left off the custom of wearing beards long ago, though you find them represented with them in Eggert Olafsen's travels through Iceland; a drawing, which, perhaps, may represent an inhabitant of Sondmoer, in Norway, but by no means an Icelander.†

Vices are indeed much less common among them than in other parts, where riches and luxury have corrupted the morals of the people. Theft is seldom heard of; nor are they inclined to incontinence, though there are examples of persons having been punished more than once on that account.

Though their poverty disables them from imitating the hospitality of their ancestors in all respects, yet the desire of doing it still exists: they cheerfully give away the little they have to spare, and express the utmost joy and satisfaction, if you are pleased with their gift. When they want to shew themselves particularly affectionate, they kiss one another on the mouth on their visits: they do the same to the husband and the wife, the mother and the daughter; they are uncommonly obliging and faithful, and extremely attached to government.‡ They are very zealous in their religion,§ and it must be

* Hans Finnsen, in his letter on the feasibility of agriculture in Iceland, Copenhag. 1772, octavo, demonstrates this by a written document during the time of Snorre Sturleson, page 64, which likewise appears from Landnama Bok, chap. 21.

† This, however, is subject to some exceptions: for the inhabitants of Omund Fiorden, and some families on the north side of the island, still wear beards; and in Fnioskadul lives a man named Benedict, known on account of his beard. Between 1740 and 1750 it happened, between the icy mountains of Sneefaelds Jokul, that two brethren dividing between themselves the inheritance left them by their father, one of them, called Helge, gave his brother four rix-dollars for the exclusive right of wearing a beard, which right, in their family, was the sole prerogative of their late father.

‡ To prevent smuggling, there is a severe penalty for piloting a strange ship into harbour. When the philosophic travellers made the coast, they were under necessity to force an Icelander to stay on board, and to serve them as a pilot. And, though appeased by good treatment and presents, he nevertheless carried the ship to an unsafe place, till the governor granted his leave to bring the ship to a safe anchorage. When the reason of this strange behaviour was asked, the Icelander answered, he would rather suffer himself to be cut in pieces, than to act against the regulations of his king. It is however told, that the inhabitants on the northern coast are not quite so docile, and therefore less obsequious.

§ An Icelander never passes a river, or any other dangerous place, without previously taking off his hat, and imploring divine protection; and he is always thankful for the protection of God, when he has passed the danger in security.

owned not entirely free from superstition. They have an inexpressible attachment for their native country, and are no where so happy. An Icelander, therefore, rarely settles in Copenhagen, though ever so advantageous conditions should be offered him.*

On the other hand, one cannot ascribe any great industry to them; they work on in the manner they are once used to, without thinking of useful improvements. Perhaps this defect lies more with the government, which being unacquainted with the nature of the country, did not make the necessary dispositions and regulations for creating and encouraging industry. They are not cheerful in conversation, but simple and credulous, and have no aversion to a bottle, if they can find opportunity; but it may easily be conceived, that this is not to be understood of all without exception. When they meet together, their chief pastime consists in reading their history (saugulestur;) the master of the house makes the beginning, and the rest continue in their turns, when he is tired. Some of them know these stories by heart, others have them in print, and those that have not, have them in writing. One of these pastimes is rumulestur, consisting in the recitation of some verses, which sometimes are indifferently sung. They besides amuse themselves in their meetings with what they call wike-waka, where a man and woman take one another by the hand, and by turns sing stanzas, which are a kind of dialogue, and to which the company sometimes join in chorus. This however affords little amusement to a stranger, as they generally sing very bad, without observing time, or any other grace, particularly as they have not the least knowledge of the modern improvements in music.†

To their diversions likewise belongs that called glæder, where one among them is disguised; ringbrud, where ten or twelve men join hands, and form a ring in dancing; and it is reckoned a great dexterity to break through the ring, without destroying their order; glimu-list, which has been mentioned before, and means wrestling: hnatt-leikur, or playing with bowls on the ice; lystridin, or riding races for a wager, &c. &c.

They are famous at playing at chess, and had formerly two sorts of this game; one of which was called jung fru schach (ladies chess) and the other riddare schach‡ (knight's chess:) at present only the last is customary. They also amuse themselves with kotra (a game at tables) they play on it togtadilla or olofstafl, when the men are ranged blindfold, without dice, according to an old song, which must be said by heart. Besides these games they have others called Mylna Faringar-tafl, and Goda-tafl. They also play some

* It seems that Providence wisely instilled into the human heart the love of that soil whereon a man is born, and probably with a view that those places, which are not favoured by nature with her choicest blessings, may not be left without inhabitants. It may be affirmed with some degree of certainty, that the love of one's native place increases in an inverse ratio of its having received favours from nature. A Frenchman seldom or never feels that longing desire for his home, which all Swedes are sensible of. A peasant of Scania (a rich country in a mild climate) eats his hasty pudding (the favourite dish in Scania) with equal pleasure and enjoyment in whatever place it be; but a native of Elfredahl and Sæma (places ill-favoured by nature) thinks his bread made of flour, mixed with the bark of trees, in his own country far preferable to the best dishes he eats in the low country. The chiefest wish of a Switzer is to die in his own country. When a Switzer in the French army sung a certain song to his countrymen in the last war, there arose in the breasts of all that heard him such a disease-like longing for their native country, that it became absolutely necessary to the French generals to give the strictest injunctions, that this song should never be heard again in the camp. This will appear incredible to those, who are acquainted with no other happiness than that which is produced by the enjoyment of luxury, affluence, and voluptuousness. It always recalls to the memory that fine passage in Seneca: "Ulysses ad Ithacæ suæ saxa sic properat, quemadmodum Agamemnon ad Myvenarem nobiles muros; neme enim patriam amat, quia magna, sed quia sua."

† I observed two kinds of musical instruments in Iceland, one called *laang spil*, with six brass strings; the other called *fidla*, with two strings made of horses hair; both are played by a bow. I likewise heard of another instrument called *symphon*, but I never could get a sight of it

‡ Vide Letter of Arnus Magnaus to Widalin, communicated to me in manuscript by Mr. Thorotti.

games at cards called Alkort, Handkarrer, Tru-spill, and Pamphile; all these games are merely for amusement, since they never play for money, which seems however to have been formerly customary among them, since in one of their old laws a fine is destined for those who should play for money.

LETTER VII....TO CHEVALIER IHRE.

OF THE DRESS OF THE ICELANDERS.

SIR, Stockholm, Sept. 6, 1774.

THE Icelanders have made very few alterations, if any, in their dress in modern times. It is not elegant or ornamental, but yet neat, cleanly, and suited to the climate. The men all wear a linen shirt next to the skin, with a short jacket, and wide pair of breeches over it. When they travel they wear another short coat (hempa) over it. All this is made of coarse black cloth (wadmal;) only the inhabitants on the north side of Arnarfiord wear white clothes. On the head they wear large three cornered hats, and worsted stockings, and Icelandic shoes on their feet.

Some of them have shoes from Copenhagen, but as they are rather too dear for them, they generally make their own shoes, sometimes of ox hide, but mostly of sheeps' leather: the manner in which they make them is this; they cut a square piece of leather, rather wider than the length of the foot, this they sew up at the toes, and behind the heel, and tie it on with leather thongs. These shoes are convenient enough, where the country is level; but it would be very difficult for us, who are not used to them, to go with them amongst the rocks and stones, though the Icelanders do it with great ease. I shall speak of their fishing clothes afterwards.

The women likewise are always dressed in black wadmal: they wear a bodice over their shifts, which are sewed up at the bosom; and above this a jacket laced before, with long narrow sleeves reaching down to the wrists. In the opening on the side of the sleeve they have buttons of chased silver, with a plate fixed to each button, on which the lover, when he buys them in order to present them to his mistress, takes care to have his name and her's engraved. At the top of the jacket a little black collar is fixed (strutur) of about three inches broad, of velvet or silk, and frequently trimmed with gold cord. The petticoat is likewise of wadmal, and reaches down to the ancles. Round the top of it is a girdle of silver, or some other metal, to which they fasten the apron (swinte) which is also of wadmal, and ornamented at top with buttons of chased silver. Over this dress they wear a hempa, or upper-dress, nearly resembling that of the peasants at Wingaker in Sweden, with this difference, that it is wider at bottom; this is close at the neck and wrists, and a hand's breadth shorter than the petticoat. It is adorned with a facing down to the very bottom, which looks like cut velvet, and is generally wove by the Icelandic women. On their fingers they wear gold, silver, or brass rings. Their head-dress consists of several cloths wrapped round the head, almost as high again as the face; it is tied fast with a handkerchief, and serves more for warmth than ornament: girls are not allowed to wear this head-dress before they are marriageable. At their weddings they are adorned in a very particular manner: the bride wears close to the face, round her head-dress, a crown of silver, gilt. She has two chains round her neck, one of which hangs down very low before, and the other rests on her shoulders. Besides these she wears a lesser chain, from which a little heart generally hangs, which may be opened, to put balsam or some other kind of perfume into it.

The dress here described is worn by all the Icelandic women, high and low, without exception; with this difference, that the poorer sort have it of coarse wadmal, with

ornaments of brass; and those that are easier in their circumstances, of broad cloth, with silver ornaments, gilt. I saw one of these dresses, which belonged to the bailiff's wife, and was worth at least three hundred dollars. Perhaps it would not be disagreeable to peruse a list of the different articles which compose an Icelandic woman's dress, one of which Mr. Banks bought, in order to take to England, with his other Icelandic collections.

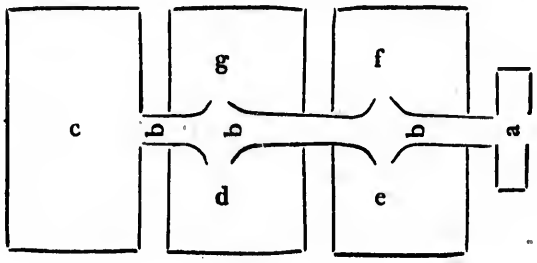
	Rix Dol.	Shil. Dan.
Hempa (upper dress)	4	0
Hættve (travelling hat)	5	0
Upphlutur (bodice)	2	24
Svinta (apron)	6	0
Treja (jacket)	4	3
Mallinda (girdle)	6	0
Fat (petticoat)	8	0
Kjedja (chain)	4	0
Laufa prionar (bodkins ornamented with silver)	6	0
Koffur (fillet)	2	0
Erma knappar (sleeve-buttons)	1	24
Quen vetlingar (rough gloves)	0	46
Aubreida (a cloth to wrap their clothes in)	4	0
	53	46

LETTER VIII....TO CHEVALIER IHRE.

OF THE HOUSES AND BUILDINGS OF THE ICELANDERS.

Stockholm, September 14, 1774.

The houses of the Icelanders are not alike throughout the country. According to some descriptions, they are tolerable on the north side of the island; but on that part of Iceland which I have seen, they were all extremely bad, excepting those of the governor at Bessestedr, the physician's at Seltiarnarnes, and the sheriff's at Wido, which were built of stone, at the king's expence. In some parts the dwellings and other buildings of the Icelanders are made of drift-wood, in others they are raised of lava, almost in the same manner as the stone-walls we make for inclosures, with moss stuffed between the lava. In some houses the walls are wainscoted on the inside. The roof is covered with sods laid over rafting, or sometimes over ribs of whales, which is both more durable and more expensive than wood. The timber-work rests on many beams laid lengthways. The walls are about three yards high, and the entrance somewhat lower. The plan of one of these houses is here annexed, to give a better idea of it.



(a) is the door or entrance of the long lobby; (bbb) is about six feet broad, and admits the light through some holes in the roof, upon which a hoop, with a skin stretched over it, is laid. At the end of the lobby is a room (c) where the women do their work, and where the master of the house generally sleeps with his wife. The walls of this room are wainscoted; it has a ceiling and floor, sometimes even small glass windows, but no fire-place. On both sides of this long lobby are four rooms, two on each side, of which (d) is the kitchen, (e) the room made use of to eat in (f) the dairy, and (g) the servant's room: these rooms have neither ceilings nor floors, and the walls are seldom or never lined. The windows are made of the chorion (liknarbelgur) and amnios of sheep (vatzbelgur) or the membranes which surround the womb of the ewe. These are stretched over a hoop, and laid over an opening in the roof, upon which a wooden shutter is let down, if the weather be stormy. They have not even a chimney in the kitchens, and only lay their fuel between three stones, and the smoke issues from a square hole in the roof. Besides this house, they have a booth or shed to keep their fish in (skœmma) sometimes another for their clothes, &c. &c. and not far off the stable for their cattle. In the poorer sort of houses, they employ for the windows the inner membrane of the stomach of animals, and which they call skœna; this is not so transparent as the before-mentioned membrane.

LETTER IX....TO MRS. CARLSON.

ON THE FOOD OF THE ICELANDERS.

Gothenburg, March 20.

THOUGH it cannot afford any great pleasure to examine the manner in which the Icelanders prepare their food, particularly after having so lately tasted at your table all the dainties of the four parts of the globe; I will, nevertheless, perform my promise, in communicating to you a description of it. Methinks I see you sometimes disdaining their dishes; but, I assure you, an Icelander is not less happy for being unable to season his food with the productions of a distant climate; he is content with what nature affords him, satisfies the cravings of his stomach, and enjoys his health, whilst we frequently surfeit ourselves by feasting on delicacies, and loathe the most wholesome food.

The larders and pantries of the Icelanders are seldom so well stored as to contain every one of the articles, at one time, which I am going to mention; some of them, however, they must be absolutely provided with, as their food entirely consists of the following articles.

Bread of several sorts, chiefly sour biscuit * from Copenhagen; but they have not much of this, as it is too dear for them; they content themselves therefore with providing it for weddings, and other entertainments. Some, instead of it, bake themselves bread of flour of rye, though they likewise get some from Copenhagen. The manner

* In most northern countries the inhabitants live on rye-bread; the flour taken to prepare it is seldom bolted, and it is commonly prepared with sour ferment or leven, which gives the bread an acidulated taste, disagreeable, and resisting the stomachs of weak persons, but palatable and wholesome to those of a strong constitution. The sour paste communicates an agreeable acidity to this bread; and as the northern climates, on account of their long winters, and the confinement of people in heated rooms full of noxious effluvia, as well on account of the chiefly salt-meat diet of the inhabitants, make the people inclined to the scurvy, this acidulated bread, the sour-crout, and, in Russia, their sour drink called Guass, afford such powerful antiseptics, that, with the diet here described, the scurvy seldom or ever gains ground among the people. These sour biscuits, no doubt, are likewise made of rye-flour, or of rye and wheat mixed together, ground without bolting, and acidulated by fermentation with sour leven.

in which they bake it is thus: the flour is mixed with some fermented whey (syra) and kneaded into dough, of which they make cakes one foot in breadth, and three inches thick; these are boiled in water or whey, and then dried on a hot stone, or an iron plate.

Flour of Fiálgrás (rock-grass*) a cask of which well cleaned and packed costs a rix-dollar; it is first washed, and then cut into small pieces by some, though the greater number dry it by fire or the sun, then put it into a bag, in which it is well beaten, and lastly worked into flour by stamping.

Flour of Kornsyra† is prepared in the same manner, as well as the two other sorts of wild corn melur,‡ by separating it from the chaff, by pounding, and lastly grinding it.

Surt smoer (sour butter). The Icelanders seldom make use of fresh or salt butter, but let it grow sour before they eat it: in this manner it may be kept twenty years, and even longer; and the Icelanders look upon it as more wholesome and palatable than the butter used amongst us. It is reckoned better the older it grows, and one pound of it then is as much valued as two pounds of fresh butter.

Striug, or whey boiled to the consistence of sour milk, and preserved for the winter.

Fish of all kinds, both dried in the sun and in the air, and either salted, or in winter frozen: those prepared in the last manner are preferred by many.

The flesh of bears, sheep, and birds, which is partly salted, partly hung or smoked, and some preserved in casks, with sour fermented whey poured over it.

Misost, or whey boiled to cheese, which is very good. But the art of making other kinds of good cheese is lost, though some tolerably palatable is sold in the east quarter of Iceland.

Beina striug, bones and cartilages of beef and mutton, likewise bones of cod, boiled in whey, till they are quite dissolved; they are then left to ferment, and are eat with milk.

Skyr, the curds from which the whey is squeezed are preserved in casks, or other vessels; they are sometimes mixed with black crow-berries (empetrum baccis nigris) or juniper berries, and are likewise eat with new milk.

Syra is sour whey, kept in casks, and left to ferment, which, however, is not thought fit for use till it is a year old.

Blanda is a liquor made of water, to which a twelfth part of syra is added. In winter it is mixed with the juice of thyme, and of the black crow-berries, or the empetrum nigrum.

They likewise eat many vegetables, § some of which grow wild, and others are cultivated; as also shell-fish,‖ and mushrooms.¶

* Lichen Islandicus, Fl. Suec. 1085. Fl. Lappon, 145. † Polygonum Bistorta.

‡ (1) Arunda arenarai, (2) arundo foliorum lateribus convolutis.

§ The following catalogue of plants used for food in Iceland is taken from the journey of Eggert Olafsen:

Rumex acetosa, in the Icelandic language called *Sura*.
——— digynus, *Olafs Sura*.
——— patientia, *Heimis niole*.
Taraxacum, *Aetti fifill*.
Carex Lin. pinguicula, *Lifia gras*, used against the dysentery.
Trifolium pratense flore albo.
Potentilla argentea, *Mura*.
Plantago maritima Lin. foliis linearibus, *Kuttartunga*.
Angelica archangelica, *Huönn; Ette-huönn*.
Lichen Islandicus, *Fialla graus*.
——— Lichenoides, *Klouungur*.

The Icelanders in general eat three meals a day, at seven in the morning, at two in the afternoon, and at nine in the evening.

In the morning and evening they commonly eat curds mixed with new milk, and sometimes with juniper berries, and those of empetrum nigrum. In some parts they also have potage of fialgras, which, I assure you, is very palatable: vallidrafli, or curdled milk, boiled till it becomes of a red colour; seiddmijolk, or new milk, boiled a long while. At dinner, their food consists of dried fish, with plenty of sour butter. They also sometimes eat fresh fish, and, when possible, a little bread and cheese with them. It is reported by some, that they do not eat any fish till it is quite rotten; this report, perhaps, proceeds from their being fond of it when a little tainted: they, however, frequently eat fish which is quite fresh, though in the same manner as the rest of their food, often without salt.

On Sunday, and in harvest-time, they have broth made of meat, which is often boiled in syra, instead of water; and in winter they eat hung or dried meat.

Their common beverage is milk, either warm from the cow, or cold, and sometimes boiled: they likewise make buttermilk, with or without water. On the coasts they generally drink blanda,* and sour milk; which is sold, after it is skimmed, at two-fifths of a rix-dollar a cask; some likewise send for beer from Copenhagen, and some others brew their own. A few of the principal inhabitants also have claret and coffee. The common people sometimes drink a kind of tea, which they make from the leaves of Holta-sollyg† and Spudwell.‡

This is the usual manner of life in Iceland. In all countries the living of the poor differs essentially from that of the rich; and if an Iceland gentleman can afford to eat meat, butter, shark, and whale, the peasants are obliged to content themselves with fish, blanda, milk, pottage of rock grass, and beina-striug. Though the Icelanders cannot in general be said to be in want of necessary aliment, yet the country has several times been visited by great famines: these, however, have been chiefly owing to the Greenland floating-ice, which, when it comes in great quantities, prevents the grass from growing, and puts an entire stop to their fishing.

I need not acquaint you, that we were not necessitated to submit to their manner of life during our stay in Iceland. Instead of blanda we drank port, and several other

Lichen Coraloides, *Kræda*
—— Niveus, *Mariu-gras.*
—— Leprosus, *Geitna-skof.*
Arundo Arenaria, *Melur.*
—— foliorum lateribus convolutis.
Cochlearia, *Skarfa-kaal.*
Plantago angustifolia, *Selgrese*
Epilobium tertagonum, *Purpura-blomflur.*
Polygonum bistorta, *Kornsura.*
Sisymbrium, Lin. *Kattar-balsam.*
|| Ventrosa crassa, *Kuskel, skelkuskel.*
Domiporta, *Kudungur, kufungur kongur.*
Mytulus, *Kraklingur*
—— Major, *Ada.*
¶ Agaricus caulescens, pileo albo, *Ætte-svepa.*
—— supra pileo plano, *Ætte-svepa.*
—— subconvexo, *Reyde-kula*
—— of an unknown sort, *Bleikula.*

* In the Elfdalln of Wermeland, in Sweden, the common beverage of the country people is milk, mixed with water, and called by them Blanda.

† Dryas octopetala.

‡ Veronica officinales.

sorts of good wine; and a French cook prepared for us some savoury dishes, and excellent puddings.

However, as we wished to try every thing, we prevailed upon the physician Biarne Paulsen, who had invited us to dinner, to entertain us after the Icelandic manner. We did not forget the good Swedish custom of taking a glass of brandy before dinner, which was here genuine; we had only once Danish distilled corn-brandy, which was served up with biscuit, cheese, and sour butter. In the middle of the table was placed a dish with dried fish cut small; the other dishes were a piece of good roast mutton, broth with syra, and a dish of salmon-trouts, &c. &c. We eat with a very good appetite; but the sour butter and dried fish were not often applied to; on the whole, we eat a greater quantity of bread than the Icelanders generally do.

So elegant an entertainment could not be without a desert; and for this purpose some flesh of whale and shark (haf-kal) was served. This is either boiled or dried in the air, looks very much like rusty bacon, and had so disagreeable a taste, that the small quantity we took of it drove us from the table long before our intention. Most probably you already thank me for my entertainment, and are happy to see the end of my letter.

LETTER X....TO CHEVALIER IHRE.

OF THE EMPLOYMENT OF THE ICELANDERS, AND THEIR CHRONOLOGY.

Stockholm, September 6, 1774.

The Icelanders principally attend to fishing, and the care of their cattle.

On the coasts the men employ their time in fishing both summer and winter: on their return home, when they have drawn and cleaned their fish, they give them to their wives, whose care it is to dry them. In the winter, when the inclemency of the weather prevents them from fishing, they are obliged to take care of their cattle, and spin wool. In summer they mow the grass, dig turf, provide fuel, go in search of sheep and goats that were gone astray, and kill cattle. They likewise full their wadmal, or coarse cloth; for which purpose they make use of urine, which they also employ in washing and bucking, instead of soap and pot ashes. The men likewise prepare leather, for which they use maid-urt (spiraca ulmaria) instead of birch-rind. Some few work in gold and silver, and others are instructed in mechanics, in which they are tolerable proficients.

As a proof of this, I need only mention a sledge which a peasant contrived some years ago in the form of a ship with sails, and large enough to contain four or five persons, that would sail in the winter season, in an even country. Unluckily two of his sons, in sailing home from church, overturned, and broke the whole carriage to pieces.

On the west side of the country they make vessels of floating wood, large enough to contain from three to twelve tons, and make their charge according to the size of the vessel, from four to six dollars.

The women prepare the fish, take care of the cattle, manage the milk and the wool, sew, spin, and gather eggs and down. When they work in the evening, they use, instead of an hour-glass, a lamp, with a wick made of fiva (epilobium) dipt in train-oil, which is so contrived as to burn four, six, or eight hours.

Their work is in some measure determined by their bya-lag, or by-laws* of their villages, in which the quantity of work they are bound to perform in a day is prescribed to them: they seldom do so much work now, so that it is called only medelmans vark, or the work of a man of middling strength. According to this prescription, a man is to mow as much hay in one day as grows on thirty fathoms square of manured soil, or forty fathoms square of land not manured, or he is obliged to dig seven hundred pieces of turf, eight feet long and three broad. If so much snow falls as to reach to the horses bellies, which they call quedsnio, he is to clear away daily the snow for a hundred sheep. A woman is to rake together as much hay as three men can mow, or to weave three yards of wadmal a day.

The wages of a man are fixed at four dollars, and twelve yards of wadmal; and those of a woman at two dollars, and five yards of wadmal. When men are sent a fishing out of the country, there is allowed to each man, by the bya-lag, from the twenty-fifth of September to the fourteenth of May, six pounds of butter, and eighteen pounds of dried fish, every week. This may appear to be too great an allowance; but it must be remembered, that they have nothing besides to live upon. When they are at home, and can get milk, &c. &c. every man receives only five pounds of dried fish, and three quarters of a pound of butter, a week.

As the division of time among the Icelanders is not determined according to the course of the sun, but by their work, this is perhaps the most proper place to say something of it. Though they have, like us, four different seasons, they only count two; the summer, which begins the Thursday before the sixteenth of April; and the winter commences on the Friday before the eighteenth of October. During the first season they perform their summer-work, and in the latter attend to their winter amusements. These two seasons are afterwards divided into twelve months, as with us, which have their common names; but in ancient records, and among the lower class of people, are called, 1. Midsvetrar. 2. Fostugangs m. 3. Iafndaegra m. 4. Sumar m. 5. Fardaga m. 6. Nottleysu m. 7. Midsumar m. 8. Heyanna m. 9. Adratta m. 10. Slaatrunar m. 11. Ridtidar m. 12. Skammdeigris m. Day and night are not divided into a certain number of hours, but into the following divisions: Otta is with them three o'clock in the morning; Midur morgon or Herdis rismal, five o'clock; Dagmal, half past eight; Haadeye, eleven; Noon, three in the afternoon; Midur afton, six in the morning; Nattmall, eight; and Midnatt, twelve o'clock at night.

When they want to know what o'clock it is, they attend to the course of the sun, and the flux and reflux of the sea; but generally they make use of an art to discover the sun by their fingers. Watches are very rare among them; every peasant, however, has an hour-glass.

* "By-laws are said to be orders made in court-leets or court-barons, by common assent, for the good of those that make them, farther than the public law binds." Atterbury. See Johnson's Dict. Though this may probably be the present meaning of the word By-law, it is not, however, the original meaning of the word; for it is derived from the old Saxon word by or, bye, signifying a town, from the Gothic word bo, to inhabit; and agreeable to this are many English names of towns, viz. Ash-by, Whit-by, &c. &c. By-law, therefore, signified formerly laws made by townships, and by districts belonging to a town, or to a leet, which amounted sometimes to a third part of a shire. These laws were made by common assent, and for the good of those that made them, which is, or ought to be, the chief aim of all laws, and they extend farther than the public law binds; because the law of the land must be general, and cannot provide for all particular cases of single towns and districts. The special regulations and restrictions, therefore, made by the common assent of the towns-people, for the common good of that particular town, beyond the law of the land, are by-laws, laws of the bye or town. The Icelandic word, bya-log, signifies laws of villages or townships; and it confirms the signification we have given to the English word by-law.

LETTER XI....TO CHEVALIER BACH.

OF THE DISEASES IN ICELAND.

Stockholm, Oct. 1, 1776.

You require, sir, that I should give you some account of the diseases common in Iceland. I will obey your commands, though it is more the province of a physician to undertake the subject, as it requires so much exactness and penetration.

As I have been so happy as to be unacquainted with any disease from my own experience, I have as little endeavoured to gain any knowledge by reading such books as treat of them; you will therefore pardon me, if my account is not very perfect.

The climate of the country, and the purity of the air, contribute very much to make the Icelanders strong and healthy, though their food and way of life frequently produce the contrary effect. Young children, for example, are not suckled more than two or three days, and afterwards brought up with cow's milk, which, in times of dearth, is mixed with flour and water.

I remember to have heard, that this is also customary in some parts of Finland; but a different manner of living may render that unwholesome in Iceland, which is less dangerous in another place: and I think I may safely venture to affirm, that the food and mode of living in Iceland do not contribute to the strength of the inhabitants. One seldom meets with any of them above fifty or sixty years of age, and the greater part are attacked in their middle age by many grievous complaints.

It is remarkable, that among the female sex, who there, as almost everywhere else, live to a greater age than the men, those particularly attain to an advanced life who have had many children. There are a great many of this class, as the women are commonly very fruitful; and it is no rare thing to meet with a mother who has had twelve or fifteen children.

Among the diseases that are most prevalent, the scurvy (Skyrbuigar) is the most common. In some it makes its appearance in the same manner as with us, but in others it produces the most dreadful symptoms, and is then called liktraad, or leprosy, which, however, differs from that horrid disease so common in the East. Its first appearances are, swellings in the hands and feet, and sometimes also in other parts of the body; the skin becomes shining and of a bluish cast, the hair falls off, the sight, taste, smell, and feeling, are weakened, and often quite lost; biles appear on the arms, legs, and face; respiration becomes difficult, and the breath fœtid; aching pains are felt in all the joints, a breaking-out spreads over the whole body, and is at last converted into wounds, which generally terminate in death.

The Icelanders make use of antiscorbutic decoctions, likewise baths, with turnips boiled in them; but chiefly mercurial remedies, by means of which the disease may be removed in its beginning. This disease is not contagious, but very obstinate; and it is remarkable, that two generations may be entirely free from it, when it shall appear in the third. It does not always prove mortal, though many are tormented with it twenty or thirty years.

The gout (torvàrk) most men have in their hands who go out a-fishing probably because they are obliged to handle and manage the wet fishing tackle in cold weather.

The St. Anthony's fire, in Icelandic a ama, is pretty common. They make use of earth-worms (anamadkur) to cure it, which they bind alive on the wounded part; and when they become dry, others are applied, till the disease is removed.

The jaundice, in Icelandic guulsot; the fever, kvefsot; the pleurisy, tak, which is sometimes infectious, and then is called landfarsot, or an infectious disease, is frequently got by cold; lowness of spirits, careinoma infantum, in Icelandic krabbe, a atumein, the spleen, and obstructions, are very common. In later years the rickets made their appearance; and the venereal disease was not known among them till the year 1753.

Besides the antiscorbutic plants, which are to be found in plenty in Iceland, they have a number of hot baths, which are of great benefit in the cure of these diseases.

There is an apothecary's shop established on the island, and four hospitals for the poor and leprous, the care of which is committed to their most skilful physicians, with proper assistants.

LETTER XII....TO CHEVALIER IHRE.

OF FISHING AND FOWLING, AND THE BREED OF CATTLE IN ICELAND.

Stockholm, October 3, 1774.

The inhabitants who live near the coasts employ themselves nearly all the year in fishing; and even those who live in the inland parts of the country come to the sea-shore at certain seasons of the year. Every master of a family has a particular fishing-dress, and is obliged to furnish one to his servant as soon as he puts out to sea. They are made of sheep or calves skins, which, in manufacturing, are frequently rubbed over with train-oil. They consist of the following articles: leistrabrakur, are breeches and stockings all in a piece, which come up pretty high above the hips, and are laced on very tight; stackur, a wide jacket fastened round the neck and the middle of the waist; taatillar, or coarse fulled stockings, or stiff worsted; and sjoskor, or water-shoes, of thick leather.

Their boats are commonly small, and only contain from one to four men, with these they fish near the shore; but with their larger boats, which are made to contain from twelve to sixteen men, and are provided with sails, they frequently venture from four to eight miles from the shore.

In these vessels they always carry a man extraordinary, whom they call formann. He sits at the helm; and the others, who are called haasetters, obey his commands. At his call they all assemble at an appointed time near the vessel, provided with knives, fishing-lines, and other proper tackle: they make use of shells, and sometimes the flesh of quadrupeds and birds, for bait.

As soon as the boat is off the shore, they all take off their hats and caps, pray for good success, and recommend themselves to the divine protection by a prayer and hymn, which they call vararsaungur, and then stand out to sea. As soon as they are come to a place where they expect a good draught, two of them sit down at the helm, to prevent the boat's being moved out of its place by the current, and to take care that the fishing-lines are not entangled. In this manner they continue fishing the whole day; and when the boat will not contain any more fish, they cut off the heads of all the fish they have caught, which they throw into the sea, together with their entrails. This not only enables them to carry a greater number of fish ashore, but also invites many insects to the place, which affords good bait.

At their return all the fish are brought ashore, and divided into equal shares: one share belongs to the owner of the boat, though he should not be out at sea with them, and this is called skipleiga (ships-hire;) another is given to him who sat at the helm; a third to him who governed the sails; in a word, every fisher gets a share. But this equal division is only made with the smaller fish; for if any one in the boat is so fortunate as to catch a turbot or other valuable fish, it is immediately cut into pieces, and the three best given to him who caught it.

As soon as they have thus shared them, every one cuts off the heads of his fish, draws them, and after cutting them up from top to bottom on the side of the belly, takes out the back-bone, from that part where it is fixed to the head down to the third joint below the heart. If the weather be such as to give them hopes of drying their fish next day, they lay them with the fleshy side facing one another; but if the weather is unfavourable, they lay the pieces on a heap, with the skinny side uppermost, and this they call lagga i kase; if they lie too long in this position (one above another) they spoil, and are then sold to the merchants at a lower price, under the denomination of kasad fisk. When the weather is fair, these pieces are spread separately on stones, or on the shore, and are frequently turned by the women, till they are entirely dry; this often requires a fortnight's time, and sometimes more. The fish prepared in this manner are called flatfiskur (flat fish.)

In some parts they do not dry the fish on stones or on the shore; but after they have ripped them up, place them in rows on stones which are laid cross-wise in a house built for that purpose; these huts are called hiallur in Iceland, and somewhat resemble the sheds in which smiths shoe horses. These fish are called hengi-fiskur, or hung-fish.

The fish they principally catch is cod, of which they have several different sorts, under the names of thyrsk-lingur, upse, isk, langr, kerla, &c. &c. Besides these they have soles, flounders, herrings, salmon, salmon-trout, trouts, and several others. Of the trouts it has been observed, that when they come up the rivers and brooks, and approach the hot springs, they are fond of staying in the lukewarm water, where they grow so fat as to be scarcely eatable.

It is unnecessary to say that the seas, as well as the rivers and lakes, abound with fish: I will therefore only mention the whale, of which there are several sorts, divided by the natives into two classes, those with and those without tusks.

The first are again divided into skidis fiskur, smooth-bellied, and reydar fiskur, or wrinkle-bellied. Among the skidis fiskur, who have whale-bone instead of teeth, the slettbakr, whose back is flat, is the largest; and some have been caught one hundred yards in length. The hnufubakr has a hump on his back, and is next in size, being from seventy to eighty yards long. Of all the known whales the steipereidur, which belongs to the class of the reydar fiskur, is thought to be the largest, as there are some one hundred and twenty yards in length. Then follow the hrafn reydur and the andarnefia; they are all considered as very dainty food; and the Icelanders say the flesh has the taste of beef.

The whales which have teeth, instead of whalebone, are also divided into two classes, those that are eatable and those that are not. To the first class belong the hnysen, hnydingur, hundfiskur, and haahyrningur: to the last, to which the name of illwhale (bad whales) is given, are reckoned the rodkammingur and naahvalur. These are forbidden as food by some ancient regulations, and particularly by the church laws. The Icelanders believe that the first sort are very fond of human flesh, and therefore avoid fishing in such places where they appear.

The other kinds of whales are sometimes struck with harpoons, and sometimes caught with nets. The Icelanders, however, seldom venture to attack the larger ones, as their

boats are small, and they unprovided with instruments proper for that purpose. They stand in so great dread of some of them, that when out at sea they are afraid to mention even their names, and carry dung, brimstone, juniper-wood, and some other articles of the same nature in their boats, in order to terrify and prevent their too near approach. Notwithstanding, it now and then happens that they catch some of the largest sort, which is done when the fish approach too near the shore at high water, and are unable to return as fast as the water ebbs. where they are killed with stones and lances. In this manner they had caught a large whale the year before our arrival at Hafnefiord.

To their fishery likewise may be reckoned the catching of liadogs, which is very considerable in some parts. They have four sorts of them, rostungur, vade-selur, blaudu-seller, and gran-selur. They are fattest in winter, and yield three or four pounds of fat, of which each pound produces seven quarts of oil: in summer, on the contrary, they are very lean. Their flesh is eaten, and their fat sold at five yards a pound. The skin is sold by weight, at the rate of sixty yards for twenty pounds.

Though the situation of Iceland renders it extremely proper for fishing, the fishery has decreased very much lately; which is partly owing to the many foreign ships which yearly come to fish in those parts, and partly to the want of men, as the number of people has decreased greatly. But I believe the chief cause is the monopoly of the trading company, which very much oppresses the country.

If the people had more encouragement, there would be more emulation and diligence amongst them than at present; for they are obliged to sell a vaett, or five pounds of dried fish, to the company, at the rate of five-sixths of a dollar, which they sell in Hamborough, where the greatest part of what is caught in Iceland is usually sent, for five banco-dollars.

Next to fishing, the principal support of the Icelanders is the breeding of cattle.

Their beeves are not large, but very fat and good. It has been reported by some, though without foundation, that there are none among them with horns: it is true, however, that they seldom have any.

They keep their large cattle at home in their yards the greater part of the year, though some have places appropriated to them in the mountains, which they call satr, where they send their cattle during the summer, till the hay harvest is over. They have a herdsman to attend them, and two women to milk them, and make butter and cheese. It is common to meet with oxen running wild about the mountains, which are however drove home in autumn, as every one knows his own by a particular mark put upon them.

The principal food of the cattle is hay, and they reckon a stack of hay for a cow's winter provision: one stack consists of thirty cocks of hay grown on manured land, and forty cocks grown on unmanured land. When there is a scarcity of fodder, they feed them in some parts with steenbitr, a kind of fish, which, together with the heads and bones of cod, is beaten small, and mixed with one quarter of chopped hay. The cattle are fond of it, and yield a good deal of milk after it; but yet it is said to have a bad taste; they only make use of this food in time of need.

Their cows yield four quarts of milk a day, though they have some that give from eight to fourteen in twenty-four hours. A cow that yields from six quarts is reckoned a good one, and must not stand dry above three weeks before she calves.

A young calf is fed with milk for ten days or a fortnight, afterwards the milk is mixed with water and chopped hay, and at last they give it whey instead of milk.

The usual price of a cow, as well as of a horse, is one hundred and twenty yards, thirty of which make a dollar. However, sometimes the better sort of horses are sold

for eight or ten dollars. They have yet less trouble with their horses than their cows; for though some saddle-horses are kept in stables during winter, the greater number of them are obliged to provide for their own subsistence, and when they cannot find this on land, they go in search of sea-weeds on the coasts; but when a great quantity of snow has fallen, the natives are obliged to clear it away for them.

There is no breed of cattle so much attended to in Iceland as that of sheep. As these can easily find subsistence there, the Icelanders look upon it as less troublesome and less expensive to breed them; and there are many peasants who have between three and four hundred sheep. Before the epidemical disease, which raged among the sheep from 1740 to 1750, it was not uncommon to see flocks of one thousand or twelve hundred, the sole property of one person.

I will not venture to examine whether it would be more advantageous to husbandry to keep more cows than sheep; but as the inhabitants seem to be more inclined to breeding of sheep, it would be well if such regulations were made, as might enable them to cultivate it with more advantage.

This has really been thought of by government; for about twenty years ago they sent Baron Hastfer, a Swede by birth, to Iceland, for that purpose. He made several regulations, and invented and prepared a kind of powder, as a cure for the diseases among sheep, which is very much made use of there, as well as in Denmark and Norway. They speak of him everywhere in Iceland, as of a man who had great knowledge in this branch of husbandry, and a sincere desire to redress all defects.

I know not if the report was well founded which was spread all over the country, that the trading company endeavoured to obstruct him in the execution of this design; so much however is certain, that the country has reaped little or no benefit from Baron Hastfer's depositions.

The Icelandic sheep differ from ours in several particulars; they have straight ears standing upright, a small tail, and it is common to meet with sheep that have four or five horns: in some places they are kept in stables during winter, but they are generally left to seek their food themselves in the fields.

It is remarkable that they are fond of hiding themselves in caves (of which there are a great many in Iceland) in stormy, tempestuous weather. But when they cannot find any retreat during a heavy fall of snow, they place themselves all in a heap, with their heads to the middle, and bent towards the ground, which not only prevents them from being so easily buried under the snow, but facilitates the owner finding them again. In this situation they can remain several days; and there have been examples of their having been forced by hunger to gnaw off each other's wool; which forming into balls in their stomachs, presently destroys them. They are however generally soon sought for and disengaged. There are no wild sheep, as has been pretended by some, for they all have their owners, who keep an exact account of them; and when they are driven to the mountains, they are scarcely ever without a shepherd to attend upon them.

Their food is grass and herbs, and the scurvy-grass (cochlearia) in particular makes them so fat, that they yield more than twenty pounds of fat. They reckon one cask of dunged hay, and two not dunged, for a sheep's winter provision. When there is a bad crop, they are obliged to put up with fish bones chopped, as well as the other cattle.

Good sheep give from two to six quarts of milk a day, of which both butter and cheese is made; it has likewise a good taste when boiled.

The principal profit they have from their sheep arises from the wool; this is not shorn off as among us, but remains on till the end of May, when it loosens of itself, and is stripped off at once like a skin, and is then called Ullafœll. The whole body is by this

time covered again with new wool, which is quite short and fine, and of better quality than the Swedish. It continues to grow the whole summer, and becomes coarser and stiffer towards autumn; it is likewise smooth and glossy, somewhat resembling camel's hair, but more shaggy. This covering enables the sheep to support the rigours of winter; but after they have lost their wool, if the spring proves a wet one, they take care to sew a piece of coarse cloth round the stomach of the weakest, and those that have least wool.

A good sheep, against which no exceptions can be made, must, according to their bye-laws, at least afford four pounds of wool, and it is not uncommon for them to produce more.

It is not unusual for an ewe to have two lambs at a time, and sometimes even three; they then take away one lamb from the mother, and give it to another who has lost hers. When the lambs are too weak to follow the mother, they are kept at home and fed upon milk, which is done by means of a quill and a wet piece of skin.

The price of six ewes, from two to four years old, together with their lambs and wool, is four dollars in autumn, according to the land-tax: a weather of four years old is sold for one dollar; but it is the custom for a merchant to pay only five marks. If any body sells a lamb ready killed, it is valued according to the quantity of fat which it has, at the rate of two marks for every pound. The flesh alone, without the head, feet, entrails, fat, skin, and wool, is valued at twenty yards, and the bye-laws fix the price of a pound of dried mutton at half a yard. The skin is sold by weight, after the rate of thirty fish for ten pounds.

They have goats in some places, but they are few in number; and, upon inquiry, I found the reason to be that they do not thrive in a country where there is no wood.

Besides these animals, they have three kinds of dogs in Iceland, fiar hundar, or lumbar, shag dogs; and dyrhandar and dverghundar; as also tame and wild cats, which last are called urdarketter; rats, white and brown foxes, some of which eat grass, and are on that account called gras tofur. To root out these animals, the king has set a premium of a rix-dollar upon every ten fox skins that are sold to a merchant. The natives have likewise made an agreement, that whosoever destroys a fox's hole, together with the fox, the she fox, and their young, is to receive one rix-dollar, which the neighbours collect among themselves.

Rein-deers were not known here formerly; but, by governor Thodal's order, thirteen heads were sent from Norway in 1770, by M. Perenson, merchant: ten of which died before they reached Iceland, for want of proper care; the three remaining ones thrive extremely well, and had calved three times before we came there: they do not want for food, as the country abounds with moss.

After having treated of their fishery, and the breed of their cattle, I think this a very proper place to say something of their birds, which, particularly in regard to those of the aquatic kind, are very important to them.

They are found in great abundance everywhere on the coast; but the greatest number by far are caught in the few places where they breed. The eggs the Icelanders make use of themselves, as likewise of the flesh, which is eaten by a great many of them; but with the feathers and down they carry on a very considerable trade.

It would be unnecessary to mention all the different sorts of birds, especially as there is scarcely any country where so many kinds, and such great numbers of them, are to be met with as in Iceland. Among the great abundance of geese, water-fowls, ducks, &c. &c. I will however say something of the swan and the eider-bird.

It is known that the swan belongs to the class of birds of passage; their numbers increase very much towards winter, though there is no scarcity of them at any time, as

the greater part of the young breed constantly remain there. In spring we may often see an hundred of them in a flock, and frequently many more; and it is then thought that part of them advance yet further to the north, and make but a very short stay in Iceland. During summer they resort to the lake; but when winter approaches, and they begin to freeze, they remove to the sea-shores. Their eggs are gathered in the beginning of spring, which are large, and said to be very palatable. In August, when they lose their feathers, they are hunted on the lakes, where they are to be found at that time, with dogs trained to catch them alive. They are said to sing very harmoniously in the cold dark winter nights; but though it was in the month of September when I was upon the island, I never once enjoyed the pleasure of a single song. An old swan has a fishy taste, but the young ones are reckoned among the best eatable fowls.

The eider-bird is yet more useful to the natives, who consider it as a kind of treasure; and it is seldom heard that a prudent house-keeper shoots or kills any of them.

The eider-birds generally build their nests on little islands not far from the shore, and sometimes even near the dwellings of the natives, who treat them with so much kindness and circumspection, as to make them quite tame. In the beginning of June they lay five or six eggs, and it is not unusual to find from ten to sixteen eggs in one nest together, with two females, who agree remarkably well together. The whole time of laying continues six or seven weeks, and they are fond of laying three times in different places: in the two first, both the eggs and down are taken away, but in the last place this is seldom done. Those to whom one of these places belong visit it at least once a week.

When they come to the nest, they first carefully remove the female, and then take away the superfluous down and eggs, after which they replace the female on the remaining ones, when she begins to lay afresh, and covers her eggs with new down, which she has plucked from herself: when she has no more down left, the male comes to her assistance, and covers the eggs with his down, which is white, and easily distinguished from the female's; where it is left till the young ones are hatched, who in an hour afterwards quit the nest, together with the mother, when it is once more plundered.

The best down and the most eggs are got during the first of their laying; and it has in general been observed, that they lay the greatest number of eggs in rainy weather. As long as the female sits, the male is on the watch near the shore; but as soon as the young are hatched, he leaves them. But the mother remains with them a considerable time after; and it is curious to see how she leads them out of the nest as soon as they creep out of the eggs, and goes before them to the shore, whilst they trip after her: when she comes to the water-side, she takes them on her back, and swims with them for the space of a few yards, when she dives, and the young ones, who are left floating on the water, are obliged to take care of themselves. One seldom sees these birds on land afterwards, for they generally live in the damp rocks in the sea, and feed on insects and sea-weeds.

One female, during the whole time of laying, generally gives half a pound of down, which is however reduced to one half after it is cleansed. The down is divided into thang-duun (sea-weed down) and gras-duun (grass down.) The last sort is thought to be the best, and is cleansed in the following manner; some yarn is streaked in a square compartment round a hoop, on which the down is laid. A pointed piece of wood is then moved backwards and forwards on the lower side of the yarn thus streaked, which causes the coarser feathers to fall through, while the fine down remains on the yarn.

Down plucked from dead eider-birds is of little worth, because it has then lost the greatest part of its elasticity; for this reason it is of little value in Iceland. The other

sort is sold at forty-five fish a pound when cleansed, and at sixteen fish when not cleansed. There are generally exported every year, on the company's account, one thousand five hundred or two thousand pounds of down cleansed and not cleansed, exclusive of what is privately exported by foreigners. In the year 1750 the Iceland company sold as much in quantity of this article, as amounted to three thousand seven hundred and forty-five banco-dollars, besides what was sent directly to Gluckstadt.

Among the land birds that are eatable, ptarmigans are not to be forgotten, and are caught in great numbers. Falcons also abound in the island, of which there are three sorts; they are purchased by the royal falconers, who give fifteen dollars a-piece for the white, ten for those that are darker, and seven for the gray.

LETTER XIII....TO CHEVALIER IHRE.

OF THE TRADE IN ICELAND.

Stockholm, Nov. 12, 1774.

The Iceland trade has been subject to many revolutions. Till the year 1408 the Norwegians were almost the only nation who sailed to Iceland, and bought all the fish the Icelanders did not consume, or export in their own ships. The English afterwards had this trade till the Reformation, when it fell into the hands of the Germans, and was peculiarly advantageous to the Hamburgers. But Christian the Fourth, who had the improvement of the whole Danish trade very much at heart, likewise directed his attention towards Iceland. He prohibited the trade of the Hans-towns thither in the year 1602, and bestowed it on Copenhagen, Malmo, and some other towns at that time subject to the crown of Denmark.

The Iceland company at Copenhagen was, however, not established till the year 1620, after the king had once more prohibited the trade of the Hans-towns to Iceland in 1619. This company continued till the year 1662, when it was suppressed by a special order. What contributed to this was the great damage done in Iceland by some pirates in 1627, who carried away great numbers of its inhabitants; the greater part of whom were, however, redeemed by the king nine years after. The king resented this so much the more, as the Iceland company had not only undertaken to provide the country with all necessary articles, but likewise to protect it. This circumstance produced a disagreeable effect to the company, which was, that those who had shares in the stocks of one thousand dollars only received five hundred; and those who had shares of two hundred dollars received not the least consideration. The company paid a certain sum to the king for every haven, and two rix-dollars to the governor for every ship. It was likewise obliged to contribute something to the king's magazines on the Westmann's Islands.

The trade of every haven was afterwards disposed of to the highest bidder once in every six years; but since 1734 it has been in the possession of a trading company, who have a grant of it, for which they pay a duty of six thousand dollars a year to the king. They send from twenty-four to thirty ships thither every year, loaded with corn, bread, wine, iron, and wood, &c. &c. and they export in return from twenty-two havens, fish, flesh, butter, blubber, skins, wool, and woollen manufactures, which they exchange against the merchandise they have brought thither, according to a tax published in the year 1702. It is difficult to determine whether the company gains much by this trade or not; so much at least is certain, that the Icelanders lose by it; for the Dutch, disregarding or evading the tax, import much better goods than the company.

For this reason the Icelanders sell a considerable quantity of fish to them privately, though several Dutch ships have been confiscated on account of carrying on a smuggling trade. The agents of the Iceland company are aware of this, by the small stock that remains for their purchase, with which they are much dissatisfied.

There is a market kept every year at Hraundals-retter, to which those resort who live up the country: they exchange butter, cloth, and sheep, for fish, blubber, and other articles of that kind. At Reikavik there is a woollen manufactory, where ten or twenty workmen are employed: one likewise meets with a few looms here and there; and many more might be established amongst the peasants, if encouragement was given them.

Danish money is current in the country, but the whole stock of ready money cannot amount to many thousand dollars. Their accounts are not all kept in money, but according to yards and fishes: forty-eight fishes, each fish reckoned at two pounds, make one rix-dollar, and twenty-four yards make one likewise. You may buy a horse for one hundred and fifty fish, and a farm for six thousand yards. A vatt is one hundred pounds and a facring ten. They reckon one hundred and sixty-three quarts to a tun, and five to a kuttur. The Icelandic ell is as big as the Hamborough ell, three of which make a fathom.

LETTER XIV....TO CHEVALIER IHRE.

OF THE ICELANDIC LITERATURE.

Stockholm, Dec. 4, 1774.

The history of ancient times shews us that our ancestors did not despise arts and sciences, though they peculiarly distinguished themselves by valour and heroic deeds. Their religion, mixed with fables, was, however reduced to some rule, and their system of morality, though not the purest and best, yet inculcated certain virtues, which were in vain sought for among the more enlightened Greeks and Romans. The long voyages they made without knowing the use of the compass, is a proof of their having been much better acquainted with astronomy and geography than could have been expected. Physic, and particularly surgery, must have been held in high esteem among so warlike a nation, though I question very much whether any person could now submit to the manner of curing an external hurt, such as was practised among the ancients. Their invention exhibits itself in riddles, history, and poetry; and how highly these were valued among them may be proved by many examples, of which I shall only mention Egil's poem, in praise of Erick Blodoxe king of Norway, by which he saved his life; and Hiarne's Epitaph on king Frode, on account of which he is said to have been made king of Denmark.

Though it cannot be entirely ascertained, that Odin brought the Runic characters to the north, yet it is proved almost beyond a doubt, that they were known among us in the fifth and sixth centuries. The art of writing was also known here, if not certain, at least as early as among the Franks and Germans; the former had no letters before they began to make use of the Latin ones in the sixth century, and the latter were likewise unacquainted with them before the time of Charlemaine.

Their taste for riddles, stories, and poetry, the Icelanders also brought along with them, from their native country, to the island where they are now settled; and whilst these traces of science diminished in Norway, on account of the troubles which shook the whole north during several centuries, they not only preserved themselves in Iceland, which was not exposed to so many disturbances, but the care of their safety likewise excited the inhabitants to apply themselves to the study of history, that they

might by it be informed of the designs of their powerful neighbours, and take the best and most necessary measures to oppose those who only wished for an opportunity of subjecting them to their yoke.

It is true they had no schools or public seminaries for the instruction of youth in the sciences, before the introduction of the Christian religion; but it was, however, not altogether neglected, for they took great pains, besides inuring the bodies of their young men to feats of strength and agility, and teaching them such exercises as enabled them to defend themselves and their countrymen, to instruct them also in history, religion, and law. Thence we find in their ancient chronicles frequent mention of persons who had made considerable progress in these sciences, and even before they received the Christian religion there were a number in the country well versed in the laws.

In their frequent voyages, before the use of the compass (Leitarstain) was known to them, they discovered new countries, when driven out of their course, which were however deserted almost as soon as discovered: however, some, if not all of them, have been discovered in later times.

Thus Bjorn Herjulfson, in a voyage he made to see his father in Greenland, was driven by a strong north wind upon a flat woody country, from whence he afterwards reached his father, after a long and troublesome voyage, without thinking any more of his new discovery. After the death of his father, he again returned to Norway; where the account of his voyage raised an inclination in Leifer to go in search of this country. He therefore set sail with thirty-five men, and at first landed on a mountainous country covered with snow, without the least appearance of verdure: from whence he continued his voyage, and came to another country, which was flat and woody; this he named Markland. He set sail again with a north-east wind, and in two days time arrived at an island which lay north of the continent. He now entered westward into a straight, where his ship struck on the sand at low water; he then had it drawn ashore with cables, and having built a house, remained there the whole winter: here they did not experience the least cold, and the grass only grew a little reddish in winter. The days were not of so unequal a length as in Iceland; and the sun appeared above the horizon on the shortest day, both when they breakfasted and at supper-time. The vine and wheat both grew wild, and this occasioned their giving the name of Vineland to the country. This gives us room to conjecture that he advanced pretty far towards the south of America. They afterwards carried on a trade with the natives of the country, whom they called Skralingar, for a long time, which, however, ceased at last, and the country, and even its name, are now totally forgotten.

Poetry formerly flourished very much in Iceland; Egil Skalla Grimson, Cormak Ogmundson, Glum Gierson, Thorleif, Jarlar Skald, Sighvatr, Thordson, Gunlaug Ormstunga, and Skad Ralfn, are celebrated as great poets. The art of writing was not, however, much in use till after the year 1000. It is true the Runic characters were known in the country before that period, and most probably brought thither from Norway. Though we have no reason to believe they were cut upon stones, as was practised among us (no Runic stones having been found there, whose age reaches to the times of Paganism;) they used, however, to scratch them on bucklers, and sometimes on their ceilings and walls: and the Laxdaela Saga makes mention of one Olof of Hiardarhult, who had a large house built, on the beams and rafters of which remarkable stories are said to have been marked, in the same manner as Thorkil Hake cut an account of his own deeds on his bedstead and chair. That Runic characters were made use of before the introduction of the Christian religion, may be proved by

Olof Tryggwasson's Saga, where he makes mention of a man, whose name was Oddni, who, being dumb, made known, by means of Runic characters, that he had been insulted by Ivar, his father's guest.

After the reception of the Christian religion in the year 1000, the sciences took another form. The Latin characters were immediately adopted; as the Runic alphabet, which only consists of sixteen letters, was found insufficient. The first Icelandic bishop, Isleif, founded a school at Skalholt; and soon after they founded four other schools, in which the youth were instructed in the Latin tongue, divinity, and some parts of theoretic philosophy. Jonas Ogmundsson, first bishop of Hoolum, sent to Gothland in the year 1120 for one Gisle Finson, to superintend the school at Hoolum. Arngrim Jonson, on this occasion, mentions a remarkable circumstance in his Crymogaea, p. 108, of the architect Thorodr, who, as he was employed in building the cathedral church at Hoolum, paid so much attention to the grammatical lessons given to the school-boys, as to make a considerable progress in them himself. The same author also mentions, that the bishop, who was a learned and zealous man, having one day surprised one of the scholars in reading Ovid's letters, and book De Arte Amandi, was so incensed thereat, as to strike the book out of his hand. At a time when no great knowledge of the Latin language could be expected even in Sweden, an Icelander however was found, of sufficient capacity and learning to instruct the young people to read and understand the Latin poets. But notwithstanding the sciences were there only in their infancy, those who desired to make greater progress in them studied in foreign universities. Gislur Isleifson studied at Erfurt; and many resorted to Paris, as Samundr Sigfusson did, from whence they were called Parisklarkar (Paris writers.) Many, however, whose names are become celebrated, have only studied in Iceland: as a proof of which, I will only mention the two most famous Icelandic writers, Are Frode and Snorre Sturleson. It may therefore be affirmed that Iceland, from the introduction of the Christian religion there till the year 1264, when it became subject to Norway, was one of the few countries in Europe, and the only one in the north, where the sciences were cultivated and held in esteem. This period of time has also produced more learned men than at any other period since. We need only read their ancient chronicles, to be convinced that they had great knowledge in morality, philosophy, natural history, and astronomy. They had tolerably clear ideas of divinity, and used to read the Fathers: but their poetical and historical productions, in particular, have bid defiance to time, even when ignorance was again beginning to resume her empire. It would be an easy matter to mention a number of poets who distinguished themselves, not only in Iceland and the Orkneys, but likewise at the Swedish, Danish, Norwegian, and English courts, as the skaldartal (or list of poets) contains no less than two hundred and forty: but it will be supurfluous to mention here any more than the three principal ones, viz. Snorre Sturleson, who was beheaded in the year 1241, in the sixty-third year of his age, at Reikholt, in Iceland; Olafr Huitaskald, who died in 1259; and Sturla Thordson, who made his exit in 1284. Some extracts of the works of these authors are inserted in some printed and manuscript chronicles.

Of much greater importance are their sayings or histories, the utility and authenticity of which have caused so many disputes: for if they have been considered by some as sure and irreversible supporters of the history of our forefathers, they have been looked upon by others as absurd inventions and falsehoods, which belong to the same class as the history of the knight Finke, Fortunatus, the horned Siegfried, and other old womens' tales. This last opinion is no less unreasonable, than an excess of veneration paid to them would be inconsiderate and rash. When they are consulted with circumspec-

tion and judgment, they are undoubtedly of great use, so much the more, as they are the only remaining monuments of the ancient northern history; and indeed some of them are written with great judgment and perspicuity.

The Are Frodes Schedæ were written since 1122, and are the most ancient Icelandic accounts extant. The writings of Sturleson, Gunlaug, Odde, and several others, are all of them works that will never be lost or hurt by time; and I do not find any thing in them, which should induce us to deny them the same credit that we so implicitly give to the writings of Tacitus and Livy.

No one can doubt that even those authors, in the compilation of their histories, which have been considered as patterns of language, have made use of the information of other writers. Nor have our Icelandic historians been remiss in this; for Sturleson himself quotes Are Thiodolfr, the langfedgatal, or genealogical table, and some ancient songs, in which their kings were celebrated: from which, indeed, he compiled his accounts.

The Icelanders were remarkably studious in preserving the memory of their ancestors; and it was the most agreeable occupation in their meetings and assemblies, to repeat those histories and poems for which their great men had been renowned, as was the practice among the Greeks. Add to this, the contents and composition of the writings themselves, which plainly prove that the authors have not been inclined to relate marvellous stories; and it would be unjust to refuse them that reliance on their veracity, which we without hesitation bestow on other writers of the same class.

The greatest part of their works were composed in the eleventh, twelfth, thirteenth, and fourteenth centuries; and some of them have even appeared in print. I have a list of these histories in my possession; and though they are by no means of the same degree of merit, it will perhaps not be disagreeable to you to have a copy of it, as it is not only a proof of their love of science, but likewise of their application.

As a fresh instance of their accuracy and assiduity in study, I must likewise mention their chronicles, in which they recorded whatever happened of importance both in Iceland and abroad. These annals are in general considered as more authentic than their sayings. Semundr and Are Frode were the first who introduced them, and they have since been continued down to our days. The following are considered as the best.

1. Flateyar Annal, which reaches to the year 1395, and of which
2. Vatnsfiardar Annal is a supplement which extends to 1660.
3. Skalholt.
4. Hola.
5. Odda.
6. Biürns a Skardzaa to 1645, of which
7. Hests Annal, which goes down to the year 1718, is a supplement. Hrafnagils Annal begins where the last leaves off, and continues to 1754.
8. Odds Ejriksonar a fitium to 1680.
9. Annales Regii, which go to the year 1341.
10. Hirdstöra.
11. Laugmanna.
12. Biskupa.
13. Annales antiqui.
14. Annales vetustiores go to the conclusion of the thirteenth century. Bjarne Halldorson's annal, as I have been informed, begins about the middle of the seventh century, and reaches quite down to 1772.

But even here the sciences have been subject to the same revolutions, which they have experienced everywhere else. The lustre in which they had maintained themselves so long was succeeded by the most profound obscurity. To give a clearer idea of this, I shall borrow the expressions of the learned bishop of Skalholt, Dr. Finneus, on this occasion, who compares the state of the sciences in Iceland to the four stages of human life, in his well-written Hist. Eccl. Islandiæ. Their infancy extended to the year 1056, when the introduction of the Christian religion produced the first dawn of light. They were in their youth till 1110, when schools were first established, and the education and instruction of youth began to be more attended to than before. Their manly age lasted till about the middle of the fourteenth century, when Iceland produced the greatest number of learned men. Old age appeared towards the end of this same fourteenth century, when the sciences gradually decreased, and were almost entirely extinct, no work of any merit appearing. History now drooped her head, their poetry had no relish, and all other sciences were enveloped in darkness. The schools began to decay, and in many places they had none at all. It was very uncommon for any one to understand Latin, and few priests could read their breviary and rituals fluently.

But this was not alone the case in Iceland, the greater part of Europe experienced the same change. For the dawn of a brighter day, which had begun to spread from Greece over Italy and the southern part of Europe, after the taking of Constantinople by the Turks in 1453, had not yet penetrated to the north. Whatever bore the name of learning was not only despised, but so gross was their ignorance, that men of the highest rank, both spiritual and temporal, were incapable of writing their names. We cannot wonder at this in Iceland, when the history of the church affords so many examples of bishops who were present at councils, at the conclusion of which they caused to be written under the acts, quoniam Dominus N. Episcopus scribere nescit, ideo eju, loco subscripsit N. N. We were also informed, that the ignorance of this age was so great, that scarce any Swedish king before Gustavus First knew how to write his name. In the annals of Konungaoch Hofdinga styrelse (supposed to be written by bishop Brynolf Carlsson, who died at Skara in 1430) it is said, no more ought to be required of a sovereign, than to know how to read, understand, and explain his letters.

The reformation produced here, as in most places, a new dawn of knowledge. Some time before a printing-press had been brought to Iceland, bishop Gissur proposed to open a new school in the convent of Videy, which had been seized by the crown; but as this had been designed for a dwelling place to the king's receivers of the customs, Christian Third commanded, in the year 1552, that a school-house should be built near each of the cathedral churches; that at Skalholt for forty scholars, and that at Hoolum for thirty-four; but they have since been reduced, the one to thirty-four, and the other to twenty-four scholars. Each of these schools was to be provided with a rector and an assistant teacher; and the king appropriated as much land to these foundations, as was sufficient to afford tolerable salaries to the teachers, and board, books, and clothing, to the scholars gratis, so long as they remained at school.

Great pains have since been taken to appoint men of known abilities as teachers to these schools; and young men are so well instructed there, that few of the clergy study any where else. Many Icelanders, however, study at Copenhagen; and in the year 1773 there were no less than fifty-four at that university, where excellent regulations have been made for the support of poor students. Some likewise study in foreign universities; and between 1760 and 1770 a native of Iceland, Paul Widalin by name, died at Leipsic, who was universally beloved and esteemed there. A Mr. Thorolti,

who has been above three years at Upsala, has likewise on all occasions shewn himself a man of great merit.

We should therefore form a very wrong judgment of Iceland, to imagine it absorbed in total ignorance and obscurity: on the contrary, I can affirm, that I have found more knowledge among the lower class, than is to be met with in most other places. You will seldom find a peasant, who, besides being well-instructed in the principles of religion, is not also acquainted with the history of his country, which proceeds from the frequent reading of their traditional histories (sagas) wherein consists their principal amusement: nor is it uncommon to find persons among them, who can repeat the poems of Kolbein, Grimson, Sigurd, Gisles, Gudmund, and Bergthors, by heart, all of them poets who flourished in later times; and among whom Vigfus Jonsson has particularly distinguished himself by his wit, though sometimes at the expence of decency. The clergymen speak Latin well; and I have found better libraries in many parts of Iceland than could have been expected.

A learned society was erected here, which is spoken of in the preface of the abovementioned Speculum Regale under the name of Societas invisibilis; and I was intimately acquainted with the rector Halfdan Ejnarson, and the late sysselman Bjarne Haldorson, who were both members of that society, though I believe it does not exist at present. I could mention several, whose learning and taste did honour to their country, but I shall only name those who have acquired most fame in the literary world.

Among these the bishop of Skalholt, Dr. Finnur Jonson, deserves the first place; who, besides many learned writings on the antiquities of Iceland, some of which have been published, has lately presented the public with an ecclesiastical history, in three volumes quarto, replete with information, criticism, and erudition. I was happy in becoming more intimately acquainted with this worthy prelate, who has been bishop ever since 1754, and found no less instruction than pleasure in his company. You may easily conceive how much I wished, at taking leave of him, that his advanced age would permit him to put a finishing stroke to his other works. We have some reason to hope for this at present, as one of his sons, the learned Mr. John Finsson, has lately been appointed his father's assistant and provost.

To this number also belong Halfdan Ejnarson, rector of the school of Hoolum, who has published the Speculum Regale, and is now employed in writing Historia Literaria Islandiæ. The provost and minister of Hiardarholt, Gunnar Paulsen, is justly celebrated on account of his great knowledge in ancient poetry. Bjarne Jonson, rector of Skalholt, composes very good Latin verses, and has a dissertation of Gandagar ready for the press. Bjarne Pulsen, in company with Eggert Olofsen, made a journey through Iceland to collect manuscripts and curiosities, at the expence of the society of sciences. The lagman Soen Solvesen has published several law-works; as has likewise the vice-lagman John Olsson, and the provosts Vigfus Jonsen and Gudlaug Thorgeirson, besides several others.

The professor and counsellor of state, Erichsen, who is not settled in Iceland, is likewise known on account of many dissertations on antiquities, and is a useful member of the Collegii Magnæani. Arnas Magnaus, Torfeus, and several other Icelanders, have also particularly distinguished themselves for literature in this and the former century. I shall give a fuller account of them in another letter, wherein I propose to treat of the Icelandic antiquities in particular, where I shall also mention those who have peculiarly distinguished themselves in that branch of literature.

The language in Iceland is the same as that formerly spoken in Sweden, Denmark, and Norway, and has preserved itself so pure, that any Icelander understands the most ancient traditional history, as easily as we do letters written in the time of Charles Ninth.

The general change which took place in the northern language during and after the time of Erick of Pomerania did not extend to Iceland, though some trifling alterations were afterwards made in it in the fifteenth century, by the introduction of religion and their trade with the Danes, English and Germans. Near the coast some Danish is understood, and some even speak it; nor is it uncommon for a peasant to say, salve domine, bonus dies, bonus vesper, gratias, proficiat, dominus tecum, vale. Notwithstanding, I cannot agree with Sperling in considering the language as being more Danish than Icelandic, since not a single word of Danish is understood in the interior parts of the country. The great pleasure they find in reading their traditional histories has contributed not a little to preserve the language in its purity.

You have yourself treated of its origin in the preface to your Swedish-Gothic Dictionary; and one may form the best judgment of the language from Olof Tryggwasson's and some other historical traditions (Sagas) which have been written in the eleventh, twelfth, and thirteenth centuries, when it was in its greatest purity. But as these works are not in every person's hands, I will here insert a copy of the Lord's Prayer as a sample, both as it was expressed and printed in 1585, and in 1746, which will clearly point out the small change which the language has undergone during a space of near two hundred years.

1585.

Fader vor thu sem ert a himnum. Helgjst nafn thitt. Tilkome thitt riike. Verde thinn vilie so a jordu sem himne. Gief oss i dag vort dagligt braud. Og fyrerlat oss vorar skulider, so em vier fyrerlautum vorum skulldunautum. Og inleid oss ecki i freistne. Helldr frelsa thu oss af illu, thuiat thitt er riikit, maattur og dyrd um allder allda. Amen.

1746.

Fader vor thu sem ert a himnum, helgesst thitt nafn, tilkomme thitt rike, verde thin vilie, so a jordu sem a himne. Gief thu oss i dag vort daglegt braud, og fyrer gief oss vorar skullder, so sem vier fyrergiefum vorum skulldunautum, og innleid oss ecke i freisne, helldur frelsa thu oss fra illu,thuiad thitt er riiked og maattur og dyrd um allder allda. Amen.

In regard to the pronunciation, they have four different dialects. Those who dwell on the east side of the country drawl out their words in pronouncing them, which is not done in other places. On the western side they have many words which are peculiar to that part of the island: and in Snefialds Jokul the aa is pronounced as ai. In the southern part of Iceland o is pronounced short before r in certain words, as for example in hvoriger, moraudt, and others, though they are commonly long in other parts. In the northern part of Iceland the words are quite of different genders, as skur, which is usually feminine, but there is masculine; and klara, masculine, which is there feminine. In South Iceland I have observed the following pronunciation.

A is pronounced		au	in	tha
Aa	—	au	—	aara
Ll	—	dl	—	gamall
Au	—	o	—	thau
U	—	o	—	upp
Ae	—	ei	—	vaere
Ja	—	iau	—	hia
O	—	ou	—	moder
Gu	—	guo	—	Gud
Y	—	i	—	fyrer
Aef	—	aep	—	kiaefda

Their alphabet consists of the same letters as ours, except the (th) which character we have lost, together with the pronunciation; the English have yet preserved it, though foreigners find it difficult to pronounce.

We have an Icelandic grammar of Runolph Jonson, printed in quarto, at Copenhagen, in 1651: it was also printed in Hickesii Elementa linguarum septentrionalium, Oxford 1688, and again in his Thesaurus, Oxford 1703. But the manuscript of Jonas Magnusen's Grammatica Islandica, which you, sir, possess, is more complete, and deserves to be published, as likewise Eggert Olsen's Orthographia Islandica. The most ancient Icelandic dictionary we have is the Wormii Specimen Lexici Runici, compiled by Magnus Olafsen, which was published, in folio, at Copenhagen, in 1650. Afterwards Gudmundi Andreæ Lexicon Islandicum was published by Resenius at Copenhagen, in quarto, in the year 1683. This was followed by Verelii Index linguæ vet. Scyto-Scandicæ, which Rudbeck caused to be printed in folio, at Upsala, 1691, and by two Lexica Latina Islandica, both published in quarto at Copenhagen, the one in 1734, and the other in 1738; to these Rugman's Monosyllaba Islandica Lat. Explicata, Upsala, 1676, in octavo, may be added. In the library at Upsala was a copy of a manuscript Lexicon Isl. Lat. which I have brought with me from Iceland. In the antiquity archives is likewise a very ample work of Gudmundr Olafsen, which has been augmented and reduced to order by Mr. Assessor Gagnerus, which will however most probably never be printed, for want of a publisher. It is to be lamented that Runolph Jonson never was able to publish his Lexicon Islandicum, though a privilege was granted him for that purpose in May 1650: we may however soon expect to have something more perfect on this subject, as the Collegium Magnæanum in Copenhagen have promised to continue the important indexes, with which they have supplied the Kristniss and Gunlaug Ormstunga Sagas.

LETTER XV....TO CHEVALIER IHRE.

OF PRINTING IN ICELAND.

Stockholm, Sept. 12, 1774.

I HAVE said in my last letter that the art of printing was introduced in Iceland a short time before the Reformation. But as many may be surprised that books were printed there so early, I shall endeavour to treat more at large in this of the different printing-offices in Iceland.

One of the most famous, but at the same time most illiterate and turbulent bishops in Iceland, was John Areson, bishop of Hoolum. He made use of many arts, and particularly of his zeal for the Roman Catholic religion, to undermine the king's power, and hinder the progress of the reformation. His plots however succeeded so ill, that he was beheaded in 1550. As this man was extremely ignorant, and had not the least knowledge of the Latin language, which was however made use of in letters of excommunication, and other ordinances, he commissioned a friend to procure him a person well versed in Latin, who might at the same time establish a printing-office. For this purpose John Mathiesson, a native of Sweden, was recommended to him, and he arrived in Iceland between 1527 and 1530.

I cannot determine with certainty whether he was in orders at his arrival in Iceland; however I am inclined to believe it, from the appellation of Sira being given him after his arrival, which is a term applicable to the clergy. The bishop immediately appointed him to the prebendary of Bridebolstad and Vesturhopi, which situation he enjoyed till

his death in 1567, when at a very advanced age. Besides several other children he left a son, whose name was John, who was a printer there in the time of bishop Guthrandr: he was succeeded in the printing-office by his son Brandur. John Bradtson, son of the latter, died in an advanced age in 1681, as provost of Hytarnas. His son John Jonson, a clergyman, died in the same place in 1732. This whole family is now reduced to poverty.

The printing-office was immediately established; and in 1531 John Mathiesson printed the first book in Iceland, which was the Breviarium Nidarosiense. There was likewise an edition of this book printed at Dronthiem, the editor of which was archbishop Erick Walkendorf, which is now very scarce. I do not remember to have seen this edition mentioned any where, except in the twenty-eighth number of the Danish Magazine, where a copy of it is said to be in the library of Mr. Klevenfeldt. But in regard to the Icelandic edition, it is generally believed that not a single copy of it remains, since the only one I ever heard of was in Arnas Magnaei's library, which was consumed in the fire at Copenhagen in 1728.

Besides the Breviarium Nidarosiense, he printed the Handbok Præsta (an ecclesiastical manual) Luther's Catechism, and other books of the same sort. Printing however did not go on very well till 1574, when bishop Guthrandr Thorlakson ordered new types to be brought thither; whereupon, amongst other books, the Icelandic bible appeared in print in folio, in the year 1584. The printing-office was at this period so well provided with types, that two presses were employed, exclusive of those at Hoolum, where several books were printed and published about that time. The Icelandic code of laws was printed in 1578, at Nupufell, twelve miles from Hoolum, as likewise the Viti Theodori Summaria in 1589.

The printing-office at Hoolum was taken from Thord Thorlakson in 1685, and transferred to Skalholt, where one-and-forty different books were printed: the first of which was Paradysar Lykell, likewise Forfadra Bok in 1686; and the last, Bœnabok Sira Thordar Bardarsonar Med Vika Saung Olearii. utl. af Sira Steines, in 1697. But in the beginning of this century the printing-office was again removed to Hoolum, after bishop Bjorn Thorleisson had bought it, together with the privileges granted to it, for five hundred dollars; and the first book published on the revival of printing at this place was the Paraphrasis Medit. Dr. John Gerhardi, 1703. Since this time, some historical books, among which I will mention the Life of Gustavus Landkrona, published at Hoolum, in octavo, 1756, translated from the Swedish into the Icelandic language, have always been published here; the greatest part of them, however, are religious books. A new privileged printing-office has likewise lately been established at Hrappsey, by Olafr Olssen, where several valuable books have already been printed.

A list of Icelandic books might perhaps not be improper in this place; but as I am unable to furnish you with a complete one, I did not think it worth while to send you a catalogue of about three hundred that I am acquainted with; of which number, however, I am happy to have upwards of one hundred now in my library.

LETTER XVI....TO CHEVALIER IHRE.

OF THE REMAINS OF ANTIQUITY IN ICELAND.

DEAR SIR, Stockholm, December 21, 1774.

How infinitely happy should I be, were I able to satisfy your curiosity in respect to the great number of remarkable and ancient monuments with which Iceland is supposed

to abound; but this is out of my power: all the information I can give you amounts to no more, than that the country is so destitute of them, that it is in vain to go in search of any antiquities deserving the least notice. There are however some ruins of an old castle near Videdal, which was formerly about two hundred perches in circumference: the remains on the north side are about twenty fathoms in height, though they are very low towards the south. Near the parsonage Skaggestad, at Laugernas, are likewise some ruins of a lesser castle, but it is not known by whom, or when, it was built. In other places are remains of heathen temples, viz. at Midfiord, Godale, Vidvik, and others: at Hegranus is a kind of ancient place of execution; there are also several burying-places from the times of paganism, among which I shall only mention Thorleif Jarlaskalds, situate on a small island in the Oxaraa. Some old swords and helmets have likewise been found, but they have not cleared up any part of history. On the heaths of Thingmans and Threkyllis are two great stones standing upright, which most probably have been erected as monuments to the memory of some deceased persons, according to Odin's regulation. This custom, which was long practised in the north, has from thence been brought to Iceland; though it was not usual in Sweden till a long time after to put any inscription on the monument. I have been told, that some years ago forty small figures of brass were found in the ground near Flatey, representing animals and other objects; but unfortunately they fell into the hands of people who did not know their value, consequently they have been all lost.

There are no other monuments remaining of Sturleson, besides his writings, but a mount over-grown with grass at Reikholt, which is said to have been raised from the ruins of his house; Stulunga Reitur, the burying-place of his family; and at a little distance from them, Snorra Laug, one of the finest baths in Iceland. This bath, which is large enough to contain fifty persons at one time, is mured in with a wall of basalt, and concreto thermarum; it has a smooth level bottom, and is surrounded with benches. In Sturleson's time a long covered passage led from thence to the dwelling-house, so that the bathers retire from the bath without being exposed to the cold. The spring is at forty paces distance, and is called Scribla, and the water from it is conveyed to the bath through a conduit made of stones. At the end of this conduit is a hole in a rock, which is shut with a spigot and faucet, and through which you let in as much warm water as you think fit; this, when too hot, may easily be cooled by water from an adjoining brook.

These are almost the only ancient monuments Iceland affords, and all, as you will readily allow, are of very little importance. There are no ancient manuscripts, Icelandic sagas, or historical traditions or accounts, to be met with, the island having been entirely stripped of them, owing to the zeal and industry of the antiquarians and others, who formerly resorted in numbers to this country, for the sole end of collecting them.

The honour of having first begun to collect them belongs to Sweden: the first who undertook it was Jonas Rugman, who went to Iceland in 1661, at the expence of the court of Sweden, where he obtained a number of manuscripts, which laid the foundation for the collection of Icelandic original records that are contained in the Swedish archives of antiquities. Encouraged by his example, Thormundr Thorvison likewise went to Iceland, furnished with an order from King Frederic the Third, of the twenty-seventh of May 1662, to the bishops Bryniolf, Svensson, and Gisle Thorlakson, to assist him in collecting Icelandic manuscripts.

After the establishment of the college, it was proposed to send Peter Salan to Iceland; but this did not take place, though they gained their point some time after, in 1680, by

means of Gudmundr Olson, who prevailed upon his brother Helge Olson to leave Iceland and come to Sweden, whither he brought a considerable number of manuscripts. Great additions were afterwards made to these collections by Arngrim Johnson, Jonas Wigfusen, Lopt Josephen, Gudmund Gudmunderson, and Thorvaldr Brockman, who were all employed as translators by the college of antiquities. Jonas Eghardsen, Magnus Benedictsen, Isleif Thorleifsen, Ejnar Ejnarsen, Arnas Hakansen, Francis Jacobsen, and Thord Thorlakson, have also very much enriched the collection, both when the college of antiquities was at Upsala, and when it was afterwards transferred to Stockholm.

The attention of the Danish court was at last excited: King Christian Fifth, in 1685, dispatched Thomas Bartholin to Iceland, with an order to the bailiff Heidemann to assist him in collecting Icelandic antiquities: he forbad at the same time, in the strictest manner, any manuscripts, histories, or other accounts relating to Iceland, to be sold to foreigners, or carried out of the country.

Stockholm, as well as Copenhagen, became therefore possest of a considerable number of Icelandic writings; but the latter court, not satisfied with what they had already obtained, dispatched Arnas Magnaus and Paul Widalin to Iceland in 1712; where they sought for whatever might remain there with such extreme care, that it is almost impossible to get sight of any manuscript history in the whole country; and notwithstanding the pains I have taken, I could only obtain an imperfect copy of the Sturlunga Saga, which I purchased.

It is in vain, therefore, that one now inquires for ancient Icelandic chronicles in Iceland; for besides the fine collection in the Swedish archives of antiquities, there is a very admirable collection of them in the library of the academy at Copenhagen, which was a gift of Arnas Magnaus; besides several small collections of less importance, in the hands of private persons.

I have already mentioned the Icelandic histories which have been published: some of them have been printed in Iceland, among which those printed at Skalholt are very rare; but the greatest part have been published in Sweden, though sometimes from very imperfect manuscripts. Olof Rudbeck the elder, Verelius, the two Peringskolds, Renhielm, Biorner, Salan, and Brokman, have however acquired a great deal of merit, by the care and diligence which they bestowed upon them. None of these editions however can be compared, in point of elegance and criticism, to those published in Copenhagen, by the Magnaanian college, the continuation of which is expected with great impatience by the literary world.

LETTER XVII....TO BARON AXEL LEJONHUFWUD.

OF THE ICELANDIC POETRY.

Stockholm, Dec. 12, 1775.

It is with the utmost pleasure that I prepare to obey your commands, in communicating to you a short account of the Icelandic poetry: I only lament that my circumscribed knowledge on a subject which is surrounded with so many obscurities, will not permit me to make my account as perfect as I could wish, and as the importance of the subject requires: I regret this inability so much the more, as I am to submit my thoughts to the eye of so great a connoisseur; but if even my observations should not be very important, I will console myself for it, as they will, however, be a proof of my readiness to comply with your wishes.

Though the opinion of some men of learning, that writing in verse has been earlier practised in Europe than writing in prose may appear extraordinary at first, yet it

seems more probable upon nearer examination. The poets among the Greeks and Romans were more ancient than their historians and most celebrated orators. The time when prose first began to be written among these nations may be ascertained with tolerable accuracy; but it is almost impossible to determine the age of poetry among them, as it is far more ancient than the siege of Troy and the Olympic games. In the same manner we know that the first work in prose among the Romans was the speech of Appius Caecius to the senate and Roman people, in the one hundred and twenty-fifth Olympiad; in which he advises them to refuse the conditions of peace offered by Pyrrhus, when it is certain that poetry had been known and cultivated among them long before.

This need not be wondered at, when we recollect that long before the knowledge of letters could have become general in Europe, many actions might, however, have been thought worthy to be consigned to posterity. How great an assistance must it have been to the memory, when the remembrance of an event, destined to be rescued from oblivion, was preserved in words composed according to a certain measure, where it might be determined, even by the ear alone, if any word had been omitted or altered. The laws of the ancient Germans were written in verse, and the stanzas in which they were composed were generally sung. The French monarch, induced by the favourable reception given to every poetical work, caused the Bible to be translated into verse in the ninth century: from the same motive Ottfried, a Benedictine monk in Alsace, translated the four Evangelists into German verse, about the same period.

Thus we see that poetry is extremely ancient among all nations; and in Sweden it may be considered as a legacy of Odin, who first brought it thither. In ancient times there was no king or chief, or any other man of note, who had not his own skald or poet, who was obliged to be present on all important occasions, to remark whatever was worthy of attention, and to relate it in songs. He was present at battles in the Skoldborg, or in the midst of the bravest warriors, that he might behold with his own eyes those actions which were to be recorded: at their banquets he was obliged to animate the guests with happy inventions and poetical encomiums on their deceased heroes. These poets were everywhere held in high esteem; they were constantly admitted to the king's presence, and frequently were both his generals and ministers. They were called skaldr, which Chevalier Ihre derives from skial, reason or prudence, from whence the expression of skiálamán, wise men. They were likewise called spekingr, from speke, wisdom, from whence the English word, to speak, derives its origin.

To the songs of these poets we owe the first accounts of the Swedish history, and cannot therefore deprive them of the honour Tacitus bestows on them in calling them antiquissimum annalium genus. Our ancient traditions are likewise filled with these songs, which we cannot alter or reject as worthless, though they are, for the most part, unintelligible to us. The cause of this is, first, that the skalds purposely composed their songs with so much art, that they were not only unintelligible to the vulgar, of which we find examples in Geila Stursonar, Viga Glum, and Greltis's Sagas; but they were not even understood by the greatest poets, of which Gretter's history gives us a proof.

They were, secondly, accustomed to transpose the order of the words in their songs in so strange a manner, as necessarily augmented the obscurity. I will only mention one example of this from Renhjelm, where the words, to follow in their natural order, ought to have been ranged according to the number placed over them:

1 2 8 9
Hilmir vann at holmi
5 7 6
Hialm-skoth rothni blothi
3 14 15 13
Huat ofduldu thess hoeldar
4 10 11 12
Hoerd oc austur i goerthom
18 20 17 19
Rogs bra Recka laegir
10 22 21
Riikur valkera lijki
23 24 27
Herstefnir let hrofnum
25 26 28
Hold flaemingia goldit.

They had, thirdly, a particular poetical language (Skaldskaparmal) which was very copious, but could not be made use of in common life. This language probably made one of the principal parts of their studies in those times, as they were not insensible of its beauty and elegance. Thus, for example, there are upwards of fifty synonymes of the word bolja, billow or wave. And Chevalier Ihre quotes Lopt Guttormson's Lyodalykil (a love-song) in which there are many different appellations, which all express the word woman. I shall borrow a few lines of this poem, which are mentioned in the Edda among the kringaheiti, and which prove how far these poets went in their Antonomasias.

Heingi eg hamri kringdan
Hang a riupu tangar.
Grimnis sylgs a galga
Gynnung bruar linna.

The natural disposition of those words is this: Eg heingi hamri kringdan linna gynnung a hang riupu bruar tangar, a Grymnis sylgs galga; which means, "I hang the round beaten gaping snake on the end of the bridge of the mountain bird, at the gallows of Odin's shield." To find the sense of these words, Mr. Ihre observes, that by the gallows of Odin's shield is meant the arm, on which it is usual to hang on the shield. By the word ripa is understood a falcon, for a skald has the permission of putting one genus for another. The bridge of the falcon is the hand, on which the falconer places him, and its end or tong (tongue) is the finger. The gaping round beaten snake means a ring; and consequently this long story means no more than, I put a ring on my finger.

Fourthly, to make themselves still more intelligible, when two words had the same sound, the Skalds were allowed the liberty of putting the periphrasis of the one for the other: for example, the word hof signifies a horse's hoof or foot; but the same word likewise means decency, moderation, understanding; and to express this the horse's hoof was frequently made use of. But the principal difficulty in the explanation of this ancient poetry proceeds from the extreme incorrectness of the manuscripts of our Sagas, particularly of the poetry, which cannot be read correctly without great attention. These are the causes why the greater part of the verses in their Sagas, published

either in Iceland itself or in Sweden cannot be understood; only very few are capable of comprehending them; that it is however possible, is proved by the new editions of Kristnis Saga, Landnamabok, and several others. The provost Gunnar Paulsen in Iceland is particularly distinguished for his great knowledge in this branch of literature.

The difficulties we meet with in ascertaining the true sense of these ancient poems is likewise the cause of the contempt with which we consider these few remains of the genius of the ancients. I will readily acknowledge that they have no poem which could be proposed as a pattern of wit and elegance; yet it cannot be denied, but that very sublime thoughts and expressions, and sometimes very beautiful comparisons, are to be met with in them: and it is impossible to read the dying Lodbrok's Biarkamal, Eigils, Hofud, Lausn, and Ejvindrs, Haconarma, without pleasure, besides several others.

They chose for the subject of their poetry whatever happened in common life; however they principally occupied themselves in composing songs in praise of the actions of their great men; in which they are accused of not being over scrupulous in bestowing their flatteries. We have several poems existing, on various subjects, among which there is a tolerable epic one on Charles and Grim, besides another on Hialmar. They have likewise some satirical pieces, which they used to call nidvisor, and the undertaking of the author was named yrkia nid; but there are no traces of their having had the least idea of theatrical performances.

From what has been said, it may be imagined, that there is no language which allows a poet so much liberty as the Icelandic; and indeed there is no language so rich in poetical expressions as this: It must not however be thought that it is confined by certain rules; on the contrary, I believe there is no prosody so copious as the Icelandic, as, according to the Edda, they had no less than a hundred and thirty-six different sorts of versifications (in Icelandic hattur) each of which had its particular rules. However, it will be extremely difficult, nay almost impossible, to say any thing certain on this subject, before we have a true explanation of that part which treats of it in the third volume of the Edda.

The Edda is one of the most celebrated remains of antiquity, and yet it has hitherto been very imperfectly known. It has generally been considered as the mythology of the ancients, and the Voluspa and Havamal have been forced upon it as two of its volumes, though they do not in the least belong to it. But Chevalier Ihre has thrown more light on this affair: in his printed letter to Mr. Lagerbring, he has attentively examined the manuscript of the Edda, in the library at Upsala, and clearly proves that it is nothing more than an introduction to Icelandic poetry, consisting of three parts: the first, daemisagor, is an extract from the Historia mythica veterum; the second, kenningar, is a mere Ærarium poeticum: and the third, liods greiner, contains the Icelandic prosody, &c. &c. The so-called dœmisagorne are for the most part translated into the Swedish language by Goranson, but the translation is very incorrect. Resenius has likewise published them, together with the Kenningarne, in Latin. But the third part, which deserves no less attention, has not yet appeared in print; and it is much to be wished that Chevalier Ihre would give it to the public, as there are so few besides himself capable of doing it justice.

The various conjectures which have been formed concerning the true author of the Edda have been no less erroneous, than those relating to the subject of the book itself. It has generally been thought that Samundr Sigfuson, who died in 1133, wrote a very ample work entitled the Edda, which treated of many important subjects, and was in a manner a magazine of all human knowledge; of which however scarce one third

has ever been preserved, and transmitted to us in the present Edda. But Chevalier Ihre asserts, that the Edda we now are in possession of has not been extracted from any one more ancient, but that it has originally been composed by Snorre Sturleson.

The difficulties and objections which have been made against this opinion by the learned Arnas Magnäus, and afterwards by professor Schlosern, can easily be removed; for most probably Sturleson's Edda has been continued by the monk Guniaug, as Bjorn of Skardsaa supposes, or rather by Olafr Hvitaskald. It is not therefore surprising, that something in praise of Sturleson should be inserted; and it may easily be explained from hence, why the author called Waldemar, king of Denmark, his master.

It is difficult to determine the true nature of the ancient Icelandic poetry: however, to give you some idea of it, I will say something of the versification most frequently used among them, and which was called drojtquade (king's song.)

It was divided into stanzas, each of which consisted of four couplets, and each of these couplets was again composed of two hemisticks, of which every one contained six syllables. and it was not allowed to augment this number, except in cases of the greatest necessity. These hemisticks consist of three or four feet, according to the different sorts of versification, and sometimes of more, in proportion to the shortness of the syllables. Besides this, the Icelandic poetry requires two other things, viz. words with the same initial letters, and words of the same sound. This assonance is called hending, and is either more or less; in the first case it is called adalhending, and in the second, skotthending. This you may clearly see by the following example:

Austur londum for undann
Alvaldur sa er gaf scaldum,
Hann feck gagn at gunne,
Gunntrör da slög mërgum,
Slydurtungur let slingra
Sverd leiks reigenn ferdar,
Scende grammur ad grundu
Gullwarpathi snarpann.

Here it must first be observed, that there is in every couplet a syllable which governs the whole verse, rader quaedinni, which is almost always the first word in the second hemistick; and two words in the first hemistick must begin with the same letter, if it is a consonant: but when it is a vowel, one vowel may be put for another. Thus, for example, in the above stanza the following words are those which govern each verse, consisting of two lines or hemisticks, radar quedandi, in the first verse, the word alvadur, because it begins with a vowel, has, in the first hemistick of this verse, the words austur and undann; in the second verse gunhörda, you find gagn and gunne in its first half: in the third verse sverd, whence in the first hemistick slydurtungur and slingra: in the fourth verse, gullvarpathi, which requires gramur and grundu in its first half. Secondly, one finds in the first hemistick of each verse a skotthending, or two words which have equal consonants with unequal vowels, such as are in the first verse löndum, undann; in the second hann, gunn; in the third, slydurtungur, slingra; and in the fourth, scende, grundu. But in the second hemistick of each verse is an adalhending, where two words have both equal consonants and vowels in the above-mentioned stanza: words of this kind are in the first verse alvald skaldumm; in the second verse gunhörda, mörgum; in the third verse sverd, ferdar; and in the fourth verse gulvarpathi, snarpann: consequently, in a stanza, which, like the above, consists of thirty-words, above one half

of its peculiar properties are contained in the impossibility of changing one word for another, or transposing it, without making a great alteration in the whole verse. These assonances, or hendingars, are generally found in the first and last word of each line: sometimes however the one assonant word is placed in the middle of the line, as in the instance of the word löndum in the first hemistick of the first verse.

This consonance of sounds must be considered as the necessary ornament of a regular verse by the ancient Skalds: the greater this uniformity is, the more the verse approaches to perfection; it likewise serves them as a guide in singing their verses. We also find something of this sort in the Latin poets: Virgil says,

—tales casus Cassandra canebat

And another poet,

Dum dubitat natura marem faceretve puellam,
Nates es o pulcher paene puella puer.

This has likewise been remarked by Boxhorn, who at the same time quotes from Giraldus Cambrensis, that this was also customary among the ancient Cambrians, and in England: so that it seems to have been the opinion of most nations, that the elegance of poetry required this harmony of sounds. For this reason the Cambrians say,

Digawn Duw da y unie
Wrth bob ctybwylh parawd.

And the English,

God is together gamman and wisdome.

David Rhaesus confirms this in his Grammatica Cambro-Brytannica, printed in folio, London 1592, and quotes several passages from their verses, which have a great deal of resemblance with the hendingar of the Icelanders.

I know not whether the agreement of the initial letters, customary in the poetry of the Finlanders, might not likewise be mentioned here, as a proof of the same custom being observed there as in Iceland: I will therefore insert a passage from Calamnii's Congratulation to the late king Adolphus Frederic, on his undertaking a voyage to Finland.

Kosta kulki kuningamme
Adolph Fredric armollinen
Meidan maalla matkusteli,
Kaicki vereni venahti,
Kaicki lükahti lihani,
Eltæ virteni viritin,
Kannoin minum kandeleni,
Isaen istuimen etehen,
Kaicki vallan kamarihin
Iosta anvin andimia.

But this carries me too far from my subject. Though we do not find any rhymes in our most ancient poetry, it may however be said with certainty, that they are older than the introduction of the Christian religion. Skulé Ejnarson is therefore wrongfully accused

of having introduced the use of rhymes, which is now become so general, that except England, which has preserved its blank verse, no nation in Europe is pleased with verses that do not rhyme. The art of rhyming, which is by no means essential to poetry, and still less useful, as it only serves to make it more difficult, was borrowed, it is not improbable, from the ancient northern skalds, and has now spread itself beyond Europe; so that rhyming is become as universal, as the complaint that the number of versifiers increases in the same proportion as the number of poets decreases. Baretti relates, that he heard a Mosambique song in rhyme, from some negroes at Madrid. Gages says the same of the Mexicans; and Nixbuhr mentions that the Arabs are great rhymers.

To conclude, I here present you with a specimen of an Icelandic poem, which Rugman composed on the death of count Magnus de la Gardia. It was printed at Upsala; but is become so scarce, that I doubt whether any person in Sweden has a printed copy of it; it may at the same time serve to shew the nature of a drottquade, as the author has observed almost all the rules which constitute one.

Aut er i seggia söti
Saknar manns i ranni
Gret ylgur Ragnvald rytto
Rom-stamir haukar fromast
Kund Lodbrokar; kiendo
Kuillinda valir illra:
Kuóldrido klarar hreldost
Kueid ari mar fast reidar
Tijd fiello tar af giodi
Tafniausir æpto hrafnar.

Thuarr og vid theingils dauda
Thydur morg bråd, i hijdi
Skreidast thui bersi skiædur
Skiott marti gråds, of otta:
Ox òdum falu faxa
Frar miog or leiptri tara
Huarma beckur ad hrockin
Hraut gron a baudar nauti.

Greto skinlaus agiætann
Gripdijr heidingia suipuls
Verdar of fædo fordum
Fleinthings allvakran kingia:
Og i oglodum huga
Undo sier menn og hrundir
Seims kuado mundar soma
Sieirrhuor huit malar thuerri.

Heidingiar ef sua hedins
Harmadu kuanar barma
Stälir sier giordi stala
Stijrir og Eida hirust:
Thars i malmgusti giera
Grad thuarr og vod til brada
Varga kna vund eborgid
Vas, thaut rafn i asi.

Hvad bæri oss er erum
Urdarbrunns tha alkunnir
Sira Jofurs thess sara
Sueita dagliga neitum ?
Og i hans erum faugru
Orda vidkuædi vordnir
Uppfræddir ad vier hreppa
Astundum gledi háá ?

Bæri oss ey bliugum vera
Breiskleika holdsins veikan
Tijitt fyri sionir settia
Synd flya, dygd i nijast ?
Hel med thui hroka stoli
Hreikir sier a faul bleikum
Akuedr ymsra thioda
Andlat med quisti handar.

Hel vægir hauldum eigi
Hrijfur or thesso lijfi
Kejsara, Klerk og Räsir
Karlmensko fulla Jarla :
Altignum amint fagnar
Og kot-af-röpa throti
Kurteisa kappa hersa
Kielling leggur ad velli.

Dæmi framm daglig koma
Drijir hel verk at nijo
Audlinga aburt leidir
Oss dauggvar tara fossi :
Mannlunga mætsta fangar
Med sier hertekna hiedan
Færir og furdum storum
Fiaurlestir meingid besta.

Sidpridi, sæmd og heidur,
Somligigur dygdar blomi,
Mangiæska, vinsæl minning,
Metrda fremd ofgietin,
Frijdleikur, fegurd, audur,
Frækn, ast, og hyller dásto
Hel med sier dregur i duala
Deyr tho goat mannord eije.

Einn nu af æfi banni
Afgieck raud moens brecku
Mætur altygin ytum
Æ tregandi lægir :
Kurreis, vis, kiænn, til vurta
Kin-stor lof dunga vinur
Haborin Jarl og Herra
Haukstandar malar grandi.

Dyr Magnus Delagardi
Dygdhar Odains bygde
Akurs vist af var rekin,
Er nara nift illskiptin :
Mord hauxa fall hans færdi
Fridostum brecko hlijda
Sorg stora sua og morgum
Slædir lax hrundum fædo.

Thar fie oss tho ad eyrir
Thad hann i gudi gladur
Als træd holds goto greida
Grand fyrtist vondra anda;
Hirdur i Gimlis gardi
Glatt singur og samklingir
Utvauldum Eingla sueitum
Endalaust lof miuk rausto.

EPITAPHIUM.

Conditur hoc tumulo juvenili mortuus ævo
Magnus, de Magna Gardia gente fatus.
In multos canus dignus qui viveret annos,
Hei mihi! quod juvenis concidit ante diem.
Hujus enim ingenium cepit non terra. Quid inde?
Tollite Cælicolæ, reddite Cælicolæ.
Dic tumulum spectans oculo properante viator:
Magno Tuo Cineri sit pia terra levis.

JONAS RUGMAN.

Scripsit Upsaliæ anno 1667,
die 14 Februarii.

LETTER XVIII....TO PROFESSOR BERGMAN.

OF THE VOLCANOES IN ICELAND.

Stockholm, Sept. 1, 1773.

HAVING received the collection I made in Iceland of the specimens of the different substances of which their volcanoes are composed, I take the liberty of sending it to you; adding at the same time a short account of these burning mountains, which is in part extracted from Icelandic writers, and partly founded on what I heard from the natives, as well as from my own observations; and which I do not think unworthy of your closer examination. Indeed it is much to be lamented that, since of late such care and application have been bestowed on the study of natural history, so little attention has been paid to the operations of Nature in this remarkable island; for hitherto a very small number of the many volcanoes are yet fully known; but that we should be more ignorant in regard to the wonderful hot spouting water-springs, with which the country abounds, is very extraordinary; not to mention many other uncommon appearances in nature.

My time and attention have been too much confined and taken up, to give you so complete an account of the curiosities of Iceland as they deserve; but I flatter myself, notwithstanding, that you will give a favourable reception to the few observations I shall make, though they should not be so important as might be expected. We may hope

to see this subject treated upon more at large, when you have time and opportunity to compare the effects of fire in Iceland with similar ones in other parts of the world.

I will not venture to determine how far the opinion of some men of learning is founded on truth, that all mountains have taken their rise either from fire or water. How probable soever this opinion may appear, of which we can find no traces in the most remote times, and the most ancient authors; yet it would be very difficult, nay almost impossible, to establish it by experience: but be this as it may, I will venture to pronounce, that Iceland has been formed by eruptions of fire.

It is no uncommon event for islands to be produced in this manner; we have many examples of it; but the size and extent of Iceland, in comparison to other islands, which owe their origin to the same cause, may raise some doubts against the reception of this hypothesis. Nor can it be denied, that this, as well as several sorts of stone which are to be found there, and which do not bear any distinct marks of the effects of fire, are likewise calculated to confirm these doubts. Again, I see nothing to hinder me from considering Iceland as produced by fire, when I reflect that the ground in all parts of the island, and particularly near the sea-shore, consists of lava or tuffa, which is frequently covered with other sorts of stones, as at Lundö, and even with a hard kind of moor-stone (saxum) or with several strata of different kinds of earth and stones, as at Laugarnœs, where the lava is fourteen feet in depth; when I find, besides, that those rocks, which have no traces of fire, are compounded of sand mixed with small pieces of spar, which may easily be produced, in two or three thousand years, since the lava has laid the foundation, I am still more inclined to support this opinion.

I am not however so credulous as to believe, that the whole island was produced at once by fire; but I rather conjecture that it has been the work of some centuries, by several cliffs and rocks having been produced at different times, whose points have been connected by new eruptions, and which have formed the basis of the whole island.

It is very difficult to determine, whether this supposition has any real foundation or not; however, I think myself authorised to believe it, as well from the arched figure into which the streams of lava have generally formed themselves, as from the probable connections of the sea and the volcanoes there: I likewise believe, that from hence it may best be explained, why several islands have been swallowed up in great earthquakes, as a building may soonest be destroyed by tearing away the pillars on which it rests.

Thus I go further back with regard to the eruptions of fire in Iceland, than the common tradition among the vulgar people there, who believe that the first inhabitants of the country, whom they suppose to have been Christians and Irishmen, were so much oppressed by the Norwegian colonists, that they were forced to leave the country, which they first set fire to, to revenge themselves. We cannot however determine, till after the arrival of the Norwegians, how often the eruptions of fire have happened. But this nation has preserved with great care whatever concerned their place of residence or habitation.

The first eruption of fire, mentioned by the ancient records, is the Ildborgar hraun, immediately after the arrival of the Norwegians on the west side of the island, in the ninth century. But it is not remarked as any thing extraordinary, only that the fire broke out near a farm belonging to Thore; and a stretch of lava, or a hraun, of three miles in length, and two and a half in breadth, remains to this day, as a monument of it. After this there are no eruptions mentioned till the year 1000, when the Christian religion was introduced there. At a time when the chiefs of the country were assembled, to consult about the reception of the Christian religion, information was brought

that fire was thrown out at Plow. The heathens considered this as a proof of the wrath of their gods, on which account they were resolved to refuse the new religion; but this resolution was overruled by Snorre Gode's asking them, "On whom did the gods display their wrath, when those rocks on which we now stand were on fire?"

The Icelandic chronicles mention many instances of fiery eruptions observed in different places during the space of eight hundred years;* it is therefore difficult to conceive how Horrebow, who has been in the country himself, could affirm, that fire is emitted only from them very rarely, and in few places.

To be sensible of the dreadful effects of fire the country itself need only be considered. The mountains are almost entirely composed of lava and tuffa, and the plains are crusted over with hraun, or tracts of lava, which are, however, in many places covered with earth or turf. The accounts which we have of certain eruptions of fire also informs us, that they have laid waste large tracts of land, either more or less.

I will not in this place mention the damages done to the inhabitants by the ashes thrown from the volcanoes, which frequently covered the fields for a space of twenty or thirty miles in length, and half a yard in height, and by which the cattle suffered very much, as it caused them to lose their teeth, and frequently to drop down dead for want of food; and when they have been killed, pummice has sometimes been found in their liver and bowels. I will only name some of the places situate nearest to the volcanoes, that have been utterly destroyed by their effects. This has been partly done by violent earthquakes, which generally preceded the eruption; and partly by inundations of water from the ice melted by the fire; and lastly, by the quantity of glowing ashes and stones thrown from the mouths of the volcanoes, and the streams of burning matter which flowed down on all sides.

In 1311 eleven farms were consumed near Roidekamb, and as many more near Tolledyngr; and in 1366, 70 at Lillehered. Heckla destroyed two in 1374; seven in 1390; and eighteen in one day in 1436. In the same manner five farms were laid waste near Myrdals Jokul in 1660, and still more in 1693 near Heckla. In 1727, at least six hundred sheep and one hundred and fifty horses were killed near Myrdals Jokul, by the flood and the pieces of ice which rushed down with it. In 1728, many farms were destroyed near Krafle, and a large lake called Myvatn was entirely dried up, into which the streams of fire that rolled from the mountains flowed during some years, and formed a tract of lava of four miles in length, and one and a half in breadth. In 1755 Kattlegiaa laid waste six parishes; and in the same year the last eruption of Heckla ravaged a tract many miles to the north-east.

It is not therefore to be doubted, but that the fire rages here with as much, and perhaps more violence than Vesuvius, Ætna, and other volcanoes; notwithstanding which, I see no foundation for the opinion of some people, who affirm that there is a communication between the volcanoes of Iceland and Italy; it might be maintained with as much foundation that Kattlegiaa and Teneriff, or Krafle and Lima, communicate.

But before I quit this subject I will mention a circumstance, which is related both by Eggert Olafsen and Jacobsen. The last time that Kattlegiaa emitted fire, a flash of lightning, as it were, burst from the flame, and pierced through the cliffs which intercepted its way. The same lightning in one placed killed eleven horses, three of which were in a stable; a farmer was also killed by it near the door of his room; his upper clothes,

* The chronicles give a list of sixty-three eruptions at Heckla and other places, from the year 1000 to 1766; of which twenty-three were eruptions of mount Heckla only.

which were woollen, remained entirely unhurt, but his shirt and waistcoat, which were both of linen, were burnt: and when his clothes were pulled off, it was found that the flesh and skin on the right side were consumed to the very bones. The maid-servant, who wanted to assist him in saving the cattle, was likewise struck by the lightning, but did not die till several days after, during which time she suffered inexpressible torture. It is likewise said, that when she put on her clothes, they were singed by the glutinous fires, which cleaved to her body. At first I hesitated to believe this as true; but when I read in your Cosmography that Braccini had observed, in 1631, that a column of smoke from Vesuvius extended over several miles of the country, from which deadly lightning proceeded, and that the same happened in 1767, when the iron rods erected in Naples became electric whenever Vesuvius emitted fire, I am the more inclined to believe that there is something electrical in this kind of fire, as the same phænomena appear in thunder and lightning.

LETTER XIX....TO PROFESSOR BERGMAN.

OF THE VOLCANOES IN ICELAND.

Stockholm, September 21, 1774.

It scarcely ever happens that the mountains begin to throw out fire unexpectedly; for besides a loud rumbling noise, which is heard at a considerable distance, and for several days preceding any eruption, and a roaring and cracking in the part from whence the fire is going to burst forth, many fiery meteors are observed, but unattended in general with any violent concussion of the earth; though sometimes earthquakes, of which the history of the country affords several instances, have accompanied these dreadful conflagrations.

Among the traces left by these eruptions are, particularly, the clefts which are frequently to be met with, the largest of which is Almennegiaa, near the water of Tingalla; it is very long, and one hundred and five feet in breadth. The direction of the chasm itself is from north to south: its western wall, from which the other has been perpendicularly divided, is one hundred and seven feet six inches in height, and consists of many stratas (each of which is about ten inches in height) of lava, grown cold at different times, as may easily be discovered by the apparent crust, which is full of blisters, of a darker brown, and not so much compressed as the remaining part of the mass of lava. The eastern wall is only forty-five feet four inches in height; and that part of it which is directly opposite to the highest part on the other side is no more than thirty-six feet five inches high.

It is likewise considered as a sign of an impending eruption, when small lakes, rivulets, and streams, dry up. Some persons believe that it does not contribute a little to hasten the eruption, when the mountain is so covered with ice, that the holes are stopped up through which the exhalations, &c. often found a free passage.

Though it is by no means my opinion that this contributes much to it, it cannot be denied, that the fire is generally contained in these mountains covered with ice, or, as they are called in the country, jokuls.

The first thing that is usually observed, before a new eruption of fire, is the bursting of the mass of ice with a dreadful noise, whence it is called in Icelandic Jokla-hliod (Jokul's Sound) and Jokla brestar.

Flames then burst forth, and lightning and balls of fire issue with the smoke, which are seen several miles off. With the flames proceed a number of larger and smaller

stones, which are sometimes thrown to an incredible distance. I have seen a round stone near Nafeirholt, about a mile from Heckla, which was an ell in diameter, and had been thrown there in the last eruption of Heckla. Eggert Olafsen also relates, that at the last eruption of Kattlegiaa, a stone which weighed two hundred and ninety pounds was thrown to the distance of four miles.

A quantity of white pumice-stone is also thrown up with the boiling waters; and it is believed, with great probability, that the latter proceeds from the sea, as a quantity of salt sufficient to load several horses has frequently been found after the mountain has discontinued burning.

Then follows generally brown or black pumice-stone, and lava, with sand and ashes.

The lava is seldom found near the opening, but rather tuffa, or loose ashes and grit; and indeed the greater part of the Icelandic mountains consists of this matter, which, when it is grown cold, generally takes an arched form, some admirable proofs of which may be seen in the cleft at Allmanagiaa: the upper crust frequently grows hard and solid, whilst the melted matter beneath it continues liquid; this forms great cavities, whose walls, bed, and roof, are of lava, and where great quantities of stalactite of lava are found.

There are a great number of these caves in Iceland, some of which are very large, and are made use of by the inhabitants for sheltering their cattle. I will here only take notice of the cave of Surtheller, as the largest of all: it is between thirty-four and thirty-six feet in height; its breadth is from fifty to fifty-four feet, and it is five thousand and thirty-four feet long.

It would be both tedious and difficult to class the different compositions of fire in these places, as it is not easily discovered to which they belong: for example, jasper, of which great quantities of red and black are found inclosed in the lava, and mixed with it: I will therefore only name those which have been evidently produced by the fire. First, tuffa, a stone, feruminated ashes and grit, which sometimes is found mixed with lava, basalt, and other sorts of stones, and having been moistened by the spouting of water, grows hard by heat and length of time. Secondly, lava, is that kind of stone which has been melted by the violence of the fire, and varies according to the difference of the state in which it served as food to the fire. This lava is sometimes found solid, and at others porous and full of bladders and holes; in the inside it is filled up with opaque and brittle square crystals of a dead white, or with green drops of glass, which decay after they have been long exposed to the air. The colour of the lava is black, dark blue, purple, reddish brown, or yellowish, but oftenest black or red. Where the fire has operated very strongly, it is, as it were, glazed, and looks like resin. In the frames or great tracts of lava it is sometimes observed, that the crust in growing cold has laid itself into folds; but generally it forms itself into a resemblance of a rope or cable, sometimes lengthways, and at others in the form of a circle, like unto a great cable rolled together; and generally so, that its thickness continually augments from the centre to the periphery. To this class I must also count a black solid matter, which strikes fire against steel, and sometimes takes the forms of trees or branches: some people have been inclined to think they are petrified trees, but I am rather of opinion that it is a real jasper. Thirdly, pumice, black, red, and even white, which last has most probably been discoloured by the boiling water. Fourthly, agate: I preserve the received name, though it is really nothing more than burned glass. In some few places it is found white, transparent, and almost in the form of crystal. The bluish sort is also rare, but found in large pieces: the most common is the black agate, which is found generally in stratas, or in small nests, and sometimes almost in the shape of crystal, in

oval, square, or pentagonal forms. The astronomer, Mr. Ejnar Jonson, has made use of this black glass in his tubes, both in Copenhagen and in Iceland, for the observation of the sun, and has found them greatly preferable to the darkened glass. The green agate is found rather coarser and more reddish, like thick bottle glass: it is called hraflinnubrodcon.

Brimstone, which may be considered as the proper fuel of the fire, is found in great abundance, pure and mineralized: in the north, principally at Husewick, and in the south, at Krysewick, there are white brimstone mines, which are called Namas. I shall reserve the basalts for a particular letter.

LETTER XX.....TO PROFESSOR BERGMAN.

OF MOUNT HECKLA.

Stockholm, September 7, 1773.

The cause of Heckla (or, as it is called in the country, Heckla-fiall) having been more noticed than many other volcanoes of as great extent, and no less wonderful and instructive, may partly be ascribed to its having vomited fire so frequently, and partly to its situation, which exposes it to the sight of all the ships sailing to Greenland and North America: as we considered it with greater attention than any other volcanoe on the island, I will give you a description of the state in which we found it on the twenty-fourth of September 1772.

After we had seen many tracts of lava, among which Garde and Wvalupe Hraune were the most considerable, we pursued our journey to the foot of the mountain. We had a tent pitched here, where we proposed to pass the night, to enable us to ascend the mountain with greater spirits in the morning. The weather was extremely favourable, and we had the satisfaction of seeing whatever we wished, the eruption only excepted.

The mountain is situated in the southern part of the Island, about four miles from the sea-coast, and is divided into three points at the top, the highest of which is that in the middle, and is, according to an exact observation with Ramsden's barometer, five thousand feet higher than the sea. We made use of our horses, but were obliged to quit them at the first opening from which the fire had burst. This was a place surrounded with lofty glazed walls, and filled with high glazed cliffs, which I cannot compare with any thing I ever saw before.

A little higher up we found a great quantity of grit and stones, and still farther on another opening, which, though not deep, however descende dlower down than that of the highest point. We thought we plainly observed evident marks of hot boiling water in this place.

Not far from thence the mountains began to be covered with snow, some small spots excepted, which were bare. We could not at first discern the cause of this difference, but soon found that it proceeded from the vapour which arose from the mountain. As we ascended higher, these spots became larger; and about two hundred yards from the summit we found a hole of about one yard and a half in diameter, from which so hot a steam exhaled, that it prevented us from ascertaining the degree of heat with the thermometer.

The cold now began to be very intense, as Fahrenheit's thermometer, which was at 54° at the foot of the mountain, fell to 24°. The wind was also become so violent, that we were sometimes obliged to lie down, to avoid being thrown into the most dreadful precipices by its fury.

We were now arrived at one of the highest summits, when our conductor, who did not take great pleasure in the walk, endeavoured to persuade us that this was the highest part of the mountains. We had just finished our observations, and found by them that Ramsden's barometer stood at 24-238, and the thermometer, fixed to it, at 27°, when happily the clouds divided, and we discovered a still higher summit. We lost no time in deliberation, but immediately ascended it, and when at the top discovered a space of ground, about eight yards in breadth, and twenty in length, entirely free from snow; the sand was however quite wet, from its having lately melted away. Here we experienced, at one and the same time, a high degree of heat and cold, for in the air Fahrenheit's thermometer was constantly at 24°, and when we set it down on the ground it rose to 153. The barometer was here at 22-247, and the thermometer at 38.

We could not with safety remain here any longer, though we were very much inclined to it; and descended, after having considered the last opening there, one of the sides of which was entirely overturned, and the other quite covered with ashes and grit. In our return we observed three considerable openings, in one of which every thing looked as red as brick. From another the lava had flowed in a stream of about fifty yards in breadth, which the Icelanders call Stenaa, or Stone Flood; and at some distance from thence the stream divided into three broad arms. Further on we found a large circular opening, at the bottom of which we observed a mountain in the form of a sugar-loaf, in throwing up of which the fire seemed to have exhausted itself.

The last eruption of mount Heckla happened in 1766; it began the fourth of April, and continued to the seventh of September following. Flames proceeded from it in December 1771 and in September 1772, but no flowing of lava, &c.

The mountain does not consist of lava, but chiefly of sand, grit, and ashes, which are thrown up with the stones, partly melted, and partly discoloured by the fire. We likewise found several sorts of pumice, and among them one piece with some sulphur in it. The pumice was sometimes so much burnt, that it was as light as tow; their form and colour was sometimes very fine, but at the same time so soft, that it was difficult to remove them from one place to another: of the common lava we found both large pieces and small bits, as likewise a quantity of black jasper, burned at the extremities, and resembling trees and branches. Among the stones thrown out of the mountain we saw some slate of a deep red colour.

LETTER XXI.....TO PROFESSOR BERGMAN.

OF THE HOT SPOUTING WATER SPRINGS IN ICELAND.

Stockholm, Oct. 3, 1774.

Among all the curiosities in Iceland, which nature presents to the eyes of an attentive spectator, to raise his admiration, nothing can be compared to the hot spouting water-springs with which this country abounds. The hot springs at Aken, Carlsbad, Bath, and Switzerland, and several others which are found in Italy, are considered as very remarkable; but to my knowledge, except in the last-mentioned country, the water no where becomes so hot as to boil: nor is it any where known to be thrown so high as at the hot spouting water springs in Iceland.

All those jets d'eau which have been contrived with so much art, and at so enormous an expence, cannot by any means be compared with these. The water-works at Herrenhausen throw up a single column of water, of half a quarter of a yard in circumference, to the height of about seventy feet; those on the Winterkasten, at Cassel, throw it up, but in a much thinner column, one hundred and thirty feet; and the jet d'eau at St. Cloud,

which is thought the greatest amongst all the French water-works, casts up a thin column eighty feet into the air: whilst some springs in Iceland pour forth columns of water, of several feet in thickness, to the height of many fathoms; and, many affirm, of several hundred feet.

But, without relying upon what has been said by others of these wonderful phænomena of nature, I think myself happy to have contemplated with mine own eyes the most remarkable of these springs, which has enabled me to give you an accurate account of it. I only beg leave to say something of them in general, before I treat of that which I saw in particular.

These springs are of unequal degrees of heat. From some the water flows gently, as from other springs, and it is then called laug, a bath; from others, it spouts boiling water with a great noise, and is then called hver or kittel (kessel.) Though the degree of heat is unequal, yet I do not remember ever to have observed it under 188 of Fahrenheit's thermometer. At Laugarnas we found it at 188, 191, 193. At Geyser, Reykum, and Laugarvatn 212; and in the last place, in the ground, at a little hot vein of water, 213 degrees.

It is very common for some of the spouting springs to close up, and others to spring up in their stead; there are likewise frequent traces of former hvers, where at present not a single drop of water is to be seen. Many remember to have seen instances of this; and Eggert Olafsen relates, that in 1753 a new hver broke forth at Reikakio, seven fathoms in breadth, and three in depth, at the distance of fifty fathoms from an old spring, which had been stopped up by a fall of earth. Frequent earthquakes and subterranean noises, heard at the time, caused great terror to the people who lived in the neighbourhood.

All these hot waters have an incrusting quality, so that we very commonly find the exterior surface from whence it bursts forth covered with a kind of rind, which almost resembles chaced work, which we at first took for lime: but we soon became dubious of this, as it did not ferment with acid; but we hope that you, sir, will soon resolve us. This crust is in general very fine; but it is, however, most pure and clear at the spouting springs; for at the others, where the water flows, the parts precipitated by the water are sometimes mixed with earth, which makes the crust appear darker.

At the hvers it is very difficult, nay almost impossible, to examine within the opening the disposition of the passage which the water has formed, both by reason of the heat of the water, and the violence with which it is forced out. One may, however, with confidence judge of the great by the small: and it gave us the greater pleasure, as we had an opportunity at Laugarnas to examine the vein of water itself a considerable way under the crust.

The water had in this place taken its course through a bright gray clay, the surface of which was covered with a white rind; but was on the side nearest the clay quite smooth, and crisped on the upper side. The vein flowed a good way under this crust, through a canal formed of a similar matter; and the whole canal was filled with crystals, which had a very pleasing effect. I had not time to examine their nature and form on the spot, as they were very small; but I expect a more particular account of this subject from you, as you will find several specimens of them in the collection I sent you. We could not, however, pursue the course of the water very far, as we were obliged to leave it to its subterranean passages, through which nature had seduced it from its reservoirs, where, heated by the warmth, and compressed by the exhalations, it at last bursts from its prison, by gushing forth at another place, in order to make way for its vapours.

The water in some places tastes of sulphur, and in others not; but when drank as soon as it is cold, tastes like common boiled water. The inhabitants use it, at particular times, for dying; and were they to adopt proper regulations, it might be of still greater use. Victuals may also be boiled in it, by putting it into a pot covered, and boiling it till a certain quantity is evaporated. Milk held over this water when boiling becomes sweet, owing, most probably, to its excessive heat; as the same effect is produced by boiling it a long time over the fire. They have begun to make salt, by boiling sea-water over it, which, when it is refined, is very fine and good. The cows which drink of it yield a great quantity of good milk. Eggert Olafsen informs us, that the water does not become troubled when alkali is thrown into it, nor does it change colour from syrup of violets. I do not know what degree of credit ought to be given to Horrebow, who asserts, that if you fill a bottle at one of the spouting springs, the water contained in the bottle will boil over two or three times during the time the spring throws it forth, and if corked too soon the bottle will burst

Though it cannot be denied that these springs have some communication with the Icelandic volcanoes, yet they are seldom found very near them, but are dispersed throughout the whole country. For this reason, hot springs are found among the mountains, and even on the top of the ice mountains; as on Torfa Jockul, where a great number of hot springs are to be met with: and among them two large hvers, which throw up the boiling water to a great height. There is likewise a lukewarm spring near Haadegis Hnuk, on Gutlands Jokul, at the foot of the mountain, with many traces of former hvers. There are even in the sea hot spouting springs, which can only be approached at low water; as at Reyka-fiord in Isa-fiord, where four springs may be observed in the water by the ascending steam, and one hver on the surface of the water. There are also two others in the Oddbiarnar shoals, still more at Drapskar, and a great number at Sando, Urdholm, Reykey, and on the flat islands. To give a better idea of the situation of these springs, I will give a list of them, which I will endeavour to make as topographical as possible.

In Borgarfiord's Syssel, near Leyraa, not far from the foot of the mountain of Skardsheides, we met with the first hver, which is, however, not a very strong one; and not far from it there is a small bath. At Lunda Reykiadal there is a hver and a bath; and near a farm yard, Varma-Lakiar-Mula, a warm spring and a bath. A little farther to the north is the valley of Reykholts, which is two miles and a half in breadth, in the bottom of which hot baths are everywhere to be met with. This spot may be discovered at several miles distance by the vapours which exhale everywhere from the hot water, and unite in the air, resembling a prodigious smoke arising from some volcanoe. The three principal hvers in this place are, Tunguhver, Aa-hver, and Scribla; the last furnishes water to Snorralaug, Snorre Sturleson's bath, which is esteemed the best in Iceland. From this place there is no hot spring to be met with northward for a very large tract, till you come to Sneefield's Cape, where there is a lukewarm spring, near the farm called Lysehol, in Stadesveit: at this place many remains of ancient hvers are to be seen. Still further to the north, in Dale Syssel, is a warm bath, with some springs. In Soling's Valley, and further on, near the farm Reyka-holer, in Reykianas, are many strong hvers; particularly three very large ones, the most considerable of which is Krablanda. From thence we came to the hot springs of Flatdarna, Oddsbiarmarskar, and Drapskar; and afterwards visited those at Talkne-fiord, Arnarfiord, and Isa-fiord in Reyka-fiord, where there is a strong spouting spring. After we had past Cape Nord, or the northern extremity of Iceland, we met with some warm springs at Reykar-fiord; others, together with a fine bath, at Biarnar-fiord, near Kaldadarna: at

Hruta-fiorden there is a great hver called Reike-hver, and another as large at Midfiorden, called Reixalaug. When you go from hence southward into the country, you will find a number of boiling springs at Hverevalle, three of which spout the water high into the air with a prodigious noise; still further to the south there is an hver near Geitland's Jokul.

If we turn again to the north, we find hot springs at Blanda, others near the haven at Skaga-Strand, and still more at a little distance from thence at Skaga-fiorden; one of which falls from a rock thirty feet high. To the east there are hot springs in many places of Vadle Syssel, as at Olass-fiordr, Langaland, Kristnas, and Hrafnegil; but in Thyngo Syssel there are springs of both sorts (baths and hvers) in great number, and of considerable dimensions. The hvers in Reykia Valley deserve to be particularly mentioned, amongst which Oxe and Badstofu are the largest.

On the east side of the country there are no considerable hvers, though warm springs are to be found in Selar, Laugarvalle, Rafukells, and Fliots valleys; and on the south, on Torfa Jukul. We then proceeded to Skalholt, where there are many springs; about a mile from thence the hvers, called Reikholt and Grafa, both which spout very high. The next hver is Geyser, which I shall afterwards mention more minutely. Not far from this last is Laugervatn, a small lake, round which a number of warm springs may be observed, and eight boiling ones. The road now leads us to the hvers at Oelves, which are thought to be the largest in all Iceland; the most remarkable of which are Geyser and Badstofu.

Here is also a dry hver, from which water formerly proceeded, but now emits only steam through its mouth; the heat of which however is so great, that a pot of water placed over the opening boils in a very short time. We met with spouting springs at Krusevik in Gullpringe Syssel, the hver Eine, the hvers at Reikianas, and several at Langarnas in Kiofar Syssel.

From this list, which, however, is far from containing all the warm springs in Iceland, you may judge, sir, of the prodigious number that we met with. Near most of them are warm baths, each of which merits a particular examination and description. Eggert Olafsen and Biarne Paulsen have made very curious observations on several of them; but I only beg leave to mention some which I made at Geyser, where is the largest of all the spouting springs in Iceland, or perhaps in the known world. These observations were made the twenty-first of September 1772, from six o'clock in the morning till seven at night.

Among the hot springs in Iceland, several of which bear the name of geyser, there are none that can be compared with that which I am going to describe, though the best description will fall very short of it. It is about two days journey from Heckla, not far from Skalholt, near a farm called Haukadal. Here a poet would have an opportunity of painting a picture of whatever Nature has of beautiful and terrible united, by delineating one of its most uncommon phænomena: it would be a subject worthy of the pen of a Thompson to transport the reader, by poetical imagery, to the spot which is here presented to the eye. Represent to yourself a large field, where you see on one side, at a great distance, high mountains covered with ice, whose summits are generally wrapped up in clouds, so that their sharp unequal points become invisible. This loss however is compensated by a certain wind, which causes the clouds to sink, and cover the mountain itself, when its summit appears as it were to rest upon the clouds. On the other side Heckla is seen, with its three points covered with ice, rising above the clouds, and with the smoke which ascends from it forming other clouds, at some distance from the real ones: and on another side is a ridge of high rocks, at the foot of which

boiling-water from time to time gushes forth; and further on extends a marsh of about half a mile in circumference, where are forty or fifty boiling springs, from which a vapour ascends to a prodigious height.

In the midst of these is the greatest spring Geyser, which deserves a more exact and particular account. In travelling to the place, about a quarter of a mile from the hver, from which the ridge of rocks near it still divided us, we heard a loud roaring noise, like the rushing of a torrent, precipitating itself from stupendous rocks. We asked our guide what it meant? he answered, it was Geyser roaring; and we soon saw with our naked eyes what before appeared almost incredible.

The depth of the opening or pipe from which the water gushes cannot well be determined; for sometimes the water sunk down several fathoms, and some seconds passed before a stone, which was thrown into the aperture, reached the surface of the water. The opening itself was perfectly round, and nineteen feet in diameter; it ended above in a bason, which was fifty-nine feet in diameter; both the pipe and the bason were covered with a rough stalactic rind, which had been formed by the force of the water; the uttermost border of the bason is nine feet and an inch higher than the pipe itself.

The water here spouted several times a day, but always by starts, and after certain intervals. The people who lived in the neighbourhood told us, that they rose higher i cold and bad weather than at other times; and Eggert Olafsen and several others affirm, that it spouted to the height of sixty fathoms. Most probably they only guessed by the eye, and on that account their calculation may be a little extravagant: and indeed I doubt that ever the water was thrown up so high, though i am much inclined to believe, that it sometimes mounts higher than when we observed it.

I will here insert an account how high the water was thrown the day that we were there, which I hope will not be disagreeable to you. We observed the height thus: every one in the company wrote down, at each time that the water spouted, how high it appeared to him to be thrown, and we afterwards chose the medium. The first column marks the spoutings of the water, in the order in which they follow one another; the second, the time when these effusions happened; the third, the height to which the water rose; and the last, how long each spouting of water continued.

No.	Time.			Height.		Duration.	
1	at 6	42 m.		30 feet		0 m.	20 s.
2	--	51	—	6	—	0	30
3	7	6	—	6	—	0	10
4	--	31	—	12	—	0	15
5	--	51	—	60	—	0	6
6	8	17	—	24	—	0	30
7	--	29	—	18	—	0	40
8	--	36	—	12	—	0	40

The pipe was now for the first time full of water, which ran slowly into the bason.

No.	Time.			Height.		Duration.	
9	9	25 m.	—	48 feet	—	1 m.	10 s.
10	10	16	—	24	—	1	00

— 12 35 minutes we heard, as it were, three discharges of a gun under ground, which made it shake, the water immediately flowed over, but sunk again instantly.

— 2 8 the water flowed over the border of the bason.

No.	Time.			
10	at 3	15 m.	we again heard several subterraneous noises, though not so strong as before.
—	4	43	the water flowed over very strongly during a whole minute.
—	..	49	we again heard many loud subterraneous discharges, not only near the spring, but also from the neighbouring ridge of rocks, where the water spouted.
11	6	51	— Height. 92 feet — Duration. 4 m. 00 s.

After this great effort, the water sunk down very low into the pipe, and was entirely quiet during several minutes, but it soon began to bubble again; it was however not thrown up into the air, but only to the top of the pipe.

No.	Hours.	Min.	No.	Hours.	Min.
1	5	7	18	5	42
2	5	9¼	19	5	43⅕
3	5	10¼	20	5	47
4	5	13⅖	21	5	48⅖
5	5	14¾	22	5	49
6	5	17	23	5	30½
7	5	18¾	24	5	51⅕
8	5	20⅛	25	5	54
9	5	21⅖	26	5	37½
10	5	23½	27	5	59
11	5	27¾	28	6	10
12	5	30¼	29	6	19
13	5	31¾	30	6	23
14	5	33⅖	31	6	26
15	5	35	32	6	29
16	5	36	33	6	30
17	5	38			

The force of the vapours which throw up this water is excessive; it not only prevents the stones which are thrown into the opening from sinking, but even throws them up to a very great height, together with the water. I must not forget to mention a very curious circumstance: when the bason was full of water, we placed ourselves before the sun, in such a manner that we could see our shadows in the water; every one observed round the shadow of his own head (though not round the heads of the others) a circle of almost the same colours which compose the rain-bow, and round this another bright circle: this most probably proceeded from the vapours exhaling from the water. I remember to have seen something similar to it when travelling in the summer, particularly in the meadows, and it is soonest observed when riding on horseback, or in a carriage, when you have your shadow on one side.

Not far from this place, another spring at the foot of the neighbouring ridge of rocks spouted water to the height of one or two yards each time.

No.	Hours.	Min.	No.	Hours.	Min.
1	3	45	7	4	0
2	3	47½	8	4	3
3	0	50⅕	9	0	5¾
4	0	53⅖	10	0	8⅖
5	0	55	11	0	11¼
6	0	57¼	12	0	14

The opening through which this water issued was not so wide as the other: we imagined it possible to stop up the hole entirely by throwing large stones into it, and even flattered ourselves that our attempt had succeeded: but to our great astonishment the water gushed forth in a very violent manner, which shews how little the weak efforts of men avail, when they endeavour to prescribe bounds to the works of nature. We hastened to the pipe, and found all the stones thrown aside, and the water playing freely through its former channel.

In these large springs the waters were hot in the highest degree, and tasted a little of sulphur, but in other respects were pure and clear. In the smaller springs in the neighbourhood the water was tainted; in some it was as muddy as that of a clay-pit, in others as white as milk; and yet there are a few springs where the water forces itself through a fire underneath as red as blood.

I have already observed, that near most of these springs and hvers there are baths, which are frequently visited by the natives: there are also in many places dry and sweating baths. Eggert Olafsen mentions one of these baths at Huusevik, in North Iceland; and I had the curiosity of seeing one of them at Thibsaarholt, not far from Skalholt, which consisted of a hut raised of earth, into which hot streams arose from many holes. Fahrenheit's thermometer, which was at 57 degrees in the open air, rose to 93 in the hut whilst it was open, and when it was placed in one of the little openings the steam arose to 125.

LETTER XXII...TO PROFESSOR BERGMAN.

OF THE PILLARS OF BASALT.

Stockholm, June 6, 1773.

Among the effects of fire, some of which are extremely dreadful, and all of them very extraordinary and remarkable, none have in latter times attracted more attention than those large regular pillars known by the name of Basalts. There had formerly been hardly any places observed in Europe where this kind of stone was found, the Giant's Causeway excepted; and the greater part of our mineralogists have, if I am not mistaken, considered them as a kind of crystallization. Mr. Desmarets was the fisrt who maintained, in a dissertation presented to the French academy of sciences, that they were produced by fire, wherein he described some basalts found near St. Sandour, in Auvergne.

This opinion at first appeared almost absurd to our natural historians, as it was not believed that volcanoes had ever been in these places where basalt pillars were found.

This new discovery however occasioned a more exact inquiry concerning other places where these pillars are met with. All these inquiries only served to confirm Mr. Desmaret's opinion, by proving that these basalt pillars must have been produced by subterraneous fires.

There is no one surely will entertain the least doubt of a subterraneous fire having formerly existed where these pillars now stand, as at Stolpenstein in Meissen; near Lauban in Lusatia; in Bohemia; near Leignitz in Silesia; near Brandau in Hessia; in Sicily; near Bolsenna, Montebello, and St. Forio in Italy; near St. Lucas in the district of St. Vicenza; near Monte Rosso in the Paduan district, and Monte Diavolo in the mountain of Verona; in Lower Languedoc; in Iceland, and in the western islands of Scotland; which you, sir, have all mentioned in your Cosmography. Also in St. Giovanni, Monte Castello, Monte Nuovo, Monte Oliveto, near Cadair Idris in Wales,

in England, almost every where in the Velay and Auvergne, where whole towns, as Chillac and St. Flour, are built upon these pillars. But as this matter has not yet been fully investigated, and it cannot be determined with certainty in what manner these pillars are formed, though they are known to be produced by fire, perhaps it will not be disagreeable to you, if I say something of the many basalt pillars in Iceland, as well as of those in the isle of Staffa, which you will readily acknowledge to be more singular than any thing nature ever produced of this kind.

It is well known that these pillars are very common in Iceland, and some account is also given of them in the Physical Description published of the country. The lower sort of people imagine these pillars have been piled upon one another by the giants, who made use of supernatural force to effect it, whence they have obtained the name of the Trolla-hlaud Trollkonu-gardur in several places. They have generally from three to seven sides, and are from four to six feet in thickness, and from twelve to sixteen yards in length, without any horizontal divisions, But sometimes they are only from six inches to one foot in height, and they are then very regular, as those at Videy, which are made use of for windows and door-posts. In some places they only peep out of the mountains here and there among the lava, or still oftener among tuffa: in other places they are quite overthrown, and only pieces of broken pillars appear. Sometimes again they extend two or three miles in length without interruption. In the mountain called Glockenberg in Snefialdsnas, this kind of stone appears in a manner very different from any other place in Iceland; for on the top the pillars lie quite horizontally, in the middle they are sloping, and the lowest are perfectly perpendicular; in some places they are bent as a semi-circle, which proves a very violent effect of the fire on the pillars already standing, as in most places, or at least in a great many, they are entirely perpendicular, and by their form and situation, that they have even been burnt in a perpendicular direction.

As to the matter of which the Icelandic basalts are composed, it is in some places similar to that of which the pillars at Staffa consist, though in others it is more porous, and inclines more to gray. And who knows, if an attentive and curious naturalist, who had both time and talents requisite for such an undertaking, might not easily trace all the gradations between the coarsest lava and the finest pillar of basalt? I myself saw some of this last sort at Videy, which were solid, of a blackish gray, and composed of several joints. And not far from thence, at Laugarnäs, near the sea-shore, I saw a porous glassy kind of stone, consequently lava, but was so indistinctly divided, that I was a long time undetermined whether I should consider it as pillars or not; but at length the rest of the company, as well as myself, were persuaded that they really were such. But I will postpone the examination of the matter of which these pillars consist, and of the manner in which they are formed, till such time as I have given you the promised description of the isle of Staffa.

A piece of good fortune procured us the pleasure of being the first who ever examined these wonders of nature with an attentive eye. Among all those who have published descriptions of Scotland, there are none, except Buchanan, whose account, however, is very imperfect, that mentions a single syllable of these pillars. Mr. Pennant, an indefatigable and experienced naturalist, in the same year that we visited this island, made a tour to Scotland, to examine the natural productions of that country, but was prevented by a contrary wind from going to Staffa. Most probably we should not have come there neither, if the usual ebb and flood, which is very strong between the western islands of Scotland, had not forced us, in our way to Iceland, on the twelfth of August in the night, to cast anchor in the sound, between the isles of Mull and Morvern on the conti-

nent, exactly opposite to Drumnen, the seat of Mr. Maclean. We were immediately invited to land, and breakfasted there, with that hospitality which characterises the inhabitants of the Highlands of Scotland. Mr. Leach, another guest of Mr. Maclean, gave us many particulars of these pillars, which he had visited a few days before. Mr. Banks's desire of information could not resist the offer of this gentleman to accompany us to Staffa; we therefore went on board our long-boat the same day, and arrived there at nine o'clock in the evening. It was impossible for our surprise to be increased, or our curiosity to be fuller gratified, than they were the next morning, when we beheld the no less than beautiful spectacle which nature presented to our view.

If we even with admiration behold art, according to the rules prescribed to it, observing a certain kind of order, which not only strikes the eye, but also pleases it; what must be the effect produced upon us when we behold Nature displaying, as it were, a regularity, which far surpassed every thing art ever produced! An attentive spectator will find as much occasion for wonder and astonishment, when he observes how infinitely short human wisdom appears, when we attempt to imitate Nature in this as well as in any other of her grand and awful productions. And though we acknowledge Nature to be the mistress of all the arts, and ascribe a greater degree of perfection to them, the nearer they approach and imitate it, yet we sometimes imagine that she might be improved, according to the rules of architecture.

How magnificient are the remains we have of the porticoes of the ancients! and with what admiration do we behold the colonnades which adorn the principal buildings of our times! and yet every one who compares them with Fingal's Cave, formed by Nature in the isle of Staffa, must readily acknowledge, that this piece of Nature's architecture far surpasses every thing that invention, luxury, and taste, ever produced among the Greeks.

The island of Staffa* lies west of Mull, three miles N. E. of Jona, or Kolumb-Kill, and is about a mile in length, and half a mile in breadth: it belongs to Mr. Lauchlan Mac-Quarie. On the west side of the island is a small cave, where there is a very convenient landing-place, but where no regular basalt figures are to be met with. To the south of this cave are some narrow pillars, which, instead of standing upright, are all inclined, and look like so many pieces of an arch. Further on you leave a small grotto on your right hand, which is not composed of pillars, though they appear more distinctly and larger above it, and in one place resemble the interior timber-work of a ship. Directly opposite to it, only a few yards distant, is the peninsula of Bo-scha-la, which entirely consists of regular though less pillars, that are all of a conical figure. Some of them lie horizontally, others incline as it were to the central point, as to the upper end, but the greater number are perfectly perpendicular. The island itself, opposite to Bo-scha-la, consists of thick columns or pillars, which are not however very high, as they gradually decrease in approaching to the water, and extend into the sea as far as the eye can reach. You may walk upon these with great ease, as from one step of a staircase to another, till you come to Fingal's, or, more properly speaking, to Fiuhn Mac Coul's grotto or cave, which enters into the mountain from N. E. to E.

This cave consists of very regular pillars, which, to a great extent on both sides, and in the most interior part, support an arched vault, composed of the obtuse points of

* Mr. Banks's account of this island, as communicated by that intelligent gentleman to Mr. Pennant, and inserted in his Tour in Scotland, and Voyage to the Hebrides in 1772, is too curious to be omitted, as it is not only very interesting in itself, but is an undeniable proof of the accuracy and fidelity with which our author, Dr. Troil, has treated of the various subjects contained in this publication: the editor deems it therefore unnecessary to apologize for subjoining an extract of it to this letter.

pillars crowded close together. The bottom of the cave, which is filled with clear fresh water several feet in depth, is likewise covered with innumerable pieces of pillars, which compose its floor. The colour of the pillars is of a blackish gray; but between the joints there is a yellow stalactic quarry rind exhaled, which serves to make these divisions more distinct, and produces an agreeable effect to the eye, by the many different modulations of colour. It is so light within the cave, that one can distinguish the innermost range of pillars perfectly well from without. The air in it is very pure and good, as it is constantly changed by the rising and falling of the water during the tide. Very far into the cave there is a hole in the rock, somewhat lower than the surface of the water standing in it, which makes a pleasing kind of noise on every flux and reflux of the tides. One may walk in most parts of the cave on the broken points of some pillars arising above the surface of the water, but it is most convenient to go in a boat. We made the following measurements of the cave:

	F.	I.	F.	I.
The length, from the farthest of the basalt pillars, which from the shore formed a canal to the cave	121	6	371	6
From the commencement of the vault to the end of the cave	250	0		
The breadth of its entrance			53	7
Of the interior end			20	0
The height of the vault at the entrance of the cave			117	6
Of ditto, at the interior end			70	0
The height of the outermost pillar in one corner			39	6
The height of another, in the north-west corner			54	0
The depth of the water at entrance			18	0
Of the inside end			9	0

Above the cave was a stratum of a stone mixed with pieces of basalt. We made the following measurements:

	F.	I.
From the water to the foot of the pillars	36	8
Height of the pillars	32	6
Height of the arch or vault above the top of the pillars	31	4
The stratum above this	34	4

From hence, a little farther north-west, we met with the largest pillars which are to be found in the whole island. The place on which they stood was likewise quite free, so that we were enabled to examine it. The following was the result of our measurement:

	F.	I.
The western corner of Fingal's Cave:		
1. From the water to the foot of the pillars	12	10
2. Height of the pillars	37	3
3. The stratum above them	66	9
Farther westward:		
1. The stratum beneath the pillars	11	0
2. Height of the pillars	54	0
3. The stratum above	61	6
Still more westward:		
1. Stratum beneath the pillars	17	1
2. Height of the pillars	50	0
3. The stratum above them	51	1

Still more to the west:

	F.	I.
1. Stratum beneath the pillars	19	8
2. Height of the pillars	55	1
3. The stratum above	54	7

The stratum beneath the pillars here mentioned is evidently tuffa, which had been heated by fire, and seems to be interlarded, as it were, with small bits of basalt; and the red or stratum above the pillars, in which large pieces of pillars are sometimes found irregularly thrown together, and in unequal directions, is evidently nothing else but lava. Though a prodigious degree of fire must formerly have been requisite to produce this upper stratum, yet there are not the least traces in its exterior, the pillars having been removed by it, for the whole enormous mass rests upon them.

When you move farther on, and pass the northern side of the island, you come to Cormorant's Cave, where the bed beneath the pillars is raised, and the pillars themselves decrease in height: they are, however, tolerably distinct, till you are past a bay which extends very far into the country, on the side of which the pillars entirely disappear. The mountains here consist of a dark brown stone, of which I cannot affirm with certainty whether it is lava or not, and where not the least regularity is to be observed; but as soon as you pass the south-east side of the island, the stones begin again to assume a regular figure, though so gradually, that it is scarcely perceptible at first, till at last the regular and crooked pillars again appear, with which I began my description.

The pillars have from three to seven sides, but the greater number have five or six, and so crowded together, that a heptagonal pillar is surrounded with seven others, which join closely to its seven sides. In some places, however, there are little insignificant openings, but they are filled up with quarz, which, in one place, had even made its way through a number of pillars, though without in the least destroying their regularity. The pillars consist of many joints or pieces, of about a foot in height, which so exactly fit upon one another, that it is difficult to introduce a knife between the interstices. The upper piece was generally concave, sometimes flat, and rarely convex; if the upper joint was flat, the lowest was so likewise, but when it was excavated, the lower one was rounded and reversed.

The sides of the pillars are not all equally broad. The following measurements were taken of four pillars:

		F.	I.
No. 1, with four sides.			
First side	Diameter	1	5
Second		1	1
Third		1	6
Fourth		1	1
No. 2, with five sides.			
First side	Diameter	1	10
Second		1	10
Third		1	5
Fourth		1	$7\frac{2}{7}$
Fifth		1	8
No. 3, with six sides.			
First side	Diameter	0	10
Second		2	2
Third		2	2

	F.	I.
Fourth	1	11
Fifth	2	2
Sixth	2	9
No. 4, with seven sides		
First side Diameter	2	10
Second	2	4
Third	1	10
Fourth	2	0
Fifth	1	1
Sixth	1	6
Seventh	1	3

The pillars are all over as smooth, and as sharp cornered, as those of the Giant's Causeway; their colours are generally black, though the external sides sometimes incline to yellow, as their surfaces are bleached by the weather. As to their grain and substance, they entirely resemble, and are most probably the same original substance as the Icelandic agate. As I have nothing remaining of it, I cannot examine what effect borax and other alloys, or aqua-fortis, and the like, would have upon it; what is the nature of its proper gravity, and what polish it will admit of, it would, notwithstanding, be useful to be informed of, in order to compare it with similar kinds of stone from other parts.

But in what manner have these regular pillars been produced? It is the received opinion that the fire has been accessary to it: you have yourself remarked, sir, that it must either have been a matter which had been melted by fire, and burst afterwards, and that then a liquid, which we are yet unacquainted with, must have produced their regular crystaline figures; or else it must have been, as you have likewise observed, a kind of earth, which, after having been softened by the exhalations arising from a subterraneous fire, its whole mass was forced out of its situation, and assumed this regular form as it grew dry. I have noticed this distinct and regular appearance in dried clay, and even in starch, when dried in a cup or bason. For it may be demonstrated that they are not crystals formed by Nature, by their not being produced as all other crystals are, by external apposition (per appositionem) nor in any other matrix, as is common among crystals.

It would be very difficult to determine whether the matter, of which these prismatic pillars consist, burst into the regular forms after it was melted, and was growing cold, or whilst it was drying, as you seem inclined to believe. I cannot deny that my eyes have prepossessed me in favour of the first opinion, in all those places where I have seen any of these pillars; but as so many objections may be offered against this opinion, I am obliged to leave the matter undetermined. The following may, however, serve as a proof that I did not, without due foundation, believe them to be a kind of lava, which burst in growing cold and hard. First, you find both in the island of Staffa and many other places, that the pillars stand on lava or tuffa, and are surrounded by this matter. Secondly, at Staffa there was a large stratum above the pillars, in which there were many pieces of these pillars irregularly thrown among one another, which leaves us to conjecture that they must have been more in number, and higher after an old eruption of fire, but that a subsequent eruption had overthrown them, and mixed them with the whole mass. Thirdly, we found one of these pillars, on breaking it, full of drops, almost like a lactile or dripping stone; and none surely will pretend a basalt to be of such a composition. Fourthly, I have formerly said that the pillars in some

places resemble the inside timber-work of a ship; that is to say, these pillars which most probably were quite strait at first, in falling received this crooked inclination; nor were it alone the joints of the outermost or lowest side which warped a little, but each stone was bent singly. Fifthly, we found on the shore at Histra, near Skalholt, a piece of basalt, with a piece of glass sticking in it, in the same manner as granate formed crystals are found in the basalts at Bolsenna, which are like those that abound in the lava of Iceland and Italy. And lastly, a kind of stone near Langarnas, in Iceland, which was much coarser, and more glassy than the common basalts, and evidently was lava burst into polyedrous and regular figures, though not quite so regular as the above-mentioned pillars.

What I have here said might easily induce one to imagine that the basalt, after having been melted, and grown hard again, had been burst into such pillars. But two objections, which you raise against this opinion, are difficult to be removed. First, this matter melts so easily, that it becomes glass without difficulty, before the blow-pipe for assaying; whence it seems that this mass must necessarily have been changed to glass, if it had been exposed to so great a fire as that of an eruption. But may one safely judge of an experiment, made in miniature before the blow-pipe, of the workings of Nature at large? Might not, perhaps, an addition we are unacquainted with have prevented the mass from becoming glass, and cause it to break into these regular figures, though we cannot now determine wherein this addition consisted? Secondly, we find that the trapp* in West Gothland, which both in appearance and substance so much resembles basalts, though it does not form itself into pillars, stands on slate; and how could this trapp have been formed by the fire, without, at the same time, kindling the bed, which is of so combustible a nature? But should not, perhaps, the fire be able to form the trapp into pillars? Perhaps all basalt pillars may have been a mass of trapp in the inside of the earth, which, having been liquified during an eruption, was thrown up, and split into pillars? But, sir, I fear to fatigue you with my conjectures and questions; it would, however, be very agreeable to me and other naturalists, if you would kindly communicate to us your thoughts on this subject. This would, no doubt, enable us to judge with more certainty of basalts, which at present engage the attention of the curious in general, and all naturalists in particular.

AN ACCOUNT OF THE ISLAND OF STAFFA,

COMMUNICATED BY JOSEPH BANKS, ESQ.

In the sound of Mull we came to anchor (August 12, 1772) on the Morvern side, opposite to a gentleman's house called Drumnen: the owner of it, Mr. Maclean, having found out who we were, very cordially asked us ashore; we accepted his invitation, and arrived at his house, where we met an English gentleman, Mr. Leach, who no sooner saw us than he told us, that about nine leagues from us was an island, where he believed no one even in the Highlands had been, on which were pillars like those of the Giant's Causeway: this was a great object to me, who had wished to have seen the causeway itself, would time, have allowed: I therefore resolved to proceed directly, especially as it was just in the way to the Kolumb-kill; accordingly, having put up two

* A kind of stone in Lynn Syst. Nat. Mineralogy.

days' provisions, and my little tent, we put off in the boat about one o'clock for our intended voyage, having ordered the ship to wait for us in Tobirmore, a very fine harbour on the Mull side.

At nine o'clock, after a tedious passage, having had not a breath of wind, we arrived under the direction of Mr. Maclean's son and Mr. Leach. It was too dark to see any thing, so we carried our tent and baggage near the only house upon the island, and began to cook our suppers, in order to be prepared for the earliest dawn, to enjoy that which from the conversation of the gentlemen we had now raised the highest expectations of.

The impatience which every body felt to see the wonders we had heard so largely described prevented our morning's rest; every one was up and in motion before the break of day, and with the first light arrived at the S. W. part of the Island, the seat of the most remarkable pillars; where we no sooner arrived, than we were struck with a scene of magnificence which exceeded our expectations, though formed, as we thought, upon the most sanguine foundations: the whole of that end of the island supported by ranges of natural pillars, mostly above fifty feet high, standing in natural colonnades, according as the bays or points of land formed themselves: upon a firm basis of solid unformed rock, above these, the stratum, which reaches to the soil or surface of the island, varied in thickness, as the island itself formed into hills or vallies; each hill, which hung over the columns below, forming an ample pediment; some of these above sixty feet in thickness, from the base to the point, formed, by the sloping of the hill on each side, almost into the shape of those used in architecture.

We proceeded along the shore, treading upon another Giant's Causeway, every stone being regularly formed into a certain number of sides and angles, till in a short time we arrived at the mouth of a cave, the most magnificent, I suppose, that has ever been described by travellers.

The mind can hardly form an idea more magnificent than such a space, supported on each side by ranges of columns, and roofed by the bottoms of those, which have been broke off in order to form it, between the angles of which a yellow stalagmitic matter has exuded, which served to define the angles precisely, and at the same time vary the colour with a great deal of elegance; and to render it still more agreeable, the whole is lighted from without; so that the farthest extremity is very plainly seen from without; and the air within, being agitated by the flux and reflux of the tides, is perfectly dry and wholesome, free entirely from the damp vapours with which natural caverns in general abound.

We asked the name of it; said our guide, The cave of Fiuhn: what is Fiuhn? said we. Fiuhn Mac Coul, whom the translator of Ossian's works has called Fingal. How fortunate that in this cave we should meet with the remembrance of that chief, whose existence, as well as that of the whole epic poem, is almost doubted in England!

Enough for the beauties of Staffa: I shall now proceed to describe it and its productions more philosophically.

The little island of Staffa lies on the west coast of Mull, about three leagues N. E. from Jona, or the Kolumb-kill: its greatest length is about an English mile, and its breadth about half a one. On the west side of the island is a small bay, where boats generally land: a little to the southward of which the first appearance of pillars are to be observed; they are small, and instead of being placed upright, lie down on their sides, each forming a segment of a circle; from thence you pass a small cave, above which the pillars, now grown a little larger, are inclining in all directions; in one place in particular a small mass of them very much resembles the ribs of a ship: from hence having

passed the cave, which, if it is not low water, you must do in a boat, you come to the first ranges of pillars, which are still not above half as large as those a little beyond. Over against this place is a small island, called in Erse Boo-sha-la, separated from the main by a channel not many fathoms wide: this whole island is composed of pillars without any stratum above them; they are still small, but by much the neatest formed of any about the place.

The first division of the island, for at high water it is divided into two, makes a kind of a cone, the pillars converging together towards the centre: on the other, they are in general laid down flat; and in the front next to the main, you see how beautifully they are packed together, their ends coming out square with the bank which they form: all these have their transverse sections exact, and their surfaces smooth, which is by no means the case with the large ones, which are cracked in all directions. I much question, however, if any one of this whole island of Boo-sha-la is two feet in diameter.

The main island opposite to Boo-sha-la, and farther towards the N. W. is supported by ranges of pillars pretty erect, and though not tall (as they are not uncovered to the base) of large diameters; and at their feet is an irregular pavement, made by the upper sides of such as have been broken off, which extends as far under water as the eye can reach. Here the forms of the pillars are apparent; these are of three, four, five, six, and seven sides; but the numbers of five and six are much the most prevalent. The largest I measured was of seven; it was four feet five inches in diamater.* The surfaces of the large pillars in general are rough and uneven, full of cracks in all directions; the transverse figures in the upright ones never fail to run in their true directions: the surfaces upon which we walked were often flat, having neither concavity nor convexity; the larger number, however, were concave, though some were very evidently convex: in some places the interstices within the perpendicular figures were filled up with a yellow spar; in one place a vein passed in among the mass of pillars, carrying here and there small threads of spar. Though they were broken, and cracked through and through in all directions, yet their perpendicular figures might easily be traced; from whence it is easy to infer, that whatever the accident might have been that caused the dislocation, it happened after the formation of the pillars.

From hence, proceeding along shore, you arrive at Fingal's Cave, which runs into a rock in the direction of north-east by east by the compass.

Proceeding farther to the north-west you meet with the highest range of pillars, the magnificent appearance of which surpasses all description; here they are bare to their very basis; and the stratum below them is also visible: in a short time it rises many feet above the water, and gives an opportunity of examining its quality. Its surface is rough, and has often large lumps of stone sticking to it, as if half immersed; itself, when broken, is composed of a thousand heterogeneous parts, which together have very much the appearance of a lava; and the more so, as many of the lumps appear to be of the very same stone of which the pillars are formed: this whole stratum lies in an inclined position, dipping gradually towards the south-east. Hereabouts is the situation of the highest pillars. The stratum above them is uniformly the same, consisting of numberless small pillars, bending and inclining in all directions, sometimes so irregularly that the stones can only be said to have an inclination to assume a columnar form; in others more regular, but never breaking into or disturbing the stratum of large pillars, whose tops everywhere keep an uniform and regular line.

* As Mr. Banks's measurement and dimensions of these and other remarkable pillars, and of Fingal's Cave, agree even to a single figure with those given by our accurate Author in this work, the repetition of them would have been useless; for which reason they are omitted.

Proceeding now along shore, round the north end of the island, you arrive at Oua na scarve, or the Cormorant's Cave: here the stratum under the pillars is lifted up very high; the pillars above it are considerably less than those at the N. W. end of the island, but still very considerable. Beyond is a bay, which cuts deep into the island, rendering it in that place not more than a quarter of a mile over. On the sides of this bay, especially beyond a little valley, which almost cuts the island into two, are two stages of pillars, but small; however, having a stratum between them exactly the same as that above them, formed of innumerable little pillars, shaken out of their places, and leaning in all directions.

Having passed this bay, the pillars totally cease: the rock is of a dark brown stone, and no signs of regularity occur till you have passed round the S. E. end of the island (a space almost as large as that occupied by the pillars) which you meet with again on the west side, beginning to form themselves irregularly, as if the stratum had an inclination to that form, and soon arrive at the bending pillars where I began.

The stone of which the pillars are formed is a coarse kind of basalts, very much resembling the Giant's Causeway in Ireland, though none of them are near so neat as the specimens of the latter which I have seen at the British Museum, owing chiefly to the colour, which in ours is a dirty brown, in the Irish a fine black: indeed the whole production seems very much to resemble the Giant's Causeway, with which I should willingly compare it, had I any account of the former before me.

Thus much we have taken from Mr. Banks's account of the island of Staffa; which Mr. Pennant assures the public, in a note to his Tour in Scotland (p. 269) was copied from his Journal, concluding in these words: "I take the liberty of saying (what by this time that gentleman, meaning Mr. Banks, is well acquainted with) that Staffa is a genuine mass of basalts, or Giant's Causeway; but in most respects superior to the Irish in grandeur."

We think Mr. Pennant might have spared his reader this information, as Mr. Banks, in his account, informs us that it is a Giant's Causeway formed of coarse basalts.

LETTER XXIII....FROM CHEVALIER IHRE TO DR. TROIL.

CONCERNING THE EDDA.

SIR, Upsala, October 1, 1776.

According to your request, I send you an answer to the objections made by Mr. Schloczer against my opinion of the Edda, which, together with a translation of my letter to Mr. Lagerbring, on the subject of a manuscript of the Icelandic Edda, is, as you know, inserted in that gentleman's Icelandic history.

It gives me great pleasure to find that my thoughts on these subjects have been examined by men of learning in Germany, by which means a number of false notions which had been formed on the subject and design of this book have been removed; and I am very happy to receive any objections which may tend to convince me that I have been mistaken.

Though I now resume the pen, it is not so much with any immediate design to refute those objections which have been made against me, as to give those accounts and explanations which have been required of me, and which I think myself more capable of doing than any other person, as I can command the codex whenever I think proper. Mr. Schloczer and I propose the same end to ourselves, namely, the investigation of truth.

Mr. Schloczer's first objection is, that I have not given a complete description of the

manuscript, its size, &c. He is perfectly right in this point, and I will briefly endeavour to repair this difficulty; but first, I must observe a diplomatic description was not so much required in that letter, as I had directed my attention more to the contents of the book than its external appearance.

I intended to shew what was the view of the author of the Edda in composing this work, what parts belonged to it, and which did not, wherein our manuscript differed from Resenius's edition, whence the book had obtained the name of Eddee, &c. &c. and its diplomatical descriptions would have afforded no information in any of these articles. This letter was besides not addressed to any foreign man of learning, but to one of my learned countrymen, well versed in ancient literature, who had frequently had this manuscript in his own hands, and examined it, and was perhaps better acquainted with it than myself. It would have been very superfluous to tell him it was written in ancient characters, in the Icelandic language, on parchment.

But to oblige Mr. Schloezer, and perhaps many others, I will inform them that this codex, as I said before, is written upon parchment, the colour of which is dark brown, which may proceed partly from its old age, and partly perhaps from its having been long kept, and made use of in the Icelandic smokey rooms. It is in very good preservation, and in general legible. It is true, there are some round holes in the parchment, but these seem to have been there at first, as no part of the text is lost by them. The size is a small quarto, one finger in thickness, containing fifty four leaves and a half, or one hundred and nine pages, besides a white leaf before, and one behind, . . which there are however some bad figures, of which these on the first represent Gangleri, with Herjafuhar and Thridi, who resolve questions. The characters are old, and when compared with many others, seem to prove that the copier lived about the beginning of the fourteenth century: but all this is of very little importance. Mr. Schloezer believes his subsequent questions may give more light in settling the principal point, as they tend to discover who was the author of the Edda, and what really belongs to it.

He is therefore more curious to know what is contained in this codex. Mr. Schloezer believes he has so much more reason for putting this question, as I myself have hinted, that besides Demisagor, Koeninggar, and Liodsgreinir, it contained a list of Icelandic lagmen, and a langfedgatal or genealogy of Sturleson's ancestors. He therefore desires to know if this codex is not a magazine of all kinds of Icelandic works, which have been accidentally collected into one volume, and bound together? I answer to this, if the case were thus, Mr. Schloezer might have expected from a man, who acted with candour and some knowledge of the matter before him, that he would not have omitted this circumstance. I therefore now declare that there is nothing else in it, but what has already been mentioned; unless I add, that p. 92 and 93, after the author has described the general rules of poetry, and the nature of letters, and the copier has left half a blank page before he writes the names of all the different sorts of versification used in the Icelandic poetry, another hand has patched in a steganographical writing, of which I did not know what to make during a long time, and indeed I did not take great pains to decypher it.

I will however give a specimen of it: dfxtfrb scrkptprks bfnfdktb skt pmnkbxs hprks. As I was reading in Vanly's Bibliotheca Anglo Saxonica, I accidentally met with a similar collection of consonants, with a key affixed to it, which shewed that the whole secret consisted in placing, instead of each vowel, that consonant which in the alphabet followed next to it; also instead of a, e, i, o, u, y, the letters b, f, k, p, x, z, were put; and according to this rule the afore-mentioned riddle signified, Dextera scriptoris benedicta sit omnibus horis.

I afterwards found the same kind of steganography mentioned in a little work ascribed to Rhrabanus Maurus, under the title of De Inventione Litterarum, and which is so celebrated on account of the proof contained in it of the runes of the Marcomans. After letters became more universally known among the people, the subtle monks however, desirous of knowing something which the vulgar were unacquainted with, invented various mysterious ways of writing in this manner, which they not only made use of among themselves, but introduced in their public writings. This taste met with admirers among our ancestors in Sweden, and thence we find so many kinds of what are called villrunes, which were unintelligible to the vulgar. See in the Bautil, N. 25, 205, 331, 361, 539, 568, 571, 572, 581, 648, 748, 767, 817, 819, 822, 1001, 1088, and many more in Vormius. Perhaps what we call among us helsinge runes have also no other origin, as the greater part of them only differ from the common runes, by having the staff taken away. It is however remarkable that our gravers of runes even made use of this cryptography in monuments erected to the memory and honour of the deceased.

It is further asked, if there are any external or internal traces of the copier having considered all the above-mentioned pieces, or at least the three first parts, as a connected work?

The answer to this may be found in the title of the book, which is at length in the Goranson edition, and runs thus:

Bok thessi heiter Edda. Henne hever sam setta Snorri Sturlo s. epter theim hœltisem her er shipat. En fyrst fra Asum ok ymi; tharnaest skalld skapar mal ok heiti marga hluta. Sidaz hœttartal, er Snorri hever ort um Hakon k. ok Skula Hertuga; that is, This book is called Edda; and has been composed by Snorre Sturleson, in the manner it now stands, viz. first of the ases and ymi, afterwards the language of poetry, and its appellations of various things. Lastly, a dissertation of the versifications Snorre made upon king Hakan and duke Skule.

I mentioned in my letter to Mr. Lagerbring, that the Rubric was written in a later hand; which is right so far as has been added after the Edda itself was begun, which may be seen by the narrow space left for it, so that it has forced the copier to bring the last line into that immediately preceding it. Besides, I clearly perceived that the manuscript was very old, and that no reasonable eye-witness could believe it was written in 1541, as Mr. Schloczer conjectures. But as it had been written with red ink, which had preserved its colour better than the black, I then believed the hand had been somewhat younger; but as I have now very minutely compared the writing in the Rubric with that of the Edda, I think I may safely affirm, that they are both written by one and the same hand. From hence it follows, that he who copied the Edda considered the above-mentioned articles, and no others, as essential parts of it.

I am come to the principal question, whether Sturleson is the author of the Edda? Here Mr. Schloczer seems to have taken most pains to prevent me from deceiving the learned world in this point.

Because Mr. Schloczer has found that most antiquarians express themselves with a kind of circumspection when they speak of the Edda and its author, and instead of positively declaring Sturleson the author, as Arngrim and some others have done, only say Creditur, existimatur auctor fuisse: that is, he believes the matter to be at least dubious, if not totally groundless.

I will not insist upon it, that there is at least more affirmation than negation in these expressions, especially as it is usual, on mentioning an evidently false opinion, to add, falso creditur, or something similar. For Mr. Schloczer himself remarks very judici-

ously, that the opinion of these men is of very little importance, when they alledge no grounds for it. He therefore believes himself entitled to maintain with certainty, that Sturleson has falsely been thought the author of the Edda. To support his opinion, he mentions three arguments in different places, which I must now examine more closely.

The first argument is to be met with in p. 39, where Mr. Schloezer submits it to consideration, whether the serious Snorre, overcharged with state affairs, could be supposed to have had time, and did not think it beneath his dignity, to write Aerarium poeticum, and become the predecessor of Weinrich? Here I will only observe, that Snorre was not constantly lagman, and that he might have compiled this work before he obtained this dignity, or in the interval between the first and second administration of this considerable charge; and lastly, even in its vacancies. Neither Mr. Schloezer nor I are able to determine how much time the management of a lagman's office requires. They hold several yearly court-days or assizes, after which I have always understood that they are entirely free and disengaged; so that I may fairly infer that the lagmen are not troubled with the examination of tedious records, or are employed in any extraordinary works. We find many Icelandic lagmen who have been poets laureats in Sweden and Norway, as Marcus Skaggason, Sturle Thordarson, and others. If Mr. Schloezer's argument was conclusive, he might go still farther, and prove that Sturleson could neither have written the Heimskringla, or history of the northern kings, which required ten times more time, and more laborious disquisitions, than the Edda.

Mr. Schloezer founds his second argument on his believing it incredible that any one, in the golden age of poetry in Iceland, should presume to advance such absurd things as I have done in my letter. He therefore believes the Edda to be a production of later times, when poetry was in its decline in Iceland.

To understand the whole force of this argument, it must be known that Mr. Schloezer divides the Icelandic literature into three periods; the simpler period, from the beginning to the introduction of Christianity; the golden period, from the introduction of Christianity to the close of the thirteenth century, when the black death, or the great plague, as well as the subjection of the Icelanders to the crown of Norway, checked the progress of poetry; and the last, from that period to the present. I will not strictly examine this division, though I cannot comprehend that the introduction of Christianity could contribute to the improvement of poetry; and still less, if the diger-death, which raged in the middle of the fourteenth century, produced the same effect on the surviving poets, as on the cultivation of the country and its population. But this I am clear of, that any one who would attempt to class the Icelandic poets with any degree of certainty must be perfectly well-acquainted with their languge, and be able to weigh the faculties of their minds against each other.

It signifies very little under what particular dynasty the poetry of the Chinese most flourished, so long as we are able to understand their poems without the assistance of an interpreter.

As to the passages of Icelandic poets, which I have quoted in different places, they prove not a tittle of what Mr. Schloezer pretends they do. For Lopt Gutormsson's verses are not in the Edda; and though the other song is to be met with in Resenius's edition of it, yet it is not in the Upsala manuscript. It is therefore not known to what period they belong; and they cannot by any means be made use of as proofs to shew that Snorre was not the author of the Edda. It is highly proper to be well acquainted with a subject before one ventures to treat of it.

I will by no means presume to defend all the phrases I have made use of; though it is well known that custom has introduced them into every language, which, were they

translated into other languages, would not only lose their original beauty, but appear aukward and graceless. For example, it would not be believed that to tread the stars under foot signified to be exalted and happy; nor would any one be understood, who would, to express a doubtful state of mind, call it hanging water. And these phrases, not to mention an infinity of others, were however in constant practice among the Latins.

But as to our ancient ancestors in particular, who indubitably originated from the east, they no doubt brought their allegorical expressions from thence. And, in my opinion, the fondness of the ancients for riddles did not contribute a little to these metaphors in speech; for their merit frequently consisted in the most perverted expressions, which in process of time were revived and admired as beauties. We are not permitted the liberty to judge without distinction in mere matters of taste and genius, though they widely differ from what is practised in other nations.

Mr. Schloezer takes this third and last, and perhaps worst argument, from the contradiction which I have observed between the Edda and Snorre's Heimskringla. I wanted to shew in my letter, that the ancients by their Asgard meant the town of Troy; and this I can prove, by the one having maintained the same things of Asgard as the other does of Troy. My opinion therefore is, that Troy and Asgard must necessarily signify one and the same place, unless we admit that Sturleson has contradicted himself. It may be easily apprehended, that what I have mentioned by no means implies that there was a contradiction between the Edda and Heimskringla, but only that the above cited place had been called by two different names. Mr. Schloezer cannot possibly be ignorant of the meaning of argumentationes ab absurdo.

Hitherto I have mentioned the arguments with which Mr. Schloezer endeavours to shew that Sturleson is not the author of the Edda; but now, to prove the contrary on my side, I will content myself with one single argument, which is of such a nature as to make all other unnecessary. In the superscription subjoined to our Codex, the copier roundly affirms Sturleson to be the author of this work; and his testimony is so much the more undeniable, as the nature of the copy itself proves that it cannot be later than the fourteenth century; and that an Icelander had made it on the spot, who certainly would not have thought it worth his attention and time to copy a work, if he had not known the author of it. That this was the general opinion of the Icelanders, I think, may be proved thus; that though various conjectures are generally made concerning the author of an anonymous work, there are hardly any except Sturleson mentioned as the author of the Edda.

I cannot on this occasion pass over in silence what I have read in p. 326 of the Danish Journal, which Mr. Lilie published in 1756; namely, that the celebrated Arnas Magnaus, in a written account left us by Sumundr Trode, was of the same opinion as Mr. Schloezer, that Sturleson was not the author of the Edda.

The arguments which he makes use of seem to carry some weight with them; that in the last part of the Edda, called Liodsgreinir or Skalida, Sturleson is not only quoted, but also recommended as a pattern to the poets; and that in this part mention is likewise made of the kings Hakan Hakanson, Magnus, Erich, and Hakan Magnusson, who all lived later than Snorre. This argument at first sight seems to be decisive, but loses its whole force upon a nearer examination. The true state of the matter is this:

In the beginning of Liodsgreinir the author of the Edda says, that he has three different heads to treat upon; viz. the rules of poetry, its licences (licentia poetica) and its faults (vitia carminum) settning, leife, and syrerbodning. The two first of these subjects are perfectly discussed in the Liodsgreinir, but the last is wanting. A later writer has

attempted to make up this deficiency, and has therefore made a supplement to Sturleson's Edda. It is not in the least extraordinary that he should have mentioned Sturleson, and given him his merited share of praise: but that this supplement does not belong to the genuine Edda, is proved by the Upsala manuscript, where it is entirely wanting.

In this manner it may be explained what is said of the late kings: they are never mentioned in the Edda; and I am much mistaken if Arnaus Magnaus has not taken them from the Skaldetal, or list of poets, where they are all taken notice of. This Skaldetal was no more than a supplement to the Edda, as I shall make appear presently. If therefore the learned Magnaus had ever seen our codex, he certainly would not have entertained this opinion.

In regard to these appendixes, I am perfectly convinced that the catalogue of Lagmen and the Langfedgetal, or genealogy, are the works of Sturleson himself. The subject contained in them refers entirely to Snorre, who was both lagman and a descendant of the Sturlunga family. The Aettartal, or genealogical table, which from the beginning descends in a strait line from the fathers' and mothers' side to the sons, at Sturle extends to all the children, and daughters' children; yet in some instances even there not to all these, but most probably to those only who were alive when this genealogical table was composed. The same is to be observed in the catalogue of the Lagmen, where it is very accurately mentioned how long every one of them possessed their place: but at the family of Snorre the catalogue stops, without observing how long they maintained this charge the last time. It is therefore impossible that this genealogy should have been composed before Snorre's time; nor is it less improbable that any one should have omitted, in later times, to add the sixteen years during which Snorre was lagman the last time; or that he should have forgot to mention this circumstance of him in the whole list of lagmen, who was the most considerable of them all.

I will in this place add, that it was very common, not only in the north, but even in other parts, to subjoin such lists, genealogical tables, and the like, to larger works, in order to rescue them from oblivion, and prevent their being totally lost to posterity. In the same manner the copier of our West Gothic law had added to it a Konunga Langd, or list of kings, as likewise a list of the bishops of Skara and Langmanner in West Gothland. Are Frode has in like manner affixed his genealogy to his Schedis, or Islandiga bok, and several others.

It is more difficult to determine something conclusive concerning the third appendix, or Skaldetal. I have always been of opinion, that it was begun by Snorre, as it commonly follows the Edda, and that it was afterwards augmented by one or more persons: Vormius did the same by a poem written by Saxo Hiærne, who obtained by that composition the regal dignity in Denmark, though as a Dane he was not properly intitled to be placed in the list of Icelandic poets.

That this catalogue was the work of several hands may, in my opinion, be perceived by more than one indication: immediately in the beginning it is said, that Starkotter was the first of the skalds, whose verses the people had learned by heart; and in the end a certain Ulfver hin Oarge is cited as the first, who, according to Mr. Schoning, lived in the second century, and consequently must have been several centuries older than the above-mentioned Starkotter. These two accounts can hardly be supposed to proceed from one and the same author.

It is besides incontrovertible, that what is said of the last Norwegian kings corresponds not with the time of Snorre. It would be of essential service if a man of Mr. Suhm's merit and abilities would critically examine this Skaldatal, and compare it with Vormius's list of poets, which differs so widely from it in several points.

This at least may be perceived by every one, that the skalds therein mentioned have not all lived in the thirteenth century; but that a great part of them existed in the tenth, eleventh, and twelfth centuries. The two hundred and thirty skalds, who, according to Mr. Schloezer's reckoning, lived in the thirteenth century, may be considerably reduced in number, by one and the same skald being mentioned in three or four different places, as if he had been in the service of as many masters. It is very remarkable that some of these skalds, as Oltar Svarte, Sigvatur Thordarson, and others, have been received as poets laureat in all the three northern courts.

Nor is it less remarkable, that some of these Icelandic skalds were taken into pay at the English court, by kings Athelstan and Etheldred: this would require an examination, to discover how their Skaldskaparmal, or poetical language, could be understood in a foreign country, as both languages, without these poetical figures, differ so widely from each other, as is evident from the remains of both.

It is lastly asked, if there are any internal or external marks, from which it might be guessed that the three parts of the Edda mentioned by me belong together, and form one work? But this question is answered by the title quoted above, wherein all the parts are clearly enumerated.

In regard to the third part, called Liodsgreinir, Mr. Schloezer desires to know how this title suits to an ars poetica?

I have already in some measure answered this question in my letter to Mr. Lagerbring, by citing the strange titles the ancients sometimes prefixed to their books. However, that a clearer idea may be formed of what relates to this appellation, it should be observed, that Sturleson immediately in the beginning divides all sounds or tones into three kinds. The first he calls vittlaus hliod, or the sound of inanimate things, as of thunder, waves, wind, and the like; to the second he reckons the sounds of irrational animals; and to the last, the articular sounds of men, which are produced by means of the tongue, the palate, &c. He then speaks of the sound of the letters, how some are long, others short; some consonants, and others vowels and dipthongs: he then proceeds to the rules of prosody, and whatever else belongs to the Icelandic skaldskap, or poetry.

From hence it may be seen what has given rise to this appellation; Liodsgreinir literally signifying no more than distinction of sounds. Sturleson has given as strange a title to this northern history, which he calls heimskringla; and this from no other reason, but because it was the first word with which the book began.

LETTER XXIV....FROM CHEVALIER BACH TO DR. TROIL.

OF THE ICELANDIC SCURVY.

SIR, Stockholm, June 12, 1776.

THE accounts with which you have favoured us of the diseases which mostly abound in Iceland must be of universal service to the Swedes. When I had the pleasure and happiness of conversing with you on this subject, my attention was peculiarly raised by the information you gave me of the Icelandic scurvy, and of its dreadful consequences on those persons who were affected with it.

What Mr. Peterson calls the Icelandic scurvy is the true elephantiasis, which is nearly related to the leprosy. Celsus has described it in the days of Augustus under the name of elephantiasis: and yet Aretæus has treated more fully upon it, in sect. 5, under the same name. It is more terrible than any other disease, producing frequently a dread-

ful end: it gives a disgusting appearance to the patient, as the body, by its colour, roughness, and scaly appearance, resembles the skin of an elephant. Whoever compares your description and Mr. Petersen's of this disease with that of the ancients, will not find it an easy matter to take the Icelandic scurvy for any thing else but the elephantiasis. In my opinion, both Ettmuller and Boerhaave, and his famous commentator baron Van Swieten, would have done better not to call the elephantiasis the highest degree of the scurvy; or if they had not confounded these two diseases, so different in their beginning, progress, nature, and remedies.

Those among us, who have written of the theory of diseases, have with more propriety given the name of scurvy where a gradual increasing languor takes place, together with a bleeding, stinking and putrid breath, and many coloured blackish blue spots on the body, particularly round the roots of the hair, and which principally proceed from corrupted salt animal food, and the want of vegetables. The elephantiasis, on the other hand, which is also called Lepra Arabum, is rather an hereditary disease; the skin becomes thick, unequal, glossy, and loses its smoothness; the hair falls off, languor and want of feeling take place in the extremities; the face becomes disgusting and full of biles, and the patient gets a hoarse nasal voice. In the real leprosy (impetigo, lepra Græcorum) the skin becomes wrinkled and full of scales, which seem to be strewed with bran, often burst, itch exceedingly, and are filled with a watery moisture.

Mr. Sauvage mentions several sorts of elephantiasis; but it is a question whether they all differ or not, as he might have multiplied their number. I believe that the elephantiasis mentioned by Cleger in his Eph. Nat. Curios, and Sauvage's Javanese elephantiasis, are very like the Icelandic. At least, it is certain that the elephantiasis in Madeira, which Dr. Thomas Heberden describes in the first volume of his Medical Transactions, almost one hundred years after Cleger, is entirely the same.

It is very remarkable that this disease has preserved its nature so perfectly in the most northern parts during more than a hundred years, and remained entirely similar to that in the hottest climates. It appears the same disease, at Martigues in Provence, has been described by Dr. Johannes in the first volume of the Medical Observations and Inquiries; and that it has been in the Ferro Islands may be seen in the first volume of Bartholin's Actis Hafn.

The disease observed in Norway, which Mr. Anthony Rob. Martin describes in the Transactions of the Swedish Royal Academy of Sciences, in the latter end of the year 1760, may likewise be reckoned amongst this class; as also that which appeared in several parts of Sweden, and of which Mr. Assessor Odhelius gives an account in the third part of these Transactions for the year 1774; all these may very properly be compared to Mr. Sauvage's Elephantiasis Legitima.

It was believed in the most early times that this disease had taken its rise in Egypt: but Lucretius positively says, that it was first discovered on the banks of the Nile. In Celsus's time it was not at all known in Italy; but Pliny relates that it was first brought into that country by an army of Pompey, from Egypt and Syria, but did not remain there long. In the twelfth century it was brought to Europe the second time by the crusaders, and is frequently mentioned in the publications of the thirteenth, fourteenth, and fifteenth centuries: it was not, however, very violent in the fifteenth and sixteenth centuries; and in the seventeenth century it seems to have entirely disappeared in England, France, and Italy, when all the lazar-houses, which had been built on purpose to receive patients infected with this disease, became useless.

But how did this dreadful disease come from the south, where the diseases connected with an eruption are most frequent, so far to the north? Could it not also have happened by means of the crusades, our forefathers in the north having had likewise the honour to partake of them? nay, even the Icelanders were not excluded from a share. The oldest Iceland writings give us examples of the elephantiasis in Norway, and other northern countries, as may be seen in the first volume of Olafsen's Voyage to Iceland, page 172. But it still remains a query, whether it was the true scurvy or not, which the learned author found mentioned for the first time, under the ancient Norway and Icelandic name of skyrbjugur, that appeared in the Norway fleet, in the year 1289, during the war of king Erick with Denmark. For, according to Mr. Petersen's testimony, the word skyrbjugur is to this day frequently made use of to express the elephantiasis; though I must confess that the scurvy seems to be a common disease among the fleets in those days, as well as in ours. However, it would be useful for the history of the diseases common in the north, if the origin of them could be determined from these old accounts, especially as these accounts of the scurvy are two hundred years older than any we have yet been able to discover. We may most probably expect this discovery from our neighbours in Denmark and Norway, who elucidate the northern history from ancient accounts with so much zeal and happy success.

Mr. Anthony Rob. Martin relates, that in the above-mentioned place the number of persons in Norway infected with this disease, in the year 1759, amounted to one hundred and fifty, for whom three hospitals were erected; and Mr. Peterson fixes the number of those who were ill of it in Iceland, in the year 1762, at two hundred and eighty persons, for whom four hospitals were established.

You may ask, sir, how this disease came to be so firmly rooted in Iceland, as it has so decreased in the south, that it has almost disappeared there?

I believe that this is not so much owing to the climate as to the manner of life and diet. People, whose continual occupation is fishing, are night and day exposed to wet and cold, frequently feed upon corrupted rotten fish, fish livers and roe, fat and train of whales, and sea-dogs; as likewise congealed and stale sour milk: they often wear wet clothes, and are commonly exposed to all the hardships of poverty. The greater number of these are therefore to be met with in this class: on the contrary, where less fish and sour whey are eaten, and more Icelandic moss (lichen Islandicus) and other vegetables, this disease is not so prevalent, according to an observation made by Mr. Peterson in the above-mentioned Transactions.

We have a very remarkable instance of the great effects of diet on the diseases of a nation, in the inhabitants of the isle of Ferro. Since fishing has declined among them, and the inhabitants have cultivated corn, and live upon other food instead of whale's flesh and bacon, the elephantiasis has entirely ceased among them, according to Mr. Petersen's account. Things bore a very different aspect there ten years before this alteration: as a proof, I will quote Mr. Debe's own words from the first volume of the Act. Hfn. pag. 98. Elephantiasis in insulis Ferröensibus frequens ex victu et áëre, has habet notas; facies et artus hic fere ubique foedantur tumoribus plumbei coloris, qui exulcerantur foedum in modum. Rauci sunt hoc morbo infecti, et per nares vocem emittentes. Vere et autumno invalescens morbus plurimos enecat.

Experience likewise teaches us, that the greater number of persons labouring under this disorder in our country reside near the sea-shore, in the districts of Abo and Oesterbottn, and in the isles scattered round the shore, who in general get their livelihood by fishing and catching sea-dogs: from what has been said before it may be learnt,

what is proper to be done gradually to remove this destructive disease. But I will reserve for another occasion whatever relates to this disease in Sweden.

About a hundred years ago plagues and pestilential fevers raged in Europe, as may be seen in the accounts of several physicians of the epidemical fevers which prevailed at certain times. But at present, when a better police has procured us more cleanliness in the streets and narrow lanes; and more neatness is observed in our apparel and habitations; as also since beer prepared with hops, wines, and other liquors, are drank, which are very salutary, though they produce other diseases when made use of in excess; since fruits and vegetables, tea and sugar, are become fashionable; these and similar disorders are greatly diminished. Sir John Pringle proves the truth of these remarks, accompanied with several examples, particularly with respect to the diseases of England, in his Observations of the Diseases of an Army.

It is very probable that the elephantiasis, and many other great disorders in the skin, quitted the southern countries from similar causes; and have on the contrary maintained themselves towards the north, where a sufficient quantity of bread cannot be provided for the natives, and where the lower sort of people, who live entirely by fishing, do not eat any vegetable food, but only feed upon rancid oily victuals; and are besides unable to keep themselves clean and neat, being continually exposed to wet and cold on the sea-shore, &c.

I should repeat the observations which have been made upon this disease in Iceland, as they might perhaps serve to make our countrymen better acquainted with the disorder itself, and the manner of curing it. But you, Sir, might perhaps tell me, that this is a more proper subject for a physical book than for letters concerning Iceland; for which reason I will be as concise as possible.

Mr. Anthony Rob. Martin has given so exact an account of this disease, that I need not here enumerate its symptoms. Whoever compares it with Mr. Petersen's little dissertation will become perfectly acquainted with the elephantiasis, its beginning, progress, and greatest height; and will readily allow, that the Icelandic name of liktraa is given it with great propriety, which signifies, that those who are infected with this disease, in its highest degree, resemble a putrefying corpse more than a living man.

The elephantiasis is either inherited from the father or mother, who are afflicted with it, or it is not inherited. In the first case, the disease frequently appears before the child is two years old, and always before the age of twenty-five, so that such persons seldom live to see thirty years. The sooner the disease makes its appearance, the sooner the patient becomes a prey to death. But those who have not inherited the elephantiasis, but have brought it upon themselves by their mode of living, and other causes, may drag on a wretched existence during twelve or fourteen years, and sometimes longer. The elephantiasis is of the same nature in the South.

Before this disease breaks out on any person, his breath is disagreeable and stinking for three, and sometimes six years preceding; he has a great appetite to eat sour, half-rotten, and unwholesome food; is always thirsty, and drinks very much: some are slothful and sleepy, and when asleep are with difficulty awakened; are short-breathed when the complaint ascends upwards; they spit very much, and complain of weariness in their knees. They shiver violently when they come out of a cold room into the open air; the eyes and lips become of a brown and blue colour: they have a weak smell: with some the feeling is likewise numbed; others have weak sight; and some lose it entirely, when their foreheads begin to swell in the beginning of the disease. They have frequently thin hair, particularly on the eye-brows; the beard likewise grows very thin

on both sides of the chin, and the skin becomes glossy, as if it had been rubbed over with grease.

This disease is not found to be particularly infectious in Iceland; as a husband afflicted with it does not infect his wife, nor a diseased wife her husband. The children may likewise be brought up without danger in the house of their diseased parents. But it has been found by experience, that when one of the parents is infected with it, some one or other of the children always catch it. It is the same thing in Madeira, as Dr. Heberden observes. Dr. Johannes informs us that at Martigues in Provence, when one of the parents has the disease, one of the children or grand-children, or a descendant in the third degree, is certainly infected with it; but in the fourth degree it again disappears, and only shews itself in a bad breath, hollow teeth, swelled throat, and a darker colour than usual.

The more ancient writers who have treated of this disease frequently relate, that people were even afraid of being infected by conversing with those who were troubled with it. The disease must therefore either have been more violent in the beginning, and in the southern countries, as the venereal diseases were formerly in the beginning of the infection; or the disease having but lately made its appearance caused more apprehensions. It is, however, always adviseable to be cautious in conversing with such patients, and neither to wear their shoes or clothes, when they have been rendered wet with sweating. When the disease is arrived at so high a pitch, that the matter which flows from the skin is corrosive, and eats into the flesh, it can no longer be denied but that it then becomes infectious, and even dangerous to converse too near with the patient.

As the elephantiasis, when it has attained its greatest height, is incurable, according to the testimony of ancient and modern physicians, it is so much the more necessary to notice the beginning of the disease, and the time preceding it, in order to prevent the danger.

A patient who finds himself in these circumstances, or lives in a place where the disease is rife, or has any other cause to believe that he has the least vestige of it existing in his body, either by inheritance, or through his own fault, should, both in his diet and in his whole manner of life, avoid whatever is likely to contribute to it, or render his body more liable to receive the infection, with the utmost caution. He must keep himself extremely clean; immediately put on dry clothes, whenever those on his back become wet; eat no other food but what is easily digested, and abstain from all oily rancid whale's flesh and the like. He must eat no half-rotten fish; nor their intestines and livers, especially if they are in a putrid state: on the contrary, he must confine himself to bread, roots, green herbs, cabbages, turnips, and salad of gentiana, campestris, sorrel (rumex acetosa, L.) rumex crispus, &c. &c. He must eat soups, boiled fresh meat, with scurvy-grass, sedum acre, and the like. He must make use of baths of the decoction of juniper, dry baths of juniper, &c. &c. In the same manner antimonial remedies would be very useful; and even Swieten's mineral mixtures, pills of an extract of hemlock (pilulæ alterantes Plumiris) and ledum palustre. I have likewise observed with pleasure, that a girl in the parish of Wester Hannings was cured of a commencing elephantiasis in the year 1774, by making use, during a long time, of Huxham's antimonial essence, with a decoction of antiscorbutic herbs.

But every one will easily apprehend, that poor wretched people, who are naturally most exposed to these and the like diseases, are likewise entirely incapable of averting them by observing a proper diet and manner of life, which are, however, almost the only remedies. Besides, these kind of people are generally careless of any illness so

long as they are able to stir; they likewise seldom consult a physician, and when they do, it is out of their power to follow his prescriptions exactly. Some persons attacked with it have, however, been freed of it, after having had the small-pox. It might, therefore, be conjectured, that patients afflicted with the elephantiasis, if they had not had the small-pox, would be benefitted by inoculation.

Some who have had this dreadful disease have gone from Iceland to Copenhagen, where they have happily experienced a cure. I will likewise mention, in justice to Dr. Thomas Heberden, that he is the only physician known to have cured the elephantiasis, after it had attained a very high degree. His manner of cure is this: he first mixes an ounce and a half of powder of bark with half an ounce of sassafras root, and then adds as much simple syrup as is necessary to make the whole into an electuary; of which he gives the patient two portions a day, of the size of a nutmeg: he causes the hands and feet to be rubbed morning and evening with a mixture, consisting of eight ounces of brandy, an ounce of lee of tartar, and two ounces of spirit of sal armoniack. He lastly causes blisters to be constantly laid between the shoulders. This method regularly pursued succeeded in the course of five months, after he had before made use of antimony, mercury, and the like, during the full period of seven years, without any lasting amendment. But I have already said too much of this loathsome disease.

Sed quænam medela excogitari peterit, quæ elephantem tam ingens malum expugnare digna sit? Aretæus.

LETTER XXV....FROM PROFESSOR BERGMAN TO DR. TROIL.

OF THE EFFECTS OF FIRE, BOTH AT THE VOLCANOES AND THE HOT SPRINGS; AND ALSO OF THE BASALTS.

SIR, Stockholm, June 12, 1776.

You have been so kind as to communicate to me your observations on Staffa and Iceland, and to desire my opinion of their natural curiosities. It would be very ungrateful, if I hesitated to comply with this request, as you presented me with the entire collections you made there, that I might chemically examine the nature of each. Mere observations, without the assistance of an exact knowledge of the substances, in respect to their original matter and composition, instead of affording any sufficient lights whereby to enable us to determine with certainty of them, would only lead us to draw very erroneous conclusions. Though the form, grain, colour, hardness, position, and external appearances, may asssit us in our conjectures of the true nature of minerals, and sometimes of the manner in which they are produced, yet we must nevertheless remain in uncertainty, till proper experiments guide us to a more clear decision.

Forgive me for mentioning the conclusions, which, in my opinion, might be drawn from your observations regarding the internal nature of these substances, so far as I have been able to discover them from actual experiments. But you must by no means expect a solution of all the difficulties that arise on this intricate business. I will cautiously endeavour to separate what is certain from what has been hitherto considered precarious and doubtful; a due regard to truth will always prevent me from offering mere conjectures, or even credible opinions, with a peremptory decision, as incontrovertible arguments. Experience has taught us that we ought to judge of the works of nature with the utmost diffidence; and we do not want examples, even from the remotest times, of persons who have pretended to explain, with the most positive certainty, not only how our earth, but even how the whole world, received its present form, and even its very origin. To determine the contrivance of so vast a machine over a writing-desk is

indeed one of the most daring enterprizes, which the proud reason of man ever proposed to itself; and, more than any other attempt, shews his weakness and arrogance. All these imaginary systems have been by little and little overturned, though the greatest pains were exerted to compare them with nature, and examine their existence. Their arguments were then discovered to be founded on a few insufficient observations, or, what is still worse, on uncertain, and sometimes evidently false, principles.

You, sir, will therefore readily excuse my timidity; for, instead of endeavouring to discover all at once, as it were à priori, though without any certainty, the manner in which nature works, and forms things in secret, I prefer the more laborious method of discovering it gradually with certainty, by experiments founded on due observations; and shall not hesitate to confess my ignorance, wherever these guides in the study of nature cease their instructions. I do not, however, reject all conjectures and proposed opinions, whenever they lead to new researches, provided they are offered as mere conjectures, and not obtruded on us as certain truths, or determined opinions.

From what I have hitherto said, you will, I believe, conceive my method; therefore I shall enter upon the subject, and briefly treat of it under separate heads, in the following manner.

OF THE HOT SPRINGS.

Your description of the Icelandic springs, the most extraordinary which have hitherto been discovered in the known world, was extremely agreeable to me, partly on account of the surprizing force of them, and partly on account of the great light obtained in mineralogy by the crustated stones formed in them. How these springs may be accounted for, I hope I have sufficiently explained in another place:* I shall, therefore, entirely pass it over here. But now I will communicate to you what I could not then understand, namely, the true nature of these depositions.

You have presented me with the following substances from the Geyser:

1. The substance, of which the water has prepared itself a bason to run from. It consists of a hard, rough, grayish, and irregular slaty, and generally martial crustated stone, over which a covering of small crystallizations has formed itself, that resembles the lichen fruticulosus, or rather the Stahlsteindruse found in the Westersilverberg, that is called the flos ferri, or Eisen bluthe. These precipitations are opaque, without of a whitish gray, blacker within, and plainly shew the formation of several crusts on one another. Each of these flos ferri, as well as the crustated stone, has the hardness of a flint; however, they are not so compact or strong as to strike fire with the steel.

The strongest acids, the fluor acid not excepted, are not sufficient with a boiling heat to dissolve this substance. It dissolves very little, if at all, by the blow-pipe with the fusible alkali, a little more with borax, and makes a strong effervescence with sal sodæ. These effects are peculiar only to a siliceous earth, and therefore there remains no doubt concerning the real nature of this crustated stone. Nevertheless, I have melted it in the crucible; first, by weight, with half as much alkaline salt, and likewise with three times as much; and have obtained in the first case a fixed glass, and in the second one, which in dissolving yielded a common liquor, silicum. The glass of the crustated stone is of a more yellowish brown than that of the crystallizations; and this difference is caused by the greater quantity of irony particles.

2. The porous crustated stone or sinter, which is found in the moor surrounding the border of the bason, is light, whitish, and here and there spotted with a rust colour: it

* In my Physika beskrisning om Jordklotet, ult. edit.

is evidently an incrustation upon moss and similar substances, which have been decayed by length of time, and left those cavities. In regard to its composition, it is of a siliceous nature as the preceding, and also perfectly similar in respect to fire and dissolvents.

I have already mentioned the solution of the flint in sal sodæ with the blow-pipe; and as I shall hereafter have frequent occasion to refer to it, I will in this place relate the whole process. The late director of the mines (bergmastare) Mr. Cronstedt, makes mention of this salt in his Mineralogy, but it is very seldom; and he considers it as less properf or using with the blow-pipe, because it is too soon imbibed by the coals. It certainly does not afford a very good solution upon coals, and I therefore made use of a silver spoon, made on purpose; by which method I have been able to make good use of the sal sodæ, which, in his examinations of the different kinds of earth in this manner, is very serviceable, and even indispensably necessary, as I shall hereafter prove more at large, in a little dissertation on the blow-pipe, and its proper use.

I have frequently inserted a supposition in my printed works, that though the siliceous earth cannot be dissolved in the usual manner in water, yet it might with the help of a great degree of heat; and that this really happened at Geyser is evidently proved by the above described crustated stone. The hot water forms of itself the large siliceous bason from which it issues out of the substance, that is in a dissolved state at the first, but quickly precipitates, on account of the heat decreasing in the open air. The heat of the water was not examined with the thermometer till such time that the bason was filled, when it was nevertheless found at a hundred degrees, according to the Swedish measure. It is in all probability much greater under the earth; for its running through cooler channels, and its spouting afterwards into the air to a great height, must necessarily very much diminish the heat, on account of the great dispersion.

This quick deposition produces both the opacity and irregular form of this stone, and prevents the particles from being so closely united, as might have been expected from the degree of the hardness of each, supposing the solvent power had diminished more gradually.

Mr. Scheele has discovered the formation of the flint; and I myself have found out, within these two years, a method of obtaining, with the help of some fluor acid, thirteen precipitated crystals, of the size of small peas. This artificial pebble in all experiments, both in the wet and dry method, and even in the focus of a burning-glass, in a piece that I sent to Mr. Macquer, discovered exactly to him the same qualities as the natural one.

All these circumstances, therefore, prove that the pebble is a saline earth, which is composed of fluor acid, and an original substance existing in the watry exhalations. It is not quite simple; but however I have not been able to consider it as any other than an elementary earth: indeed, my judgment is, that it cannot be compounded from any other principle.

I do not in this place mean a finer or coarser powder, by the denomination of earth, as is generally understood under this appellation; but I take the word in a chemical sense, to express a fixed principle, which is obtained in analysing any substance, and that cannot be dissolved in boiling water, after the nicest mechanical division. It is well known that the dissolubility of any substance may be lessened by certain compositions; and that a solvent can better attack the substance, according to the extent of its surface; and that, lastly, water in an open vessel will not admit of any greater degree of heat than one hundred degrees, according to the Swedish thermometer. A substance may, by this rule, be dissoluble by itself, after having gone through a preparatory cleansing, or a chemical separation, or with the assistance of a greater degree of heat, though it may be indissoluble without any preparation, or with the usual method of boiling; and it is with a view to this circumstance that I call the flint a kind of salt earth.

I have likewise examined the substances you collected in the morass near the Geyser, and have found them to be the following:

3. A dark-red bole, which became darker in the fire, but was afterwards a little attracted by the magnet. It crumbled into pieces in the water, and is fine and tough to the touch.

4. A bluish-gray clay, which contains green vitriol of decayed pyritæ.

5. A brighter-gray sort, which did not seem to contain any vitriol.

6. A white or yellowish clay, with rust-spots.

All these sorts become very hard in the fire, and take a good deal of time before they liquify. The last, when it softens, is harsh and more sandy to the touch than the preceding sorts.

The different sorts of stone collected at Laugarnas are of another nature; nor does the water here spout out of a bason, but through many small openings in the earth.

7. A whitish irregular plated crust, which often grows on the outside into small globular blunt points. This in acids gives a sudden fermentation, that immediately ceases, without its being any otherwise attacked. It dissolves with borax by the blow-pipe with great difficulty, and without motion, but with a loud effervescence with sal sodæ. It is consequently a siliceous mass, outwardly covered with lime, and has fixed itself on the following substance.

8. A solid irregular plated and broken crust, of a dark colour, but in many places tinged with bright blue spots. It becomes quite smooth in cutting, almost like stone marle, but does not crumble in water, nor does it become soft in it; with acid it shews an effervescence which soon ceases: with the blow-pipe it grows hard, scarcely melts at the thinnest edges, and is attacked with some motion both by borax and fusible urinous salt and sal sodæ, but is not entirely dissolved by any of them.

9. The substance found at the botttom of the brook, which carries off the water that gushes out, is brown, spongy, and composed of pretty hard flakes and threads, that are covered with fine glassy crystallizations. These are clear only in some few places; but lose their brown colour, both in fire and marine acid, and become quite clear.

The small crystals puff up very much under the blow-pipe, almost like borax; they float in bubbles on the surface, and are dissolved with great difficulty by borax; they are attacked by sal sodæ with a strong ebullition; it is the same with the more solid flakes, but they do not puff up so strongly as the crystallization. These several qualities here mentioned evidently shew, that this crustated stone consists of zeolite.

10. From Reykum you sent me calcareous spar in lumps, that are externally rounded, as if they had been tossed backwards and forwards by the water, and rubbed against hard bodies. In them there are small grayish green crystallizations, that dissolve by the blow-pipe to a black slag: the sal sodæ causes some effervescence in them, but does not dissolve them; they are likewise attacked with some emotion by fusible urinous salt.

11. A loose, tubulose, whitish crustated stone, or an incrustation cavernous, and with impressions of leaves, stalks, and the like. As to its nature it is siliceous; but seems at the same time to contain a different substance, as it dissolves more slowly with sal sodæ.

The spring which here bursts forth in a very sloping direction towards the horizon, according to your account, deposits a kind of sulphureous grease by its hot steam on the cavities of the upper side; but I have found no specimen of this in the collection you communicated to me.

From what I have hitherto said we may gather, that the Icelandic hot springs contain very different substances from what are to be met with in other places of the same sort, especially siliceous earth.

There is no lime at all near the Geyser; but at Laugarnas there are some faint traces of it, partly as an external covering, and partly as constituent parts in the zeolite, of which more will be said hereafter. The balls of lime found at Reykum are most probably thrown out by the spring, and have been rounded on the surface by the friction.

OF THE ERUPTIONS OF FIRE.

I have in another* place treated pretty extensively of the dreadful devastations caused by subterraneous fires on the surface of the earth in many parts of the world, both in regard to their causes and effects; I have therefore not any thing to add in this place but what particularly relates to Iceland, and what may serve to explain the eruptions which have happened there from time to time.

Whether Iceland is to be considered as entirely produced by volcanoes is a question, which most probably will remain unresolved many years. It is true, sir, that, according to the accounts you have collected there, the volcanoes have raged in a great many places, and that the whole country is in a manner covered with traces of their destructive effects: we also learn, from undeniable facts, that new islands have been produced by volcanoes in many places. But all this proves not any thing more than that the most dreadful effects have been produced by fiery eruptions in Iceland.

To determine this question, it would be indispensably necessary that a naturalist should thoroughly examine all Iceland. If a granite or any other stone or berg-art, was found in solid rocks, and not separate, or in loose fragments, which may have been brought thither from distant parts, I should entirely dissent from your opinion. But before these and the like discoveries were made, I believe no conclusions could be drawn.

I may venture to maintain with more certainty, that your collection confirms what I before concluded from other reasons, viz. that in all volcanoes pyrites are found, which on decomposing produce heat and fire; and likewise slate, that, penetrated with bitumen, serves to feed the fire.

12. The slate which you have brought from Iceland splits into thin plates, which discover many sorts of impressions, particularly of leaves; the colour is black, and it is exactly of the same nature as the common aluminous slate.

13. The two pieces of surturbrand, or fossil wood, which you brought with you, bear evident marks of a vegetable composition; and I may almost affirm, with perfect certainty, that the largest is a kind of pinus abies; on the outside are barks and branches, and in the inside all the rings of the sap appear: the lesser is a piece of rind without wood: both are black, quite soft, easily take fire, and flame in burning. After the flame is extinguished, one hundred parts afford forty-two parts of coals, which after being only calcined yield two parts of yellowish-brown earth, that is attracted by the magnet, and partly dissolves with acids: it makes some effervescence with borax and fusible urinous salt; the sal sodæ also causes a little ebullition at first, but does not entirely dissolve it.

Your conjecture, sir, concerning the manner in which the subturbrand is produced, does not seem improbable. I have already observed a long time with surprise, that fishes, othoceratites, lituites, wood, &c. &c. which are to be found in slate, have been compressed or flatted, whilst they preserve their entire form and roundness in lime.

This same circumstance may be observed in the two pieces described above, especially in the larger, which is only an inch and a half in thickness, though it is nineteen inches

* Verlds beskrifn, § 149.

in length, and thirteen in breadth. The outside of it has no marks of any roundness, but is quite flat. An exceeding great weight is required to press a stick to a flat plate; and I cannot conceive how the most immense beds, which must necessarily have been soft when spread over it, could ever produce this effect. The cause of this is yet undiscovered, and will probably remain so a long time; however, something may be found there which seems to shew, that the bituminous slate has been produced in the same manner, as it has not only penetrated the substance of the slate, but every thing else which has been laid upon it, for it may yet be obtained by means of distillation. But by what means has this been brought thither? How could it be imbibed by the clay, in case this was under water, which however seems to be undeniable, from the prodigious number of marine animals which are found buried? and how could the inclosed bodies have been pressed down horizontally? All these problems I cannot as yet answer satisfactorily, much less explain with any degree of certainty.

14. Very coarse, heavy, and hard lava, full of bladders, almost black, intermixed with white grains resembling quarz, which in some places have a figure not very unlike a square.

The black matter is not attracted by the magnet; but if a piece of it is held against a compass, the needle visibly moves. When tried in the crucible, it yields from ten to twelve pounds of iron in every hundred weight: it does not dissolve in the least with sal sodæ, with great difficulty with borax, and hardly visible by fusible urinous salt. It seems to contain a great deal of clay-earth in its composition, which may be extracted by all solvents of acids.

It is well known that this earth, when it is entirely free from any other mixture, may, by means of heat and drying, be brought to that degree of hardness as to give fire with a steel, which proceeds from the parts being brought closer together, and contracted in a space only half as large. By being thus contracted, it obtains a solidity and hardness; and, besides, the surface is so much diminished, in proportion to the whole mass, that the water cannot penetrate any farther to soften it.

We have almost daily opportunities in the study of chemistry of convincing ourselves, that a substance with a small surface cannot be changed in any manner by liquid solvents, but may however be attacked by them, in proportion to the different degrees of pulverization; nay, even a substance, which cannot be reduced by the finest mechanical division, may frequently be separated, as much as is necessary, by a chemical one; that is to say, by a preceding solution in another solvent. The attraction is here in proportion to the extent of the surface; and the larger this is, the stronger will be the attack: consequently I cannot believe that any clay, petrified by heat or slow drying, can have undergone any essential change, but only that its parts have so contracted themselves as to give it the hardness of a flint, to prevent it from imbibing any visible quantity of water. But as soon as it has been dissolved by any acid whatever, and its parts have by this means been brought out of its former contraction to the requisite degree of fineness and expansion, it becomes as soft as before, without the acid contributing any more to it than has been said, as all kinds of acids succeed equally well.

I have a very good assortment of the lava of Solfatera, by which it is very evident that the sulphureous acid, which had penetrated the black lava, deprived it, gradually, partly of its combustible quality, and had also whitened it (to effect which other substances, particularly silk, are likewise exposed to sulphureous exhalations) and partly had reduced it by solution, either to a perfect allum, or at least to the common nature of any loose clay. I have likewise produced all these effects with aqua-fortis, or any other acid, in a lava which had not yet suffered any change.

The white, which possesses more or less of those transparent grains or rays with which the lava is chequered, do not seem to be of the nature of quarz, as they cannot be attacked by sal sodæ; they are, however, with some difficulty dissolved by borax and fusible urinous salt.

These effects are perfectly similar to those produced upon the diamond, ruby, saphire, topaz, and hyacinth. The chrysolite, garnet, turmaline, and shirl, can neither be dissolved by sal sodæ, though they are somewhat attacked by it, when reduced to a fine powder; and upon the two last mentioned ones it produces a slight effervescence. On this account it is possible that the precious stones of mount Vesuvius, which are sold at Naples, are nearer related to the real precious stones than is generally imagined.

15. A finer kind of lava, quite porous within, and entirely burnt out, and considerably lighter on that account than the preceding ones. I have not found any such grains in it resembling quarz.

16. The so called Icelandic agate. This is of a black or blackish-brown colour, and a little transparent at the thin edges, like glass, and gives fire with the steel.

It cannot easily be melted by itself, but becomes white, and flies in pieces. It can hardly be dissolved in the fire by fusible urinous salt; but it succeeds a little better with borax, though with some difficulty; with sal sodæ it dissolves very little, though in the first moments some ebullition is perceived, and the whole mass is afterwards reduced to powder.

From hence it may be concluded, that the Icelandic agate has been produced by an excessive fire out of the lava described in No. 14. I have found no crystals of this glass in the collection. If any person has such in their possession, they should be examined, to see if they are exactly of the same nature and substance with the above described agate, and if their form has not been produced accidentally by bursting asunder.

17. More or less light, spongy, and burnt-out pumice stone, particularly black and reddish-brown. Quarz crystals are sometimes found in them; but oftener the rays and grains resembling quarz.

Stones thrown out of the volcano, gray or burnt brown, which seem to consist of a hardened clay mixed with siliceous earth. They are sprinkled with rays and grains resembling quarz, and some few flakes of mica. They fuse with great difficulty in the fire; with sal sodæ they shew some effervescence at first, but however it soon ceases: the parts resembling quarz do not produce any motion at all. From this we may conclude, that the lava mentioned in No. 14 principally originates from this mass.

The other loose stones which I have received from you, sir, to all appearance have no absolute connection with the eruptions of fire, though some have been suspected of it. I will enumerate them here separately.

19. Red and green jasper, which, in some places where it is broken, is quite smooth and shining; this circumstance distinguishes it from the common jasper, which is dull and clay-like where it is broken. It has besides all the qualities of true jasper; strikes fire with the steel, does not melt in the most violent fire, but is dissolved by sal sodæ with an effervescence, &c. &c. As to the smoothness of some parts, it cannot proceed from a commencing fusion, as it becomes black and dark in a weaker fire. We here only find a new link in the connected chain of nature, by which the jasper is united with the flint.

There is no black jasper in your collection; but the pieces, which to appearance come nearest to it, belong to the class of the trapp, and shall be described hereafter.

20. Gray, greenish slate, resembling jasper, that gives sparks with the steel, is attacked with a quick effervescence by sal sodæ, but not farther dissolved by it. In some

places are grains resembling quarz, which are easily dissolved in fusible urinous salt, but do not shew the least effervescence in sal sodæ.

21. The small crystals, said to resemble cocks-combs; they are nothing but a different appearance or change of the heavy spar.

22. A chalcedon crust with smooth prominencies, like what they call hæmatites: this is dissolved with the utmost difficulty by fusible urinous salt, with more ease by borax, and with a violent effervescence by sal sodæ, exactly as the flint.

23. Zeolite; two kinds: the one is solid, white, and internally, as it were, composed of globose parts, in which rays proceeding from the centre appear, that resemble fine threads.

This sort swells a little by the blow-pipe, dissolves perfectly with borax, separates in sal sodæ with some effervescence, but soon ceases, and leaves some part undissolved.

The other sort consists of a plate, which in colour and break resembles a carnelia: it has a quantity of small prominences in it, filled with irregular white chrystals, and some of the cavities are filled with a loose-grained and brownish-red substance.

The substance resembling a carnelian becomes white in the fire, bubbles up, and becomes fusible.

The crystalline substance becomes more frothy in the fire than the carnelian, and has all the qualities of the zeolite.

The sandy substance hardly swells, is dissolved with difficulty by borax, and is attacked at first with a sudden effervescence by sal sodæ.

As it is not uncommon even in the professors of morality to pass from one wrong step to another, so are we not without examples of this kind in those who make nature their study. Ten years ago it was a general opinion that the surface of the earth, together with the mountains upon it, had been produced by moisture. It is true, some declared the fire to be the first original cause, but the greater number paid little attention to this opinion. Now, on the contrary, that a subterraneous fire had been the principal agent gains ground daily: every thing is supposed to have been melted, even to the granite. My own sentiments with regard to it is this, that both the fire and water have contributed their share in this operation, though in such a proportion, that the force of the former extends much further than the latter; and, on the contrary, that the fire has only worked in some parts of the surface of the earth.

It is not an easy matter to explain how the granite, which consists of clear quarz crystals, solid field-spar, and glimmer (mica) with flat scales, has been able to support a fusion, without the quarz bursting, or becoming opaque.

This is yet less to be conceived of the field-spar, that becomes soft and liquid in a weak fire, and has a dull appearance. The glimmer splits its scales asunder in the fire, and frequently twists them together again, in a very different manner from that in which they appear in the granite. Notwithstanding all this, if the granite is considered as a production of the fire, it need not be wondered at that the zeolite has likewise been comprehended in this supposition.

I will allow that crystals may be produced by the dry method, and I know several ways of obtaining them, both by fusion and sublimation; but I can never be persuaded that the zeolite has been produced by the assistance of fire. It is true, that sometimes they are found in loose stones, and in such places where volcanoes had formerly raged: it is likewise found in solid rocks that have never been exposed to these fires, as at Gustavenberg in Jemtland.

If more sorts than one are also certainly free from all suspicion of having been subject to fusion, how is it possible, without the clearest proofs, to suppose that the whole genus

has been subject to it? If the Icelandic zeolite has been prepared by fire, we may justly question how it can produce above five quarts in twenty-five of water in distilling. This may likewise be applied to all the other sorts, though they generally contain less water, and the red sort from Adelfors only one quart in twenty-five. This is evidently the water of crystallization, in proportion to which each kind swells more or less by the blow-pipe. The Icelandic and Feroe zeolites are most subject to this, almost like borax; the Adelfors zeolite swells much less, and that from Upland, and several other sorts, so little, that it ceases in a moment; and even then produces so small an expansion of space, that it is scarcely perceivable to the eye.

Since therefore all zeolites contain this water of crystallization, which is neither found nor expected in the productions of fire, it seems to me to be undeniable, that they have been produced in the way of moisture; besides, the zeolites do not consist of a simple particular kind of earth, but of three different sorts, which are mixed together, and in a manner the one dissolved by the other, in consequence of which their connection cannot be considered as an original earth. In all, the greatest part consists of siliceous earth, the next is argillaceous earth, and the least part is calcareous earth. The two last sorts may be dissolved by acids, and then precipitated by alkali volatile causticum, by which the argillaceous earth, but not the calcareous earth, after being separated from the first by filtrating, may be precipitated by sal sodæ.

In this manner I have found that the zeolites described above contain forty-eight in one hundred of siliceous earth, twenty-two of pure argillaceous earth, and from twelve to fourteen of calcareous earth. If these numbers were added together, and reckoned with what it contains of water, the produce is something more than one hundred. This surplus proceeds from the calcareous earth that enters into the zeolite without fixed air, with which it is afterwards impregnated during the precipitation. Other zeolites contain exactly the same substances, only in different proportions.

Of those which I have hitherto examined, the Jemtland zeolite contains the greatest quantity of calcareous earth, that is to say, sixteen parts in one hundred, and that from Feroe the least, namely, eight in one hundred. The red zeolite from Adelfors contains the greatest quantity of siliceous earth, to wit, eighty in one hundred, and the Icelandic the least, to wit, forty-eight in one hundred. The zeolite from Feroe contains most argillaceous earth, namely, about twenty-five in one hundred, and that from Adelfors the least, or about nine in one hundred. When the original composition of any kind of stone is thus known, it is not difficult to determine its qualities.

The zeolites at first froth and swell in the fire, the cause of which has been already explained.

They afterwards fuse more or less perfectly. The swapparara may be reduced to a clear glass, and the Upland red zeolite can hardly be brought to give any signs of vitrification on the surface.

It is well known that quarz, pure argillaceous earth and lime, cannot separately be made to fuse, nor two and two mixed together in many cases; but when all three are compounded, they are more or less inclined to fusion. One part of pure argillaceous earth, with one part of lime, and two and a half to three parts of quarz, afford a mixture, which is easiest brought to fuse. If the composition of the zeolites is compared with this mixture they are found to be fusible, in the same measure as the proportion of their constituent parts approaches more or less to the above-mentioned composition.

They are more strongly attacked by sal sodæ than by borax, or fusible urinous salt, because there is in all most siliceous earth, which is best dissolved by the solid alkaline salt in the dry way.

Lastly, several sorts have the quality of yielding jellies, that is to say, they change a proportionable quantity of acid to a semi-transparent congealed mass, which resembles a jelly.

These congelations may in general be produced in different ways; sometimes the menstruum by length of time loses its power, when the dissolved part is attacked gradually, though imperfectly dissolved, so that in a manner it remains suspended half dissolved, and after some evaporation at last congeals to a tough coherent substance. This frequently happened in dissolving tin in marine acid, or aqua regia, when the inflammable substance decreases too much, and by that means weakens the connection between the metal and the solvent.

Sometimes a kind of gelatinous congelation is produced by an imperfect precipitation. For instance, when the liquor silicum is united with a certain quantity of acid, so that the siliceous earth is not entirely separated, but remains suspended in the liquor. This much resembles a circumstance exhibited by some zeolites, which I will now more fully explain.

As the red zeolite of Adelfors produces this effect more clearly than any other, it shall serve as an instance of it. After this is separated and freed as much as possible from calcareous spar, three or four tea-spoons full of it must be thrown into a wine-glass half filled with common aqua-fortis; when, after a short time, the whole solution will be found in the form of a reddish gelatinous substance, that nothing of it runs out, if even the glass is turned. To discover the cause of this, I have taken some of the clearest jelly, and dissolved it with boiling water in a glass mortar, and left it to dry on a filtering paper after a perfect filtration, by which means the place which it occupied was incredibly diminished. I then tried this substance with acids, but it was not at all attacked, and did not melt in the strongest fire alone. The fusible urinous salt hardly attacked it; borax dissolved it, though with difficulty; but sal sodæ dissolved it perfectly, with a strong effervescence. In consequence of this the gelatinous substance chiefly consists of siliceous earth, expanded in the highest degree. But by what means has this indissoluble substance been introduced into a solvent?

We have before observed, that the Adelfors zeolite contains eighty parts in a hundred of siliceous earth, nine and a half of argillaceous earth, and six and a half of calcareous earth, free from fixed air; all which substances are united as close as possible. If therefore the powder is thrown into an acid, and remains there during some time, the argillaceous and calcareous earths are immediately attacked by it; but these are internally connected with the siliceous earth, and consequently take a considerable part of it, half dissolved, into the spongy and swollen state which all substances generally exhibit in the moment of precipitation. The same thing happens when a resinous gum is laid into spirits of wine; part of the gum, together with the resin, is then immediately dissolved by the spirits of wine, on account of its connection, though the first alone cannot be dissolved by it at all. If a sufficient quantity of water or acid is added before the liquor begins to congeal, no congelation ensues, but the siliceous earth falls in loose flakes to the bottom, which evidently proves that the solvent, in regard to its quantity and strength, must be confined within certain limits. An addition of some chalk increases its tendency to gelatinous congelations, partly because the solution becomes more broken and solid, and partly by means of bubbles of fixed air, which attach themselves to the spongy siliceous powder, and make it lighter; whence the zeolite of Adelfors in this case seems to have an advantage over every other sort, on account of the lime-spar naturally mixed with it; the principal part however no doubt depends on the several parts which compose it. Some sorts afford only a gelatinous substance, after a preparatory calcination; the cause of which most probably is this, that the calcareous

earth has not before been enough united with the siliceous earth, at least not with the whole of it. It is well known that lime and quarz, when exposed to the operation of a fire, that has only caused them to bake together, nevertheless afterwards yield a gelatinous substance. Alkaline salt mixed with sand affords a similar demi-concretion, as when we calcine pot-ashes; on which account the clearest solution a long while after precipitates siliceous powder, in the same proportion that the alkaline salt attracts fixed air, with which it preferably unites itself. This generally produces a gelatinous congelation, when the water is saturated with alkaline salt, and also is well charged with siliceous earth.

For the same cause, clay, spathose fluor, and other substances, hard to be dissolved in acids, may be brought to a gelatinous congelation, when they have before by fusion been united with alkaline salt, borax, or calcareous earth: calcareous earth by itself never gives a gelatinous substance in acids, consequently it can so much the less become a siliceous earth by this method, as has however been thought by some, who would soon relinquish their opinion, if they would only make experiments themselves; where there is no flint before, it cannot possibly be proposed by any other acid, but that which is obtained from spathose fluor.

But at present this is enough of the zeolite, of which I have treated more extensively, as it is found in great abundance in Iceland, and is supposed by some to be produced in the dry way; but I hope that this matter is at present entirely determined, not only by its separation, but also by its production, which happens daily in the water. See No. II.

I have for several years past endeavoured to discover the number as well as the nature of the original kinds of earth. In the year 1758 Mr. Cronstedt counted nine; if he had lived longer, for the benefit of the sciences, he would no doubt have rectified this account. In consequence of my experiments I have discovered the following six sorts:

1. Calcareous earth, which, after being saturated by acid of vitriol, affords a kind of gypsum.

2. Terra ponderosa, which, with acid of vitriol, gives a ponderous spar, and in several respects is very different from the calcareous earth.

3. Magnesia, which, together with acid of vitriol, produces the English or Epsom salt.

These three kinds are generally found saturated with fixed air, and they are on that account subject to an effervescence with stronger acids.

4. Argillaceous earth, which, together with the vitriolic acid, produces allum.

The common argillaceous earth is always mixed with siliceous earth, but the sort here ment must be entirely pure.

5. Siliceous earth, which is not attacked by any acid yet known, the fluor acid excepted. In the dry way it can be dissolved with a third part of its weight of fixed alkali to a transparent lasting glass, which at first is affected with a strong effervescence.

6. Gemmeous earth, that is not attacked by any known acid, and clearly distinguishes itself from the preceding sorts, by its being entirely indissoluble, and being subject to a weaker effervescence in the fire with fixed alkali. It is found in all the gems or precious stones.

I have in vain made use of various methods to separate these earths into more simple principles, and to all appearance others would have no better success than I have had: if they are really compounds, they are at least simple, in regard to the method known among us of separating substances, and do not arise from one another. Whatever has therefore been objected to this opinion, from prejudice, cannot subsist after experiments

have been made upon that subject. We must not pretend to improve nature according to our notions, but endeavour to distinguish all kinds of substances which have sufficient and lasting marks of distinctions. No certain origin can be made, unless the separation and composition of them, which may be relied on, has been made before. All the different sorts of stone and earth, hitherto known, are composed of one or more of the six principal sorts before-mentioned, which shall be proved more at large in another place, as soon as I am able to make some experiments that require repetition.

OF THE BASALTS.

OF all the mountains hitherto known, there are without doubt not any more remarkable than those that are composed of angular pillars. A few years ago only one or two of this kind were known; but new ones are daily discovered, which is a plain proof how much our attention requires being roused, to prevent it from slumbering even on the most important occasions.

It cannot much be doubted that there has been some connections between these pillars and the effects of a subterraneous fire, as they are found in places where the signs of fire are yet visible; and as they are even found mixed with lava, tophus, and other substances, produced by fire.

The cause of the regular form of these pillars is a problem, which we have hitherto been unable to solve satisfactorily. This difficulty has appeared so insurmountable to some, that they have thought it impossible to be the effects of Nature, and have considered them as works made by human hands: this idea betrays the utmost ignorance in regard to the true nature of these mountains of pillars, and does not even deserve a refutation.

As far as we know, Nature makes use of three methods to produce regular forms in the mineral kingdom, namely, that of crystallization or precipitation: secondly, the crusting or settling of the external surface of a liquid mass whilst it is cooling: and, thirdly, the bursting of a moist substance whilst it is drying.

The first method is the most common, but to all appearance nature has not made use of this in the present case. Crystals are seldom or never found in any considerable quantity running in the same direction, but either inclining from one another, or, what is still more common, placed towards one another in several sloping directions. They are also generally separated a little from one another, when they are regular; the nature of the thing likewise requires this, because the several particles, of which the crystals are composed, must have the liberty of following that power which affects their regular disposition.

The basalt columns, on the contrary, whose heights are frequently from thirty to forty feet, are placed parallel to one another in considerable numbers, and so close together that the point of a knife can hardly be introduced between them. Besides, in most places, each pillar is divided into several parts or joints, which seem to be placed upon one another; and indeed it is not uncommon for crystals to be formed above one another in different layers, when the solvent has been visibly diminished at different times; but then the upper crystals never fit so exactly upon the lower ones, as to produce connected prisms of the same length and depth as all the strata taken together, but each stratum separately forms its own crystals.

How then can the Giant's Causeway in the county of Antrim, Fingal's Cave at Staffa, and all other assemblages of pillars of the same kind, be considered as crystallizations? Precipitation, both in the wet and dry manner, requires that the particles

should be free enough to fix themselves in a certain order; and as this is not practicable in a large melted mass, no crystallizations appear in it, except on its surface, or in its cavities.

Add to this, that the basalts, in a fresh fracture, do not shew a plain smooth surface under the microscope, but appear sometimes like grains of a different magnitude, and at other times resemble fine rays running in different directions, which does not correspond with the internal structure of the crystals, which I have endeavoured to examine in another place.

From what I have hitherto mentioned, the opinion that the basalts have been produced by crystallization becomes at least less probable, whether we admit the wet or dry method. But I must not omit that the spars exhibit a kind of crystallization, which, at first sight, resembles a heap of basalts, but, upon a close examination, a very great difference is observed. The form of the spar is everywhere alike, but the basalts differ from one another in point of size and number of sides; the former, when broken, consists of many small unequal cubes, but the basalt does not separate in regular parts, &c. &c.

Nature's second method to produce regular forms is that of crusting the outer surface of a melted mass. By a sudden refrigeration, Nature, to effect this purpose, makes use of polyedrous and irregular forms. If we suppose a considerable bed, which is become fluid by fire, and spread over a plain, it evidently appears that the surface must first of all lose the degree of heat requisite for melting, and begin to congeal; but the cold requisite for this purpose likewise contracts the uppermost congealed stratum into a narrower space, and consequently causes it to separate from the remaining liquid mass, as the side exposed to the air is already too stiff to give way. In this manner a stratum is produced, running in a parallel direction with the whole mass, others still are produced by the same cause, in proportion as the refrigeration penetrates deeper.

Hence we may, in my opinion, very plainly see how a bed may be divided into strata. In the same manner the refrigeration advances on the sides, which consequently divides the strata into polyedrous pieces of pillars, which can hardly ever be exactly square, as the strongest refrigeration into the inner parts of the mass advances almost in a diagonal line from the corners. If we add to this, that a large mass cannot be equal throughout its composition, nor everywhere liquid in the same degree, it will be easy to discover the cause of several irregularities. If the depth of the bed is very considerable, in porportion to its breadth, prismatic pillars, without cross divisions, are produced, at least lengthways, from the uppermost surface downwards.

The third way is perfectly similar to the preceding in respect to the effect, but is different from it by the mass being soaked with water, and by the bursting of it asunder, being the effect of the contraction whilst it is drying. If we suppose such a bed to be spread over a level space, the drying advances in the same manner as the refrigeration in the former case.

This separation into strata properly happens when a considerable quantity of clay enters into the whole composition, because the clay decreases more than any other kind of earth in drying.

We must now examine which of these two ways may best serve to explain the manner in which the basalts are produced, for it is hardly possible that they should have been formed by crystallization.

However well founded the opinion may appear of deducing them from a melted substance, several very considerable objections however may be raised against it, which I shall not forget to mention. It seems therefore more credible to me, that they have been

produced out of their substance whilst it was yet soft, or at least not too hard to be softened by exhalations. If we therefore suppose that a bed is spread over a place where a volcanoe begins to work, it is evident that a great quantity of the water, always present on these occasions, is driven upwards in exhalations or vapours; these, it is well known, possess a penetrating softening power, by means of which they also produce their first effect; but when they are increased to a sufficient quantity, they force this tough moist substance upwards, which then gradually falls, and during this time bursts in the manner described above.

My reasons for this opinion are these; first, we do not find the internal grain of the basalts melted or vitrified, which however soon happens by fusion, and for which purpose only a very small degree of fire is requisite. It consequently is very hard to explain how this substance could have been so fluid, that no traces of bubbles appear in it (at least I have not been able to discover any, after the nicest examination into the Scotch and Icelandic basalts) and yet when broken appear dull and uneven. I know very well that lava is seldom vitrified within; but the great number of bubbles and pores which are found in the whole mass are more than sufficient proofs, that it has not been perfectly melted to its smallest parts, but has only been brought to be near fluid.

Secondly, the basalts so much resemble the finer trapp, both in respect to their grain and original composition, that they can hardly be distinguished in small fragments, as will be more plainly proved in the comparison which I will make hereafter. See NO. 24.

But the trapp in all probability has never been melted, at least not in those parts where I have had opportunities of examining it.

Almost in all the west Gothic stratified mountains, the uppermost stratum is trapp; and it must be well observed, that it always lies upon black allum slate. Is it therefore credible that this substance, which in many places extends above a hundred yards, can have been perfectly melted, without causing the slate lying beneath it to lose some part of its blackness, even in those places where they touch one another, as this effect may be produced in a small culinary fire?

There is besides a finer kind of trapp, which is generally found in veins or loads, and frequently in very ancient mountains, where not the least traces of subterraneous fire are to be seen.

The basalt mountains seem to be very ancient, at least I do not know that the age of any one is ascertained. Should they then be so old, that the substance of the trapp was not yet perfectly hardened, when were they produced? Besides, we frequently find to this day clayey substances at a great depth, which are so soft that they may be scraped by the nail, but afterwards become very hard when exposed to the air.

There have without doubt been many eruptions of fire on the isle of Staffa, as the situation of the pillars and their being removed out of their places evidently prove.

You, sir, have likewise brought a very clear proof of this from thence, which is a piece of basalt, that on the exterior is full of hollows, and in a manner burnt.

A hard substance, when exposed to a degree of heat insufficient to melt the whole piece, may, however, be attacked by it in some parts of the surface most liable to become fluid. The mixture of a large mass is seldom everywhere so uniform, that some parts should not be more liable to melt than others.

Crooked pillars may be produced as well by the drying as the refrigeration of a liquid mass; for this purpose it is only necessary that the surface should be bent, as the stratum always runs in a parallel direction with it.

From what I have hitherto said, you will perceive it is my opinion, that the basalts have been produced by the assistance of a subterraneous fire, but that it is not yet determined whether they have been rent asunder after the fusion, or by drying: this last however appears more credible to me, on account of the reasons I have mentioned. For, to speak strictly, the substances inclosed in the basalts, though they should even be volcanic, do not yet with certainty prove a preceding fusion, as a substance softened by water may be as proper for it as one fused by fire. I am, however, very far from being inclined to maintain my opinion any farther than it agrees with certain experiments and experience.

Truth will sooner or later be discovered; and I know nothing more derogatory to the honour of a natural historian, than having wilfully obstructed its passage.

I will now give a more full description of the basalts and different kinds of trapp, which you have brought from Staffa and Iceland.

24. Basalt from Staffa. The piece presented to me is a prismatic hexagonal fragment, three sides of which are almost of equal dimensions, and are connected with one another, two others are larger, and are separated from one another by the sixth and smallest; it is a little concave at the top, and convex at the bottom.

Trapp is generally found in square irregular cubes, whence it has most probably obtained its denomination, on account of some similarity with stones made use of for staircases.

It is also found in prismatic triangular forms, though rarely, as also in the form of immense pillars. Of this kind are those called Trælestenar, opposite Bragnum, at the foot of the Hanneberg, which have separated themselves from the remaining part of the bed; and in 1759, when I first saw them, formed an angle of about eight degrees with the plumb-line.

The basalt from Staffa, when newly broken, is of a blackish gray, shining, and small scaled; and I have discovered with the microscope some small white particles sprinkled up and down.

The finest trapp is perfectly similar when broken, only of a lighter colour, which proceeds from the greater quantity of white particles.

The surface decays to a gray yellow loose crust, which loses itself in the more solid mass.

The fine trapp decays in the same manner.

The basalt when struck with the steel hardly gives fire, though a spark may now and then be obtained with difficulty.

This same circumstance may be observed of the trapp.

Its specific weight is about 3000, and that of the trapp about 2990.

It becomes very beautiful by cutting, polishing, and grinding.

Likewise the more fine kind of trapp.

It yields an ash-coloured powder.

The trapp yields rather a powder of a more light colour.

It soon melts to black glassy flags.

The trapp likewise.

The basalt is attacked by sodæ with an effervescence which soon ceases, and, though some separation ensues, the greater part however remains undissolved. Borax perfectly solves it without effervescence, and gives a clear iron-coloured glass. It is solved with great difficulty by fusible urinous salt, and whilst cooling becomes of a whitish gray, and not transparent.

The same effects are produced by these acids upon the trapp.

One hundred parts of basalt, very finely powdered, and several times digested with fresh aqua regia, and then well washed and dried, leave sixty-eight parts undissolved.

The remainder of this shews a little effervescence before it unites with the sal sodæ, and dissolves very little. It is dissolved with ease by borax, and with difficulty by fusible urinous salt. It seems therefore to be a mixture of siliceous and gemmeous earth.

The solution gives, by precipitation with lixivium sanguinis, as much Prussian blue as is equal to twenty-six parts in one hundred of iron; though the basalt, by being tried in the usual manner in the crucible, does not yield above ten in one hundred. This proves that lixivium sanguinis affords the most exact method of assaying iron ore.

When at last the solution is precipitated with caustic volatile alkali, after the iron has been separated by lixivium sanguinis, saturated with acid, pure argillaceous earth is obtained.

Sometimes a little calcareous earth appears after a preceding precipitation; when dissolved, sal sodæ is added; but sometimes not the smallest traces of it can be discovered, even with the acid of sugar, which is however the safest method hitherto known of discovering it. The calcareous earth seems therefore to be accidental. This is however very certain, that the interstices between the pillars are sometimes found filled up with calcareous spar.

The trapp is exactly of the same nature, and contains nearly the same allay, so that the experiments differ only one or a half part in one hundred. The most considerable difference consists in the calcareous earth appearing here more visibly, so that generally a slight effervescence is observed when an acid is poured on the powder.

25. Basalt from Hvitara, near Skalholt, in Iceland. The piece in my possession is too small to discover its form; only a part of the outside can be distinguished. When fresh broken it resembles the basalt from Staffa, though something may be observed in it, which is very seldom discovered in the last. These are small round cavities, not larger than pins heads, thinly scattered in some places, as likewise on the outside. All these cavities are filled up with a white, green or brown powder.

May not these perhaps have been some particles of a substance, which easily dissolving was become liquid, though the whole mass had not a sufficient degree of heat to melt it?

But whence can these cavities be filled with this powder? In the midst of so solid a mass, no decay seems to be possible.

The substance of the basalt itself produces a little effervescence with sal sodæ, and separates, without being visibly dissolved. It dissolves in borax, as likewise in fusible urinous salt, although with more difficulty. By the common method of proving it in the crucible, it yields ten parts in one hundred of iron. The same circumstances may be observed in trying the powder that fills up the cavities; it only seems to melt a little easier than the solid substance surrounding it.

26. The basalt from Langarnas perfectly resembles coarse trapp, though it has more white particles, and sometimes crystallizations as large as a cherry-stone; the dark gray and white parts prove to be entirely of the same nature by the blow-pipe, becomes fluid by itself, and produces a sudden effervescence with sal sodæ, but without being quite dissolved by it: it is exactly as the preceding sort.

27. Black, solid, glossy trapp, knotty within, and resembling wood in its internal structure, being full of filaments. Many pieces are grown to a crust of pumice on one side or another, though their edges are quite fresh and smooth; whence we may conclude, that they themselves have not been melted, but have either been thrown into the

lava, which was already burnt out, or that the lava has flowed over them: some part of it however seems to have been more attacked by the fire.

The manner in which the fire and acids operate upon this trapp is exactly the same as with the preceding basalt. There are likewise some grains scattered in it resembling quarz, which are not solved by sal sodæ, nor does it causé any effervescence; borax and fusible urinous salt entirely dissolves them, though slowly.

28. A co[illegible] dark brown trapp from Vido, the surface of which is glassy and uneven, as if it [illegible]n made fluid by fire. It must also be observed, that crystallizations of fresh pyrites are frequently found in these glassy rough pieces. The glassy substance easily becomes fluid, with some ebullition, almost like shirl; besides, it exhibits the same circumstances with acids as the preceding.

You will see, sir, by this long letter, that in the eruptions in Iceland argillaceous and siliceous substances have been principally concerned, as has been the case in other parts. I know very well that Mr. Beaumè maintains, that silex might be made to afford allum with acid of vitriol, after it has been dissolved in liquor silicum with sal sodæ. But when the fusions are made in vessels which contain no argillaceous earth, no allum can be obtained with acid of vitriol, which, however, may be obtained, when the vegetable alkali is kept fluid during a considerable time in a common crucible, because the alkali dissolves some part of the vessel itself. Pure siliceous earth is entirely indissoluble by itself in acid of vitriol, let it be treated in any manner whatsoever.

Let this account of these dreadful devastations be sufficient.

Homo naturæ minister et interpres, tantum facit et intelligit, quantum de naturæ ordine, re vel mente observaverit, nec amplius scit aut potest. *Baco.*

RELATION OF A VOYAGE IN THE NORTH SEA, ALONG THE COASTS OF ICELAND, GREENLAND, FERRO, SHETLAND, THE ORCADES, AND NORWAY, MADE IN THE YEARS 1767 AND 1768, BY M. DE KERGUELEN TREMAREC, OF THE ROYAL MARINE ACADEMY IN FRANCE, LIEUTENANT, COMMANDER OF THE FRIGATES LA FOLLE AND L'HIRONDELLE.

PREFACE.

HIS majesty being desirous that encouragement and protection should be given to the cod fishery on the coast of Iceland, carried on between the months of April and September, the Duc de Praslin, minister and secretary of state for naval affairs, dispatched the frigate La Folle to a station off Iceland, to preserve good order among the French fishermen, to protect them, and to furnish them with any succours they might require. Towards the end of January 1767 I received an order at Brest from the Duc de Praslin, to repair to court upon his majesty's service. I set off immediately, arrived at Versailles, and presented myself to the minister, who informed me that he had appointed me to the command of the frigate La Folle, of twenty-six guns, and two hundred men, for the object I have before described. Although I must necessarily on this cruize be subject to much fatigue and inconvenience, the novelty of it, and the inclination which from my most tender infancy I had always felt for cruizing, occasioned me an indiscribable satisfaction. M. Rodier, first clerk in the navy office, communicated to me sundry documents and regulations relative to the fishery in question. On the same subject I had the honour of seeing the president Ogier, who during his embassy to Denmark obtained considerable information on this branch of commerce, and had amicably settled some disputes which had arose upon the occasion of it. He had the kindness to impart to me all the elucidation I could require: he informed me that the king of Denmark had granted to a company established at Copenhagen the exclusive privilege of trading with Iceland; that every foreign vessel, or even Danish, not belonging to the company, was liable to confiscation, if found upon the coasts of Iceland; that the company kept cruizers to maintain its rights, and to capture any vessel infringing them; that these cruizers, three years before, had made themselves masters of two ships from Dunkirk, which were sold at Copenhagen; that these two ships had been fishing for cod upon the coast of Iceland, and were surprised in a harbour by the cruizers, with wool and other contraband articles on board, but, being ambassador at the time, he had reclaimed them, and had them restored with all costs and interest. The Duc de Praslin ordered me to Dunkirk, to confer with the gentlemen of the chamber of commerce on the means of encouraging the fishery, and securing success, by establishing regulations and a discipline, by which the men were to abide. After taking the measures necessary at Dunkirk, and choosing two sailors well acquainted with the coasts of Iceland, I returned to Versailles for my last orders from the Duc de Praslin, and proceeded afterwards to Brest to equip my frigate: on the first of April she was taken into dock to be careened; she came out again on the third, and the fourth her equipment began; in order to hasten which I divided the operation among my officers. M. Duchastel, who was my second lieutenant, had the care of the stowage and general inspection, with M. de la Martilliere, midshipman; lieutenant Le Chevalier Ferron had the inspection of provisions, with Messrs. Pehan and Le Rouge, midshipmen; M. Lerondel and Le Chevalier Menyeau, midshipmen, looked to the guns and ammunition; and Messrs. Dorvault and Menyeau, senior, to the

sails and rigging. By the exertions of these officers, whose talents cannot be too highly praised, my frigate was entirely equipped in four days, with six months provision on board. She fell down to the road-stead on the eleventh of April, where I anchored in ten fathoms water, with bottom of mud and sand, mooring her E. S. E. and W. N. W. with a heavy anchor. Being moored, I set Point Porzic at W. quarter S. W. five degrees S. and Round Island at S. quarter S. E. four degrees E. This is the best anchorage in the road; it is called La Fosse, on account of the bottom rising from the middle; but as it is at some little distance from the port, it is mostly frequented by large vessels.

Nothing interesting occurred to me in the road till the twenty-first, when I experienced a heavy gale of wind from the S. S. W. During my stay there I exercised the ship's company in the rigging, and at the great guns. M. Duchastel made out the roll for the watch, and engaging; that for engaging was made after a manner which ought to be generally adopted: it distributed, for example, to the starboard watch the uneven guns, one, three, five, seven, and to the larboard watch the even ones, two, four, six, eight.

By this means a vessel can never be taken by surprise; for the watch on duty on the deck may by night and day serve half the guns: she may prepare on a sudden as well to fire from both sides, on giving the word starboard to the starboard, and larboard to the larboard side. To conclude, the watch may exercise at the guns, without waking those who have turned in.

FIRST PART.

CONTAINING THE COURSE FROM BREST TO ICELAND.

I RECEIVED my instructions from court the twenty-sixth of April 1767, and the next day, the twenty-seventh, I left Brest roads at nine in the morning, at the beginning of flood tide, and with a very weak N. E. wind; as I got off the land it became stronger: at five in the evening we made Ushant, bearing E. N. E. five leagues and a half distant. I steered all night W. N. W. to make an offing, and seeing by the weather that the easterly winds were likely to continue, I kept the point ahead at N. N. W. in order to reach Cape Clear. The twenty-eighth, at noon, I was by observation in lat. 48° 46′, and long. 10° 3′ W. from Paris. At sun-set I noticed the variation of the compass to be 20° towards the W. The twenty-ninth, at half past eight in the morning, after having run forty-five leagues by the log in the preceding day, I discovered Cape Clear. At ten o'clock, Missin-head bearing N. N. E. five leagues distant, I sounded, and found sixty-five fathoms water, the bottom a muddy sand mixed with pebbles. Afterwards I steered N. W. quarter W. On the twenty-ninth, at noon, I found the lat. 51° 5′, and long. 12° 24′ W. M. Boutanguoy, my first pilot, observed 21° of variation in the morning. I remarked that Missin-head was a better land to make for than Cape Clear, on account of its being higher, and more easy to perceive. I took notice of the Schyllings islands, which I found badly laiddown in the map of M. Bellin, naval engineer, engraved in 1751. These islands stretch more to the W. and W. S. W. than they are described to do in that chart.

On running from Cape Clear to the Schyllings I noticed a sensible current to the N. E. After doubling these islands, I kept the Cape at S. S. E. On the thirtieth, at noon, I observed the polar height was 52° 44′, and by calculation 14° 54′ W. longitude from Paris. At noon I steered N. N. E. the wind S. E. but light, and a fine sea.

On the first of May I was by reckoning in latitude 53° 18′, and I found it by observation 53° 30′, which gave a difference in twenty-four hours of twelve minutes; this

could not have arisen from the log-line, the knots of which were made at a distance of forty-seven feet six inches: this distance is correct, the sea-league being reduced by the gentlemen of the academy of sciences to 2850 toises, from their finding in 1672 that a degree in the celestial sphere was equal to 57000 toises on the earth. If the third part of 2850 be taken, it will give 950 toises of the Chatelet at Paris, or 5700 royal feet, which, divided by twelve, yields forty-seven feet and a half, the distance or interval of each knot on the log-line. The difference could not proceed from the half-minute glasses either, which I proved the correctness of, by comparing them with each other, and by a watch I had which pointed the seconds. These small glasses, the purpose of which is to measure the distance passed over on the log-line during their run, which is half a minute, cannot be proved too frequently, for the change of weather from dry to humid alone may occasion a considerable variation; and one single second error in half a minute will cause a difference of thirty leagues in a run of a thousand. It would be useless to enter into minutiæ on this matter so often noticed, and particularly by M. Dechabert, at present captain of a frigate, who in his Journal of a Voyage to North America displays all the causes of errors in navigation. It is sufficient to observe that the 12′ difference of the latitude did not arise either from the log-line or the half-minute glasses, but from the currents, which I reckon to run N. E. in this quarter, owing to the bay of Galway, the bearing of the coast, which is N. and S. and the S. W. winds, which almost continually blow in this latitude, all which should necessarily determine the currents running to the N. E.

I found next day again a difference N. between the height by observation and that by reckoning, and perceived tide-banks and sea-weed, the direction of which were N. E. and S. W. which confirmed me in my opinion. I noticed the same day 22° 50′ variation at sun-set; a short time previous to which we had a most pleasing sight. The rays of the sun, broken and reflected by dark clouds on the horizon, represented at a distance, apparently of two leagues, a rapid river, which seemed to precipitate itself in cascades of different colours, azure, silver and gold.

The third, fourth and fifth, nothing particular occurred; the winds were variable, and I made most advantageous tacks: until the third, the wind had been S. E.

On the sixth, after keeping all day a N. N. E. course, the wind blowing hard and fresh, with a rough sea, the main and fore-top-sails reefed, as soon as the evening came on I stood under bare poles, not wishing to make way till day-light, thinking myself five leagues to the S. S. E. of a sand-bank, as described in the Dutch charts. The seventh, at noon, I found myself by observation in lat. 56° 41′, and long. 16° 15′, W. of Paris.

The eighth, at night, a violent gale of wind came on from the east, with a dreadful sea; it snowed and hailed, and was colder than what we find it at Paris in the sharpest winters. I then recollected the application made by M. de Frezier in the same circumstances, when doubling Cape Horn, of the thought of Horace:

> Meliusne fluctus,
> Ire per longos fuit, an recentes
> Carpere flores?
>
> Or gives them more delight,
> A dangerous voyage o'er the distant main,
> Or gath'ring flowers from the tranquil plain?

In truth, there is some difference between the smiling days of May, such as we experience in France, and the rigorous weather we had to undergo; and when I compared the comfort of a life on shore, with a tolerable competency, to the tiresomeness of the

sea, especially in bad weather, I wondered that any man enjoying a sufficiency could be induced to trust himself twice to the mercy of the winds and billows: fortunately for this condition of life, one hour of fair weather obliterates the remembrance of days of danger and toil.

The ninth, we had the same weather, the wind was equally boisterous, and the sea as tremendous as before; I still kept all sails reefed: once I attempted to set the main top-gallant and the mizen, in order to pass by day-light the latitude of another bank marked on all the Dutch charts, and the existence of which the experienced pilots I had on board assured me had been verified by the loss of several vessels; but I was obliged to haul in the main-top-gallant. This bank, according to the Dutch accounts, extends, from N. to S. eleven leagues, and from E. to W. about five leagues. I caused it to be marked on our charts. I do not affirm there being any very high shelving or dangerous sand in this position; but I am persuaded, from the prodigious number of birds, the multitude of them of those species which only resort to shallows, and from the frequent striking of the waves against the vessel, that there is a bank there. Several times during the day, and in the evening, I sounded, but without finding a bottom: when exhausted by the bad wether, and the violent rolling to which we had been subject for two days, I was anxious to get some rest, and laid down, after ordering the officer of the watch to sound at midnight; which was done. After letting out sixty-five fathoms of line, they cried bottom, because the lead did not draw any longer; but as the tallow with which the lead is loaded to take the impression of the bottom shewed nothing, they thought they might have been deceived, and did not wake me, which I had ordered them to do, in case of finding bottom. I conjecture that we passed the edge of the bank, and fathomed it, and which persuades me was the case, on examining by day-light the large end of the lead to which the tallow is applied, I found adhering to it some fine grains of sand, the roughness of which was distinguishable by the finger; and I conceive that the violent agitation of the waves might have washed the lead on heaving it up, and the more easily from the grains of sand being very fine and mixed with mud.

The tenth and eleventh, the same weather still continued, violent east winds, and very high sea.

On the eleventh at noon, I was by reckoning in 61° 20′ latitude, and longitude 19° 30′ westward of Paris; in the afternoon the wind veered to the S. E. it was less impetuous, I deemed the weather notwithstanding too bad to make land, but at four o'clock seeing several vessels called Doggers, which went before the wind to the N. W. I judged that they who were fishermen going to Iceland had fallen in the day before, and recognized the isles of Ferro, and satisfied with respect to their position, they bent their course to fall in with the islands of Westerman, which are to the S. of Iceland. The course of these doggers, and the tiresomeness of the bad weather, engaged me to go before the wind. I did not, like the fishermen, however, keep directly before the wind, but steered N. N. W. in order to make land higher up, that is to say, more to the east than the Westerman islands.

I kept on this tack all night, and until five the next morning, the twelfth of May, when I made cape Heckla; I then steered W. N. W. for the Westerman islands, which I saw at eight o'clock. I took an altitude at noon, and from the difference of latitude by observation from that of bearings, I found that on the large chart of M. Bellin, published in 1767, the coast was laid down in general 8′ more to the S. than what it ought to be. Off cape Heckla, in the morning, we noticed the variation of the compass was 29°. I observed that cape Heckla had two points stretching from E. to W. We saw also mount Heckla, which is nearly in the N. W. corrected by the cape. The volcanoe

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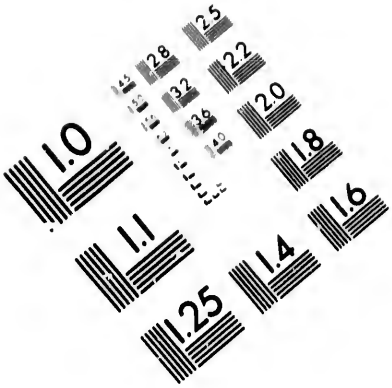

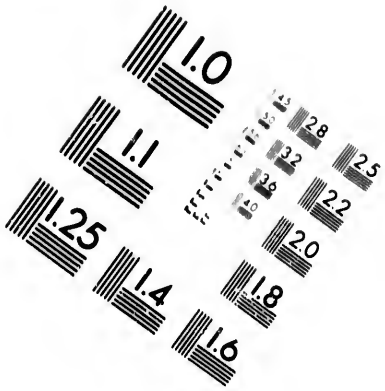

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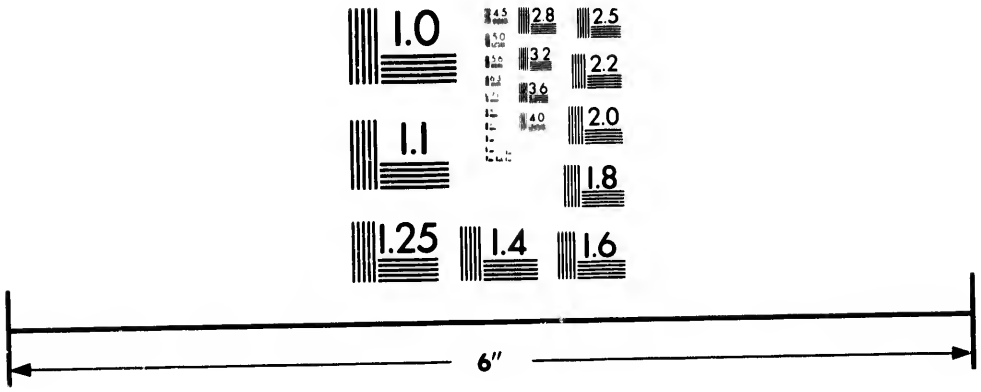

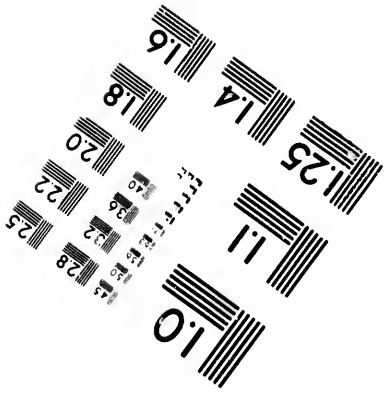

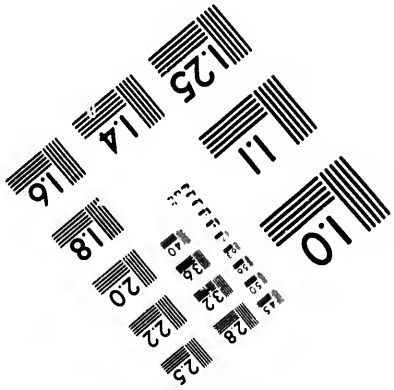

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of this mountain, one of the most considerable on earth, is known from its frequent, and sometimes terrible, eruptions: towards the close of this journal I shall speak of it more particularly. Between cape Heckla and the Westerman islands the land falls in in the bay, owing to which I understand there is a good anchorage. Above all, behind the western point of cape Heckla there are excellent moorings, well sheltered: to go up them requires a south or westerly wind. There are many passages between the Westerman islands, but they are little known, being unfrequented, except by Iceland fishermen; nevertheless some fishing smacks lay off there to fish, and I saw a dogger from Dunkirk, which had in a week's time caught seventy tons of cod there. A violent current runs between all these islands; they appeared to me to stretch more to the S. W. than what they are described in the French and Dutch maps. The distance of the Westerman islands to the western point of Heckla is well laid down on the chart of M. Bellin. The currents run to the W. N. W. from cape Heckla to the isle of Birds, but in the midst of these islands they run N. W. with dreadful eddies. At new and full moon it is high water at eleven o'clock. Between the Westerman islands and the point of Iceland contiguous to the isle of Birds, there is anchorage, under shelter from the N. wind; but if the wind should happen to change, it is necessary to weigh anchor immediately and put out to sea. All this coast is very healthy, and there is a very fine passage through the middle of the isles of Birds.

About twenty leagues to the S. of the western point of Iceland there is a heap of rocks, which form a low and dangerous island: it was not described in our charts, but is known to the Dutch: it has often been seen. An inhabitant of Iceland, a man of great sense and learning, who has frequently been to Copenhagen, and who has even wrote an abridged account of the natural history of Iceland, has often spoke to me of this dangerous island, only described in Dutch charts. Having sent him a large French chart of Iceland, on which I had marked with pencil the situation of this heap of rocks, according to the Dutch, he wrote to thank me in Latin, which was the language through the medium of which I was enabled to enjoy his learned and instructive conversation; and speaking of this island this was his remark: "Lætus video te ipsum notavisse scopulos, quos ipse semel vidi transeundo." I see with pleasure that you have noticed the rocks, which I saw also in sailing by.

On the twelfth, at six in the evening, the winds began to blow pretty strongly from the N. E. I steered N. W. quarter W. with no canvass out, in order that I might not pass by the isles of Birds before day-light. The wind drove us nine knots, that is to say, three leagues an hour, without a sail up. At two in the morning, lying N. and S. of the most western of the islands, according to reckoning, I was desirous of carrying sail to haul the wind; but as it was too violent, I was obliged to be content with the main and mizen-sail part reefed.

The thirteenth, by observation at noon, I was in lat. 63° 15′, and by reckoning in long. 26° 15′ W. of Paris.

In the night between the thirteenth and fourteenth the wind became furious; I lowered the mizen-yard to reef in the sail, and at one in the morning the force of the wind was so great that the waves could not rise, and the sea was covered with foam. A matter which astonished me was, to see in the height of the gale thousands of birds covering the surface of the main, unappalled by the approach and motion of the vessel: the force of the wind had driven them, I imagined, from the islands of Birds. This continual violent weather began to try my frigate, which was an old one; she leaked, and we were obliged every two hours to keep at the pump. The apprehension of being obliged to make a port, without being able to complete my mission, began to give me

uneasiness; but on the fifth the gale abated, the thermometer, which the day before was four degrees below the freezing point, was now three degrees higher, from which I drew an auspicious foreboding of finer weather: in effect, the wind changed to the S. E. blowing a little fresh by eight in the evening, when I reckoned myself S. of the largest of the isles of Birds, at eleven leagues distant. I steered towards the north, to fall in with it; but I saw no island, doubtless from the currents to the west being stronger than what I had esteemed them. When N. of the islands of Birds, which I conjectured myself to be from the run I had made, as well as from their being a calmer sea, the consequence of being between lands, I steered N. E. to fall in with the coast, and to make it the sooner.

The sixteenth, at eight o'clock in the morning, distant fifteen leagues, I descried mount Jeugel, bearing N. E. This mountain, or rather cape, which advances far to sea, rises very high above the horizon; I think it may be discerned in fair weather twenty leagues at sea. It must be remarked, that as the high lands of Iceland are almost wholly and continually covered with snow, and resemble each other in colour, in order to distinguish one from the other, respect must be had to their height and shape. Having taken the latitude under this cape, I found by its bearings that it is rightly laid down in the charts; but its northern point is not sufficiently far stretched out upon them to the N. N. E. The currents here run N. the variation 31°. Between the islands of Birds and cape Jeugel, there is a large bay, called the Bay of Hannefiord; it is little known to the fishermen, and my examination of it was restricted to finding that several fine rivers empty themselves into it, and that to the S. of this bay there is an island, under which there is good anchorage, sheltered from all winds, in four fathoms water.

Continuing my course to the N. E. at two o'clock I made the point of Brederwick, or Brederfiord. The gulf of Brederwick, which is between the point bearing that name and mount Jeugel, is very spacious and very deep. It is twelve leagues wide at the mouth, and receives many large rivers: there are in it many islands, behind which I am persuaded there must be excellent anchorage, but they are not known. The fishermen even have not frequented this before the three last years: there is notwithstanding a quantity of cod caught here. When the winds are northerly, there is a good mooring at the northern part of the bay, in from fifteen to twenty fathoms water, with a sandy bottom: ships frequently anchor here, but it is safe only during the prevalence of northerly winds.

The seventeenth, in the morning, the wind easterly, I stood in towards point Brederwick, which must not be approached nearer than to two cables length, on account of a sand or shelve which stretches out to sea from that point. When I had doubled it, I distinguished, notwithstanding the fog, more than four score fishing vessels. I steered for the middle of them, consisting half of French, half of Dutch, and hoisted a white and blue flag at the fore-top (the signal agreed upon) to make myself known. I spoke several French fishermen, in order to learn news of the fleet, and what the success of the fishery. I spoke a Denmarker, from whom I learnt that he had already taken ten lasts, a considerable quantity for a month's fishing, for a last is fourteen tons. He added, that he had taken six lasts in the Westermann islands, where he only stopped a week.

There is 32° variation at the point of Brederwick: we observed it many times, as well by corresponding elevations, and by meridional observations; for every body knows that when the polar elevation is great, the eastern and western observations are not to be depended on.

The eighteenth, nineteenth, and twentieth, the winds continually varied; they were sometimes N. E. then S. W. at times light, at others violent. In these latitudes there

is always a great instability in the winds; they however mostly blow N. E. and S. E. These three days were employed in reconnoitering the coast, and in taking bearings, and making remarks on the direction of the shores.

The twenty-first the wind was W. and not perceiving more than two or three vessels, I bore N. N. W. to seek the fleet. At ten o'clock in the morning, six or seven leagues from the land, I perceived the sea white before me to the horizon. The two pilots for those coasts which I had on board assured me that this whiteness was nothing but the sea itself, which was frozen. I continued my course N. N. W. to take a nearer view, and getting within a half a league of it, I satisfied myself, the sea appearing wholly frozen in one solid mass, extending from the N. W. of the compass as far as to the North Cape, which was at E. S. E. I tacked immediately, to avoid the danger, and warn the fleet of it. The year before the strait between Greenland and Iceland had been entirely frozen over all the summer. I cannot here refrain from making some reflections on this frozen sea, and on the mountains of ice which are found on the north sea during voyages from Europe to North America, and sometimes on doubling cape Horn. Some have been met with, which, like islands or rather continents, appear to be many leagues in length, and elevated more than two hundred feet above the surface of the water. How are we to account for those enormous masses? Every body knows that the total cessation of motion in insensible particles causes cold, and that cold is the immediate and true cause of the formation of ice; that there are other subordinate and accidental causes, such as spirits of salt and nitre, which, expanded in the air, occasion even in the midst of summer such extreme cold, as to freeze lakes and rivers. Thus the north wind in the northern hemisphere, and the south wind in the southern hemisphere, contribute to cold and the forming of ice, because they bring from the poles corpuscles or cold particles, which, penetrating the surfaces of bodies, suspend the motion of the imperceptible particles. I shall enter into some detail to develope the different causes of cold and ice.

I compute, in the first place, on the existence, as a base, of an ætherial matter, extremely subtle and active, which surrounds and penetrates in a larger or smaller degree all liquid substances; if its motion be lessened, its spring become weak, so that it be no longer able to overcome the resistance of the integral parts of the liquid (that is, which causes the cold) ice will be produced; thus the formation of ice is, the immediate result of the diminished motion of the subtle matter which constitutes fire and heat.

Let us now examine the accidental causes. Salt, nitre, saltpetre, these make up the first accidental cause of the formation of ice. In places where they abound the air becomes loaded with them, they penetrate the pores of liquids like so many small wedges, they close the passages against the entrance of the gross particles of the subtile matter, stop the motion of the imperceptible particles of liquids, and thus harden and convert them into ice. It is thus that in certain caverns, whose neighbourhood abounds in nitre, pyramids of ice are formed, as in a cave near the village of Chaux, five leagues from Besancon, where three were found, in the month of September 1711, of fifteen feet in height.* Wind I consider to be the second cause of ice.

Many persons imagine the wind to be an obstacle to the formation of ice; it is true, when it has much hold of an extensive surface of water, as of rivers, lakes, and seas, it frequently hinders them from freezing while it continues to agitate them, and deprives the integral parts of the liquid from uniting together, notwithstanding it is certain that for the most part wind ought to accelerate freezing, as I am about to explain. In cold weather, approaching to frost, a dry wind, such as the N. E. in our climate, contributes

* Histoire de l'Acad. 1712. p. 22.

to freezing; for the air, which is at rest on the surface of a liquid, participates by degrees of the coldness thereof, and keeps at that temperature; so that the subtile matter which circulates in the interstices of the liquid, and the motion of which is always in proportion to the motion of that which immediately surrounds it, is not yet sufficiently weakened to admit of freezing taking place; but if the communication of cold to the surface of the liquid be hastened by a violent impulsion of the air, which immediately adjoins its surface, and substituting (which the wind does) a more cold and dense air, such as is requisite for occasioning congelation, the subtile exterior matter imposed on the liquid will be weakened, and, by this means, that in the interior as well, which must necessarily lose in its action as much as the external, in order to preserve an equilibrium. Nevertheless, should the fresh airs remain at rest, freezing would not succeed; but if continually cold air in succession should drive away that which preceded it, until that which should be of a temperature to excite freezing should be in contact, it is evident, that ultimately it must communicate its frigidity to the liquid, and paralize the motion of the internal matter so as to occasion frost; thus wind produces frost, as a fan excites in our frame the sensation of coolness, by expelling from around us the airs warmed by our secretions and breathing.

The third accidental cause of the formation of ice is, the diminution of the exterior heat of the sun, arising from the distance of its source, the oblique and ungain disposition of the surface which receives its rays, and, lastly, the interposition of vapours, and dense and dark atmosphere, such as a fog, which in measure intercepts its rays. It is to be observed as well, that the obliquity of the globe causes the solar rays to be intercepted by a greater column of air.

There are besides many other accidental causes, such as climate, local circumstances, and the suppression of the central aspirations, or vapours, which are continually arising from the bosom of the earth. Many naturalists, and particularly a celebrated academecian, M. Dortous de Mairan, have maintained the theory of a central fire.

From this short dissertation, and from examination of circumstances, it is easy to conceive that the sea may freeze in the neighbourhood of the poles, even as far as forty leagues from the shore;* and that considerable masses of ice may be met with at sea; but how are we to account for the pyramids, the islands, and towering heaps of ice of six or eight leagues in length which are found floating? These mountains of ice, formed at first by the union of different masses, owe their height to snow, and rain, frozen on its reaching them; and I am inclined to imagine, that when become of a certain size, they always increase in bulk. A learned Englishman, who wrote in the middle of the last century, adopted the idea of their being perpetual, especially near the poles, and computed that they rose so high as to cause the figure of the earth to be sensibly lengthened thereby at the extremities of its axis:† It is on this theory that he explains the elliptic appearance of the shadow of the earth on the disk of the moon in two eclipses, the one observed by Kepler, the other by Tycho Brahè; but all these reasonings are unfounded. The sea is not frozen round the poles for a greater distance than fifteen or twenty leagues from land, and the mountains of ice which various navigators have seen have no more effect in altering the rotundity of the globe, than five or six grains of millet floating on the surface of a globe of four or five feet in diameter.

The twenty-second, the wind was N. W. a very fresh gale, the weather foggy, with a heavy sea; and perceiving every appearance of a tempest, I decided on making land, to take shelter in the gulf of Patrixfiord. At eleven in the morning, during a moment's

* Memoires de Trévoux.

† Mr. Childrey's History of the Singularities of Scotland.

clearness, I saw several vessels which were making for different ports, to shield themselves from the threatened storm. For my part, I preferred the gulf of Patrixfiord, because one of the directors of the Danish company resided there, and the whole of the coast offered so secure a road, that, using an expression of Virgil, we may justly denominate it, "Sedes tutissima navi." I entered the gulf, sounding all the way; I found continually from thirty to thirty-five fathoms water, with a muddy bottom, and when I had doubled the warehouses of the company, which I left to leeward a quarter of a league distant, I anchored in twenty-two fathoms, with a muddy bottom. I stopped with the anchor apeak for some time, while we sounded all round the frigate, and, when I found no danger to be apprehended, I let out eighty fathom of cable, and moored S. E. and N. W. I then bore N. N. E. upon the warehouses of the director, the pyramids of stone, which are the point of the gravel lying N. five degrees E. and the first point out of the gulf bearing N. W. a quarter N five degrees N. I could have anchored nearer the shore more deep in the inlet, but it would not have been so advantageous a position to sail from. The proper time to anchor is on bearing N. and S. of the point of gravel.

As soon as my frigate was moored, I went to the director of the Danish company, whom I informed that the bad weather had forced me to anchor there: that the king of France had sent me to preserve a proper discipline and good order among the fishermen, and to hinder their trading with the inhabitants of Iceland, or doing any thing which might be considered as infringing the privileges of the company. The director received me with a cool civility, and did not appear to give much credit to what I said. It had been told him, that there were three French frigates in that latitude, for the purpose of protecting a smuggling trade with the inhabitants, and that we certainly had bad designs; but very soon he was dissuaded from such an opinion, and convinced of the contrary. The order which I preserved quickly destroyed the wrong impressions which had been stamped on his mind respecting us. I always kept a guard in my row-boats, never suffered any but the officers to go on shore, and, for any thing I wanted, addressed myself to the director.

The day after my arriving in the bay, the wind being still N. W. the sky clear, and the weather sufficiently mild, I sounded the roadsted, and took bearings. For several days I continued the same employment. I determined the position of the principal points by means of a rule with copper mountings, furnished with a telescope, and contrived to form a plan of the bay, on which reliance may be placed, as well for luffing as for anchoring, although not laid down with the nicest precision.

The twenty-ninth, at noon, a violent gale of wind arose from the N. E. which lasted forty-eight hours. As I was moored at the foot of a high mountain, which covered the station, the sea did not run very high: but the swiftness of the clouds, and the whistling of the wind in the rigging, shewed the force of the gale. The cold was intolerable; Reaumur's thermometer was on the thirtieth at 4° below 0. The storm drove to the entrance of the bay several large fragments of ice, detached in all probability from the frozen ocean, which I had had sight of. The sight of these islets of ice surprised me less than the information which I received of the road of Patrixfiord having been, as it were, covered with ice on the fourteenth of May. This is however what the director told me, as well as several of my officers. The storm occasioned thirty-six fishing vessels, French and Dutch, to go into port; several of which had received damage, which I caused to be repaired with diligence; so that in three days such as had been injured were in condition to return to sea.

SECOND PART.

CONTAINING A DESCRIPTION OF ICELAND.

During my stay in Iceland, I neglected nothing in making myself acquainted with what was remarkable in this island, such as the mode of living of its inhabitants, their manners, their religion, and government. I paid attention to all these, and the frequent conversations which I had with Mr. Olave, who had dwelt a long time at Patrixfiord, and who was very learned, gave me information on every subject which can be gratifying to the reader relative to this country. Some writers have spoken of this island but merely from the report of a few fishermen, or sailors, very ill informed, and very incapable of giving due regard to things. Mr. Andersen, burgomaster of Hamburgh, who published the natural history of the country in German, obtained all that he collected relative to Iceland from the oral testimony of fishermen. Mr. Horrebows also has given the world an historical and physical description of the island, in the German tongue, with critical observations on the history of Mr. Andersen. These two authors frequently contradict each other. We have as well a description of Iceland by Pieriere, author of the system of Pædamites. These are the three writers who have furnished us with any knowledge of Iceland; but as all their histories are replete with errors, I conceive that the reader will not object to a more exact and faithful account here offered him. I shall follow the steps of Mr. Horrebows, who was born a Dane, and is best informed.

The island of Iceland is situated in the north sea, between 63° and 67° N. latitude, and between 15° and 30° W. of Paris. The etymology of the word is derived from ice and land. The frost, which is so severe, and in the mountains, which are constantly covered with snow and ice, gave origin to the word.

Iceland is one hundred and thirty leagues long, of twenty-five to a degree, and seventy leagues wide; it is only seventy-eight sea-leagues distant from Ferro, and thirty-five from Greenland; which, on the coast opposite to Iceland, is inaccessible, from the ice and rocks which surround it.

History does not positively fix the period of the discovery of Iceland; some writers have taken it to be the Thule of the ancients, mentioned by Virgil, lib. I. Georg. I rather imagine this Thule to be Ireland, one hundred and sixty-four leagues from Iceland. Angrinus Jonas, author of the Icelandic Chronicles, refutes the opinion of writers, especially Pontanus, who contended for Iceland being the ancient Thule, in his Specimen Islandicum.

This island was discovered in 798 by Nadocus, who called it Sneeland, on account of the great quantity of snow with which it was covered. In 872 a Swede, named Gardanus, observed it more particularly. The following year a Norwegian pirate, called Flocco, gave it the name of Iceland; and in the year 874 Ingulf, or Ingultus, a Norwegian nobleman, took refuge here, in consequence of having killed two barons of his country. He found it uncultivated, and very thinly inhabited; he is said to have been its first king.

Every thing I have said shews that Iceland was very little known, and the first ideas we have had of the country originated in Mr. Andersen and Mr. Horrebows.

The maps of this island have been hitherto very defective. Europe had no other map of it than that of Andrew Velleius, a Dane, engraved in 1585, copied by the Dutch in 1698, and by Mr. Bellin in 1751, for his reduced chart of the North Sea. This skilful hydrographer, whose useful labours have furnished us with so fine a collection of plans and charts of every kind, presented me with a map of this island on a

large scale, reduced from a greater drawn by Danish surveyors from actual observation, and finished in 1734; I found it however very bad and highly dangerous. In my two voyages I neglected nothing in correcting it; and I flatter myself that all navigators will be perfectly satisfied with that which Mr. Bellin is about to publish from my remarks and observations.

Iceland is, as it were, nothing but a heap of mountains and rugged rocks, which cut each other in parallel lines nearly in the direction of the cardinal points; but between these rocks and mountains are fine vallies, furnishing good pasture for flocks. These mountains are almost all barren, and continually covered with ice and snow. Many of the mountains are volcanic, but the most famous in the island, and even in the whole world, is that called Heckla; in 1766 it vomited forth such a prodigious quantity of stones, that the sea was covered with them for twenty leagues from the shore in the southern part. It is nowise surprising that these stones should float, penetrated as they are by so violent a fire, that it consumes all their solid parts. The mountains which are continually covered with snow are called Joekul, or Jeckelen; they yield in the summer large torrents, whose troubled and dirty waters exhale a most feted smell. In the neighbourhood of these Jeckelen there are some mountains more lofty, but on which ice is not perpetually found, doubtless on account of saltpetre in them, which causes it to thaw. A singular circumstance is noticeable in the Jeckelen; they increase, diminish, become higher and lower daily; every passing moment adds to or takes from their shape; so that if desirous of following the steps of any one, who the day before should have travelled among them, the traces are suddenly lost at the bottom of an enormous accumulation of ice, which it is impossible to traverse; and if it be passed by a circuitous route to the right or left, the steps of the traveller are distinguishable again at the same elevation, and in the same line as the former track, which is a proof of the non-existence of the mass of ice upon the previous day; it must be confessed this phenomenon is singular.

That travelling is difficult in this country from this is easily deducible, there is no road for carts or carriages; the mode of travelling and transporting of effects is by horses; but in many places there is no means of advancing except on foot, when the merchants are obliged to carry every thing on their backs: add to which, the traveller is not secure of being able to pass one year by the same route he did the preceding; for thaws sometimes separate rocks in twain, which presents an invincible obstacle, and torrents rushing from the mountains precipitate into the roads heaps of stones, which cover and render them impassable.

Iceland at this time contains more than seventy thousand souls; before that terrible pestilence, known by the name of the black plague, which ravaged the whole of the north in the middle of the fourteenth century, it was much more populous. The Icelandic annals make no mention of this calamity, it is only known by oral tradition, that the infection existed in the vallies covered with a heavy dew, and that, as a preservative from death, it was requisite to fly to the highest rocks.

The maritime part is better peopled than the interior, on account of the prodigious quantity of fish which resort to the coasts, and the facility of trading with the vessels of the company established in different ports. It would be much more populous were it not for the frequent earthquakes, which have oftentimes destroyed numbers of the inhabitants, and whatever M. Horrebow, who ridicules M. Andersen for his remarks on the destructive igneous eruptions and earthquakes, may say, the recital of M. Horrebow himself will shew whether or no these fires are matters to be lightly esteemed. This is his own relation of them. "In 1726 some shocks of an earthquake were per-

ceived in the northern districts; after these a considerable mountain, called Krafle, began with a dreadful noise to vomit forth smoke, fire, ashes, and stones. Horrible sight for those who dwelt in the neighbourhood, and particularly for two travellers who happened to be passing below the mountain! To them, however, from there being no wind, not any accident occurred, the ignited stones cast up by the mountain falling back perpendicularly. It continued burning for two or three years; and, in 1728, the fire communicated to some mountains of sulphur situated near the volcano; they burnt for some time until the mineral matter had melted, and formed a river of fire which run from the mountain towards the south. The inhabitants established on the borders of a great lake, called My-Varne, three leagues distant from the mountain, were apprehensive of this burning river, which continued advancing towards their abode. They took away the wood of their houses to remove to some other spot; at length it continued its course, and proceeded to the farms and the lake before mentioned. There it overturned, burnt, and consumed a farm, called Reikchild, its meadows, and two other farms, named Groff and Fragrenes, situated on the lower shore of the lake. It at length discharged itself into the lake My-Varne with a frightful noise, causing an ebullition, a frothy whirlpool in the highest degree horrible." From this description of Mr. Horrebow, who certainly did not exaggerate, for he was very much inclined, being a Dane, to lessen the physical vices of an island belonging to Denmark, some judgment may be formed of the volcanic eruptions and earthquakes, to which Iceland is liable: it is certainly true, that it is subject to all sorts of catastrophes. Mountains are seen to sink in an instant, and lakes form; Jeckelen, or ice mountains, to melt, and throw out fire, uniting the double horror of flood and conflagration.

Springs of hot water are found in several districts of Iceland. Messrs. Horrebow and Andersen agree upon the singular effects of many of these springs, but the most curious of all these fountains is that situated near a farm called Raycum, in the district of Huzevig. There are three hot springs distant from each other about thirty toises; the water boils in each alternately. They rise from a flat surface; two of them throw up water from the midst of stones to the height of eighteen inches; the third has a round opening of the size of a brewer's vat, and throws up water ten feet high. What is surprising, these springs only play alternately, and after having boiled three times, which serves as a notice to those who are nigh to retire. It is remarkable, that when a stone of whatever dimensions is cast into them, the force of the ebullition is so great as to throw it back. M. Olave informed me, that the inhabitants of the neighbourhood of these hot springs use them for cooking their meat and fish, and that travellers heat water in them for making tea.

Marble is found in some parts of the island, and crystal frequently in the rocks. The crystal of Iceland possesses the faculty of doubling the objects which are seen through it. Mr. Horrebow conceives it to be rather a lapis specularis than a crystal. He is mistaken, as well as others, who have imagined it, from its leafy tissue, to be a sort of talc. Some have reckoned it in the number of selenites; but it is demonstrated to be a calcareous spar, which care must be taken in ranking with other substances resembling it. The excellent work of Huygens on light may be consulted upon this subject, with the Memoirs of the Academy of Sciences, for the year 1710, p. 341.

Iceland contains in its bowels mines of copper and iron; and I myself have often found pure masses of these metals in the mountains. M. Horrebow certifies, that large lumps of silver are frequently found almost at the surface of the earth; this I never saw, nor ever heard of any body's finding.

Brimstone is met with both in the plains and mountains. It is discovered by the vapours rising from the earth, and in the vicinity of hot springs. It is always covered with a stratum of slime, or sand. It is of different colours, white, yellow, green, red, and blue. It is not necessary to dig lower than three or four feet to find exceeding good sulphur. Those places are preferred where there are small eminences, at the summit of which is a focus by which a hot vapour exhales. At a short distance from the eminence sulphur is met with in small detached lumps, but it is under the eminence itself that it is found the most compact and in the greatest quantity. The workmen who dig the sulphur mines take especial care to envelope their shoes with coarse woollen rags, in order to preserve their feet from the heat; in fact, the brimstone, when fresh brought from the mine, is so hot, that it is impossible to keep it in the hand.

M. Horrebow criticises M. Andersen, upon his saying that no wood is found on the island; he then gives an account of two or three forests, which he affirms are more than half a league in circumference. For my part I never saw any wood, and have been told that there is none other than brambles and small bushes, such as thorns and juniper: but nature, always beneficent, makes up this deficiency by the prodigious quantity of wood which the sea throws on shore in several parts of the island. On the coasts where this advantage is wanting the inhabitants make their fires of turf, and the refuse of fish, dipped in oil made from cods' liver. In many places old roots are dragged from the ground, which proves that the island was formerly covered with wood.

M. Olave shewed me pieces of a singular kind of wood found in sand, and at times in the midst of stones. This wood, to which he gave the Latin name of lignum fossile, is black, heavy, and resembles ebony. The Icelanders call it schwartzen brand, black brand. It is found both in broad and narrow pieces, and always among rocks surrounding it. This wood, if it be wood, deserves the particular attention of naturalists. I give here the substance of what M. Olave says of it in one of his letters. "Some persons rank fossil wood among the class of petrefactions, but improperly, perhaps owing to their not having seen it itself. The nature of it, in which it bears resemblance to wood, of splitting, being cut, and receiving a fine polish, sufficiently proves the contrary. Nevertheless this fossil genus is not wood, nor vegetable, since it does not possess proper vessels for the reception of alimentary juices, nor either throws out roots below, or spreads its branches above the earth. It is called black brand by the Icelanders. It thrusts itself from the fissures of dirty rocks, either abounding in bark, or for the most part earthy; on the inside it is curious for its very fine grain, which runs in the course of its length; in its most internal part, where most perfect, it is wavy, and does not yield to ebony. Hence it is turned by the inhabitants of the towns into stands for caskets, tables, &c. Heavier than any other wood, it sinks in water, is not liable to rot, nor easy to be consumed by fire, burning like earth. In its substance it bears resemblance to wood, in its origin to minerals; whence can it be that in Iceland, where it was first produced, it should be so long unknown, and its nature for so long a time be unexplored? How comes it that a matter so curious has not been thought worthy the trouble of more diligent inquiry?" The reader may not be displeased with my producing this fragment of a letter, which may serve to make him acquainted with the nature of this fossil wood.

A botanist would find much to observe in Iceland. I shall not detail the numerous salutary plants which the earth produces in large quantities, many of them unknown in France; these matters are not in my way, but I could not refrain noticing, while I admired the wise bounty of Providence, that those simples the most necessary to the inhabitants were the most common, such as garlick, sorrel and cochlearia; excellent preservatives against the scurvy, which is the most prevalent malady of the country. An-

gelica as well is met with every where, it grows so plenteously that the inhabitants often live upon it themselves, and give it to their cattle; it is moreover of a most exquisite flavour, and extraordinary size.

But the most singular and valuable plant is that which is found upon the rocks; it is a species of moss, which very much resembles lungwort, or ladies' wild-wort. Many Icelanders make flour of it which they prefer to wheat: it is called by them fialla-gras, or rock-grass. M. Olave sending me at the same time a handful of it, thus speaks in praise of the plant in one of his letters. "I send to you, sir, a herb, which resembling lung's-wort serves among the Icelanders as a succedaneum for bread, it is called Iceland moss, and grows on the rocks of the loftier mountains, so that with truth we may say, God gives us bread from stones. It never grows in earth or soil of any description, nor casts forth roots. It affords us a noble feast; the powder of it, taken most frequently in milk, is so pleasant and salubrious, that I prefer it to every kind of flour; it is besides an excellent stomachic, and a most safe medicine in dysentery." The reader will perceive that M. Olave who is well versed in botany, attributes highly salutary qualities to this plant.

Pulse and fruit do not grow in Iceland, owing to the excessive cold, according to M. Andersen; and notwithstanding what M. Horrebow may say, who affirms that he ate currants from the garden of the governor of Besested, I believe it to be as difficult to raise turnips in Iceland, as pine apples at Paris. It is at this time impossible to grow corn there; and the regulations respecting agriculture, which are used as an authority for the supposition of its having been formerly cultivated, do not prove the fact; for the wisdom of legislators every day provides for occurrences that never happen.

There are no wild beasts in Iceland. Sometimes bears are brought over on sheets of ice from Greenland; but as soon as they land and are perceived, they are shot, or killed with javelins: they come over of different colours, black, white, silvered, and striped, but never have time to multiply.

The only undomesticated animals in Iceland are foxes. They are black, blue, red, and white. In order to collect a number of these animals, the inhabitants place in the fields a dead sheep or horse, whose carcass, exhaling a strong smell to a great distance, draws together the foxes around it; somewhere in the neighbourhood the sportsman fixes himself, having beforehand built a place from which he can see, without being seen, and whence he is enabled to kill four or five foxes at a shot.

There is a plenty of horses in Iceland, of a small race, coming, according to M. Andersen, from Norway; according to M. Horrebow from Scotland; probably neither is in the right. However that may be, they are strong and swift. In the mountains are thousands of them, which for several years never enter a stable; they possess the instinct of breaking the ice in order to get their food. The saddle horses are kept in the stable all the winter; but when an inhabitant wants any for labour, he sends his servants into the mountains, who gather them together, and take them with halters. The horses taken in the mountains at five years old generally become the handsomest and most vigorous of any.

The Icelanders raise numerous flocks of sheep. Every farm has its flock, and some farmers have as many as five sheep walks. In some districts they are left to wander all the year about, and even during the winter, in the mountains. The only precaution used is to separate and take into folds the yearlings, who, not being so well fleeced as the older sheep, would not be able to support the cold. These animals are obliged to make a hole in the snow in order to get to their pasture: it is a very precarious possession to the inhabitants, who oftentimes lose the fruit of all their cares in an instant.

When it snows and the wind is violent whole flocks, obliged to yield to its violence, are driven to the sea shore, whence a successional tempest carries them off to sea. M. Horrebow reports his having seen some which the force of the wind had taken four leagues out to sea. It often happens when the sheep are in the fields in winter time, while it snows and freezes, they huddle themselves together, their fleece then becomes frozen in such manner that they cannot separate, having above them more than twenty feet depth of snow. In this situation they remain until the weather allows of their being sought for and released. At times they are safely relieved, at others they are smothered by the weight of snow, or strangled by the foxes, which are always persecuting them. A singularity which appears fabulous is related by M. Andersen. He says, that when the sheep are obliged to remain some days in the snow, hunger causes them to feed on their wool, and that they subsist themselves in this manner until they meet with succour. This I have myself been assured in the country is a fact: I was even f.....er informed, that when the farmer discovers any possessed of this mania, he kills them, as it is injurious to the fleece of the others, which is their only protection from the cold. The wool of the sheep is very fine, but varies in quality according to the quarter of the island, which is of great extent.

Iceland has plenty of bulls and cows of small size. The bulls have a game flavour, the cows give a quantity of milk,* some ten gallons a day, of an excellent quality; it is both meat and drink for the sick; skimmed, it forms the principal beverage of those who are well, it is called then syre. It becomes sour as it gets old; it is then esteemed good and wholesome: when too fresh, they even mix the juice of sorrel with it.

The game of Iceland consists of woodcocks, snipes, and partridges. The partridge called by the natives riper is white, it is larger than ours, and has its feet covered with a down similar to that of the rabbit: partridges in Lapland are white plumed as well, and as large as those of Iceland. The Icelanders shoot them, or take them in nets.

Iceland is full of an infinite number of birds of prey of every kind, such as eagles, vultures, hawks, falcons, owls, crows, and many others, both with distinguishing names, and without them. Of all of them the falcon is best worthy attention. It is met with, white, a light gray, and gray. It is well known that the falcons of Iceland are the best, they are larger and stronger than those of other countries, and hawk for more than a dozen years. The king of Denmark sends for some every year. He gives two guineas of our money for a gray falcon, and seventy shillings for a white one.

There is plenty of aquatic fowls, such as swans, geese, ducks, plovers, &c. but the most remarkable, and the most gainful to the inhabitants, is the duck which yields the eiderdown. This duck brings two-fold profit to the inhabitants; it lays excellent eggs, which it may be made to renew three times, and it gives a precious down.

This bird forms the inside of its nest of the down which it tears from its breast, afterwards it lays three or four eggs; the inhabitant to whom the nest belongs takes away the down, and the eggs; the female strips herself again, and lays other eggs, which a second time are taken away: the male then strips its breast of down, and the female lays eggs for the third time; but these are left her, since if taken away the third time she would lay no more, and would leave the district, which would be an unfortunate event, and a considerable loss; as the young ones the succeeding year return to multiply on the place which gave them birth. M. Andersen relates that he had been told that the Icelanders put a stick half a yard long into the nest of these ducks, in order to make the female lay as many eggs as would cover the height of the stick, in order to hatch them.

* For want of hay the inhabitants feed their cattle on the refuse of fish boiled.

I am surprised that M. Andersen could repeat such idle tales; for my part all that I relate is credible. During our stay in Iceland we killed a number of these birds, both male and female, and I remarked that the down taken from the male, which has many white feathers, is much more fine and delicate than that of the female.

The quantity of fish of every sort with which Iceland abounds is astonishing: they are fished for all the year about; but the most suitable season is from March to September. The fishery produces herrings, cod, haddoc, hollebut, soles, plaice, maids, mackarel, ray fish, &c. All these fish are well known, but we caught of them some unusually large; a maid one day, for example, which weighed three hundred pounds. The most singular fish of this island is that we call the wolf-fish, which the Icelanders name steen bit (stone-eater;) when opened, it is always found full of little stones or gravel: it feeds also upon small cod, which it is continually pursuing. As often as the weather will allow, the Icelanders go fishing in the bays, or even as far as a league or two to sea; they embark for the purpose in small boats, which are called by them yawls. The most common and most advantageous fish for the inhabitants is the cod, which they know by the name of forsch; it is their principal article of barter; they maintain themselves by exchanging it against whatever they have occasion for. It is this fish that the French and Dutch go to fish for in the months from March to September. The vessels they use are called doggers, and are of about an hundred tons burthen. The fishery begins at the head-land of Bederwick, and ends at the point of Langeness, going round by the North cape and the island of Grims. The people fish with the hook, which is furnished with a bit of raw meat, or the heart of a fish newly taken. The French and Dutch doggers usually fish at the distance of five or six leagues from shore, in forty to fifty fathoms water. Many vessels even go fifteen leagues to sea, and fish in one hundred fathoms water. When the cod is taken the head is cut off; it is well washed and cured, and afterwards put in casks with rock or Lisbon salt. Thus is this fishery carried on, which employs annually about eighty French and two hundred Dutch ships. Cod fish thus prepared is white and delicate, rock salt contributing to preserve its whiteness, not precipitating a dirty sediment, like French salt. It is surprising, on noticing the great quantity of cod that is annually taken on the great bank, in the north, &c. that the sea should not be exhausted; but a naturalist, who had the patience to enumerate the eggs of a cod, and who found in one only 9,344,000 eggs, has sufficiently satisfied us that its increase must exceed its destruction. After the cod the most common fish is the herring, along the coasts, and throughout the north sea, the fishery of which is infinitely productive to the hyperborean nations. This fish is so numerous, that it is calculated that the whole taken by the fishermen of the north bears proportion to the number which populate the sea as one to a million only. This fishery supports more than one hundred thousand people in Holland. M. Huet values the annual produce of the Dutch fishery at twenty-five millions, of which seventeen millions are gain, and the expences eight. Doot affirms that in 1688 the number of four hundred and fifty thousand Dutchmen were employed in the herring-fishery and its concerns.

A great number of whales are met with, particularly in the summer, on the coast of Iceland. I have seen twelve or fifteen together, five or six leagues from shore, north of Bird's island; I fired about twenty cannon-shot at them, to exercise my gunners, and wounded several. In Iceland they catch a quantity of salmon; and in the lakes, such as the Myvarne, of which I have before spoken, numbers of excellent trout are met with, which the inhabitants dry and salt. Eels as well are very common; but the Icelanders have a particular antipathy to them.

W. Shaw sc.

Lady of Iceland

[illegible] VOYAGE TO THE [illegible]

[illegible]

After describing the productions of the island, it is fit I should notice the constitution, labours, and private life of the Icelanders. These people are of a common size, and robust nature, enjoying their health admirably; a manly education, a sober, frugal, and laborious life, no doubt contribute to give them this temperament. They are mostly nimble and well made, have fine teeth, and generally light hair. The women are not of so strong constitution as the men; their occupations are very light, they work and prepare the wool, and their most laborious employment is hay-making. Their labours are not so easy nor so fortunate as M. Andersen describes; they do not proceed to bathe, and resume their different work immediately after laying-in. In the different places I resided at in the country my surgeon delivered several, and always with the same difficulty, and I know that they always kept their bed for a week. I have even been informed, that for want of midwives, surgeons, and necessary assistance, many women are lost. The Icelanders have no good surgeons, nor skilful physicians; nevertheless, after fifty years of age they are much in need of them; it is then that they begin to be attacked by disorders and infirmities. A man of eighty years of age is seldom seen on the island. They die chiefly from complaints in the breast, the scurvy, and obstructions. They call almost all the disorders which are fatal by the common title of landsarsak. They have an hereditary complaint differing little from the leprosy, but not contagious. It will perhaps appear surprising that the Icelanders, whom I have described so vigorous, should become infirm so soon; but respect must be had to their rude occupations, and the sedentary life they lead. They have no public exercise, no games, no dancing, and both by night and day in fishing are subject to the inclemency of the weather; or if they inhabit the interior, they never leave their home without getting wet at feet, from the number of rivulets and torrents which fall from the mountains covered with ice and snow. The Icelanders bring up their children with great tenderness, and do not wean them earlier than in France. M. Andersen, is deceived in imagining that they do not suckle more than eight or ten days; but (without offence to M. Horrebows) he is correct in stating that when a child is carried to be baptised, a bit of linen dipped in milk is put into its mouth: I have seen and can certify the truth of this. Their mode of bringing up their children surprised me; they put them in breeches at the end of two months.

I have observed that the life of an Icelander was sober and frugal: the reader may form an estimate of it from their meals; they live during the summer principally on cod's heads, and in the winter on sheep's heads: they cut off the heads of the cod to dry or salt the fish, and they are mostly consumed at home. A common family make a meal of three or four cods' heads boiled in sea-water: they boil every thing. The sheep's heads which they consume in the winter are the remnants of the mutton they salt for trading with. They put them in a kind of vinegar for keeping. The vinegar is made from skimmed milk, the juice of sorrel, and other strong herbs. All their dishes are cooked without either salt or spice; butter is the only sauce: milk however is their principal food. Bread is very uncommon in Iceland; the poor are unacquainted with it, living on dried fish alone: those in easy circumstances eat bread on high days, such as wedding and baptismal days, and where particular company visit, &c. This bread is brought from Copenhagen: it consists of broad thin cakes, or sea-biscuits, made of rye flour, and extremely black.

The dress of the Icelanders, particularly the women, is singular: I do not speak of the officers of the law who come from Denmark, and who dress after the manner of their country, but only of the inhabitants of Iceland. The men dress in much the same manner as seamen; they have a jacket shaped like a coat, and a good cloth waistcoat, with breeches of the same. They have four and even six rows of buttons to their waist-

coat, and as they are always of metal, either copper or silver, they serve for ornament. The fishermen wear above it a coarse smooth waistcoat, and a large skin jacket of leather or sheep's skin; they rub this over with the oil of fish's liver or grease, to keep out the rain, and preserve it. The rest of the body they cover with a sort of pantaloons of leather, which supply the place of breeches, stockings, and shoes. They have large flapped hats, which keep them from the inclemency of the weather when they go a fishing. The women wear gowns, jackets, and aprons, made of a cloth manufactured in Iceland, called wadmel: over their jacket they wear a very wide robe, pretty much resembling that worn by the Jesuits, but it does not reach down so low as the petticoats, which are exposed. This robe is of a different colour, mostly black, and is named hempe; it is trimmed with a velvet binding, or some other ornament. The rich wear down the front of their hempe several ornaments of silver. They trim the bottom of their aprons and petticoats as well, and the seams of their jackets, with silk ribbon, galoon, or velvet, of a different colour. They wear a stiff collar three or four fingers wide. This collar, or necklace, is always of a very fine stuff, or velvet, embroidered with gold or silver. Their head-dress resembles a cone, or a sugar-loaf, of two or three feet high; it consists of a kerchief of very coarse cloth, which stands erect, and is covered over by another finer kerchief, forming the figure I have mentioned. Both men and women wear shoes of fox's or sheep's skin tanned, and sewed together by the women. Their shoes have no heels, but are fastened to the instep by small straps.

Messrs. Horrebow and Andersen do not agree about the dwellings of the Icelanders. The first, who sees every thing in a brilliant point of view, describes the houses of the rich; the latter, who only wrote from the relation of fishermen frequenting the coasts, pictures the cabins of the poor. The descriptions of the former are too magnificent; the account of the other is not very wide of truth. Entering a house, says M. Horrebow, you meet with a deep passage, six feet wide, at the top of which are cross rafters roofed over. In the passage, from space to space, are round openings to admit the light; they are closed with small panes of glass, or more commonly by small cask hoops, over which is stretched a parchment made from the bladders of bulls and cows: this parchment is called hinne; it is very transparent. At the end of this passage is the common entrance to the house. In the front of it is a room fourteen ells long by eight broad, which the Icelanders call the stove; this apartment is generally the working room: the women dress the wool, make clothes, and do other household work in it. At the end of this there is mostly a bed-room for the master and mistress of the house: above, the women servants sleep, and the children. There is usually besides two other apartments on each side the passage; one a kitchen, another a pantry, the third a dairy, and the fourth and last a bed-room, near the entrance of the passage, for the men servants; this apartment is with them called Skaule. In the roof of every room are openings as in the passage, for the admission of light through frames of hinne; but the work room is ordinarily lighted through two glass windows: besides these different apartments, the generality have besides, adjoining the skaule, a parlour, to receive strangers in. Near the dwelling-house they have a small building, called forge, where all their works are carried on. Every inhabitant, in addition to these, has his stable, his cow-house, and sheep-pen. The Icelanders do not house their hay, but place it on a high spot, surrounding it with a ditch, stacked in heaps six feet high and six square. They place these stacks at small distances from each other, which they cover with turf in a sloping direction, so as to carry off the rain to the ditch. This is the description Mr. Horrebow gives of the common houses of the Icelanders; afterwards he wainscots the apartments, and ornaments them with glasses and furniture. The richest people of the country, it is true,

have their houses portioned out in the manner above mentioned, but without pannelling, glasses, or gaudy furniture. The rooms, the bed-chambers, or even the parlours appropriated to the reception of strangers, are rarely floored: a table, some chests or wardrobes, and a stove, these complete the furniture of the most easy; the poor and the fishermen have only a wretched cabin, half under ground, the lower part of which is occupied by cattle, and the upper part, separated only by a few straggling planks, serves for the residence of the masters, their children, and servants: for the rest, all the houses are covered with turf. Nevertheless, in towns, such as Hoolum and Skalholt, the houses of the bishops and mayors are built of brick, stone, and wood, and are covered with planks; but they are very expensive, since almost all the materials are brought from Copenhagen. A heap of houses scattered at a distance is called a town with them.

The Icelanders are not so vicious as Mr. Andersen relates, nor so virtuous by much as Mr. Horrebow asserts them: they are good-natured, mild, humane; but lazy, mistrustful, and drunkards. The factors of the Danish company, who have warehouses on different parts of the coasts, give them brandy in exchange for dry fish, wool, and other merchandise of the country; and this trade furnishes the inhabitants with the means of inebriation. They did not appear to me to be courageous: I have however been informed that there are Icelanders among the troops of the king of Denmark: they are good sailors for coasting. The Dutch, who attend the fishery, frequently entice them to serve on board their vessels. They are judicious, fond of the arts and sciences, play much at chess, and are greatly attached to the game. Many of them whom I met with speak Latin: numbers of them go to study at Copenhagen, and with success. There are as well colleges at Skalholt and Hoolum, to which the Icelanders send their children, who most of them make progress in liberal knowledge.

In the year 1000 they were plunged in the darkness of idolatry. They paid divine worship to Jupiter, under the name of Thor, and to Mercury, under the title of Odin: these were their only divinities. The catholic religion was some time after established, but in succeeding times banished by Christian Third of Denmark: at present they are Lutherans of the church of Augsbourg. This doctrine was not established among them without bloodshed. A catholic bishop, of the strictest virtue, at the head of a powerful party, resisted the progress of error; he maintained himself for a long time, but became the victim of his zeal, it costing him his life.

The Icelanders trade with a company of Copenhagen, which has an exclusive privilege, the price of a certain consideration paid to the king. This company, which I have before mentioned, establishes factors or directors in every part, who have warehouses full of goods, which in course of the year they sell to the inhabitants. This continual and daily sale does not hinder a great consumption every year, at the arrival of every vessel in either of their ports. The articles of exportation consist of dry fish, salt mutton, salt beef, butter, fish oil, tallow, wool in the grease, wadmel, fine and coarse jackets, woollen stockings and gloves, sheep and foxes skins, sulphur, feathers, and eider-down. The articles of importation consist of all sorts of iron ware, dry bread, beer, brandy, stuffs, flour, fishing-tackle, planks, carpentery, tobacco, and horse-shoes. The Icelanders barter the productions of their country against whatever they need. Money is scarcely known among them. All sales, all contracts, in one word, all business is negotiated for fish, and with such every thing is paid for according to valuation: an ell of pig-tail tobacco is the price of a fish. Thus fish and tobacco may be considered as the money of the island.

The government of Iceland remains to be mentioned. This island is divided in four parts, or provinces, the northern, the eastern, the southern, and the western, governed

by bailiffs. There are eighteen or twenty cantons, each of which comprises fifteen or sixteen parishes. All these parishes are directed by two bishops; one governs the northern, the other the southern part. The seat of the sovereign council is Bessested, under the direction of a grand bailiff, who resides there. The king, for the receipt of taxes, maintains a seneschal at the same place. These two principal officers render an account to the governor-general, who dwells at court. This is the whole of what is interesting, without extending beyond the bounds I have prescribed to myself, which I can say of Iceland. I now take up the thread of my journal.

THIRD PART.

CONTAINING THE COURSE FROM ICELAND TO BERGHEN; DESCRIPTION OF BERGHEN, OF NORWAY, AND THE PEOPLE SITUATED NORTH OF NORWAY.

As I had ordered all the fishing vessels, which the gale of wind of the twenty-ninth of May had obliged to take shelter at Patrixfiord, to inform the whole fleet that I should remain a fortnight longer in that road, in order to be nearer to render them assistance, and that they might not be under necessity of groping for me, as it were, in foggy weather, I remained in the same position to the fifteenth of June. I shall here remark, that any king's ship which may be sent to protect the fishery can never be more effectually serviceable, than by giving a general rendezvous to all vessels who may stand in need of succour or repairs; for the fishery of Iceland is so extensive, that it would require four frigates for its protection; and there are in these climates such thick fogs, that it is sometimes impossible to perceive a vessel at the distance of musket shot.

The fifteenth of June, in the morning, in the prospect of a south wind, I caused a small anchor with a towing line to be heaved out to the S. S. W. to be the better enabled to raise it easily and quickly either from the frigate, or by means of my long boat. The strength of the anchorage, the depth of water, and the projection of the inlet, inclined me to this expedient. It was calm all day, I weighed my two main anchors in the afternoon, and at nine in the evening, the wind southing, I set sail. I did not ship my oared cutters before I was out the points, lest it should have fallen calm, and I have need of them to tow me. I forgot to observe that south of the southern point of Patrixfiord, outside, is an inlet of yellow sand, which serves as a mark at four leagues distant, and is a beacon on that side.

The sixteenth, I took bearings along the coast. The seventeenth and eighteenth, the wind varied from W. N. W. to S. W. a light breeze, and foggy. The nineteenth, being in that part of the sea, and on the precise spot where formerly were several islands, under the name of Goubermans, I sounded and found one hundred and forty fathoms of water, muddy bottom, mixed with herbs.

The sketch of these islands was taken by some Danish engineers, who drew the map of Iceland. The Islanders relate that they formerly consisted of nine; that they were no more than four leagues from the main island, and that they were swallowed up during an earthquake: what is certain respecting them is, that they are noticed in all maps, and that there now remains no vestige of them, their former residence being that part of the coast where now is the greatest depth of water. It is not more difficult to imagine that these islands may have been swallowed up by an earthquake, or owing to subterraneous fires, than to conceive, as does a celebrated naturalist,* that Iceland itself

* Egerhardus Ola. de Igne Subterraneo, page 14.

is the production of a volcano, thus being a child of the earth. The same day at noon, having taken the latitude, I perceived myself exactly upon the line of the polar circle: I was desirous of continuing my course towards the north; but was stopped by a chain of ice which extended from the North Cape as far as the eye could distinguish to the N. W. I did not choose to expose myself to it with a frigate of a weak description, which was leaky, and which from its length was difficult to navigate amid islands of ice. I thought it therefore expedient to veer about to the south; and as I was obliged to go into some port, in order to take in wood and provisions, I preferred Berghen in Norway, whilst the fishing vessels were employed in seeking a passage between the ice, to reach the isle of Grims and the point of Langerness.

On the twentieth at midnight, as we were steering W. S. W. to pass at large the island of Birds, the wind N. E. and the weather foggy, a cry from the forecastle warned us of being upon the ice. At the same instant I saw on the starboard quarter large pieces, which made part of a bank of ice, the extremities of which were before me. I immediately brought the ship to larboard, to double it with the wind, and passed so nigh, that I struck against several detached fragments, but without damage, although the frigate received rather rude shocks from the contact. It may not be useless here to mention some expedients, which may be of service to those who should for the first time be entangled in ice. It is no ways wonderful that such persons should be intimidated at the sight of these enormous masses, which will frequently break of themselves about them with a horrid crash: their dread however will disappear, on learning that vessels have frequently taken shelter amid the ice, and that navigators frequently resort to it for protection from storms, on account of the sea being always smooth when surrounded by it; amidst it the vessel rides as if in harbour: but it is requisite to guard the outside of the ship with the ends of old cables, mattrasses, or paillasses. A ship may even be moored along-side a piece of ice, fixing in it iron crows of five feet long, to which small cables are fastened at head and stern, taking care to make them tight on board by means of the capstan. In the absence of iron crows, graplins and iron bars are made use of, which are driven into the ice with mallets. The sails are taken in and brailed, and a ship rides there as well as beside a wharf. Care must be taken not to moor to a mass of ice of too much elevation, since such are often subject to break and roll over. When the sight of an opening in the ice, a change of wind, or the neighbourhood of shore, induce to go about, the vessel is steered by help of her lashings, the same as in port. If desirous of breaking way, either to enter or to go out, two spare top-masts are taken, the thicker ends of which are lashed to the mizen-chain wales, and the two small ends are made to form a fork before the prow, which fork is supported by lashing under the bowsprit; this fork serves to separate the ice in front of the vessel. If it be not considered proper to use this tackling, a fragment of ice is chosen, in a small degree more elevated than the prow, which is steered upon under easy sail, and when got under the cutwater, all sails are set. This lump of ice, driven by the vessel, drives forward in its turn all those which obstruct the way of the ship, which by this means receives no injury.

The twenty-first, twenty-second, and twenty-third, the wind continually varying, and the sea running high, I steered S. S. W. and S. W. quarter S. and the twenty-third, at midnight, reckoning myself ten leagues W. of the Bird's island, I sounded, and found two hundred and five fathoms water, with sand as black as gunpowder. The quality of the bottom brought to mind what I had heard the captain of a fishing vessel say, that he had met with a rock N. W. of Bird's island, at a distance of seven leagues; that he had sounded all round, and found twenty fathoms water, with a bottom of black sand.

The resemblance of the bottom which I found with that of the environs of the rock seems to confirm the existence of it.

Before leaving Iceland, it is right I should impart to the reader the knowledge I was enabled to acquire of the ports situated west and north of the island. I shall begin with Adelfiord, north of Lusbaye, and shall continue the same to the point of Langerness. Adelfiord, or the bay which bears that name, is very extensive and deep, but the anchorage is bad for large vessels, as the coast is rugged, and it is necessary to anchor close to the shore. The fishing vessels lying at anchor have the poop so near the land, that the sailors go on shore by means of a plank laid from the ship's side.

The bay of Direfiord is as fine and as large as that of Lusbaye; there is no danger in entering it, care being taken of the squalls of wind which come from the gorges, as I before mentioned in speaking of Patrixfiord. The anchorage is good everywhere for vessels of war. At the bottom of the bay are two points in the shape of a sugar-loaf, which at sea are taken for two pyramidal islands, and which mark the bay of Direfiord on coming from sea.

The bay of West Norderfiord is as extensive as the preceding; there is good anchorage in the first inlet to larboard on entering, but it is suitable to those vessels only which mean to sail again directly; for shelter it is better to proceed higher up. In the middle of the bay there is twenty-five fathoms water; but at the extremity the anchorage is in sixteen to eighteen fathoms, with good bottom: there are rocks both on the larboard and starboard quarter on entering, but they are all above water.

The bay of Pikhol is too open, it is fit only for fishing vessels or corvettes, the anchorage is close to the minister's house, where there is shelter under the north point.

The bay of Bolk-Bogt is more properly a gulf than a bay; it is little known. The fishermen seldom proceed up it; notwithstanding, an owner or master told me that he had once sailed to the bottom of the bay, and that behind a point of land which projects he found most excellent anchorage, below the house of the factor of the company. He even said, if he were obliged to winter in Iceland, he should prefer this spot to any.

The roads of Seertel Bay are very fine, there is excellent anchorage for all shipping: a ship may anchor to starboard on entering, after doubling a point, but the best anchorage is at the foot of a remarkable cliff at the bottom of the Roadsted. These roads are distinguishable by a hill of gray sand, perceptible at a great distance.

In the Bay of Radkol there is anchorage in twelve fathoms water, with a sandy bottom. There is shelter from the wind on the south and the east, but with a N. or W. wind a vessel would be much exposed.

The roads of Rakbaye are very large and very good; fifty vessels of war might easily anchor in them; the best place for casting anchor is at the extremity of the bay, on the south side, half a league from shore. Drift wood is met with here, cast on shore by the sea.

In going out of Rakbaye the North Cape is on the starboard quarter. Eastward of the North Cape, on the side of the gulph of Orgel Bogt, there is a cascade or river, which falls in large volumes of foam, and with a considerable noise; it is a land's mark on the coast. This cascade or river is called Watalope.

In the whole of the gulf of Orgel Bogt, there is only the bay of east Nordefiord where a frigate can take refuge; its anchorage is to starboard on entering, two cables' length from the cabins of the Icelanders. The fishermen go for anchorage to the bottom of the bay; but they must pass a bar, over which at low water there is only twelve feet depth. The sea throws wood on shore here also; a river empties itself into

this bay, which abounds in salmon. At the eastern point of the gulf there is a reef, or chain of rocks, which proceeds farther out than is noticed in the Dutch maps. Eastward of this reef four islands are distinguished, pretty high and very lofty, the fourth is at the entrance of Klipbaye, where there is anchorage close to shore, either on the starboard or larboard quarter; but heed must be taken of a large bank in the middle of the bay, and which does not allow of luffing. Eastward of the four islands a large flat island is seen, called Ulakiland, at the foot of which westward there is an anchorage. This island is in the S. one quarter S. E. corrected, from the isle of Grims, where the anchorage is in the southern part. There is shelter from the north, but a vessel there must be prepared to sail upon its blowing S. E. or S. W. The tides run very strong, the direction of them E. and W. Good anchorage is found at the point of Roodchoke, in ten fathoms, with sandy bottom, south of a round rock, which is safe and very distinguishable; sheltered from S. E. winds. There is besides good anchorage at Oudeman, safe from all winds to S. but when it veers to the N. the ship must change her birth. This is the summary of what I learned from experience in my own vessel, and from several fishermen with whom I frequently conversed on this subject. Lower down I shall speak of the roads and ports of the east side. I do not conceive that any one will be surprised in reading this journal at noticing my entrance, whether by night or day, into all the ports of Iceland. No one is ignorant, that under the poles there is six months of day, and the same length of night; that the nearer the poles are approached, the longer the days and the nights, according to the season of the year. Every one knows also, that the sun gives its light by refraction when below the horizon; and that this is called twilight; that that which precedes the rising is called the dawn, or morning twilight, and that that follows its setting is named the twilight, or evening twilight; moreover, that the farther the observer proceeds from the equator, the longer the twilight. Thus it may readily be conceived, that in Iceland, which extends northward as far as the polar circle, by favour of the twilight a continual day reigns from May to September, so as to enable a person to read and write at midnight, and that the sun does not set below the horizon for eight days before and eight days after the summer solstice: that is to say, from the twelfth of June to the first of July.

The twenty-fourth the wind varied, making the entire circle of the compass; sometimes gentle and at others violent, but continually a heavy sea. I steered S. one quarter S. W. and the twenty-fifth at noon was in latitude 60° 58′, and longitude W. of Paris 19° 30′. By the map I perceived I was 3° E. of Ferro, 110 leagues distant, according to the chart of Mr. Bellin; and acording to the Dutch charts, from the same station, Ferro bore E. N. E. 42 leagues distant, making a difference of 68 leagues, or nearly 7° in that latitude. The rock at S. of these islands, according to Mr. Bellin, is in latitude 61° 17′: according to the Dutch 61° 44′: that is to say, 27° more N. These differences as well in latitude as longitude surprised me, and made me hesitate as to the course to steer. I resolved, at length, to make the southern point of the isles of Ferro, according to the latitude described by Mr. Bellin. I steered accordingly, and observed the variation of the needle in the evening to be the same as the day before, 23° 30′.

The twenty-sixth at noon, having made 43 leagues of way under a fresh breeze from the E. S. E. I observed the latitude to be the same as the day before, 60° 58′, and the longitude 14° 58′. As I had no difference of latitude after having steered E. S. E. for twenty-four hours with great circumspection, I conjectured that the difference arose from two points of wind, or 22° 30′.

The twenty-seventh, at three o'clock in the morning, having run E. one quarter S. E. with a N. and N. N. W. wind from the twenty-sixth at noon, the wind fresh with a high

sea, we made the Ferro Isles. I passed two leagues south of a rock laying south of the islands, and distant from them by appearance about a league. I perceived breakers at half a league from this rock. At noon I took an elevation under the land, and found, after making a back observation to try my former by, after noticing the bearing, and casting my log-book, that these islands are correctly laid down in Mr. Bellin's map. We found 18° of variation from two corresponding elevations. After doubling the isles of Ferro, I directed my course to the northward, to make the Shetland Isles; but not falling in with them on the twenty-eighth, at four in the morning, and judging, by the way I had made, that I must have passed them (for I had continually steered E. one quarter S. E.) I tacked to the S. E. one quarter E. to proceed to Berghen. I believe that the currents carried me towards the north in my passage from the isles of Ferro to Shetland. I must observe as well that in the passage I had two floods to one ebb tide.

The twenty-ninth the wind fresh and strong from the N. W. the sea very heavy, with a thick fog. In such weather I was not desirous of encountering the coasts of Norway. I kept under main and foresail, and employed myself in taking soundings, waiting for more favourable weather.

The thirtieth, at five o'clock in the morning, the weather brightening and the wind becoming lighter, I steered E. S. E. with a north wind to make land; but observing at noon that I was in latitude 59° 12′, I saw that I was too far to S. to enter by the way of Cruxfiord, which is the shortest and the most usual passage; I worked to windward, it blew N. and I steered N. E. As I was by observation 18′ more to the south than by my log, I sought for the cause of this difference in the position of the islands, and the coasts of the north, which, by the manner of their lying, govern the following course of currents. At flood the tide flows from the W. S. W. upon the isles of Shetland, and, changing its direction on ebbing, flows S. S. E. varying its course according to the line of the coast, as far as to the straits of Dover, but the waves meeting here with another flood, flow back, and throw themselves upon the coasts of Jutland, which sends them back to Cape Derneus, from which they take their course, direction, and motion, according to the position of the coasts of Norway: this, according to my opinion, is the cause of the current which runs always to the south on the coasts of Shetland, and that which runs always north on those of Norway: this general movement not interfering with the ebb and flow incident to each particular spot. It is here that I should notice the observations I made for knowing with certainty, by sounding, whether a ship be approaching the coast of Shetland, or Norway, which is of consequence and interesting for those vessels which cruise or navigate these seas, almost continually over-shadowed with fogs.

When in the middle of the channel between the isles of Shetland and the coast of Norway, or but little distant from the middle, there are 65, 70, and 75 fathoms of water, clean and fine sand. On nearing Shetland the depth does not diminish, it rather increases in different places; but the bottom is different, the sand is larger, darker, and mixed more with gravel the closer you get to shore. On the contrary, when approaching the coasts of Norway, the depth of water sensibly increases, the bottom changes, becoming more muddy, and this mud becomes less dark as you go near the coast of Norway. This channel is called the Great Tun by mariners, and the passage between the Arcades and the Shetland Isles in the north or south of the little island of Fairehil, which is in the middle, is called the Little Tun.

The first of July, at three o'clock in the morning, having steered E. N. E. with very little wind from the N. from the preceding noon, I made land; it was perfectly calm,

and nature was as it were asleep; but the sun appearing above the horizon re-animated her, and brought us a breeze; this is what is frequently experienced in the torrid zone; the reason of it is this.

During the whole of the day, the sun by its heat expands and causes to rise from the plains, and above all from the surface of the sea, aqueous particles and bubbles of rarified air, which it attracts to a distance from the earth. Those which ascend the last fall again almost immediately after sun-set; they approach each other in their fall, and cause that first coolness of the evening which is called serenity; but all the other particles which in the long course of the day have surmounted the gross airs, and become in equlibrium with the first strata of that air in a superior region, remain suspended there during the calm of night; at sun-rising the first rays of heat, being felt by the chilled and contracted air, necessarily dilute it. One mass of air expanded by the heat drives on another, which meets with resistance from a third; this motion of the air becomes a wind, and the atmosphere is affected by it in a less or greater degree.

At eight o'clock, being yet three leagues from shore, some Norwegian pilots came on board, who informed me that I was a great deal to the south of the passage of Cruxfiord, but that there was a passage two leagues north of where I was, and that if by luffing I could get up these two leagues (for the wind was north) they would take me into good anchorage, where I might wait for a south wind to get into Berghen. I luffed therefore, to head the wind. At noon I observed the latitude; and at four o'clock a storm arose, which determined the pilots to make the land, in order to seek the passage to the north of the isle of Bommel; through which they steered me to anchor at Ingeson. As the anchorage is difficult on the coast of Norway, that is to say, on the currents of Berghen, and as they require great precaution, I shall detail the methods I made use of in anchoring; it would be proper to inform the reader the first, what observations I made on the coast.

I first assured myself by three observations of the variation: the one an eastern, the other by azimuth, and the third meridional. The agreement of these three observations shewed me that the variation of the needle was 17° 50′ on the coast of Norway, under the isle of Bommel. I took the latitude at noon, and from the bearings I found the isle of Bommel to be 15′ more north, than what it is set down in the large chart of the Neptune. On my second voyage I made the same observation, and found the whole of the coast of Norway to be 15′ more north, than what it is described in the above-mentioned chart. In short, I remarked that the exterior grounds, and bed of the channel of Berghen, almost wholly resemble each other. There are everywhere rocks of the same elevation, fashioned and craggy alike; which renders making land a difficult matter, as nothing short of perfect experience can enable a person to know where to make for land. It may be said that in an extent of twelve leagues of coast on the side where I made for shore, there is only mount Bommel, in the island of that name, that is distinguishable from others. The objects of the continent seldom serve for land-marks, on account of their being generally hid by fogs, and covered with snow, besides being greatly in land. There are several passages to enter the canal or river of Berghen. From the isle of Shuttness to the town of Berghen is sixteen Danish miles, about ninety English, and in this extent of the coast there are eight passages to enter the canal. In coming from the sea to the north of Berghen, there are also two passages much frequented, the most northerly of which is only six Danish miles from the town. North of these are some other passages, but they are so little known, so little frequented, and so difficult, that they are not worth mentioning.

These are the names of all the passages, beginning with the most southerly; 1° Stavangerfiord near Stavanger, sixteen Danish miles from Berghen; 2° Schuttness, which is the beginning of the canals, fourteen miles distant; 3° Udeiro thirteen miles; 4° Bommelfiord eleven miles; 5° Solmenfiord five miles; 6° Papefiord four miles; 7° Cruixfiord three miles; 8° Jettefiord nearly three miles west of the town.

The two passages or openings which are frequented at the north of the town, are 1° Herlefiord; this passage is between two islands advancing some distance into the sea, known by the names of Henne and Feyer, five miles from the town; 2° Foensfiord: there is in the middle of the second passage a little lofty island, called Holmen Graac. It serves as a land mark: this passage is six miles from Berghen. It will be seen by what I have observed that it is better to make land south of the town, on account of there being in that quarter more passages than in the north; besides which, they are more practicable, and the currents run towards the north, the whole length of the coast; in other respects the wind must decide; the best latitude at which to make land I consider to be 59° 40′.

A vessel may make for land without apprehension; it is very safe; the coast of Norway presents a dreadful aspect everywhere, it is a continued chain of rocks, the sight of which makes one shudder; but nothing should prevent making for them; for as I before observed, a ship may range very close under them, and when at two leagues from shore, pilots always come out, unless there happens a storm; but in fine weather they proceed even as far as three leagues to get on board a ship: they row with all their might as well to be first, for the first boat which touches the vessel with an oar has a right to furnish a pilot, the others then return, but not without asking for biscuit or brandy, of which they are extremely fond.

I have before observed that the land may be approached at all times, however, when the weather is foggy, with a strong W. N. W. wind, unless the case were urgent, I would not advise making for shore, seeing that there is no shifting from a W. N. W. wind.

I return to my anchorage at Ingeson, and as all anchoring in the river of Berghen requires care, I shall describe the method I used at Ingeson; it will serve as instruction for all vessels which may be going to Berghen; that port, which of all in the North Sea yields the greatest resources, there being a mast yard, a capital rope warehouse, and plenty of provisions. By chance a vessel may be obliged to enter the passages without pilots, either owing to the superiority of an enemy's vessel, or to storms, and what I am about to observe will be of great utility.

On coming from sea with a north wind, keeping Mount Bommel at six to eight leagues distant at S. E. the ship must continue its way, steering as close to the wind as possible, in order to keep before the wind, and north of the isle of Bommel. At about a league from shore, an opening will be seen between the rocks, which is the passage of *Solmenfiord, five miles from Berghen. Imagining the reader at the entrance of the passage, I recommend him the expedient I made use of. The wind was northerly, I kept close to the islets and rocks in the north, which I passed at two cables' length, in order to avoid the stones which are in the middle of the passage under water, and which I left to starboard going before the wind. At a quarter of a league from the isle of Rootholm, I made in short to coast round this island, till I should discover an opening to leeward. I then bore up for the inlet, steering S. and S. quarter S. E. I went up this creek, and when about a cable's length from the bottom of the bay, I cast anchor to larboard, I put the helm to starboard, to round to the wind, letting the cable run. As

* This passage is nearly a league wide; on my second voyage I luffed up it.

soon as I had anchored, and the frigate rode at her moorings, I sent a tow-rope ashore to the eastward, which was lashed astern to starboard: by this means the vessel does not lay with the current, but it is secure. The main anchor is heaved into eighteen fathom water, sand and gravelly bottom; there is six fathoms below the vessel, and as the bottom rises in a sloping manner, there does not need more than forty-five fathoms of cable out, comprising the platting. The tow-line is moored to a rock on shore, cut for the purpose. Great care must be taken to plat the cable, and examine it often, for there are rocks in many places at the bottom. The tide does not run strong. The difference of high and low water is eight feet; the tides are of six hours. I forgot to observe that five-and-twenty fathoms of bitter must be used in anchoring, and to recommend to be always ready to let out cable, so as to ride easy on the wind. Moreover, it will be necessary to have another anchor in reserve, ready to be cast, in case the first should not hold. It is needless to advise the coming to an anchor with as little wind as possible. I observed that a vessel is sufficiently well moored with a tow-rope astern; for as soon as the wind souths, she sets sail for Berghen. If the wind should happen to blow S. S. W. it would be prudent to have a second tow-rope to larboard, on the western side.

When about to sail, a vessel must pay out tow-rope while heaving at the capstan. The anchor is weighed and catted, the topsails and mizen-topsails are then tallied, the tow-rope is paid out, or cut, and an oared boat sent ashore to bring it after.

The second and third we had a dead calm. I employed myself in taking a draft of this road, or rather this bason. At musquet shot from this anchorage, as well as near all others along the river, you meet with a tavern, provided with meat, fish, eggs, milk, beer, and in short every thing the country affords.

The fourth, at nine in the evening, the wind S. with fog, we sailed from Ingeson for Berghen. We made nearly eight leagues among the rocks, which we passed very close to during a thick fog, that almost entirely obscured the feeble glimmering of twilight. On the road the pilots made me notice several anchorages, both to starboard and larboard, as well for large as small vessels.

The fifth, at four o'clock in the morning, the wind at S. E. but weak, we anchored at Behoriaven, nearly three sea leagues from Berghen. The starboard anchor was cast in twenty fathoms water, sandy bottom, with flint stones. As soon as the frigate rounded, I sent two tow-ropes ashore to two iron rings, fixed for the purpose of vessels to moor to; there are similar rings along all the canals of Berghen, wherever there is anchorage; for it must not be conceived that a vessel can anchor any where, although enclosed by land and rocks; sometimes it is requisite to proceed three or four leagues to get to an anchor, on account of there being not less than eighty to one hundred fathoms water between one anchorage and another. At two o'clock in the afternoon we had a weak S. wind and sailed, when under sail it veered to W. N. W. and N. W. I had great difficulty in doubling the last point, which forms the entrance of the bay of Berghen on the side of the west, at which point there is a buoy to mark a sunken rock. In the middle of the bay, a league, from the anchorage, we experienced a violent current which prevented our advancing, and kept us as it were at anchor, notwithstanding we had a good wind, and all sails set; this current was occasioned by the ebb tide emptying itself from the two bays, the one north, the other south, of the citadel. I manned all the boats of the frigate, and sent them before, to row her. By dint of rowing, with all sails set, I made shift to pass this current, which otherwise might have carried me on to the north shore. At six o'clock I anchored in nine fathoms, with a sandy bottom, and the frigate lying with her head to windward, after paying out forty fathoms of cable, struck on a flat rock, the only danger to be apprehended in this roadstead: there were fourteen

feet two inches of water on the rock, but the draft of the frigate was fourteen feet three, and it yet wanted four or five inches of low water. I immediately lashed a tow-rope to a dead-head, which was out with my anchor, and which served to shew where to weigh it. I pumped out my water, and heaved at the tow-rope, as well as the cable, but all in vain. We were obliged to wait for the flood-tide. This accident would not have happened, if the Norwegian pilots had cast anchor more to the north, as I wished them, in sixteen fathoms water. It only occasioned us however a great deal of trouble, and owing to the care of M. Duchatel and my officers, we had no confusion, which in similar circumstances is extraordinary. When afloat I heaved my main-anchor and got to the entrance of the port; my great stream-anchor was in ten fathoms water, sand and gravelly bottom; my bower-anchor S. E. of the first in six fathoms, muddy bottom. I sent a tow-line ashore, which I moored to the post of the Corps de Garde, and a small anchor to N. E. These precautions made me perfectly secure, but I was surrounded by a number of merchant vessels, and that is not a proper mooring for a large frigate. Ships of war in general anchor at Sandvick, they go entirely into port, where they ride in four moorings; but when desirous of going thus far into port, and get within the citadel, it is required that the powder should be landed.

To avoid the rock on which I struck, it is essential to notice a buoy which points out the place it lays in. What deceived my experienced pilots was, the buoy's having been carried away two hours before by a Dutch vessel, which struck as well as I did on the same rock; but in case the buoy should not be seen, it must be remembered that the rock lays S. E. half a cable's distance from a buoy, which serves as a dead-head to moor to.

As soon as I had arrived, I sent an officer to pay my respects to the governor of the town, who lives in the castle, and the next day, accompanied by my staff, I paid him a visit. We went as well to see Mr. Deschiel, grand bailiff of the city and territory of Berghen. He loaded us with kindness, and offered to render every service of which we stood in need. We did not meet with so favourable a reception from the people. The merchants, workmen, and all those to whom we had recourse for what the frigate wanted, treated us coolly. They fled before us in the streets, and even refused in the public markets to sell to my maitre d'hotel. We owed this reception to the bad conduct of some captains of privateers, who, under the title, and in the uniform of his majesty's officers, which they had the impudence to take upon them, had during the last war committed so many excesses in this town, that the grand bailiff, fearing we might meet with insult, thought right to publish that we were truly possessed of the king's commission, recommending civility towards us. Our mode of acting and the discipline we maintained soon shewed them who we were. A sailor having stolen a silver spoon out of an ale-house in a fit of drunkenness, I caused him to be dipped from the main-yard for three successive days, and but for the intercession of all the ladies, at a grand supper given by Mad. Deschiel, his punishment would have been of longer duration. I gave a dinner on board the frigate to Mad. Deschiel, and all the principal ladies, to the staff-major, the officers in garrison, and all the principal persons of the place. This dinner, which was succeeded by a ball, spread a gaiety through every quarter of the town, where the healths of the kings of France and Denmark were drank, under the discharge of the cannon of the frigate; notwithstanding this, the people could with difficulty forget that a Frenchman, the captain of a fine vessel, or who represented himself in that character, had threatened, upon a refusal of some indiscreet demand, to fire upon the citadel, and that upon several occasions their women had met with insult from them.

I cannot here refrain from a reflection on the high idea thatthe public entertains of certain intriguers, whose merit consists in their praising themselves; who propose the grandest schemes, because they run no other risk than that of falling back into the nothing from which they are studious of raising themselves, and whom we every day see fail in their enterprizes with shame, although supported by an ignorant cabal, prejudiced against the royal navy. The proofs of this blind perversion are but two widely spread. Even in the Encyclopedia most indecent absurdities are to be found, under the head marine. An abstract from a work, intitled Reflexions of a Citizen on the Navy, is inserted there. This is the work of an officer, a merchant of Dieppe. The rank of this man sufficiently shews that he is a blackener of the characters of his majesty's officers. He says, "the gentleman sailor takes no pride in his occupation, he despises seamanship, &c." I must however do justice to his sentiments, when speaking of war and armaments. "The captain," he says, "ought to be completely master of the fighting his ship, &c. To wage war with the English, their commerce must be attacked, and ourselves be satisfied with preserving our possessions; it is precisely playing with a chance of losing, and none of gaining, to act otherwise: it is against the English commerce, alone, that we should wage war; no durable peace with this nation can be expected without following this polity. Let England tremble for her trade in a war with us; this is the important point. The enemy, in the war of 1744, made considerable insurances on our merchant vessels, in this war few, and those at very heavy premiums. Why so, because they imagined that a war on the continent would cause us to neglect our navy, and they were in the right: it is the finances alone of the enemy which support her navy, and its finances depend upon her trade; let us then make war on her commerce, and on her commerce only. Take a colony from the English, they murmur; ruin their trade, they will revolt. We have three hundred leagues of sea-coast to protect. This case requires a considerable navy....what! Are vessels requisite to guard our shores? Delusive error We want soldiers only for that purpose, a hundred and fifty thousand men shall be put in arms for saving's sake, nevertheless the shores will be insulted; a hundred and fifty thousand men are clad in arms, and it is evident that twenty-five sail of the line at Brest, and fifteen thousand men near that place, will be sufficient to prevent any such consequence; nay, any thing except the prejudice in favour of soldiers." It is visible that this seaman is possessed of judgment, although he does not display the necessity of a navy with equal eloquence with Mr. Thomas, in his eulogy of Duguay Trouin. However, that orator, guided by an excusable prejudice, seeing that he had never frequented the sea-ports of his majesty, lets escape him some critiques in favour of the merchant vessels, to the injury of the king's ships. Labouring under the same prejudice, a monk has manufactured an historical journal of a voyage to the Madeira islands in 1763 and 1764. The editor of this insipid journal, printed at Berlin in 1769, seems to have left his convent for no other purpose than to reap in another hemisphere an ample harvest of lies and invectives. Returning to Europe, he takes pleasure in pouring the coarse poison of his graceless pen upon the navy, in a digression which contains as many blunders as phrases. "On the fifteenth of June 1764," says the stupid son of St. Benoit, "a vessel is seen to windward in the N. W. the flag and pennant is hoisted, a flag is plaited and hoisted, and we lay close to the wind; in spite of all these pretended signals, the vessel continues its course." This learned Cenobite imagines that a vessel, who should so act can be no other than a French vessel. Upon this his bile inflames, his love for his country and the commonweal puts in his mouth a violent diatribe against a navy which he ought to respect; but in what order has this monk learnt, that a love for one's country is shown by exclaiming in a Hottentot dialect, that "the license of thereds causes the sla-

very of the blues, that the officers of the royal navy possess prejudices which raise them much above the profession of sailors, and make them imagine it unnecessary to learn the art of seamanship, in order to practise it, &c." If this paper-stainer had read the ordonnances of the marine, he would have known that there are schools established for the education of young people in this art: if he had been at any one of the sea ports, he must have seen officers applying themselves to the theory, and anxiously desirous of reducing this theory to practice; if he had taken the trouble to seek for information, he might have learnt that it is necessary, before a man can become a captain of a merchant vessel, that he should have made at least two voyages on board of a king's ship, and obtain satisfactory credentials from his commanders; which pre-supposes that it is on board these vessels alone that proper discipline, and a perfect knowledge of the necessary subordination and service at sea, can be acquired; and that the officers in the navy are the competent judges of the merchants' captains: had he sailed on board vessels truly commanded by his majesty's officers, he would not have affirmed that "every vessel is obliged to strike, when a king's ship orders her to do so, by firing a gun and bringing round the pennant to the mast, at the part it ought to be, according to the rank of the officer commanding the king's ship." He would have known that the pennant is hoisted, and not brought round, and that a merchant vessel is not obliged to strike, but to bring to, in order to receive orders. If he had resided in a sea-port, he might have learnt the language of a profession, which, had he possessed any modesty, he must have been persuaded is a necessary acquisition to him who professes to give lessons; he would have seen how highly the Barts, the Duguai Trouins, and the Cassards, are respected: all these great men were entitled to the stations they held on board the king's ships; they had fought in desperate engagements, made many skilful manœuvres, taken ships of war from the enemy; let any one present himself after such striking recommendations, and certainly he will be received with as much welcome as distinction. Notwithstanding the officers of the royal navy are much above such paltry aspersions as those lanced from so palsied an arm as that of the traveller to the Malucca islands, I have not been able to restrain the first boilings of anger, which the reading of the fastidious volume of that monk-errant occasioned me.

During the stay I made at Berghen I sounded, and caused to be sounded, the port, the roadstead, and the neighbourhood of the town; respecting which I shall say more in succession, intending now to give a description of the town and territory of Berghen. I shall even say something of Denmark, Norway, the Laplanders, the Samoiedes, and other people of the north of this second kingdom, which are but little known, and of whom many fabulous tales have been related. As I have conversed with and received my information from persons of education who have travelled in that country, receiving from the fountain-head my accounts, I think they will meet with estimation.

The city of Berghen, formerly Biorginn, capital of the diocese of that name, is the largest and most considerable trading city of Norway; it is situated at the bottom of a valley, surrounded and defended by seven large mountains; its fortifications on the sea-side do not deserve mention. Formerly there were thirty churches and convents in Berghen: at present there are only four parish churches, three of which are Danish, and one German. The churches are built of stone, as well as the houses of the noblemen, consuls, and principal merchants. The most remarkable building is the custom-house, at the entrance of the port. There is a Latin school, founded in 1544, and endowed by Peter the bishop; its revenues were encreased by Frederic Second and his successors. At this time it maintains twelve students in philosophy, mathematics, history, and the French language. The marine school was formerly sufficiently numerous, but it is fallen into decay.

Berghen formerly had the privilege of coining; this she retained until 1575. As yet there is preserved in the cabinet of medals, at Copenhagen, one which was struck here in the reign of Eric. The city was built in 1070 and 1071. Several councils have been held here. As the greatest part of Berghen is built of wood, this town has frequently been a prey to the flames: it was burnt in 1248; eleven churches were reduced to ashes: the same misfortune happened to it in 1472, in 1623, in 1640, in 1702, and in 1756; at this last fire sixteen hundred houses were destroyed. The city is very extensive. The streets are not straight, and are irregularly paved with large and small stones, but are kept very clean. The houses, although built of wood, afford a very pleasing appearance, from the diversity of colours with which they are painted: they are extremely pretty within; no gold or silver is seen, but the furniture is neat, and agreeably simple.

The city of Berghen may contain three thousand houses, and more than twenty thousand inhabitants: the inhabitants of Hamburg, Lubeck, and Bremen, annually resort there for the fishery.

The religion of the country is Lutheran, of the creed of Augsburg, known in Germany by the title of Evangelical; it is the religion of the sovereign, and prevails through all the possessions of the king of Denmark. All other religions are tolerated (but without allowance of public worship) provided they do not disturb the commonweal. Every inhabitant, whatever may be his religion or station in life, enjoys equally the protection of the government; no one undergoes vexation for conscience sake.

As to the manners of the inhabitants of Berghen, it is difficult to satisfy the reader on that article, for it is composed of different nations; many Germans and Scotch have successively come to establish themselves here, and intermarried with the natives: in general the men are strong and robust, little polished, although affable to strangers from interest. There is but little nobility at Berghen; most of the inhabitants are merchants or tradesmen, dealing by wholesale or retail. There are however some distinguished families, but they are very few in number.

The women are in general fond of work; they employ themselves in their household affairs, and in commerce; they are not addicted to luxury; they receive strangers, to whom they are partial, with courtesy, and particularly the French, who are very welcome visitants; which occasions on the part of the husbands a great jealousy of them. The Norwegian women are handsome, but not well informed: more politeness is met with in other parts of Norway, but throughout the country Bacchus and Ceres find more votaries among the men than Venus. They are fond of spirits, and smoke a great deal. They make up assemblies, consisting wholly of men, and prefer them, which they call estaminet, to the society of the ladies; this engages them in turn to revenge themselves without ceremony, by the help of more amiable and gallant strangers.

The garrison of Berghen is composed of one battalion of regular troops, one free company of one hundred and fifty men, and a small detachment of artillery, making together six hundred men.

The commerce of the city of Berghen consists of all sorts of fish, fat merchandise, skins and wood. These commodities are produced in the provinces north of Berghen. The haven is safe and good, and can hold a large number of vessels of every dimension. It has an additional advantage of never freezing, and being always navigable. The burghers of Berghen have about eighty vessels employed in external commerce, and with which they trade through the ocean, in the Mediterranean, in the North Sea, and in the Baltic. Besides, upwards of one thousand vessels of different nations arrive there, bringing salt, grain, flour, brandy, and other commodities. They also send several

vessels to Greenland to fish for seals, the fat of which serves to make oils, very much esteemed for lamps. A very considerable traffic in grain of every description is carried on at Berghen, on account of the ground throughout the bailiwick being poor and sterile. Its inhabitants, particularly on the coast, are, generally speaking, fishermen: they are obliged to furnish themselves with what grain they may have occasion for from the warehouses in the city, which are always abundantly supplied. All the inhabitants to the north of Berghen resort there, from the distance even of three hundred leagues, to lay in their stock of corn and other commodities, Drontheim not possessing equal advantages: in short, Berghen is the granary of Norway. The river of Berghen, and all the neighbourhood of the coast, abound in fish. The most considerable and profitable fisheries are those of the cod and herring; it is from the produce of these that the Danish and foreign vessels take in their loading for all parts of Europe. These are the gold mines of the country. The stock-fish prepared at Berghen is in great esteem throughout the ports of Spain, Italy, Holland, Flanders, and even England. It is also exported to the Baltic, as well as cod dried and barrelled, which the Norwegians send all over Europe. A very large quantity of fish oil as well is shipped at Berghen, besides goats' skins, sheep skins, tallow, pitch and planking.

I have now to mention the trade in rogue, of which there is a great consumption in Brittany: rogue is the roes of cod-fish; it is a bait without which there is no fishing for sardines. The cod fishery, for the purpose of extracting the roes, is carried on on the coasts of Norway from the beginning of January to the middle of April. Cod is taken at other times of the year; but it is within these periods only that the roe is found. The fishery begins in January on the coast of Nordland and Finmark, more than an hundred leagues north of Berghen. The fish descend successively along the coasts, always towards the south, as far as Berghen, and thirty leagues beyond to Schuttness, where the fishery ends with the month of April, on account of the cod then leaving the shore for the sea, in order to lay its eggs. The fishery does not begin at Berghen before the end of March. The Norwegian fishermen carry on this fishery in close places only: they use small boats of six or eight tons burthen. They have small wooden storehouses on shore, where, after opening the fish and taking out the roe, they salt and lay it in pyramidal piles, and transport it to Berghen after the end of the fishery in April. The merchants then buy the roes of the fishermen, and barrel it. This fishery is seldom considerable in the bailiwick of Berghen, although it be of seventy leagues extent; it is deemed large, when it extends to four thousand barrels. But the best fishing is on the coast of Nordland, the sea on which coast affords more fish than any other. The inhabitants of these northern countries bring to Berghen, the most considerable port in Norway, and that which is most resorted to by foreigners, the whole produce of their fishery, as well the fish as the roe, in vessels of from one hundred to two hundred tons burthen. The ice and storms hinder the arrival of these vessels before the month of May, so that it is impossible before that time to fix the price of rogue. In tolerable years, at the beginning of June, there are commonly fifteen or sixteen thousand tuns of rogue in the warehouses of Berghen (the measure of the tun is about twenty-eight gallons Winchester) the price of which is commonly three or four rix-dollars, from twelve to fifteen shillings of our money; and in plentiful years, as low as two rix-dollars, or eight shillings nearly. It has even been known as low as a dollar, or three shillings and ninepence per tun; but in 1767 and 1768 the price was excessive. Never was it known so high, owing to a competition among the buyers; it was sold at from five to six dollars. This price, which is without example, makes it desirable, for prevention in future, and for the benefit of Brittany, that a single company should possess the privilege of

selling the roes to the fishers of sardines upon the coasts of that province. It is to be noticed, on packing the tuns sworn guagers attend to see them well packed and filled. Thirteen of these tuns go to a last, or two tuns English; weight is out of question. The freight paid at Brest, or any other port of Brittany, is about twenty-five shillings per last, with ten per cent. of average. The duties, which are trifling, and all the expences included, do not amount to sevenpence-halfpenny per barrel. This is all the information which I can give of the trade of Berghen and Norway.

I shall now sketch out an idea of the manufactures, and branches of external trade, existing in Norway: I shall explain its mode of administration; but as it is united to that of Denmark, and as privileged companies formed at Copenhagen direct the external trade of the two countries, I shall first enter into a detail of the government and forces of Denmark.

The goverment is despotic, but mild, and tempered by its solid and fixed constitution. The provinces are governed by bailiffs, charged with the maintenance of the laws, the inspection of the king's revenues, and the special protection of the country people. They have no jurisdiction over them but in matrimonial cases; in any others they can act only as mediators: they cannot prevent access to the throne, nor even keep those from appealing to superior tribunals, who may have complaints to prefer against them, which occasions great mildness in the administration of law in the provinces. The king is the soul of justice; he reserves to himself the approbation of all decisions. No sentence can be put in effect before it has obtained his signature, whether it affect the life or credit of the individual. In this is seen an important law, which proves the wisdom of the legislator; it is found in the nineteenth chapter of the first book of the Danish code. "Any person accused of a crime, of whatsoever description it may be, may, on giving surety, come to court, and return; enjoying all necessary freedom for his defence."

I have already observed that the Lutheran is the only religion authorised by law, but that every other is tolerated. The king, in the same manner as all protestant princes, is head of the church in his dominions: his sentence in any matter relative to the church and the exterior mode of worship is conclusive. The authority of the bishops, a restraint upon the clergy, only extends to the conferring holy orders, and keeping the priests to their duty: they have no temporal jurisdiction, nor other rights, than such as are necessary for preserving proper discipline and regularity in the church.

The Danes and Norwegians love their king; but the former are better instructed, and of more gentle manners. This is the result of an examination which is practised in the towns of Denmark, by persons selected by the magistrate to watch over the education of the children, and the administration of the property of the pupils: they can of their own authority dispose of children neglected by their parents, and put them out to employments. The law even allows them to reimburse themselves by execution for the advances which they make for the children; and if the family be indigent, the alms-houses are obliged from their funds to reimburse them. The same people are obliged to watch over the property of minors, and exact a just account; and for the better security of the pupils, the law requires of those who dwell in a house, or in the neighbourhood, where a father dies, having orphan minors, to make a declaration as early as possible before a magistrate, under a severe penalty.

With respect to the external commerce of the Danes, Christian the Fourth was the first of their kings who established in his states an East India company. Christian Fifth new-modelled it, and gave it a charter, the twenty-eighth of November 1670. It fell to the ground under Frederick the fourth, who used great efforts towards supporting it. Christian Sixth, in 1732, set it on foot again: this is the epoch of the present establishment.

The insurance company was formed in 1727; it is divided into shares of a thousand crowns.

The bank, which may be esteemed the spring of the Danish trade, owes its existence to a company, which by this establishment rendered a signal service to the two kingdoms of Denmark and Norway.

The African company was established in 1755, to continue a branch of commerce begun by individuals: its charter, granted for forty years, allows an exclusive right to this trade from the 22° to the 36° of latitude. Hitherto the trade has been carried on chiefly with Saffy, Sallee, and Santa Cruz. The company import wool, copper, wax, and leather; it exports thither linen and woollen cloths, spices, and other commodities which Europe furnishes to Africa. The same company exports to the West Indies, that is to say, to the island of St. Thomas, St. John, and Santa Cruz; it is composed of five hundred shares, each of five hundred crowns.

I have previously noticed the company which carries on exclusively the trade of Iceland. I have a few words to say of the manufactories. Frederic the Fifth neglected nothing to establish them in Denmark and Norway. They manufacture sail-cloth, ordinary linens, cambric, paper, tobacco, stuffs, refined sugar, earthen ware, porcelain, allum, and soap. At Copenhagen they make lace, gold and silver fringe, all sorts of jewellery, arms, muskets for the army, blankets, and silk stuffs, stained and painted carpets, wove stockings, hats, and velvet. Their industry in tanning of leather promises them success. The gloves of Runder and Odensu are famous; in short, manufactures increase and mend daily: whatever foreign merchandise can be dispensed with is regularly prohibited.

In Zealand and Norway are cannon and other founderies. This is the roll of the land forces of Denmark, according to the regulation of 1763.

Horse and foot guards	704
Cuirassiers	4380
Dragoons	2920
Hussars	600
Infantry	20,020
Artillery	1158
Engineers	31
Total	29,813

Besides these, in Denmark and in Norway are thirty thousand national guards, among which is a body of skaters, of six hundred men, very dangerous enemies; who, by means of a particular kind of skate, get forward over the ice and snow with incredible swiftness.

The king of Denmark in 1763 had twenty-six sail of ships, carrying from forty to ninety guns, and seven or eight frigates. The sailors designed for the royal navy are of two classes. Those who dwell by the sea-side are classed, and their number is about twenty-five thousand. These men serve the king in all extraordinary armaments, and almost always in partial equipments. The second class, which is more intimately united to the the royal navy, is composed of four divisions: each division has its chief, and ten companies, each of one hundred and eighteen men. The companies are commanded by captains of ships, who have two subaltern officers under them. It is in imitation of this corps that, at the end of the war, sixteen companies of soldier-sailors were formed in France, under the name of the regiment of Dunkirk. This second class of sailors

consists of four thousand seven hundred and twenty men. It furnishes complements of men for common occasions, and workmen for the dockyards; a commission was established in 1739, charged with the direction of the building of vessels; it is composed of three captains of ships and three builders. By this wise establishment no vessel is built, the construction of which has not been previously planned, and none are constructed in opposition to the remonstrances of experienced officers, such as have frequently in France been occupied through an entire voyage in endeavouring to remedy the faults of the builder.

There is a company of cadets living at Copenhagen, in an edifice erected by Frederick Fourth in 1701. This company is the seed-bed of officers, as the Royal Marine Establishment is in France. The director of navigation teaches them that art, and geometry; an officer of artillery gives them lessons in that branch. They have other masters for arithmetic, geography, history, the English and French languages, drawing, dancing, and fencing. The first builder explains to them the construction of a vessel. In order to combine practice with theory, every year a frigate is afforded them, on board of which they successively go through the duties of sailors, pilots, and officers. The marine department is directed by a council, under the title of The United College of Admiralty and Commissariat General. It is composed of three civil officers; the first of which is secretary of state, and chief of the department, and of four admirals.

I forgot to mention that the war department is generally given to a general officer, who, as soon as he obtains this dignity, renounces his command. All memorials respecting the advancement of officers, the administration of justice, and the maintenance of discipline, are addressed to him. He signifies what are the orders of his majesty. There is a particular department, called the Commissariat General of War, composed of six persons, the chief of whom is the minister; its functions, to look to every thing which regards the pay and clothing of the troops, providing for them, and directing their stations.

I shall terminate this article with an enumeration of the towns and inhabitants of Denmark and Norway. There are in the kingdom of Denmark sixty-eight towns, twenty-two burghs, five hundred and eighty-three noblemens' estates, sixteen baronies, and fifteen lordships. In Denmark and Sckleswick thirty-three thousand two hundred and fifty-nine children were born in 1776, and twenty-nine thousand nine hundred and fifty-nine persons died: from which may be inferred, with likelihood, that the population of Denmark is about one million.

There are but eighteen towns in all Norway. In 1766 twenty two thousand three hundred and seventy children were born, twenty thousand and ten persons died; the enumeration of its inhabitants may consequently be estimated at about seven hundred thousand.

On speaking of the roe of the cod, I did but mention the names of Nordland and Finmark, it may be well to say something more of them. Nordland and Finmark are two bailiwicks north of Drontheim, which is but the second commercial town of Norway, although looked upon as the capital. Drontheim was formerly the residence of the kings of Norway; it has an excellent port, and, next to Berghen, produces more articles requisite for shipping than any port in the north. The bailiwick of Nordland extends from Nummedal to Finmark; it comprehends the provostship of Heligeland, formerly Halogia; Ramus endeavours to maintain that this country is the Ogygia of Homer, and Ulysses the god Outin: the result in such case would be, that this province must have been inhabited immediately subsequent to the siege of Troy. It furnishes fat articles and fish; good pastures are met with here, and large forests. At the

end of this provostship is a mountain with seven points, very highly elevated, and which are distinguishable twenty leagues from shore. The inhabitants are principally engaged in the fishery, as well as those of Finmark. Finmark is divided into eastern and western. The first part includes the mountain called Nord Kin, ten Danish miles from the North Cape, at the extremity of the main land; it comprehends the isle of Wardoe as well, situated about an English mile from shore: beside a port of this island is the town of Wardhuys, which is the most northerly fortress in the world. The second part of Finmark, the western, comprises the isle of Mageroe, in which is the most northern mountain of Europe, called the North Cape. On all these shores, ports, or excellent anchorage, is met with. It seems as if nature took pleasure in forming retreats of greatest security in the most frightful quarters of the universe, and in the most ungenial climes; any vessel, tempest tost, which should be under the necessity of making for the coast, is everywhere secure of an asylum, whatever wind may blow. The reader has to be informed that every fisherman is a pilot, and that they proceed two leagues out to sea to pilot a vessel, however high the wind may be. It is further to be understood, that notwithstanding these coasts have a most tremendous appearance, they are much less dangerous than they seem, on account of all the peril being visible and navigation safe everywhere, except where there are breakers seen. What I have mentioned of the coasts and inhabitants of Nordland and Finmark may be said of the coasts and neighbouring nations, all of whom trade in tallow, butter, oil, fish, and wood; they follow the same mode of living, and are far from being so cowardly as some authors have reported. On the contrary, all these people are brave. Oftentimes they have been seen to wait steadily for the famished bear advancing to seize them: others, without any other weapon than a knife, pursue these animals, at the risk of being strangled and torn to pieces, which frequently happens.

Detailed accounts of the Laplanders and Samoiedes are not wanting, but they agree in so few points, that the reader is at a loss what to believe; add to this, they are so much encumbered with childish fables, that I consider it to be obliging the public by undeceiving it on those matters, false or doubtful, which relate to these savages. The particulars I am about to detail were afforded by a learned man, who has made several voyages to Archangel, and who translated for me into Latin all the observations which he had written in German. Nothing is so important for the natural history of mankind, as to obtain exact acquaintance with these northern nations, in which is still to be traced the original character of man in his primitive state of nature; whence may be calculated the progress of instruction and the value of society.

Many journals of voyages to Russia, and, above all, the observations on the Samoiedes published at Petersburg in 1732, fix the earliest establishment of these people in the neighbourhood of Archangel. On the contrary, it is a fact that they are not to be met with nearer than three hundred wersts, or two hundred and ten miles English from this town; what gave rise to this error was the circumstance of some Samoiedes bringing fish, oil, and merchandise to Archangel, for the account of different merchants, who maintain them as well as their rein-deer; this also has induced others to assert, that the fishery for seals and sea-calves upon the coasts of the White Sea, from which oil is extracted, is carried on by Laplanders and Samoiedes inhabiting the shores of that sea. This assertion is devoid of truth. The Russians alone carry on that laborious and dangerous fishery; neither Laplanders or Samoiedes ever inhabited the banks of the White Sea. Their first habitations, which are not stationary, are found on the district of Mezene, beyond the rivers of that name. This colony consists of three hundred families, all of which are descended from two different tribes; one of which is called Laghe,

and the other Wanouta; a distinction minutely observed among them. This colony bears the name of Objondire; another which adjoins it that of Tihijondire, while that in the neighbourhood of Poustozer, opposite to the strait of Weigats, commonly called Gougorskoi, gives itself the name of Guaritzi. This savage nation occupies the extent of more than 30° of longitude, along the northern coasts of the Ocean and Frozen Sea, between 66° and 70° of north latitude, and reckoning from the river Mezene towards the east, beyond the Oby as far as Guenisee. All these Samoiedes, notwithstanding their being dispersed over so great an extent, and divided into different families, have doubtless a common origin; as appears from their physiognomy, their manners, their mode of living, and their language.

On the other side of the White Sea the Laplanders inhabit a wide spread country, from Kandalax to Kola; and from the frontiers of Swedish and Danish Lapland to the straits of the White Sea, they occupy more than a thousand wersts, or seven hundred miles. Nevertheless, all this large track of country is peopled by no more than twelve hundred families of Laplanders. I have united in this account the Laplanders and Samoiedes, for no other purpose than to designate the exact position of the country, and the districts inhabited by each. I am far from imagining, with others, that these two people compose but one nation. The gentleman from whom I hold these particulars assures me of the contrary; and further he added, that M. Buffon is egregiously mistaken in his Natural History, when he reckons the Laplanders, the Zemblians, the Borandians, the Samoiedes, and all the Tartars of the north, to be the same race of people. On this subject he observed to me, that, in speaking of the Zemblians, he spoke of an imaginary nation; it being well known, that the country denominated Nova Zembla never had inhabitants, navigators mistaking for inhabitants of the country the crews of some Russian vessels; particularly as the Russians, who go there to fish for seals, are accustomed to dress in the same manner as the Samoiedes. Another probability in favour of this opinion is, that the Russians who passed the winter there never once met with the least trace of man, seeing no living creatures except white bears, white foxes, and rein-deer, which feed on moss and fish that the sea threw on shore. As for the Borandians, the name is utterly unknown in the north. I have as well been informed, that the crew of a vessel desirous of wintering there some years after had entirely perished. The twenty-four men, of which it was composed, were found dead, on the spot fixed upon for their winter quarters. For a long time it was imagined that they perished from extreme cold; but it was satisfactorily shewn, that it was owing to the thick and unwholesome fogs, occasioned by the putrefaction of vegetables and moss on the sea-shore, which poisoned and destroyed them. What confirms this which I am stating is, that a colony from Mezene, composed of twenty persons, who had established their dwelling at a place twenty leagues from the others, suffered extremely from the same fogs. Although none of them died, they were all ill. The terrible pestilence, which in the middle of the fourteenth century depopulated Iceland, was no other visitation than one of these fogs.

Some authors relate that silver has been found in certain places of Nova Zembla. This is not unlikely, since it is current throughout Russia, that in the reign of the empress Ann several rocks were discovered in a desert island, encrusted with the finest silver. Bars of it were sent to Petersburg. Great riches were looked for from this discovery; the rocks were bored, but the interior was not found to contain any of this precious metal; that which had been met with being only a simple crust, possibly as old as the creation.

The Samoiedes are for the most part below the common size, they have a stout, nervous frame, broad shoulders, and short legs, small feet, a short neck, a very large head,

a flat face, little black eyes, a sunk nose, wide mouth, and thin lips; their strong black hair hangs over their shoulders, their complexions are olive brown, and their ears very large. They have little or no beard. The physiognomy of the women bears resemblance to that of the men; they however have rather more delicate features, and smaller feet; but as the two sexes dress alike, it is difficult to distinguish them. Both one and the other wear dresses made of rein-deer skins, turned inside out, which bind round and cover their bodies.

As to what relates to the Laplanders, scarcely any resemblance is to be found between them and the Samoiedes, unless it be their dress, which is nearly the same, their wandering life, and their common use of the rein-deer. The Laplanders pretty much resemble the Europeans, and particularly the Fins; they have however the upper jaw-bone rather longer and more high. Their hair is of various colours; and as for what regards the women, there are some among them who would pass for handsome in any nation. The Laplanders further differ from the Samoiedes in their beard, which the former have very thick and bushy. The Laplanders are esteemed to be descendants of the Fins, and the Samoiedes of some Tartar race, anciently inhabiting Siberia, which, pressed upon by other hordes, retreated to the extremity of the continent. The Laplanders do not, as is mentioned in different relations, use the javelin, they are even ignorant of the use of it; they have muskets, and buy their powder at Kola. They do not eat their meat and fish raw like the Samoiedes, they do not make flour of pounded fish bones, this custom is usual among the Fins of Carelia; but the Laplanders make use of the fine pellicle which is under the bark of the fir-tree; they lay in a stock of it in the month of May, dry it, reduce it to dust, and mix it with flour of which they make bread; they pretend it a sovereign remedy against the scurvy. They do not make fish-oil their beverage. It is not true that polygamy is allowed among them, any more than the reputed practice of marrying without regard to affinity. They do not offer their wives and children to strangers; this charge is void of proof. Much has been said of the witchcraft of the Laplanders, but all the tales on that subject are much exaggerated. Although the greater part of them profess Christianity, they have nothing of it among them but the name. They find great difficulty in changing their manners, and quitting their idols. Neither the Laplanders nor the Samoiedes are so short as they have been reputed by historians, who have been desirous of making them pass for pygmies; however, they are very little more than from four feet three to four feet five in height. The life of the Laplanders is an image of the life of our first parents. They live without houses, without farms, without sowing, without planting, without sewing, or making cloth, &c. Providence has afforded them an animal which requires little or no care, and this satisfies all their wants. The rein-deer is the least expensive of all domestic animals, and at the same time the most useful; it feeds and takes care of itself; in summer it lives on moss, leaves, and herbage, which it meets with on the mountains; in winter it scratches up the snow with its feet to get to the moss, which instinct points out to it. When a rein-deer has been running all day, his master does no more than let him loose, or tie it to a tree, and carry it a couple of handfuls of moss: it has a strong resemblance to the stag, but differs in its horns projecting forward. This animal serves the Laplander instead of fields, meadows, horses, and cows. Its flesh and its milk form his principal food; its skin he uses for clothing in winter, and in summer he sells it, or exchanges it for a tent, which serves him to dwell in. Of its hair thread is made, its bones and horns make furniture and tools, its skin provides him with a bed, and to sum up the whole, its milk makes him excellent cheese. Thus does the rein-deer make the fortune of a Laplander. Several of them keep as many as a thousand; and know them all by their names. When they travel, or are desirous of transporting their effects,

they use a sledge in form of a boat: the water cannot penetrate it, and the traveller in it is sheltered from cold. These sledges are drawn by the rein-deer with so much swiftness, they that seem almost to fly over the mountains and valleys, and through the forests: they are used only upon ice and snow. The Laplanders, as well as the Fins, make use of a singular kind of skate peculiar to themselves; it is made of planks six or seven feet long, and nearly a foot broad: this plank is pointed, and turned up before. A similar plank is fastened to each foot, and taking a long stick, the bottom of which has a flat circle attached to it, to prevent its sinking into the snow, they skate with such velocity as to overtake bears and wolves. This is the whole which in detail can be said of these northen people. I return now to Berghen.

FOURTH PART.

CONTAINING THE COURSE FROM BERGHEN TO THE EASTERN COAST OF ICELAND; A DESCRIPTION OF THE PORTS IN THOSE PARTS; OF THE ISLANDS OF FERRO, SHETLAND, AND THE ORCADES; AND RETURN TO FRANCE.

After taking in refreshments at Berghen for my ship's company, and completing the necessary repairs to my frigate for fitting her for sea, I made ready to sail. The wind was adverse for several days. I was desirous of a south wind, in order to get out by one of the passes north of Berghen, and continue my course direct towards the coasts of Iceland; but the wind did not come round to the south before the tenth of August, at three in the morning, and at four o'clock we weighed anchor, the wind weak, and the sky overcast, with small rain. We hoisted all our sails, and ran six leagues on the N. N. W. to N. W. tacks, keeping the land to leeward, that is to say, the south, on account of the winds from shore. After running this distance, we perceived an opening in the northern bank of the river; we made for it immediately, in order to keep the cape at N. E. and pass through it. We coasted along a small isle to leeward, within pistol-shot, in order to avoid a rock under water, which was still nearer to us, to judge from the eddy, and which the pilot pointed out. After passing this rock, we steered N. then N. quarter N. W. afterwards N. N. W. in order to double several small islands or rocks which we left to leeward. After doubling all these islands, we found ourselves in a little road, close as a basin; the entrance of which, and the way of getting out, was invisible. A squadron of four or five vessels might anchor here in seven fathoms water, sandy bottom; vessels have wintered here. On all sides iron rings are seen, for the purpose of mooring. We went out of this basin through a gullet or narrow strait, wherein two vessels could scarcely pass abreast, and found ourselves afterwards in a bay of more than twelve leagues in circumference, and which had no apparent opening but to the N. W. three leagues before us. I then shipped my oared cutter, and carried all the sail I could, steering N. W. in order to get out of the bay by the opening we saw. At noon we were between the two islands which form this passage, which is called the passage of Hennegat, or Hennefiord; hence the Norwegian pilots returned, and I steered W. N. W. in full sail, in order to get rid of the land. It may be observed, that this way out of the river of Berghen is long, but it is not difficult. It is ten French leagues from Berghen to this pass, called Hennegat; but in these ten leagues there is no more than half a league of difficult navigation. Two anchorages are to be met with for large vessels, and several for small, between Berghen and the entrance of the little basin, of which I have before made mention, where ships may ride in safety, whether the wind be contrary, or too violent, to go to sea. This road-stead is even more happily situated for vessels coming from sea, which find themselves upon the coast in bad weather; for

they find a safe asylum-statio bene tuta carinis. This way out from Berghen by the north, although longer, is a much finer one than that by the south, called the Passage of Cruxfiord, which is only six leagues from Berghen. The course by Cruxfiord is shorter, but it is narrower also, and the anchorages are not so good; in other respects the wind, and the destination of the ship, must decide which to prefer, for on the side of the passages of Hennegat, or Holmfiord, more to the north, the ground or rocks which form the beds of the water are very low; there is no good land-mark, and the continental objects are very distant. No danger however can occur from making land towards the north, particularly in fine weather; pilots are met with everywhere; there are even four in the two islands which form the passage of Hennegat. These pilots, who follow the trade of fishermen as well, are always at sea. When the weather allows, as soon as they descry a ship, they hoist all sail, or row with all their might, to reach her. This passage is, according to my estimate, in lat. 60° 40′.

I before observed, that on leaving the pass I steered W. N. W. to leave the land, and enable myself to take advantage of whatever wind might blow. We had had a S. and S. S. W. wind, and it might possibly get round to W. I run fifteen leagues, steering W. N. W. and N. W. quarter N. The eleventh I was in lat. 61° 20′, long. 1° 34′, W. of Paris. I ought not to forget to remark, that being by estimation twelve leagues from Norway, I sounded, but found no bottom; but after proceeding eight or ten leagues farther I found one hundred fathoms water, with a muddy gray sand, which confirms the observation before made, that the more one nears the coast of Norway the greater the depth of water, the bottom becoming muddy; and that the more one approaches the coast of Shetland, the more gravelly the bottom, mixed with black stones; and that in mid-channel there is seventy fathoms water, with a fine sandy bottom.

The twelfth, thirteenth, fourteenth, and fifteenth, little wind, continually changing all round the compass. According to the variations I directed my course, and the fifteenth, at noon, I found the lat. 6[illegible]° 20′, long. 10° 5′, from Paris. During the whole of these four days the sky was overcast, but with a fine sea. The twelfth, we observed 17° of variation, and we saw a prodigious bank of little red fish, which had the appearance of a sand-bank, over which the sea broke for an extent of two leagues. Similar heaps of fish are frequently met with in these seas, which may cause anxiety to navigators at the first sight, the more so from their attracting prodigious flocks of sea-fowls, as is noticeable on sand banks. These seas are also well peopled with whales. On the fifteenth, in the morning, I saw a bird which merits description: it was as large as a goose, with a white body; but its head, its tail, its neck, and the end of its wings, were of a jet black.

The sixteenth, the wind blew hard from the N. E. with a heavy sea; I made a tack under main and fore-sail, conceiving myself to be E. quarter S. E. of the point of Langerness, and eighteen leagues distant. I kept on the N. W. and N. N. W. tack, and made the point of Langerness at six o'clock in the evening, bearing N. N. W. six leagues distant. As I was threatened with bad weather I made another tack, lest the wind should get more to the E. I saw many fishing vessels luffing up to shore. By night the wind blew high, with a dreadful sea.

The eighteenth, the wind somewhat subsided, and the sea became calm; this is what always happens in these climates: the sea swelling and subsiding continually with the wind, I steered N. W. to make the land. I spoke to several Dutch vessels, and to one Dunkirker, who informed me there was nothing new in the fleet. At six o'clock in the evening, the weather serene and clear, I made the point of land S. of Burgerfiord, at S. E. computedly distant eight leagues. It is to be remarked, that although the land-

marks of Iceland be very high, you must be near to them to see them, owing to their summits being covered with snow, and lost in fogs frequently, as I have (I believe) before observed. I sounded, on taking the bearing before described, and met with one hundred and five fathoms water, with a muddy bottom. I observed with care the same day the variation of the needle, which I found to be 29°. I was then within sight of land, in 67° of latitude.

The nineteenth, twentieth, and twenty-first, the wind variable, sometimes weak, at others violent. I bore under various gales, to observe the bearings of the land, and look for the French fishing vessels, which usually are widely dispersed.

The twenty-second, at three o'clock in the morning, the wind E. the sky serene, I bore to the north as far as 69° of latitude. I then applied to myself the lines of Virgil:

> Hic vertex nobis semper sublimis; at illum
> Sub pedibus stix atra vidat, manesque profundi
> Maximus hic flexu sinuoso dubitur anguis
> Circum, perque duas in morem fluminis arctos
> Arctos, oceani metuentes equore tingi. Lib. I. Georg.

The fog thickening, and the wind changing to the south, I made a tack to S. S. W. for fear of being surrounded by the ice, owing to the fog and currents. Towards ten at night the wind became violent, nevertheless I carried the two lower sails. In the night the tack and false tack of the main-sail gave way, the small stay-sail was carried away; at the same time a surge struck the prow violently, and knocked off one of the bumpkins.

The twenty-third, twenty-fourth, and twenty-fifth, it blew N. and N. E. a gentle gale, with a fine sea, but continually a thick fog. I steered S. under easy sail, and sounding every two hours. This precaution was necessary, for as we had foggy weather for several days, and the Dutch charts notice that the currents run west at the north of Langerness, I might very easily have encountered the shore; but after sounding from time to time, I found I had nothing to fear in steering to the south, as there are forty fathoms water four leagues from shore to the north of Langerness.

The twenty-sixth we had a fresh breeze from the N. W. and fine weather; I observed and found the latitude 65° 57′. In the evening I spoke with several French and Dutch fishermen, and saw two corvettes from Dunkirk, which were leaving the fishery and returning to France.

The twenty-seventh, twenty-eighth, and twenty-ninth, the wind changeable, rounding the compass, the heavens overclouded, and fog at intervals. As all the fishing vessels are accustomed to leave the fishery between the twenty-fifth and thirtieth of August, I made ready for my return as well to Brest, the more willingly from the continual reign of foggy weather and the incessant bad weather, which put it out of my power to be of any service. These latter days were occupied in my seeking the island Enkhuysen. I got into its latitude, and bore on different tacks, E. and W. in order to fall in with it, but in vain. In the night of the twenty-eighth we were under some uneasiness: it was very dark, and perfectly calm: the officer on watch came to wake and tell me that they heard an unusual noise. I immediately went upon deck, and effectively heard sounds like those made by the sea on breaking over rocks. I immediately hove the lead, and payed out one hundred fathoms without finding a bottom. Nevertheless, the noise continued about a quarter of an hour, after which we heard no more of it. I imagine the noise to have been occasioned by a swarm of fish about the frigate; and consider that there is room for believing that Enkhuysen island is no longer in existence, since of five

hundred fishing vessels, which annually resort to the fishery, not any for these thirty years past have fallen in with it. This island has perhaps been swallowed up by some similar revolution to that of the Goubermans; or, possibly, owing to the fog or bad weather, an ice-bank may originally have been mistaken for an island.

I promised to speak of the ports situated on the eastern side of Iceland. As I am on the point of leaving that station, it may not be an improper place to introduce to the reader the information, on that head, I have been enabled to obtain. I shall begin with the first anchorage south of Langerness, and successively descend to the lower part of the coast. Langerness is a very long tongue of land, and very even faced; it may be discerned six or eight leagues out at sea. It is situated exactly under the polar circle. South of it is a place where any vessel may anchor in ten or fifteen fathoms, sandy bottom, sheltered to the north, and on the west. On coming from the east to this anchorage, whether to take shelter from bad weather, or to take in water, a ship must keep close to shore; it is very safe, and may be coasted securely at musquet-shot distance. The first object distinguished is a mast, or flag-staff, on three or four houses or cabins. She may anchor opposite these, but it is better to proceed higher up, and leaving these houses on the starboard quarter, proceed till other houses are seen on a hillock fronting the sea; it is here she should make ready to anchor. Fishing vessels generally anchor a quarter of a league from shore, opposite these second houses; but a vessel of war will lay very well half a league from shore; when the wind is northerly or westerly, a vessel is safe at this anchorage; but if there be appearance of a south or east wind, she must set sail.

Vapenfiord is a good bay for fishing vessels of all dimensions; the anchorage is opposite some huts, in fifteen to eighteen fathoms water, bottom of muddy sand; but as there are two rocks in the middle of the bay, large vessels, which cannot tack quickly, should not enter, unless with a favorable wind.

Zand-boek is a road where a vessel is sheltered from all winds from towards the south, anchoring on the south side opposite the Icelanders' huts. There are rocks in the north part of the bay. Between these two ports there is a small and very safe island, called Bourhick.

Burgerfiord is a good road for small frigates and corvettes. When eight leagues from shore or thereabouts, you perceive a mountain which has the appearance of the embrazure of a cannon, and which serves as a landmark for this part of the coast, being placed between the two bays I have just mentioned.

Lommer-fiord is a very good port for frigates: they must anchor to starboard on entering, at the foot of some fishermens' huts, in ten fathoms water, a cable's length from shore. Behind this bay, there is also a mountain, which at a distance resembles a crown.

Zuider-fiord, a small road for fishing-vessels, or very small corvettes.

Meuve-fiord, a small road, open to the east wind, which blows full upon it.

Ruider-klip, without dispute the best haven on all the coast of Iceland. It is indeed a road; it is exactly closed, and fifty vessels of war might anchor in it, with ease, in perfect safety. It may be entered with any wind from the eastward, a vessel may anchor any where in the bay in twenty-five to thirty fathoms water, muddy bottom; but the best anchorage is at the bottom of the bay, on the north side, after passing or doubling a point of gravel, which looks red at a distance, and which, advancing into the bay, forms a creek in which there is excellent anchorage. There is fifteen to eighteen fathoms water, with sandy bottom. A ship may moor across, sending a towing rope with a small anchor ashore, which care must be taken in sinking into the ground, or otherwise securing.

Kolholm is a bay which has good anchorage, but the entrance is difficult; you have to pass to the south of an island called Schorres, which is before the bay, because in the north part there is a reef which extends very far, and renders the passage to the north of this island almost impracticable.

Papei-fiord is an open road, to which the island Papei, which lays at the entrance, has given name.

Preister-bay, and Ingelse-bay, are two other roads; this last is so denominated, from its being much frequented by the English: on the parallel of these two bays, six or eight leagues out at sea, there is a large flat rock called Walsboc, looking like the back of a whale. As fishermen have informed me that there are dreadful currents, and terrible eddies between this rock and the land, I am given to think there may be a chain under water, extending from this rock to the shore; and that there would be danger in passing between: notwithstanding fishing vessels have frequently passed. May it not also be conceived that Enkhuysen, which is placed under the same parallel, is no other than the island or rock Walsboc, seen through a fog by fishermen who could not distinguish the land, and who were ignorant of the distance they were away from it. This is the more probable, in so much as the greater part of the masters can neither read nor write, and are not qualified to make a good observation.

The islands of Ferro are situated in the North Sea, between 61° and 63° of latitude, and between 8° and 10° of longitude, west of Paris. The exact time when these islands were discovered is not known, but it is known that under Harold Haoïager, king of Norway, they were inhabited and frequented by foreigners. Towards the eleventh century the christian religion was preached here. Christian Third having introduced the reformation into his states, governed the isles of Ferro by a provost, who depends on the bishop of Zealand, and has seven priests under his direction, who do duty in forty churches. These islands are under the bailiwick of Iceland. They have besides a provincial judge, a seneschal, two subaltern magistrates, and a receiver general for the king's lands, who is as well the director of the commerce of these islands with Copenhagen. The trade is carried on for the king's account, by the chamber of finances. These islands are twenty-five in number, seventeen of which are inhabited and cultivated. They are divided into six parishes: 1. Norderoe, which comprises the following isles and churches. Videroe, called on the Neptune Vidro. Fulgloe, or Fuloe, two Danish miles in circumference. Suinoe, of the same size. Bordoe, which has a good port in the N. W. Canoe, three miles in circumference; and Calloe, or Kalsoe, of the same extent. 2. Ostroe, eighteen miles in circumference; it has seven churches, and two ports, called Fugle-fiord, and Kons gaven: this last port is in the gulf of Skaale. 3. Stromoe, this island is twenty miles in circumference. It is divided into two parts; the northern, which comprehends the principal church of Kolde-fiord, and the ports of Wertmanhan and Haldersviig: and the southern, which comprises the town of Thorshan, which has a commodious port, defended by a redoubt. It is the principal place of all the islands, and the only one where there is a market; the seneschal, and the director of trade, reside there. There is generally a hundred men in garrison. King Christian the Third established a college here, which was perfected by Christian the Fourth. M. Thurot came in here to refit in the last war, commander of the privateer called the Marshal Bellisle, being entirely dismasted for the third time. 4. Waagoe, this island is six miles in circumference. Its principal church is near the port of Midvaag. This island has besides another port called Sorvaag, which as well as the former is in the south part of the island. Waagoe is that island, which on the Neptune is marked Wage. 5. Sandoe, this island is eight miles in circumference. There

is a frightful currrent south of this island, near the islets or rocks called Daslnipen and Dasflets. South of the island Sandoe are two small islands, called Skuoe and Stoeredimen. This last, which is a mile in circumference, is a round rock, so rugged as to be inaccessible. South of this is Lutteldimen, where as often as white sheep are put, they turn black at the end of three months. 6. Suderoe, this island is about twenty miles in circumference. Here is the port of Lobroe, at the bottom of the small gulf of Vaago-fiord. This port is one of the safest and most commodious in the island. There is a very violent and dangerous current at the south of this island, near to Somboe, and round a rock called the Monk, which is a league and a half from shore; and which must not be neared too closely, for I have seen breakers which extended more than a quarter of a league. 'Tis said there is a mountain called Famogen, in the island Suderoe, on which is a lake that ebbs and flows at the same time as the sea at Lobroe. It is high water at the Ferro islands, at new and full moon, at twelve o'clock. These islands are subject to fogs, which cause colds, scurvy, and other maladies, resulting from damp. They are nothing but rocks covered with a little earth, fertile enough, however, to render twenty for one. Their only crop is barley. Flocks of sheep form the riches of the inhabitants, who are reckoned at twenty thousand souls. The whole trade of these islands consists in tallow, skins, salted mutton, feathers, eider-down, stockings, and woollen caps, and shirts. These islands are pretty well set down on the Neptune, as well as on the chart of M. Bellin. The rock called the Monk, which is south of these islands, and which from a distance appears like a building, is in longitude 9° 5′ west of Paris. Upon taking observations on a line running E. and W. through the rock, I found it to lay in 61° 17′. I compute the variation to the south of the islands of Ferro to have been 19°.

The Orcades are a heap of islands lying north of Scotland, from which they are separated only by the strait of Pentland, which is two leagues and a half broad, and four leagues long; there are sixty-seven of them, of which twenty-eight are inhabited. These islands were very little known to the ancients, for histories do not agree upon their number. Pliny and Pompenius Mela do not reckon more than forty. They doubtless considered some of these islands called Holms by the inhabitants, and which are very small as rocks, which however yield excellent pasture. These islands were formerly governed by separate kings, but the Scotch dethroned them, and became masters; the Danes, or rather the Norwegians, afterwards seized upon them, but in 1472 the Scotch re-took them. They are now a province of England; they belong to lord Merton: their contribution to the state is no more annually than five hundred pounds sterling. The climate is healthy, but cold and damp. Their crops are chiefly barley, which thrives abundantly. The inhabitants have plenty of cattle, and are much given to fishing; so that fish and salt beef form the principal trade of the islands. Nevertheless they furnish tallow, leather, salt, rabbit-skins, barley, and woollen stuffs. The coasts of these islands possess excellent bays and creeks, but they must be known to be entered without danger, for the tides are strong, and the currents violent. The master of a Dunkirker related to me a striking anecdote of the currents of the Orcades: he told me that being becalmed in a privateer belonging to Dunkirk, nearly two leagues from shore on the northern side, the privateer was drawn by the current into the midst of the islands; upon this he cast anchor, but his cable was cut in an instant, and the vessel was on the brink of being lost, when some fishermen came on board, who, by the help of a light breeze, conducted her out to the west of the islands, after having passed through much danger, and by dreadful eddies. The mariner from whom I gathered this confessed to me that they were mortally afraid that their pilots, with whose nation they were at war,

were about to conduct them into some port, where they should be made prisoners; and that they were much astonished at getting rid of the islands so cheaply, it costing them no more than five gallons of brandy, which was the price agreed upon. This privateer was ignorant, without doubt, that there is a resolute conduct to be held on such an occasion, the pilot being a foreigner; it is to promise a handsome reward for putting the vessel out of danger, and to make him responsible with his life for any accident which may befal the vessel.

I am unable to describe all the ports and anchorages of the Orcades. Not having been within reach of examining them, I could but take soundings and views; I shall therefore only observe in this place, that in the north of the Orcades, where I sounded, there are fifty fathoms water, rocky bottom, at scarcely two leagues from the shore; and that I was informed there were thirty fathoms water a quarter of a league from land. Therefore, when less than fifty fathoms water are met with, it is high time to tack, in order to avoid the currents. I shall observe, that having taken the latitude with an excellent sextant pretty close to land, for better security of exactness in my bearings and distance, I found these islands lay six minutes more south than they are marked in the Neptune. This is the whole of the observations I made respecting these islands: what I was enabled to gather beyond, from different navigators, agrees pretty well with what Mr. Bellin says of them in his Essai sur les Isles Britanniques, and with a chart on a large scale of these islands and those of Shetland, which was given me at Berghen by the captain of a merchant vessel, who every year takes a trip to the Orcades, and to Shetland. I have thought proper to state here, notes of what Mr. Bellin says of these islands, after making the necessary corrections, and adding whatever is useful.

Pomona, or Pomonia, is the largest and principal of all the islands. The lands are very high on the western side. It is in this island the town of Kirkwall is situated, the capital of the Orcades, and residence of a bishop. This town is on the north side, it has a port and roadstead, but the most considerable ports of the island are Schappa, opposite to Kirkwall, Cairston, Carston, and Dursound.

The port of Cairston is on the S. W. of Pomona. It is a very safe port, and fit for the navigation of the western side, there are several passages to it between the islands. The passage called Hamsound, which is south of Pomona, is very good for vessels coming from the east. This passage is navigated by leaving the point of Ross-ness to starboard, which must not be neared too close, as a reef runs out from it, although to no great distance. This point of Ross-ness is south of Pomona. Afterwards the little island of Lamholm is left to larboard, whence you coast along Pomona; and if with contrary winds, there is anchorage in a creek to the south of Pomona in six fathoms water, called Schappa-roads. If the weather be favourable, you coast along Pomona; on the way a little island is passed, which the country people call Burrer Botter; it is safe, and may be passed, according to the wind, either on the larboard or starboard quarter. Carra is then passed to the northward, and afterwards a small island, both very safe, and at equal distance between Carra and Pomona; whence steering N. W. quarter W. you arrive at the port of Cairston, where there is anchorage in the road in seven fathoms water; but if desirous of proceeding higher up and getting in shore, you may anchor in four fathoms, perfectly sheltered from all winds, and without any currents or tides to molest you.

Cairston is a small town, at the bottom of the port; provisions may be obtained there. It is most easy to approach Cairston from the west, and the road is much the shortest; but care must be taken not to near the southern point of Pomona, as there

is a ridge of rocks about it. There is also a good passage to it between the islands of Soult-Ronalza and Burra, but it is very narrow. It is dangerous to attempt it, unless with a sure and favourable wind. South of Pomona the tide runs S. E. at new and full, and the difference of high and low water is twelve feet.

The port of Dursound is on the N. E. of Pomona, within Mull-head, the most eastern point, and a league from the W. of the point. Mull-head is a very high and distinguishable land; it is besides healthy and rugged. There are two rocks to the E. and two others to the N. N. W. but they are very nigh the shore. The entrance of the port of Dursound is nearly a mile wide; the middle must be taken, on account of some rocks under water close to land, particularly towards the point to larboard of the entrance. After doubling this point you enter the port where there is anchorage everywhere; but to be best sheltered vessels lay west of the point of Nestin, which is that of the starboard on entering, where you anchor in five fathoms water. Small vessels go to the south of Dursound, into a creek called Market-bay, where they anchor in three fathoms. Care must be taken respecting the height of tide on entering this creek; for in the middle of it there is a bank, on which there is no more than five feet depth at low water. Neap and spring-tides rise twelve feet at Dursound, ordinary tides but eight feet.

The Port of Kirkwall is north of Pomona; to get at it by the east you must take the passage of Stronsafirth, south of the island Stronsa, and north of Mull-head. You must near the cape pass before Dursound, between the north of Pomona and the south of the isle of Schapinsha, leaving the island called Elgarholm to starboard, and that of Thievesholm to larboard. As soon as you have passed the latter island steer S. S. W. to avoid a rock a mile to the N. W. of Thievesholm, on which there is but six feet at low water. Afterwards steer S. quarter S. W. to enter the road of Kirkwall, where you anchor in six or eight fathoms water. You may get nearer the town at the bottom of the bay; there is better shelter, but it is not so eligible a station to sail from. There is excellent anchorage a league and a half to the west of Kirkwall, called Monoo's Bay: but as there are rocks to starboard and larboard on entering, the middle of the channel must be kept: it would even be a prudent precaution to take a practised pilot of the place on board; they are always to be found.

The island Rousa is north of Pomona; it is of small extent, but the lands are very high. Between Rousa and Pomona the currents are very violent.

East of Rousa is the anchorage called Wire-sound: to enter it, coming from the east, you must pass through Stronsafirth; but instead of keeping to the south of Shapinsha, you must keep to the north, having the islands Warms and Grain to starboard, after which you steer W. S. W. to have the island of Egilsha, and those of Wire and Rousa, to larboard; it is between Rousa and Egilsha that the anchorage of Wire-sound is in six or seven fathoms water. The entrance of this anchorage is without danger; all that is necessary is to avoid certain rocks which extend a mile from shore to the south of Egilsha: to clear them it is requisite to keep half a league from the point, and to keep close to the isle of Wire, which has given name to the Sound. To anchor well in Wire-sound, you must keep St. Agnes church, in the isle of Egilsha, at N. E. and by E. The tide does not run strong in this road, which is greatly frequented by fishermen, who resort to Iceland. You may get out of Wire-sound by a small passage north of the anchorage, between the island of Rousa and the islet of Stockness. In this passage there are four fathoms water, but it is very narrow. On leaving this pass you enter Westrafirth, or the strait of Westra: the currents are very violent, particularly at high tides. On going through the canal, attention must be paid to keeping close to Rousa, because towards the middle of it, S. W. of Westra, there are very dangerous rocks under water. When desirous of leaving Wire-sound towards the west, keeping the isles of Wire and

Pomona to larboard, care must be taken to keep in with Rousa; and when an island is perceived, called by the natives Inhalla, you must steer to come up to it on the south, and leave it to larboard, on account of there being no passage north of the island: it requires a good deal of wind to stem the current in this passage. You may also reach Wire-sound coming from the east by the passage of Sanda-sound. This passage is between the islands of Sanda and Stronsa, leaving Sanda and Eda to starboard, and Strensa and Schapinsha to larboard.

After describing the passages and anchoring-places which are in the interior of the Orcades, I shall make mention of what concerns the exterior, which is not less important to vessels which may be driven upon the coasts. I shall begin by the southern part, or strait of Pentland, which is, as I believe I mentioned, between Scotland and the Orcades. On coming from the east to make this passage, an island, which is at the entrance, must be kept at a mile's distance; it is the same thing whether a-head of it north or south. After passing this island it is requisite to steer through mid-channel, and rather keep close to the Orcades than the Scotch coast, on account of many rocks under water on the Scotch side; but after reaching the south side of the isle of Hoy, an island in the middle of the strait is to be kept at W. quarter S. W. When at no greater distance than a league and a half from this island, nothing remains to be apprehended from the Scotch side: it is the same whether this island be passed on the north or south side, there being twenty-five fathoms water on both sides. When this island, called Stroma, is passed by, the channel opens, and the currents are less forcible. Stroma must not be coasted too near, as it is surrounded with rocks. N. N. E of Stroma, in the isle of Hoy, there is a creek with anchorage in four fathoms water. On the east side of the Orcades the shores are tolerably safe; almost everywhere there is thirty fathoms water at half a league from the shore. On luffing near her shores, one may prolong a tack without apprehension when the wind is strong; but when there is a chance of a calm a greater distance must be kept, for fear of being carried away by the currents. On the eastern side of the Orcades, the point of Sanda is the only dangerous one; nevertheless the rocks from this point advance no more than half a league to sea towards the N. E. North of this point there is a small island, which is only safe on the south side; there a vessel may anchor, to take shelter from a north wind. This island is called North Ronaldsa. North of the isle of Sanda there are two rocks under water near to shore; but two leagues from the north point, and N. quarter N. W. of it, there is a dangerous rock above low water.

Any vessel may anchor north of the isle of Edda, south of a small and perfectly safe island, called Kale of Edda. At the north point of Westra there are rocks a quarter of a league from shore; but the south part of this point affords a creek open to the east, where a frigate may anchor under shelter from the W. or N. W. A league N. E. of this anchorage is the island of Papa Westra, surrounded by rocks on the west, north, and east: they extend more than a quarter of a league on the eastern side. The western shores of the Orcades are for the most part very safe: they may be coasted as close as you please; but care must be taken of the currents which run through the straits. I observed in 1768 on these coasts 20° 40′ of variation in the needle. I must not forget to notice that there are rocks, about ten leagues west of the Orcades, about lat. 59° 2′ or 3′: there is one above water; they are called the Stacks. A league north of these are others, three fathoms under water. It is high water at the Orcades, at full and new moon, at forty-five minutes past two.

Between the Orcades and Shetland there is a small island, called Fair-isle. As this island is in the middle of a much frequented passage, called the Tun, I paid particular at-

tention to it. Fair-isle is placed on the chart of M. Bellin, engraved in 1757, in lat. 59° 30′. According to my observations it is 3′ more southerly. This island is pretty high, it may be seen ten leagues off in fine weather; it is safe, particularly towards the south and east. On the north and west side there are some rocks, but they are near the shore. On my second voyage I coasted this island, a short league from shore, on its south side, and remarked a beautiful verdant plain and several houses, the latter of which were distinguished by their whiteness. It appeared to me that it is in this spot, at the foot of the hill, that the anchorage is as marked in the Dutch charts; for the coast goes shelving in this place, so that a vessel must necessarily be sheltered from all winds from the N. W. round to the N. E. Fair-isle may be about six leagues round. The houses which I saw on this island announce its being inhabited; and sea-faring men have assured me, that finding themselves in fine weather within a league of shore, the inhabitants had come off in boats to the privateer, on board which they were to sell them eggs and fowls, and offering them sheep very cheap. We know besides that Fair-isle is fertile in barley, and in good pastures. According to my observations, the variation at Fair-isle was 19°, and its long. west of Paris, 3° 29′.

North of Fair-isle are situated the Shetland isles, which are but seven or eight leagues distant. These are very lofty; they are variously laid down in the Dutch, French, and English charts, so much as to agree in no shape one with the other. Many days are required to be passed upon the coasts in examining them, in taking their bearings, and in making observations of latitude and longitude, in order to appreciate the defects of their different plans, and make corrections of the islands. I was not able to effect these purposes, having a distinct mission to attend to; but from such remarks as I was enabled to make, and the conversations I have had with different navigators, whose accounts I have compared with the notes of M. Bellin, and those of Routier the Dutchman, I have been able to give some insight to the navigation of the coasts, and the entry of the different ports. As to the difference in respect of the position and figure of the islands, according to the French Neptune and the Dutch chart, I shall remark that the French chart is more exact in the latitude; but that I give the preference to the Dutch for the representation of the figure, and bearings of the land, of as many as I had the opportunity of seeing. Nevertheless, Fulo is very ill placed in the Neptune of 1757, with respect to its latitude. This island is there laid down in 60° 19′; and from three successive observations, made in sight of and very near the land, I found it lay in lat. 60° 3′. Fulo island is ten miles west of the Shetland islands; it is very high, we descrying it at sixteen leagues distance. It is the most remarkable and best land-mark of all the Shetland islands: when seen at eight or ten leagues distant, it has the resemblance of a slipper; it is very healthy, and a vessel may boldly pass between it and the other Shetland islands, for in the channel there is more than two leagues to luff up in. On this island I observed the variation of the needle was 18° 30′. Eighteen leagues west of Fulo I have met with eighty fathoms water, with bottom of large sand, of a grey colour, with black spots: as you approach the land, the sand is more mixed with gravel and stone; and at four leagues from the island there are seventy fathoms water, bottom gravel and black stones. East of this island are the Shetland islands, on the number of which authors do not agree; but there are only three large ones, the principal of which is called the Mainland. The climate of these islands is similar to that of the Orcades; the land produces equally well both barley and oats; the pastures are very good. Fishing, herds of cattle, flocks of sheep, and cows, make up the wealth of the inhabitants. These islanders are of Norwegian origin. Their language is a Gothic dialect, partaking of the Danish, and particularly of the English language. They make turf-fires, as there is no

wood grows on any of the islands. They follow the reformed religion. These islands are well peopled; above all, round the coasts, which present several bays, creeks, ports, and anchorages.

Mainland island is seventeen leagues long from N. to S. and five leagues from E. to W. at an average. This island alone includes more ports and anchorages than the islands of Yelle, Unst, and all the others together. I shall speak of those only even which are in Mainland, the others not being frequented, nor fit to receive vessels of any burthen, as well that ships of any description absolutely require pilots of the place for steering them. Let us begin with the southern part of Mainland, where there is anchorage for a squadron of ten vessels north of a small island called Pard-isle. The entrance into this road is either by the E. or W. of this island, which is safe; and the anchorage is in twelve to sixteen fathoms water, bottom of large sand. This road is at the extremity of a very high and distinguishable cape, called Swineburger-head. This is the best in this part. Mr. Bellin designates three other anchorages between this cape and cape Fitzul, which is the most western point of the southern lands, but these anchoring-places are bad, being exposed to hurricanes of wind, which render the seas dreadful. There is only Quendale-bay which can receive large vessels. It is large and spacious; there is an easy entrance, and an easy way out. On all the western side there is only one road fit to receive vessels of war, it is that which the Dutch call Magny-fiord. Its entrance is three leagues N. of the cape, called Fitzul by the French. On the eastern part are the best ports and anchorages. Four leagues N. of Swineburger-head, towards the E. a little island is seen, called Connix isle, which, with the large island, forms an excellent road, called Hamburger-haven; there is eight fathoms water; it may be entered by the N. or by the S. but the best harbour of the whole of the Shetland isles is that of Laerwyck, which is four leagues more to the N. than the last. The roads of Laerwyck would contain a whole fleet. Every year, about St. John's day, five hundred fishing vessels are seen anchored before the town of Laerwyck. The Dutch, who every year resort to these coasts for the herring fishery, call these roads the Great-bay, or Brassa-sound, on account of the island of Brassa, which forms the harbour and protects it from the east winds. To enter Brassa-sound from the south, Brassa must be left to starboard at a cable's length, and the course be continued up the channel till you come before the town of Leerwick, where there is anchorage in five, ten, or fifteen fathoms, according as you go near to or keep distant from shore. North of the town are the vestiges of a fort which commanded the roads, and which was destroyed by Mr. Bart. The entrance of the road of Laerwyck is easily known by Noss island, which is also called Hanging-cliff, on account of a remarkable rock, which hangs over into the sea, forming a natural vault. This island is east of Brassa, and serves as a land-mark for the port of Laerwyck; the fleet enters south of Brassa, and the eddy consequently carries them to the south. The tide is stronger towards the north of the channel, and the passage more difficult. This is the mode of getting out through the passage called North Sound, and these the precautions necessary to be taken. I observed that the flood bore to the north. You steer so as to leave to starboard a small island called the Holm of Cruester, at about a mile's distance, on account of the rocks which are under water at half a quarter of a league to the west of the island. When this island is past, and bears E. quarter S. E. there is nothing further to be apprehended from the rocks called Fabarre. You continue your course, keeping mid-channel, until you perceive the channel begin to narrow; then, in order to avoid a bank, which is in the middle of the narrowest part of the channel, and over which there is but twelve feet at low water, you must pass by either on the one or the other side

of this bank : if you near the island of Brassa, you must keep at two cables distance, but if the western side be kept, you may near the shore to within half a cable, on account of its being very safe ; when through this channel, the road becomes wide, but soon after it becomes much narrower than before. It is requisite then to steer well, and sail by an islet or rock called Scotland, in preference to coasting of Brassa ; because in this part Brassa has rocks under water about it, which extend for a mile from shore. When you have doubled Scotland and the most northern point of Brassa, the passage is very good between the rocks called the Brothers and Green-island, which you have to larboard, and the island of Beoster, north of Brassa, which is left to starboard. When the island of Beoster is sailed by, the passage of North sound is gone through, and you are at liberty to take what course may suit.

North of Brassa island, between it and the point of Mainland, called Mull of Enwick, the sea forms a large bay, where are four good anchoring-places, called Deals-woe, Laxford-woe, Webster-woe, and Catford-woe. I shall not give a description of the three first, which can only receive merchant vessels or corvettes ; but the anchorage of Catford-woe, which is the most northerly of the four, is also the most considerable ; it forms three creeks, which afford three good ports ; the one is E. S. E. the other W. N. W. and the third N. These ports can receive any vessels of war, and afford shelter from all winds. The anchorage is in from three to fifteen fathoms water, according as you near the land. When from the eastern side of the Shetland islands you are desirous of entering one of these ports, you must steer for the isle of Noss and the Hanging cliff, afterwards bear N. W. to pass between Green-island, which is left to starboard, and the rocks called the Brothers, which are left to larboard. Or, if the wind serve better, you may pass between Green-island to larboard, and House Stack and Glatness to starboard. From Swineburger-head to Noness, the flood-tide runs to the north ; from Noness to Brassa, and from Brassa to Catford-woe, S. S. E. The ebb-tide runs in a contrary direction. On the western side the flood-tide runs south from Swineburger-head to Scalluwa, and the ebb-tide runs north.

I have now to speak of the soundings for making land. I have already observed, that, on approaching these islands, the bottom, which is always large sand, is more mixed with gravel and stones. All round these islands, at about four leagues distance, there are seventy-five fathoms water. It must however be observed, that on the eastern side there are three or four pits or wells, where there is more than a hundred fathoms water. Four leagues north of the Unst island, the most northern of the Shetland islands, during my second voyage, I took an observation in fine weather, and found that the most northerly highlands of Unst lay in latitude 60° 44′. The highlands of Shetland are not very lofty ; they may however be discerned ten leagues at sea. Twelve leagues east of these islands I noticed the variation 18° 42′. I now take up my journal.

The twenty-ninth of August I was forty leagues from the islands of Ferro. The rock at the north of these islands, called the Bishop, was south of me, distant as described.

The thirtieth, weak winds, varying from S. E. to S. W. a fine sea, and continuation of foggy weather. I kept the closest I could, whether the larboard or starboard tack, to make the south, and endeavour to fall in with the island Enkhuysen. I sounded every now and then, because I saw eddies or whirlpools made by the tides, but I could find no bottom.

The thirty-first, a south wind rather fresh, a thick fog ; I ordered the officer of watch at the beginning of the night to bring to till morning, but if the wind increased to

haul it. The wind getting round to the east and blowing hard, the officer of the watch came to inform me that he had taken in the foresail, on account of its blowing hard from the east to E. S. E. with a very high sea. As the wind was favourable for returning to France, as I had not seen any thing of the fishing vessels for some days, as the season for the fishery was far advanced, and the continual fogs did not allow of my rendering any further assistance to the French ships, I steered W. S. W. foresails and topsails set, to pass between Iceland and the islands of Ferro, and thence to continue my course for Brest.

The first of September, the wind east, very fresh at noon, I took an observation, and found myself in latitude 60° 8′ and in longitude by reckoning 15° 58′ W. of Paris. The middle of the bank of which I spoke in the beginning of my journal bore W. quarter S. W. exactly, twenty-five leagues distant, and the island of Rokol at the S. forty-five leagues distant: the island of Rokol is not marked in any French chart, but I am certain of its existence. I have requested M. Bellin to insert it; its situation is in latitude 57° 50′, and longitude 16° 0′ W. This island is very healthy; it is a sharp rock, which, at four leagues distance, looks like a ship; it has frequently been mistook for one. East of Rokol island, a quarter of a league away from shore, is a rock under water, with breakers. Under nearly the same latitude as Rokol, but much more to the W. is another island. It is Buss Island; it is not either on the French charts, but it exists in latitude 58° 0′, longitude 28° W. On the night between the first and the second, we saw an Aurora Borealis, which afforded us the most beautiful spectacle that nature can display. From ten in the evening until one in the morning, the heavens were on fire throughout the arctic hemisphere; the night was as brilliant as the day; I read a letter at midnight as easily as I could have done at noon. We first of all saw a luminous cloud in the form of an arch, which occupied half the firmament. From this about eleven o'clock rose columns perpendicular to the horizon, and alternately white and red. The upper part of these columns towards midnight changed into sheaves of a flame colour, from the centre of which arrows of light issued into the air like rockets; at length, after midnight, these columns, which were arranged with such admirable symmetry, were confounded all at once in a brilliant chaos of cones, pyramids, radii, sheaves, and globes of fire. This celestial appearance disappeared gradually; but the air was full of light even till day.

Phenomena of this description have been seen in all ages and countries; but what are their origin? Why are they observed towards the north? As every one is allowed to have his own system, I shall hazard a conjecture on the probable cause of the aurora borealis, called so from its luminousness resembling that of dawn, although more commonly known by the name of the northern lights, on account of their being seen in the north. 1. I imagine the matter of the aurora borealis to be the same as that of lightning or electricity. 2. That the diurnal motion of the earth occasions a continual flux of this matter towards the poles; which makes these meteors most visible in the neighbouring regions. 3. That a certain density, temper, and particular constitution of air be requisite to cause to approach, heap together, and compress the igneous particles, so as by their fermentation to produce those sheaves, rockets, and luminous columns which are peculiar to the aurora borealis. 4. That all the rapid movements, the lateral divergencies, the sudden appearance of columns, &c. result from their mutual and alternate attraction and repulsion, a natural property of electric fire, as is proved by the alternate attraction and repulsion of gold leaves and light bodies by electrical globes. 5. That if this meteor appear but rarely, it is because the air possesses seldom the requisite density, or is properly constituted to produce it.

The most celebrated philosophers have long maintained an opinion that the element of fire was dispersed throughout existence, and that solid and fluid bodies were abundantly impregnated with igneous particles. I conceive that the æther of Newton, the elementary fire of Boerhaave, and electric fire, are the same substance, whose different effects vary in proportion to the impulse, agitation, direction, strength, and quantity of the assembled matter: hence the action of the sun on this substance produces the double advantage of light and heat. Thus the attrition of a globe of glass reunites a certain quantity of it, which, managed and directed with art, produces the various phenomena of electricity. Thus the sudden and violent collision of two hard bodies elicits sparks, and the continual friction of two bodies, of whatsoever description they may be, excites and originates elementary fire, in sufficient quantity to inflame and consume any combustible matter exposed to its action.

When a great quantity of particles of fire is accumulated in condensed clouds, which compress and drive them together, the particles of fire then striking the one against the other, inflame, sparkle, kindle into a blaze, and burst with explosion the prison which incloses them. Hence the flash of lightning and the thunder clap; and if the lightning be seen before the thunder be heard, it is because the vibrations which expand from the igneous matter are more rapid of flight than the undulations of the air which bring us the sound.

When clouds have less density; when they pass over space more lightly and more freely; when they contain only a small quantity of the particles of fire, then, should they unite and clash together, they kindle into flame without explosion; they produce that silent lightning, and those falling stars, which shine and disappear. When the atmosphere is not too much overspread with clouds, and that they have no more than the density requisite for sustaining and leading on the particles of fire in their sphere of mutual attraction, without keeping them in, without heaping or pressing them, then no explosion succeeds; but the particles of fire inflame in the open air, and according to the different figures, though different consistence of the inflammable matter, and the different refractions of light, those globes, pyramids, radii, sheaves, and columns differently coloured of the aurora borealis, are seen. The identity of the essence of lightning and that of electricity, which has latterly been discovered, and whose respective effects are very various, greatly supports the hypothesis, that the light of the sun, of lightning, electric phenomena, common fire, are only different effects of the same cause, differently acted upon, disposed, modified and circumstanced. These auroræ boreales are greatly useful to the inhabitants of the polar regions; it seems as if nature was desirous by them to make amends for the absence of the sun, and the privation of his beams.

The second of September, having steered S. W. for twenty-four hours, the wind going round from S. E. to N. by degrees, I took the latitude at noon, and found it 58° 2′, and longitude 17° 10′ W. by reckoning. I was too much to the west to make Rokol island, which is distinguishable at no greater distance than four or five leagues. Not seeing this island, I conjectured that my reckoning was good, for had I been ten leagues more to the east, I must have seen it; and if, on the contrary, I had been the same distance more to the west, I should have seen some part of Iceland.

The third, fourth, and fifth, and the sixth, the wind veered backwards and forwards from south to west, blowing very fresh and a strong sea. When it blew from the west I steered south, when from the south, west, in order to take advantage of the W. and S. W. winds. The sixth, at noon, the wind skipped round to the W. N. W. in an instant. Latitude 51° 10′, longitude 16° 52′, W. of Paris. After taking the latitude, I steered S. quarter S. W. in order, before night-fall, to get south of the rocks called

Brazil, which are laid down in the Dutch charts in latitude 52°, and in those of M. Bellin in 51°. At six o'clock, the wind blowing fresh from the N. W. having passed the latitude of Brazil, I steered S. S. E. keeping rather more to the east as I advanced towards the south.

The seventh, at noon, I was in latitude 48° 50′; Ushant bearing E. 4° S. seventy-eight leagues distant.

The eighth, at eight in the morning, having steered continually E. S. E. from yesterday noon, the wind W. and fresh, I changed my course to S. E. quarter E. on account of the wind veering to S. W. and the possibility of its getting to the S. as well because I had to mistrust the currents of the channel, that is to say, of the flood-tide, which is stronger than the ebb: I sounded at four in the morning, and met with one hundred fathoms water, bottom red sand, with pieces of broken shining shells. At noon I was in latitude 48° 21′, Ushant bearing E. 4° N. twenty-seven leagues distant. I continued steering S. E. quarter E. till half past four, when I sounded. I found ninety fathoms water, bottom of sand, not red, and shells not so much broken as in the morning. This sounding and my reckoning placed me in the direction of W. quarter S. W. of Ushant, eighteen to twenty leagues distant. At seven o'clock the wind became W. the weather milder, the sky clear, I steered north, in order to keep before the ebb-tide, and at ten o'clock S. S. W. to take advantage of the flood. At the opening of the Iroise the tides run S. W. and N. E.

The ninth, at two in the morning, I sounded; finding the same depth, and same bottom I steered E. quarter S. E. the wind blowing W. N. W. very fresh, a fine sea, but cloudy weather, with some rain falling at the bounds of the horizon, which the wind was bringing towards us. At noon I fell in with Ushant, laying N. E. five leagues distant, there was one hour of flood to come, I hoisted all sail to take advantage of the tide, and anchored in Brest roads at five o'clock.

Thus finished my first voyage, in which I have inserted some observations made on my second voyage: but as I could not include the whole, I have subjoined them in the form of a supplement to the four parts, which have been read before.

SUPPLEMENT

TO THE FOUR PARTS OF THE RELATION OF A VOYAGE TO THE NORTH SEA.

Containing, return to Iceland; passing between Birds island; abridged Account of Greenland; Description of the port of Brandsoom in Norway; Remarks on the Soundings, and Navigation of the Dogger-Bank; Entrance into Ostend; Notes relative to entering the Port, and that of Dunkirk; Return to Brest through the Channel.

AS soon as the frigate La Folle was dismantled, I set off to render an account of my mission to the duke de Praslin. This minister informed me that I must make ready to repeat the voyage in the spring. I requested of him in preference to a frigate the corvette l'Hindrolle, of sixteen six-pounders, with a complement of one hundred and twenty men; on account of such a vessel being the fittest for the operations which I had planned. I repaired to Brest at the end of April to begin equipping the vessel.

The tenth of May I was in the roads, and I only waited for a fair wind to set sail. The duke de Praslin was so obliging as to grant me the two first officers I had on board La Folle, Messrs. Duchatel, and the chevalier Ferron, two officers full of zeal and genius; M. le Chev. Bernard de Marigny, an officer of distinguished merit, gave proofs

of his attachment to the service in joining us. He had recently commanded a king's ship, and the fatigue of a new voyage, full of hardships, had nothing in it to deter him. I had for the fourth officer M. Soyer de Vaucouleur, master of a fire-ship, who had commanded several privateers, a man of the best disposition.

I left Brest the fifteenth of May, 1758, with a weak E. wind; my intention was to pass by St. George's channel, but the wind which came round to the N. blowing very fresh, and continuing several days, prevented me: I passed to the west of Ireland, as on my first voyage; I kept however more closely in shore, on account of the banks and high bottoms, which I before noticed.

Nothing interesting occurred before the twenty-seventh, at eight in the evening. We had a fresh gale from the west, with a heavy sea; and were steering north, when we perceived before us a tide-bed, covered with sea-weed and foam; we were shortly in the midst of it, and the sea, everywhere else running very high, was here as calm and as even as in a pond; except the surface of the sea's trembling and boiling up the current, bearing us with rapidity to windward. I immediately brought to and sounded; we found no bottom; but I am persuaded we were in the neighbourhood of rocks, the more so from our being by reckoning between Rokol and St. Kilda islands; there is anchorage in eighteen fathoms water south east of the largest of the St. Kilda islands, and a passage between that and the one which lays N. quarter N. E. of it. In case of need a vessel may anchor in this channel in twenty-six fathoms water, sand and stony bottom.

The thirty-first, steering north to make land, cape Heckla bearing by estimation N. W. twenty leagues distant, we encountered a furious gale of wind from the eastward, with a thick fog. As the weather was unseasonable for making land, and as I had a long way to make to the west, I resolved on bearing W. N. W. and N. W. quarter W. before the wind, till the weather should change and the sky appear. My intention being, in case the weather should not clear up, to steer under bare poles, and stand to sea till such time as I should find myself in the longitude of Birds' islands.

The first of June, the wind fell towards night, but the fog continued very thick, which caused me to keep on the same tack, under easy sail.

The second, in the morning, the sky being somewhat clear, the wind still E. I steered N. E. quarter N. in order to make land. At noon I found myself in latitude 63° 20′, and continued the same course; at length, at two o'clock in the afternoon, we made the Birds' islands. That which is nearest to shore bore N. E. quarter E. four leagues distant, and another west of the former bore N. W. I continued some time steering N. E. quarter N. for the purpose of getting in shore, at length I bore away at N. quarter N. E. to fall in with the islands, and pass between the first and the second, on the side of the main land. The two islands are full two leagues asunder. I found in this passage tide-beds and eddies, which made a dreadful noise. The direction or course of the tides is N. W. and S. E. North of the two islands between which I sailed, I perceived the passage between the main land and the first island; it appeared to me scarcely a league wide; on account of the currents, it ought not to be attempted, except with a strong and leading wind. A little north of these two islands, I saw three others at sea, which appeared to me to bear W. quarter N. W. of the former. All these islands are but sharp and inaccessible rocks. I continued my course N. quarter N. E. to fall in with Mount Jeugel, and afterwards get under Bredervick point, where all the fishermen were assembled.

The fourth I anchored at Patrixfiord, where I remained some days, to give to the French vessels what assistance they needed. I say nothing here of the bearings of the anchorage, or what relates to it, having already mentioned it before. After remaining

eight days at Patrixfiord, I made ready to depart for Berghen in Norway, to take in a month's provisions; but before I leave the western part of Iceland, it will be proper to say something of Greenland, the land most contiguous to Iceland.

Respecting Greenland we have only an imperfect knowledge. Some geographers look upon it to this day as an island, others as a peninsula. This country was discovered by a person of the name of Gunbiorn, and made more particularly known by Eric, surnamed Red-head, in 982. The green pastures of the country caused him to call it Greenland. He saw savages there, who doubtless had passed over there from America, but of the origin of which there is nothing certain. The king of Norway being informed of this discovery, caused missionaries to be sent over with a colony. The Greenlanders, in 1256, revolted against king Magnus, but this prince, assisted by the Danes, reduced them again to subjection in 1261. The black plague which ravaged all the north interrupted navigation to Greenland, and for two ages the country remained entirely forgot. Martin Frobisher left England in 1576, to attempt to reach Greenland, but the ice did not allow of his landing until 1577. He gave his name to a strait in latitude 63°. In 1585 John Davis went more to the north, and gave his name to a strait which he discovered. Christian the Fourth, in 1605, sent three vessels thither, which established a trade with the Greenlanders, five of whom were brought to Copenhagen, but died of grief at being separated from their country; the next year five ships were dispatched, and in 1616 this prince dispatched captain Munck with two vessels for Hudson's Bay, in order to discover a north-west passage. It is captain Munck who gave the name of Farewell to the cape, which forms the south part of Greenland. In 1636 some merchants of Copenhagen sent two vessels to Davis's straits, who trafficed with the Greenlanders, and brought back a large quantity of gold dust. It is not known for what reason this trade was discontinued by the Danes to 1718, when a clergymen, full of zeal, obtained an order from the king to go over to Greenland with all his family. His name was Egede, and all the Greenlanders to whom he preached the gospel had the highest veneration for him. In 1731 the king of Denmark recalled all his subjects from Greenland. Egede alone remained with all his family. The king sent thither again in 1734, and at this time the commerce of Greenland is carried on by the general company of Copenhagen, which every year dispatches three ships to that country.

The coasts of Greenland are difficult of access, on account of the shelves and ice which surround them. It is even affirmed that Frobisher's straits are at this day so full of ice, that its existence is disputed. The eastern part of Greenland, which is opposite to Iceland, is entirely inaccessible, owing to the ice floats which come from Spitsbergen, and which even shut the passage sometimes between Iceland and Greenland, which is thirty-five leagues wide. This happened in 1766; in that year it has been already observed the fishing vessels were never able to double cape North.

The climate of Greenland is cold, and the weather very inconstant and variable. In the vallies, the ground consists of marshes and turf, and the mountains, which are so many sharp rocks, are covered with ice and snow; trees are met with here in no greater abundance than in Iceland. There are in Greenland several mountains of Amianthus. Very small white hares are found here, and rein-deer, but which have no resemblance to the Lapland rein-deer. The foxes there are gray, white, and blue; bears are met with, but which no ways resemble the bears of other countries; they have more suppleness, and are more nimble. No other birds are seen but those called Riper by the Icelanders, which build their nests in the highest rocks; but, as well as in Iceland,

there are quantities of aquatic fowl. The rivers are full of trout and salmon, and on the coast plenty of fish and whales are caught.

The Greenlanders are small of stature, gross and fat, they have all of them black hair, and red and brown countenances; they are subject to colds in the head, to the scurvy, to complaints of the eyes and the breast. They know nothing either of physicians or surgeons, they have priests, who serve them as well for philosophers and doctors, for whom they entertain the highest respect, and whom they frequently consult. The language of the Greenlanders much resembles that of the Esquimaux Indians, who inhabit North America. Their dresses are made of birds feathers, rein-deer skins, and seals skins, sewed together with the guts of them. The Greenlanders have huts for the winter, and in the summer live in tents; their huts are similar to those of the poor Icelanders; their tents are made of seals skins. They make but one meal, which is at night. They live upon hares, kids, sea-dogs, different sorts of birds, and fish, and drink nothing but water. Neither arts nor sciences are to be met with among the Greenlanders; their trade consists in lard, whalebone, unicorns horns, kid skins, reindeer, sea-dogs, and foxes. They take, in barter, linen and other necessaries. These people have a sort of religion; they acknowledge a Supreme Being, believe the souls of the dead ascend to Heaven, and go a hunting there, and that the bodies remain to rot in the earth; women are buried alive as soon as they appear to be in a dying state.

The above is all that is most interesting of the history and manners of the Greenlanders; there remains I should speak of their boats for fishing, and their manner of fishing and navigating. Hunting and fishing are the only occupations of a Greenlander. They fish in their lakes, rivers, and rivulets, but their principal fishing is in the sea; where they catch whales, unicorns, and sea-dogs, cod, and other fish, which abound upon the coast. Their hooks were formerly of bone, but they have steel hooks now, which the Danes bring them. Their lines are made of small splinters of whalebone, and their casting nets of deer's guts twisted, the harpoon which they use for striking the whales is furnished with a forked bone, or a pointed stone, some have also harpoons of iron, which they barter for with the Danes, giving them oil and grease in exchange. As these poor people have but little wood and iron, they make use of the precaution of fastening to the middle of every harpoon which they throw the bladder of a sea-dog, that if the harpoon should not strike the fish, or detach itself from it, it may float on the water, and be readily found again; this expedient was known to the fishermen of the Atlantic Ocean, for Opien in his Halieuticon speaks of it, lib. V. v. 177. "They dart, says he, large sacks blown up by the breath, and fastened to a cord, immediately at the fish, as it is about to plunge." The arrows which the Greenlanders use are armed as well either with bone or sharp stones, and they exercise themselves in drawing the bow, from their tenderest infancy. The inhabitants of the new island on which M. Bougainville landed lately in the South Sea, not having any iron, make use of bone for heading their arrows, of scales and shells for knives, and sharp stones for felling of trees; these examples shew that necessity is the mother of invention, and that industry is every where alike. The canoes or boats, in which the Greenlanders embark for the fishery, are made of wood fastened together by traverses, joined with thin slips of whalebone at different distances. They are lined with the skin of seals, well sewed together with animal fibres instead of thread, and the joints are well greased, to prevent water from penetrating. These canoes are of different sizes. Some are capable of carrying twenty persons, with their arms and baggage, and a good quantity of fish or whales' blubber. These canoes have a sail made of the bowels of the whale, split and dried, and sewed

one to the other. Historians inform us, that this mode of navigating is common among all the northern people that have been discovered. Scheffer cites several examples in his work, De Militia Navali Veterum. The Musœum Regium Danicum, and the authors which M. Hasæus refers to in his dissertation de Leviathan Jobi, may be consulted. I have observed that the Greenlanders had no knowledge of arts and sciences. They are unable to count farther than twenty-one. They count by moons. It is by the course of that planet they compute the return of the whales, and other fish, to their coast.

The fifteenth of June I sailed from Patrixfiord, to go to Norway; it was during this run that I sounded, and made the observations on the Shetland islands, and the Orcades, which I have before detailed to the reader; I passed south of Fair isle in the little Tuns, and afterwards directed my course towards the shores of Norway.

The first of July, in the morning, I made land. I took the latitude at noon, five leagues north of the rocks or islands which are called Utsires; and found these islands to be placed too far south by 15′ in the Neptune. On the Utsires, pilots are to be met with for the Berghen roads. I shall not enter into any further account of the bearings of this coast, all that was necessary to say having been mentioned before. At two o'clock in the afternoon, being about three leagues from shore, Norwegian pilots came on board, who made me luff up to make the passage of Rooth-holm; but the wind, which blew but gently from the north, at length entirely died away, and we had calm all the night long.

The second, at three o'clock in the morning, a feeble wind arose in the N. E. with a thick fog: we luffed under the land, keeping always a league from shore; and by ten o'clock, it clearing up, we entered the above-mentioned passage of Rooth-holm, through which I passed the year before; but instead of proceeding up it as far as Ingeson, as on our first voyage, we anchored in the port of Brandsoom, which is west of Ingeson: it is larger, and the entrance more commodious. The entrance of Brandsoom is known by an island, in the shape of a pye, at the opening of the port, and which is very healthy: three vessels of war may moor there in safety. There is always a fine sea, and no wind is felt there. This port is to starboard on passing to the north of Bomel; it is possible to enter it by any wind from the N. W. to the E. A vessel mooring there should cast anchor in fifteen to twenty fathoms, with gravelly bottom, and send a small anchor with a tow-line on shore from the stern, south of the stream-anchor.

The third, it rained, the sky was overcast, and the wind blew fresh from the south. I sailed at two in the afternoon to get up to Berghen. After proceeding three or four leagues a calm came on, and we were obliged to be towed by all our boats, to get to an anchorage.

The fourth, in the morning, a light wind arose from the S. S. W. I got under sail, and anchored at Berghen at half past two, in the same place I had done in the frigate La Folle. After having taken in what provisions and refreshments I required, I left Berghen on the twenty-fourth of July, and went out through the northern passage, as I had done the year before, to return to Iceland.

The thirtieth, at night, considering myself twelve leagues S. E. of Langerness, the wind northerly, with fog, I sounded, but found no bottom, and brought to. I ordered the officer of the watch to sound every two hours during the fog, and to steer W. N. W. if it dispersed sufficiently for discerning the distance of three leagues.

The thirty-first, at five in the morning, we saw land; I continued my course to get near it, but the wind blew very faintly from the north. At noon I found the latitude 66° 26′. We saw in the afternoon a number of doggers, or fishing vessels, all of whom

that I spoke told me there was nothing new in the fleet. We had seven or eight days of fine weather, which I employed in sounding and taking bearings.

The tenth of August, seeing the appearance of bad weather, I got off the coast.

The twelfth and thirteenth, we had a gale of wind from the S. W. with a terrible sea. We brought to with the stay-sails set, and in this attitude my vessel bore very well. From the thirteenth the wind was continually changing, with foggy weather; at length, on the nineteenth, seeing the weather did not clear up, and that the season was advanced, I run for the Shetland islands.

The twenty-fourth, being by log fifteen leagues E. N. E. of Boqueness, I sounded, and found sixty fathoms water, muddy bottom. I continued my course four leagues, on the W. N. W. tack, and found, on sounding, seventy fathoms water, with a muddy sand. I pursued my way under the same breeze, and considered myself four leagues east of the middle of cape Boqueness; I did not perceive it; I sounded, and found fifty fathoms water, bottom fine sand mixed with mud: I then steered S. quarter S. E. to fall in with the Dogger-bank, with a very fresh breeze from the north: as the horizon was clear, and cape Boqueness very high, and as I had spoken to several herring-fishers, who told me they were twelve leagues from land, I am surprised at not having seen Boqueness, and I thence conceive it to be more north than is marked in the French chart. This chart places it in lat. 57° 32′, but the Dutch charts place it in lat. 57° 58′. At the point of Boqueness is a small bank, which the Dutch call Vatterburg, which signifies rat's-tail, on account of its figure. On this bank there is at low water three fathoms water; there is a passage a league wide between the bank and the shore. South of Boqueness an island is perceived, and several rocks, and near them there is anchorage in ten fathoms water, sheltered from all winds from the north. The currents run south along all these coasts.

The twenty-sixth, at noon, I took the soundings on the Dogger-bank, and from that instant I did not cease heaving the lead till I reached the banks of Ostend. As the detail of the different courses I took in sounding would be tedious, I shall only describe the sounding, and the points of latitude and longitude.

TABLE OF SOUNDINGS, FROM THE NORTH-WEST EXTREMITY OF THE DOGGER-BANK TO THE BANKS OF OSTEND.

Lat.		Long. W. from Paris.			Fathoms.
55°	9′	0	59	gray sand with black spots	26
55	3	0	55	same bottom	21
54	59	0	52	same	20
54	56	0	50	flint and small stones	18
54	53	0	47	ditto	14
54	50	0	39	ditto	15
54	53	0	34	ditto	18
54	54	0	19	ditto	18
54	48	0	21	ditto	18
54	44	0	14	ditto	17
54	39	0	7	ditto	15
54	35	E.	2	ditto	15
54	33	0	6	fine sand and shells	14
54	31	0	9	fine sand	12
54	30	0	18	same, extremity of Dogger-bank	18
54	20	0	33	fine white sand and shells	26

Lat.		Long. E. from Paris.			Fathoms.
54°	7′	0	41	large sand and small pebbles -	28
53	54	0	40	same bottom - - -	24
53	50	0	40	muddy sand - - -	31
53	47	0	39	same - - -	22
53	35	0	32	same - - - -	20
53	17	0	23	fine red sand mixed with black -	18
53	10	0	21	the same - - - -	25
53	7	0	21	the same - - -	20
53	5	0	20	fine white sand (white bank) -	17
53	0	0	18	the same - - -	22
52	46	0	15	fine gray sand - - -	28
52	26	0	46	red and gray sand - -	25
52	14	0	47	same bottom - - -	17
52	10	0	40	fine sand - - -	19
51	50	0	28	sand and small gravel - -	20

The variation of the needle 19°.

I traversed the Dogger-bank, and the banks south of this, first, taking soundings every hour, of which the table is annexed. Vessels which are passing over the Dogger-bank should take the middle of it as much as possible, for on the eastern side the currents are violent, and run to the Categat; and on the western side there is no more than eight or nine fathoms water, which occasions surges so much the more dangerous, as the bottom is large gravel and small pebbles. South of the middle of the Dogger-bank there is twenty-five to thirty fathoms water, muddy bottom. Ten leagues south of the middle of the Dogger-bank is the white water: the bottom is of white sand, and there is sixteen or seventeen fathoms water. Five leagues east of this bank the Well-bank is met with, the bottom of which is of stone; there are eighteen fathoms water on it. West of this bank the bottom, which is a yellow sand and black gravel, increases to twenty-two fathoms. A little lower down are the Lemon-banks, very dangerous; on these there is no more than one fathom at low water. Many vessels are annually lost there. The middle of Lemon is about seven leagues N. N. E. of Yarmouth. The banks of Yarmouth also are to be guarded against. By all that I have observed, it must be evident that the west side of the Dogger-bank is very dangerous. In calms, ships anchor on the Dogger-bank to wait for wind and tide. The fishing vessels of Dunkirk, decked boats of thirty-five tons, anchor there in all weathers; they pay out three hundred fathoms of cable, and meet frequently dreadful gales of wind while at anchor. By accident sometimes a vessel is lost in this manner: the vessels on tacking fall foul of their cable, and on the after-tack run again upon, when, should the cable pass under the keel, the vessel is sometimes overset.

The twenty-eighth of August, at three o'clock in the morning, having sounded, and found twenty-four fathoms water, with sandy bottom, and being within the first of the Flemish banks, I cast out a small anchor to wait for the tide. At six o'clock the wind blew fresh from the E. S. E. I set sail and steered S. S. W. At nine o'clock I saw the towers of Ostend, which bore S. quarter S. W. five leagues distant. I continued running S. S. W. on account of the flood running strongly to the east. At noon the towers bore south, two-thirds of a league from me. I fired three guns to cause pilots to come on board, who were remiss; and at half past noon I entered between the jetties. The tide began to ebb from the port, which made me run the hazard of being driven on a

bank to starboard on entering. Luckily a sloop belonging to the port was there, which quickly carried a lashing to the moorings of the eastern or larboard side of the jetties on entering. On coming from the north to make Ostend, two towers at first are distinguished, the largest of which has a steeple, and belongs to the parish church; the other, which is terminated by a gallery, is that of the clock of the town-house. In making the land, the one must be kept in line with the other until you reach the buoy, which is at the western extremity of the traverse, on which is a little red flag; this must be kept to larboard: you then steer for the eastern jetty, which is the safest, and which you must keep close to, whether in coming in or going out. At high water you pass over the Stroom and the Traverse: on these two banks the water rises eighteen feet. A pilot, kept for the purpose, takes care at half flood to hoist a small blue flag, in order to shew that small vessels can enter. To give information to large vessels that they may enter, he hoists a large blue flag, on which there is an eagle. When none is hoisted, it is a sign of there not being sufficient water; in that case, if the ship be at sea, she must either tack or cast anchor: a vessel may anchor in the roads, or moor on the Stroom, and W. N. W. of the Traverse, in six or seven fathoms water, with sandy bottom. The spring-tides rise nineteen feet, and neap-tides fourteen feet. At low water there is but six or seven feet on the Stroom. The mode of avoiding it is to keep the two towers open, by about the space of the size of the largest tower, which must be kept to the east. At the eastern point of that bank there are three fathoms water. There is only three feet water on the Traverse, or bar, and even but two a little east of the jetty, at the end of the moorings. In short, to enter Ostend, great attention must be paid to the time of high water, which is at twelve o'clock in that port, and new and full at three o'clock upon the banks out at sea. Attention must be paid as well to the flood running with rapidity E. N. E. on which account a ship should steer a little within the eastern jetty, and manage the sails according to the wind. The entrance of the port, or of the jetties, is S. S. E. and N. N. W. but after having passed the bank on the starbord quarter on entering, the port makes an elbow, and bears to the S. S. W. If a vessel be obliged to enter into port without a pilot, and if the wind be strong, she must be ready to cast anchor on the starboard side, as soon as she has passed the bank which is at the entrance of the port, and laid the vessel S. S. W. for in case of not anchoring, she would be carried away by the current to the mud-banks at the bottom of the port. Ostend is very commodious for every ship under forty guns; but it keeps filling up every day, particularly since a dam has been thrown up to prevent the overflowing of Polder St. Catharine, which is nearly two thousand five hundred acres of new well cultivated land. In this space, lately overflowed by the tide, the finest basin in the universe might be constructed, by forming a sluice in the middle of the dam made thirty years ago, to oppose the inundation. The Ostenders will be able to cleanse and excavate their port as much as they please, by means of the waters which they may dam up after flood in the Sandfort. In respect to the bank on the inside of the jetties to starboard on entering, it is easy to destroy it, by making an elbow upon the eastern jetty, to change the direction of the drifts, by an angle of reflection equal to the angle of incidence: the waters of the fine sluice of Schlick, although very distant and badly placed, would be sufficient to carry away the bank. If this sluice had been placed nearer to the trading port at the entrance of the canal of Bruges, its defence and its use would have been united: instead of which, it is of very little service where it is towards cleansing the port, and very difficult to protect from the attacks of an enemy. The town of Ostend is small, but very pretty; it rendered itself famous during the wars of the Low Countries. Ostend takes its name from its situation; as it is at the extremity of Flanders, on the eastern side, it is called

Ostend (East-end.) Ostend particularly signalized itself by the siege which it sustained in 1601 against the archduke. This siege, which lasted three years, began in the month of July 1601; and the town did not capitulate until September 1604. There perished during the siege fifteen colonels, seven marshals, five hundred and sixty-five captains, eleven hundred and sixty-six lieutenants, three hundred and twenty-two ensigns, four thousand nine hundred and eleven serjeants, nine thousand one hundred and sixty-six corporals, six hundred and ten anspassades, fifty-four thousand three hundred and sixty-six soldiers, six thousand and eleven sailors, eleven hundred and ninety-six women and children; making in the whole seventy-eight thousand persons and upwards. Ostend only began to be fortified in 1572. It was however a town known for several ages before; for it is seen in the grand Flanders Chronicle, that Robert de Frise, eighteenth count of Flanders, died in 1093, after reigning twenty-two years, and built thirty churches dedicated to St. Peter, the first of which was erected at Ostend. The abridgment of the Flemish Chronicle speaks also of Ostend, in mentioning Philipes Elsaten, sixteenth count of Flanders, who died in 1191, and who caused to be hung and exposed along the coast, from Blankemberg to Ostend, eighty Norman gentlemen, who had seized upon some ships belonging to the Princess of Portugal, his wife. In the time of Philipes Elsaten, there was taken on the coast near Ostend a sea-monster, forty feet long, with eight large fins. Jaques Marchantiers, in his description of Flanders, book I. page 79, says, in speaking of this monster, Rostro aquilino, cristâ gladiata; the expression cristâ gladiata makes me conceive it to have been a kind of sword-fish; perhaps it was a particular species.

After repairing my vessel at Ostend, and refreshing my crew, I made dispositions to continue my course to Brest, the twelfth of September.

The thirteenth, at noon, the wind blew pretty fresh from the east, the weather overcast, I left the port, keeping close to the eastern jetty. When outside the jetties we steered west, to pass to the south of the buoy, which is at the extremity of the bank before the port. After passing this buoy we bore W. N. W. and W. S. W. coasting along shore, three quarters of a league distant, till we got opposite to Nieuport, which we rounded, keeping rather farther from shore. At four o'clock we directed our course south, to avoid the point to the east of Brac, and gain the entrance of the road of Dunkirk on the eastern side. When wide of the Brac on the east, a vessel is desirous of nearing the land to gain the channel, the tower of St. Catherine should be kept in line with the two towers of Bergues, keeping however those of Bergues a little to the east of that of St. Catherine, which is the only tower on the coast in this neighbourhood. Knowing by sounding, or the increased depth of water, that we had passed the point east of the Brac, and that we were in the channel at the entrance of the road, we steered N. W. and N. quarter W. under top-sails, to look for our anchorage. At half past four o'clock we cast anchor in seven fathoms water, with a bottom of muddy sand, and we moored east and west, the same bottom and same soundings. Being moored, the battery bore S. quarter S. W. and the tower of Dunkirk S. I ought not to forget to observe, that in going from Ostend to Dunkirk there is a channel more secure and easy than that which we took, particularly for a vessel like l'Hirondelle: a vessel has need to coast the shore at no more than a quarter of a league distant, and take care in rounding the bank which is at the entrance of Nieuport. The road of Dunkirk is good, on account of there being but little water (six, seven, eight, and nine fathoms) and the ground holding well. This road would hold the largest fleet; it is shut only by a sand-bank, called the Brac, on which at low water there is but one fathom water, and which in some places even is dry. The winds the most to be apprehended in this road are those from

the W. N. W. to the N. E. The sea there frequently runs very high, particularly when the wind blows from the W. N. W. on account of the surges entering by the western passage. This is the most likely wind to make the anchors drive and break the cables, especially in flowing tides, for then ships have at the same time to sustain the power of the wind and the impulse of the flood.

Dunkirk is celebrated for its antiquity, its port, and the revolutions it has undergone. About sixty years before the Christian æra, the people inhabiting the coasts of the sea where Dunkirk now is situated were called Diabintes. This name, which is latinized, is derived from the German, in which language it is thus written: Die hap inden; signifying, navigating in a port of a secure form, or navigating in a port of the shape of a hatchet. The Morini were their neighbours, that is to say, the people of Boulogne, Calais, St. Omer, Therouane, and Aire; and those of Bergues, Honschoot, Furnes, Dixmude, and Nieuport, were called Menapii: these three people went to meet Cæsar on his conquering Gaul, and gave him battle on the banks of the Sambre; it remained for a long time undecided, and Cæsar gained it only by means of a considerable reinforcement which he had received during the engagement; notwithstanding this, his loss was so great, that he was unable to subjugate these people until the following year, when he again fought with and defeated them. Cæsar conquering them, left them Corvinius for governor. The Romans constructed several fortresses, among others that of Cassel, six leagues from Dunkirk inland, where the governor of the Low Countries used to reside. The village of Mardyck, which has been made a good fortress, is situated a league and a half, or thereabouts, from Dunkirk; it has given the name to several camps and battles: it was formerly the celebrated Portus Iccius, of which Cæsar speaks in his Commentaries, who has even retained the name: the Sieur Chifflet has drawn a plan of it, with an ample description. He says, that in the time of Cæsar the greater part of this country was covered with wood, and overflowed in different parts, and that there were only some banks or roads raised above the marshes, which led to the seashore; the sea then extended as far as to a town called Cithieu. This town was afterwards named St. Omer's, from the name of a bishop of Therouane, who built a church and several houses there, for the residence of the poor of his diocese, and to enable them to live by the trade of the place. After his death, the relics of the saint being transported to Cithieu, his name was given to the church, and the town which was afterwards built.

St. Victricius, bishop of Rouen, was the first who came to preach the Christian religion on the coast of Dunkirk, in 396. The last of the Romans were driven out by Meroue, who subjugated this province to France in 450. St. Eloi came to preach the faith in 646, and made some stay there, which brought over a number of proselytes; he built a pretty large church there on the downs, where for some time a number of fishermen and poor people were collected together. This place was soon frequented by a number of the Christians of the neighbourhood: the name of Dunkirk was given to this church, and to the town which was afterwards built on that spot; the word kerke signifying church in the Teutonic language, from which the Flemish is derived.

The Low Countries were governed for a long time by foresters appointed by the kings of France. Baldwin, in 864, was forester of Flanders, or the Low Countries, having run way with and married Judith, daughter of Charles the Bald, who forgave him his conduct and sanctioned his marriage; he became the first count of Flanders, the king making this country a county, reserving a homage to France. The number of the inhabitants of Dunkirk augmenting every day, from the commodiousness of its natural port, Baldwin Third surrounded it with a wall in 906, to protect the inhabitants from the inroads

of banditti. They addicted themselves to trade and fishing, and embellished and added to the convenience of the port. Philip of Alsace built several vessels of war there, to go with to the Holy Land. In 1170 the Norman pirates, for the most part gentlemen, interrupted their commerce, by stopping their vessels in the channel; they detained and even plundered the Princess of Portugal, who was on her voyage to marry Count Philippes in Flanders. Philippes fitted out a strong fleet at Dunkirk, which he sent after them, and was fortunate enough to take them all and carry them into Dunkirk, where they were condemned to death, as I have before observed in speaking of Ostend. This defeat endeared the Dunkirkers to their sovereign, who granted them many privileges and exemptions. In 1232, Dunkirk being sold to Godfrey de Conde, bishop of Cambray, on condition of reverting after his death to the count of Flanders, he very much enlarged and deepened the port, and constructed two jetties, proceeding a good distance out to sea.

Dunkirk was separated from the county of Flanders, and erected into a private lordship by Robert of Bethune, in favour of Robert of Cassel, his son, who built a castle, and established a magistracy. He founded three brotherhoods of cross-bow-men, bow-men, and gunners, to exercise the citizens, and perfect them in the use of arms: dying without a son, his only daughter Jolanda married a duke of Bar. This alliance gave its first arms to Dunkirk.

In 1382, the people of Ghent revolting from their sovereign called the English to their assistance, and seized upon the town of Dunkirk; but Charles the Sixth, king of France, retook it the same year, and restored it to its lord.

In 1403, the walls and fortifications, damaged by the sieges it had sustained, were repaired, and the ditches greatly deepened.

In 1436, the English took Dunkirk.

In 1440, a church was built at the foot of the tower built a short time before, to serve as a pharos and belfry for the parish.

Among many great men which this town has produced is Nicholas Vanderhelle, a great theologian, four times recteur magnifique of the university of Louvain; Cornelius Schepper, a great philosopher and politician, who, under Francis the First, was professor of philosophy and mathematics at Paris. He was chosen by Charles the Fifth to watch over his interests with the major part of the princes of Europe, and was twice appointed ambassador to Sultan Solyman: he was greatly beloved by the learned.

The fishery being from earliest time the principal trade of the town, in 1532 five hundred busses or vessels, from fifty to sixty tons, designed for fishing in the north, belonged to this port: every one of these vessels had among the lines with which they fished, one called the holy line; all the fish caught by it were sold for the benefit of the church: out of these gifts the church, which was burnt in 1558, was rebuilt in 1560.

In the war between France, Spain, and England, in 1558, marshal Termes with seventeen thousand men set down before Dunkirk: there were in garrison in the place at the time no more than four hundred men; it was taken by assault, and pillaged, and many of the citizens were massacred. Bergues suffered the same fate. The pillage in these towns and in the neighbourhood was so great, that a cow was sold in the French camp for two or three sous, and thirty-eight horned beasts for a gold crown: the bells were even broken, in order to take away the pieces: the enemies of France having collected an army in the neighbourhood of St. Omer's, for the purpose of attacking the French, Marshal Termes was disposed to retreat, and set fire to several parts of the town, in order to complete the destruction of what had escaped the rage of the soldiery; the church, the convents, and almost the whole town, were consumed by the flames, as well

as several vessels were laden with booty, which were detained by contrary winds in the port. After these excesses he departed to join the main army, but Count Egment, the general of the Spaniards, came up with fifteen thousand troops, and a large number of peasants, who cut to pieces the army of Marshal Termes, making him with the chief of his staff prisoners.

In 1583 the town of Dunkirk was taken by the confederates, and retaken the same year by the Duke of Parma, who greatly repaired the port, and built there several vessels of war, among others, fourteen commanded by vice-admiral Wacken, which made many Dutch prizes; the following year, the proprietors of these vessels made a number of prizes, which they conducted into port, notwithstanding it was blockaded by a Dutch squadron. Charles Dauwere and his son John were the chiefs of these fleets of privateers; they were both of them intrepid, and very skilful in manœuvres. This caused the squadron of the Dutch, which had cost a great deal for little advantage, to draw off. About this time the Spanish fleet arrived in the channel, named the Invincible, which was dispersed by a storm; many ships perished at sea, others were lost on the shores of France and England, and the sad remains of this fleet were fortunately conducted back to Spain through the skill of Michael Jacobs, a Dunkirker, an excellent seaman; nevertheless the Dunkirkers did not cease fitting out privateers, and making considerable prizes of Dutchmen and Zealanders. These riches drew a number of foreign sailors to Dunkirk. The ardour of the Dutch for blockading Dunkirk was redoubled, sending even a hundred vessels before it; which however did not hinder the privateers from stealing out under favour of night, and, owing to the lightness of their vessels, proceeding in making prizes in the North Sea. They were attacked by a large ship of war, commanded by the vice-admiral Anthonisen, but who was not then on board. In his absence, the commander, seeing himself disabled, half his crew wounded, and the enemy already boarding his ship, set fire to the powder-room, and blew himself up; at the same time doing considerable damage to the Dunkirkers. The town was fortified with new works, and privateering continued. In 1595, one captain of a privateer brought into the port of Dunkirk as many as thirty masters of busses and other vessels, which he was satisfied with ransoming for more than two hundred thousand livres; an enormous sum for that age. Another named Koster, returning to Dunkirk after ransoming several vessels, was surrounded by a Dutch fleet; he fought desperately, and disabled several vessels; at length, pressed upon at all sides, he set fire to the magazine, and blew himself up, together with the ships which were boarding him.

The Cardinal Archduke Albert of Austria, who replaced the Duke of Parma, being desirous of signalizing his accession to the government of the Low Countries, laid siege to Calais in 1596, which he carried in a little time; this acquisition was of great advantage to cruizing against the enemy. The Dutch, interested in hindering, sent fourteen large vessels to anchor before Dunkirk, while nine others kept the sea, to intercept the vessels desirous of entering. Calais was given up to the French by the treaty concluded in 1598, between France and Spain; in spite of the Dutch squadron prizes arrived in safety, and the engagements which took place were fought with so much the more obstinacy from each party hanging their prisoners.

In 1609 a truce was concluded for twelve years between the Dutch and Spaniards. At the end of it the privateers, assisted by nine Spanish vessels, ruined the Dutch commerce.

In 1622 the citadel of Mardyck was constructed, to shelter Dunkirk from the insults of its enemies. In this year John Jacobson of Dunkirk, a captain in the navy, commanding the St. Vincent, of a hundred and fifty men, on going out of port with two

Spanish vessels commanded by Spaniards, was attacked, about four hours after leaving the jetties, by nine Dutch men of war, which surrounded and engaged the St. Vincent; his two companions made their escape. Jacobson maintained the unequal fight for thirteen hours, sunk two of the vessels, and did great damage to the others, but, reduced to two or three men, the rest being either killed or wounded, he was boarded by fifty of the enemy, when he set fire to the magazine, and blew them up with himself: the explosion was so violent, that one of the Dutch vessels was dismasted, and another was in great danger from the falling of some heavy pieces of brass cannon which had been blown up, and alighted on the deck; all the rest were in a sad plight. The enemy in this engagement lost more than four hundred men. This loss, far from dispiriting the Dunkirkers, only inflamed them with a desire to revenge their companions. The Sieurs Wandewalle, father and son, equipped eighteen vessels, which, in conjunction with others, made more than six hundred prizes, of which six were vessels of war of the largest size; from the prizes captured by four vessels only of Wandewalle, the tenth, which belonged to the king of Spain, came to more than a hundred thousand florins; and in spite of the blockade of the town, which the Dutch maintained continually, the cruizers ruined their fishery and their trade. In 1626 the profits of our privateering were estimated at more than 10,000,000 f. In 1629 the Dunkirkers made prize of ninety-one vessels richly laden; without including ransoms, and ships which they burnt in Norway and other places.

Matthew Rombout, a Dunkirker, vice-admiral of the Spaniards, fought Admiral Peter Hein; the latter lost his life. He was much regretted by the Dutch. Tired at length with their continual losses, after depriving Admiral Drop of his commission, who commanded before Dunkirk, they augmented their fleet to eighty sail, in order to blockade the place entirely; but, getting two close to Mardyck, the cannon from the fortress played on them with so well directed a fire, they were fain to retire, after sustaining considerable damage.

War being declared in 1635 between France and Spain, the Dunkirkers made prize of fourteen French ships at once, laden with wine; and some days after, Captain Nordman captured eleven others. Admiral Colaert, a Dunkirkman, commanding seventeen vessels of war, burnt more than a hundred and fifty Dutch busses, convoyed by a squadron; the admiral's ship itself was destroyed, and the vice-admiral was carried prisoner to Dunkirk. One of the most considerable prizes was that of the famous French pirate Loutre; she mounted eighteen guns, had made prize of seventeen vessels, which had been sunk, after taking out their most precious effects; there was on board this vessel seventeen thousand florins, six thousand piastres, one hundred and twenty-two pounds of silver in ingots, a coffer full of silver plate, and a great quantity of precious stones.

In 1636 the same Colaert took and conducted to Dunkirk the Dutch admiral Haute Been, or Wooden-leg. This Colaert was in the Spanish service for thirty-six years, took from the enemy one hundred and nine-vessels, and twenty-seven ships of war, bearing collectively more than one thousand five hundred pieces of cannon; he died at Dunkirk in 1637. The great number of prisoners brought into the town caused a plague, by which numbers of persons perished. The owners of privateers made fortunes, notwithstanding Van Tromp commanded the blockade of the port. In 1640 the circumference of the lower town was enlarged, in order to furnish dwellings for the increased number of inhabitants; so greatly did the equipments from the place attract population.

It was in 1641 that Don Pedro de Leon, governor of Dunkirk, obliged Vice-admiral Matthew Rombout to go out of port with his squadron, to assist the Spaniards against

the Portuguese, who had revolted. This governor, a general officer on shore, knew nothing of the difficulty of passing through the enemy's fleet, superior in number, which laid between Gravelines and the town. He would not listen to the representations of Rombout, who, forced to obey, was defeated, as he had predicted, and killed in the engagement, after having fought with the greatest resolution. A part of his squadron was taken, the other was obliged to fly. His death gave as much concern to the Spaniards, as pleasure to the Dutch, who feared him greatly. A descendant in a direct line of this Admiral Rombout went two voyages with me as a pilot.

In 1642 Joseph Pieters, vice admiral, being with five vessels and a long-boat in the roads of Vivaros in Spain, was attacked at eleven o'clock in the morning by twenty-four French vessels and eight galleys; the French admiral's ship, carrying sixty-six guns, was so ill treated, that he was obliged to withdraw. The battle lasted till night, during which the Dunkirk man made shift to escape with his six vessels.

In 1645, the French attacked the fort of Mardyck, which capitulated after six weeks siege. But the governor of Dunkirk having assembled all the seamen and some troops, took it again during a winter's night. It was taken again by the French in 1646, after a siege of twenty-one days. That of Dunkirk immediately succeeded; the Prince of Condé made himself master of it in less than a month, notwithstanding it was vigorously defended by the Marquis de Lede, who was obliged to capitulate, all succour being cut off both by sea and land. He surrendered with military honours.

In 1652, during the civil wars of France, the Archduke Leopold retook it, and gave the government of it to the Marquis de Lede, who had before so well defended it.

In 1656, the English, united with French and Dutch, made war with Spain. The Dunkirkers, joined to those of Ostend, took a whole fleet of English ships, consisting of forty-four sail, and a few days after thirty-three others.

In 1657, Marshal Turenne, with some English troops, took the fort of Mardyck. He gave it up to the English, who sent there a fleet laden with a quantity of materials, to fortify and render it in some measure impregnable. They put fifteen hundred men in garrison in it.

In 1658, Marshal Turenne invested Dunkirk, the king joined him with a powerful army. The Spaniards, under the conduct of Don John of Austria and the Prince of Condé, endeavoured to throw succours into the place, but they lost the battle of the Downs; and the Marquis de Lede dying of the wounds which he received, the garrison capitulated on the twenty-fifth of June, after six weeks siege. The next day the Spanish garrison went. The king entered it the same day in the morning, and in the afternoon gave up the place to the English, on condition of suffering the town to enjoy all its privileges; thus in less than a day it saw itself successively under the domination of three crowns. The privateers of Dunkirk and Ostend had taken during the war more than two thousand five hundred vessels. The English caused a strong citadel to be constructed, instead of Fort Leon, and greatly strengthened the town, which was sold to the French in 1662 for the sum of five millions of livres, through the negotiation of the Comte D'Estrades. The king made his entry into it the second of December, maintained its privileges, and made it a free port. In 1665 new fortifications were constructed, and the citadel improved. In 1680 the foundations of the Fort Risbau, Fort Verd, and Fort de Bonne Esperance were laid, which were perfected, and projected far out to sea. The king often came to see the works, which lasted from ten to eleven years. The bason was constructed in 1686.

In 1688 France was at war with the Dutch, the English, and the Spaniards, during which the Dunkirkers fitted out a number of privateers. In 1689 M. Bart, ordered to

escort a fleet of fourteen merchant vessels to Havre, went on board a frigate of twenty-eight guns, and with M. Forbin under his orders, of sixteen guns, they met with two English ships of forty-eight and forty-two guns, and fought them sufficiently long to give time to the convoy to pursue its course; but, both wounded, one hundred and forty men disabled, and their vessels complete wrecks, they were taken. The loss of the English vessels was so great, that the command of their vessels devolved to a boatswain's mate, all the officers being killed in the engagement. The two French captains escaped from prison some time afterwards. The first fitted out a vessel and made many prizes. He entirely destroyed the fishery of the Dutch, and made a descent in England, near Newcastle, with seven frigates, burnt there two hundred houses, and carried back booty to Dunkirk of the value of fifty thousand livres. Some days after he sailed again with three frigates, cruised in the north, where he took a Dutch fleet, escorted by three vessels of war, fought the latter, took one, and put the other two to flight, after having greatly damaged them. He came back to Dunkirk with the whole fleet, laden with wheat, barley, iron, pitch, &c.

France having purchased a large quantity of wheat in the north in 1694, M. Bart was ordered to go and convoy the fleet, consisting of a hundred and odd sail of vessels. This fleet sailed under escort of three Swedish and Danish ships, and was taken near the Texel on the twenty-eighth of June, by the commodore Hidde Vries, commanding a squadron of eight ships of war; but the twenty-ninth of June, M. Bart falling in with it, attacked the Dutch with so much bravery, that in less than half an hour the commodore was taken, commanding a vessel of fifty-eight guns; another of fifty, and a third of thirty-six, were captured, as well as the five others much shattered, which betook themselves to flight and escaped. He retook the whole fleet; he conducted to Dunkirk the three vessels and thirty of the merchantmen, the rest made for their destination in different ports of France. The commodore died of his wounds shortly after his arrival. This service rendered to France, at a time of extraordinary scarcity of wheat corn, engaged his majesty to ennoble M. Bart, who had been honoured with the cross of St. Louis some time before for other exploits.

The eleventh of August 1695, the enemy with one hundred and fourteen sail, under the orders of Admiral Barclay, attempted to bombard the town, they sent in several fire-ships loaded with combustibles for burning the forts and jetties; but they were driven back by the well sustained fire of the forts, and by the vigilance of M. Derlingue, who commanded in the harbour, and went out with several boats to grapple the fire-ships launched against the forts and jetties, and conduct them to stations where they might burn out, without doing any injury. M. Bart commanded at Fort Esperance, M. de St. Claire at Chateau Verd. The enemy threw more than one thousand two hundred bombs, and a number of carcasses, between eight o'clock in the morning and seven in the evening, without doing any damage: ten bombs fell in the Risban, they killed an officer there; another bomb which fell in Fort Verd did no more than dig its grave; one of the enemy's frigates having grounded on a bank at low water, M. Derlingue went with his boats to it, and made prisoners of its crew, in spite of the firing of the enemy. This expedition was expensive to the enemy without profit. The preceding year they made a similar attempt.

In 1696, M. Bart sailed from Dunkirk, and took a Dutch fleet in the north, of one hundred and six sail; sixty-one of which he ransomed, after carrying by boarding five vessels of war, which convoyed the fleet. He was made Chef d'Escadre in 1697; and sailed the fifth of September with six vessels and a frigate, to transport the Prince de Conti to Poland, notwithstanding an enemy's squadron superior in number, which

could not cut him off, he arrived at Dantzig the twenty-sixth, and brought this prince back again to Dunkirk November the eleventh following; circumstances not having answered the hopes which the Poles had made this prince conceive. While this was happening, the peace of Ryswick was made; during this war the privateers of Dunkirk had made prizes of the collective value of twenty-two millions of livres.

In 1701 war broke out afresh; Fort Blanc was constructed. M. Bart being ordered to fit out a squadron, applied himself to it with such activity, that a pleurisy carried him to the grave the twenty-seventh of April 1702, aged fifty-two years, and generally regretted. His son Andrew followed the steps of his father; he distinguished himself under M. de St. Pol, who commanded a squadron in the north, and under M. de Forbin, who succeeded M. de St. Pol, he being killed in 1705, in an engagement in which his squadron had the advantage. M. Bart, by his services, reached the rank of vice-admiral.

In 1712, peace being concluded, the sluices, forts, and fortifications of Dunkirk were demolished. During this war the Dunkirkers brought in one thousand six hundred prizes; which sold for more than thirty millions of livres, exclusive of vessels carried into other ports of France.

In 1714, the canal and port of Mardyck were dug, to carry off the waters of the country; this port is half a league from Dunkirk to the west, beside the ancient Mardyck. Two sluices were made to admit ships, but in 1717 the largest was destroyed, and only the smaller one of sixteen feet was preserved, for letting off the water. By this canal, which ended at Dunkirk, commerce was carried on, but at a heavy expence, in spite of the English. A dam had been thrown across the port, between the town and citadel, but a furious wind having driven the sea with violence against it, it gave way shortly before 1720, and was entirely carried away. Navigation was begun upon it, and forts and jetties, in fascinage, were constructed on it in 1744, and the town was surrounded with a rampart of turf; but the forts were demolished at the peace of 1748. After this peace, a dyke was made to carry off the water from the ditches of the town, which had become stagnant. The last war the sluice of Bergues was re-established, and the basin and forts, in fascinage, were constructed close to the sea; but at the peace the forts were demolished, the basin, and the dyke, leaving the sluice of Bergues for carrying off the water.

The twenty-fourth of September, at nine in the morning, having two thirds of flood-tide, the wind weak from the south, I sailed from the road of Dunkirk, to return to Brest, by the channel. We steered at first W. quarter N. W. and W. N. W. to get out of the road, which terminates E. and W. with the points of Brac. A vessel is known to be west of Brac, when the belfry de petite Samte is in a line with the buoy of Mardyck, as well that it is east of Brac, when the belfry of St. Catherine is in a line with the towers of Bergues. After going out of the roads by the passage of the west, and about to make for the Straits of Dover, you must steer W. N. W. and N. W. quarter W. to avoid the Snow, a bank which is dry, and which must be left to larboard; you must neither steer more N. than N. W. quarter W. for fear of falling in with the Breban, on which there is but three feet of water, in certain parts, at low water; but no risk is run in steering W. N. W. and N. W. quarter W. You know that you are clear, that is to say, W. of the banks, when you have the tower of St. George, which is flat, in a line with a small down, which looks like an island, or when the great tower of Gravelines bears S. quarter S. W. of the compass. At noon on the twenty fourth I was in that position, light wind; but having the ebb for me I made way. The tides are twelve hours long at Dunkirk, eleven and half at Calais, and three in the middle of the

strait. From noon to six o'clock I bore west, all sails set, the wind S. E. weak. At six o'clock I made Cape Grines, bearing S. 4° W. three leagues distant, and the castle of Dover bearing N. N. W. four leagues distant; whence I took my departure, steering W. quarter S. W. and W. S. W.

The twenty-fifth, at day-break, I was five leagues from the English coast, and by log I ought to have been eight leagues; the flood-tide, which we had from seven o'clock till midnight, had doubtless carried us to the north. At noon Beachy-head, on the coast of England, bore north by the compass, distant four leagues and a half; I observed the variation 19° 52′. From noon till two o'clock we had a weak S. S. W. wind; I steered west; at two o'clock, the wind getting round to the W. and the tide ebbing, I steered S. S. W. At six o'clock Beachy-head bore N. N. E. eight leagues distant. At seven o'clock, being high water, and perfectly calm, I anchored a small anchor in twenty-six fathoms water, bottom gravel and broken shells. I then cast the log, which shewed me the tide ran three knots. At eleven o'clock, the wind blowing S. S. W. I sailed, steering west.

The twenty-sixth, at noon, I made Cape Barfleur, which bore S. W. quarter W. seven leagues distant. I took the altitude, and found myself in latitude 50° 0′, longitude 0° 18′ W. of Paris. From noon to five o'clock a weak S. wind. I steered W. quarter N. W. with all sails set. At five o'clock, being the beginning of flood, I cast the stream anchor in thirty seven fathoms, bottom small pebbles and shells. Being at anchor cape La Hogue bore S. S. W. 5° W. six leagues distant. The tide ran five knots at half past seven.

At eight o'clock, my anchor breaking at the middle of the shank, I set all sails; at the same time coiling all my towing ropes. I steered W. quarter N. W. to stem the current; at ten o'clock I steered W. N. W. and N. W. quarter W. not to get near the Caskets; at midnight perceiving distinctly the fires of the Caskets, I steered W. N. W. at four o'clock I made a tack to the W. S. W. and at seven o'clock, the wind being S. E. I steered S. W. to make the coast of Brittany. The twenty-seventh at noon, I was in latitude 49° 30′, and longitude 6° 3′. The same day at sunrise I found the variation 19° 45′. From noon till four o'clock I steered S. W. The wind fresh from the S. E. At four o'clock perceiving land, which by the tack I was upon I kept from, I stood closer, in order to make it before night. At six o'clock, the largest of the seven islands bearing S. S. E. four leagues distant, I steered W. and kept all night under easy sail.

The twenty-eighth, at five o'clock in the morning, I kept close to shore. At seven o'clock I laid N. and S. of Abrevrack. I continued running along the coast, and at nine o'clock I got into Le Four, where, meeting with contrary winds, I luffed till eleven o'clock, when the flood obliged me to cast a small anchor in twenty six-fathoms water, gravelly bottom, a league to the S. S. W. of a rock called le Four. I sailed at five o'clock in the afternoon, but night obliged me to cast anchor at the Blanc Sablon.

The twenty-ninth, at seven in the morning, weak and variable winds from the south side, I sailed, and passed by favour of the current against the wind the great and little Vinotierre. I anchored in Brest roads at six in the evening, and the next day my vessel entered into port to be disarmed.

THE VOYAGE OF THE RIGHT HONOURABLE GEORGE EARL OF CUMBERLAND TO THE AZORES,* ETC. WRITTEN BY THE EXCELLENT MATHEMATICIAN AND ENGINEER MASTER EDWARD WRIGHT.

HACKLUYT. II. 148. SECOND PART.

THE right honourable the earl of Cumberland having at his own charges prepared his small fleet of four sails only, viz. the Victory, one of the queen's ships royal; the Meg and Margaret, small ships (one of which also he was forced soon after to send home again, finding her not able to endure the sea) and a small caravel; and having assembled together about four hundred men (or fewer) of gentlemen, soldiers, and sailors; embarked himself and them, and set sail from the Sound of Plymouth, in Devonshire, the eighteenth day of June 1589, being accompanied with these captains and gentlemen which hereafter follow:

Captain Christopher Lister, a man of great resolution, captain Edward Careless, alias Wright, who in Sir Francis Drake's West Indian voyage to St. Domingo and Carthagena was captain of the Hope; captain Boswell, M. Mervin, M. Henry Long, M. Partridge, M. Norton, M. William Mounson, captain of the Meg, and his vice-admiral, now Sir William Mounson, M. Pigeon, captain of the caravel.

About three days after our departure from Plymouth we met with three French ships, whereof one was of Newhaven, another of St. Malo's, and so finding them to be leaguers and lawful prizes we took them, and sent two of them for England, with all their loading, which was fish for the most part from Newfoundland, saving that there was part thereof distributed amongst our small fleet, as we could find stowage for the same; and in the third all their men were sent home into France. The same day and the day following we met with some other ships, whom (when, after some conference had with them, we perceived plainly to be of Rotterdam and Embden, bound for Rochelle) we dismissed.

The twenty-eighth and twenty-ninth days we met divers of our English ships, returning from the Portugal voyage, which my lord relieved with victuals. The thirteenth day of July, being Sunday, in the morning we espied eleven ships without sight of the coast of Spain, in the height of 39°, whom we presently prepared for, and provided to meet them, having first sent forth captain Mounson in the Meg before us, to descry whence they were. The Meg approaching near, there passed some shot betwixt them, whereby, as also by their admiral and vice-admiral putting forth their flags, we perceived that some fight was likely to follow. Having therefore fitted ourselves for them, we made what haste we could towards them, with regard always to get the wind of them, and about ten or eleven of the clock we came up to them with the Victory. But, after some few shot and some little fight passed betwixt us, they yielded themselves, and the masters of them all came aboard us, shewing their several passports from the cities of Hamburg and Lubeck, from Bremen, Pomerania, and Calice.

They had in them certain bags of pepper and cinnamon, which they confessed to be the goods of a Jew in Lisbon, which should have been carried by them into their country to his factor there; and so finding it by their own confession to be lawful prize, the same was soon after taken and divided amongst our whole company, the value whereof was esteemed to be about four thousand five hundred pounds, at two shillings the pound.

* These isles properly belong to Europe, as lying nearer Portugal than any other country. See Pinkerton's Modern Geog. vol. i. p. 601.

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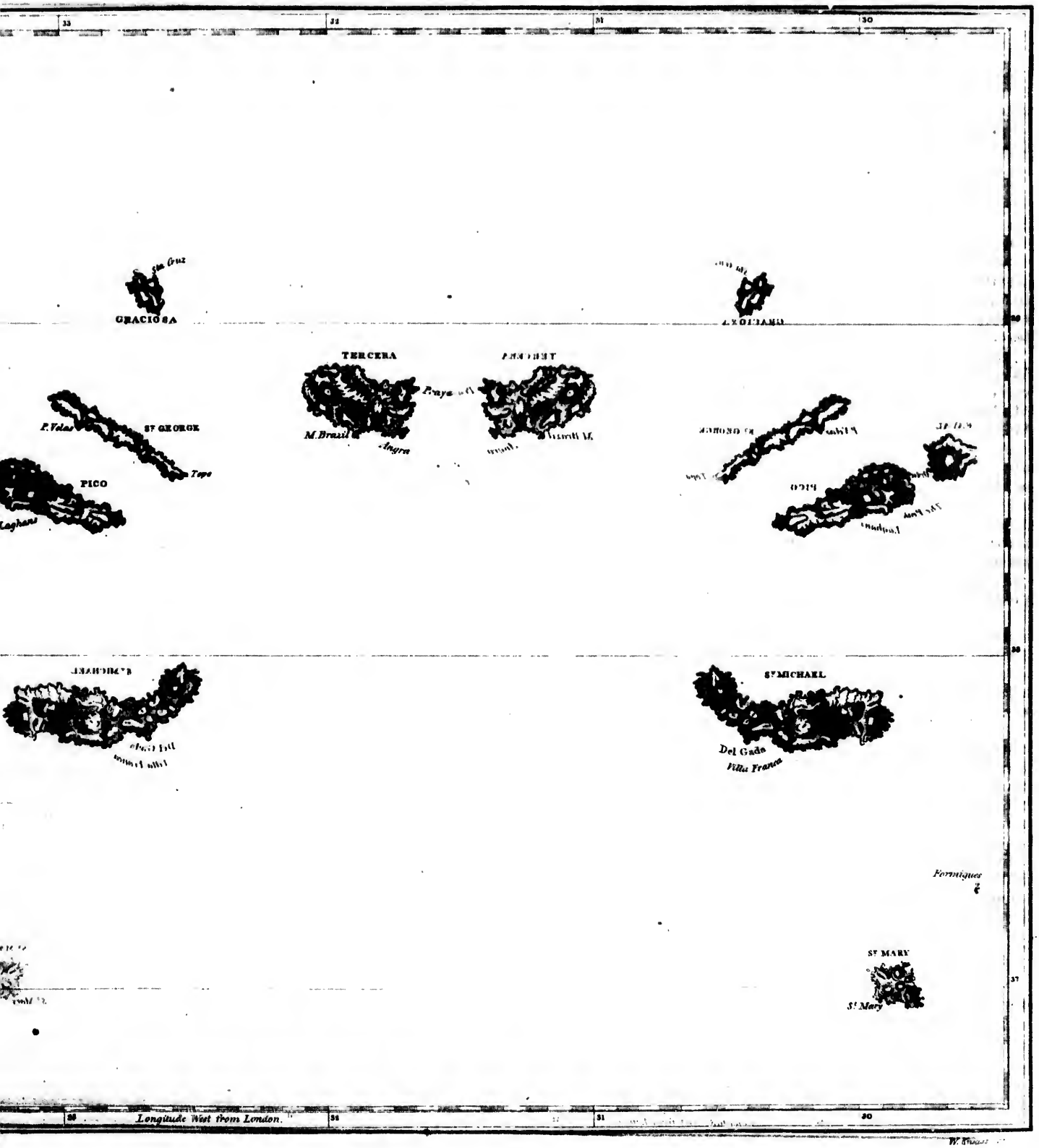
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TERCERA
M.Brazil
Angra
P.Velas
ST GEORGE
Topo
PICO
Laghans
ST MICHAEL
Del Gada
Villa Franca
Formigues
ST MARY
St Mary
Longitude West from London.

The seventeenth day the aforesaid ships were dismissed, but seven of their men that were willing to go a long with us for sailors we took to help us, and so held on our course for the Azores.

The first of August, being Friday, in the morning, we had sight of the island of St. Michael, being one of the easternmost of the Azores, towards which we sailed all that day, and at night having put forth a Spanish flag in our main top, that so they might the less suspect us, we approached near to the chief town and road of that island, where we espied three ships riding at anchor and some other vessels; all which we determined to take in the dark of the night, and accordingly attempted about ten or eleven of the clock, sending our boats well manned to cut their cables and hawsers, and let them drive into the sea. Our men coming to them found that one of those greatest ships was the Falcon, of London, being there under a Scottish pilot, who bore the name of her as his own. But three other small ships that lay near under the castle there our men let loose, and towed them away unto us, most of the Spaniards that were in them leaping overboard, and swimming to shore with loud and lamentable outcries; which they of the town hearing were in an uproar, and answered with the like crying. The castle discharged some great shot at our boats, but shooting without mark, by reason of the darkness, they did us no hurt. The Scots likewise discharged three great pieces into the air, to make the Spaniards think they were their friends and our enemies, and shortly after the Scottish master, and some other with him, came aboard to my lord, doing their duty, and offering their service, &c. These three ships were fraught with wine and sallad-oil from Sivil.

The same day our caravel chased a Spanish caravel to shore at St. Michael, which carried letters thither, by which we learned, that the caraks were departed from Tercera eight days before.

The seventh of August we had sight of a little ship, which we chased towards Tercera with our pinnace (the weather being calm) and towards evening we overtook her; there were in her thirty tons of good Madeira wine, certain woollen cloth, silk, taffeta, &c. The fourteenth of August we came to the island of Flores, where we determined to take in some fresh water and fresh victuals, such as the island did afford. So we manned our boats with some a hundred and twenty men, and rowed towards the shore; whereto when we approached, the inhabitants that were assembled at the landing-place put forth a flag of truce, whereupon we also did the like.

When we came to them, my lord gave them to understand by his Portugal interpreter, that he was a friend to their king Don Antonio, and came not any way to injure them, but that he meant only to have some fresh water and fresh victuals of them, by way of exchange for some provision that he had, as oil, wine, or pepper, to which they presently agreed willingly, and sent some of their company for beeves and sheep, and we in the mean season marched southward about a mile to Villa de Santa Cruz, from whence all the inhabitants young and old were departed, and not any thing of value left. We demanding of them what was the cause hereof, they answered, fear; as their usual manner was, when any ships came near their coast.

We found that part of the island to be full of great rocky barren hills and mountains, little inhabited, by reason that it is molested with ships of war, which might partly appear by this town of Santa Cruz (being one of their chief towns) which was all ruinous, and (as it were) but the relicks of the ancient town, which had been burned about two years before by certain English ships of war, as the inhabitants there reported.

At evening, as we were rowing towards the Victory, a huge fish pursued us for the space well nigh of two miles together, distant for the most part from the boat's stern

not a spear's length, and sometimes so near that the boat struck upon him, the tips of whose fins about the gills (appearing oftimes above the water) were, by estimation, four or five yards asunder, and his jaws gaping a yard and a half wide, which put us in fear of overturning the pinnace, but, God be thanked (rowing as hard as we could) we escaped.

When we were about Flores, a little ship, called the Drake, brought us word that the caraks were at Tercera, of which news we were very glad, and sped us thitherward with all the haste we could; and by the way we came to Fayal Road the seven and twentieth day of August, after sunset, where we espied certain ships riding at anchor, to whom we sent in our skiff, with captain Lister and captain Mounson in her, to discover the roaders: and, lest any danger should happen to our boat, we sent in likewise the Sawsie-Jack and the small caravel; but the wind being off the shore, the ships were not able to fetch it so nigh as the Spaniards ride, which nevertheless the boat did, and clapped a ship aboard, of two hundred and fifty tons, which carried in her fourteen cast pieces, and continued to fight alone with her for the space of one hour, until the coming up of other boats to the rescue of her, which were sent from the ships, and then afresh boarding her again, one boat in the quarter, another in the hawse, we entered her on the one side, and all the Spaniards leaped overboard on the other, save Juan de Palma the captain of her, and two or three more, and thus we became possessors of her. This ship was moored to the castle, which shot at us all this while: the only hurt which we received of all this shot was this, that the master of our caravel had the calf of his leg shot away. This ship was laden with sugar, ginger, and hides, lately come from St. Juan de Puerto-Rico; after we had towed her clear off the castle, we rowed in again with our boats, and fetched out five small ships more; one laden with hides, another with elephant's teeth, grains, cocoa-nuts, and goats' skins, come from Guinea, another with woad, and two with dog-fish; which two last we let drive in the sea, making none account of them. The other we sent for England the thirtieth of August.

At the taking of these prizes were consorted with us some other small men of war, as master John Davis, with his ship, pinnace, and boat, captain Markesbury, with his ship, whose owner was Sir Walter Raleigh, the bark of Lime, which was also consorted with us before.

The last of August, in the morning, we came in sight of Tercera, being about some nine or ten leagues from shore, where we espied coming towards us a small boat under sail, which seemed somewhat strange unto us, being so far from land, and no ship in sight, to which they might belong; but coming near, they put us out of doubt, shewing they were Englishmen (eight in number) that had lately been prisoners in Tercera, and finding an opportunity to escape at that time, with that small boat, committed themselves to the sea, under God's providence, having no other yard for their main-sail but two pipe staves tied together by the ends, and no more provision of victuals than they could bring in their pockets and bosoms. Having taken them all into the Victory, they gave us certain intelligence, that the caraks were departed from thence about a week before.

Thus, being without any further hopes of those caraks, we resolved to return for Fayal, with intent to surprise the town; but until the ninth of September we had either the wind so contrary, or the weather so calm, that in all that time we made scarce nine or ten leagues way, lingering up and down not far from Pico.

The tenth of September, being Wednesday, in the afternoon, we came again to Fayal Road. Whereupon immediately my lord sent captain Lister, with one of Graciosa, (whom captain Mounson had before taken), and some others, towards Fayal, whom cer-

tain of the inhabitants met in a boat, and came with captain Lister to my lord, to whom he gave his choice; either to suffer him quietly to enter into the platform there without resistance, where he and his company would remain a space without offering any injury to them, that they (the inhabitants) might come unto him, and compound for the ransom of the town: or else to stand to the hazard of war.

With these words they returned to the town; but the keepers of the platform answered, that it was against their oath and allegiance to king Philip to give over without fight. Whereupon my lord commanded the boats of every ship to be presently manned, and soon after landed his men on the sandy shore, under the side of an hill, about half a league to the northward from the platform: upon the top of which hill certain horsemen and footmen shewed themselves, and other two companies also appeared, with ensigns displayed, the one before the town upon the shore by the sea-side, which marched towards our landing-place, as though they would encounter us; the other in a valley, to the southwards of the platform, as if they would have come to help the townsmen: during which time they in the platform also played upon us with great ordnance. Notwithstanding, my lord (having set his men in order) marched along the sea-shore, upon the sands, betwixt the sea and the town, towards the platform, for the space of a mile or more, and then the shore growing rocky, and permitting no further progress without much difficulty, he entered into the town, and passed through the street without resistance unto the platform; for those companies before mentioned, at my lord's approaching, were soon dispersed, and suddenly vanished.

Likewise they of the platform being all fled, at my lord's coming thither, left him and his company to scale the walls, to enter and take possession without resistance.

In the mean time our ships ceased not to batter the foresaid town and platform with great shot, till such time as we saw the red cross of England flourishing upon the forefront thereof.

This Fayal is the principal town in all that island, and is situate directly over against the high and mighty mountain Pico, lying towards the W. N. W. from that mountain, being divided therefrom by a narrow sea, which at that place is by estimation about some two or three leagues in breadth, between the isles of Fayal and Pico.

The town contained some three hundred households; their houses were fair, and strongly builded of lime and stone, and double covered with hollow tiles, much like our roof-tiles, but that they are less at the one end than at the other.

Every house almost had a cistern or well in a garden on the back-side: in which gardens grew vines (with ripe clusters of grapes) making pleasant shadows, and tobacco, now commonly known and used in England, wherewith their women there dye their faces reddish, to make them seem fresh and young: pepper, Indian and common; fig-trees bearing both white and red figs: peach-trees not growing very tall: oranges, lemons, quinces, potatoe roots, &c. Sweet wood (cedar, I think) is there very common even for building and firing.

My lord having possessed himself of the town and platform, and being careful of the preservation of the town, gave commandment, that no mariner nor soldier should enter into any house to make any spoil thereof. But especially he was careful that the churches and houses of religion there should be kept inviolate, which was accordingly performed, through his appointment of guarders and keepers for those places: but the rest of the town, either for want of the former inhibition, or for desire of spoil and prey, was rifled, and ransacked by the soldiers and mariners, who scarcely left any house unsearched, out of which they took such things as liked them, as chests of sweet wood, chairs, cloth, coverlets, hangings, bedding, apparel: and further ranged into the country, where

some of them also were hurt by the inhabitants. The friary there containing and maintaining thirty Franciscan friars (among whom we could not find any one able to speak true Latin) was builded by a friar of Angra, in Tercera, of the same order, about the year of our Lord 1506. The tables in the hall had seats for the one side only, and were always covered, as ready at all times for dinner or supper.

From Wednesday in the afternoon, at which time we entered the town, till Saturday night, we continued there, until the inhabitants had agreed and paid for the ransom of the town two thousand ducats, most part whereof was church-plate.

We found in the platform eight-and-fifty iron pieces of ordnance, whereof three-and-twenty (as I remember) or more, were ready mounted upon their carriages, between barricadoes, upon a platform towards the sea-side; all which ordnance we took, and set the platform on fire, and so departed; my lord having invited to dinner in the Victory, on the Sunday following, so many of the inhabitants as would willingly come (save only Diego Gomes, the governor, who came but once only to parley about the ransom;) only four came, and were well entertained, and solemnly dismissed with sound of drum and trumpets, and a peal of ordnance: to whom my lord delivered his letter, subscribed with his own hand, importing a request to all other Englishmen to abstain from any further molesting them, save only for fresh water and victuals necessary for their intended voyage. During our abode here (viz. the eleventh of September) two men came out of Pico, which had been prisoners there: also at Fayal we set at liberty a prisoner translated from St. Jago, who was cousin to a servant of Don Antonio, king of Portugal, in England: these prisoners we detained with us.

On Monday we sent our boats ashore for fresh water, which (by reason of the rain that fell the former night) came plentifully running down the hills, and would otherwise have been hard to be gotten there. On Tuesday likewise, having not yet sufficiently served our turns, we sent again for fresh water, which was then not so easy to be gotten as the day before, by reason of a great wind; which in the afternoon increased also in such sort, that we thought it not safe to ride so near the land; whereupon we weighed anchor, and so departed N. W. and by W. along the coast of Fayal island. Some of the inhabitants coming on board to us this day, told us, that always about that time of the year such winds, W. S. W. blew on that coast.

This day, as we sailed near St. George's Island, a huge fish lying still a little under water, or rather even therewith, appeared hard by, ahead of us; the sea breaking upon his back, which was black coloured, in such sort as deeming at the first it had been a rock, and the ship stemming directly with him, we were put in a sudden fear for the time: till soon after we saw him move out of the way.

The sixteenth of September, in the night, it lightened much, whereupon there followed great winds and rain, which continued the seventeenth, eighteenth, nineteenth, twentieth, and twenty-first of the same. The twenty-third of September we came again into Fayal-road to weigh an anchor, which (for haste and fear of foul weather we had left there before, where we went on shore to see the town, the people (as we thought) having now settled themselves there again: but notwithstanding many of them through too much distrustfulness departed, and prepared to depart with their packets, at the first sight of us; until such time as they were assured by my lord, that our coming was not any way to injure them, but especially to have fresh water, and some other things needful for us, contenting them for the same.

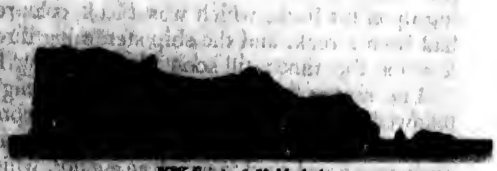
So then we viewed the town quietly, and bought such things as we desired for our money, as if we had been in England. And they helped to fill us in fresh water, receiving for their pains such satisfaction as contented them.

S.W. View of the Island Pico of the Azores.

Strait between Pico and Fayal from the S.

City of Angra. Mount Brazil &c. from the S.

Villa Franca from the S.



N.W. Point of St. Michel.

The St. Mary.

E. Point of St. Michel.

Lenny sc.

The twenty-fifth day we were forced again to depart from thence, before we had sufficiently watered, by reason of a great tempest that suddenly arose in the night, insomuch, that my lord himself, soon after midnight, raised our men out of their cabins to weigh anchor, himself also together with them hauling at the capsten, and after cheering them up with wine.

The next day we sent our caravel and the Sawsie-Jack to the road of St. Michael, to see what they could espy: we following after them, upon the twenty-seventh day, plying to and fro, came within sight of St. Michael, but by contrary winds, the twenty-eighth, twenty-ninth, and thirtieth days, we were driven to leeward, and could not get near the island.

The first of October we sailed alongst Tercera, and even against Brazil (a promontory near to Angra, the strongest town in that island) we espied some boats coming to the town, and made out towards them; but being near to land, they ran to shore, and escaped us.

In the afternoon we came near to Graciosa, whereupon my lord forthwith sent captain Lister to the islanders, to let them understand that his desire was only to have water and wine of them, and some fresh victuals, and not any further to trouble them. They answered they could give no resolute answer to this demand, until the governors of the island had consulted thereupon, and therefore desired him to send again to them the next day.

Upon the second day, early in the morning, we sent forth our long boat and pinnace, with empty casks, and about some 50 or 60 men, together with the Margaret, and captain Davis his ship; for we now wanted all the rest of our consorts. Just when our men would have landed, the islanders shot at them, and would not suffer them. And troops of men appeared upon land, with ensigns displayed, to resist us: so our boats rowed alongst the shore to find some place where they might land, not with too much disadvantage; our ships and they still shooting at the islanders: but no place could be found where they might land without great peril of losing many of their lives, and so were constrained to retire without receiving any answer, as was promised the day before. We had three men hurt in this conflict, whilst our boats were together in consulting what was best to be done: two of them were struck with a great shot (which the islanders drew from place to place with oxen) wherewith the one lost his hand, and the other his life, within two or three days after: the third was shot into his neck with a small shot, without any great hurt.

With these news our company returned back again at night, whereupon preparation was made to go to them again the next day; but the day was far spent before we could come near them with our ship: neither could we find any good ground to anchor in, where we might lie to batter the town, and further we could find no landing place, without great danger to lose many men; which might turn not only to the overthrow of our voyage, but also put the queen's ship in great peril, for want of men to bring her home. Therefore my lord thought it best to write to them to this effect: that he could not a little marvel at the inhumanity and cruelty which they had shewed towards his men, seeing they were sent by him unto them in peaceable manner, to receive their answer, which they had promised to give the day before: and that were it not for Don Antonio, their lawful king, his sake, he could not put up so great injury at their hands, without just revengement upon them: notwithstanding, for Don Antonio his sake, whose friend he was, he was yet content to send to them once again for their answer: at night captain Lister returned with this answer from them; that their gunner shot off one of their pieces, which was charged with powder only, and

was stopped; which our men, thinking it had been shot at them, shot again, and so began the fight: and that the next morning they would send my lord a resolute answer to his demand, for as yet they could not know their governor's mind herein. The next morning there came unto us a boat from the shore with a flag of truce, wherein were three of the chief men of the island, who agreed with my lord that he should have of them 60 butts of wine, and fresh victuals, to refresh himself and his company withal: but as for fresh water they could not satisfy our need therein, having themselves little or none, saving such as they saved in vessels or cisterns when it rained, and that they had rather give us two tuns of wine than one of water; but they requested that our soldiers might not come on shore, for they themselves would bring all they had promised to the water-side, which request was granted, we keeping one of them aboard with us until their promise was performed, and the others we sent to shore with our empty casks, and some of our men to help to fill and bring them away, with such other provision as was promised: so the Margaret, captain Davis his ship, and another of Weymouth, staid riding at anchor before the town, to take in our provision. This ship of Weymouth came to us the day before, and had taken a rich prize, (as it was reported) worth sixteen thousand pounds, which brought us news that the West Indian fleet was not yet come, but would come very shortly. But we with the Victory put off to sea, and upon Saturday, the fourth, we took a French ship of St. Malo (a city of the unholy league) laden with fish from Newfoundland, which had been in so great a tempest, that she was constrained to cut her main-mast overboard for her safety, and was now coming to Graciosa to repair herself. But so hardly it befell her, that she did not only not repair her former losses, but lost all that remained unto us. The chief of her men we took into our own ship, and sent some of our men, mariners and soldiers, into her, to bring her into England.

Upon the Sunday following, at night, all our promised provision was brought unto us from Graciosa; and we friendly dismissed the islanders with a peal of ordnance.

Upon Monday, Tuesday, and Wednesday, we plyed to and fro about these islands, being very rough weather. And upon Thursday at night, being driven some three or four leagues from Tercera, we saw 15 sail of the West Indian fleet coming into the haven at Angra in Tercera. But the wind was such, that for the space of four days after, though we lay as close by the wind as possible, yet we could not come near them. In this time we lost our late French prize, not being able to lie so near the wind as we, and heard no more of her till we came to England, where she safely arrived. Upon Monday we came very near the haven's mouth, being minded to have run in amongst them, and to have fetched out some of them, if it had been possible: but in the end this enterprise, was deemed too dangerous, considering the strength of the place where they rode, being haled and towed in nearer the town, at the first sight of our approaching, and lying under the protection of the castle of Brazil on the one side (having in it five and twenty pieces of ordnance) and a fort on the other side, wherein were thirteen or fourteen great brass pieces. Besides, when we came near land, the wind proved too scant for us to attempt any such enterprise.

Upon Tuesday the fourteenth, we sent our boat to the road to sound the depth, to see if there were any anchoring place for us, where we might lie without shot of the castle and fort, and within shot of some of those ships, that we might either make them come out to us, or sink them where they lay. Our boat returned, having found out such a place as we desired, but the wind would not suffer us to come near it, and again, if we could have anchored there, it was thought likely that they would rather run them-

selves a-ground to save their lives and liberties, and some of their goods, than come forth to lose their liberties and their goods to us their enemies. So we shot at them, to see if we could reach them, but it fell far short. And thus we departed, thinking it not probable that they would come forth so long as we watched them before the haven's mouth, or within sight of them. For the space of five days after we put off to sea, and lay without sight of them; and sent a pinnace to lay out of sight close by the shore, to bring us word if they should come forth. After a while the pinnace returned, and told us, that those ships in the haven had taken down their sails, and let down their top-masts: so that we supposed they would never come forth, till they perceived us to be quite gone.

Wherefore, upon the twentieth, hearing that there were certain Scottish ships at St. Michael, we sailed thither, and found there one Scottish roader, and two or three more at Villa Franca, the next road, a league or two from the town of St. Michael, to the eastwards: of whom we had for our relief some small quantity of wine (viz. some five or six butts of them all) and some fresh water, but nothing sufficient to serve our turn.

Upon Tuesday the one-and-twentieth, we sent our long-boat to shore for fresh water at a brook, a little to westwards from Villa Franca.

But the inhabitants, espying us, came down with two ensigns displayed, and about some hundred-and-fifty men armed, to withstand our landing. So our men, having spent all their powder upon them in attempting to land, and not being able to prevail at so great odds, returned frustrate.

From hence we departed towards St. Mary's island, minding to water there, and then to go for the coast of Spain. For we had intelligence that it was a place of no great force, and that we might water there very well: therefore, upon Friday following, my lord sent captain Lister, and captain Amias Preston, now sir Amias Preston (who not long before came to us out of his own ship, and she losing us in the night, he was forced to tarry still with us) with our long-boat and pinnace, and some sixty or seventy shot in them, with a friendly letter to the islanders, that they would grant us leave to water, and we would no further trouble them.

So we departed from the Victory for the island, about nine of the clock in the forenoon, and rowed freshly until about three o'clock afternoon. At which time our men being somewhat weary of rowing, and being within a league or two of the shore and four or five leagues from the Victory, they espied (to their refreshing) two ships riding at anchor, hard under the town; whereupon, having shifted some six or seven of our men into captain Davis his boat, being too much pestered in our own, and detaining with us some twenty shot in the pinnace, we made way towards them with all the speed we could.

By the way, as we rowed, we saw boats passing between the roaders and the shore, and men in their shirts swimming and wading to shore, who, as we perceived afterwards, were labouring to set those ships fast on ground, and the inhabitants as busily preparing themselves for the defence of those roaders, their island, and themselves. When we came near them, captain Lister commanded the trumpets to be sounded, but prohibited any shot to be discharged at them, until they had direction from him: but some of the company, either not well perceiving or regarding what he said, immediately upon the sound of the trumpets discharged their pieces at the islanders, which, for the most part, lay in trenches and fortified places, unseen, to their own best advantage, who immediately shot likewise at us, both with small and great shot, without danger to themselves: notwithstanding, captain Lister earnestly hastened forward the sailors

that rowed, who began to shrink at that shot flying so fast about their ears, and himself first entering one of the ships that lay a little farther from the shore than the other, we speedily followed after him into her, still plying them with our shot. And having cut in sunder her cables and hawsers, towed her away, with our pinnace. In the mean time captain Davis his boat overtook us, and entered into the other ship, which also (as the former) was forsaken by all her men: but they were constrained to leave her, and to come again into their boat (whilst shot and stones, from shore, flew fast among them) finding her to stick so fast a-ground that they could not stir her; which the townsmen also perceiving, and seeing that they were but few in number, and us (busied about the other ship) not coming to aid them, were preparing to have come and taken them. But they returned unto us, and so, together, we came away towards the Victory, towing after us the prize that we had now taken, which was lately come from Brazil, laden with sugar.

In this fight we had two men slain, and sixteen wounded: and as for them, it is like they had little hurt, lying, for the most part, behind stone walls, which were builded one above another hard by the sea side, upon the end of the hill, whereupon the town stood, betwixt two vallies. Upon the top of the hill lay their great ordnance (such as they had) wherewith they shot leaden bullets, whereof one pierced through our prize's side, and lay still in the ship, without doing any more harm.

The next day we went again to the same island, but not knowing before the inconvenience and disadvantage of the place where we attempted to land, we returned frustrate.

The same night, the twenty fifth, we departed for St. George's Island, for fresh water, whither we came on Monday following October twenty-seven; and having espied where a spout of water came running down, the pinnace and long-boat were presently manned, and sent under the conduct of captain Preston and captain Munson, by whom my lord sent a letter to the islanders as before, to grant us leave to water only, and we would no further trouble them: notwithstanding, our men coming on shore, found some of the poor islanders, which, for fear of us, hid themselves amongst the rocks.

And on Wednesday following our boats returned with fresh water, whereof they brought only six tuns for the Victory, alledging they could get no more, thinking (as it was supposed) that my lord, having no more provision of water and wine but only 12 tuns, would not go for the coast of Spain, but straight for the coast of England, as many of our men greatly desired: notwithstanding my lord was unwilling so to do, and was minded the next day to have taken in more water: but through roughness of the seas and wind, and unwillingness of his men, it was not done. Yet his honour purposed not to return with so much provision unspent, and his voyage (as he thought) not yet performed in such sort, as might give some reasonable contentment or satisfaction to himself and others.

Therefore, because no more water could now conveniently be gotten, and being uncertain when it would be gotten, and the time of our staying aboard also uncertain, the matter being referred to the choice of the whole company, whether they would tarry longer till we might be more sufficiently provided of fresh water, or go by the coast of Spain for England, with half so much allowance of drink as before, they willingly agreed that every mess should be allowed at one meal but half so much drink as they were accustomed (except them that were sick and wounded) and so to go for England, taking the coast of Spain in our way, to see if we could that way make up our voyage.

Upon Saturday thirty-first, we sent the Margaret (because she leaked much) directly for England, together with the prize of Brazil which we took at St. Mary, and in them some of our hurt and wounded men, or otherwise sick, were sent home as they desired for England: but captain Munson was taken out of the Megg into the Victory.

So we held on our course for the coast of Spain, with a fair wind and a large, which before we seldom had. And upon Tuesday following, being the fourth of November, we espied a sail right before us, which we chased till about three o'clock in the afternoon, at which time, we overtaking her, she struck sail, and being demanded who was her owner, and from whence she was, they answered, a Portugal, and from Pernanbuck in Brazil. She was a ship of some hundred and ten tons burden, freighted with four hundred and ten chests of sugar, and fifty kintals of Brazil-wood; every kintal containing one hundred pound weight: we took her in latitude nine-and-twenty degrees, and about two hundred leagues from Lisbon, westwards: Captain Preston was presently sent unto her, who brought the principal of her men aboard the Victory, and certain of our men, mariners and soldiers, were sent aboard her. The Portugals of this prize told us that they saw another ship before them that day, about noon. Having therefore dispatched all things about the prize aforesaid, and left our long-boat with captain Davis, taking his lesser boat with us, we made way after this other ship with all the sails we could bear, holding on our course due E. and giving order to captain Davis his ship and the prize, that they should follow us due E. and that if they had sight of us the morning following, they should follow us, if not, they should go for England.

The next morning we espied not the sail which we chased, and captain Davis his ship and the prize were behind us out of sight: but the next Thursday, the sixth, (being in latitude 38° 30′, and about 60 leagues from Lisbon, westwards) early in the morning captain Preston descried a sail, some two or three leagues a-head of us, after which, we presently hastened our chase, and overtook her about eight or nine of the clock before noon. She came lately from St. Michael's road, having been before at Brazil, laden with sugar and brazile. Having sent our boat to bring some of the chief of their men aboard the Victory, in the mean time, whilst they were in coming to us, one out of the main top espied another sail a-head, some three or four leagues from us.

So, immediately upon the return of our boat, having sent her back again with some of our men aboard the prize, we pursued speedily this new chase, with all the sails we could pack on, and about two o'clock in the afternoon overtook her: she had made provision to fight with us, having hanged the sides of the ship so thick with hides (wherewith especially she was laden) that musket shot would not have pierced them: but when we had discharged two great pieces of our ordnance at her, she struck sail, and approaching nearer, we asking of whence they were, they answered from the East Indies, from Mexico, and St. Joan de Lowe (truly called Ulkua.) This ship was of some three or four hundred tons, and had in her seven hundred hides, worth ten shillings a piece: six chests of cochineal, every chest holding one hundred pound weight, and every pound worth six and twenty shillings and eight pence, and certain chests of sugar and China dishes, with some plate and silver.

The captain of her was an Italian, and by his behaviour seemed to be a grave, wise, and civil man; he had put in adventure in this ship, five and twenty thousand ducats. We took him with certain other of her chiefest men (which were Spaniards) into the Victory; and captain Lister with so many other of the chiefest of our mariners, soldiers, and sailors, as were thought sufficient, to the number of twenty or thereabouts, were sent into her. In the mean time (we staying) our prizes, which followed after, came up to

us. And now we had our hands full, and with joy shaped our course for England, for so it was thought meetest, having now so many Portugals, Spaniards, and Frenchmen amongst us, that, if we should have taken any more prizes afterwards, we had not been well able to have manned them without endangering ourselves. So about six of the clock in the afternoon (when our other prize had overtaken us) we set sail for England. But our prizes not being able to bear us company without sparing them many of our sails, which caused our ship to roll and wallow, that it was not only very troublesome to us, but, as it was thought, would also have put the main mast in danger of falling overboard: having acquainted them with these inconveniences, we gave them direction to keep their courses together, following us, and so to come to Portsmouth. We took this last prize in the latitude of 39°, and about forty-six leagues to the westwards from the Rock.

She was one of those sixteen ships which we saw going into the haven at Angra in Tercera, October eighth. Some of the men that we took out of her told us, that whilst we were plying up and down before that haven, as before was shewed, expecting the coming forth of those ships, three of the greatest and best of them, at the appointment of the governor of Tercera, were unladen of their treasure and merchandise, and in every of them were put three hundred soldiers, which were appointed to have come to lay the Victory aboard in the night, and take her; but when this should have been done, the Victory was gone out of their sight.

Now we went merrily before the wind with all the sails we could bear, insomuch, that in the space of twenty-four hours we sailed near 47 leagues, that is seven score English miles, betwixt Friday at noon and Saturday at noon (notwithstanding the ship was very foul, and much grown with long being at sea) which caused some of our company to make accompt they would see what running at tilt there should be at Whitehall upon the queen's day. Others where imagining what a Christmas they would keep in England with their shares of the prizes we had taken. But so it befell, that we kept a cold Christmas with the Bishop and his Clerks (rocks that lie to the westwards from Sylly, and the western parts of England:) for soon after the wind scanting came about to the eastwards (the worst part of the heavens for us from which the wind could blow) in such sort, that we could not fetch any part of England. And hereupon also our allowance of drink, which was scant enough before, was yet more scanted, because of the scarcity thereof in the ship. So that now a man was allowed but half a pint at a meal, and that many times cold water, and scarce sweet. Notwithstanding, this was a happy state in comparison of that which followed; for from half a pint we came to a quarter, and that lasted not long neither; so that by reason of this great scarcity of drink, and contrariety of wind, we thought to put into Ireland, there to relieve our wants. But when we came near thither, lying at Hull all night (tarrying for the day-light of the next morning, whereby we might the safelier bring our ship into some convenient harbour there) we were driven so far to leeward that we could fetch no part of Ireland, so as with heavy hearts and sad cheer we were constrained to return back again, and expect till it should please God to send us a fair wind either for England or Ireland. In the mean time we were allowed every man three or four spoonsfull of vinegar to drink at a meal; for other drink we had none, saving only at two or three meals, when we had instead thereof as much wine, which was wringed out of wine-lees that remained. With this hard fare (for by reason of our great want of drink we durst eat but very little) we continued for the space of a fortnight or thereabouts; saving that now and then we feasted for it in the mean time; and that was when there fell any hail or rain: the hail-stones we gathered up,

and did eat them more pleasantly than if they had been the sweetest comfits in the world; the rain-drops were so carefully saved, that, so near as we could, not one was lost in all our ship. Some hanged up sheets tyed with cords by the four corners, and a weight in the midst, that the water might run down thither, and so be received into some vessel set or hanged underneath; some that wanted sheets hanged up napkins and clouts, and watched them till they were thorough wet, then wringing and sucking out the water. And that water which fell down and washed the filth and soiling of the ship, trod under foot, as bad as running down the kennel many times when it raineth, was not lost I warrant you, but watched and attended carefully (yea sometimes with strife and contention) at every scupper hole, and other place where it ran down, with dishes, pots, cans, and jars, whereof some drank hearty draughts even as it was, mud and all, without tarrying to cleanse or settle it: others cleansed it first, but not often, for it was so thick and went so slowly through, that they might ill endure to tarry so long, and were loth to lose too much of such precious stuff; some licked with their tongues (like dogs) the boards under feet, the sides, rails, and masts of the ship; others, that were more ingenious, fastened girdles or ropes about the masts, daubing tallow betwixt them and the masts (that the rain might not run down between) in such sort, that those ropes or girdles hanging lower on the one side than on the other, a spout of leather was fastened to the lower part of them, that all the rain drops that came running down the mast might meet together at that place, and there be received.

He that got a can of water by these means was spoken of, sued to, and envied, as a rich man, "Quam pulchrum digito monstrari et dicier hic est?" Some of the poor Spaniards that we had taken (who notwithstanding had the same allowance that our own men had) would come and crave of us, for the love of God, but so much water as they could hold in the hollow of their hand; and they had it, notwithstanding our great extremity, to teach them some humanity, instead of their accustomed barbarity, both to us and other nations heretofore. They put also bullets of lead into their mouths, to slake their thirst.

Now in every corner of the ship were heard the lamentable cries of sick and wounded men, sounding woefully in our ears, crying out, and pitifully complaining for want of drink, being ready to die, yea many dying for lack thereof; so as by reason of this great extremity we lost many more men, than we had done all the voyage before: having before this time been so well and sufficiently provided for, that we lived in a manner as well and healthfully, and died as few, as if we had been in England, whereas now lightly every day some were cast overboard.

But the second day of December, 1589, was a festival day with us, for then it rained a good pace, and we saved some pretty store of rain water (though we were well wet for it, and that at midnight) and filled our skins full besides; notwithstanding it were muddy and bitter with washing the ship, but (with some sugar which we had to sweeten it withal) it went merrily down, yet remembered we, and wished for with all our hearts, many a conduit, pump, spring, and stream of clear sweet running water in England; and how miserable we had accounted some poor souls, whom we had seen driven for thirst to drink thereof, and how happy we would now have thought ourselves, if we might have had our fills of the same; yet should we have fared the better with this our poor feasting, if we might have had our meat and drink (such and so much as it was) stand quietly before us: but besides all the former extremities, we were so tossed and turmoiled with such horrible stormy and tempestuous weather, that every man had best hold fast his can, cup, and dish, in his hands, yea and himself too, many times, by the ropes, rails, or side of the ship, or else he should soon find all under feet.

Herewith our main sail was tore from the yard, and blown overboard quite away into the sea, without recovery, and our other sails so rent and torn (from side to side, some of them) that hardly any of them escaped whole. The raging waves and foaming surges of the sea came rolling like mountains one after another, and overraked the waste of the ship like a mighty river running over it, whereas in fair weather it was near twenty feet above the water, that now we might cry out, with the princely prophet, Psalm 107, v. xxvi. "They mount up to Heaven, and descend to the deep, so that their soul melteth away for trouble: they reel to and fro, and stagger like a drunken man, and all their cunning is gone." With this extremity of foul weather the ship was so tossed and shaken, that by the cracking noise it made, and by the leaking, which was now much more than ordinary, we were in great fear it would have shaken in sunder, so that now also we had just cause to pray a little otherwise than the poet, though marring the verse, yet mending the meaning.

Deus maris et cæli, quid enim nisi vota supersunt
Solvere, quassatæ parcito membra ratis.

Notwithstanding it pleased God, of his great goodness, to deliver us out of this danger. Then forthwith a new main sail was made and fastened to the yard, and the rest repaired as time and place would suffer, which we had no sooner done, but yet again we were troubled with as great extremity as before, so that again we were like to have lost our new main sail, had not master William Anthony, the master of the ship, himself (when none else would or durst) ventured, with danger of drowning, by creeping along upon the main yard (which was let down close to the rails) to gather it up out of the sea, and to fasten it thereto, being in the mean while oft-times ducked over head and ears into the sea.

These storms were so terrible, that there were some in our company which confessed that they had gone to sea for the space of twenty years, and had never seen the like, and vowed that if ever they returned safe home, they would never come to sea again.

The last of November, at night, we met with an English ship, out of which (because it was too late at night) it was agreed that we should have had the next morning two or three tuns of wine, which, as they said, was all the provision of drink they had, save only a butt or two, which they must needs reserve for their own use: but after that, we heard of them no more, till they were set upon ground on the coast of Ireland, where it appeared that they might have spared us much more than they pretended they could, so as they might well have relieved our great necessities, and have had sufficient for themselves besides, to bring them into England.

The first of December, at night, we spake with another English ship, and had some beer out of her, but not sufficient to carry us into England, so that we were constrained to put into Ireland, the wind so serving.

The next day we came to an anchor, not far from the St. Kelmes, under the land and wind, where we were somewhat more quiet, but (that being no safe harbour to ride in) the next morning we went about to weigh anchor, but having some of our men hurt at the capsten, we were fain to give over, and leave it behind, holding on our course to Ventre haven, where we safely arrived the same day, that place being a very safe and convenient harbour for us, that now we might sing, as we had just cause, "they that go down to the sea," &c.

So soon as we had anchored here, my lord went forthwith to shore, and brought fresh water, and fresh victuals, as muttons, pigs, hens, &c. to refresh his company withal. Notwithstanding himself had lately been very weak, and tasted of the same extremity that his company did: for in the time of our former want, having a little fresh water left him remaining in a pot, in the night it was broken, and the water drunk and dried up. Soon after the sick and wounded men were carried to the next principal town, called Dingenacush, being about three miles distant from the foresaid haven, where our ship rode, to the eastward, that there they might be the better refreshed, and had the chirurgions daily to attend upon them. Here we well refreshed ourselves, whilst the Irish harp sounded sweetly in our ears, and here we, who for the former extremities were in a manner half dead, had our lives (as it were) restored unto us again.

This Dingenacush is the chief town in all that part of Ireland, it consisteth but of one main street, from whence some smaller do proceed on either side. It hath had gates (as it seemeth) at either end, to open and shut as a town of war, and a castle also. The houses are very strongly built with thick stone walls and narrow windows, like unto castles; for as they confessed, in time of trouble, by reason of the wild Irish, or otherwise, they used their houses for their defence, as castles. The castle, and all the houses in the town, save four, were won, burned, and ruinated by the earl of Desmond. These four houses fortified themselves against him, and withstood him and all his power per force, so as he could not win them.

There remaineth yet a thick stone wall that passeth overthwart the midst of the street, which was a part of their fortification. Notwithstanding, whilst they thus defended themselves, as some of them yet alive confessed they were driven to as great extremities as the Jews, besieged by Titus, the Roman emperor, insomuch that they were constrained to eat dead men's carcasses for hunger. The town is now again somewhat repaired, but in effect there remain but the ruins of the former town. Commonly they have no chimnies in their houses, excepting them of the better sort, so that the smoke was very troublesome to us, while we continued there. Their fuel is turfs, which they have very good, and whins, or furs. There groweth little wood thereabouts, which maketh building chargeable there: as also want of lime (as they reported) which they are fain to fetch from far, when they have need thereof. But of stones there is store enough, so that with them they commonly make their hedges, to part each man's ground from other; and the ground seemeth to be nothing else within but rocks and stones; yet it is very fruitful and plentiful of grass and grain, as may appear by the abundance of kine and cattle there: insomuch that we had good muttons (though somewhat less than ours in England) for two shillings or five groats a piece, good pigs and hens for three pence apiece.

The greatest want is industrious, painful, and husbandly inhabitants, to till and trim the ground: for the common sort, if they can provide sufficient to serve from hand to mouth, take no further care.

Of money (as it seemeth) there is very small store amongst them, which perhaps was the cause that made them double and treble the prices of many things we bought of them, more than they were before our coming thither.

Good land was here to be had for four pence the acre, yearly rent. There are mines of allum, tin, brass, and iron. Stones we saw there as clear as crystal, natually squared like diamonds.

That part of the country is all full of great mountains and hllis, from whence came running down the pleasant streams of sweet fresh running water. The natural hard-

ness of that nation appeared in this, that their small children run usually in the midst of winter up and down the streets bare-footed and bare-legged, with no other apparel (many times) save only a mantle to cover their nakedness.

The chief officer of their town they call their sovereign, who hath the same office and authority among them that our mayors have with us in England, and hath his serjeants to attend upon him, and bear the mace before him, as our mayors.

We were first entertained at the sovereign's house, which was one of those four that withstood the earl of Desmond in his rebellion. They have the same form of common prayer, word for word, in Latin, that we have here in England. Upon the Sunday the sovereign cometh into the church, with his serjeant before him, and the sheriff and others of the town accompany him, and there they kneel down every man by himself privately, to make his prayers. After this they rise and go out of the church again to drink, which being done, they return again into the church, and then the minister beginneth prayers.

Their manner of baptising differeth something from ours: part of the service belonging thereto is repeated in Latin, and part in Irish. The minister taketh the child in his hands, and first dippeth it backwards, and then forwards, over head and ears, into the cold water, in the midst of winter, whereby also may appear their natural hardiness, (as before was specified.) They had neither bell, drum, nor trumpet, to call the parishioners together, but they expect till their sovereign come, and then they that have any devotion follow him.

They make their bread all in cakes, and for the tenth part the bakers bake for all the town.

We had of them some ten or eleven tuns of beer for the Victory, but it proved like a present purgation to them that took it, so that we chose rather to drink water than it.

The twentieth of December we loosed from hence, having well provided ourselves of fresh water, and other things necessary; being accompanied with sir Edw. Dennie, his lady, and two young sons.

This day, in the morning, my lord going ashore to dispatch away speedily some fresh water, that remained for the Victory, the wind being very fair for us, brought us news that there were sixty Spanish prizes taken and brought to England. For two or three days we had a fair wind, but afterwards it scanted so, that (as I said before) we were fain to keep a cold Christmas with the Bishop and his Clerks.

After this we met with an English ship, that brought us joyful news of ninety-one Spanish prizes that were come to England, and sorrowful news withal, that the last and best prize we took had suffered shipwreck at a place upon the coast of Cornwall, which the Cornish men call Als Efferne, that is Hell-cliff, and that captain Lister and all the men in the ship were drowned, save five or six, the one half English, the other Spanish, that saved themselves with swimming; but notwithstanding much of the goods were saved, and reserved for us, by sir Francis Godolphin, and the worshipful gentlemen of the country there. My lord was very sorry for captain Lister's death, wishing that he had lost his voyage to have saved his life.

The twenty-ninth we met with another ship that told us the same news, and that sir Martin Frobisher and captain Reymond had taken the admiral and vice-admiral of the fleet that we espied going to Tercera haven. But the admiral was sunk with much leaking, near to the Idy Stone, a rock that lieth over against Plymouth sound, and the men were saved.

This ship also certified us that captain Preston's ship had taken a prize laden with silver. My lord entered presently into this ship, and went to Falmouth, and we held on our course for Plymouth. At night we came near to the Ram-head (the next cape westwards from Plymouth sound) but we were afraid to double it in the night, misdoubting the scantiness of the wind. So we stood off to sea half the night, and towards the morning had the wind more large, and made too little spare thereof, that partly for this cause, and partly through mistaking of the land, we were driven so much to leewards, that we could not double that cape: therefore we returned back again, and came in Falmouth haven, where we struck on ground, in seventeen feet water; but it was a low ebb, and ready again to flow, and the ground soft, so as no hurt was done. Here with gladness we set foot again upon the English ground (long desired) and refreshed ourselves with keeping part of Christmas upon our native soil.

A VOYAGE TO THE AZORES WITH TWO PINNACES, THE ONE CALLED THE SERPENT, AND THE OTHER THE MARY SPARKE OF PLYMOUTH, BOTH OF THEM BELONGING TO SIR WALTER RALEIGH; WRITTEN BY JOHN EVESHAM, GENTLEMAN, WHEREIN WERE TAKEN THE GOVERNOR OF THE ISLE OF SAINT MICHAEL, AND PEDRO SARMIENTO, GOVERNOR OF THE STRAITS OF MAGALANES, IN THE YEAR 1586.

[HACKLUYT, VOL. II. P. 120, SECOND PART.]

THE tenth of June 1586 we departed from Plymouth, with two pinnaces, the one named the Serpent, of the burden of thirty five-tons, and the other the Mary Sparke of Plymouth, of the burden of fifty tons, both of them belonging to Sir Walter Raleigh, knight: and directing our course towards the coast of Spain, and from thence towards the Isles of the Azores, we took a small bark laden with sumack and other commodities, wherein was the governor of St. Michael's Island, being a Portugal, having other Portugals and Spaniards with him. And from thence we sailed to the Island of Graciosa, to the westward of the Island of Tercera, where we descried a sail, and bearing with her, we found her to be a Spaniard: but at the first, not greatly respecting whom we took, so that we might have enriched ourselves, which was the cause of this our travail, and for that we would not be known of what nation we were, we displayed a white silk ensign in our main top, which they seeing, made accompt that we had been some of the king of Spain's armadas, lying in wait for English men of war: but when we came within shot of her, we took down our white flag, and spread abroad the cross of St. George, which when they saw, it made them to fly as fast as they might: but all their haste was in vain, for our ships were swifter of sail than they, which they fearing, did presently cast their ordnance and small shot, with many letters, and the draft of the Straits of Magelan, into the sea, and thereupon immediately we took her: wherein we also took a gentleman of Spain, named Pedro Sarmiento, governor of the Straits of Magelan: which said Pedro we brought into England with us, and presented him to our sovereign lady the queen.

After this, lying off and about the islands, we descried another sail, and bearing after her, we spent the main mast of our admiral; but yet in the night our vice admiral took her, being laden with fish from Cape Blank, the which ship we let go again,

for want of men to bring her home. The next day we descried two other sails, the one a ship, and the other a caravel, to whom we gave chase, which they seeing, with all speed made in under the isle of Graciosa, to a certain fort there for their succour, where they came to an anchor, and having the wind of us, we could not hurt them with our ships, but we having a small boat, which we called a light-horseman, wherein myself was, being musqueteer, and four more with calivers, and four that rowed, came near unto the fore against the wind, which, when they saw us come towards them, they carried a great part of their merchandise on land, whither also the men of both vessels went and landed, and as soon as we came within musket shot, they began to shoot at us with great ordnance and small shot, and we likewise at them: and in the end we boarded one ship, wherein was no man left, so we cut her cables, hoisted her sails, and sent her away with two of our men, and the other seven of us passed more near unto the shore, and boarded the caravel, which did ride within a stone's cast from the shore, and so near the land that the people did cast stones at us, but yet in despight of them all we took her, and one only negro therein; and cutting her cables in the hawse we hoisted her sails, and being becalmed under the land, we were constrained to row her out with our boat; the fort still shooting at us, and the people on land with muskets and calivers, to the number of one hundred and fifty or thereabout, and we answered them with the small force we had; in the time of which our shooting, the shot of my musket being a cross-bar-shot, happened to strike the gunner of the fort to death, even as he was giving level to one of his great pieces, and thus we parted from them without any loss or hurt on our side. And now, having taken these five sails of ships, we did, as before, turn away the ship with the fish, without hurting them, and from one of the other ships we took her main mast to serve our admiral's turn, and so sent her away, putting into her all the Spaniards and Portugals (saving that gentleman, Pedro Sarmiento, with three other of the principal men and two negroes) leaving them all within sight of land, with bread and water sufficient for ten days, if need were.

Thus setting our course for England, being off the islands, in the height of 41° or thereabout, one of our men being in the top, descried a sail, then ten sail, then fifteen, whereupon it was concluded to send home those prizes we had, and so left in both our pinnaces not above sixty men. Thus we returned again to the fleet we had descried, where we found twenty-four sail of ships, whereof two of them were caraks, the one of twelve hundred, the other of a thousand tons, and ten galions; the rest were small ships and caravels, all laden with treasure, spices, and sugars, with which twenty-four ships, we, with two small pinnaces, did fight, and kept company the space of thirty-two hours, continually fighting with them, and they with us; but the two caraks kept still betwixt the fleet and us, that we could not take any one of them; so, wanting powder, we were forced to give them over against our wills, for that we were all wholly bent to the gaining of some of them, but necessity compelling us, and that only for want of powder, without loss of any of our men (which was a thing to be wondered at, considering the inequality of number) at length we gave them over. Thus we again set our course for England, and so came to Plymouth within six hours after our prizes, which we sent away forty hours before us, where we were received with triumphant joy, not only with great ordnance then shot off, but with the willing hearts of all the people of the town and of the country thereabout; and we not sparing our ordnance (with the powder we had left) to requite and answer them again. And from thence we brought our prizes to Southampton, where sir Walter Raleigh, being our owner, rewarded us with our shares.

Our prizes were laden with sugars, elephants' teeth, wax, hides, rice, Brasil, and cuser, as by the testimony of John Evesham himself, captain Whiddon, Thomas Rainford, Benjamin Wood, William Cooper, master, William Cornish, master, Thomas Drake, corporal, John Ladd, gunner, William Warefield, gunner, Richard Moon, John Drew, Richard Cooper of Harwich, William Beares of Ratcliffe, John Row of Saltash, and many others, may appear.

A REPORT OF MASTER ROBERT FLICKE, DIRECTED TO MASTER THOMAS BROMLEY, MASTER RICHARD STAPER, AND MASTER CORDALL, CONCERNING THE SUCCESS OF A PART OF THE LONDON SUPPLIES SENT TO MY LORD THOMAS HOWARD TO THE ISLES OF THE AZORES, 1591.

[HACKLUYT, VOL. II. P. 176. SECOND PART.]

WORSHIPFUL, my hearty commendations unto you premised; by my last of the twelfth of August from this place, I advertised you particularly of the accidents of our fleet until then. It remaineth now to relate our endeavours in accomplishing the order received for the joining with my lord Thomas Howard, together with the success we have had. Our departure from hence was the seventeenth of August, the wind not serving before. The next day following I caused a flag of counsel to be put forth, whereupon the captains and masters of every ship came aboard, and I acquainted them with my commission, firmed by the right honourable the lords of her majesty's council; and with all the advertisements of sir Edward Denny, of my lord's determination to remain threescore leagues to the west of Fayal, spreading north and south, betwixt thirty-seven and a half, or thirty-eight and a half degrees. And not finding him in this height, to repair to the isles of Flores and Corvo, where a pinnace of purpose should stay our coming until the last of August, with intent after that day to repair to the coast of Spain, about the height of the rock, some twenty or thirty leagues off the shore. The which being advisedly considered of, having regard unto the shortness of time, by reason of our long abode in this place, and the uncertainty of the weather to favour us, it was generally holden for the best and surest way to meet with my lord, to bear with the height of the Rock, without making any stay upon the coast, and so directly for the islands, which was accordingly fully agreed and performed. The twenty-eighth day we had sight of the Burlings, and the twenty-ninth, being thwart of Peniche, the wind serving us, without any stay we directed our course west for the islands. The thirtieth day we met with captain Royden in the Red-Rose, sometime called the Golden Dragon, separated from my lord of Cumberland in a storm: who certified us of fifty sails of the Spanish king's armadas to be gone for the islands, but could not inform us any news of my lord Thomas Howard, otherwise than upon presumption to remain about the islands, and so we continued our course, the wind standing with us.

The fourth of September we recovered Tercera, and ranged along all the islands, both on the south and north sides the space of four days: during which time it was not our hap to meet with any shipping, whereby either to understand of my lord, or of the Indian fleet: hereupon we directed our course to the west from Fayal, according to the instructions of sir Edward Denny. The eleventh day in the plying to the westwards we descried a sail out of our main top, and in the afternoon, between two

and three of the clock, having raised her hull, the weather became calm, so that the ship could not fetch her. I sent off my skiff thoroughly manned, furnished with shot and swords, the Cherubin, and the Margaret and John doing the like. Upon this the sail stood off again, and the night approaching, our boats lost her, and so returned. In this our pursuit after the sail, the Centurion being left astern, the next morning we missed her, and spent that day plying up and down seeking her. And for as much as every of the ships had received order, that, if by extremity of weather or any other mischance they should be severed from our fleet, they should meet and join at Flores, we, according to the instructions of Sir Edward Dennie, proceeded to the finding of my lord Thomas Howard, being in the height appointed, and not able to hold the same, by reason of extreme tempests, which forced us to the isles of Flores and Corvo, which we made the fourteenth day in the morning, and there also joined again with the Centurion, whose company before we had lost: who declared unto us, that the twelfth day, being the same day they lost us, they met with five-and-forty sails of the Indian fleet. The same night, upon these news, we came to an anchor between Flores and Corvo, and the morrow following, at the break of day, a flag of council being put out, the captains and masters came aboard me: where, for the desire to understand some tidings of my lord, as also the supplying our want of water, it was thought good to send our boats furnished on shore, under the conduct of captain Brothers, and then it was also ordered, after our departure thence, to range along the south sides of the islands, to the end we might either understand of my lord, or else light on the Indian fleet; and, in the missing of our purpose, to direct our course for cape Saint Vincent.

The boats, according to the foresaid determination, being sent on shore, it chanced that the Costly, riding uttermost in the road, did weigh, to bring herself more near among us, for the succour of the boats sent off, and in opening the land discovered two sails, which we in the roads could not perceive; whereupon she gave us a warning-piece, which caused us to wave off our boats back, and before they could recover our ships, the descried ships appeared unto us, towards the which we made with all haste, and in a very happy hour, as it pleased God. In that we had not so soon cleared the land, and spoken with one of them, which was a bark of Bristol, who had also sought my lord in the heights appointed, and could not find him, but a violent storm arose, in such a manner, as if we had remained in the road we had been in danger of perishing: and the same extremely continued during the space of threescore hours. In which storm I was separated from our fleet, except the Cherubin and the Costly, which kept company with me. And so sailing among the islands, I viewed the road of Fayal, and finding no roaders there, went directly for the isle of Tercera.

The nineteenth in the morning, coming unto the same with intent to edge into the road, a tempest arose and scanted the wind, that we could not seize it; from the which being driven, we fell among certain of the Indian fleet, which the said storm dispersed, and put them from the road: whereupon myself with the other two ships in company gave several chases, and thereby lost the company of each other.

In following our chase above noon we made her to strike and yield, being a Portugal, laden with hides, salsa-parilla, and anile. At this very instant we espied another, and taking our prize with us followed her, and somewhat before night obtained her, named the Conception, Francisco Spinola being captian, which was laden with hides, cochonillio, and certain raw silk; and for that the seas were so growen, as neither with boat nor ship they were to be boarded, we kept them till fit opportunity. The same night, a little before day, there happened another into our company, supposing us by our two prizes to be of their fleet, which we until the morning dissembled.

The twentieth day, in the morning, the sail being shot somewhat a-head of us, having a special care for the safe keeping of the two former, we purposed to cause our prizes to put out more sail, thereby to keep them near in giving chase to the other: unto the which the master would not hearken, nor be persuaded but that they would follow us; by the which his wilfullness, by such time as we had caused the other to yield, and sent men on board, the Conception, Francisco Spinola captain, being brought astern and having gotten the wind of us, stood off with all her sails bearing, so as we were forced to make a new chase of her; and had not the wind enlarged upon us we had lost her. In the pursuit, before we recovered her, and brought ourselves again in company of our other prizes, the whole day was spent, and by this means we lost the opportunity of that day, the weather fitly serving to board the Portugal prize, which was in great distress, and made request to take them, being ready to sink, and, as we well perceived, they ceased not to pump day and night; the which ship to all our judgments the same night perished in the sea.

The one-and-twentieth day, the Conception, whereof Francisco Spinola was captain, being also in a leak, and the same still increasing, notwithstanding the continual pumping, in such sort as not to be kept long above water, I took and discharged out of her two-and-forty chests of cochonillio and silks, and so left her with eleven feet water in her hold, and her furniture and four thousand seven hundred hides, unto the seas.

The other prize, which we have brought into the harbour, is named Nostra Sennora de los Remedios, whereof Francisco Alvares is captain, laden with sixteen chests of cochonillio, certain fardels of raw silk, and about four thousand hides. Upon the discharge of the goods your worships shall be particularly advertised thereof.

In the boarding of the prizes the disorder of the company was such, as that they letted not presently, besides the rifling of the Spaniards, to break open the chests and to purloin such money as was in them: notwithstanding that it was ordered at convenient leisure to have gone aboard myself, and there, in the presence of three or four witnesses, to have taken a just account thereof, and the same to have put in safe keeping, according to the effects of articles received in this behalf.

And whereas there were also certain sums of money taken from the company, which they had thus purloined and embezzled, and the same with some other parcels brought aboard my ship, amounting unto two thousand one hundred and twenty-nine pezoes and a half, the company, as pillage due unto them, demanded to have the same shared, which I refused, and openly at the main-mast read the articles formed by my lord treasurer and my lord admiral, whereby we ought to be directed, and that it was not in me any way to dispose thereof until the same were finally determined at home. Hereupon they mutinied, and at last grew into such fury, as that they would have it, or else break down the cabin, which they were also ready to put in practice, whereby I was forced to yield, lest the Spaniards which we had aboard, being many, perceiving the same, might have had fit opportunity to rise against us, which, after their brawls were appeased, they sought to have put in execution.

By the last advice from Castile, the general of the king's armada, which is lately come to sea, hath received commandment to join his fleet with those of the Indies, and for to stay altogether at Tercera till the fifteenth of October; for that six pataches, with seven or eight millions of the king's treasure, will come by that time, or else they stay their coming from Havanna until January next, or the king's further pleasure therein to be known. These pataches are said to be of three hundred tons the piece, and to carry thirty pieces of brass, and also of sail reported to have the advantage of any shipping.

There perished of the Indies fleet, sunk in the sea before their coming to Flores, eleven sails, whereof the general was one, and not one man saved. And it is by the Spaniards themselves pre-supposed, that the storms which we had at Flores and at Tercera have devoured many more of them, whereof in part we were eye-witnesses: and so, what by the seas and our men of war, I presume that of seventy-five sails that came from Havanna, half of them will never arrive in Spain.

The eleventh day of October, at night, we came to anchor in the Sound of Plymouth, and the next morning with our prize came into Cattewater, for which God be thanked; for that a vehement storm arose, and with such fury increased, as that the prize was forced to cut over her main mast, otherwise, with the violence of the storm, her ground-tackle being bad, she had driven on shore, which was the most cause that moved me to put in here; intending now here to discharge the goods without further adventure, and have certified thus much unto my lord admiral, and therewith also desired to understand the direction of the lords of the counsel, together with yours, insomuch as my lord Thomas Howard is not returned. How the rest of our consorts, which were separated from us, have sped, or what prizes they have taken, whereof there is much hope, by reason of scattering of the West Indian fleet, as yet we are able to say nothing. And thus, expecting your answer, and for all other matters referring me unto the bearer, captain Furtho, I end.

Your worship's loving friend,

ROBERT FLICKE.

Plymouth, October 24, 1591.

A REPORT OF THE TRUTH OF THE FIGHT ABOUT THE ISLES OF AZORES, THE LAST OF AUGUST 1591, BETWIXT THE REVENGE, ONE OF HER MAJESTY'S SHIPS, AND AN ARMADA OF THE KING OF SPAIN: PENNED BY THE HONOURABLE SIR WALTER RALEIGH, KNIGHT.

[HACKLUYT, II, 169, SECOND PART.]

BECAUSE the rumours are diversely spread, as well in England as in the Low Countries and elsewhere, of this late encounter between her majesty's ships and the armada of Spain; and that the Spaniards, according to their usual manner, fill the world with their vain-glorious vaunts, making great appearance of victories, when, on the contrary, themselves are most commonly and shamefully beaten and dishonoured, thereby hoping to possess the ignorant multitude by anticipating and forerunning false reports: it is agreeable with all good reason, for manifestation of the truth, to overcome falsehood and untruth, that the beginning, continuance, and success of this late honourable encounter of sir Richard Greenvil, and other her majesty's captains, with the armada of Spain, should be truly set down and published, without partiality or false imaginations. And it is no marvel that the Spaniards should seek by false and slanderous pamphlets, advisoes, and letters, to cover their own loss, and to derogate from others their due honours, especially in this fight being performed far off; seeing they were not ashamed in the year 1588, when they purposed the invasion of this land, to publish in sundry lan-

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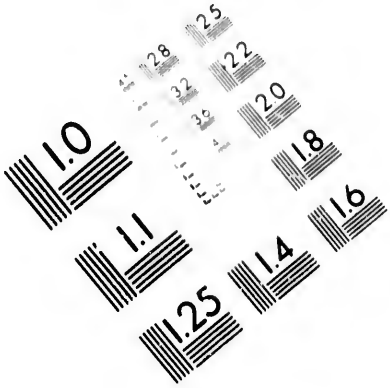

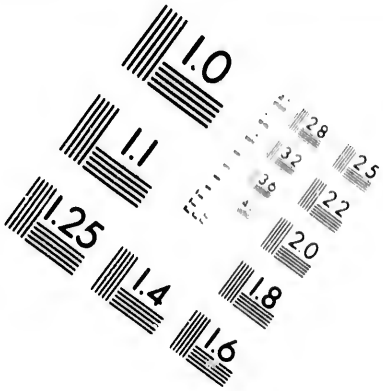

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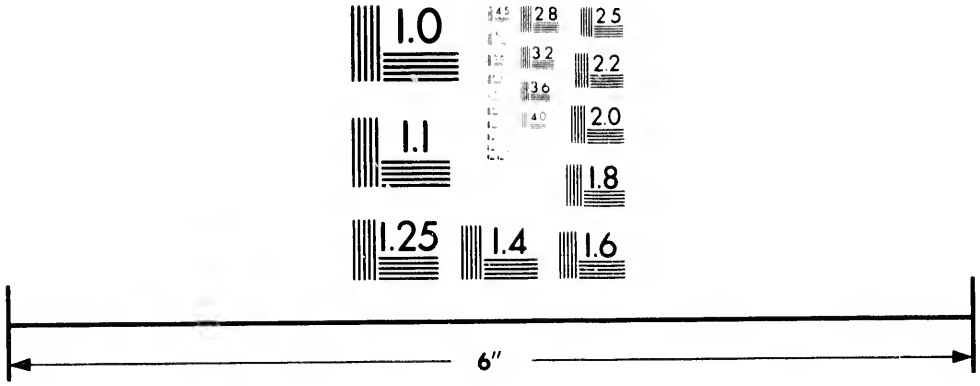

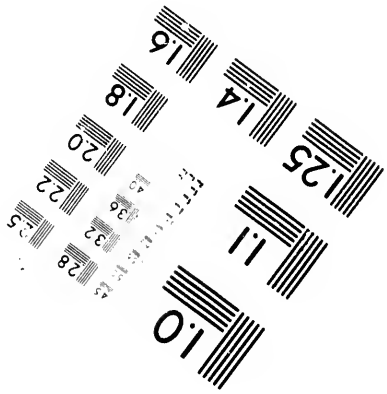

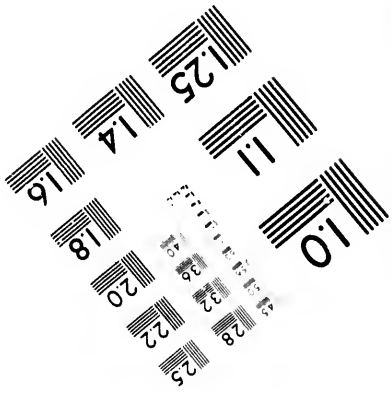

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guages in print, great victories in words, which they pleaded to have obtained against this realm; and spread the same in a most false sort over all parts of France, Italy, and elsewhere. When shortly after it was happily manifested in very deed to all nations, how their navy, which they termed invincible, consisting of 140 sail of ships, not only of their own kingdom, but strengthened with the greatest Argosies, Portugal caracks, Florentines, and huge hulks of other countries, were by 30 of her majesty's own ships of war, and a few of our own merchants, by the wise, valiant, and advantageous conduct of the lord Charles Howard, high admiral of England, beaten and shuffled together; even from the Lizard in Cornwall first to Portland, where they shamefully left don Pedro de Valdes, with his mighty ship; from Portland to Cales, where they lost Hugo de Moncado, with the gallias of which he was captain; and from Cales, driven with squibs from their anchors, were chased out of the sight of England, round about Scotland and Ireland. Where, for the sympathy of their barbarous religion, hoping to find succour and assistance, a great part of them were crushed against the rocks, and those other that landed, being very many in number, were notwithstanding broken, slain, and taken, and so sent from village to village, coupled in halters, to be shipped into England. Where her majesty, of her princely and invincible disposition, disdaining to put them to death, and scorning either to retain or entertain them, they were all sent back again to their countries, to witness and recount the worthy achievements of their invincible and dreadful navy; of which the number of soldiers, the fearful burthen of their ships, the commander's name of every squadron, with all other their magazines of provisions, were put in print as an army and navy unresistible, and disdaining prevention. With all which so great and terrible an ostentation, they did not, in all their sailing round England, so much as sink or take one ship, bark, pinnace, or cockboat of ours; or even burnt so much as one sheepcot of this land. Whereas, on the contrary, sir Richard Drake, with only 800 soldiers, not long before landed in their Indies, and forced Sant-Jago, Santo Domingo, Carthagena, and the forts of Florida.

And after that sir John Norris marched from Peniche in Portugal, with a handful of soldiers, to the gates of Lisbon, being above forty English miles, where the earl of Essex himself and other valiant gentlemen braved the city of Lisbon, encamped at the very gates; from whence, after many days abode, finding neither promised party, nor provision to barter, they made retreat by land, in despight of all their garrisons, both of horse and foot. In this sort I have a little digressed from my first purpose, only by the necessary comparison of their and our actions: the one covetous of honour, without vaunt of ostentation; the other so greedy to purchase the opinion of their own affairs, and by false rumours to resist the blasts of their own dishonours, as they will not only not blush to spread all manner of untruths, but even for the least advantage, be it but for the taking of one poor adventurer of the English, will celebrate the victory with bonfires in every town, always spending more in faggots than the purchase was worth they obtained. Whereas we never thought it worth the consumption of two billets, when we have taken eight or ten of their Indian ships at one time, and twenty of the Brazil fleet. Such is the difference between true valour and ostentation, and between honourable actions and frivolous vain-glorious vaunts. But now to return to my purpose.

The Lord Thomas Howard, with six of her majesty's ships, six victuallers of London, the bark Raleigh, and two or three other pinnaces, riding at anchor near unto Flores, one of the westerly islands of the Azores, the last of August, in the afternoon, had intelligence by one captain Middleton of the approach of the Spanish armada.

Which Middleton, being in a very good sailer, had kept them company three days before, of good purpose, both to discover their forces the more, as also to give advice to my lord Thomas of their approach. He had no sooner delivered the news, but the fleet was in sight: many of our ships' companies were on shore in the island, some providing ballast for their ships; others filling of water, and refreshing themselves from the land with such things as they could either for money or by force recover. By reason whereof our ships being all pestered, and romaging every thing out of order, very light for want of ballast, and that which was most to our disadvantage, the one half part of the men of every ship sick, and utterly unserviceable; for in the Revenge there were ninety diseased; in the Bonaventure, not so many in health as could handle her main-sail. For had not twenty men been taken out of a bark of sir George Carey's, his being commanded to be sunk, and those appointed to her, she had hardly ever recovered England. The rest, for the most part, were in little better state. The names of her majesty's ships were these, as followeth: the Defiance, which was admiral, the Revenge vice-admiral, the Bonaventure, commanded by captain Crosse, the Lion by George Fenner, the Foresight by M. Thomas Vavasour, and the Crane by Duffild. The Foresight and the Crane being but small ships; only the other were of the middle size; the rest, besides the bark Raleigh, commanded by captain Thin, were victuallers, and of small force or none. The Spanish fleet having shrouded their approach by reason of the island, were now so soon at hand, as our ships had scarce time to weigh their anchors, but some of them were driven to let slip their cables and set sail. Sir Richard Grenvill was the last that weighed, to recover the men that were upon the island, which otherwise had been lost. The lord Thomas with the rest very hardly recovered the wind, which sir Richard Grenvill not being able to do, was persuaded by the master and others to cut his main-sail, and cast about, and to trust to the sailing of the ship; for the squadron of Sivil were on his weather-bow. But sir Richard utterly refused to turn from the enemy, alledging that he would rather choose to die, than to dishonour himself, his country, and her majesty's ship, persuading his company that he would pass through the two squadrons in despight of them, and enforce those of Sivil to give him way. Which he performed upon divers of the foremost, who, as the mariners term it, sprang their luff, and fell under the lee of the Revenge. But the other course had been the better, and might right well have been answered in so great an impossibility of prevailing. Notwithstanding, out of the greatness of his mind he could not be persuaded. In the mean while, as he attended those which were nearest him, the great San Philip being in the wind of him, and coming towards him, becalmed his sails in such sort, as the ship could neither make way, nor feel the helm: so huge and high carged was the Spanish ship, being of a thousand and five hundred tons, who after laid the Revenge aboard. When he was thus bereft of his sails, the ships that were under his lee luffing up, also laid him aboard; of which the next was the admiral of the Biscaines, a very mighty and puissant ship, commanded by Brittandona. The said Philip carried three tier of ordnance on a side, and eleven pieces in every tier. She shot eight forth right out of her chase, besides those of her stern ports.

After the Revenge was entangled with this Philip, four other boarded her; two on her larboard, and two on her starboard. The fight thus beginning at three o'clock in the afternoon, continued very terrible all that evening. But the great San Philip having received the lower tier of the Revenge, discharged with cross-bar-shot, shifted herself with all diligence from her sides, utterly misliking her first entertainment. Some say that the ship foundered, but we cannot report it for truth, unless we were assured.

The Spanish ships were filled with companies of soldiers, in some two hundred, besides the mariners; in some five, in others eight hundred. In ours there were none at all besides the mariners, but the servants of the commanders, and some few voluntary gentlemen only. After many interchanged vollies of great ordnance and small shot, the Spaniards deliberated to enter the Revenge, and made divers attempts, hoping to force her, by the multitudes of their armed soldiers and musketeers, but were still repulsed again and again, and at all times beaten back into their own ships, or into the seas. In the beginning of the fight, the George Noble, of London, having received some shot through her, by the armadas, fell under the lee of the Revenge, and asked sir Richard what he would command him; being but one of the victuallers, and of small force, sir Richard bid him save himself, and leave him to his fortune. After the fight had thus, without intermission, continued while the day lasted, and some hours of the night, many of our men were slain and hurt, and one of the great gallions of the armada and the admiral of the huiks both sunk, and in many other of the Spanish ships great slaughter was made. Some write that sir Richard was very dangerously hurt almost in the beginning of the fight, and lay speechless for a time ere he recovered. But two of the Revenge's own company, brought home in a ship of Lime from the islands, examined by some of the lords, and others, affirmed that he was never so wounded as that he forsook the upper deck, till an hour before midnight; and then being shot into the body with a musket, as he was a dressing, was again shot into the head, and withal his chirurgion wounded to death. This agreeth also with an examination taken by sir Francis Godolphin of four other mariners of the same ship, being returned, which examination the said sir Francis sent unto master William Killegrue, of her majesty's privy chamber.

But to return to the fight, the Spanish ships which attempted to board the Revenge, as they were wounded and beaten off, so always others came in their places, she having never less than two mighty gallions by her sides, and aboard her: so that ere the morning, from three of the clock the day before, there had fifteen several armadas assailed her; and all so ill approved their entertainment, as they were by the break of day far more willing to hearken to a composition, than hastily to make any more assaults or entries. But as the day encreased, so our men decreased; and as the light grew more and more, by so much more grew our discomforts; for none appeared in sight but enemies, saving one small ship called the Pilgrim, commanded by Jacob Whiddon, who hovered all night to see the success; but in the morning, bearing with the Revenge, was hunted like a hare amongst many ravenous hounds, but escaped.

All the powder of the Revenge to the last barrel was now spent, all her pikes broken, forty of her best men slain, and the most part of the rest hurt. In the beginning of the fight she had but one hundred free from sickness, and four score and ten sick laid in hold upon the ballast. A small troop to man such a ship, and a weak garrison to resist so mighty an army. By those hundred all was sustained, the vollies, boardings, and enterings of fifteen ships of war, besides those which beat her at large. On the contrary, the Spanish were always supplied with soldiers brought from every squadron; all manner of arms and powder at will. Unto ours there remained no comfort at all, no hope, no supply either of ships, men, or weapons; the masts all beaten overboard, all her tackle cut asunder, her upper work altogether rased, and in effect evened she was with the water, but the very foundation or bottom of a ship, nothing being left overhead, either for flight or defence. Sir Richard finding himself in this distress, and unable any longer to make resistance, having endured, in this fifteen hours fight, the assault of fifteen several armadas, all by turns aboard him, and by estimation eight hundred shot of great artillery, besides many assaults and entries, and that the ship and

himself must needs be possessed by the enemy, who were now all cast in a ring round about him (the Revenge not able to move one way or other, but as she was moved with the waves and billows of the sea) commanded the master gunner, whom he knew to be a most resolute man, to split and sink the ship, that thereby nothing might remain of glory or victory to the Spaniards; seeing in so many hours fight, and with so great a navy, they were not able to take her, having had fifteen hours time, above ten thousand men, and fifty and three sail of men of war, to perform it withal; and persuaded the company, or as many as he could induce, to yield themselves unto God, and to the mercy of none else; but as they had, like valiant resolute men, repulsed so many enemies, they should not now shorten the honour of their nation, by prolonging their lives for a few hours, or a few days. The master gunner readily condescended, and divers others; but the captain and the master were of another opinion, and besought sir Richard to have care of them; alledging that the Spaniard would be as ready to entertain a composition, as they were willing to offer the same; and that there being divers sufficient and valiant men yet living, and whose wounds were not mortal, they might do their country and prince acceptable service hereafter. And whereas sir Richard had alledged that the Spaniards should never glory to have taken one ship of her majesty, seeing they had so long and so notably defended themselves; they answered, that the ship had six feet water in hold, three shot under water, which were so weakly stopped, as with the first working of the sea she must needs sink; and was besides so crushed and bruised, as she could never be removed out of the place.

And as the matter was thus in dispute, and sir Richard refusing to hearken to any of those reasons, the master of the Revenge (while the captain won unto him the greater party) was conveyed aboard the General Don Alfonso Bacan; who (finding none over hasty to enter the Revenge again, doubting lest sir Richard would have blown them up and himself, and perceiving by the report of the master of the Revenge his dangerous disposition) yielded that all their lives should be saved, the company sent for England, and the better sort to pay such reasonable ransom as their estate would bear, and in the mean season to be free from galley or imprisonment. To this he so much the rather condescended as well, as I have said, for fear of further loss and mischief to themselves, as also for the desire he had to recover sir Richard Greenvil, whom for his notable valour he seemed greatly to honour and admire.

When this answer was returned, and that safety of life was promised, the common sort being now at the end of their peril, the most drew back from sir Richard and the master gunner, being no hard matter to dissuade men from death to life. The master gunner, finding himself and sir Richard thus prevented and mastered by the greater number, would have slain himself with a sword, had he not been by force withheld, and locked into his cabin. Then the general sent many boats aboard the Revenge; and divers of our men, fearing sir Richard's disposition, stole away aboard the General and other ships. Sir Richard, thus overmatched, was sent unto by Alfonso Bacan to remove out of the Revenge, the ship being marvellous unsavoury, filled with blood and bodies of dead and wounded men, like a slaughter-house. Sir Richard answered that he might do with his body what he list, for he esteemed it not, and as he was carried out of the ship he swooned, and reviving again, desired the company to pray for him. The general used sir Richard with all humanity, and left nothing unattempted that tended to his recovery, highly commending his valour and worthiness, and greatly bewailing the danger wherein he was, being unto them a rare spectacle, and a resolution seldom approved, to see one ship turn towards so many enemies, to endure the charge and boarding of so many huge armadas, and to resist and repel the assaults

and entries of so many soldiers. All which and more is confirmed by a Spanish captain of the same armada, and a present actor in the fight, who, being severed from the rest in a storm, was by the Lion of London, a small ship, taken, and is now prisoner in London.

The general commander of the armada was don Alfonso Bacan, brother to the marquis of Santa Cruz. The admiral of the Biscaine squadron was Britandona. Of the squadron of Sivil the marquis of Arumburch. The hulks and fly-boats were commanded by Luis Coutinho. There were slain and drowned in this fight well near one thousand of the enemies, and two special commanders, don Luis de Sant John, and don George de Prunaria de Mallaga, as the Spanish captain confesseth, besides divers others of special account, whereof as yet report is not made.

The admiral of the hulks and the Ascension of Sivil were both sunk by the side of the Revenge; one other recovered the road of St. Michael, and sunk also there; a fourth ran herself with the shore, to save her men. Sir Richard died, as it is said, the second or third day aboard the General, and was by them greatly bewailed. What became of his body, whether it was buried in the sea or on the land, we know not: the comfort that remaineth to his friends is, that he hath ended his life honourably in respect of the reputation won to his nation and country, and of the same to his posterity, and that being dead, he hath not outlived his own honour.

For the rest of her majesty's ships, that entered not so far into the fight as the Revenge, the reasons and causes were these. There were of them but six in all, whereof two but small ships; the Revenge engaged past recovery; the island of Flores was on the one side; 53 sail of the Spanish, divided into squadrons, on the other, all as full filled with soldiers as they could contain; almost the one half of our men sick, and not able to serve; the ships grown foul, and scarcely able to bear any sail for want of ballast, having been six months at the sea before. If all the rest had entered, all had been lost; for the very hugeness of the Spanish fleet, if no other violence had been offered, would have crushed them between them into shivers. Of which the dishonour and loss to the queen had been far greater than the spoil or harm that the enemy could any way have received. Notwithstanding, it is very true that the lord Thomas would have entered between the squadrons, but the rest would not condescend; and the master of his own ship offered to leap into the sea, rather than to conduct that her majesty's ship and he rest to be a prey to the enemy, where there was no hope nor possibility either of defence or victory. Which also in my opinion had ill sorted or answered the discretion and trust of a general, to commit himself and his charge to an assured destruction, without hope or any likelihood of prevailing; thereby to diminish the strength of her majesty's navy, and to enrich the pride and glory of the enemy. The Foresight of the queen's, commanded by M. Thomas Vavisor, performed a very great fight, and staid two hours as near the Revenge as the weather would permit, not forsaking the fight till he was like to be encompassed by the squadrons, and with great difficulty cleared himself. The rest gave divers vollies of shot, and entered as far as the place permitted, and their own necessities, to keep the weather gage of the enemy, until they were parted by night. A few days after the fight was ended, and the English prisoners dispersed into the Spanish and India ships, there arose so great a storm from the W. and N. W. that all the fleet was dispersed, as well the Indian fleet, which were then come unto them, as the rest of the armada that attended their arrival, of which 14 sail, together with the Revenge, and in her 200 Spaniards, were cast away upon the isle of St. Michael. So it pleased them to honour the burial of that renowned ship the Revenge, not suffering her to perish alone, for the great honour she

achieved in her life-time. On the rest of the islands there were cast away in this storm fifteen or sixteen more of the ships of war; and of an hundred and odd sail of the India fleet, expected this year in Spain, what in this tempest, and what before in the bay of Mexico, and about the Bermudas, there were 70 and odd consumed and lost, with those taken by our ships of London, besides one very rich Indian ship, which set herself on fire, being boarded by the Pilgrim, and five others taken by master Wats his ships of London, between the Havanna and Cape St. Antonio. The fourth of this month of November we received letters from the Tercera, affirming that there are three thousand bodies of men remaining in that island, saved out of the perished ships; and that by the Spaniards own confession, there are ten thousand cast away in this storm, besides those that are perished between the islands and the main. Thus it hath pleased God to fight for us, and to defend the justice of our cause against the ambitious and bloody pretences of the Spaniards, who, seeking to devour all nations, are themselves devoured. A manifold testimony how unjust and displeasing their attempts are in the sight of God, who hath pleased to witness, by the success of their affairs, his mislike of their bloody and injurious designs, purposed and practised against all christian princes, over whom they seek unlawful and ungodly rule and empire.

One day or two before this wreck happened to the Spanish fleet, when as some of our prisoners desired to be set on shore upon the islands, hoping to be from thence transported into England, which liberty was formerly by the general promised, one Morice Fitz John, son of old John of Desmond, a notable traitor, cousin german to the late earl of Desmond, was sent to the English from ship to ship, to persuade them to serve the king of Spain. The arguments he used to induce them were these. The increase of pay, which he promised to be trebled: advancement to the better sort: and the exercise of the true Catholic religion, and safety of their souls to all. For the first, even the beggarly and unnatural behaviour of those English and Irish rebels, that served the king in that present action, was sufficient to answer that first argument of rich pay. For so poor and beggarly they were, as for want of apparel they stripped their poor countrymen prisoners out of their ragged garments, worn to nothing by six months service, and spared not to despoil them even of their bloody shirts, from their wounded bodies, and the very shoes from their feet; a notable testimony of their rich entertainment and great wages. The second reason was hope of advancement if they served well, and would continue faithful to the king. But what man can be so blockishly ignorant ever to expect place or honour from a foreign king, having no other argument or persuasion than his own disloyalty; to be unnatural to his own country that bred him; to his parents that begat him; and rebellious to his true prince, to whose obedience he is bound by oath, by nature, and by religion? No, they are only assured to be employed in all desperate enterprizes, to be held in scorn and disdain even among those whom they serve. And that ever traitor was either trusted or advanced I could never yet read, neither can I at this time remember any example. And no man could have less become the place of an orator for such a purpose than this Morice of Desmond. For the earl his cousin being one of the greatest subjects in that kingdom of Ireland, having almost whole counties in his possession, so many goodly manors, castles, and lordships, the count palatine of Kerry, five hundred gentlemen of his own name and family to follow him, besides others (all which he and his ancestors possessed in peace for three or four hundred years) was, in less than three years after his adhering to the Spaniards and rebellion, beaten from all his holds, not so many as ten gentlemen of his name left living, himself taken and beheaded by a soldier of his own nation, and his land given by a parliament to her majesty, and possessed by the English: his other cousin, sir John

of Desmond, taken by master John Zouch, and his body hanged over the gates of his native city, to be devoured by ravens: the third brother sir James hanged, drawn, and quartered in the same place. If he had withal vaunted of his success of his own house, no doubt the argument would have moved much, and wrought great effect; which because he for that present forgot, I thought it good to remember in his behalf. For matter of religion it would require a particular volume, if I should set down how irreligiously they cover their greedy and ambitious pretences with that veil of piety. But sure I am, that there is no kingdom or commonwealth in all Europe, but if they be reformed, they then invade it for religion sake: if it be, as they term Catholic, they pretend title; as if the kings of Castile were the natural heirs of all the world: and so, between both, no kingdom is unsought. Where they dare not with their own forces to invade, they basely entertain the traitors and vagabonds of all nations, seeking by those, and by their runnagate jesuits, to win parts, and have by that means ruined many noble houses and others in this land, and have extinguished both their lives and families. What good, honour, or fortune, ever man yet by them achieved, is yet unheard of, or unwritten. And if our English Papists do but look into Portugal, against which they have no pretence of religion, how the nobility are put to death, imprisoned, their rich men made a prey, and all sort of people captived, they shall find that the obedience even of the Turk is easy and a liberty, in respect of the slavery and tyranny of Spain. What have they done in Sicill, in Naples, Millaine, and in the Low countries? who hath there been spared for religion at all? And it cometh to my remembrance of a certain burgher of Antwerp, whose house being entered by a company of Spanish soldiers, when they first sacked the city, he besought them to spare him and his goods, being a good catholic, and one of their own party and faction. The Spaniards answered, that they knew him to be of a good conscience for himself, but his money, plate, jewels, and goods, were all heretical, and therefore good prize. So they abused and tormented the foolish Fleming, who hoped that an Agnus Dei had been a sufficient target against all force of that holy and charitable nation. Neither have they at any time, as they protest, invaded the kingdoms of the Indies and Peru, and elsewhere, but only led thereunto, rather to reduce the people to christianity, than for either gold or empire. When as in one only island, called Hispaniola, they have wasted thirty hundred thousand of the natural people, besides many millions else in other places of the Indies; a poor and harmless people, created of God, and might have been won to his knowledge, as many of them were, and almost as many as ever were persuaded thereunto. The story whereof is at large written by a bishop of their own nation, called Bartholomew de las Casas, and translated into English and many other languages, intitled, "the Spanish Cruelties." Who would, therefore, repose trust in such a nation of ravenous strangers, and especially in those Spaniards, which more greedily thirst after English blood, than after the lives of any other people of Europe, for the many overthrows and dishonours they have received at our hands, whose weakness we have discovered to the world, and whose forces at home, abroad, in Europe, in India, by sea and land, we have even with handfulls of men and ships overthrown and dishonoured. Let not, therefore, any Englishman, of what religion soever, have other opinion of the Spaniards, but that those whom he seeketh to win of our nation he esteemeth base and traitorous, unworthy persons, or unconstant fools; and that he useth his pretence of religion for no other purpose, but to bewitch us from the obedience of our natural prince; thereby hoping, in time, to bring us to slavery and subjection, and then none shall be unto them so odious and disdained as the traitors themselves, who have sold their country to a stranger, and for-

saken their faith and obedience, contrary to nature and religion; and contrary to that humane and general honour, not only of christians, but of heathen and irreligious nations, who have always sustained what labour soever, and embraced even death itself, for their country, prince, or commonwealth. To conclude, it hath ever to this day pleased God to prosper and defend her majesty, to break the purposes of malicious enemies, of forsworn traitors, and of unjust practices and invasions. She hath ever been honoured of the worthiest kings, served by faithful subjects, and shall, by the favour of God, resist, repel, and confound all whatsoever attempts against her sacred person or kingdom. In the mean time, let the Spaniard and traitor vaunt of their success, and we, her true and obedient vassals, guided by the shining light of her virtues, shall always love her, serve her, and obey her, to the end of our lives.

VOYAGE TO TERCERA, UNDERTAKEN BY THE COMMANDER DE CHASTE, GENTLEMAN IN ORDINARY OF THE KING'S BED-CHAMBER, AND GOVERNOR FOR HIS MAJESTY OF THE TOWN AND CASTLES OF DIEPPE AND ARQUIS.

[TRANSLATED FROM THE FRENCH IN THEVENOT'S COLLECTION, VOL. IV.

THE queen dowager being resolved to oppose the expedition fitted out by the king of Spain against the islands of Tercera and Fayal, comprising a great force in readiness and properly equipped at Lisbon, and the different other ports subject to him, for the purpose of reducing the said islands, remaining dependencies of the kingdom of Portugal, and possessed by the said king for five or six years before in his right of a strong and cunning neighbour: and Don Anthony, elected king of Portugal after the death of his predecessor Don Sebastian, having implored the assistance of the queen for a long time in his distressed situation, sojourning for that purpose, and following up his entreaties in person at the court of the king of France, her majesty promised to aid him, for a valuable consideration, trusting to the assurances which he gave her of the island of Tercera being able to defend itself, with a thousand French, against the army of the king of Spain, which he represented to consist of five or six thousand men at most; stating further, that there were six or seven thousand fighting men belonging to Portugal on the island, commanded by his viceroy the count de Torrevedros, and five hundred French, who had stopped there the preceding year 1582 (after the battle of Mons. Strossy) commanded by captain Baptista, an Italian and serjeant major, and captain Carles of Bordeaux. Besides, he informed her majesty that the island of Tercera was eighteen great leagues in circumference, that landing was very difficult, and that there were no more than three points of access, which could with ease be fortified.

Her majesty, trusting to the truth of what his majesty Don Anthony related, gave the command of nine companies of foot, and of the other French who were upon the island, to the commander de Chaste, constituting him general, with order to repair to Tercera, and defend the place. After the said commander had thanked her majesty, he most humbly entreated her to reflect on the importance of the enterprise, which he did not esteem of moment in respect to the risque of his own life, provided he might be able to give satisfaction to her majesty; this he considered difficult to effect, the voyage being precipitated at the instigation of a poor and passionate king, in despair of recovering his kingdom of Portugal, of which these islands were all that remained, and which he was desirous of preserving at the expence of the honour and blood of others, himself without experience of war. The commander entreated permission of her majesty to be allowed to embark alone in a small vessel, and to allow a delay until he could himself reconnoitre Tercera, in order to make a perfect report of its strength, and the force it might require for its defence. Her majesty considered this representation as reasonable, and agreed to the request of the commander; nevertheless delaying his departure so long, that she was informed of the embarkation of the Spaniards at Lisbon, and their being ready to sail; which obliged the commander to proceed with all dispatch to Havre de Grace with his nine companies, in compliance with his orders, to go on board, which he effected on the 17th of May, 1583. On account of calms and storms they had been 24 days at sea, when, at the distance of forty or fifty leagues off Tercera, he dispatched a sloop belonging to his fleet, commanded by Le Sieur Cusson, to reconnoitre, and see if the Spaniards had made themselves masters of it; and fol-

lowing the same course, he received certain advice that this island was still free, and arrived the 11th day of June following in the port of Tercera, which joins the city; a large, open place. He was saluted by several pieces of ordnance and arquebusses, and was received with great distinction by Mr. de Torrevedros, the viceroy, as well as the Portuguese, who shewed great demonstrations of joy on the occasion of the arrival of the commander and his troops; the people exclaiming loudly, "long live king Anthony, long live the king of France and the commander de Chaste, who is come to succour us." The ladies were seen at the greatest part of the windows of the city, strewing over his head abundance of roses and other flowers, and coming before, threw orange flower water in his face, saying, "you shall be sprinkled, since you are the friend of our good king Anthony." This was continued the whole length of this city, until he reached his abode. The poor French who remained there from the year before were so much delighted at seeing them, that they cried for joy, and came to embrace the knees of their companions and countrymen; for they were under apprehension of being confined to the island, where they lived but badly, on account of the inconveniences they experienced of every description.

Immediately after their arrival, they received advice from an island called the Peak, of the Spanish armament being seen, consisting of twenty-five sail: Le Comte de Torrevedros came directly to the commander to consult on what should be done, and to propose to send three hundred men to the isle of Fayal, where there was no more than one French company: to this proposition the commander replied, that he trusted that to him, as he was best acquainted with that island, and of course knew what landing-places it had, and what number of men were requisite for its defence; giving, however, to be understood at the same same time, that his orders were to defend Tercera. Upon this the count, reiterating his propositions, desired the three hundred men might be sent, as the island of Fayal was of the greatest consequence, since, if in the hands of the enemy, they might shelter their galleys there, and by that means be secure of capturing Tercera. At length it was resolved, that captain Carles of Bordeaux should proceed thither with four French companies, and one company of English; it was as well resolved to retain the vessels which had brought the commander; as much to make use of the soldiers and sailors belonging to them, as to form a chain of the said vessels, traversing the harbour of Angra, having noticed on their arrival the small number of men there was for the defence of the island. This being done, he begged the count to accompany him to reconnoitre the accessible points of landing, to which he agreed, and they went together, accompanied by some captains; upon their arrival they found, quite contrary to the statement which his majesty king Anthony laid before the queen of there being but three landing-places, that is to say, Angra, Porto Indio, and Praya, that, besides these, there were a number of others which had been badly fortified, their intrenchments being made at two great distance from the sea, and very weak: which was the cause of their separating the men, in order to furnish a defence at each of the places of access, in the following manner: at Angra, captain Baptista with his company, consisting of 90 men, and that of captain Brevel of 80 men, and some Portuguese, had to prevent a descent at Angra; and from Brazil to the forts St. Anthony and St. Michael, a full league and a half of space, captains Bazet and Capen with their companies of 100 men collectively, and two companies of Portuguese; at La Casa de Salque, a quarter of a league from Porto Indio, and a mountain between, captain La Valade with his company of forty men, and a company of Portuguese; at St. Catherine, a league's distance from La Casa de Salque, and a great mountain between, captain Bourguignon and his company of fifty men, with two

companies of Portuguese; at Port Piscard, half a league from St. Catherine, and another mountain between, very inconveniently situated, as it hindered the observing or hearing them if attacked, to afford them assistance, captain Grano with his company of sixty men, and a company of Portuguese; at St. Sebastian, half a league distance from Port Piscard, captain Louis with his company of forty men, and a company of Portuguese: at Gilles Fernandez, a great league distant from St. Sebastian, and all of it accessible, captain Campagnol with his company of sixty men, and three companies of Portuguese; at St. Marguerite, a quarter of a league from Gilles Fernandez, captain Chouin with forty men, soldiers and sailors, and two companies of Portuguese; at Porto Martin, a quarter of a league from St. Marguerite, captain Campols with his company of eighty men, and a company of Portuguese; at La Praya, which was the shore for the greatest distance accessible, and where it was expected the enemy would land, and make an attempt, one league and a half distant from Porto Martin, the commander de Chaste posted himself, with the companies of Capios, Laste, Armissac, Le Barre, and Lignerol; each of about one hundred men, and four companies of Portuguese; at Villanova, one great league and a half from Praya, a serjeant belonging to the company of captain Barre, with fifteen men; at Biscuit, a league from the four rivers, and two landing-places, half a league distant from each other, captain Armand with his company of sixty men, the master of the camp with his company of ninety men, with the said count and a thousand Portuguese, who were to follow the army in the vineyards which were at La Praya and Porto Indio, and captain Pomyne with his company of thirty-five men. Orders were issued that the sailors should be separated as became necessary; and that sixty of the best cavalry of the island should repair to the commander at La Praga, to learn which would be attacked first; and that the sloop belonging to the count should be sent to speak the island of St. Michael, kept by the Spaniards; this on its return brought intelligence, that fifteen or sixteen large vessels of the armament had been discovered; at the same time arrived one of those belonging to the commander's fleet, which had been detained behind the rest by bad weather at sea. Upon its arrival, all the captains of the ships came to intreat the commander for permission to return to France, as the whole fleet had arrived. This took place in the presence of the count, who represented to the commander, that the forces brought to Tercera were not sufficient to preserve it, and that he protested against his granting permission to the captains to sail; they having discovered many landing-places, which had not before been attended to, and which they had neither leisure nor means of fortifying, seeing the Spanish army was so near at hand. The commander, having listened to these remonstrances, would not allow the captains to sail, but ordered them to stay the event, and land their crew; these, after some dispute, agreed on obeying the order; so far from attending to their promise however, the vessels of Captain La Haye, that of M. de Sarlobut, the ship De Poupiere, and another called the King, set sail, and departed without leave the next day. The commander followed them in a sloop eight or ten leagues to sea, and again ordered them, in the king's name, and under pain of death, to return to the island, for the need they had of them of importance to his majesty's service; they armed themselves, and replied to the commander by a refusal, affirming that they would not be lost, as he would and those who accompanied him, and were at Tercera, who, without doubt, in ten days time would all of them have their throats cut; stating that the Portuguese themselves would betray the French: they then begged him without assertion of authority to leave them, which, being powerless of forcing them to his orders, he did.

On his return he sent another sloop to sea to reconnoitre, which discovered the whole fleet under sail, directing its course towards Tercera; of which being informed, the count came to the commander at La Praya, and assured him that the Spanish fleet consisted of forty large vessels, twelve galleys, two galleasses, and the remainder of small vessels or sloops, making together a hundred sail. The commander immediately went to reconnoitre the forts, which were along the shore of La Praya, and see if they were provided as he had ordered; when he heard the sentinels, on the mountains, give signals of their seeing the fleet, by the sounding of bells. Being returned to Praya, he learnt that the count had retired to Angres, which was his station, upon hearing the alarm.

The next morning, the twenty-third of July, the whole fleet was in sight before Praya, at a league's distance, which continually nearing, coasted along the island. The commander followed them as far as St. Marguerite, when they cast anchor, keeping a quarter of a league from shore; before the galleys anchored, like their admiral, they came very near to a landing-place, where there were only a few Portuguese, who fired a few shot at them. The commander du Mayet, being at hand with a small number of French soldiers, advanced, and upon his getting up, the galleys retired, and captain Pomyet was placed at the shore, with his company of 30 men.

The Sunday following, at day-break, the galleys approached La Praya very near to shore; and fired a number of guns and arquebusses at our trenches, sending forward a boat to examine the landing-place; which came very near, as there was no moon up; on sun-rise, they returned to the fleet, and in the afternoon, they coasted all along the Island again, to reconnoitre every place of landing; firing guns wherever they saw any people. The Maitre de Camp advanced, to station himself with his company at the landing-places between Gillez Fernandez and Port Pescart. At two o'clock in the afternoon, a boat, with a white flag, was dispatched from the fleet, towards the quarter where the commander du Mayet was posted, who fired three or four guns at it, to prevent the recognizing of that landing-place, which caused it to retire. The commander du Chaste, who had not yet observed the count make his appearance, sent to tell him, that he looked upon it as extraordinary he did not join the army, and that both the Portuguese and the French thought very ill of such demeanor; that he begged him to join them, and to send the cavalry which was ordered to La Praya, and a different captain to that who commanded the Portuguese, on account of their having no confidence in him, looking upon him as either a coward or a traitor, from his manner of behaviour; at the same time to provide the soldiers with bread; for from the time of their arrival they had so little, that they were half famished.

The next day, which was Monday, all the galleys came before Praya by day-break, firing a number of cannon and arquebusses, and retired an hour after sun-rise, keeping close to shore all day long, to reconnoitre nearer; the commander followed them up to the fleet, meeting in the way John de Castres, a Portuguese, whom the count sent to command at La Praya, who delivered him a letter from the count, which he had received from the marquis de Santa Cruz, admiral of the fleet, by two Portuguese of Tercera which he had made prisoners; this letter was fastened to the neck of one of them, who swam on shore; a plan to which the marquis stated he had recourse, as the governor would not allow a cartel to approach. The marquis, in this letter, endeavoured to persuade the count to surrender the island to the king of Spain, to whom, he stated, it belonged, assuring him, upon his honour, of a free pardon on the part of his majesty for his past disobedience; in spite of which, his wife and children, who were prisoners

at Madrid in Spain, should be delivered up to him, and be reinstated as well as himself in all their possessions; and further, that his majesty would honour him with valuable grants and employments: with respect to the French in the island, he would forgive them also, knowing well that they at all times were willing to adventure wherever a good opportunity presented itself of making their fortune, and that he had in express command from his majesty, to furnish them with three months allowance, and afford them a passage to France, in the ships which brought them; and although he had no doubt of the conquest of the island, he, nevertheless, to shew that his master was a prince both mild and benignant, on his part, made these offers with power in his hands.

As soon as the commander had seen the subject of this letter, he tore it in pieces without communicating its contents to any one, and in the evening the count came to him at Praya with the cavalry, promising to send him sixty horses, which he did not do. Returning to his station, he passed by that of the Maitre de Camp, and the commander du Mayet, who informed him, it was his opinion that the enemy meant to make an attack the next day on Porto Indio, or St. Catherine, where there were not a sufficient number of people to prevent a descent, and beseeching the count to send him the French sailors who were at Angra, to place them: which he promised to do, assuring the Maitre de Camp and du Mayet, that he would proceed thither with four thousand men. So far from acting thus, having met the sailors on the road, he conducted them back to Angra, and no more was heard of him till the succeeding day, in the afternoon, the day of the battle. The same evening the Maitre de Camp and du Mayet ordered captain Baptista to send his company to sleep, to a mountain which was between St. Catherine and Porto Indio, to be ready to succour either, as there might be occasion; which he did not do, but went to sleep at St. Sebastian, a league from the spot.

On the succeeding day, which was Tuesday, an hour before day, three galleys of the Spanish fleet came to La Praya, and fired several balls at a corps de garde, where they saw a fire: in the mean time, the other galleys, with fifteen or twenty large boats accompanying each, approached to the shore of St. Catherine, where captain Bourguignon was posted with two companies of Portuguese, who took to their heels on the first discharge of cannon from the galleys; so that the said Bourguignon remained with only fifty French soldiers belonging to his company. This small force opposed the landing vigorously; thirty-five of his number were killed, with the captain; his lieutenant and his ensign, with the fifteen men who remained, being wounded. The Spaniards landed at once six thousand men, and the rest of the army filed after them, to the number of fifteen thousand, in such excellent discipline, that their order of battle was formed immediately on landing, every one knowing his station. Du Mayet arrived there, and captain La Grave, shortly after the Maitre de Camp beginning a skirmish; but were obliged to retreat for want of men. As soon as day appeared, the commander de Chaste ordered captain la Barre to advance towards the army, expecting it was about to land, and at the instant he heard a cannonade on the side of St. Catherine, which caused him to proceed thence towards with his companies, making them march in sight of each other; and continuing in this order along the sea shore as quick as he could, to the place where the enemy was advancing, in order that, if the enemy were repulsed, he should not have an opportunity of landing with his galleys in another quarter. At the head of his companies he was informed, by a man on horseback, whom he had sent forward, that all the enemy had landed, and that, at a little village

close to them, seven or eight hundred musqueteers and arquibusiers were advancing to take possession of a spring; these the commander determined upon charging, on coming up; which he effected with such spirit with the four hundred men he commanded that he repulsed them, and drove them back to a small mountain, at the foot of which was the army in order of battle. More than four hundred Spaniards were killed by wounds of the sword and halbert, and the Maitre de Camp, and du Mayet, having rallied round the commander, the possession of the mountain was much disputed, and gained and lost four or five times, the commander being at last obliged to fall back, on account of the extreme inequality, there not being at most more than five hundred French, of which, already, a great number were either killed or wounded; the other soldiers, seeing the check they received, lost their courage; as well they had had such bad fare from the first appearance of the army, and were so much harassed with the distance and quickness of the march they had made, in view of opposing the descent; some having come one, some two, and some three leagues, the heat of the weather being so great, as to cause a number to faint by the way. The commander resolved on regaining the before-mentioned mountain, and formed a batallion of his remaining men, attacked and drove the Spaniards from it, determined rather to die than lose again a single foot of ground; his brave men being jealous of the fate of their companions and friends, whom they saw expiring at their feet, and pay their debt of nature, satisfied within themselves that a similar lot awaited them; seeing, as well, that the Portuguese abandoned them, who formed their greatest force, and without whom the commander preserved the mountain until night. From this may be judged, whether the French, in possession of the advantages which the enemy enjoyed, would have been driven out in such a manner. I do not mean, however, to insinuate that there were not, in the Spanish army, a number of brave men and old soldiers; but, in good truth, they are prudent and cautious in their conduct; and knowing the nature of the French, who charge the first, whether weak or strong, they let this fume evaporate, which they cannot constrain without immense loss to themselves.

In the evening, and after all these engagements, the count arrived with a thousand Portuguese, and three or four hundred cows; and assured the commander, that the Portuguese would fight with them, and that it would be advantageous, for on a former landing of five or six hundred Spaniards on the island, they were defeated by the cows, which had been enraged by goading. The commander in answer observed, that such a manner of fighting was dishonourable; that it belonged only to rustics and villains to use such measures: that as well they might do them more injury than benefit, if they were to turn on them, rather than attack the enemy; and that it would have been much more reputable of him to have been present at the landing and the battle, as he had promised, and his duty engaged him to have been, than to invent a cow-defence; that he was the cause of the loss of the island, and the ruin of the French; but as the fault was committed, that he saw no other remedy, than for him, with them, to meet an honourable death, rather than suffer the cruelty which it was usual for the Spaniards to inflict for some time back on the French, as well in Florida, as on the occasion of the voyage, and battle of Mons. Strossy, and in other places, where they had broken their promises, and caused several French gentlemen to be executed by the hands of the common hangman. The count, convicted of cowardice, confessed he was wrong; but that he could not go out to battle, begging the commander to excuse him, saying that God had deprived him of all strength and understanding; but assuring him he would make the Portuguese go whom he had brought with him, and that they should

die with him; and that, in the mean time, he would attend to matters for which he was better adapted than to fighting. Seeing this, the commander resolved on returning to battle, and assembled the remainder of his force.

Being advanced towards the enemy, to engage him, the count informed him that it would be well to postpone his intention till the next day, for that night would be hurtful to himself as well as his people: upon this, the commander went to those Portuguese who pretended a disposition to fight, and begged of them not to quit their ranks until the succeeding day, in the morning, till when the battle was put off, which they promised; in the mean time he went to look after those who were dead, and the wounded.

Officers killed....Captain Bourguignon; captain Armissac; captain Espalingues; the lieutanant and ensign of the Maitre de Camp; the lieutenant of captain Campagnol; the ensign of captain La Grave; the ensign of captain La Valade; the ensign of captain Baptista.

Officers wounded....The commander du Mayet; captain Brevet; captain Lasto; captain de la Barre; captain Louis; the ensign of captain Campagnol; the lieutenant and ensign of captain Bourguignon; the ensign of captain La Barre; the lieutenant and ensign of captain Loys.

Volunteers killed....Messrs. de Montmurat, Mollin, and Besses.

Gentlemen volunteers wounded....Cusson, Mailhames, Favet, Nivaudioux, Incantz, Villaubes, Tascort, and Meremont, with many soldiers killed and wounded.

The commander remained encamped very close to the Spanish army until one o'clock in the morning, by which time he was informed by the count that the Portuguese had broke their ranks, and had fled into the mountains, and that he advised him thereof, in order to deliberate on what to do. The commander asked his advice; which was, that he should retire to a mountain, by means of which a great part of the island might be preserved, and some provision and ammunition might be carried thither, with a train of cannon. The commandant replied, he would consult with his companions on the subject. He assembled them immediately, but the greater part were for their throwing themselves into the fortress of Angra, sending them the provisions which were on board of three French ships in the harbour, joining the said fortresses. He informed the count of this, who was of a different opinion; alledging that their fortressess could not contain more than two hundred men, and that they would be forced in twenty-four hours, and battered to pieces with cannon; and that he preferred his first recommendation of retiring to a mountain. By this he shewed the mistrust he continually entertained of the French, and the apprehension he was under, lest they should become masters of the fortresses; which he confessed at his death, of which I shall have to speak.

The commander being resolved to be accompanied to the mountains by the count, about one in the morning he caused his troops to begin their march, and as he proceeded, upon inquiry for the count, he was not to be found, having departed without either having a guard or making a rendezvous. The commander did not, however, cease to advance towards the mountain, endeavouring to overtake him, and consult on what he had proposed. An hour before day-light he found himself at a village called Nostre Dame Dager de Loup, where he was informed that the count had embarked in two boats, and made his escape. This caused the commander to resolve on his first intention, of throwing himself into the fortresses of Angra. Being near, he sent to reconnoitre them by a man on horseback, who reported that the enemy were in possession of them, the Portuguese having carried them, the night before, the keys into their camp:

this he learnt from a negro who had escaped from a Spaniard, and who was flying towards the mountains. The commander seeing himself deceived by the count, and by the Portuguese, of which not fifty would have fought, and serving only to nourish panic among the French, he reflected on the expediency of returning to the village of Nostre Dame Dagar de Loup, in order to entrench himself, and hold out with his troops as long as possible. Immediately on entering the place, he caused the men to begin working at the barriers and entrenchments, and assigned a station for his captains, where, by eleven at night, all the soldiers assembled, and began to make a noise, exclaiming in a loud voice, "To arms, to arms, we must massacre our general and his captains, they design to save themselves, and leave us in pledge:" and elected a chief to conduct them to the marquis de St. Croix, with their colours, meaning to throw themselves upon his mercy. The commander, upon observing this, left his apartment, entered the corps de garde, where the soldiers were assembled, and inquired the cause of the noise. They told him they knew very well that it was his design to save himself with his captains, which he denied; he told them, if he had been so disposed, he should have done so on the day of the battle; that he had had an opportunity, having been solicited thereto by captains Rosset, Chaurin, and Girard, of the marine, who were not then in want of boats; that they might inquire of them the answer which he had made them; which was, that he would rather plunge his sword through his heart, than be guilty of such a base action; that he would live and die with his companions. This the captains of the marines declared aloud; but "I see very well," said the commander, "that there are some cowards among you, who have invented this tale in order to ruin us; some, who prefer dragging on a miserable existence in the gallies, which is the highest favour they can expect from a Spaniard, than to die an honourable death." To satisfy them farther he swore to them, that he would either lose his life or place them at liberty, and that he would be the last to leave the island. The commander, thinking he had reasoned with them enough, returned to his apartment, where a few hours after he heard a similar alarm; they had elected for their chief a serjeant of capt. Armissac's company, who exclaimed aloud, "Let us, let us kill our captains, I shall now begin with mine," he at the same time presented the point of his halbert towards capt. Casson, who represented to him the consequences of such an alarm; but the commander caused the man to be hung on board of ship, on his return from Tercera, not being then enabled to punish him, on account of the cowards and mutineers being the most numerous, the greatest part of the good soldiers being either dead, wounded, or sick; nevertheless, he went from his apartment, and exposed to them their crime, in ruining themselves in such an infamous manner, and in crediting that he should make his escape; an action too detestable for any man of honour to follow, and which, in fact, were he so base as to intend, he had not the means of effecting; but to satisfy them entirely on that subject, he desired that forty or fifty of them should mount guard over him at the house where he lodged, with seven or eight of his wounded attendants. This was done, and the following day they went to fetch captain Casson, an Italian, whom, by entreaty, they prevailed upon to go to their commander, the general, to implore him to send to treat with the marquis de Santa Cruz, promising in case of a refusal to die at his feet, and give no more disturbance. The commander, having heard this from captain Casson, answered, that he was not disposed to be dictated to by such a set, that he knew very well what it was his duty to do; and desired him to assemble them together, which having been effected, he addressed them for the third time: "Fellow soldiers, I am sorely concerned, that bearing the name of Frenchmen you should have so little regard thereto; being no longer capable of bearing with your insolence, I am resolved, let what will follow, to

chastise with rigour the first who shall again evince any such mutinous disposition, and separate those soldiers who behave with propriety." These he promised on his life and honour he would never abandon, but die with them; stating at the same time his willingness to allow any who had not courage enough to follow him to battle to declare themselves, and allowing such the liberty of going wherever they pleased. Upon this they exclaimed aloud that they would never give him again any cause to be angry, but would follow his orders.

Towards midnight on the same day, which was Thursday, the commander was informed that a Spanish soldier had arrived at the first barrier of the village, bringing a letter from Don Pedro de Padilhe, and Don Augustino Inique, maitres de camp of the Spanish army, which he sent for to the barrier, not being willing to speak to the Spaniard. The subject of this letter was, that the said Padilhe and Inique, being convinced of the extremity to which the commander was reduced, and the risk he ran of his life, had begged the marquis de Santa Cruz to have it preserved, which he had promised them: and as they were his friends, and had noticed his bravery, and that of his companions, on the day of battle, they gave him intelligence of this in order that he might not refuse the proffered courtesy. The commander gave for answer verbally, by the means of one of his captains, who bore it to the Spaniard at the barrier, that he was much obliged to those gentlemen, who were more concerned for his life than he was himself; that it was not in so much danger as they imagined, but if it were lost with those of his companions in the service of the king his master, he should consider it well expended, but at any rate they should not be cheaply bought. And although the commander was under great affliction from having no other means of support than water, which ran in a brook across the village, and scurvy green pears, on which they had already subsisted for eight or nine days, very little ammunition, and few soldiers inclined to suffer more hardships with himself and his companions, a good part of his best men being dead, wounded, or sick, nevertheless he would not listen to any capitulation, without first consulting with the chief Portuguese captains, who were in the mountains, and learning from them, whether, after the fault they had been guilty of, in abandoning him in the battle, who had purposely come to risk his life, and that of his companions, for the preservation of theirs, their property, and their liberty, their courage should have returned, in which case he was perfectly ready to meet the enemy afresh, from whom they had as little mercy to expect as the French, informing them, at the same time, that a capitulation was proposed to him, which, however, he would not give ear to, provided they determined upon an honourable death with himself.

Instead of answering the commander, they sent his letters to the marquis de Santa Cruz, to whom Francisco Diez, one of the principal Portuguese captains, wrote as well that he was the humble slave and subject of king Philip, and that if he had not declared as much before, it was for want of knowing his right to the kingdom of Portugal; but that if his services were acceptable, he would come and join him with his Portuguese, and would act againt the French, who had solicited him to join them, that he would make a prisoner of the count de Torrevedros, who was wandering about the mountain, his boat in which he had attempted to save himself being wrecked. In the interim, the commander received a second letter from Don Pedro de Padilhe and Don Inique, in which they complained of the commander not having returned a written answer, and stating their surprise at his resolution of so unadvisedly losing his life, since, having no means of serving his master by that sacrifice, he could acquire no great honour by it; that knowing his merit they were much concerned in his fate; and entreating him, if he had any regard for himself, he would send some gentlemen of his party to treat of a capi-

tulation, before as were the marquis's orders, the army was put in motion to overwhelm him. The commander, in rejoinder, informed them, that his resolution had only encreased, and sought them not to trouble themselves further with attempts to persuade him, as he would not listen to them; telling them, if they ventured to assail him and his companions, he would make them see, in a different manner to what they had yet done, the valour of his Frenchmen, and how willingly they devoted themselves to death, which however would not take place without their first rendering especial service to his majesty, in spite of any suggestions to the contrary. This however was but, as is said, a good countenance with a bad hand. In the mean time the commander was told that the count was on the mountain, his boat having been destroyed on his attempting to save himself, and that the Portuguese were in search of him, on account of his having rendered them cowards, and engaged them to abandon the French in their distress: he requested him to furnish them with bread and ammunition, assuring him, that although the Portuguese should not listen to his representations, engaging them to join him in battle, he would yet rather die than capitulate to the Spaniards, from whom he looked for no mercy. In his answer the count begged to speak with him, requesting that he might not allow the French in his way to behave injuriously towards him, which he was greatly apprehensive of. This the commander promised, notwithstanding he had more cause to ill treat him than to receive him. On his arrival, when passing by the French, they exclaimed. "Look at the coward who abandoned us, and who is the cause of all our misfortune, kill him, kill him." The count upon this, crying bitterly, covered with shame for his behaviour, addressed them thus: "Frenchmen, brothers, and friends, you have just reason to take away my life, but beforehand, in the name of God, I beg your forgiveness." The commander, hearing this exclamation from his house, which was adjoining, ran out, and touched with pity at seeing a viceroy on his knees, imploring his life from Frenchmen, he commanded them to be silent, and not to speak a word which might hurt his feelings. I can safely affirm that there was not a brave man present, however much he might suffer from his conduct, who, seeing him in this condition, did not pity him, notwithstanding his previous want of courage. He informed the commander that there were no means left of furnishing him with other provisions or ammunition; that he had been six weeks without tasting bread, and abandoned by all his people; but if he could come to any terms, he would do well to accept them in his distressed situation; in that case, he humbly besought him that he might be included, and his life saved. The commander replied, "It would be to me a double calamity to keep remembrance of you, considering the little title you possess to my notice from your conduct; nevertheless, if it be possible it shall be done."

At this instant he was informed by some of his captains, that sixty of the poltroons who had been mutinous had deserted to the marquis de Santa Cruz; and that the rest were inclined to follow their example, and were throwing their arquebusses and corslets over the walls, breaking their swords, and sending aloud to the devil their fathers and mothers, who had brought them into the world to suffer such calamity, crying out, "Let us go to the galleys, is it not better than to be hung, or killed; we are all lost, and our general refuses our lives when they are offered us." The poor fellows who were wounded hearing the cries of those cowardly scoundrels, and foreseeing that their disloyalty would involve and bring to a miserable end the better sort among them, lost all hope, and hearing on all sides, to arms, to arms, the enemy, they looked upon their companions who were passing by, and, unable themselves to move, exclaimed, "Alas! is there none among you who will put an end to our miseries, by the means of a shot a piece, and prevent the Spaniards from exercising their cruelty upon us." The commander seeing this, and

the little hope there was of receiving succour; that a part of his men had already surrendered, and given account of his distress; the greater part of those remaining being ready to do the same; some dying of hunger and thirst, and the wounded for want of being dressed, some of the surgeons having gone over to the enemy, and the others having lost their unguents; he assembled his captains, who entreated him to propose terms, and preserve those who were dying hourly to no avail, and this being resolved upon among them, and hearing from a particular friend, a knight of Malta, who was with the army, that the enemy was in motion to force his entrenchments, and who entreated him to have some pity on him, and send immediately a person to treat, they chose the commander, du Mayet, for that purpose, who having proceeded to the Spaniards, made proposals as advantageous as if we had been on equal terms; he was, in consequence, sent back again by them with derision, without any other answer than that it was a great folly and a temerity on the part of the French, whose lives were in their hands, instead of humiliating themselves to ask for them, and render at discretion, to propose to make the boldest and best conditions. They ordered the commander, du Mayet, to withdraw immediately, and informed him he should have a reply to his impertinent requests carried by fifteen thousand fighting men. Notwithstanding this, Don Pedro de Padilhe did not discontinue writing to the commander De Chaste, but acquainted him, that having sent one of his officers who had no reason in his proposals, he had consequently returned without concluding any treaty, which, from the affection he bore towards him, and the regard he had for his life, he had hoped would have been concluded; that the marquis de Santa Cruz had begged and forbid his people to speak to him any more about capitulating with the French, as he would see the end of them for their obstinacy; however, that if he would immediately send some other person, more yielding than the commander du Mayet, the whole company of Spanish cavaliers would entreat the marquis to listen to him; that he had foreseen that his reliance upon the cowardly Portuguese coming to rally about him would be the cause of his loss; and that he had nothing to expect on that score: for the purpose of certifying as much to him, he sent him the letter which the commander had dispatched to the Portuguese captain Francisco, which had afterwards been sent by him to the marquis, accompanied with an offer of his services to ruin the French; that he committed himself much in courting that wretched race, having been already deceived by them; and which if joined to his force could not prevent his ruin. Hereupon the commander having communicated with his captains selected M. Angernaques, Maitre de Camp, to whom he gave full power to treat of his surrender; he immediately departed, and his arrival caused the army to halt, which was on its march from the city of Angra, to force the French entrenchments; and although M. Angarnaques required several things which he had no hopes of obtaining, he, nevertheless, with great difficulty, concluded the following treaty. 1. That the said marquis promised the said commander and his people should be allowed to return to France with their swords. 2. That he would hire vessels, properly victualled, for their transport with their baggage: (which would not much encumber the backs of the French, they having lost every thing, preserving no more than the clothes they had on the day of battle.) And 3. That the said marquis, on account of the doubt entertained of his faith, should swear upon the Holy Evangelists to observe the treaty which he should sign, with the principal officers of his army. This was done, and these articles, agreed to and signed, were carried to the commander, who was on his way with his troops towards Angra, where the said army was. At about a quarter of a league he was honourably met by the most considerable officers, and assured by the before mentioned Padilhe, on the part of the marquis, that he might

now esteem himself among his most faithful brothers and friends. They gave him a horse, as he was on foot at the head of his troop, and caused several gentlemen who followed the commander to mount behind them on their horses, proceeding to the city, where quarters and provisions for the French were already provided, the same as for the Spaniards. The commander rode on direct to the house of the marquis, who received him with great politeness, observing to him afterwards, that he was surprised that a man of his quality, and so brave, should have ventured himself in a place so distant from his own country, and with so little hope of preserving it, or even his own life and honour, being accompanied by so few men; and to assist the most contemptible nation upon earth, the Portuguese; by the answer of the commander understanding that he was greatly afflicted, and hurt at his fate, as he told the marquis, that had the representations made by the king Don Anthony to the king his master and the queen mother been true, his enterprise would not have met with such an adverse destiny, but that he should have hindered the landing, and taking of the island; as he would yet have done, if the galleys had not reached the coast, where, Don Anthony had assured them, there was not depth of water for them to navigate, and the Portuguese had not abandoned him; and that he lamented exceedingly that he had not died in the engagement, and so been spared the misfortune which had befallen him, which would be a subject of affliction to him as long as he lived, the marquis observed: "In good truth Mr. de Chaste it would be doing too much wrong to the French nation not to allow their high courage and valorous enterprise, but you must grant that they are frequently inconsiderate, and too hasty, as I should esteem them to be in this instance, but for the apparent reasons which you alledge; what, however, surprises me is, to hear you misname good fortune bad; for as you were deceived in the principal point of your intention, which is no fault of yours, this I consider alone as your misfortune; on the other hand I esteem you very fortunate to recover what was lost, that is to say your lives, and bearing away only great renown acquired among us, as we have been witnesses that you and yours have done even more than your duty, on as well the day of landing, as in having fought furiously with but a handful of men for a whole day against so large and strong an army, shewing nothing in your ranks but a contempt of death; you ought therefore to rejoice, and consider that never before did any cavalier of your nation effect so much for obtaining a favourable result to so perilous an undertaking, or was more remarkable in his return to France." He spoke in exemplification of seigneur Strossy and his army, the expedition of the French to Florida, not one in which escaped, and several other battles, where they had been worsted, not for want of valour, but from bad conduct and bad plans. After this long conversation, supper time came on and meat was brought on table, with which the gentlemen who accompanied the commander were very well satisfied, desiring nothing better than to set their teeth to work, whatever the subject of discourse; however, they did not sup at the marquis's, each of the Spanish officers taking one by the hand, and conducting them to their quarters, where they treated them (at least apparently) with much good will, and where they supped without waiting for sauce. The commander, after supping with the marquis, by whom he was again assured of a faithful observance of the treaty, and that they should speedily be embarked to return to France, wished him good night, and withdrew to the apartments of Don Pedro de Toledo, son of the former viceroy of Naples, a very civil and brave cavalier, who shewed great politeness and kindness towards the French.

The next day the marquis published a law, forbidding, throughout his army, that any one, of whatsoever rank or quality he might be, should dare to molest any of the French, whether by words or otherwise, under pain of death; and as well that who-

ever should bring him the Count de Torrevedros, who was in the woods of the mountains, whether dead or alive, should receive five hundred ducats, the commander not having been able to include him in his capitulation, although he had endeavoured to do so more out of commiseration than from his desert. Immediately the Spanish soldiers, fond of money, began forming into parties to go to the mountains in search of the count, being no longer afraid of the French, as the treaty was signed, and having very little regard for the Portuguese; a corporal and eight of his companions proceeded thither, and on the skirts of the wood, at the foot of the mountains, perceived a negro, who ran away from them; he spurred on his horse, pursued him, and seizing him by the collar, his sword in his hand, and swearing, said, "if you do not inform me where the count is, I will certainly kill you." The negro, being afraid of his fury, confessed to him that he had been his groom for eight years, and that he had left him in a cavern, where he had resided seven or eight days, entirely abandoned by his gentlemen and domestics. The Spaniard made him get up behind, quitted his companions, who were on foot, and pursued his way towards the count, who at that instant came out of his cave to see if his negro was bringing him some bread, as he had promised him. The count had no other dress than that of a country person, and a wallet fastened to his neck; the corporal, who had no knowledge of him, and observing his miserable appearance, and that he was drawing back, cried out to him, "here, my good man, speak to me and fear nothing." The count approached, his hat in his hand, not having been able to regain his cavern, and said to him, "What do you want, sir? Are you not, said the corporal, one of those dogs of Portuguese who fought against us?" "I cannot deny, said he, that I am a Portuguese, but I am a poor wretch, who by my labour maintain my wife and children on this miserable soil, and have no concern with war." The corporal then observed, "I shall not say much, but if you don't immediately shew me the place where the count is concealed, you shall die by my hand." The other, being a party concerned, observed to him, "Sir, you may do as yo please; as to shewing you the count it is impossible, for it is a long while since I have seen him." He held a ducat in his mouth to prevent thirst, on account of the extreme heat, and the distress in which he was; perceiving this the corporal asked, "what is that you are rolling about in your mouth?" He answered that it was a piece of gold, which was all he was worth in the world, with which he wished to buy bread at some of the houses in the mountains, to carry to his children, whom he had not seen since they landed in this country, and he was dying with hunger. The corporal took the ducat, and rummaging him, asked him, if that was all he had. O yes sir, said the count, and I have had it more than fifteen years; but for the love of God give me some piece of money: Go along, you rascal, I ought to take away your life, said the Spaniard, and went his way. The negro who was behind to apprehend his master was fearful he would be killed, and seeing him in this miserable plight, and representing to himself the kindness he had shewn him, was moved with pity, and, the tear standing in his eye, he pretended not to know him; but the corporal going into the woods, said to him, "What, you poltroon, will you make me ride about all day long without bringing me to this cavern? I see that you are tired of living, but I shall do for you presently." Then placing his hand on his sword, the negro exclaimed; "forgive me, sir, you have just left him, but I could not point him out to you I was so much affected." "How," said the corporal, "is it possible it could be that man who looked so mean?" When galloping back and finding him in the filthy entrance of the cave, he said to him, "hollo father, take back your ducat, I have not the conscience to deprive you of it." The count then approaching, held out his hand to receive it, which was seized by the corporal, who made him a prisoner in the name of king Philip. "Wretch," then exclaimed

he to the negro, "you have betrayed your master; but I don't complain; I was but too well assured that I must lose my life, having already lost my judgment and my courage." The Spaniard, grumbling, struck the negro from behind him by a stab he gave him in the breast, of which he died, and placed the count in his seat, whom he carried before the marquis, who received him with very rude language, and sent him afterwards on board the great Galleass, belonging to the fleet, where he was cruelly treated, in order to extort confession from him of what were the plans of king Anthony, and those on the continent in Portugal; condemning him afterwards to be beheaded, and instantly executed, in spite of the intercession in his favour made by the most considerable personages in the army, who were related to him, and were desirous of saving his life, to the marquis of Santa Cruz; but his council were of opinion that their prayers should not be granted, on account of an answer he had sent to a letter which the king of Spain had addressed to him, to entice him to join him with fair words and promises; "that he would rather do homage to the devil than to such a perfidious tyrant." At length he died as a good Christian should do, with so much resolution, that he might have been taken for one of the bravest of men, confessing, as I have before stated, that he himself had been the cause of the loss of the island, and the ruin of the French, beseeching the marquis to respect the engagements he had entered into with respect to them, and to treat them as men of honour, such as he had always found them. The whole of this speech was made in presence of the Spanish army, with a smiling countenance, and with great collectedness, so much so that the French were astonished, having witnessed his want of courage on emergency, and were extremely affected at beholding him led forward with so much brutality, in a wretched dress, having been accustomed to see him treated with honour and respect by his own people, as well as by the inhabitants of the island, in as great a degree as if he had been their king; being served at table in a most honourable manner, his gentlemen and domestics remaining always bareheaded, and presenting him to drink kneeling, with a golden salver held below to catch what might fall from his glass; nevertheless, all his grandeur did not prevent a death so odious in itself, and so distressing to the French, whom he ever respected, and promised to assist in a manner the Almighty did not allow him means to effect.

Six days before the capitulation, Don Pedro, son of the late viceroy of Naples, was commanded to besiege the island of Fayal with three thousand Spaniards, where a Portuguese captain commanded, accompanied by four hundred French, with captain Carles of Bourdeaux at their head. Don Pedro embarked aboard the galleys and some large vessels, and the succeeding day, after reconnoitring the island, easily effected a landing at the quarter where were the Portuguese, who played the same game as at Tercera, running away to the mountains; nevertheless the French, seeing the landing effected, and the retreat of the Portuguese, resolved to fight and die: they shortly cut the throats of fifty or sixty Spaniards, who had gained a fort on the shore, and from that quarter attacked the van of the large body led on by Count Pedro, where they had not much success, on account of the inequality, being repulsed, fighting all the way to a fort they had constructed in the mountains, where they capitulated, upon the same conditions as their companions at Tercera, to which place they were carried by the said count, and treated in the same manner as the others.

Upon their arrival, the commander de Chaste entreated the marquis to fulfil the conditions of the capitulation, and furnish him with vessels and provisions for transporting him to the coast of France, together with his people, which the marquis promised should be done on the succeeding day. The next day the marquis ordered Don

Pedro de Padilhe to tell the commander de Chaste, that he must proceed with his people to Lisbon, where he should be embarked for France, as he had not the power of forwarding him from there, not having a sufficient number of vessels to transport his army back; with this the commander was obliged to acquiesce, in spite of all dispute to the contrary. However, while waiting from day to day for the departure of the army, he was informed by some of his captains, that the Spaniards endeavoured to seduce them to join them, with their troops, in order to be present at a battle which the king Philip meant to give the Moors at Larache, where Don Sebastian was killed four years before, and lost the day. On the same day the commander being invited to the quarters of Don Pedro de Toledo, where the principal captains of the army were assembled, was repeatedly pressed to be gay, and enjoy himself, on account of his appearing sad and cast down at his bad fortune; upon which subject Don Lopez de Foulquoal, Maitre de Camp, general of the army, thus expressed himself: "Mons. de Chaste, in my opinion, you have no reason to grieve in the manner you do, seeing that, in this instance, nothing has occurred but what has been advantageous to you. I will refer the statement of your adventures to the judgment of the most experienced warriors in the world; I am certain, upon explaining every circumstance, that they can form no other idea thereof, than such as is entertained by myself and my companions; which is, that although you should have had all the good fortune possible against us, you could not appear in a braver or more honourable light, nor better have signalised your renown, than you have done, in having fought with, and kept a whole strong and numerous army employed for an entire day with such a handful of men, who cheerfully exposed themselves in the fight, with fixed arms advancing to give a shock to our soldiers, and meeting their steel with resolution, to bathe their own in the blood of ours; killing a great number of our bravest men, notwithstanding your being abandoned by the Portuguese, and their chief, with some of your own deserted from you to us, informing us of your distress; in this position, engaging the marquis de Santa Cruz to enter into terms with you, notwithstanding the information received of your being a prey to thirst and hunger, which were destroying your people, and saving your lives from absolute condemnation; for my part, I think we were too easy, that it would have been an eternal affront and stain upon the honour of our nation, if we had had the disgrace to have granted beyond what we have done; and that you have to thank God for the assistance he has afforded you, and that you are at present in the hands of men of honour, from whom you receive every courtesy you can desire." The commander thanked him very humbly for his politeness, and said: "I should be the most ungrateful of beings, if I were not to shew proper sentiments, when opportunity may offer, for the honour and kindness shewn me; but as the French are incapable of concealing what is uppermost, as in the instance of myself, I shall freely observe, that all the caresses and kind treatment shewn us are done with a design of which I cannot approve; what, for two days back, has given me greater cause of vexation, is the hearing that your captains were seducing my and their men to go to the battle of Larache, which I gave the more credit to, from the marquis having already begun to break the treaty of capitulation, putting off the embarkation of my men for France, which should have taken place from this island to Lisbon, which is done more to induce us to make a party in this battle, than from any want of vessels, as he says; or, if this be not the cause, it is for the purpose of playing off some villainy upon me and mine; breaking his engagements entirely. He is not to conceive, that although I should be forced to go to Lisbon, I shall the more be persuaded, either willingly, or by constraint, to go to the said battle; for, rather than do so, I would stab myself in fifty places, as would all my companions, except we were ordered to proceed, by the king my master, to whom I shall go to render an account

of my conduct. To lose one's life or fortune, I consider but little; not so of my honour, which would be forfeit, were I to act otherwise; or else the circumstance would serve to immortalize the want of faith of Spaniards, in shewing that a general of an army, with all the principal men of your nation, were devoid thereof, as you are in the fair road to demonstrate." Upon this, they all answered: "Mons. de Chaste, you do us an injury in entertaining so bad an opinion of our faith; do not for an instant imagine, unless it be by voluntary consent of yourself and your people to accompany us to the glorious battle of Larache, where every good christian ought to be present to oppose the infidels, that the marquis would on any account oblige you, nor even break his treaty with you; and if he should be so disposed, our honour is so precious to us, we would rather forfeit our lives, than suffer him to do so." After this they immediately waited on the marquis, to whom they repeated the observations made by the commander, on his want of faith in taking him to Lisbon, after promising him shipping from Tercera to return to France. They represented to him, that if such were his intentions, the commander would have cause to complain; and that he would compromise not only his own reputation, but that of the whole Spanish nation. They besought him to keep his faith and promise, and ship the French from the island, before the Spaniards sailed: which the marquis agreed to do, upon condition that the commander should leave le Sieur d'Anguaraques, the Maitre de Camp, with four captains and their companies; not being able to embark the whole for want of vessels. The commander, upon learning this, repaired to the marquis, and told him, that in the capitulation no mention of hostages was made; that such conduct was a retraction of promise; and that, if he by force or authority should be constrained to abide by those conditions, it should be himself who would remain as an hostage, and make good his retreat, running his chance. The marquis answered: "Mons. de Chaste, leave me the hostages I have required; I esteem you too much to consent to your ruin, as I should do, if, remaining as an hostage, you were to answer for the disorder which your soldiers might be guilty of, on passing through the territories of the king of Spain my master, from bad conduct: you must embark to-morrow with your people, in three Biscayan vessels, each of four hundred tons, and a bark for your sick and wounded; these shall be at your disposal, with provisions and people to conduct you to the French shores in the neighbourhood of Fonterabia; and as soon as I hear of the treatment which the said Biscayans may have received, and of their arrival in port, I will not fail to ship the remainder of your people, which, however, I shall take to Lisbon: this is all I can do for you; and on which I am resolved." "Very well, said the commander, the strongest, as you do, make the law, sir." When taking leave, he assured him of sailing with his people.

The next day, which was Saturday, 14th August, they went aboard in such confusion, that the vessels were full of French soldiers or sailors, and a great number were concealed belonging to the companies which remained as hostages, being apprehensive that this would be their last chance, which was the cause of a greater part dying of hunger and thirst, or the bloody flux, at sea, as we were two months on the voyage, which we reckoned upon effecting in a fortnight, if the wind had been favourable; but being contrary, and the vessels bad, we were in danger of foundering on Tuesday the seventeenth of the same month, and the men were consequently so much affected, that several dead were thrown into the sea, the remainder being very ill of the bloody flux, the consequence of the distress they had to combat with in the mountain of Tercera, before the capitulation, and on board continuing to live so wretchedly, that they had nothing to drink but a small sour wine, stinking water, broken biscuit made four years before at Milan, hard as a stone, and half worm-eaten, and some spoilt salt fish; so that the best entertainment the poor fellows who were sick and

wounded could obtain, was a piece of biscuit boiled in an earthenware pot in stinking water; and of this so small a quantity, as scarce to be perceptible when swallowed. This caused so great a mortality, that more than two hundred perished. Tuesday, twenty-fourth of the same month, the vessel, on board of which was the commander, was near sinking, owing to the desperation of a sailor, who, lying under the cabin, either vexed at living so miserably, or in anguish from the pain he experienced from a shot which had broken his leg, forced open a plank of the vessel; in which there was already two feet of water, and but for the assistance of the sailors who perceived the leak, the vessel had been lost. The same vessel, the next day, was a second time in danger from fire, which the French sailors, running to the part where some drunken Biscayans had been regaling themselves, extinguished; these latter were accustomed to cook and enjoy themselves in presence of the poor French, who with joined hands, at times, would intreat a morsel of them for the love of God, which they paid small attention to, mocking their distress; and frequently, on passing by them, would give them kicks in the belly and the reins, telling them they were dogs and swine, to have blood voided by them below.

How the poor sick were treated, who died while lying one upon another in every corner of the vessel, without being able to move, or help themselves, may be imagined. Frequently speaking of the most wicked nations, I have heard them compared to the Biscayans, but from experience I can affirm that they are the most barbarous and least friendly people upon earth: the commander was even informed one day that the Biscayans had thrown a French gentleman overboard, who was yet alive; and having noticed this to the captain of the ship, as well as the rest of their bad conduct, he answered him that he was so much hurt at having to carry people so much afflicted, as were the French on board his ship, that he wished the devil might sink her, with all that she contained: notwithstanding this insolence, the commander armed himself with patience, in consideration of those who remained as hostages behind, who might suffer for any punishment inflicted on this wicked Biscayan and his companions, which the commander had yet the power to inflict.

Friday following, the twenty-seventh of the same month, they began to discover the sea-coast of Gallicia, where being desirous of touching at Cape Finisterre, to take in water at the nearest village, such a violent storm arose that most of the sailors prepared to throw themselves overboard, in order to swim to shore, but God calmed the tempest, their vessel passing within a foot or thereabouts of the rocks. During the whole day they were unable to make the land; but the next day they cast anchor in a bad road of a village called Maujy, where several Frenchmen thinking it a remedy for their sickness, went to drink at a spring, and after filling themselves four or five died upon the spot: on this account the commander caused them to be re-embarked. A great number of the soldiers, upon returning on board, besought their commander to discharge them, and in order to obtain their request the more readily, they pretended to have made a vow to go to St. James's of Gallicia, six or seven leagues distant, in order that they might be out of danger. The commander represented to them their bad health, and the risque they ran in passing through Spain, of being knocked on the head, that it would be much better to wait two days longer, in which time it was to be hoped the N. E. wind, which prevented the continuance of their voyage, would change, that in that case, in twice twenty-four hours they might run 160 leagues, which was our distance from the French coast, which by land it would take them two months to travel over: he assured them further that in case the wind should not become favourable, he was resolved upon running the same risk as themselves, being thereunt

obliged from the scarcity of provision, which was so great, that the portion of each soldier was reduced to about as much of stinking water as could be contained in the hollow of the hand, and about the size of a walnut of biscuit per day. But the commander being importuned to discharge them, gave his consent for that purpose to one hundred and twenty, the greater part of whom died in Spain, owing to the bad treatment they received, or the illness under which they laboured.

Tuesday, sixteenth of the month, the contrary wind appearing to change, gave an opportunity for weighing anchor, and setting sail, after the captain had put seven or eight casks of water on board; but in leaving the roads a fog arose, accompanied by a great storm which, shattered the main mast, and shivered all the sails in such manner, that we all imagined we were at the end of our afflictions; on this occasion the Biscayan captain shewed the baseness of his soul, and his avarice; for full of rage he exclaimed, "O God! wilt thou at last make me lose my dear ship which cost me ten thousand franks; rather than so, let the devil take me." On this occasion, all the others aboard invoked the assistance of the Almighty, who again preserved them from this misfortune, and quelled the storm; which separated the two other vessels and barks from the commander, and drove them, the commander du Mayet, who was in one, into Valentia, in Spain, thirty-six leagues distant from the commander; captain Carles, of Bordeaux, to the islands of Bayonne, twenty-four leagues distant; and captain Campagnol, who was with the sick on board the bark, away to sea a considerable distance from the commander; this contrary wind, which became more and more violent, tossed them about nearly a fortnight, during which time ten or twelve bodies were daily thrown overboard, from the commander's vessel, which had no longer any thing to eat on board, and very little to drink; so that without the interposition of the Almighty, who by earnest prayer was induced to send a favourable wind, we were upon the point of casting lots who should be devoured by the rest. After two days and one night in this condition, they arrived at the part of the town of Gueytarge to which the Biscayan captain belonged, where they immediately obtained bread and water, through the medium of a French gentleman who was better provided than his companions, and who lent the commander money. It was ten leagues by sea from there to Fontarabia, to which place the Bicayan captain was ordered to conduct us; he however told the commander, that he had not determined to carry him any farther, but that he might go by land if he pleased; upon this the commander immediately gave advice to the governor of Fontarabia, informing him of the little respect shewn by the Biscayan to the orders of the marquis of Santa Cruz, and that owing to his neglect his people were dying. Immediately upon this, the governor sent a man to the Biscayan, ordering him upon pain of death to proceed instantly to the village of Andaye, opposite to Fontarabia, there being only a small arm of the sea between, which separates France from Spain. He accordingly immediatly prepared sloops and boats to carry the commander and his people to Fontarabia, and as they were passing this little arm, a Spanish gentleman came on the part of the governor, to offer to the commander provisions, money, horses, and clothes, stating that he had directions from his Spanish majesty, to shew every kindness in his power to him, and to his people; the commander thanked him but accepted nothing of him, but horses to transport him and those who were the most ill to Bayonne, about ten or twelve leagues distant. At length they landed at the village of Andaye, on the fourth of October, where the inhabitants of the place seeing them arrive so miserable and ragged received them into their houses, and treated them in the best manner they were able; the next morning the greater part of them brought their mules, and asses, to carry them to the trembling bridge, three leagues from there; and some women

and girls of the place accompanied them, as in this neighbourhood they are very charitable. The commander as well received great kindness in this place; and accommodated in the hospital of St. Jean de Luz, which is adjoining, a great number of them; continuing to have others in the hospitals, and charitable houses, along the road to Bayonne, ten or twelve leagues distant; where the greater part died; the others came as far as to the gates of Bayonne, to whom the captain gave six hundred crowns, to enable them to reach their houses, which he borrowed, causing them to be accommodated with carts from space to space throughout Gascony, by the medium of Le Sieur de Pasliere, governor of Bayonne, who furnished them with a commissary to guide them, and provide them quarters. The commander having thus provided for his people, took post at Bayonne aforesaid to proceed to Paris, in order to render account of his commission; and kissing the hand of the queen mother, from whom he had expressly received the orders for this expedition, he presented her with an abstract of this relation, adding, "Madam, I know very well that in relating my adventure, I must necessarily occupy too great a length of time upon a subject which can be but little agreeable to your majesty; I am extremely hurt, Madam, that my voyage was not undertaken with as much success in its favour, as I had inclination to give greater satisfaction to your majesty: You will see if you please, Madam, what has been dictated by truth in this paper; if you conceive that a fear for my own life can have made me forget for an instant the duty I owe your majesty, I bring you my head to answer for it." To which her majesty replied, "Monsieur le Commandeur, I know you are too honest a man to have failed in your duty, I thank you for the affection which I know you bear towards my service, and I reserve to myself a good disposition towards seeking the means of promoting your welfare."

END OF THE FIRST VOLUME