

MEMOIR,
DESCRIPTIVE AND EXPLANATORY,
TO ACCOMPANY
THE GENERAL CHART
OF THE
NORTHERN OCEAN,
DAVIS' STRAIT, AND BAFFIN'S BAY;
INCLUDING
THE NAVIGATION FROM GREAT BRITAIN AND
IRELAND TO SPITZBERGEN

AND
The White Sea :

AND CONTAINING

1. TABLES of the DETERMINED POSITIONS of all the PRINCIPAL POINTS, &c., with the Authorities ; illustrated by Notes, including Remarks on the Variations of the Compass.

2. The GENERAL PHENOMENA of the NORTHERN OCEAN : the Atmosphere, Winds, Ices, Colour of the Sea, and best Places for Fishing, Currents, &c.

3. PARTICULAR DESCRIPTIONS of the COASTS and ISLANDS ; with DIRECTIONS for SAILING, &c. This Section includes the Eastern Coast of Great-Britain ; the Islands of Orkney ; Islands of Shetland ; the Fishing-Banks of Scotland, particularly those about Orkney and Shetland ; the Voyage from England to the White Sea, Archangel, and Onega ; the Voyage from England to Spitzbergen, including that of the Hon. Captain Phipps, 1773, and of Captain Buchan, 1818 ; Island of Jan Mayen ; the Færøerne, or Færøe Islands ; and the Voyage of Captain Ross, with Lieut. Parry, around Baffin's Bay, &c., in 1818. Also, Directions for Hudson's Straits and Hudson's Bay.

A DESCRIPTION of ROCKS and SHOALS in the NORTHERN OCEAN, with the Authorities on which they have been inserted in the Chart.

By JOHN PURDY, HYDROGRAPHER.

LONDON :

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NO. 53, FLEET-STREET.

1820.

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CONTENTS.

* * COURSES and BEARINGS expressed thus [E. S. E.] denote that such are by COMPASS.

SECTION I.

GENERAL REMARKS on the CHART and NAVIGATION, with TABLES of DETERMINED POSITIONS, and the Authorities, &c. including NOTES on the VARIATION of the COMPASS.

	PAGE
GENERAL REMARKS on the Chart, Variation, &c.	1
1. Eastern Coasts of Great Britain, Orkney, Shetland, and Færoerne or Færoe Islands	9
2. Eastern Coasts of the North-Sea; Coasts of Norway, Lapland, &c. to the White Sea, inclusive	17
3. Spitzbergen, East-Greenland, and Iceland	27
4. Greenland, Davis' Strait, and Baffin's Bay	34
5. Hudson's Strait, Hudson's Bay, and Labrador	43

SECTION II.

The GENERAL PHÆNOMENA of the NORTHERN OCEAN: the ATMOSPHERE, WINDS, ICES, CURRENTS, &c.

1. Phænomena of the Atmosphere, Winds, &c.	45
2. The Ices and other Phænomena of the Sea	50
3. The Currents	61

SECTION III.

PARTICULAR DESCRIPTIONS of the COASTS and ISLANDS; with DIRECTIONS for SAILING, &c.

1. The Eastern Coast of Great Britain	63
2. The Islands of Orkney	66
3. The Islands of Shetland	67

	<i>PAGE</i>
4. The Fishing-Banks of Scotland; particularly those about Orkney and Shetland	71
5. The Voyage from England to the White Sea, Archangel, and Onega. General Circular of the Russian Consul, respecting Quarantine	80
Geographic Terms, Danish and Russian, which frequently occur on the Charts	87
6. The Voyage from England to Spitzbergen	88
The Voyage of the Honourable Captain Phipps, in 1773	88
The Voyage of Captain Buchan, in 1818	103
7. The Færoerne or Færoe Islands	109
8. Description of Iceland	111
9. West-Greenland, Davis' Strait, and Baffin's Bay	122
The Voyage of Captain Ross and Lieut. Parry, in 1818	123
10. Hudson's Strait and Hudson's Bay	155

SECTION IV.

Description of the Rocks and Shoals in the Northern Ocean, and of the Authorities on which they have been inserted in the Chart.... 160

COAST of NORWAY.

General Remarks	164
<hr/>	
Captain Ross's Rules for Aberration of the Compass	164

GENERAL
DETERMI
cluding N

A PORTIO
trate, wa
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variation of th
or Columbus,
When Colon h
Islands, his cor

PGAE
and
... 71
ga. 80
... 86
on
... 87
... 88
... 88
... 103
... 109
... 111
... 122
... 123
... 155

MEMOIR, &c.

SECTION I.

GENERAL REMARKS *on the* CHART, *with* TABLES *of* DETERMINED POSITIONS, *and the* AUTHORITIES, &c., *in-* *cluding* NOTES *on the* VARIATION *of the* COMPASS.

A PORTION of the Chart, which the present Memoir is intended to illustrate, was drawn by the late learned and respected L. S. de la Rochette; it has been for some years before the public, and has been generally approved, because its defects remained unknown, until exposed by recent surveys. It was, however, at the period of its publication, the best Chart of the Seas of Spitzbergen, &c., and so it has remained to this day.

Such parts as we could not pretend to amend, still remain in their original state; but, to both of the plates, formerly published, some additions have been made. The White Sea is now exhibited according to the last Survey, made under the direction of the Russian Admiral Von Dessen; the Shetland Islands have been adjusted according to the observations by Captain Ross; and the whole of Davis' Strait, Baffin's Bay, &c., have been added since the Expedition of 1818. Some other new features will appear on inspection; not less novel than important to the navigator.

The following Memoir, &c., has been composed on the principle of PRACTICAL UTILITY; being intended for, and adapted to the use of, the adventurous MARINER who annually visits the ARCTIC SEAS. It, nevertheless, describes many curious particulars, and involves a great variety of information; but all from the most authentic sources, as shown in the course of the work.

VARIATION OF THE COMPASS.—We noticed in our former work, the 'Memoir to accompany the Chart of the Atlantic Ocean,' that the state of the Variation had become a subject of peculiar and curious inquiry to the navigator and philosopher. Since that time, additional facts and observations have given an interest to this subject, which it never before possessed; some of them being of a very embarrassing nature. The first notices we have, of any observed variation of the magnetic needle from the true meridian, were those of Colon, or Columbus, in his first voyage, 1492, and of Sebastian Cabot, in 1497. When Colon had advanced two hundred leagues to the west of the Canary Islands, his compass began to fail him, and it was found not to point to the Pole

2 GENERAL REMARKS ON THE CHART, &c.

of the earth, or exactly north, but to the westward of that point. From this period the variation began to be observed, and became more and more known. For more than a century and a half mathematicians have made it a regular part of their business to observe it, in different parts of the earth, with its annual alterations.

In the year 1723, a very accurate observer, George Graham, of London,* discovered that the magnetic needle had a diurnal, as well as an annual, variation: and it is now well known, from observations made at London, St. Helena, and other places, that, from about eight o'clock in the morning, the magnetic needle verges to the west, until about two o'clock in the afternoon. When it has attained its greatest westerly variation, it gradually returns to the east, until about eight or nine o'clock in the evening, when it becomes stationary until the next morning. Tables expressive of this diurnal variation are become common, and are to be found in the Transactions of all Philosophical Societies. Thus, in the most regular state of the magnetic needle, it is constantly subject to two variations, an annual and a diurnal one; and it is also subject to an aberration arising from the state of the atmosphere, humidity, lightning, local attraction, &c.

In the Thames Mouth and the Eastern part of the English Channel, the quantity of variation does not, at present, exceed $24\frac{1}{2}$ degrees; at Edinburg, as shown hereafter (page 16), it is $27^{\circ} 42' W.$; to the westward of Shetland, 30° , to the eastward 25° . At the North Cape, it is about $10^{\circ} W.$; thence it decreases to the eastward, until the line of no variation is found to pass through the mouth of the White Sea.†

On the west, at the Scilly Islands, the variation was found by Mr. Bain to be $27\frac{1}{2}^{\circ} W.$ in the year 1814: in Dublin Bay, the late Admiral Bligh found it to be $26^{\circ} 48' W.$ in December, 1800. On the South of Ireland, near Cork, it was found to exceed 28 degrees at the same period. At St. Kilda, Western Isles, it was $31\frac{1}{2}^{\circ}$ in 1806. (See Note 10, page 12.) Off the Southernmost coast of Greenland, as shown by the Chart, it was $47^{\circ} W.$ in 1818: Off Disco Island, in Davis' Strait, it was at the same time $72^{\circ} W.$ In Melville Bay, 90° , or 8 points, the magnetic needle here pointing due west. On the opposite side of Baffin's Bay, near Cape Clarence, it was found to amount to 107° ; and, in Lancaster's Sound, the maximum of variation, as given in Captain Ross's Table, is $115^{\circ} W.$ See the diagram on the Chart.

From Lancaster's Sound, southward, it rapidly diminishes. Off Home Bay, in the parallel of $60^{\circ} N.$, it appeared to be 73° . Off Cape Walsingham, 70° . Off the Entrance of Cumberland Strait, 68° . Off the coast of Labrador, in the parallel of $57^{\circ} N.$, it is about 43° ; and, finally, off the Entrance of the Strait of Belle Isle, about $29^{\circ} West$.

Other particulars will be found attached to the Notes on the Tables of Positions hereafter: See, more especially, page 42.

In the year 1580, the variation at, or near, London was found to be $11^{\circ} 15'$

* Genius has no settled residence; she does not hide herself from the rich, nor is she ashamed of the poor; but, like the wind, "bloweth whithersoever she listeth;" and some of her proudest gems have sparkled in the midst of the most lowly soils. GEORGE GRAHAM was one of her favourite children, and he deserved to be so; it is to him that we owe, in reality, the invention of that useful and admired machine called an 'Orrery.' Mr. Graham communicated many ingenious and important discoveries to the Royal Society, and died in London, in November 1751. *W. Weekes, Gent. Mag.* 1818.

† The line of no variation on the South of the great Continent of Asia passes through the intersection of the Malabar Coast and the meridian of $75^{\circ} East$.

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East; in 1657, no variation existed here; in 1692, it was found to be 6 degrees *West*; in 1740, it had increased to 15° 40' W.; in 1765, to 20° 0' W.; in 1796, to 24° 0'; and, in 1818, it seems to have arrived at its maximum, which was, at noon, in the month of August, 24° 45' 58" W., and, in the evening, 24° 37' 50". The latter is to be considered as the general mean.

From a series of astronomic and magnetic observations, made by Colonel Beaufoy, at Hackney Wick, near London, (on the East,) in May, 1813, the greatest variation was observed, on the third of that month, and appeared to be 24° 26' 20". At 8 h. 5 m., in the morning of that day, it was only 24° 9' 45", and continued to increase until 35 minutes past two; at which time there was a *great deal of thunder* in the west; but, on the next day, when there was thunder in the east, the variation amounted to only 24° 16' 30", the difference being 9' 50".

The mean of the morning, noon, and evening, observations, taken by the same ingenious and scientific officer, on fifteen days of the same month, was as follows:

Morning, 24° 11' 15"; *Noon*, 24° 20' 55"; *Evening*, (or general mean,) 24° 15' 54".

Colonel Beaufoy has continued his observations to the present time; and his latter statement, which is a very important one, was published on the 1st of January, 1820. It follows:

VARIATION AS OBSERVED BY COLONEL BEAUFOY, F.R.S. NEAR LONDON, IN 1817, 1818, AND 1819.

		1817.	1818.	1819.	
August,—	Morning	24° 31' 16"	24° 34' 40"	24° 32' 33"	W.
	Noon . . .	24 42 51	24 45 58	24 42 49	—
	Evening..	24 33 45	24 37 50	24 34 24	—
September,—	Morning.	24 33 2	24 34 29	24 32 29	—
	Noon . . .	24 41 36	24 45 22	24 41 35	—
	Evening..	24 34 38	24 37 28	24 33 27	—
October,—	Morning.	24 31 6	24 35 36	24 33 27	—
	Noon . . .	24 40 46	24 43 28	24 40 8	—
	Evening..	— — —	— — —	— — —	—

By an examination of this statement, it will appear that the variation at London, which had been increasing to the westward from 1580 to 1818, is now inclining to the eastward; that is to say, the westerly variation was less, near London, in the year 1819 than in 1818. This event has long been expected, and we have little doubt that it will be confirmed. Of the cause, nothing need be said, because nothing is known. 'The subject has hitherto defied the scrutiny of the minutest philosophers, and may be ranked among the numberless evidences of the limits of the human mind. With dutiful humility we must rest, at present, with the practical use of the facts before us.'

The westerly variation has been decreasing, for many years past, in Canada and the northern part of the United States of America; in many other parts it seemed to be increasing until very lately: but the observations made in the Observatory of the Imperial Academy at St. Petersburg confirm those of Colonel Beaufoy, near London. According to these observations, the variation at St. Petersburg, in the year 1806, was 7° 52' W., and, in June, 1817, only 7° 16' W. We presume, from the authority, that the observations were

so correct, as to render the fact unquestionable, although the average rate of decrease was but three minutes annually.

To the late Mr. William Wales, Mr. John Churchman, Mr. Murdo Downie, and Captain Matthew Flinders, to Mr. Ralph Walker, Mr. Thomas Yeates, Captain Horsburgh, and Mr. William Bain, navigators have, latterly, been indebted for keeping up a spirit of enquiry into this important subject. Nor are the recent remarks of Captain Ross and Lieut. Parry to be forgotten. A liberal and judicious critic, in noticing Mr. Bain's work,* says, "We have read this little treatise with very considerable interest, as we think all persons must, who have ever contemplated the curious phenomena of the magnetic needle, its direction, its dip, and the variation of the dip, &c.: but it is of still greater importance to the mariner, from the publicity which it gives to a source of variation, which, though it might be known before, has never appeared in any shape to meet the eye of those whom it more immediately concerned. The circumstance to which we here allude is the *local attraction* of the ship on the compass, and the consequent change of direction, according to the position of the vessel at the time of observation. The reciprocal attraction between iron and the compass-needle has always been known, since the invention of that useful nautical instrument; and, when we consider the great quantity of iron in all vessels, and particularly in ships of war, it appears singular that no suspicion was ever entertained that this substance might have the effect of deranging the natural position of the needle. Yet this was so far from being supposed, that, even after a change in the direction of the needle had been observed to depend on the position of the ship's head, this explanation does not appear to have suggested itself; but the fact seems to have been considered as involving some mystery, like many others of the phenomena of this instrument, that are inscrutable to the philosophical enquirer.

Mr. Wales, so well known for his mathematical talents, as also from his having accompanied Captain Cook in his several voyages in the capacity of astronomer, appears to have been the first who noticed this phenomenon; and we are surprised that the source of it did not immediately suggest itself to, so keen an examiner of natural causes. Mr. Wales remarks, in the introduction to his *Astronomical Tables*, at the end of the voyage:

"In the English Channel, the extremes of the observed variation were from $19\frac{1}{2}$ to 25° ; and, all the way to the Cape of Good Hope, I frequently observed differences nearly as great, without being able any way to account for them, *the difference in the situation being by no means sufficient*. These irregularities continued after leaving the Cape, which at length put me on examining into the circumstances under which they were made. In the examination it soon appeared that, when most of these observations were made, wherein the greatest west variation had happened, the *ship's head was north and easterly*; and that when those, where it was least, had been observed, it was *south and westerly*. I mentioned this to Captain Cook and some of the officers, who did not, at first, seem to think much of it; but, as opportunities happened, some observations were made under those circumstances, and very much contributed to confirm my suspicions; and, throughout the whole voyage, I had reason to believe that, *variations observed with the ship's head in different positions, and even in different parts of her, will differ very materially from one another*; and

* An Essay on the Variation of the Compass, showing how far it may be influenced by the direction of the Ship's Head; with an exposition of the dangers arising to navigators from not allowing for this change of variation. Interspersed with practical observations and remarks. By William Bain, Master in the Royal Navy, octavo, London, 1817.

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much more will observations observed on board different ships, which I now find fully verified, on comparing those made on board the Adventure, with my own made about the same time in the Resolution."

Notwithstanding the singularity of these results, and the interest which Mr. Wales seems to have taken in them, we see no attempt at explanation; nor are we aware that they were ever seriously considered till Captain Flinders undertook his voyage to Australia, in 1801 and 1802: but the attention of this able navigator was very early, in the course of that voyage, called to an investigation of the same circumstances; and he soon found that the quantity of local attraction of the vessel was not the same in all places, nor depending on the quantity of the natural variation. It was not till after much research, and comparison of different observations, that he found it varied with the *dip of the needle*;* so that, when there was no dip, there was no variation arising from the local attraction of the ship; and, when the dip was the greatest, the ship's attraction was also a maximum.

On this subject, Captain Flinders observes:

"After some consideration, it appeared to me that, the magnetism of the earth, and the attraction forward in the ship, must act upon the needle in the nature of a compound force; and that the errors produced by the attraction should be proportionate to the *sines* of the *angles* between the ship's head and the magnetic meridian. I tried this upon many observations where the direction of the head was least doubtful, and found the difference to correspond as nearly as could be expected, and sometimes exactly: it therefore seemed probable, that, the *error produced at any direction of the ship's head would be to the error at east or west, at the same dip, as the sine of the angle between the ship's head and the magnetic meridian was to the sine of eight points, or radius.* According to this, when the error was ascertained at any given direction, more especially at east or west, where it was greatest, it might be found at any direction required, by inspection in the Traverse Table.

After Captain Flinders' arrival in England, he made application to the Lords Commissioners of the Admiralty to have experiments tried on board some of his Majesty's ships, that the observations he had made during his voyage might be verified. A series of observations were accordingly made on board five different ships at Sheerness and Portsmouth, which appeared to establish the accuracy of his former conclusions. After being satisfied in this particular, he considers the law before deduced from analogy as certain.

Mr. Bain has added many observations to those of Captain Flinders, and has examined the fatal consequence that must, at times, arise to navigators who neg-

* To some of our readers the following may be information. The **DIPPING NEEDLE** is an instrument used for observing the quantity of inclination towards the earth, assumed by any needle or other body after it has acquired the magnetic virtue. This was first observed by our countryman, Robert Norman, a maker of compasses, about the close of the 16th century; who, finding that he was always obliged to counterbalance that end which turns to the north, by a bit of wax or such other substance, though the balance had been ever so exact before, published an account of his discovery, as a matter of importance. The subject was instantly attended to; and instruments were not only contrived for ascertaining the quantity of the *dip*, but various speculations formed concerning the cause of such a surprising phenomenon.

The general phenomena of the dipping needle are, that, about the equatorial parts of the earth, it varies but a few degrees from an horizontal position, but depresses one end as we recede from these; the north end, if we go towards the north pole, and the south end if we proceed towards the south pole. The farther north or south that we go, the inclination becomes the greater. At London, in the year 1592, the dip was $71^{\circ} 50'$ below the horizon, and it is, at present, nearly the same. At Spitzbergen, as shown hereafter, it is 82° , and, in Baffin's Bay, it has been found to amount to 86° .

lect such an important datum in their reckoning, as that which is here pointed out; and which, according to the author's observations, made with the greatest care and attention, will amount, in many cases, to 10 or 12 degrees: that is, the variation of the compass, with the ship's head at east, will appear to be 22 or 23°; and, with the ship's head at west, the variation will be found 32° or 33°: so that, on either of these courses, the ship will be steering 5° too much to the east or to the west. The fatal consequence that may ensue from such an error in the reckoning will be sufficiently obvious; and we think, with Mr. Bain, that many of the accidents which are continually taking place off our coast, may be attributed to this source of mistake.

Even in a philosophical point of view, the phenomena pointed out in this little tract are very interesting; particularly the circumstance mentioned by Captain Flinders, that the local attraction of the ship varies with the dip. This, we confess, we should be glad to see verified by other observations; because, if such be found to be an invariable result, we think that it might be useful in throwing some light on the mysterious laws of magnetic attraction. Abstractedly, however, from philosophical considerations, we cannot but regard the practical observations and deductions contained in this work as of the utmost importance to pilots and the masters of vessels of every description; and we, therefore, earnestly recommend it to their serious contemplation and study.*

The deviation of the needle from the magnetic meridian, occasioned by local attraction, &c. requires a term by which it shall be distinctly understood. Captain Horsburgh, in order to express it, uses the word **ABERRATION**; and, as it seems that this word is least liable to be mistaken for, or confounded with, **VARIATION**, in its common acceptation, we have also adopted it for the same purpose. It is consequently substituted, in future quotations, for any other phrase which may have been originally used.

Captain Ross, in his late voyage, has given some striking illustrations of the Aberration of the compass, which are hereafter noticed. This gentleman says that, when the variation is great, the aberration, which is more or less in every ship, will increase in *no settled* proportion, but will be governed by so many causes, that no surer method of ascertaining the course really steered can be adopted, than that of determining the actual variation at the time, according to the course in which the ship is steered.

In alluding to the origin of observations on the Aberration, Captain Ross observes that, it was reserved for Captain Flinders to elucidate this interesting fact; "to lay down a rule for correcting the error of variation, occasioned by changing the ship's head, which, under the circumstances, and within the limits of his observation and experience, were probably legitimate and correct. But the principle on which this rule is founded will *not be found applicable to every circumstance*, and to all situations, and particularly where it has now been put to the test, in Baffin's Bay. He adds that, the experiments made after the return of Captain Flinders, gave *some insight* into the causes of the aberration, but were *insufficient* to explain them perfectly; and this Captain Ross has most fully proved by his experience on the voyage, during which, every possible opportunity was embraced of taking observations, and making all the necessary experiments and comparisons.

In the month of May, 1818, by repeated experiments, the aberration, which had first been found to be half a point, was afterwards found to be increased to a point and a half.

* Monthly Review, 1817, page 301.

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On the 8th of June, latitude $68^{\circ} 10'$, longitude $55^{\circ} 26'$, the aberration was found to be three points in the morning, and $2\frac{1}{2}$ in the evening.

On the 9th of July, it was found to be about four points: and, on board of the ship *Harmony*, a whaler, of Hull, it was found, at the same time, to be greater.

On the 1st of September, near Lancaster's Sound, the aberration in the *Alexander* seemed to be so great, as to render the bearings of the land of no value.* In a thick fog, on the 4th, and the ship having considerable motion, all the compasses ceased to act.

On the 7th of September, an aberration of four points was again found; that is, two points on each side; for, the wind being S. S. W., the ship lay on one tack W. N. W., and on the other E. S. E.; on the former tack the wind appearing to be S. W., and, upon the latter tack, to be South. At the same time, by Lieut. Parry's report, it appeared that the *Alexander's* aberration had been, in one instance, five points; but this was probably owing to the removal of some casks of iron from the quarter-deck.

It is not, therefore, wonderful that the whalers should so often complain of the total uselessness of the compass in these seas.

On the 4th of June, 1818, in latitude $65^{\circ} 44'$, longitude $54^{\circ} 46'$, observations were made, as nearly as possible, on the four cardinal points, which gave the following results:

With the ship's head North, the variation appeared to be $60^{\circ} 50' 15''$; ship's head South, $52^{\circ} 25' 0''$; ship's head E. S. E., $48^{\circ} 10' 0''$; ship's head West, $77^{\circ} 33' 30''$: the mean variation, $59^{\circ} 44' 41''$: the greatest difference, $29^{\circ} 23' 30''$.

On the 9th of June, the variation was observed by azimuth, on the four cardinal points, and the mean amounted to 5° more than the true variation, as found on an iceberg, which was $67^{\circ} 10'$.

From these, and many other experiments, it appeared,

1st, That there is a *point of change*† in the aberration, occasioned by the attraction of the ship.

2d, That the point of change is not the magnetic north, but near it, in the ship *Isabella*.

3d, That it varies in different ships, and is affected by increase or decrease of variation, by proximity to land, or to another ship.

4th, That the point of change may be found by azimuth, or by the bearing of a distant object, situated near the magnetic north, or in any other direction, if that cannot be had.

The rule, therefore, is,

Take an azimuth, or the bearing of a very distant object by the azimuth compass, with the ship's head at different points, East and West of North, until the points of least and greatest aberration are found; the mean of these will be, nearly, the point of change.

The several facts collected from all the experiments made at different times during the Expedition to Baffin's Bay, 1818, were as follow:

* See the Voyage of Captain Ross, quarto, page 184.

† The POINT OF CHANGE is the point on which there is the least deviation, or aberration, from the correct bearing by compass.

1. That every ship has an individual attraction, which affects the compasses on board her; and, to ascertain the exact quantity of its effect, though possible, requires the most particular care and the nicest attention.

2. The effect of this attraction being different in different ships, and not progressive always, but often irregular, no general calculation will therefore apply in the case of all ships, to ascertain it for the purpose of correction; and, consequently, all the rules hitherto given for obtaining it, particularly in arctic climates, cannot be relied on.

3. As six compasses were compared with each other on board the *Isabella*, and found to agree in the *same* place, and all to disagree, when placed in different situations between the stern and the foremast, it is evident that the aberration in any ship will vary, according to the station of the compass at the time of using it; and, therefore, as the point of change will not be the same at every part of the ship, all observations must be made in one and the same place, where the point of change has been obtained, and to which only that point of change will apply.

4. The aberration does not always continue the same under the same apparent circumstances, and varies according to the point the ship's head is on.

5. The aberration appeared to be materially affected by heat and cold, as well as by atmospheric humidity and density.

6. The direction of the wind seems to have an irregular effect on the aberration.

7. The dip, also, has an irregular effect on the aberration.

8. That the points of change found with the compass, in the same part of the ship, will remain the same, unless some material alteration is made in the stowage of metallic substances on board, yet the amount of aberration, with the ship's head on any point of the compass, will be on a proportion, though not a regular one, with the increase or decrease of the variation and dip; by both of which, the aberration appears, in some degree, to be governed, though not the points of its change, they seeming to be independent of any influence but the ship's attraction or magnetism; and which is not of equal force in every part of the same ship; nor, perhaps, alike in any two. It is, however, presumed that, the experiments and observations that have been made, and the rules proposed and exemplified, will be sufficient to correct the errors in the mariner's course, which have so often proved fatal, and hitherto been attributed perhaps, to defects in compasses, to currents, and other unaccountable causes.

CAPTAIN ROSS'S RULES for finding the POINT of CHANGE in Aberration, are given on the last page of this work.

WE now proceed with the TABLES of POSITIONS, exhibiting the authorities with Notes descriptive and explanatory; every division of which concludes with the existing variations of the compass, at the places inserted in the respective Tables.

1. EAST

* * * The F

GREENWICH
OBSERVATORY
Gravesend, church
Sheerness, flagst
The Naze of Essex
tower [2] . . .
Landguard Fort,
Bawdsey, church
Orford, high light

Yarmouth, church

Lynn, old tower

Spurn, lighthouse
Flamborough Head
house

Whitby

Hartlepool, steep

Easington, steep

Sunderland, light

Tynemouth, light

Coquet Island, tower

Sunderland Point

Cheviot Hills, sun

feet)

Faru Islands, light

house [3]

Staples, lighthouse

Bamboro' Castle

Holy Island Castle

Berwick upon Tweed

St. Abb's Head . . .

Bass Rock or Isle

Leith Pier

EDINBURG, the

St. Monance, spiral

Pittenween, steep

East Anstruther, tower

Kilrenny, spire . . .

Crail, spire

Fiterness [4]

May Island, light

1. EASTERN COASTS OF GREAT-BRITAIN, ORKNEY,
SHETLAND, and FÆROERNE.

* * The FIGURES in Parentheses refer to the NOTES subjoined to each Section.

	LATITUDE.			LONGITUDE.			AUTHORITIES.
	°	'	"	°	'	"	
GREENWICH, ROYAL OBSERVATORY	51	28	40	0	0	0	The Grand Trigonometric or Ordnance Survey of Great Britain, commenced in the year 1784, by the late General Roy, F.R.S. under the direction of the Royal Society; subsequently under the orders of the Masters-general of the Ordnance; and now proceeding under the direction of Major-General Wm. Mudge, F.R.S., and of Captain Thos. Colby, of the Royal Engineers.
Gravesend, church [1]	51	27	39	0	22	10	
Sheerness, flagstaff	51	26	45	0	44	26	
The Naze of Essex, Walton tower [2]	51	51	51	1	17	7	
Landguard Fort, cupola	51	56	19	1	19	4	
Bawdsey, church	52	0	39	1	24	52	
Orford, high lighthouse	52	5	0	1	34	14	
Yarmouth, church	52	36	40	1	44	22	
Lynn, old tower	52	46	52	0	25	4	
Spurn, lighthouse	53	36	13	0	10	54	
Flamborough Head, lighthouse	54	7	50	0	2	20	Grand Trigonometric or Ordnance Survey. Inferred, by means of the large County Survey, from the points determined by the Grand Trigonometric Survey.
Whitby	54	28	30	0	35	20	
Hartlepool, steeple	54	41	49	1	10	31	
Easington, steeple	54	47	9	1	21	1	
Sunderland, lighthouse	54	55	12	1	21	16	
Tynemouth, lighthouse	55	1	21	1	24	31	
Coquet Island, tower	55	20	11	1	31	47	
Sunderland Point, windmill	55	34	45	1	37	56	
Cheviot Hills, summit (2658 feet)	55	28	52	2	8	12	
Faru Islands, high lighthouse [3]	55	37	11	1	38	51	
Staples, lighthouse	55	38	9	1	37	5	
Bamboro' Castle, flagstaff	55	36	42	1	42	8	
Holy Island Castle, flagstaff	55	40	20	1	46	38	
Berwick upon Tweed, spire	55	46	21	1	59	41	
St. Abb's Head	55	54	50	2	8	20	
Bass Rock or Islet	56	4	53	2	37	47	
Leith Pier	55	59	50	3	10	0	
EDINBURG, the college	55	57	57	3	10	30	
St. Monance, spire	56	12	24	2	45	37	
Pittenween, steeple	56	12	48	2	43	2	
East Anstruther, spire	56	13	40	2	41	24	
Kilrenny, spire	56	14	17	2	40	35	
Crail, spire	56	15	58	2	36	55	
Fifeness [4]	56	17	0	2	34	0	
May Island, lighthouse	56	11	22	2	32	47	

EASTERN COASTS OF GREAT-BRITAIN, &c., CONTINUED.

	LATITUDE.			LONG. W.			AUTHORITIES.
	°	'	"	°	'	"	
Bell Rock, lighthouse [5] ...	56	26	50	2	22	10	Inferred, by the best Chart, from May Island.
Dundee	56	28	0	2	57	30	Latitudes, with a small correction, Mr. Murdo Downie, Master, R. N. Long. inferred by the Charts of the same, and other surveys.
Button-ness, lighthouse	56	28	0	2	44	15	
Montrose-ness	56	42	10	2	27	15	
Aberdeen, Observatory [6] ..	57	9	0	2	8	0	The astronomer, Dr. Andrew Mackay, F.R.S. Ed. &c.
Buchan-ness, lighthouse	57	29	15	1	47	0	Latitudes, with a small correction, Mr. Murdo Downie, Master, R. N. Longitude inferred by Charts of the same, and other surveys.
Kinnaird's Head, lighthouse ..	57	41	40	2	1	0	
Duncansby Head	58	39	45	3	6	20	
Pentland Skerries, lights	58	42	40	3	2	30	
Cape Rath or Wrath [7]	58	38	30	4	57	0	The Chart of Captain Huddart, with a small correction.
Ullapool [8]	57	53	30	5	3	20	Capt. Joseph Huddart, F. R. S. on his Survey of the Western Isles.
Butt of Lewis [9]	58	31	0	6	13	30	Capt. Huddart, &c. by Chart.
St. Kilda [10]	57	49	30	8	32	30	
Flannan Islands [11]	58	18	0	7	31	0	Inferred, by survey, from the Butt of Lewis.
Suliskar, or Barra [12]	58	58	0	6	3	0	
Rona, North [13]	58	59	30	5	53	30	
Nun Rock, summit [14]	58	52	30	4	56	0	Inferred, by the Plan of Capt. Ramage, from Cape Rath.
Stack [15]	59	1	0	4	25	0	The Chart of the Orkneys, from Mackenzie, compared with the Plan of Captain Ramage, &c.
Sule Skerry	59	2	30	4	20	0	
ORKNEY ISLANDS, &c.							
Hoy Head [16]	58	55	0	3	28	30	The Latitudes from the surveys of Mr. Murdoch Mackenzie, and the Longitudes inferred, by the same, from Duncansby Head: but see Note 16.
Stromness, the town	58	57	30	3	23	0	
Old head of So. Ronaldsha ..	58	44	30	3	1	20	
Copinsha	58	55	20	2	46	0	
KIRKWALL, the road	58	59	0	3	4	0	
Lamb Head, on Stronsa	59	4	0	2	39	0	
Start Point, lighthouse	59	16	30	2	22	0	
Dennis-ness, on North Ronaldsha	59	22	30	2	22	0	
Fair Island [17]	59	30	0	1	47	0	Latitude, Mr. Downie. Long. inferred; but it is also given, by the same officer, as here stated.
SHETLAND.							
Fulo or Foul Island	60	5	0	2	13	0	For the authorities, see Note 17. Latitude, Mr. Murdo Downie. Long. inferred from Brassa.
Sumbro' Head [18]	59	52	0	1	27	30	

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Balta Sound [20

Lambaness

FÆRØERNE (V
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Suder-oe, South
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Sand-oe, South
THORSHAVN, in
Fagl-oe, Bispen
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EASTERN COASTS OF GREAT-BRITAIN, &c., CONTINUED.

	LATITUDE			LONG. W.			AUTHORITIES.
	°	'	"	°	'	"	
Hangcliff, on Noss [19].....	60	9	0	1	7	30	} Inferred from Gardie House, on Brassa, and Sumbro' Head. See Note 19.
LERWICK, the fort	60	10	30	1	18	0	
Out-Skerries	60	29	30	0	56	0	
Balta Sound [20]	60	45	0	1	9	30	} Lat. Capt. Wm. Ramage, R.N. and M. Biot, M.R.I., F.R.S., &c. Long. inferred, by survey, from Brassa.
Lambaness	60	48	0	1	9	30	
FÆRØERNE (vulgo FÆRØE ISLES.) [21]							
Munken or Monk Rock.....	61	23	0	6	52	15	} The Trigonometric Survey of Captain Born, published, by order of the Danish Government, in 1806.
Suder-oe, South end	61	26	20	6	53	0	
Great Dimon	61	44	0	6	53	30	
Sand-oe, South end	61	47	15	6	48	0	
THORSHAVN, in Stromøe	62	2	10	6	50	30	
Fugl-oe, Bispen or E. Rock ..	62	20	40	6	18	0	
Myggenæs or Western Isle, W. end	62	8	0	7	42	30	

NOTES.

1. The EASTERN COAST OF ENGLAND, &c.—We have already explained, in our 'Memoir on the Atlantic Ocean,' the origin and progress of the Grand Trigonometric Survey, particularly to the southward and westward. The third volume of the account of that survey, which was published in 1811, communicated the positions of those places in the North which are enumerated in our Tables. The fourth volume, which is expected shortly, will exhibit a farther progress to the North and West.

2. NAZE OF ESSEX, OR HARWICH NAZE, &c.—The difficulties in the navigation of this part of the British coast have lately been obviated, by the large Chart lately published by Mr. Laurie, entitled, 'A Chart of the Coasts of Essex and Suffolk, from the Western Spitway to Orford Haven, including the Harbour and Environs of Harwich, with the Rivers of Ipswich, Woodbridge, &c.—Scale, more than one inch and a half to a mile.

3. The FARN ISLANDS, &c.—The intricate navigation of the Farn Islands, &c., has, in a great degree, been divested of its dangers, by the New Chart of Lieut. Edw. John Johnson, R.N., dedicated to the Lords of the Admiralty, and which contains distinct views of the islands, lighthouses, &c.

4. FIFENESS, &c.—It is well known that the greatest danger in the vicinity of Fifeness is the CARR ROCK, and it became our duty, not long ago, to announce, in the Book of Directions for the North Sea, the destruction of an excellent beacon, intended to distinguish this danger. In answer to an enquiry upon the subject, we have been obligingly informed, by Robert Stevenson, Esq., the constructor of the Bell Rock lighthouse, that, the work of the first four years, which brought the building up to about *low water of neap tides*, still remains entire; but the commissioners, on their meeting, on the 8th of January, 1820, have resolved to erect a beacon of some kind upon the remaining courses. The difficulty, however, is, to establish any thing permanent, on so small a base, to forewarn the mariner of his danger, unless cast-iron, of great thickness and ponderosity, were used; but this would enhance the expense much beyond what it is conceived would

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would be proper to expend on so hazardous an undertaking. It is therefore probable that a spur or spar-beacon may be constructed on the rock: but nothing has been yet determined further than that it is proper that the operations should again be resumed on a modified scale. (12th January, 1820.)

5. BELL ROCK LIGHTHOUSE.—A description of this noble and useful ornament of the Eastern Coast of Scotland, is given in our last edition of the Directions for the North Sea, which also include the descriptions of the new lights on May Island, Inch Keith, &c.

6. ABERDEEN.—The situation of the Observatory at Aberdeen was given by the late Mr. Murdo Downie, as $57^{\circ} 9' N.$ and $2^{\circ} 9' W.$ Dr. Mackay subsequently gave the longitude as $2^{\circ} 8'$; and this we have adopted as the final result of numerous observations.

7. CAPE RATH OF WRATH.—Rath, signifying a conical hill, seems to be the proper name. This headland is represented by Mr. Arrowsmith, in his large map of Scotland, as in latitude $58^{\circ} 36' 35''$, longitude $4^{\circ} 56'$. But Captain Huddart's Chart of the Western Isles represents the latitude as $58^{\circ} 39'$, and the longitude as $4^{\circ} 58'$. We, therefore, conclude that it must stand, if not exactly, very nearly, as expressed in the Table. For the Nun Rock, &c., which lies to the northward, see note 14, page 14.

8. ULLAPOOL.—This position is given as one of the principal stations adopted by Captain Huddart, in his Survey of the Western Isles; for the particulars of which, see our 'Memoir on the Atlantic Ocean,' Note 7, attached to the section entitled Coasts of Ireland, &c.

9. BUTT of LEWIS.—The latitude is given according to Captain Huddart. Some charts have represented it more to the southward; but Mackenzie, in his Survey of the Orkneys, makes it even as high as $58^{\circ} 35' N.$

10. ST. KILDA.—We have already noticed, in our 'Memoir on the Atlantic Ocean,' that, in July, 1806, Mr. Lamont, jun. surveyed the Islands of St. Kilda, &c. His results agree very well with Captain Huddart's. The variation, found by an excellent compass, was $31\frac{1}{2}^{\circ} W.$ A general southerly current prevailed during the whole 20 or 21 days he remained on and about the islands, and is known to prevail during summer. St. Kilda is said to be visible from the hills of Skye, in very clear weather.

Dr. John Macculloch, in his recent *Description of the Western Islands of Scotland*, has included the island of St. Kilda, and he has said that, 'The spirit of romance seems still to reside in the clouds and storms which separate this narrow spot from the world; but, like other spirits, it vanishes before the rude touch of investigation.'

'Previously to my arrival, more than a year had elapsed since any one had visited the island. The appearance of an armed vessel brought the whole population down to the beach; nor could we help admiring the courage of the chief personage, then, as it happened, the wife of the minister, who hailed us with the important question, 'Friends or Enemies?' After a favourable answer and friendly conference, it became a contest who should be nearest, or render the greatest number of good offices; the whole male population, down to the age of seven, attending my progress throughout the island, with a civility at least equal to their curiosity. The following of an antient chieftain could not have been more attentive, and have probably seldom been so happy. He who is ambitious of distant fame, need only visit St. Kilda: he will, assuredly, be recorded in its annals.'

The population consists of twenty families, containing, at the time of my visit, one hundred and three individuals. They are so much attached to their home, that a native seldom leaves the island.

The rent of the whole island, £40, is paid in feathers, the produce of the innumerable birds that frequent its cliffs to breed; and which form, at the same time, a principal part of the food of the inhabitants; being both consumed fresh and salted for winter use. The cultivation consists chiefly in barley, which is by much the finest to be seen in the whole circuit of the isles. The oats are much inferior in quality, and are but scantily cultivated; nor are potatoes grown to nearly the extent used in highland farming. The cultivated ground is limited to a narrow spot, close to the little crowded cluster of houses that forms the village, which is characterized by a feature unknown in highland villages elsewhere, a stone causey. Excepting on the highest hills, the soil is every where of an excellent quality, and might be cultivated to a greater extent. But the violence of the winds is an obstacle to its extension on the western side, where the finest soil, and, consequently, the best pasture, is found.

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The native of St. Kilda may, with reason, refuse to change his situation, finding his amusement where his chief occupation lies, in the pursuit of the sea-fowl, that constitute, at the same time, his game, his luxury, and a considerable part of his wealth.

The reputation of the bird-catchers, for dexterity and courage, has long been celebrated. The puffins are taken in their burrows by small dogs; this chase being generally conducted by the children, both male and female, while the men are employed in higher game. The gannets and larger birds are caught by hand, or with snares, on their nests; the bird-catchers descending the cliffs by the assistance of a rope of hair secured above. Accidents are rare.

11. FLANNAN ISLANDS.—These are seven in number, and lie nearly N.W. by N. by compass, $15\frac{1}{2}$ miles from Gallen Head, on Lewis, to which estate they belong. The largest appears to contain about eighty acres, the second about twenty, and the rest are disproportionately less. The first two are fully stocked with sheep, although the traveller, who has found some difficulty in climbing to the surface, may be at a loss to conjecture by what means they are carried up the cliffs or removed. The smaller are unoccupied; a circumstance rare in the highlands, and arising here only from their inconvenient situation.

The annual rent paid for the whole is £10, a price paid rather for the birds by which they are inhabited than for the grass they produce. Various sea-fowl, of the species usually found in these seas, have here established their colonies, but the most numerous is the puffin. These literally cover the ground; so that when, on the arrival of a boat, they all come out of their holes, the green surface of the island appears like a meadow thickly enamelled with daises. The soil is so perforated by these burrows, that it is scarcely possible to take a step on solid ground. On any alarm, a concert of a most extraordinary nature commences. Those who have not frequented similar coasts will, perhaps, smile, when the effect produced by the united cries of the various sea-fowl is called harmonious. Separately considered, the individuals cannot be esteemed peculiarly melodious, yet the total effect is no less pleasing than extraordinary. It requires no effort of imagination to trace the sound of the flute, the hautboy, the bassoon, in the cries of the several birds; the upper parts being maintained by the terns and the gulls, the tenors by the auk tribe, while the basses are occasionally sounded by the cormorants.

12. SULISKAR OF BARRA.—This islet appears to be about half a mile in diameter, having a grassy slope towards the north, and presenting to the south a bluff face of three hundred feet, or more, in height. It is inhabited only by sea-birds, and principally by gannets, the exposed situation, and the difficulty of landing, rendering it inexpedient to keep sheep on it, as is done, with no great profit, indeed, in the Flannan Isles. (See note 11.) During one week, in the breeding season, it is visited for the sake of the feathers, by the tenant, who resides in Lewis.

13. RONA.—Rona is accessible in one spot only, and even that with difficulty, from the long swell, which is rarely altogether absent in this sea. The landing-place is on the face of an irregular cliff, and it is necessary to be watchful for the moment, to jump out on the first ledge of rock to which the boat is lifted by the wave.

The length of this island is estimated at an English mile and a quarter, and its breadth, where widest, at half a mile. Its position is nearly east and west; and, at the western extremity, the rocks run far out into long flat ledges; there is, also, a similar ledge towards the north, partially covered with grass. The remainder of the island is surrounded by high cliffs, more or less abrupt, perpendicular at the northern side, and there rising to an elevation of 400 feet, or more. Numerous caverns, some of considerable magnitude, are seen in these cliffs, while the contrast, between the great foam of the waves, that break into them, and the pitchy darkness of their deep abysses, united to the gray mist of the driving sky, speckled with the bright wings of innumerable sea-fowl, produces effects fitted for the pencil of the most perfect artist, and of him alone.

The violence and height of the mountainous seas, which, in the winter, break on this island, are almost incredible. The dykes of the sheep-folds are often thrown down, and stones of enormous bulk removed from their places, at elevations reaching to 200 feet above high-water mark; so powerful is the breach of the sea. Thus the land is in a state of constant diminution at the western end, and the soil is here washed away for a considerable space. The island lies with a general declivity towards the south, and presents an even swelling surface, covered with verdure. The highest point is near the eastern extremity, and does not seem to exceed 600 feet. To sit on this spot, whence no trace of human existence is visible, and to contemplate from such narrow bounds the
expanse

expanse of water every where meeting the sky, produces a feeling of solitude and abandonment like that of the deserted mariner on a distant rock. The ship on the ocean is a world in itself. There, even if alone, we seem to move toward the society we have left; but Rona is, for ever, fixed in the solitary sea.

Some years have now passed since this island was inhabited by several families, who contrived to subsist by uniting fishing to the produce of the soil. In attempting to land on a stormy day, all the men were lost, by the upsetting of their boat; since which time it has been in the possession of a principal tenant in Lewis. It is now inhabited by one family only, consisting of six individuals, of which the female patriarch has been forty years on the island. The occupant of the farm is a cotter, cultivating it, and tending fifty sheep for his employer, to whom he is bound for eight years; an unnecessary precaution, since the nine chains of the Styx could afford no greater security than the sea that surrounds him, as he is not permitted to keep a boat. During a residence, now of seven years, he had, with the exception of a visit from the boat of the *Fortunée*, seen no face but that of his employer and his own family. Twice in the year that part of the crop which is not consumed on the farm, together with the produce of the sheep and the feathers obtained from the sea-fowl, which he is bound to procure, are taken away by the boat from Lewis, and thus his communication with the external world is maintained. Fortunately, he seemed to care but little for any thing out of the limits of his own narrow kingdom.

On the appearance of our boat, the women and children were seen running away to the cliffs, to hide themselves, loaded with the very little moveable property they possessed, while the man and his son were employed in driving away the sheep. We might have imagined ourselves landing on an island of the Pacific Ocean. A few words of Gaelic soon recalled the latter, but it was some time before the females came from their retreat: very unlike in look to the inhabitants of a civilized world.

Such is the violence of the wind in this region, that not even the solid mass of an highland hut can resist it. The house is, therefore, excavated in the earth, the wall required for the support of the roof scarcely rising two feet above the surface. The roof itself is but little raised above the level, and is covered with a great weight of turf, above which is the thatch; the whole being surrounded with turf-stacks, to ward off the gales. The entrance to this subterraneous retreat is through a long dark, narrow, and crooked, passage, like the gallery of a mine, commencing by an aperture not three feet high, and very difficult to find. With little trouble it might be effectually concealed; nor, were the fire suppressed, could the existence of a house be suspected; the whole having the appearance of a collection of turf-stacks and dung-hills. Although our conference had lasted some time, none of the party discovered that it was held on the top of the house. It seemed to have been constructed for concealment from white bears, or men more savage still, with a precaution now, at least useless. The interior strongly resembles that of a Kamtschatkan hut; receiving no other light than that from the smoke-hole, being covered with ashes, festooned with strings of dried fish, filled with smoke, and having scarcely an article of furniture. Such is the life in North Rona; and though the women and children were half-naked, the mother old, and the wife deaf, they appeared to be contented, well fed, and little concerned about what the rest of the world were doing.

We are indebted for this, as well as for the three preceding notes, to the valuable work of Dr. Macculloch, already mentioned, which appeared in 1819; and have considerably exceeded our intended limits from the very interesting nature of the information. A further apology will not be required.

14. The NUN ROCK and BANK.—This rock, with the adjacent bank, was surveyed, under an Admiralty order, by Captain Ramage, in the Cherokee, sloop of war, 1817. According to Captain R., from the centre of the rock, Cape Rath bears, by compass, S. 32° W. nearly 15 miles; Farout Head, S. 10° W. 18 miles; Whiten Head, S. 6° E. 21½ miles; the Stack, S. 85° E. 14 miles.

From the summit of the rock, the eastern part of Whiten Head appears in a line with a round-topped or conical hill; the Isle Balag just open of the land on the S.W. of Cape Rath; and, the top of the Stack just appearing in the horizon. Height of the eye, 20 feet.

Captain Ramage says that, the shoalest part of the rock may be said to terminate in a point; it being difficult to drop upon it two handleads at the same time. Here the depth is four fathoms at low water, neap-tides; eighteen feet in common spring-tides; and, with very low tides, 15 feet. Within the distance of six yards from the centre, the

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"A little after people of Fair Isl boats, bringing fow poverty; at least t is a lofty island, w I learnt, to my ut island contained : although they betr proved that they w

"In most Chart Fair Isle; on the t not be earlier than Islands. The fish from the N.W., an the flood. It is of

depth is $4\frac{1}{2}$, 5, 6, 7, and, in one spot, 11 fathoms; in another 15; and, at the distance of 30 yards, in one spot, 18 fathoms. From the centre of the rock, and sounding along a radius of 80 yards, in all directions, from 6 to 12 fathoms were found, and so very irregular, that the same depth was no where twice obtained within the space of one yard. Extending the radius 250 yards from the centre, gave from 12 to 18 fathoms, with similar irregularity.

From the shoalest point, in a westerly and southerly direction, the rock extends 500 yards, to the depths of 19, 20, 22, and 24, fathoms; then clean ground and deep water: at the like distance from the centre, eastward and northward, the depths are 20, 22, 24, and 25, fathoms; then foul ground, with 25 fathoms, to a considerable distance; the whole mass forming a rude circle, nearly 1000 yards in diameter, situate on the S.W. edge of a Bank or Shoal of rotten rock, about ten miles in extent N. by E. and N.E. from the rock, about two miles wide on the middle of the arm, stretching eastward around the Stack and Skerry, where it again expands to the breadth of six miles. The extreme length of the bank is above 30 miles, and the depths over it from 20 to 35 fathoms. Between the bank and the shore the deepest water is 49 fathoms; the bottom coarse sand, gravel, and broken shells, individually or combined. Near the land, in less depth than 30 fathoms, black pebbles abound; and, near the rock, to the southward and westward, the bottom is of a similar description.

Upon the rock, the time of high water, full and change, is XI. Spring tides set at the rate of about 4 miles, neap-tides 2 miles, an hour. The flood runs to the eastward; first, E.N.E.; middle, East; latter, E.S.E.

Captain Ramage states the rock to lie in latitude $58^{\circ} 51'$, and longitude $4^{\circ} 50'$: but it is to be noticed that, the scale of latitude on his plan is in an improper direction, being on the *magnetic* meridian; and if we have given the correct situation of Cape Rath, that of the Nun Rock must be as shown in the Table. The Captain gives the variation near Cape Rath as 31° , and near Hoy Head as $27^{\circ} 30' W.$; but we believe that, at Cape Rath, it does not exceed 30 degrees.

15. THE STACK.—We have exhibited the situation of this rock, which is high above water, nearly as given in the general Chart of the Orkney Islands. Captain Ramage, in his recent sketch of the Nun Bank, &c. represents it as lying S. $85^{\circ} E.$ by compass, 14 miles from the Nun Rock; and, if this be correct, the Stack must lie, on a true bearing, about two miles more to the W.S.W.

16. HOY HEAD.—We give the latitude of Hoy Head, and of other points of the Orkney Isles, agreeably to the surveys of Mackenzie, having, at present, no reason to question his accuracy here, whatever may be the case in other parts. For Stromness, &c. see the particular description, in Section III. hereafter.

17. FAIR ISLAND.—Captain Krusenstern, in the account of his late voyage around the world, says, of Fair Island, "The middle of this island bore due east, and we had the most favourable opportunity that we could have wished of determining its latitude in an accurate manner. The day was clear, the horizon unincumbered, and the sun's altitudes could therefore be most correctly measured. These gave for the latitude of the island $59^{\circ} 32' 46''$. Kerguelen places it in $59^{\circ} 27' N.$ The latitude of Fulo, which bore at the same time N. $6^{\circ} W.$, was found to be $60^{\circ} 6'$, and its longitude $2^{\circ} 10' 55'' W.$ Captain Krusenstern afterwards states the longitude of Fulo, by corrected rate of chronometer, as $2^{\circ} 15' 55''$. M. Kerguelen gives $60^{\circ} 3'$ as the latitude of this island.

"A little after twelve o'clock it fell calm, and continued so the whole day. The people of Fair Isle availed themselves of this circumstance to come on board in several boats, bringing fowls, sheep, fish, and eggs, for sale. They live apparently in the greatest poverty; at least their tattered clothes appeared to indicate such a condition. Fair Isle is a lofty island, with craggy shores, and may be approached within half a cable's length. I learnt, to my utter astonishment, that this small, rocky, and apparently inhospitable, island contained 250 inhabitants, whose appearance was fresh and healthy; and, although they betrayed outward signs of poverty, the supply they brought us sufficiently proved that they were in no want of wholesome provisions.

"In most Charts, ten o'clock is set down as the time of high water on the ground at Fair Isle; on the full and new moon; but we found it later; and, in fact, that it could not be earlier than twelve o'clock in the channel between Fair Isle and the Shetland Islands. The fishermen told us that it was at a quarter past eleven. The tide sets from the N.W., and the ebb, besides continuing an hour longer, appears stronger than the flood. It is of importance to know the exact time of their change in this channel;

for,

for, if great attention is not paid to the ensuing change, and it should happen to fall calm, a ship might easily be driven on shore. The channel is not above twenty miles wide, and the tides, at the time of the full and new moon, run at the rate of from 6 to 7 miles an hour."

The late Mr. Downie gave the latitude of Fair Isle at $59^{\circ} 30'$; Mackenzie the same: and these being in the mean of the different results, are those which we have adopted.

18. **SUMBRO' HEAD.**—This headland, with all the other points of Shetland, have, until lately, been very erroneously represented. It is a well known fact, that, the northern part of Shetland was, not many years ago, laid down as nearly half a degree to the northward of its true position. Mr. Downie seems to have been correct in his latitude of Sumbro' Head, but he represented its longitude as only as $1^{\circ} 20'$. This, however, seems to have been one of the nearest approximations: and indeed, the longitude now rests on the accuracy of Captain Ross, in his longitude of Brassa, as explained in the next note.

Captain Krusenstern gives the latitude of *Scantness*, which is to the westward of Sumbro' Head, as $59^{\circ} 50' 45''$, but he differs with us considerably, in placing Hangcliff on Noss in only $0^{\circ} 55' 25''$ W.

19. **BRASSA SOUND.**—Captain Ross, in the progress of his voyage to Baffin's Bay, seems to have determined the longitude of Shetland. He states that, on the 1st of May, 1818, by observations taken at Gardie House, in Brassa Sound, the longitudes, by different chronometers, appeared to be as follow: by Earnshaw's No. 815, $1^{\circ} 15' 48''$; Arnold's, No. 369, $1^{\circ} 9' 50''$; Parkinson's, No. 228, $1^{\circ} 33' 34''$; Earnshaw's, No. 1024, $1^{\circ} 16' 22''$; Arnold's, No. 25, $1^{\circ} 13' 45''$. Mean of the whole, $1^{\circ} 15' 52''$.

Captain Ross had previously, in 1814, made the longitude $1^{\circ} 15' 30''$ W. Captain Ross has not given us the latitude, which may be presumed to have been accidentally omitted: but that of Hangcliff, which we have gained by inference, agrees exactly with the result of observations made by the Hon. Captain Phipps, in 1773. Gardie House is situate on the western side of Brassa, opposite to Lerwick. Hence we readily gain the position of that town. For a description of the Harbour, see Section III. hereafter.

20. **BALTA SOUND.**—The latitude of the Isle Balta has been ascertained by Captain Ramage, who made it $60^{\circ} 45'$; it had for some time previously been taken at rather less; but Mons. Biot has since made it the same, or very nearly so. The observations of the latter gentleman, well known as a Member of the French Institute, F.R.S. &c., were made at the house of Mr. Edmonstone, the latitude of which he gives as $60^{\circ} 45' 35''$; but observes that, it is certain to within some seconds only, because it was calculated from only three or four series of observations of the sun and stars, made to the south of the zenith. (Length of the pendulum here, reduced to a vacuum and to the level of the sea, 39,1719 inches.)

The longitude of this place, as well as of the other parts of Shetland, has been inferred from Brassa, see preceding note, 19.

21. **FÆROERNE.**—The positions are given from the Chart described in the Table, which bears every feature of accuracy, and is, indeed, the only authentic document. A reduction of it is given on our Chart, and a description of the islands will be found in a subsequent part of this work.

VARIATIONS OF THE COMPASS.—The Variation of the Compass in the Thames Mouth has been, for some years past, about $24\frac{1}{2}^{\circ}$ W. It increases, slowly, to the northward, as was observed by Lieut. Johnson, at the Farn Islands, in 1817, where it was 25° . At Edinburg, numerous observations, taken by Mr. Bain, gave different results, as follow. At Edinburg Observatory, the mean of 120 observations gave $27^{\circ} 50' 10''$; in Granger's Park, the mean of 30 observations gave $27^{\circ} 36' 2''$; in Major Alves's Garden, close to the south side of the Castle drawbridge, the mean of 40 observations gave $27^{\circ} 41' 35''$.—Mean of the whole, $27^{\circ} 42' 30''$.

At Cape Rath, we take the variation to be, as already noticed (Note 7), 30° W. It is less at the Orkney Isles. Captain Krusenstern, in July 1806, found it, to the N.W. of Fair Isle, only $27^{\circ} 3' 30''$. Near the Færoerne, Captain Ross found it 30° W. in 1818; and, about Shetland, on the west, we may therefore conclude that it is now from 28 to 29 degrees.

2. EASTERN of NORWAY inclusive.

Ostende, or Oster

Flissingen, or Fl
West Cappel, ligh
Mouth of the Ma
AMSTERDAM, Sta
Kijk Duin, or K
at the entrance
Texel, fort....

Schelling, West e

Heiligeland, ligh
Hamburg.....
Horn Point.....
Holmen, or Holm
Skaw Point, ligh

NORWAY

Lindersnæs, or
lighthouse [S].
Listerland, Lister
Western end..
Jedderen Reef..
Hviddings-oe, ligh
Skudesnæs, lighth
Tarvestad.....
Udsire, Isle, centr
Selboe Fiord, entr
Kors Fiord, entran
BERGEN, the castl
North Leed, Holu
the entrance...
Udvær, Isles.....
Bue Land, N.W. s
Tempa Bank, mid
Froe Soen, entran
Stadt-Land, N.W.
Rond-oe, lighthou
entrance of Bree
Nogva Fiord, entra
Haaevaer Sund, en

2. EASTERN COASTS of the NORTH-SEA; COASTS of NORWAY, LAPLAND, &c., to the WHITE SEA, inclusive.

	LATITUDE.			LONG. E.			AUTHORITIES.
	°	'	''	°	'	''	
Ostende, or Ostend [1]	51	13	57	2	54	53	The Triangles of France, &c. See 'Memoir on the Atlantic Ocean.'
Vlissingen, or Flushing	51	26	42	3	34	42	
West Cappel, lighthouse [2]	51	31	45	3	26	40	The Grand Survey of the Netherlands, by General Krayenhoff, &c.—1802 to 1811.
Mouth of the Maes	51	57	0	4	5	0	
AMSTERDAM, Stadt-house	52	22	17	4	53	0	Trigonometric Survey of the Texel, by Lieut. J. C. Ryk, of the Dutch navy, 1816.
Kijk Duin, or Kyk Down, at the entrance of the Texel, fort	52	57	3	4	43	10	
Schelling, West end	53	22	30	5	12	0	The Survey of General Krayenhoff, &c., above mentioned.
Heiligeland, lighthouse	54	11	40	7	53	0	
Hamburg	53	32	51	9	58	22	Survey of the Elbe, &c. The continental astronomers, Great Survey of Denmark, completed by Messrs. Bugge and Wilster, in 1805.
Horn Point	55	34	15	8	5	0	
Holmen, or Holms	57	8	0	8	37	30	
Skaw Point, lighthouse	57	43	44	10	37	35	
NORWAY, &c.							
Lindersnæs, or the Naze, lighthouse [3]	57	57	50	7	3	15	The Trigonometrical Surveys of the Coasts of Norway, &c., from Drontheim and the Halten Isles to the Cattegat, performed, under the orders of the Danish Government, by Commissary N. A. Wibe, Lieut. B. d'Aubert, Danish Engineers, and Capt.-Lieut. C. F. Grove, R.D.N. (A beautiful copy of these Surveys, comprised in five Charts, has been published in London, by Mr. R. H. Laurie.)
Listerland, Listersteene, or Western end	58	5	40	6	36	0	
Jedderen Reef	58	45	40	5	29	0	
Hiddings-oe, lighthouse	59	4	0	5	24	30	
Skudesnæs, lighthouse	59	9	0	5	19	0	
Tarvestad	59	22	40	5	14	50	
Udsire, Isle, centre	59	18	0	4	54	0	
Selboe Fiord, entrance	59	57	0	5	2	0	
Kors Fiord, entrance	60	8	30	5	1	0	
BERGEN, the castle	60	24	0	5	20	0	
North Leed, Holmengraa, at the entrance	60	50	30	4	40	0	
Udvær, Isles	61	2	0	4	32	0	
Bue Land, N.W. side	61	17	20	4	37	0	
Tempa Bank, middle	61	27	0	4	31	0	
Froe Soen, entrance	61	41	30	4	49	0	
Stadt-Land, N.W. point	62	11	30	5	7	30	
Rond-oe, lighthouse, at the entrance of Breed-Sund	62	24	35	5	35	25	
Nogva Fiord, entrance	62	42	40	6	10	0	
Haaevaer Sund, entrance	62	52	0	6	26	0	

COASTS OF NORWAY, LAPLAND, &c., CONTINUED.

	LATITUDE.			LONG. E.			AUTHORITIES.
	°	'	"	°	'	"	
Lingvaer Fiord, entrance.....	62	57	0	6	47	0	The Trigonometric Surveys of Norway, &c. See page 17.
Grib-oen or Isles, centre....	63	14	0	7	34	0	
TROND-HEIM, or Drontheim Titter-heads, or S.W. end of Froyen	63	25	30	10	21	30	
Halten-oen or Isles, centre..	64	11	0	9	22	0	The Trigonometric Maps of C. J. Pontoppidan, published at Copenhagen, 1785 and 1795.
Sor-oe, or S.W. of the Vigten Isles [4].....	64	44	30	10	50	0	
Rost, or S.W. of the Loffoden Isles [5].....	67	37	0	10	59	0	
Væroe[6].....	67	42	0	11	41	0	The Danish Surveyors.
Sand-oe, within the Loffoden Isles	68	56	15	16	49	45	
Altengaard (bottom of Alten- Fiord)	69	55	0	23	4	0	
Hammerfest [7]	70	38	28	23	43	15	The mean of several concordant observations.
NORTH CAPE [8]	71	10	15	26	0	30	
Wardhus Island	70	22	36	31	6	45	
Kola	68	52	28	33	0	30	The Russian Surveyors. (See the St. Petersburg Calendar and Conn. des Temps, subs. to 1807.
Kilduin Island.....	69	22	0	*	*	*	
Nagel Island.....	68	32	0	38	2	0	Captain Wm. Ramage, R. N., 1817.
Swijatoi Noss, or Sweetnose	68	9	0	40	2	30	The Russian Surveyors of the White Sea, under Admiral Von Dessen.
Ponoi, the town.....	67	4	30	41	9	15	
Archangel, outer road	64	57	0	40	15	0	
Archangel, city of [9]	64	31	40	40	43	15	
Onega, town	63	53	36	37	58	30	

NOTES.

1. OSTENDE or OSTEND, &c.—The eastern coasts and isles of the North-Sea have, until very lately, been inaccurately represented; and it is to the French, Prussian, and Danish, Governments, in particular, that we owe the more correct delineation, by the appointment of able surveyors, and the publication of the surveys. Our General Chart of the North-Sea, already noticed, and published in 1819, has been adjusted according to these valuable documents.

2. WEST CAPPEL.—It may not be generally known, that, on the 20th March, 1818, the church of West Cappel first appeared as a light-house, for the guidance of the mariner. The light is very conspicuous on approaching the island from the northward or the westward; as it consists of 32 lamps, with 8 reflectors, which may be seen from every point, on 220 degrees of the compass.

3. LINDERSNES or the NAZE.—This point, with its lighthouse, is described in the Book of Directions for the North-Sea, together with the coast to the eastward. The coast of Norway, from Drontheim in the north, to the Naze in the south, is described in a subsequent part of the present work.

4. VIGTEN ISLES and COAST NORTHWARD.—With the Haltenvær or Halten Isles, the nautical survey of the Norwegian coast is terminated, and our knowledge of its configuration hence to the northward is limited to the maps of Pontoppidan, with a few corrections. These maps, however, having for their bases many triangles and astronomic observations,

observations, be degree of confid
The Islands lying without th the islands call two miles from clear.

5. ROST.—Th surrounded by n nearly three lea

6. VÆR-ØE, l Moskenes, is the been told, both l than dangerous, in circuit,) and a is described as fi when it is flood, with a boisterou equalled by the vortex is so pow beaten to pieces the fragments ar turn of the ebb too near the stre describe their bo A bear, once att that island, was c be heard on shor

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observations, bear a genuine scientific character; and we therefore rely on them with some degree of confidence.

The Islands and Ridge of Halten are the northernmost of all the islands and ridges lying without the entrance of the North-Lead of Drontheim, and are the northernmost of the islands called the Froe-oerne. Without the two small ridges, which lie nearly two miles from them to the northward, there is nothing to fear, the sea being open and clear.

5. ROST.—This islet is the south-westernmost of the range called the Loffodens. It is surrounded by numerous rocks, but the channel between it and the next isle, *Væroe*, is nearly three leagues in breadth.

6. VÆR-OE, MALSTROM, &c.—Between *Væroe* and the next larger island, named *Moskenes*, is the famous whirlpool called the *Målstrom*, of which wonderful stories have been told, both by the learned and unlearned. Its effects are doubtless no less singular than dangerous, but by no means so extensive as they have been described, (20 leagues in circuit,) and absorbing, for six hours, all that is near it, water, ships, &c. The bottom is described as full of craggy spires, and the roar of the water is tremendous. The depth, when it is flood, is between 36 and 40 fathoms. The stream flows up within the isles with a hoisterous rapidity, and the roar of its impetuous ebb to the sea is scarcely equalled by the loudest cataracts, the noise being heard several leagues off, and the vortex is so powerful as to absorb every ship that falls within its influence. It is then beaten to pieces against the rocks at the bottom; when the water becomes smoother, the fragments are thrown upward: but these intervals of tranquillity happen only at the turn of the ebb and flow, and last but one quarter of an hour. Whales frequently come too near the stream, and are overpowered by its violence. It is then impossible to describe their howlings and bellowings in the fruitless attempt to disengage themselves. A bear, once attempting to swim from *Moskenes* to *Væroe*, to prey upon the sheep in that island, was caught by the stream, and borne down, while he roared so terribly as to be heard on shore.

In the year 1645, the stream raged with such noise and impetuosity, that, on the isle of *Mosken*, the very stones of the houses fell to the ground. In 1812, it was stated that, the whirlpool was so active, as to make it dangerous for ships to approach within the distance of twelve miles.

To the northward, and about the Loffoden Isles, nature exhibits some of her sublimest features; and it may reasonably be supposed, from the broken fragments of rock, in greater and smaller masses, that many unrecorded convulsions have occurred here from age to age: how the climate and other circumstances have changed is unknown; but many spots of the coast appear

“As if the *KRAKEN*, monarch of the sea,
Wallowing abroad, in his immensity,
By polar storms and lightning shafts assail'd,
Wedg'd with ice-mountains, here had fought and fail'd.”—MONTGOMERY.

Among the wonders of this coast, the *Kraken* is not the least: and upon the existence of this object we are tempted to give a few remarks, extracted from the disquisition of an ingenious and learned writer (W.), in the second volume of *Blackwood's Edinburgh Magazine*.

This gentleman says, “The two most famous monsters described in history, are the *Kraken* or *Krabben*, called by the Norwegians, *Soe-horven*, and *Anker-trold*, and the great Sea-Serpent. Till of late years, the history of these animals was deemed entirely fabulous; and although the existence of the latter has more than once been proved, by the most satisfactory evidence, within a very recent period, the former is still regarded as a mere chimera. It is, indeed, singular, that, when one of those facts has been fairly verified, which had been so long a matter of doubt, and the credibility of the author thereby established, we should still remain equally sceptical regarding the other, though not in itself in any degree more wonderful.

“The history of the *kraken* is still involved in great obscurity. In the first place, it may be observed that, the belief in a certain monstrous sea-animal, which appears in calm weather, on the surface of the ocean, like a floating island, and stretching forth enormous arms, or *tentacula*, is universal among the sailors and fishermen of the Norwegian coast. A similar monster is alluded to by almost all the Scandinavian writers, from the

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the earliest period of their history down to the present day. The epitome of these accounts is this, that, during the prevalence of fine weather, in the warmest days of summer, an enormous animal has been observed in the North-Sea, resembling a floating island, about a quarter of a mile in diameter, and appearing to be covered with seaweed, &c. So soon as it has reached the surface, it usually stretches up many vast arms, which equal in size the masts of ships. Having rested for some time, it begins slowly to sink to the bottom, causing a great eddy in the surrounding waters."

The account given by Pontoppidan, we think it necessary to quote at length, as follows:

"Our fishermen unanimously affirm, and without the least variation in their accounts, that, when they row out several miles to sea, particularly in the hot summer days, and, by their situation, (which they know by taking a view of certain points of land,) expect to find 80 or 100 fathoms water, it often happens that they do not find above 20 or 30, and sometimes less. At these places they generally find the greatest plenty of fish, especially cod and ling. Their lines, they say, are no sooner out than they may draw them up with the hooks all full of fish: by this they judge that the kraken is at the bottom. They say this creature causes those unnatural shallows mentioned above, and prevents their sounding. These the fishermen are always glad to find, looking upon them as a means of their taking abundance of fish. There are sometimes twenty or more boats together, and throwing out their lines at a moderate distance from each other; and the only thing they then have to observe, is, whether the depth continues the same, which they know by their lines, or whether it becomes shallower by their seeming to have less water. If this last be the case, they find that the kraken is raising himself nearer the surface, and then it is not time for them to stay any longer; they immediately leave off fishing, take to their oars, and get away as fast as they can. When they have reached the usual depth of the place, and find themselves out of danger, they lie upon their oars; and, in a few minutes after, they see this enormous monster come up to the surface of the water; he there shows himself sufficiently, though his whole body does not appear, which, in all likelihood, no human eye ever beheld (excepting the young of this species, which shall afterwards be spoken of); its back, or upper part, which seems to be in appearance about an English mile and an half in circumference, (some say more, but I choose the least for greater certainty,) looks at first like a number of small islands, surrounded with something that floats and fluctuates like sea-weed. Here and there a larger rising is observed, like sand-banks, on which various kinds of small fishes are seen continually leaping about, till they roll into the water from the sides of it; at last several bright points or horns appear, which grow thicker and thicker the higher they rise above the surface of the water, and sometimes they stand up as high, and as large, as the masts of middle-sized vessels.

"It seems these are the creature's arms; and, it is said, if they were to lay hold of the largest man-of-war, they would pull it down to the bottom. After this monster has been on the surface of the water for a short time, it begins slowly to sink again, and then the danger is as great as before; because the motion of his sinking causes such a swell in the sea, and such an eddy, or whirlpool, that it draws every thing down with it." He adds, "The great Creator has also given this creature a strong and peculiar scent, which it can emit at certain times, and by means of which it beguiles and draws other fish to come in heaps about it.

"It is a favourite notion of Pontoppidan, and seems indeed extremely probable, that, from the appearance of the kraken, originate those traditions of floating islands so frequently seen in the North-Sea. Thus Debes, in his *Feroa Reserata*, alludes to certain islands which suddenly appear, and as suddenly vanish. Similar accounts may be found in the *Mundus Mirabilis* of Harpelius, and in the History of Norway, by Torfæus. These islands are looked upon, by the common people, as the habitations of evil spirits, which appear at sea for the purpose of confounding their reckoning, and leading them into danger and difficulty. That these superstitious notions are occasioned by the appearance of some monstrous sea-animal, is the more likely, in as far as real floating islands are never seen at sea, being incapable of resisting the swell and tumult of its waters. In lakes, marshes, and rivers, they have sometimes been met with, but never elsewhere.

"But, according to the laws of truth," says Pontoppidan, "we ought not to charge this apostate spirit without a cause. I rather think that this devil, who so suddenly makes and unmakes these floating islands, is nothing else but the kraken, which some sea-faring people call *Sos-draulen*, that is, *Soe-triolden*, or *Sea-mischief*. What confirms

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me in this opinion is, the following occurrence, quoted by that worthy Swedish physician, Dr. Urban Hierne, in his Short Introduction to an Enquiry into the Ores and Minerals of that country, p. 98, from Baron Charles Grippenheim. The quotation is as follows: 'Amongst the rocks about Stockholm, there is sometimes seen a certain track of land, which at other times disappears, and is seen again in another place. Buræus has placed this as an island in his map. The peasants, who call it Gummers-ore, say that it is not always seen, and that it lies out in the open sea, but I could never find it. One Sunday, when I was out among the rocks, sounding the coast, it happened that, in one place I saw something like three points of land in the sea, which surprised me a little, and I thought that I had inadvertently passed them over before. Upon this, I called to a peasant to enquire for Gummers-ore, but when he came we could see nothing of it; on which the peasant said, all was well, and that this prognosticated a storm, or a great quantity of fish,' &c. 'Now,' says the Bishop, 'who is it that cannot discover at first sight, that this visible and invisible *Gummers-ore*, with its points and prognostications of fish, cannot possibly be any thing but the *kraken*, *krabben*, or *soe-horven*, improperly placed in a map by Buræus as an island. Probably the creature keeps himself always about that spot, and often rises up among the rocks and cliffs.'

"Many people have objected to the account of the *kraken*; alleging that, if such a creature had been created, it would have multiplied, like other animals, in the course of time; and, by its occasional occurrence, would ere this have dispelled all doubts concerning its existence. The same arguments were applied to the sea-snake; and the occurrence of the animal itself among the Orkney Isles, in the summer of 1808, and more recently off the American coast, where it was seen by hundreds of people, has scarcely been deemed sufficient to corroborate the testimony of the older writers. It appears, in fact, to be a law of nature, that all animals of extraordinary magnitude produce much fewer young than those of inferior dimensions; at least the elephant, the rhinoceros, the hippopotamus, and the giraffe, are among the least prolific of the race of quadrupeds; and the whale and the walrus are even more sparingly multiplied. We need scarcely wonder then, that so few instances have occurred of a nature sufficiently positive to dispel all doubts regarding the existence of monstrous sea-animals.

"We shall next relate the only instance on record, of the dead body of the *kraken* having been found on the Norwegian coast. The account was drawn up by the Rev. Mr. Friis, consistorial assessor, minister of Bodoen, in Nordland, and vicar of the college for promoting Christian knowledge. In the year 1680, a *kraken* (perhaps a young and careless one) came into the water that runs between the rocks and cliffs in the parish of Alstahoug, (lat. 65° 55') though its usual habit is to keep several leagues from land. It happened that, its extended long arms, or antennæ, caught hold of some trees standing near the water, which might easily have been torn up by the roots: but, besides this, as it was found afterwards, he entangled himself in some openings or clefts in the rock, and therein he stuck so fast, and hung so unfortunately, that he could not work himself out, but perished and putrified on the spot. The carcase, which was a long while decaying, and filled great part of that narrow channel, made it almost impassable, by its intolerable stench. Such is the narrative of Mr. Friis.

"The *kraken* is frequently mentioned by the northern poet, Dass. From those writings, as well as from the popular tales of the country, we might adduce many additional quotations to prove the universality of belief in this uncommon animal. The same monster is, in all probability, alluded to by Olaus Wormius, when treating of whales, &c. That the animal mentioned by Wormius, though classed by him among the whales, is the same as the *kraken*, we have the testimony of Crantz, the missionary, who wrote the history of Greenland.

"Crantz says, 'The most horrible of fabulous sea-monsters is the *kraken*, or *hafgufa*, which many of the Norway fishers pretend to have seen in part, but none entire. They say that, when they find a place which is at one time 80 or 100 fathoms deep, and at another only 20 or 30, and also observe a multitude of fishes, allured by a delicious exhalation which the *kraken* emits, they conclude that there is one below them. They therefore hasten to secure a large draught of the fry around them; but, so soon as they perceive the soundings to grow shallower, they scud away, and, from a safe distance, behold him rising, in a chain of ridges and spires, that thicken as they emerge, till they resemble the masts of innumerable vessels, moored on a rocky coast. He then riots upon the fish that have been stranded and entangled in the forest of spikes upon his back, and, having satiated his hunger, plunges into the depths, with a violent agitation of the waters.'

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"Thomas Bartholinus describes the same animal, likewise, under the name of *hafgufa*, and his relation is confirmed by Olaus Magnus, in his work *De Piscibus Monstrosis*.

"Before proceeding to draw conclusions concerning the true nature of this animal, or to shew the agreement, in many remarkable particulars, which exists between the accounts now quoted, and those given of another sea-monster, by modern naturalists and navigators of unquestionable authority, it may not be amiss to notice, that the general tenor of these relations is strengthened by the authority of Pliny, who has described an animal somewhat similar, with great branches, or rays, &c.

"The vast branches, or rays, with which the animal of Pliny is said to be provided, recalls to mind the description of the long arms of the kraken. The same author, in another part of his work, describes a similar species of animal under the name of *Oxana*, so called on account of its diffusing a strong odour, which, it is said, induces the fish to approach it. It is described as a species of polypus, a name, we may observe, frequently applied by the antients to the sepia, or cuttle-fish, of which we shall have occasion to speak in the sequel. According to the report of Lucius Lucullus, the proconsul of Bœtica, this monstrous polypus used to rob the repositories of salt fish on the coast of Corteia; its head was equal in size to a cask capable of containing fifteen amphoræ; its arms measured thirty feet, and were so thick, that a man could hardly clasp one of them, and were moreover covered with great suckers or fasteners, as large as basins, that would hold four or five gallons each. There is here, then, a manifest agreement with the accounts already cited of the kraken, not only in the general tenor of the descriptions, but also in that remarkable property of being able to allure, within its reach, the smaller fishes, by means of some odorous exhalation.

"Having now, we trust, sufficiently established the existence of a monstrous sea-animal, described by the antients as a polypus, and known in more modern times by the name of kraken, we shall next endeavour to prove its identity with a certain species which has been recorded by some of the most authentic writers in the annals of science. Athanasius, Kircher, and Athapæus, describe a large animal found in the Sicilian seas, provided with ten rays or branches, the body of which is equal in bigness to that of a whale. Pennant, in his description of the eight-armed cuttle-fish, mentions that, he has been well assured, by persons of undoubted credit, that, in the Indian seas, this species has been found of such a size as to measure two fathoms in breadth across the central part, while each arm was nine fathoms in length. He further states that, the natives of the Indian isles, when sailing in their canoes, always take care to be provided with hatchets, in order to cut off immediately the arms of such of those animals as happen to sting them over the sides of the canoe, lest they should pull it under water, and sink it. The opinion of Shaw is equally decided regarding the occurrence of this animal.

"The existence of some enormously large species of the cuttle-fish tribe in the Indian and Northern Seas can hardly be doubted; and, though some accounts may have been much exaggerated, yet there is sufficient cause for believing that such species very far surpass all that are generally observed about the coasts of the European seas. A modern naturalist chooses to distinguish this tremendous species by the title of the colossal cuttle-fish, and seems amply disposed to believe all that has been related of its ravages. A northern navigator, of the name of Dens, is said, some years ago, to have lost three of his men in the African seas, by a monster of this kind, in raking the sides of the vessel. The colossal cuttle-fish seized these men in its arms, and drew them under water, in spite of every effort to preserve them; the thickness of one of the arms, which was cut off in the contest, was that of a mizen-mast, and the acetabula, or suckers, of the size of pot-lids." Shaw's Lectures, vol. ii. p. 137.

The preceding account of this ferocious animal greatly resembles that given by Pliny, and is also consonant with the character of the Norwegian monster.

"The krakens have never been known to do any great harm, unless they have taken away the lives of those who, consequently, could not bring the tidings. I have never heard but one instance mentioned, which happened a few years ago near Frederickstad, in the diocese of Aggerhuus. They say that two fishermen, accidentally, and to their great surprise, fell into such a spot on the water as has been before described, full of thick slime, almost like a morass. They immediately strove to get out of this place, but they had not time to turn quick enough to save themselves from one of the kraken's horns, which crushed the head of the boat so, that it was with great difficulty they saved their lives on the wreck, though the weather was as calm as possible; for these monsters, like the sea-snake, never appear at other times." Nat. Hist. of Norway, vol. ii. p. 213.

"According to Olaus Magnus, there is authentic evidence of the existence of this mon-

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"But, of all the authors who have written on the colossal cuttle-fish, the most zealous is undoubtedly Denys Montfort. In his work there are many instances mentioned of its occurrence in various parts of the world, the accounts of which he was fortunate enough to procure from those who were eye-witnesses to what he relates. He mentions, particularly, the circumstance alluded to by Dr. Shaw, of Captain Magnus Dens having lost three of his men by an attack from this monstrous animal, and the narrative of the fact was given him by Dens himself. He further mentions that, at St. Malo, in the chapel of St. Thomas, there is an *ex voto*, or picture, deposited there by the crew of a vessel, in remembrance of their wonderful preservation from a similar attack off the coast of Angola. An enormous cuttle-fish suddenly threw its arms across the vessel, and was on the point of dragging it to the bottom, when the combined efforts of the sailors succeeded in cutting off the tentacula with swords and hatchets. During the period of their greatest danger, they invoked their patron, St. Thomas, vowing to him a pilgrimage, if, by his intercession, they were successful in this perilous encounter. The confidence inspired by the hope of celestial aid gave fresh vigour to their exertions, and they succeeded in freeing themselves from their dreadful opponent. On their return home, and before visiting their families and friends, they went in procession to the chapel of St. Thomas, and offered up their prayers of gratitude.

"We shall now terminate our investigation of the history of this extraordinary animal. The different authorities, which have been quoted, are, we trust, sufficient to establish the existence of an enormous inhabitant of the deep, possessed of characters which, in a remarkable degree, distinguish it from every creature with which we are at all familiar; and the agreement which may be observed in its descriptions, when compared with those of the celebrated kraken, is sufficiently obvious to warrant the inference which we are now prepared to draw, that the great Norwegian animal so named, is to be considered, not as a wild and groundless chimera, but as either identical with, or nearly allied to, this colossal cuttle-fish. It must be confessed, that many of the accounts to which we have referred, if considered singly, are much too vague and indefinite to form the foundation of any opinion; but it is the general import and tendency of the whole combined, which should be considered. In this view, it would be inconsistent with the spirit of an enlightened philosophy, to reject as spurious the history of an animal, the existence of which is rendered so probable, by evidence deduced from the prevailing belief of different tribes of mankind, whose opinions, it is evident, could not have been influenced or affected by the traditions of each other, but must have resulted from the occasional appearances of the monster itself in different quarters of our globe. That great exaggeration pervades the generality of these accounts is perfectly evident; but it is equally clear that, in all the most striking and characteristic properties, there is a very particular and, indeed, surprising coincidence. Thus, the great length and dangerous power of the arms or branches, and the peculiar odour exhaled from the body of the animal, were well known both to the Roman and the Scandinavian fishermen, and the acetabula, or suckers, are described nearly in the same words by Pliny, and the navigators who collected their accounts from the untutored Indians.

"It is probable that, the animal of the North-Sea is not specifically the same as that of the Indian or Atlantic ocean, though their general characters induce us to believe that they are closely allied. Several well-known species of cuttle-fish, though infinitely less, agree with these enormous animals in the nature of their long and numerous tentacula, and more particularly in the pleasant odour which emanates from their bodies. One of these, called the eight-armed cuttle-fish, appears almost to emulate the ferocity of the gigantic species. Its arms are of great extent, and furnished with a double row of cups, or suckers. When full grown, it is a fierce and dangerous animal, and so strong, that it is extremely hazardous to attack it without caution. Such is the ferocity with which it is said to defend itself, that the strongest mastiff can hardly subdue it without a long and doubtful contest, and it has even been known to attack a person when swimming, by fastening itself with violent force round his body and limbs."

With all due respect to the writer, from whose paper these extracts have been made, we would ourselves at liberty to doubt as to the existence of the kraken. Among his authorities may be included several weak and superstitious persons; nor do any seem to be entitled to implicit confidence. That an enormous sea-monster *may have existed* is probable: but the tentacula, or masts, or chain of ridges and spires, may have been the pinacles of rocks, raised by internal convulsions of the earth; and the flight of the fishermen

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from their productive fishing-banks of 20 or 30 fathoms, may be attributed to the same cause. Sir James Hall has satisfactorily shown that the water has been actually thrown over large portions of dry land by the sudden uplifting of the bed of the ocean. Similar effects have been produced in our own times, on a smaller scale, by the partial upheaving of the bed of the ocean, though the bed may afterward have sunken down to its former level. See *Monthly Review*, 1819, page 386; *Buffon*, &c.

7. HAMMERFEST.—The position of this place, according to the tabular statement of Pontoppidan, is latitude $70^{\circ} 39' 40''$, and longitude $23^{\circ} 35' 50''$, but the later statement of the continental astronomers is $70^{\circ} 38' 22''$, and $23^{\circ} 43' 15''$. An intermediate longitude was given in the *Connaissance des Temps*, for 1802, of $23^{\circ} 53' 15''$. An officer of the British frigate *Sybill*, in 1814, says, I made a survey of this place, and ascertained its latitude and longitude as correctly as possible, which are as follow :

The latitude of Hammerfest town, ascertained by a good sextant and false horizon, taken on shore, was found	$70^{\circ} 38' 34''$
Longitude by Arnold's chronometer, No. 1981, taken on shore, by the same means	$24^{\circ} 28' 0''$
Variation, by same means	$11^{\circ} 4' 0''$
Range of thermometer, on board	70° to 75°
Range of thermometer, on shore	75° to 80°

It will be seen, by the Table, that we reject the longitude of the British officer, on the presumption of its inaccuracy: but his latitude confirms the previous result. The tide flows here, on the full and change, at III h. The vertical rise is 8 feet. It was found to be very much influenced by the wind, which, when prevalent from the N.W., raises the water considerably higher.

"At about this time," says the *Journal of the Sybill*, 20th June, 1814, "we bore away for the North Cape, in order to water and procure any refreshments that could be gotten. After making the land to the westward of the Cape, we stood into a large bay, to look for a place of safety, in order to accomplish our purpose, hardly suspecting that any inhabitants were to be found. On standing in, we observed some boats under sail, one of which was soon brought alongside, that contained a family of Finmarkers, some of whom spoke the Danish language. They informed us of the town of Hammerfest being close by, and offered to take us in. This offer was soon embraced; and, in a few hours, the town opened to our view; which, to our astonishment, contained a church, batteries, &c. The captain of the port soon made his appearance, and anchored us in safety.

"The town of Hammerfest is situated on the island named Qual-oen, 25 Danish miles in extent, and is one of the departments of West Finmark, which contains 25,000 souls. This province is divided into parishes, each having its priest, and over the whole is a bishop, to enforce the duties of the Lutheran religion. There are 200 regular soldiers, scattered in different quarters of the province, commanded by a captain, who governs the whole country. About 30 houses compose the town of Hammerfest, with about 200 inhabitants; with one church, one hospital, a custom-house, and some public and private stores. The custom-house has regular established officers appointed from Copenhagen. The captain of the port is under the same appointment, and wears the uniform of the Danish navy.

"The principal trade of this place is in furs and fish, which are all sent into Russia. The extent of the imports and exports I was not able accurately to learn, but suppose them, in time of peace, to be something considerable. I was told, by the captain of the port, that, in 1808, two hundred sail had been seen here at one time. The Russian merchants have their agents scattered all over West as well as East Finmark. They make their purchases from the Finmarker, with flour, brandy, sail-cloth, fishing-line, coarse cloth, and other articles of that kind, for enabling them to carry on the fishing and hunting business. I was informed that 3000 boats were annually employed by the Finmarkers in fishing; for, so soon as the hunting season is over, they devote their whole attention to the fisheries. Four or five men are attached to each boat.

"Cod and herrings abound on this coast, and are the finest I ever saw, being of much firmer and better texture than those caught on the Banks of Newfoundland.

"As the Finmarker dries his fish in the sun, without salt, it must be but a very poor employment; but, as all his wants are easily supplied, with this kind of commerce he is satisfied, and thinks money of little consideration. Perhaps, after all, they are more happy than the lower orders of more enlightened nations.

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"Perhaps a fishing establishment at Hammerfest might be attended with considerable advantage. The deepness of the water would render a departure from the mode of fishing observed on the Banks of Newfoundland indispensable. The hook and line are here of little consequence. The Finmarkers all fish with nets, and we adopted the same method with considerable success. No place is better adapted than this for curing with salt. From its situation, embosomed by hills, the thermometer, in the summer, as our observations show, often reaches a very high degree of temperature. With proper management, a cod might then have been prepared for the market in three days, while at Newfoundland, in the best weather, it requires five.

"At Newfoundland, they have only from 12 to 14 hours sun; at Hammerfest, nearly four months. The advantages, therefore, as to climate, on the South side of Hammerfest, are most obvious. Perhaps, too, an establishment in the North might, in time of war, be of some importance, as it would the better enable us to prevent our enemies enjoying any share of so lucrative a trade as the whale-fishing.

"The cold is by no means so intense in winter as might be expected. The inner harbour, though seldom agitated by winds, was never seen frozen over; and the moonlight is sufficiently strong to render labour practicable. Nature has been very provident with respect to fuel, the whole country abounding with good turf. The severity of the climate diminishes the vital principle in the human race; the men soon get old, and the women are past child-bearing at thirty-five.

"The chase of the bear, who is never killed before January or February, when they are in the best condition, sets the courage and cool deliberation of the Finmarker in a most conspicuous point of view. In October, the Finmarker carefully watches the haunts of the bear, who at that time seeks for a winter retreat; and, having marked it, returns in January to the attack. Having prepared a lance, to which a cross-bar is affixed, about one foot from the point, the Finmarker, when the wind is in a favourable direction, makes a large fire before the bears' den; the smoke soon irritating the animals, they rush out, one by one: at this critical moment the Finmarker, concealing his lance, places himself behind the fire, and the bear, rearing on his hind-legs, in order to seize him, he plunges his lance up to the cross-bar in his breast. The rest are served in the same manner.

"The rein-deer are here extremely plenty, but very dear: we paid 2*l.* for one of them.

"Some of the better sort of people at Hammerfest possessed a few cows and sheep. The cows were not larger than a bull-dog, and the sheep like a good tom-cat.

"The female beauty of this place had sufficient attraction to induce the gentlemen of the Princess Carolina and Sybille, to give them a ball and supper. The invitation was quite general, and the whole went off with great *eclat*.

"Most of the Russian agents and merchants spoke the English language; but they were by no means anxious to communicate information, which they thought might, one day or other, ruin their commercial pursuits. It was only when they had taken a good dinner and plenty of wine, that any thing particular could be drawn from them."

8. THE NORTH CAPE.—Pontoppidan represents the North Cape as in latitude $71^{\circ} 11' 40''$, longitude $25^{\circ} 53'$, but it is generally admitted that the position which we have assumed is correct. The approach to the North Cape by land has been pleasingly described by Acerbi, in his travels through Lapland; and the following description of it has been given on advancing from the sea. It is to be observed that, the writer describes a near approach only; its distant appearance will be described hereafter, in the Directions for Sailing to the White Sea.

"On approaching the cape, at a little before midnight, its rocks at first appeared to be nearly of an equal height, until they terminated in a perpendicular peak: but, on a nearer view, those within were found to be much higher than those of the extreme peak, or point. Their general appearance was highly picturesque. The sea, breaking against this immovable rampart, which had withstood its fury from the remotest ages, bellowed, and formed a thick border of white froth. This spectacle, equally beautiful and terrific, was illuminated by the midnight sun; and the shade, which covered the western side of the rocks, rendered their aspect still more tremendous. The height of these rocks could not be ascertained; but here every thing was on so grand a scale, that a point of comparison could not be afforded by any ordinary known objects.

"On landing, the party discovered a grotto, formed of rocks, the surface of which had been washed smooth by the waves, and having within a spring of fresh water. The only

accessible spot in the vicinity was a hill, some hundred paces in circumference, surrounded by enormous crags. From the summit of this hill, turning towards the sea, they perceived to the right a prodigious mountain, attached to the Cape, and rearing its sterile mass to the skies. To the left, a neck of land, covered with less-elevated rocks, against which the surges dashed with violence, closed the bay, and admitted but a limited view of the ocean. To see as far as possible into the interior, our navigators climbed almost to the summit of the mountain, where a most singular landscape presented itself to the view. A lake in the fore-ground had an elevation of at least ninety-feet above the level of the sea; and, on the top of an adjacent, but less lofty, mountain was another lake. The view was terminated by peaked rocks, chequered by patches of snow.

“At midnight the sun still remained several degrees above the horizon, and continued to ascend higher and higher till noon, when, having again descended, it passed the north, without dipping below the horizon. This phenomenon, which is as extraordinary to the inhabitants of the torrid and temperate zones, as snow is to the inhabitants of the torrid zone, could not be viewed without a particular interest. Two months of continued day-light, during which space the sun never sets, seem to place the traveller in a new state of existence, while the effect on the inhabitants of these regions is singular. During the time the sun is perpetually above the horizon, they rise at ten in the morning, dine at five or six in the evening, and go to bed at one. But during the winter-season, when, from the beginning of December until the end of January, the sun never rises, they sleep above half the twenty-four hours, and employ the other half in sitting over the fire, all business being at an end, and a constant darkness prevailing.”

9. ARCHANGEL.—This city has been strangely misrepresented in every way, both as to latitude and longitude: but, it is to be presumed that, the position now assigned, being that given by the Russian astronomers, on the late survey, is correct. See the Chart, and the directions given hereafter. Kandenos, or Candinose, is placed in the New Russian Chart in lat. 58° 38' 30", and long. 44° 36' 0".

VARIATIONS OF THE COMPASS.—It has already been shewn, in the note on this subject, page 16, that the Variation, on the west of the Shetland Isles, is from 28 to 29 degrees: on the east of these isles it diminishes to 25 degrees; and on the coast of Norway, in the same parallel, it does not exceed 24 degrees. Near Drontheim, in the year 1790, it was 22° 30', and thence to the eastward and northward it diminishes to the North Cape, where it is, at present, about 11 degrees. From the North Cape to the White Sea it continues to diminish, as shewn on the Chart; and it is, near the Bar of Archangel, only 3° West.

The Variations on the voyage from Shetland to Archangel, for the year 1814, have been given by Captain Ramage, as follow:

Lat.	Long.	Var.	Lat.	Long.	Var.
62° 17'	1° 46' W.	27° 40'	71° 30'	29° 30' E.	5° 26'
63 37	0 30 —	20 30	69 0	36 0 —	3 30
65 29	1 51 E.	19 20	68 0	40 0 —	} 3 0
67 8	4 46 —	18 50	To the Bar of Archangel.		
69 30	10 1 —	16 30			

The line of NO VARIATION passes through the entrance of the White Sea; as it appears, by the late survey, that, at Kandé-nos, or Candinose, the variation is 3° East; and, in the Gulf of Mezene, or Mesen, 2° East. At Sweetnose, as shown by the same survey, it is only 1° West; and, at the entrance of the Gulf of Onega, 2° West.

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3. SPITZBERGEN

3. SPITZBERGEN, EAST GREENLAND, and ICELAND.

	LATITUDE.			LONGITUDE.			AUTHORITIES.
	°	'	''	°	'	''	
Bear or Cherry Island [1]	74	30	0	19	5	0 E.	} Captain Wm. Scoresby. (See Laing's Voyage, p. 45.)
Hope Island, centre	76	24	0	20	30	0 —	
South Cape	76	35	0	14	0	0 —	} Voyage of the Hon. Captain Phipps, in 1773, Dutch Charts, &c. The positions ascertained on the late voyage of the Dorothea and Trent, having been deposited at the Admiralty, and not published.
Saddle or Black Point	78	7	0	10	35	0 —	
Fair Foreland	78	51	0	8	44	0 —	
Amsterdam Island	79	45	0	9	15	0 —	
Cloven Cliff	79	56	0	10	6	0 —	
EAST GREENLAND, in general [2]	*	*	*	*	*	*	} See the NOTE, No. 2.
ISLE OF JAN MAYEN [3]							
North Hook	71	8	20	7	25	48 W.	} Captain Wm. Scoresby, jun., F. R. S., Ed., and F. W. S.
South Hook	70	49	0	8	44	0 —	
ICELAND. [4]							
Portland Isle	63	22	0	18	54	0 —	} The celestial and chronometric observations of the Danish surveyors, &c., 1776 to 1788.
Reikianæs	63	55	0	22	47	45 —	
REIKIAVIIG, the road	64	9	0	21	51	30 —	
Bessestœd	64	6	0	21	54	0 —	
Lambhús	64	6	17	21	55	30 —	
Patríx Fiord	65	35	45	24	9	53 —	
Holum	65	44	0	19	44	0 —	

NOTES.

1. SPITZBERGEN, in GENERAL.—Our knowledge of the coasts of Spitzbergen seems limited to those on the western side; or, at least, that of the eastern coast is exceedingly imperfect. In all the land there are neither settlements nor fixed inhabitants; but, from some Russians, who have wintered there, we learn that the winter generally sets in about the latter end of September and beginning of October. It sometimes sets in with winds from the North, N. N. W., and N. W., and, at other times, commences with calm weather, hard frosts, accompanied with snow.

In winter, the winds are very high and frequent, so that two-thirds of the season may be said to be boisterous. Storms of snow are very frequent, and of long duration, continuing for two, three, and four, days, and sometimes for as many weeks; but the latter do not occur but once or twice in a year.

Cold and dreary as the long winter of Spitzbergen must certainly be, it does not seem to be more severe than that of Nova-Zembla, to the south-eastward. The latter, in 76° N. produces not even grass, so that the only quadrupeds which frequent it are foxes and bears, both of which are carnivorous. In Spitzbergen, on the other hand, are reindeer, which are often excessively fat; and there are several plants which flower during the summer.

The

SPITZBERGEN

The nature of the barrier of ice, on the north side of Spitzbergen, is so well known, that it would be almost superfluous to describe it. This barrier is not supposed to be very antient; as it is clear, from many facts, collected and recorded by the Honourable Daines Barrington and others, that the sea, to the northward, has frequently been so clear of ice, that ships have nearly reached the Pole.

The learned and ingenious writer, above mentioned, has exhibited, in his enquiries, an uncommon degree of ardour, and he sought for information on the subject in every quarter, abroad and at home. With regard to Spitzbergen, he enquires of Captain John Hall, "From what quarter is the wind coldest when off that coast?"

Answer.—Northerly and E.N.E. winds are most frosty; but snow and frost we have commonly with all winds, except during part of June, July, and August. If the winds be southerly, the weather is milder, but subject to snow, sleet, and thick weather. The winds, currents, and the ice, are very variable.

Captain Humphrey Ford said, "I generally find that northerly winds bring frost and snow; on the contrary, southerly winds bring mild weather and rain; but none of those winds appear to be periodical, unless close in with the land called Fair Foreland, where I generally find the winds, in the months of June and July, to blow mostly from S. S.W., and very often excessively strong."

Capt. Ralph Dale said, "I have observed, let the wind blow from what quarter it may, it is, at times, impregnated with frost, snow, &c.; but when most so I am unable to determine. As for rain, I do not recollect ever seeing any there. The weather I have generally found mildest when the wind blows southerly. As for periodical winds, I do not suppose that there are any in Greenland."

Captain John Greenshaw said, "In regard to the winds and weather, it freezes continually; but the wind from the southward doth commonly bring rain and thick foggy weather, which is chiefly in the latter end of June and July. If you are to the northward and westward of Spitzbergen, the wind from the N.W. and N.N.W. doth always open the ice; but, at the same time, if it come to blow any time from that quarter, packs it close in with the land; and the winds from the southward have the contrary effect."

Captain Andrew Fisher, who had been twenty-four voyages from England to the Greenland Seas, has said that, "The best season of the year, to be at or near Spitzbergen, is from the 15th of May to the 1st of June, though the years differ, and the laying of the ice exceedingly: some years it is not possible to get north of 80°; at other times, you may meet with very little ice, which is chiefly owing to the weather in winter, and the winds in April and May.

"The land of America is sometimes seen by our Greenland traders in from latitude 74° to 76°; and, as it is not seen any farther North, is supposed to round away to the N.W., which makes it imagined by many that there is not any land near the Pole.

"South winds bring most snow; north winds bring frost; but that is in the month of April and two-thirds of May; after that time, to the 1st or 10th of July, it is, in general, mild, fine, clear, sunshine, weather, and winds variable; after that again, often thick fogs and high winds."

Sam. Standidge, Esq. in a letter, dated 4th March, 1774, said, "It appeared to me that the narrowest place in those seas was betwixt Spitzbergen and the American (Greenland) shore, where the current is observed to come always from the north, which fills this narrow place with ice, but, in general, loose and floating in the summer, though, I believe, congealed and permanent in the winter. Those from whom I enquired informed me that the sea was abundantly clearer to the north of Spitzbergen, and the farther north the clearer. This seems to prove a wide ocean and a great opening to the north, as the current comes from thence that fills this passage, as aforesaid."

Captain James Marshall, in a letter dated 25th February, 1776, said, "I remember that, about five years since, I was in 81° north latitude, by observation, when there was a clear sky to the northward, as far as the eye could reach from the mast-head; and I could not help observing to my people, that, if it had happened that we were then upon discovery, we might have had a fine run to the north, as the wind blew fresh at south. The like clear sea I have observed several times during the time I have been in the Greenland service, which is now about twenty-one years. I have no doubt but that a navigator might reach a higher latitude than I have been in, provided he was well acquainted with the currents and the ice, for much depends thereon, and took the advantage of a favourable season. I have remarked that, when the frost has been severe

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in England and to the southward, there has been a great deal less ice to the northward in the ensuing summer than usual, and weather has been remarkably fine in Greenland."

Mr. Barrington says, "If I am right in what I have before supposed, that the ice, which often packs near the coasts of Spitzbergen, comes chiefly from the rivers which empty themselves into the Tahtarian sea, it seems highly probable that this is the proper time of pushing to the northward, as the ice in such rivers cannot be then completely broken up. What other ice therefore may be seen at this time is probably the remains of what was disembogued during the preceding summer.

Another proof of this arises from what happened in 1773, for the Carcass and Racehorse were obstructed, at $80\frac{1}{2}^{\circ}$, by an immense bank of ice, during part of the months of July and August; but four Greenland masters were a degree farther to the northward, during the months of May and June, in the same year.

Letter from Mr. John Walig, who had been master of a Greenland ship from the year 1740, to his owners.

Helder, 3d Jan. 1775.

"In answer to your letter, of the 22d of December, concerning the question whether we have been nearer to the pole than $80\frac{1}{2}^{\circ}$, I must inform you that we have been often to 81° , near the Seven Islands, to the northward of the N.E. land, and some have been in 82° , but then not clear from ice, in which they drove about. I never heard of any discoveries made there, as they have always been fishers, who, *driving with the ice to the northward*, leave that direction upon getting room; and then, now and then, the sea has been free from ice; that has happened commonly in the months of June and July. In 1763, I spoke with a Scotch captain in Greenland, who told me he had been to 83° , that the sea was then free from ice, but that he had made no discoveries, without mentioning any more particulars, for *we ask after nothing but whales*. When I spoke to him, it was in July, and then we could get no farther North than $79^{\circ} 30'$, for the ice. In short, we can seldom proceed much higher than $80\frac{1}{2}^{\circ}$, but almost always to that latitude; for, it seems that, the *conjunction of the currents often fastens the ice there*. I fished last year from $80^{\circ} 25'$ to $80^{\circ} 35'$, according to the land we made afterwards.

"But, in the year 1707, Captain Cornelis Gillis, having gone without any ice to the northward of 81° , sailed to the north of the Seven Islands, proceeding from thence east, and afterwards S.E. remaining to the east of the north-east land; when coming again to latitude 80° , he discovered, about twenty-five miles East* from the country to the N.E., very high lands, on which, as far as we know, no one has ever been. As to the season when the Spitzbergen seas may be expected to be free from ice, I believe, according to my observations, that the most open sea to the northward generally happens in the month of September; but then the nights begin, and make the navigation dangerous.

"I am, &c. JOHN WALIG."

Captain William May, of the Dutch navy, in his communications, stated that, "In all my conversations with our Greenland commanders, I never failed to ask which course they would take to reach high northern latitudes; the result was, that, they would never seek it to the westward of Spitzbergen, but run out to the north from the west coast of Nova Zembla. Mr. Baske's reasons and those of other commanders were,

1st. That all the western coasts of the northern countries were, for the most part, free from ice, occasioned by the winds and tides coming chiefly from the east, which experience proves.

2d. That the ice comes originally from the Tahtarian Rivers; for, that the sea never freezes but where it is calm, and at the same time a great snow falls.

3d. That near the Seven Islands navigators often meet with a great north-east swell, which proves that, at such time, the sea, to a considerable distance to the N.E., is not locked up by the ice.

4th. That the drift-wood could not come to the northward of Spitzbergen in case the seas between the North of Asia and that island were frozen; whereas a great quantity of that wood is driven on the Northern Coast of Iceland, which is a demonstration that the currents come from the north-east.

* Dutch miles; equal to 100 of our nautic miles.

5th. That,

5th. That, in some of the trees, the marks of the axe were very plain, and the colour of the wood so fresh, that they certainly had not been six months in the sea.

6th. That some whole trees appeared with buds thereon, which they think could not have remained so fresh if the trees had been a year in salt water.

7th. That the East Coast of Greenland was now discovered to the latitude of $79\frac{1}{2}^{\circ}$; that it probably extended farther to the N.N.E., which they look upon to be the cause of the stoppage of ice between that coast and Spitzbergen, and the reason why they never find a N.W. or northerly swell.

8th. That generally all ships, which had once got to the north as far as 82° , met with little or no obstructions from the ice; and more arguments to the same purpose. There were some, however, would rather make the trial between Spitzbergen and the land discovered by Mr. Gillis.

"Thus, says Mr. Barrington, do the Dutch seamen, employed in the Greenland Fishery, agree with our own countrymen, in never having so much as heard of a perpetual barrier of fixed ice, to the northward of Spitzbergen, in $80\frac{1}{2}^{\circ}$,* which indeed is one of their most common latitudes for catching whales, whilst all of them suppose the sea to be generally open in those parts, and many of them proceed several degrees beyond it.

"The Rev. Mr. Tooke, chaplain to the factory at Petersburg, hath been assured by several persons who have passed the winter at Kola, in Lapland, that, in the severest weather, whenever a northerly wind blows, the cold diminishes instantly, and that, if it continues, it always brings on a thaw so long as it lasts.

"He hath also been informed, by the same authority, that the seamen, who go out from Kola upon the whale and morse fisheries early in March, (for the sea never freezes there,) throw off their winter garments so soon as they are from 50 to 100 versts† from land, and continue without them all the time they are upon the fishery, during which they experience no inconvenience from the cold, but that, on their return, (at the end of May,) as they approach land, the cold increases to such a severity, that they suffer greatly from it.

"This account agrees with others: the north wind cannot therefore, during the coldest seasons of the year, be supposed to blow over ten degrees of ice.

"Governor Ellis, indeed, whose zeal in prosecuting the attempt of discovering the N.W. passage, through Hudson's Bay, is so well known, hath suggested to me an argument, which seems to prove the almost impossibility of a perpetual barrier of ice from $80\frac{1}{2}^{\circ}$ to the Pole.

"If such a tract hath existed for centuries, the increase, in point of height, must be amazing in a course of years, by the snow, which falls during the winter, being changed into ice, and which must have formed, consequently, a mountain perhaps equal to the Peak of Tenerife. Now the ice, which sometimes packs to the northward of Spitzbergen, is said, commonly, not to exceed two yards in height. D. B."

The ices and other phenomena of the ocean will be treated on in a subsequent division of this work: The later expeditions to Spitzbergen in a following one; so that here we may close the general note on Spitzbergen.

CHERRY or BEAR ISLAND, to the southward of Spitzbergen, is described by Mr. Laing, as mountainous, craggy, and dreary in its aspect; exhibiting, in some places, a scene of black stupendous precipices; and, in others, lofty eminences, covered with snow.

An officer of the Sybille, quoted by Mr. Laing (p. 138), says, "On the 16th of June, 1814, saw Bear or Cherry Island, which, at a distance, looks like a saddle, both extremities being very high, and the middle low. It may be seen 20 leagues off in clear weather. At noon it bore, by compass, N. by E. $\frac{1}{2}$ E., when I observed in $73^{\circ} 44'$ good observation, and our chronometer gave good sights $20^{\circ} 3' E.$ By seven p. m. we had run 33 miles on a N. N. W. course corrected, when the south end of the island bore, by compass, E. by N. 3 or 4 leagues; which, brought up from noon, will make it $74^{\circ} 19' N.$ and $20^{\circ} 7' E.$ At this time it came on foggy, and prevented us from ascertaining its extent. Soundings are to be obtained to the southward of this island, and up to Spitzbergen; black mud and small shells."

* One, indeed, says that, the ice frequently packs in that latitude, which he supposes to arise from the meeting of two currents.

† Three versts are equal to two English miles.

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"19th, saw Spitzbergen, and, on the 20th, were close in with the South Cape. We carried regular soundings to 11 fathoms, about three miles off; but this part of the coast appearing to be surrounded with rocks, we did not attempt approaching it more closely. Our chronometers made it in about $16^{\circ} 2' E$. We saw some beacons placed along the coast, each in the form of a cross, which are, no doubt, placed there for the guidance of the Russian hunters."

It may be observed that, we have rejected the position as given in the Sybille's journal, although *apparently* from good observations, and have preferred that of Captain Scoresby. See note on Hammerfest, page 24.

2. The COAST of EAST-GREENLAND, in general.—By East-Greenland, we mean that land which is so designated in the Chart, and not Spitzbergen, which is sometimes so called by navigators. It is generally known that, in ages past, this country, as well as that to the west, was inhabited, although it has long since been rendered inaccessible, by the annual accumulation of ices on the coast. "The Danish Chronicle says that, the Greenland colonists were tributary to the kings of Norway from the year 1023; soon after which they embraced Christianity. In its more flourishing period this province is stated to have been divided into a hundred parishes, under the superintendance of a bishop. From 1120 to 1408, the succession of seven bishops is recorded. In the last-mentioned year, *Andrew*, ordained Bishop of Greenland, by *Askill*, Archbishop of Drontheim, sailed for his diocese, but whether he arrived there, or was cast away, was never known. We still see, on the old Charts, the situation of the cathedral, lat. $65\frac{1}{2}^{\circ}$, of the church of *St. Olaus* in $65\frac{1}{2}^{\circ}$, and of *Dyrnar* in $64^{\circ} 20'$, but all further knowledge is lost; perhaps for ever.

Though the coast is, in general, inaccessible, it does not appear that the sea to the northward is always and uniformly obstructed by ice. From the periodical papers of the year 1817, we learn that, in this season, a brig from Bremen, after making *Jan Mayen's* island, stood to the westward in quest of seals: and, in latitude 72° , saw the land to the westward: she sailed due north along this coast, without seeing ice; and the commander declares that, he saw bays, &c. to latitude $81^{\circ} 30'$, when he found that he could steer to the westward, which he did for several days. That he then lost sight of land; and, directing his course to the southward and eastward, he, in 78 degrees, fell in with the first fishing-vessels he had seen. He gave this account to several ships from Aberdeen, pointing out his course upon the Chart. To the northward he saw no appearance of ice; and this part of his story is very probable; for several ships had been as high as 83° in this summer, where they saw no ice, or appearance of it, to the northward. When the Captain was asked, with symptoms of surprise, whether he had seen no ice here, he waved his hand to the open sea, and answered, "No more as dere, no fish, no seal." He saw no marks to show that the country was inhabited.

It does not appear that the coast of East-Greenland, as exhibited in our Charts, can be correct; but there seems to be an almost total deficiency of materials for amendment; with, probably, the single exception of the following observations made by Captain Scoresby, jun. addressed to Professor Jameson, of Edinburg, 27th August, 1817. This gentleman says,

"On account of the singular openness of the Greenland seas, I have twice (during my last voyage) penetrated to the longitude of $10^{\circ} W.$, when the weather was foggy, and once at $10\frac{1}{2}^{\circ} W.$ when the weather was clear; on which last occasion, (July 29-30,) the coast of Greenland, rarely before seen by any British Navigator, was in sight. According to our best, and indeed only, authorities, the Dutch, this coast of Greenland is laid down in longitude 4° or $5^{\circ} W.$ from Greenwich, in the latitude of 75° to $76\frac{1}{2}^{\circ}$. Its situation, by the Dutch, is very erroneous. I had good sight, by the chronometer, in $5\frac{1}{2}^{\circ}$, $7\frac{1}{2}^{\circ}$, and $9^{\circ} 33' W.$ immediately previous to each of the occasions in which we penetrated so far as 10° and $10\frac{1}{2}^{\circ} W.$ Hence, I am assured that, the land lies farther to the westward than $11^{\circ} W.$ in each parallel of latitude between 74° and $76^{\circ} N.$ It is probable as far West as 14° , 15° , in the parallel of 74° , in which I saw it. The ice in this situation was mostly muddy, and black, with dirt on the edges, as if it had recently rubbed against the shore. We were sixteen days navigating between the meridians of $5\frac{1}{2}^{\circ}$ and $10^{\circ} W.$ without even being able to see four miles, from fog; and, frequently, the mist was so thick for eight hours together, that we could not see objects at the distance of a hundred yards. At these times, when we had light winds, we sometimes groped, as it were, through the ice, for a few hours in the day, but generally moved in the evening, and in fresh winds."

3. ISLAND OF JAN MAYEN.—Our knowledge of the situation and nature of this island is derived from a paper, read before the Wernerian Natural History Society, on the 30th of December, 1817, and entitled 'Narrative of an Excursion upon the Island of Jan Mayen; containing some account of its appearance and productions; by Wm. Scoresby, jun. F.R.S. Ed. and M.W.S.' From this interesting paper we have made the following Extracts:

"JAN MAYEN received its name from that of its discoverer, who visited this island, according to the Dutch authorities, in the year 1611; but, as their whale-fishery did not commence until 1612, it is probable that it was not discovered until after that period. It is situated in latitude $70^{\circ} 49'$ to $71^{\circ} 8' 20''$ N. and longitude $7^{\circ} 25' 48''$ to $8^{\circ} 44' W.$

"On approaching Jan Mayen, the first object which strikes the attention, when the atmosphere is clear, is Beerenberg (*Bears' Mount*). This mountain rears its icy summit to the height of 6870 feet above the level of the sea, and frequently appears above the clouds. It is seated on a base, which is, of itself, mountainous. The general appearance of the land strikingly resembles that of the coast of Spitsbergen, both in colour and character. As, at Spitsbergen, your approach to it seems amazingly tardy. At the distance of ten or fifteen miles, a stranger would suppose himself within half a league of the rocks. This deception arises partly from the great elevation of the sea-coast, and partly from the strong contrast of light and shade, produced by the blackness of the rocks and whiteness of the snow, with which the land is in a great measure covered. At this time, (August the 4th,) all the high lands were covered with snow and ice; and the low lands, in those deep cavities where large beds of snow had been collected, still retained part of their winter covering, down to the very margin of the sea.

"Between the Capes North-east and South-east, three remarkable icebergs appear. They occupy three hollows in the cliff, which is almost perpendicular, extending from the base of Beerenberg to the water's edge. Their perpendicular height, ascertained geometrically, appeared to be about 1284 feet. These icebergs differed in appearance from any thing of the kind I had before seen. They appeared rough on the surface, were of a greenish-gray colour, and presented altogether the appearance of immense cataracts, which seemed as if, when in the act of tumbling from the summit of the mountainous coast, they had been suddenly arrested in their progress, and congealed on the spot by the power of an intense frost.

"Like cataracts, their prominent colour was variegated by snow-white patches, resembling foam; they seemed to follow, in a great measure, the figure of the rocks over which they lay, and were marked with curvilinear striæ, running from the summit to the foot of the icebergs. As in cataracts, also, the jetty points of the most prominent rocks were here and there seen peeping through their surfaces.

"I left my ship (the *Esk*) at three quarters past one in the morning, accompanied by Captains Bennet and Jackson, whose ships were close by us at the time, and landed at half past two, on a beach covered with coarse greenish-black sand, whereon there was a considerable surf. This was the first place from North-east Cape, four leagues distant, where the coast seemed, at a distance, to be at all accessible. Great-wood Bay, of the Dutch, was immediately on the left, to the westward, separated by a rocky islet; on our right, South-east Cape was at the distance of five miles. The beach was sandy through an extent of two or three miles in length, and about a furlong in breadth. It was strewed throughout with logs of drift-wood, some of which seemed to be tolerably good timber, others were much bruised, and a little worm-eaten. One log, I observed, had been squared, and was marked with the letter G.

"I had not advanced many paces before I observed signs of volcano. The sand (iron sand) was coarse, black, or reddish-brown, mixed with greenish-coloured crystals of augite. The opaque parts of this sand were very ponderous, and strongly magnetic. When separated by the magnet, they strikingly resembled cannon gunpowder, both in colour and in form of the grains. The beach, (after a few feet of rise,) produced by a vast bed of this sand, which was thrown up apparently by the waves, continued level to the margin of the cliff, which was, in this place, at the distance of about a quarter of a mile, but seemed occasionally to have been covered by the sea only to that extent. Coarse pebbles, and afterwards large masses of lava, were seen at a little distance from the sea; blocks of burnt clay, and large masses of red clay, partly baked, but still in a friable state, occurred about the base and sides of the cliff.

"After leaving the shore, where a few common pebbles, such as quartz, porphyry, indurated clay of various colours, gravel, sand, and other alluvial substances, together

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with the floetz-trap rocks, were seen, I perceived no other minerals, but such as bore indubitable marks of recent volcanic action. Seeing a steep and peculiar-looking mount close by, from which the profusion of cinders, earth-slag, burnt clay, scoriæ, &c., around us seemed to have been projected, we hastened to climb its loose and rugged sides. The steepness of the hill, and the looseness of the materials of which its surface was composed, made this ascent a most fatiguing undertaking.

"The summit of this volcanic mountain, which was from 1000 to 1500 feet in elevation, afforded a view interesting and grand. To the north, appeared Beerenberg, now first distinctly seen, free from clouds, rising in majestic importance, by a steep and increasing slope, from the very verge of the sea on the south, to the height, apparently, of the highest clouds. At the foot of the mount, on the south-eastern side, near a stupendous accumulation of lava, bearing the castellated form, was another basin or crater of a volcano, of smaller dimensions than the one already described, situated on a level, very little above that of the sea. Towards the north-west, a thick fog obscured the prospect, which, as it advanced with majestic grandeur towards us, gradually drew the curtain over the distant scenery, until, at length, the nearest mountains were wrapped in impenetrable gloom; at the same time, the atmosphere of above half the hemisphere, lying towards the south, east, and west, was altogether free from obscurity, and the sun shone with resplendent blaze. On the west, the whole of the eastern shore of the island was distinctly seen to the south-western point, where it abruptly terminates; and a rock, lying at a distance from the shore, exhibited a resemblance so strikingly like that of a ship under sail, that it called forth from the sailors the frequent exclamation of 'a ship,' or, 'a sail.' Excepting the interest excited by the volcano, on the ridge of whose summit we long admired the sublimity of the prospect around us, Beerenberg sunk every other object into insignificance. A solid mass of ice capped its summit, and an almost uninterrupted stratum of the same extended to the water's edge, about a league to the eastward of us. The blackness of the rocks, the delicate greenness of the ice, and the whiteness of the snow, formed a contrast, at once bold, delicate, and beautiful. In the valleys, the snow presented a surface pure and unbroken; on the sides of the hills, the naked rocks protruded their black points through the surface of the snow; and, on the peaks of the loftier mountains, ice and snow harmonized together, and appeared to be as firm and indissoluble as the rocks themselves.

"When we landed, we could not perceive the least sign of vegetation on any part of the beach or neighbouring land; but, on ascending the sides of the volcano, we saw several plants in flower, specimens of each of which I collected; and, on my return to the ship, had them placed in a box of earth and sand.

"Near the sea-shore, the burrows of blue foxes were seen in different places, and traces of their feet upon the beach, below high-water mark. The foot-marks of bears, and probably of rein-deer, also, were perceptible. The birds were neither so numerous, nor appeared in such variety, as I had anticipated. We, however, saw burgo-masters, fulmars, looms, sea-parrots, sea-swallows, &c.

"We returned to our ships at six in the morning, when, the weather being clear, I took bearings of the most remarkable parts of the coast, together with several altitudes of the sun, for ascertaining the longitude by the chronometer.

"A fishing-party, whom I sent out, proving unsuccessful in the offing, approached the shore, about two miles to the eastward of the place we visited; where, though the surf was considerable, and the strand very contracted, they succeeded in effecting a landing. They observed much drift-wood, a boat's oar, and some other pieces of wrought wood, scattered along the shore. Every mineral they noticed bore the marks of volcanic action. Near some large fissures, which here and there occurred in the rocky precipitous cliff, vast heaps of lava appeared, which seemed to have been poured out of these chinks in the rocks. Cinders, earth-slag, arenaceous iron-stone, and various descriptions of volcanic rocks, covered the beach, and so much of the cliff as they had leisure to examine." *Whitby, 6th October, 1817.*

4. ICELAND, in general.—A description of this varied and beautiful country will be given hereafter. The positions in the Table are those of the Danish astronomers, published by the Admiralty of Denmark, under the orders of which a part of the Eastern coast, and a greater portion of the Western coast, have been surveyed. The surveys which we have in possession are, on the East, the coast from Borgar Fiord to Breidal's Bay, with particular plans of Lodmunder Fiord, Faskrud Fiord, and Breidal's Bay: these were executed by, and under the direction of, Captain P. J. de Wleugel, commander

of the frigate Kiel, 1776. The surveys of the eastern part are, Faxe and Breede Bays, with particular plans of the environs of Reikiaviig, &c., surveyed by H. E. Minor, 1776 and 1777, and published in 1788. It is said, that the King of Denmark has been lately pleased to order a completion of the work. The town of Reikiaviig is the present capital, and its population amounts to about 50,000 persons.

The tides or currents set very strongly to the south-eastward on the western side. On the eastern side, also, the flood sets to the southward and S.S.W. High water, full and change, XII to II.

VARIATIONS OF THE COMPASS.—According to Mr. Bain, the Variation near Cherry Island, in 1814, with the ship's head W.S.W., was 14° 28'; between Cherry Island and Spitzbergen, in 75° 12' N. and 18° 21' E.; it was 16° 12', with the ship's head N. by E. Off Prince Charles' Island, in 78° 11' N. and 6° 55' E.; it was 19° 6' with ship's head E.S.E.

The officers of the Dorothea, in 1818, made the variation in the Harbour of Sweerenberg, within Amsterdam Island, 24° 30', being nearly the same as in the River Thames. Captain Phipps made it so much less in 1773, that we are inclined to think the true quantity does not exceed 20° in this place.

The Danish officers, in 1776, allowed 30° as the variation on the Eastern Coast of Iceland; and we presume, from the late voyage of Captain Ross, that it is very little more at the present time.

4. GREENLAND, DAVIS'S STRAIT, and BAFFIN'S BAY.

	LATITUDE.			LONG. W.			AUTHORITIES.
	°	'	''	°	'	''	
Staatenhuck, or Staten Hook	59	38	0	46	20	0	Inferred, by Danish Chart from the determined situation of Cape Farewell.
CAPE FAREWELL [1]	59	45	0	47	50	0	Captain Upton, R.N., from lunar observations, taken in the Sybille, frigate.
Lichtenfeld	62	59	0	51	18	0	Inferred, by Danish Chart, from Godt-haab.
Godt-haab [2]	64	9	55	51	50	0	Dr. Maskelyne's Requisite Tables.
Mosquito Cove	64	55	13	52	56	45	Lieut. Richard Pickersgill, 1776 (Forster says, 64° 57' 0'' N.)
Cocken or Coquin Sound	65	38	0	53	0	0	Captain John Ross, 1818 (Mis-stated in Captain Ross's Table.)
Victorious Rock [3]	66	21	0	53	47	0	Journal of the Victorious, M.W. of 74 guns, 1814.
Queen Anne's Cape	66	24	0	53	20	0	Capt. Ross, in the Isabella, 1818.
Boquhan Reef, West end [4]	67	40	0	53	55	0	Latitude, Mr. Thomas Buchanan. Longitude inferred from the Journal of Captain Ross.
Wild or Savage Isles	67	44	0	53	40	0	The observations made in a voyage of discovery, under Capt. Ross. (See the next page.)
North Bay Islands	68	19	0	53	47	0	
Cape Chidley [5]	68	37	0	53	33	0	
Duck Island	68	49	0	53	42	0	
WHALE ISLANDS, Kron Prins Island [6]	68	54	0	53	30	0	
South-east Bay	69	0	0	52	0	0	

GREENLAND

- Leifse or Love Bay
- Havn
- Disco Island, S. I. No
- Waygat or Harechorage on the [8]
- Four Islands' Point
- Jacob's or N.E. E
- Merchant's or Uland
- Cape Cranston
- Black Hook
- Cape Lawson
- Dark Head
- Vrouw or Woman
- UPERNAVIK, or [9]
- Cape Shackleton
- Kingston Bay
- Three Islands of B
- Sugar-loaf Island
- Wilcox Point
- Devil's Thumb
- Allison Bay
- Baffin's Islands
- Horse's Head
- Red Head
- Cape Seddon
- Duneira Bay
- Browne's Islands
- Sabine's Islands
- Cape Lewis
- Melville's Monument
- Thom Islands
- Capt Walker
- Cape Murdoch
- Cape Morris
- Skene's Island
- Cape Melville
- Sowallick Point, Mounts
- Suffkowallick
- Bushman's Isle
- Inmallick
- Cape York
- Beverly Cliffs
- Crimson Cliffs
- Cape Dudley Digby
- Petowack

GREENLAND, DAVIS'S STRAIT, AND BAFFIN'S BAY,

CONTINUED.

	LATITUDE.			LONG. W.			AUTHORITIES.
	°	'	"	°	'	"	
Leifse or Love Bay, or Gude Havn	69	10	0	54	40	0	
Disco Island, S.W. end [7]	69	8	0	54	30	0	
<i>North end</i>	70	12	0	55	0	0	
Waygat or Hare Island, anchorage on the N.E. side [8]	70	26	17	54	51	49	
Four Islands' Point	70	46	0	54	3	0	
Jacob's or N.E. Bay	71	0	0	53	30	0	
Merchant's or Unknown Island	71	0	0	53	45	0	
Cape Cranston	71	15	0	54	20	0	
Black Hook	71	27	0	55	31	0	
Cape Lawson	71	45	0	55	36	0	
Dark Head	72	10	0	56	0	0	
Vrouw or Woman's Islands	72	45	0	56	40	0	
UPERNAVIK, or Operniwick [9]	73	25	0	57	26	0	
Cape Shackleton	73	36	0	57	15	0	
Kingston Bay	73	48	0	57	20	0	
Three Islands of Baffin	74	1	0	57	25	0	
Sugar-loaf Island	74	2	0	57	30	0	
Wilcox Point	74	10	0	57	45	0	
Devil's Thumb	74	16	0	57	56	0	
Allison Bay	74	40	0	57	56	0	
Baffin's Islands	74	41	0	57	25	0	
Horse's Head	74	49	0	58	15	0	
Red Head	75	12	0	58	54	0	
Cape Seddon	75	17	0	59	0	0	
Duneira Bay	75	27	0	58	50	0	
Browne's Islands	75	17	0	59	30	0	
Sabine's Islands	75	29	0	60	9	0	
Cape Lewis	75	31	0	59	0	0	
Melville's Monument	75	33	0	59	18	0	
Thom Islands	75	40	0	60	0	0	
Cape Walker	75	46	0	59	54	0	
Cape Murdoch	76	8	0	61	28	0	
Cape Morris	76	9	0	62	8	0	
Skene's Island	76	7	0	63	24	0	
Cape Melville	76	5	0	64	30	0	
Sowallick Point, or Iron Mounts	76	10	0	65	4	0	
Suffkowallick	76	6	0	65	57	0	
Bushnan's Isle	76	4	0	65	28	0	
Inmallick	76	0	0	66	46	0	
Cape York	75	55	0	66	38	0	
Beverly Cliffs	75	57	0	67	30	0	
Crimson Cliffs	76	0	0	68	0	0	
Cape Dudley Digges	76	5	0	68	54	0	
Petowack	76	11	0	69	0	0	

The observations made in a voyage of discovery, under the orders of the British Admiralty, in the ship *Isabella*, Captain John Ross, K.S., and the *Alexander*, Lieut. W. E. Parry, during the months of June, July, August, and September, 1818.

(The names printed in *italic* are so printed, in order to denote that they are inaccurately stated in Capt. Ross's original Table.)

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GREENLAND, DAVIS'S STRAIT, AND BAFFIN'S BAY,
CONTINUED.

	LATITUDE.			LONG. W.			AUTHORITIES.
	°	'	''	°	'	''	
Cape Athol	76	23	0	69	41	0	
Wostenholme Island	76	24	0	70	22	0	
Dalrymple Rock	76	28	0	70	42	0	
Wolstenholme Sound, entr. . .	76	29	0	70	0	0	
Arabella Rock	76	34	0	70	34	0	
Cape White	76	35	0	70	26	0	
Cape Stair	76	43	0	70	55	0	
Booth's Sound	76	49	0	70	50	0	
Cape Hoppner	76	56	0	70	48	0	
Cape Parry	77	6	0	71	23	0	
Whale Sound, entrance	77	15	0	71	20	0	
Cape Robertson	77	24	0	71	36	0	
Carey's Islands	76	49	0	73	10	0	
Cape Saumarez	77	30	0	73	52	0	
Cape Alexander	77	43	0	75	30	0	
Smith's Sound	77	55	0	76	15	0	
Cape Isabella	77	48	0	77	0	0	
Cape Hurd	77	49	0	78	48	0	
Cape Mouat	77	29	0	79	0	0	
Cape Clarence	76	45	0	77	45	0	
Cape Hardwicke	76	30	0	78	58	0	
Edward's Bay	76	38	0	78	30	0	
Cape Frances	76	28	0	79	25	0	
Jones's Sound, entrance	76	20	0	79	10	0	
Cape Caledon	76	16	0	79	22	0	
Cape Lindsay	76	6	0	79	24	0	
Barnard's Mountains	75	55	0	81	0	0	
Lady Anne Bay	75	54	0	80	0	0	
Cape Leopold	75	40	0	78	12	0	
Prss. Charlotte's Monument ..	75	36	0	78	28	0	
Coburg Bay	75	35	0	78	40	0	
Cape Horsburgh	74	55	0	78	45	0	
Cape Cockburn	74	49	0	78	45	0	
Banks' Bay	74	46	0	79	8	0	
Cape Cunningham	74	40	0	79	2	0	
Cape Charlotte	74	32	0	79	30	0	
Cape Beatrice	74	32	0	80	24	0	
Hope's Monument	74	26	0	80	45	0	
Cape Osborne	74	24	0	81	28	0	
Cape Warrender	74	19	0	82	30	0	
Lancaster's Sound, entrance ..	74	19	0	83	50	0	
Cape	74	15	0	83	17	0	
Barrow's Bay (or Sound)	73	40	0	83	45	0	
Catharine's Bay	73	30	0	81	50	0	
Cape Hay	73	35	0	80	35	0	
Elizabeth's Bay	73	30	0	80	0	0	
Martin's Mountains (central) ..	73	25	0	80	0	0	
Cape Fanshawe	73	40	0	78	6	0	
Possession Bay	73	33	0	77	28	0	

The observations made in a voyage of discovery, under the orders of the British Admiralty, in the ship *Isabella*, Captain John Ross, K.S., and the *Alexander*, Lieut. W. E. Parry, during the months of June, July, August, and September, 1818.

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GREENL
Cape Byam Mar
Cape Walter Bai
Cape Graham M
Pond's Bay ...
Cape Bowen ...
Cape M'Culloch
Cape Coutts ...
Coutts' Inlet ...
Cape Antrobus
Cape Jameson
Cape Cargenholn
Cape Hathorn ...
Bell's Isle
Mary Anne's Isla
Cape Agnew
Hamilton's Bay ..
Cape M'Donald
Cape Adair
Scott's Bay
Cape Eglinton ..
Ardrossan Bay ..
Agnes' Monumen
Cape Christian ..
Haig's Island
Bruce Bay
Cape Hewett ...
Bute Island
River Clyde
Cape M'Leay ..
Salmon Islands ..
Cape Paget
Cape Aston
Cape Roper
Cape Kater
Isabella's Bank ..
Wollaston Island
Cape Bisson
Alexander Bank ..
Home Bay
Cape Nius
Cape Hooper
Brodie Bay
Cape Broughton ..
Merchants' Bay ..
Cape Mackintosh.
Reid's Bay
Dyer's Cape
Mount Raleigh ...
Hynd's Bay

FIN'S BAY,

GREENLAND, DAVIS'S STRAIT, AND BAFFIN'S BAY,
CONTINUED.

AUTHORITIES.

	LATITUDE.			LONG. W.			AUTHORITIES.
	°	'	"	°	'	"	
Cape Byam Martin	73	33	0	77	10	0	
<i>Cape Walter Bathurst</i>	73	8	0	76	22	0	
Cape Graham Moore	72	54	0	75	28	0	
<i>Pond's Bay</i>	72	38	0	75	30	0	
Cape Bowen	72	25	0	74	40	0	
Cape M'Culloch	72	13	0	74	14	0	
Cape Coutts	72	0	0	74	10	0	
Coutts' Inlet	71	58	0	74	12	0	
Cape Antrobus	71	57	0	73	50	0	
Cape Jameson	71	45	0	73	30	0	
Cape Cargenholme	71	32	0	72	36	0	
Cape Hathorn	71	30	0	72	20	0	
Bell's Isle	71	27	0	72	0	0	
Mary Anne's Island	71	25	0	71	35	0	
Cape Agnew	71	24	0	71	45	0	
Hamilton's Bay	71	25	0	70	40	0	
Cape M'Donald	71	24	0	70	48	0	
Cape Adair	71	24	0	70	0	0	
Scott's Bay	71	10	0	70	0	0	
Cape Eglinton	70	49	0	68	34	0	
Ardrossan Bay	70	37	0	68	40	0	
Agnes' Monument, a rock ..	70	37	0	67	30	0	
Cape Christian	70	35	0	67	37	0	
Haig's Island	70	29	0	67	45	0	
Bruce Bay	70	28	0	67	32	0	
Cape Hewett	70	27	0	67	18	0	
Bute Island	70	26	0	67	30	0	
River Clyde	70	21	0	67	30	0	
Cape M'Leay	70	15	0	66	25	0	
Salmon Islands	70	11	0	65	30	0	
<i>Cape Paget</i>	70	10	0	65	55	0	
Cape Aston	70	10	0	65	25	0	
Cape Roper	69	54	0	65	10	0	
Cape Kater	69	39	0	65	15	0	
Isabella's Bank	69	30	0	65	0	0	
Wollaston Island	69	25	0	65	20	0	
Cape Bisson	69	10	0	65	20	0	
Alexander Bank	69	9	0	65	0	0	
<i>Home Bay</i>	68	40	0	65	0	0	
<i>Cape Nius</i>	68	45	0	65	48	0	
Cape Hooper	68	6	0	64	36	0	
Brodie Bay	68	0	0	64	5	0	
Cape Broughton	67	47	0	63	30	0	
<i>Merchants' Bay</i>	67	38	0	63	20	0	
Cape Mackintosh	67	0	0	62	0	0	
Reid's Bay	66	48	0	61	40	0	
Dyer's Cape	66	42	0	61	6	0	
Mount Raleigh	66	30	0	61	30	0	
Hynd's Bay	66	33	0	61	0	0	

The observations made in a voyage of discovery, under the orders of the British Admiralty, in the ship *Isabella*, Captain John Ross, K.S., and the Alexander, Lieut. W. E. Parry, during the months of June, July, August, and September, 1818.

(The names printed in *italic* are so printed, in order to denote that they are inaccurately stated in Capt. Ross's original Table.)

ations made in a discovery, under the British Admiralty, in the ship *Isabella*, Captain John Ross, and the Alexander, Parry, during the months of June, July, August, and September, 1818.

nted in *italic* are in order to denote inaccurately stated in Capt. Ross's original Table.)

GREENLAND, DAVIS'S STRAIT, AND BAFFIN'S BAY,
CONTINUED.

	LATITUDE.			LONG. W.			AUTHORITIES.
	°	'	"	°	'	"	
<i>Exeter Bay</i>	66	30	0	61	15	0	The observations made in a voyage of discovery, under the orders of the British Admiralty, in the ship <i>Isabella</i> , Captain John Ross, K.S., and the <i>Alexander</i> , Lieut. W. E. Parry, during the months of June, July, August, and September, 1818.
Cape Walsingham	66	0	0	60	50	0	
Cape Durham	65	59	0	61	54	0	
Borthwick Bay	65	54	0	61	30	0	
Inglis Bay	65	47	0	61	50	0	
Cape Dacres	65	36	0	61	50	0	
Sheffield Bay	65	30	0	62	30	0	
Hoare Bay	65	18	0	63	30	0	
Cape Mickleham	65	18	0	62	50	0	
Miller's Island	65	12	0	63	18	0	
Loch Ryan	65	6	0	63	45	0	
Cape Fry	65	6	0	63	25	0	
Saunderson's Tower	64	50	0	63	44	0	
Cape St. Clair	64	15	0	64	55	0	
Cape Campbell	64	6	0	65	12	0	
Cape Enderby	63	45	0	65	30	0	
Charles' Island	63	0	0	64	50	0	

NOTES.

1. CAPE FAREWELL.—We reserve the general description of the coasts of Western Greenland for a subsequent section of this work. As to population, &c., see Note 10, page 40.

In the Maps and Charts, in general, the name of Cape Farewell is attached to the southern point of the continent of Greenland. In the Dutch Charts, which have been republished in London, the same name is applied to an island at the assumed distance of 45 leagues W.N.W. from that point. Hence, one point has frequently been mistaken for, or blended with, another: and this affords, therefore, one reason for the discordant accounts of longitude, &c.

In our recent enquiries, as to the longitude of Cape Farewell and the neighbouring headlands, we wrote to Hull, and were informed, in answer, that Staaten-huck, the southernmost point of Greenland, lay in 59° 25' N. and 43° 30' W., and Cape Farewell in 60° 28' N. and 47° 55' W.: but, as these are precisely the situations assigned to the two points on the *old charts of Vankeulen*, we presume that those charts have been referred to, and considered as correct.

It has been shown, in our 'Memoir on the Atlantic Ocean,' that the longitude of Cape Farewell had been stated in the Tables of the French Nautical Almanac, the *Coinnaissance des Temps*, as well as in the English Tables, as 42° 42'; but, in the French Almanac for 1821, the position is given as 59° 42' N.; and, by chronometer, 45° 16' 15" W. (from Greenwich). The lunar observations of Captain Upton, commander of the *Sybil*, give, however, 47° 50' W., as shown in the Table. This accords so well with the longitudes of Captain Ross, &c., that we have no doubt of its being very near the truth. In this case, we assume Cape Farewell as the larger island of a group, at about 16 leagues to the westward of Staaten-huck, or Staten Hook.

The description of Sir Charles Giesecké, given hereafter, is sufficient to justify this assumption; as it will be seen, that Nettingiack, on the continent, is eastward from Cape Farewell; Nennortolik, or Bearland, is an island eastward from Cape Farewell; and Tessermint is a large frith to the north of the Cape. See Note 10.

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2. **GODT-HAAB.**—The given position has stood, for many years, both in the English and French Tables, and accords very well with the late observations.

3. **VICTORIOUS ROCK.**—The knowledge of this rock was first communicated by Lieut. Edward Chappell, R.N., in his 'Narrative of a Voyage to Hudson's Bay,' &c. 1817. In page 37, this gentleman says, July 23, 1814, "Early in the morning, we saw five Greenland ships, returning to England from the whale-fishery; and, shortly afterwards, we perceived two ships of war in the N.W. quarter. At noon, we spoke with His Majesty's ships the Victorious and Horatio. They had been to Davis's Straits, for the purpose of protecting the whale-fishery, and the former vessel exhibited a melancholy proof of the ill effects likely to result from the extreme state of ignorance in which our best navigators are placed, relative to the exact situation of the Northern lands. The Victorious had struck on a rock, in latitude $66^{\circ} 21'$, longitude $53^{\circ} 47'$, entirely owing to the coast of Greenland having been laid four degrees wrongly in the Admiralty Charts. The consequences likely to result from the loss of a seventy-four gun ship, in such a situation, may be easily imagined; allowing every man to have been safely conveyed on board the Horatio. The frigate must herself have been short of provisions at the moment; and in what possible way could the captain have provided for the subsistence of nearly six hundred people, in addition to his own ship's company, in a part of the world where he could not have formed the most distant hope of receiving a supply? Fortunately they were not destined to experience the horrors of so dreadful a situation; the Victorious was gotten off the rock again, without much difficulty: yet, that her danger had been imminent cannot be doubted, as she was obliged to get a topsail under her bottom; and, at the time when we met with her, there were some apprehensions that she might not reach England in safety; the leak being so bad, that the crew were compelled to labour incessantly at the pumps. The Horatio, of course, remained with her until she reached a British port."

4. **THE WILD ISLES and BOQUHAN REEF.**—Of these isles and reef a particular plan is given on the Chart, from the original survey of Mr. Thomas Buchanan, assisted by Mr. John Johnson, mate of the ship Gardiner and Joseph, in May, 1817. By reference to the Chart, it will be seen that Boquhan Reef, never before laid down or known, is six miles in extent from east to west; and that, on one spot near the east end, there is only four feet of water. On the south side of the reef the bottom is sandy, but that of the shoal is, in general, of rock.

5. **CAPE CHIDLEY.**—The headland bearing this name, in the maps of Captain Ross and others, is the **EGEDSMINDE** of the old charts, and forms the S.W. point of Fish or Disco Bay. See the particular plan of Disco, &c. on the Chart.

6. **WHALE ISLES.**—The given position is that of Kron Prins (*Crown Prince*) Island, in which is the Danish factory. In the narration of Captain Ross, page 45, the latitude is mis-stated $63^{\circ} 54'$, and we have therefore given it from his Table, p. xcvi, $68^{\circ} 57'$ N.

7. **DISCO.**—We assume the position of Leifle Bay, at the S.W. end of Disco Island, as given in Captain Ross's Table: but, taking it thus, Captain Ross's positions, both of the north and south ends of Disco, must be wrong. The North end he gives in long. $49^{\circ} 12'$; this should probably be the N.W. end, in $55^{\circ} 12'$: the South end he gives in lat. $69^{\circ} 11'$, long. $56^{\circ} 30'$: this we presume should be the S.W. end, in $69^{\circ} 8'$ or $69^{\circ} 9'$, and long. $54^{\circ} 30'$. See the particular plan of Disco, &c. above mentioned.

8. **WYGGAT, OF HARE ISLAND, &c.**—The Isabella and Alexander lay on the N.E. side of this island from the 17th to the 20th of June, 1818: and, as the best observations were made on shore during this interval, there is every reason to suppose that the given position is correct. It is important to know this, because it regulates the position of Disco and other points.

Again, on the 29th of June, Captain Ross says, "This morning we had good lunar observations; three sets of mine agreed within a mile of each other, and within $1' 15''$ of the chronometers." This was in Jacob's, or N.E., Bay: the S.W. point of which, Four Islands Point, is given in Captain Ross's Table, p. xciv, as in $70^{\circ} 46'$ N. and $53^{\circ} 3'$ W. But in page lxxxiii, we find the anchorage on the coast within this point in 27 fathoms, stated to be in $70^{\circ} 45'$ and $54^{\circ} 22'$, or $1^{\circ} 19'$ to the westward of the point, instead of being at some distance eastward of it. These discordances have puzzled us very much, in the construction of the Chart, but we conclude that Four Islands Point is in $70^{\circ} 3'$ W.

2. **GODT-HAAB**

9. **UPERNAVIK.**

9. UPERNAVIK.—From this place northward, and around Baffin's Bay, our information as to the situation of the points, and the trend of the coast, is limited to the voyage of Captain Ross, of which an analysis is given hereafter. So that here we conclude the particular notes to the fourth division of the Tables.

10. TEMPORARY RESIDENCES of the GREENLANDERS during the winter-season, and POPULATION of the Country. By Sir Charles Giesecké, Professor of Mineralogy to the Dublin Society, M.W.S. &c. 1819.

"The Greenlanders, being a migrating people, transfer very often their abodes, for the winter-season, from one place to another. Their houses are generally built near the shores, on small islands, or at the mouths of the friths. They cannot subsist in the interior of them, as the sea is frozen there very early in the autumn.

The following places were inhabited during the years from 1810 to 1813:—

I. JULIANAS-HAAB District.—In the South of Greenland, that is, in the 60th degree, or the most southern district of Julianas-haab, round Cape Farewell, are inhabited,

1. *Alluk*, that is, the *Soles* (of the feet), two small islands.
2. *Kippingajak*, an island to the south of Alluk.
3. *Pysursoak*, a small bay to the north of Staatenhuck.
4. *Nettingiak*, on the continent, eastward from Cape Farewell.
5. *Nennortolik*, that is, Bearland, an island eastward from Cape Farewell.
6. *Tessermint*, a large frith to the north of Cape Farewell, formerly inhabited by the old Norwegians. At its mouth are several Greenland houses, 64 miles south from the colony of Julianas-haab, in the 60th degree.
7. *Kognamint*, to the south of Julianas-haab, on the continent.
8. *Innersutalik*, an island 40 miles southward from Julianas-haab.
9. *Agluitsock*, on the continent, 30 miles southward from the colony.
10. *Sardlok*, an island 16 miles southward from the colony.
11. *Omenalik*, 12 miles to the south of the colony.
12. *Upernaviarsuk*, 16 miles towards the east of the colony.
13. *Itiblik*, 20 miles towards the east of the colony.

At the colony of Julianas-haab, natives only are employed in the service of the trade who live in Greenland houses.

Between the 61st and 62d degrees, are inhabited,

14. *Ikertongoak*, an island 8 miles towards the west, at the mouth of the frith called Kakortok.
15. *Narksak*, in the vicinity of the continental ice, 20 miles northward from the colony.
16. *Krimatuluitsanik*, an island 40 miles northward from Julianas-haab.
17. *Okaitsermint* and *Kikerteitsiak*, 44 miles from the colony. Here ends the district called Julianas-haab. It is inhabited by 1762 natives, viz. 754 males and 1008 females.

II. FREDERICKS-HAAB District extends from the *Nunarsoi* Island to the *Ice-blink* about one-third of a degree to the north of Fredericks-haab. Of the southern part of the district are inhabited,

18. *Torngarsuk*, an island 32 miles to the south of the colony.
19. *Kangarsuk*, a cape of the continent of Greenland.
20. *Narksalik*, 28 miles southward from the colony; and
21. *Sioramint*, 8 miles to the north of the colony. The population of this district comprehends 552 natives, viz. 234 males and 318 females.

III. FISKER-NÆR District extends from $62^{\circ} 52'$ to $63\frac{1}{2}^{\circ}$.

22. The inhabitants of the district Fisker-nær have their houses at the settlement of the Moravian Brethren, called Lichtenfeld. Their number is 280, viz. 112 males and 168 females.

IV. GODT-HAAB.—The district of the colony Godt-haab begins at $63\frac{1}{2}^{\circ}$, and reaches to $64^{\circ} 52'$.

The following
23. *Kariet*,
24. *New Herlik* and *Baal's R*
25. *Godt-haa*
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The following places are inhabited :

- 23. *Kariet*, eight miles southward from the colony.
- 24. *New Herrn-hut*, a Moravian settlement, situated between the friths of Ameraglik and Baal's River.
- 25. *Godt-haab*, the Danish colony in Baal's River: and
- 26. *Sarlok*, to the N.E. of Baal's River.—The population of this district amounts to 489 natives, viz. 186 belonging to the Danish mission, and 303 belonging to the Moravian mission. The former consists of 81 males and 105 females, and the latter of 123 males and 180 females.

V. *SUKKER-TOP*.—The district of *Sukker-top* (Sugar-loaf) begins at 64° 52', and ends at 66° 17'.

In this district the following places are inhabited by natives :

- Towards the south of the colony,
- 27. *Nappasok*, an island situated 40 miles southward of the colony.
- 28. The colony *Sukker-top* itself, called *Manetsok* by the natives; and
- 29. *Akpamiut*, 16 miles northward from the colony.—The population of this district is 304, viz. 143 males and 161 females.

VI. *HOLSTEINBURG* District is the last in South-Greenland.

30. The district of *Holsteinburg* begins at 66° 16', and ends with 67° 45'. The natives, being employed in the whale-fishery, have all their winter-houses round the colony. The number of the inhabitants of this district is 169, viz. 87 males and 109 females. Thus the whole population of South-Greenland, the limits of which are fixed to the Strom Frith, in 68°, comprehends a number of 3583 souls.

NORTH-GREENLAND commences in latitude 67° 43', and comprehends the following districts :

1. Egedes-minde district, extending from	67° 43'	to 68° 0'
2. Christianshaab district	68 0	.. 68 10
3. Jacobshavn district	68 10	.. 69 40
4. Rettenbenks district	69 40	.. 71 0
5. Omenaks district	71 0	.. 72 8
6. Upernaviks district	72 8	.. 76 30

The population of North-Greenland is not entirely ascertained, but it does not exceed the number of 3000 souls. The country, from 67° to 69°, is uninhabited. The first district of North-Greenland is that of the colony *Egedes-minde*. The natives belonging to this and the other districts situated round Disco Bay, or Fish Bay, have their houses at the colonies, for the sake of the whale-fishery.

The Greenlanders of *Omenak* district are the only natives of the whole coast who live, during winter, in the interior of that extensive frith, having their supply in catching the seals, by means of nets, which are set under the ice.

The most northern district is that of *Upernavik*: it begins at 72°, and reaches to the remotest north; but it is inhabited only to 73°. Southward from *Upernavik* is situated

Kangersoietsiak, an island inhabited by natives.

At *Upernavik*, four or five Greenland families have their abode.

At *Tessiursak*, an island in 74° 15', eighty miles northward from *Upernavik*, one family terminates the population of this forlorn country.

The line of coast Sir Chas. Giesecké was no longer able to trace beyond 72° 30'; but he carefully examined the numerous islands by which it is fringed, and which are so crowded, that a ship at sea cannot fail to consider them as a part of the continent. Sir Charles had penetrated as far as Nullok, Saitok, and Ujordlersoak, to the latitude of 76° 30', but had found no inhabitants in any of the twenty-three islands to the north of *Tessiursak*.—(*Edinb. Phil. Journal*, No. 1. 1819.)

The ancestors of the modern inhabitants first appeared on the western coast of Greenland in the fourteenth century, and are generally supposed to have overpowered the few Norwegians settled in that quarter. They were called *Skraellings*, a word of uncertain etymology. Of their origin nothing can be ascertained. It seems, on the

whole, not incredible, (from evidence and arguments which need not be quoted here,) that they are the descendants of Tahtaröan rovers, gradually emigrating from the heart of Asia, crossing over into the west of America, traversing the northern latitudes of that continent, and settling, or wandering, as suited their convenience, till the foremost hordes reached Canada and Labrador; whence the Skraellings may have found a passage, by land or sea, to Greenland. That the Greenlanders are of the same stock with the Esquimaux, or Iskimos, is obvious, from the remarkable correspondence between their persons, dress, habitations, boats, and implements of hunting and fishing, as well as the similarity of manners, customs, superstitions, and language.

Crantz says that, there is a district on Baal's River, called *Pissiksarbik*, or the *place of arrows*, where it is believed that the Skraellings and Norwegians fought a battle, in which the latter were defeated. The modern Greenlanders affirm that, the name is derived from the circumstance of the parties having shot their arrows at one another from opposite banks of the stream. Many *rudera*, or ruins of antient buildings, supposed, principally, to have been churches, are found along the coast from Disco Bay to the southern extremity of the country.

VARIATIONS of the COMPASS, and TEMPERATURE of the SEA.—We have exhibited on the Chart the variations of the needle, as they have been given by Captain Ross, throughout the course of the expedition, both outward and homeward, so that it is not requisite to say much upon the subject here. The extraordinary aberrations of the compass have been already explained. It has, however, been thought that the variation given by Captain Ross may be, in some instances, greater than that really existing; and we therefore make no apology for introducing the following "Results of the mean of several observations, taken on the ice, and which may be considered as approaching nearly to the truth.

Where taken.	Latitude.			Longit.			Dip.			Variation		
	°	'	"	°	'	"	°	'	"	°	'	"
Waygat or Hare Island	70	26	17	54	53	55	82	9	39	71	42	45
Three Islands of Baffin	74	1	20	57	55	45	84	9	15	81	37	19
West Coast of Greenland	74	57	45	59	49	30	—	—	—	87	19	34
Ditto	75	29	0	60	42	43	84	25	6	87	43	11
Ditto	75	49	0	62	43	45	—	—	—	90	43	22
Ditto	75	51	30	62	40	0	84	44	55	—	—	—
Ditto	75	50	0	64	48	57	—	—	—	91	2	12
Head of Baffin's Bay	75	54	21	65	56	0	—	—	—	92	1	0
Ditto	76	32	0	73	45	0	85	44	38	—	—	—
Ditto	76	33	5	77	9	52	—	—	—	107	3	57
Ditto	76	8	28	78	35	38	85	59	31	109	35	58
Western Coast of Davis's Strait	73	30	0	77	24	9	—	—	—	109	32	53
Ditto	70	36	0	67	27	45	84	39	35	86	14	44

Taken on shore.

"A series of observations, on the temperature of the sea, at the surface and at certain depths, may serve to correct erroneous notions, which, it would appear, have prevailed on this subject. We have no doubt that they are the most accurate that have yet been made, and in deeper water than a self-registering thermometer had ever been sent down before in any part of the world. The result is very different from that of former observations. It seems that, in Baffin's Bay, the temperature, generally speaking, decreases with the depth. At 1005 fathoms, in lat. 71° 24', the temperature was 8½°, at the surface, 36°; and, whenever the depth exceeded 100 fathoms, the thermometer generally descended to 30°, or below, when 34 or 35 at the surface. Near Cape Walsingham, it is stated that, from the depth of 660 fathoms, the thermometer came up at 25½°; from 400, at 28°; from 200, at 29°; and from 100, at 30°; the temperature of the air being 37°. It would be difficult to explain why the sea remained in the state of water at 25½° of Fahrenheit. Did the pressure of the column of water prevent its freezing?

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ing? or was the water more strongly impregnated with salt? These, and other observations, made in the course of this voyage, both on land and sea, are completely at variance with the theory of isothermal lines of temperature, which had been assumed, as it would now appear, from a too limited number of facts. But the most unaccountable circumstance is that of the Polar expedition having, in the seas of Spitzbergen, on the same parallels of latitude, invariably obtained a contrary result, the temperature of the sea increasing with the depth; so that, when the thermometer, at the surface, stood at 32° or 33°, at 300 fathoms it was 36° or 37°. We pretend not to explain this singular anomaly; indeed, we do not conceive that we are yet in possession of a sufficient number of facts to enable us to reason on the subject."—(*Quart. Rev.* No. XLI. May, 1819.)

5. HUDSON'S STRAIT, HUDSON'S BAY, and LABRADOR.

	LATITUDE.			LONG. W.			AUTHORITIES.
	°	'	"	°	'	"	
Cape Resolution [1].....	61	25	0	65	2	0	Mr. Summer, astronomer to the Hudson's Bay Company.
Cape Churchill, in Hudson's Bay	58	50	0	93	4	0	
Five-fathom Hole, at York, the ship's anchorage.....	57	8	0	92	28	0	
York Factory [2]	57	2	0	92	38	0	
LABRADOR.							
Button's Isles, middle	60	35	0	65	20	0	- <i>Connaissance des Temps</i> , &c.
Port Manvers, entrance [3]..	57	0	0	61	55	0	- Captain T. Manby, R.N. 1808.
Nain, a Moravian settlement	56	24	0	61	48	0	- Inferred from Port Manvers.
Huntingdon Island, at the entr. of Netsbucktoke, or Sandwich Bay [4] ... }	53	50	0	56	30	0	- Lane's Survey of Labrador.

NOTES.

1. CAPE RESOLUTION.—Some useful instructions for the navigation to Hudson's Bay may be found in a subsequent section of this work. A description here is, therefore, unnecessary. By reference, it will be seen that Cape Resolution, at the entrance of the Strait, and situated as above, is visible at the distance of 10 leagues.

2. YORK FACTORY, in Hudson's Bay.—For description, see the Sailing Directions above mentioned.

3. PORT MANVERS, LABRADOR.—Port Manvers, formerly called Saltpetre Haven, was visited and explored by the *Thalia* and *Medusa* frigates, which wooded and watered here in 1808. The islands in the vicinity are those formerly called the *Sadel Isles*. Of the mode by which the longitude was ascertained we have not been informed. The coast now appears more to the westward than it was formerly represented. See the particular plan on the Chart.

4. LABRADOR.—The formation of icebergs on this coast, which are so frequently met with to the southward, were described in a letter, addressed to the Honourable Daines Barrington, 28th February, 1776, as follows:

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" Dear Sir,

" In conformity with my promise of yesterday, I now send you, as nearly as I can recollect, my brother's account (who hath resided four years on the Labrador coast) of the formation of those great masses of frozen snow, seen annually, in very great numbers, on the northern coasts of America, and by mariners usually called *Islands of Ice*.

" Along the coast of Labrador, the sea, in winter, is frozen to a great distance from the land. The north-west is the prevailing and coldest wind. The snow, carried by this or any other westerly winds over the cliffs of the coast, falls becalmed upon the ice at the foot of the said cliffs, drifting up to the very tops of them, although many of them are not inferior to that of Dover, or those about Lulworth. The current of the strong western winds, having passed these precipices, takes its course downward into the undisturbed air below; but it is not until it arrives at some distance from the land that it can be felt on the surface of the sea. Having the frozen surface of the sea for a base, and the precipice for a perpendicular, an hypothenuse is made by the descending direction of the wind. The inclosed triangle, be the cliffs ever so high, will be filled with snow; because the tops of the adjoining hills, being quite naked, are entirely swept clear of snow by the violence of the storms; and what would otherwise have laid there, is carried to the leeward of the hills, and under the shelter of the cliffs, where it is deposited in infinitely greater quantities than it would fall in without such a cause. The hypothenuse of such triangle is frequently of such a slope, as that a man may walk up or down without difficulty. By frequent thaws, and the occasional fall of moisture interrupting the frost, during the first parts of the winter, the snow will, in some small degree, dissolve, by which means, it only acquires a greater hardness when the frost returns; and, during the course of that rigorous season, is generally become a very compact body of snow-ice. In the spring of the year, the icy base gives way, and its burden plunges into the sea, sometimes entire, sometimes in many fragments. As the depth of water, in many parts, is 40, 50, 100, fathoms, and upwards, close to the shore, these bodies of ice, vast as is their bulk, will frequently float without any diminution of their contents, although the very large ones do often take the ground, and sometimes are not sufficiently reduced by either the penetration of the sea and the rain water, or of a whole summer's sun, to get at liberty again before another winter.

" The above relation, which my brother gives from his own observation, in north latitude $52^{\circ} 15'$, accounts very naturally and easily for the formation of that surprising number of vast pieces of ice, which is annually seen on the Labrador coast, and considerably to the southward.

" JOHN CARTRIGHT."

" The first floating ice, which is observed on the coast of Labrador, is a joyful presage to the inhabitants of the approach of summer." Lieut. Curtis, in *Phil. Trans.*

VARIATIONS of the COMPASS.—The variation in Port Manvers, as found by Captain Manby, in 1808, was 40° W. It decreases thence to the southward; on the northern coast of Newfoundland it is about 26° . In St. John's Harbour, Newfoundland, it was ascertained, by Mr. Francis Owen, to be $23^{\circ} 24'$, in 1798.

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SECTION II.

The GENERAL PHÆNOMENA of the NORTHERN OCEAN: the ATMOSPHERE, WINDS, ICES, CURRENTS, &c.

I. PHÆNOMENA OF THE ATMOSPHERE, WINDS, &c.

THE most remarkable phænomena of the Atmosphere, over the Northern Seas, are those denominated AURORA BOREALIS, or the *Northern Lights*, and ICE-BLINKS. The first, called also the *Streamers* and *Merry Dancers*, have been accurately described by Mr. Pennant, in his 'Arctic Zoology,' who, in describing the Shetland Islands, &c. says,

"Owing to the great refraction of northern latitudes, for about three months in summer, the people enjoy the sight of the sun almost without intermission; but, for the same space in winter, (especially in December,) that luminary hardly rises above the horizon, and is commonly obscured by clouds and mists.

'The sun from far shows with a sickly face,
'Too weak the fogs and mighty dews to chase.'

"In this gloomy season, the absence of day is supplied partly by moon-light, and partly by the radiance of the *aurora borealis*, or *merry dancers*, as they are called in these islands. These are the constant attendants of clear evenings, and prove great reliefs amidst the gloom of the dark winter-night. They commonly appear at twilight, near the horizon, of a dun-colour, approaching to yellow; sometimes continuing in that state for several hours, without any apparent motion; after which they break out into streams of stronger light, spreading into columns, and altering slowly into ten thousand different shapes, varying their colours from all the tints of yellow to the obscurest russet. They often cover the whole hemisphere, and then make the most brilliant appearance. Their motions at these times are amazingly quick; and they astonish the spectator with the rapid change of their form. They break out in places where none were seen before, skimming briskly along the heavens; are suddenly extinguished, and leave behind an uniformly dusky tract. This again is brilliantly illuminated in the same manner, and as suddenly left a dull blank. In certain nights they assume the appearance of vast columns, on one side of the deepest yellow, on the other declining away, till it become undistinguished from the sky.

"They have, generally, a strong tremulous motion, from end to end, which continues till the whole vanish. According to the state of the atmosphere, they differ in colours. They often assume the colour of blood, and make a most dreadful appearance. The rustic sages represent these phænomena as prognosticative of future events, and thereby affright the gaping multitude with dread of war, famine, and pestilential devastations. This superstition is not peculiar to the northern islands; nor are these appearances of recent date. The antients called them *Chasmata*, and *Trabes*, and *Bolides*, according to their forms or colours."

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It was, for a long time, a matter of doubt, whether this meteor made its appearance only in the northern hemisphere, or whether it was to be observed near the south pole. This has been ascertained by Mr. Forster, who, in his Voyage around the World, with Captain Cook, assures us that he observed them in the high southern latitudes, though with phenomena somewhat different from those which are seen in the north.

"A beautiful phenomenon (says he) was observed during the preceding night, which happened again this and several following nights. It consisted of long columns of a clear white light, shooting up from the horizon to the eastward, almost to the zenith, and gradually spreading on the whole southern part of the sky. These columns were sometimes bent sidewise at their upper extremities; and, though, in most respects, similar to the northern lights (*aurora borealis*) of our hemisphere, yet differed from them in being almost of a whitish colour, whereas our's assume various tints, especially those of a fiery purple hue. The sky was, generally, clear when they appeared, and the air sharp and cold."

The following observations on the AURORA BOREALIS were made by Lieutenant W. Robertson, on the return of the ships from Baffin's Bay, in 1818. "The attention of this officer," Captain Ross says, "was particularly directed to these phenomena, which were not seen until late on the homeward passage; and, it is to be regretted that, the ship never, while they were seen, was in a situation where the electrometer could be used. The observations are, however, not uninteresting, as they tend to establish that these phenomena are often very near the earth, and that they appear in every direction, as well as in the north.

"H. M. S. Isabella, in Davis's Strait, lat. $66^{\circ} 30' N.$ long. $59^{\circ} W.$ September 23d, 1818, about ten o'clock in the evening, the Aurora Borealis was seen in the true south horizon; the horizon was first illuminated like the rising or setting of the moon behind a cloud, or rather like the illumination of the atmosphere, caused by great fires; this extended over four points of bearing, (or 45° of the horizon,) rays were soon after darted up perpendicularly, in bundles, to 20 degrees of altitude; the Aurora spread to S.E. without darting rays, and soon after disappeared. At midnight, a very brilliant meteor darted from the zenith to the eastern horizon, like a rocket, and was seen for 2 or 3 seconds: the evening was fine, with a light breeze from the westward, which shifted in the morning to the southward, blowing fresh, with hazy weather.

"September 26, in lat. $65^{\circ} 50' N.$ long. $61^{\circ} W.$ (Western side of Davis' Strait,) about nine in the evening, the Aurora Borealis was seen, appearing very brilliant, in every point of bearing, and shooting bundles of rays, of unequal length, to the zenith. This Aurora was first seen through a thick mist in the zenith; as the mist passed away, the Aurora increased in brilliancy; the stars shone brightly; not a cloud to be seen. At eleven the Aurora became less brilliant, and the sky again obscured with mist; the horizon continued hazy, till two next morning, when the Aurora was again seen very brilliant in the zenith; weather again became foggy; the wind was light from the northward, which shifted to S. by W.; moderate cloudy weather."

"September 28, lat. $65^{\circ} N.$ long. 63° (Western side of Davis's Strait.) At eleven *p. m.* observed the Aurora very brilliant, from S. by E. to S. by W. It first appeared from behind a cloud at the altitude of 5 degrees, shining with a silvery light, shortly after darting up small bundles of rays to the altitude of 16 degrees. There was no appearance of the Aurora in any other part of the

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" September 29, as above. At ten in the evening, the Aurora was seen very brilliant from S. W. to S. E. true bearings, shooting rays to the altitude of 15°; in the morning of the 30th, the Aurora was spread all over the heavens. Strong breezes from the westward with clear weather, continuing to blow fresh from that quarter to past noon.

" October 1, lat. 62° 30' N. long. 63° W. (Western side of Davis' Strait.) At eight in the evening, the Aurora was seen in the true S. S. W. to S. S. E.; at nine, the luminous appearance spread from S. W. round by the S. E. quarter to N. E. in an arched form; the centre of the arch 18° high; the luminous part of the arch 3° broad; there was a very dark appearance under the arch, through which the stars appeared with the same glimmering light that they shone with through the luminous parts. Small bundles of sharp-pointed rays were shot perpendicularly from all parts of the arch to the altitude of 40°. About ten the arch shifted more to the westward, and soon disappeared, fresh breezes from W. S. W.; true and clear star light; at four *a. m.* October 2, light winds S. W., continuing all day with hazy weather.

" October 6, in the entrance of Davis' Strait, lat. 60° N. long. 56° W. Strong gales and squally, with snow and sleet; observed the whole sky suddenly illuminated, which lasted five or six minutes, this might be Aurora in the zenith; wind N. N. W. moderating towards noon.

" October 8, lat. 59° N. long. 50° W. (South-westward of Cape Farewell.) At eight in the evening, observed the Aurora very bright on the true east quarter, shooting beautiful rays, in bundles, from the horizon to the altitude of 60°; this was soon obscured by squalls of snow and sleet. From nine to twelve, the Aurora was seen, in every part of the heavens, shooting streams of light in every direction, the most luminous appearing from N. by W. to W. by N., true bearings; strong winds and squally, with sleet from N. W. by N. true, increasing to a hard gale on the ninth at noon, continuing to blow hard to noon of the tenth, when it moderated.

" October 17, lat. 61° N. long. 25° W. (Iceland to the N. E.) At eight *p. m.* observed the Aurora to begin in two concentric arches, the greatest arch from true east to west, passing through the zenith, the smaller arch south of the large one at an altitude of 45° shooting fine rays from all parts of the arches, but most brilliant from the western part. At half past eight, these arches disappeared, and another most brilliant one was seen north of the zenith, the centre passing through the pole star, the extremities touching the eastern and western horizons, emitting fine rays, having all the prismatic colours: this arch was soon broken, and the Aurora flitted about, in beautiful corruscations, in the north-western part of the heavens, shifting round to the southward: the moon shone unclouded at the time, and the Aurora was sometimes seen passing her, eclipsing her in splendour. At 9h. 30m. the Aurora disappeared, the weather moderate at the time, with some light fleecy clouds in the sky, which had a dark appearance when passing under the Aurora. It blew hard from the westward in the morning, and had moderated towards evening; wind shifted to the southward next day, with moderate weather."

The eminent mathematician, M. de Maupertius, in his description of a winter in Lapland, has given a vivid description of the Aurora Borealis. He says, " Though the days in winter are extremely short, and the nights long and tedious, yet this evil is, in some measure, compensated by the pleasant luminous summers, when the sun is, for weeks together, constantly above the horizon.

Even

Even in winter, the brightness of the moon-light and of the stars, and the effulgent corruscations of the Aurora Borealis, afford light sufficient for most occasions of life,

“ The short days are no sooner closed than meteors of a thousand figures and colours light the sky, as if designed to make up for the absence of the sun. These lights have not a constant situation : though a luminous arch is often seen fixed towards the north, they more frequently possess the whole extent of the hemisphere. Sometimes they begin in the form of a great fan of bright light with its extremities upon the horizon, which, with the motion resembling that of a fishing-net, glides softly up the sky, preserving a direction nearly perpendicular ; and commonly, after these preludes, all the lights unite over head and form the top of a crown. It would be needless to mention the different figures which these meteors assume, and the various motions with which they are agitated. Their motion is most commonly like that of a pair of colours waved in the air, and the different tints of their light give them the appearance of so many vast streamers of changeable silk. I saw a phenomenon of this kind that, in the midst of all the wonders to which I was every day accustomed, excited my admiration. To the south, a great space of sky appeared tinged with so lively a red, that the constellation of Oriōn looked as though it had been dipped in blood. This light, which was at first fixed, soon moved, and changing into other colours, violet and blue, settled into a dome, whose top stood little to the S. W. of the zenith ; the moon shone brightly, but did not efface it. In this country, where there are lights of so many different colours, I never saw but two there that were red ; and such are always taken for presages of some great misfortune. It is not, indeed, surprising, that people, with an unphilosophic eye, should fancy they discover, in these phænomena, armies engaged, fiery chariots, and a thousand other prodigies.

“ Another advantage of Lapland, &c. is the twilight, which begins four or five hours before sun-rise, and lasts as long after that luminary is set. Many of the inhabitants sleep away most of the dark season, and employ the luminous part of the year in their respective occupations, without any particular injury to their health. The summer lasts for three months, from the beginning of June to that of September ; and, in this season, at times, the thermometer rises as high as 90 degrees, which is equal to the heat of many parts of the West-Indies ; and, in winter, it has been known to fall to 40 degrees below the freezing point, or about 25 degrees below what is usually felt, in winter, in London.”

These observations on the atmosphere and climate of Lapland apply in a great degree, to Norway, even to the southern parts. Mary Wollstonecraft in her Letters from Norway, says, “ Nothing can equal the beauty of the northern summer's evening and night ; if night it may be called, that wants only the glare of day ; for I could write at midnight, very well, without a candle. I contemplated all nature at rest ; the rocks, grown darker in their appearance, looked as if they partook of the general repose, and reclined more heavily on their foundation. What, I exclaimed, is this active principle which keeps me still awake ? Why fly my thoughts abroad, when every thing around me appears at home ?

“ The cow's bell had ceased to tinkle the herd to rest ; they have all paced across the heath. Is not this the witching time of night ? The waters murmur and fall with more than mortal music, and spirits of peace walk abroad to calm the agitated breast. Eternity is in these moments ; worldly cares melt into the airy stuff that dreams are made of ; and reveries, mild and enchanting as the

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But we have, for a moment, lost sight of the aurora borealis, and have not yet touched on its supposed causes. Upon these we find the following observations, from the pen of our respected friend, the late Mr. Murdo Downie.

"From the extreme subtilty of the electric fluid, little is known concerning it, except its appearance and effects. In appearance it is every way similar to fire; and its effects are such as, in general, would be produced by that element; consequently, if the electric fluid be not the same as the fluid of fire, it cannot differ much from it; for, from late experiments, fire is allowed to be a fluid inherent in all matter, and a great part, if not the most part, to exist in substances in a latent state; and the electric fluid may be also said to be the same. Fire is collected and becomes active, or in a burning state, by *friction*; the electric fluid, by friction, is found to do the same, by accumulating about those substances to which it has a propensity to adhere, and which, from that circumstance, are commonly called *electrics*; and it is, from its effects, produced from these accumulations, that its existence comes to our knowledge. And may not the production of fire by friction, in substances which are not electrics, be the electric fluid collected, and activity given to it, so as to become fire in a burning state; although, by being non-electrics, the fluid does not adhere in a latent state, so as to accumulate? So that the effects of the electric fluid and of fire, being the same, as far as our knowledge goes in tracing them, there is every reason to suppose that they are actually of one and the same quality.

"Now, by admitting, (as we are led to believe by modern discoveries,) that a fluid, in the act of freezing, emits a quantity of fire, and imbibes a like quantity in the act of thawing; and that the electric fluid and the fluid of fire are the same, may we not carry our conjectures somewhat farther, by supposing that, the fire emitted from the nightly freezings that take place in the climates near the poles, during the winter season, being, either from the activity of the frost, or from there being no water floating in the air to attach itself to, driven into the higher regions, where, accumulating from frequent freezings, it gathers activity from its quantity, upon the same principle that lightning is produced in a cloud, and, thus appearing in fire, forms what is commonly called the *aurora borealis*."

"What further countenances this supposition is that, as freezing takes place more frequently, and, by increasing, becomes more general in the end of autumn and beginning of winter, so we find the aurora borealis to be more abundant in this season than at any other time of the year. Also, upon account of more freezing taking place upon the continents, we see it more abundant there than upon the sea."—(*Observations on the Atmosphere, &c.* p. 9.)

REFRACTION of the ATMOSPHERE.—In noticing the effect of refraction, in high northern latitudes, Mr. Downie has observed, with regard to the eastern coast of Scotland, that, "In observing the latitude, by the sun's meridian altitude, besides the allowance of three or four miles for dip, allowance ought also to be made for refraction, and subtracted from the altitude. The refraction of the meridian altitude on this coast is from five miles in the winter to near one in the summer; and, if no allowance be made for it, the latitude observed will be all the refraction to the southward of the true latitude."

No precise rule can perhaps be given for refraction, although we have tables calculated for the purpose, which may be considered as an approximation. Captain Ross has shown us a very remarkable example, which occurred on the eastern coast of Baffin's Bay, 4th July, 1818, in latitude, $72^{\circ} 30'$. The passage is as follows:—

“A remarkable appearance of unequal refraction was observed here, in the ships near us and at a distance. Those within two or three miles seemed to be extended to a monstrous height; while those at double the distance appeared to be drawn out in a horizontal direction, even to flatness, upon the water.” This is not the case in the Greenland Seas only; for Captain Horsburgh says that, in Table Bay, Cape of Good-Hope, the refraction is often so mutable near the horizon, that correct altitudes of the sun cannot be obtained. Objects in the horizon, at the entrance of the bay, are sometimes reflected double; a picture of a vessel under sail was seen distinctly in the atmosphere above her, and other objects were reflected in various ways.

THE ICE-BLINK is simply a beautiful effulgence or reflection of light seen over the congregated ices, or even about individual ice-bergs: with these it is described hereafter.—See page 55.

THE WINDS.—It is superfluous to say that the winds of the Northern Ocean are exceedingly irregular, and that, in the vicinity of all the high lands they are, at times, summer excepted, inexpressibly powerful and boisterous. We have already noticed their extraordinary effects on the north-western isles of Scotland, and they are no less so at the Færoerne to the N.W.* Here the land is rugged, mountainous, rocky, and steep-to: the sea around is turbulent; and, at times, so much agitated by whirlwinds, that vast quantities of water are forced up into the air, and the fishes contained therein frequently deposited on the tops of the highest mountains. These are equally resistless on land; tearing up trees, stones, and animals, and carrying them to very distant places. Whirlpools, too, are very numerous about these islands, as will be shown hereafter.

II. THE ICES AND OTHER PHENOMENA OF THE SEA.

The following explanation of terms used in the Icy Seas has been extracted from the account of his voyage to Baffin's Bay, &c. by Captain Ross.

ICEBERG. An insulated mountain of ice.†

A FIELD. A piece of ice so large that its extent cannot be seen.

A FLOE. A piece of ice of a considerable size, but the extent of which cannot be distinguished.

A PATCH. A number of pieces of ice joining each other.

A STREAM of Ice. A number of pieces of ice joining each other in a ridge or in any particular direction.

LOOSE ICE. A number of pieces near each other, but through which the ship can make way.

SAILING ICE. A number of pieces at a distance, sufficient for a ship to be able to beat to windward among it.

BRUSH ICE. Ice in a broken state, and in such small pieces, that the ship can easily force through.

CAKE ICE. Ice formed in the early part of the same season.

BAY ICE. Newly-formed ice, having the colour of the water.

* See the note on the Flannan Isles, &c. page 13.

† More particularly described by Captain Scoresby. See page 54. ED.

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HUMMOCKS of ICE. Lumps of ice, thrown up by some pressure or force on *Field or Floe*.

HEAVY ICE. That which has a great depth in proportion, and is not in a state of decay.

A LANE OF VEIN. A narrow channel between two *Floes or Fields*.

BESET. Surrounded with ice, so as to be obliged to remain immoveable.

A TONGUE. A piece projecting from the part of an iceberg which is under water.

A CALF. A piece of ice which breaks from the lower part of a *Field* or *Berg*, and rises, with violence, to the surface of the water.

A BARRIER. Ice stretching from the land-ice to the sea-ice, or across a channel, so as to render it impassable.

LAND-ICE. Ice attached to the shore, within which there is no channel.

SEA-ICE. Ice within which there is a separation from the land.

NIPT. Caught and jammed between two pieces of ice.

The **SPECIFIC GRAVITY** of ice to water is various, according to the nature and circumstances of the water, degree of cold, &c. Dr. Irving found the densest ice he could meet with, in Phipps's Voyage to the North-Pole, about fourteenth part lighter than water. M. de Mairan found it, at different trials, one fourteenth, eighteenth, or nineteenth, lighter than water; and, when the water was previously purged of air, only a thirty-second part.

"Many of our readers are already acquainted with the name of Captain Scoresby, one of the most skilful and intrepid of the Greenland captains.* Many years since he attracted the attention of several of the most distinguished professors in our University, not more by the accuracy of his information, in all matters connected with his avocations, as a seaman, than by the facility and industry with which he applied himself to various branches of learning, not immediately connected with the duties of his profession. The success which attended his studies is the more surprising, as even at this time he was engaged, during the greater part of the year, in the most active and least sedentary employment which it is easy to conceive, namely, as mate or master on board of a Greenland vessel. In consequence, however, of his residence in Edinburg, and the opportunities which were there afforded him of associating with scientific and literary men, he perceived the value bestowed on such observations, as an intelligent person would have an opportunity of making in those high northern latitudes, which he so often had occasion to explore. Instigated, therefore, as well by the natural bent of his inclination, as by the expectations of those men who had been both his friends and instructors in his succeeding voyages, he soon proved, by the originality and accuracy of his remarks on those wonderful phenomena with which he was daily surrounded, that the most sanguine anticipations were not likely to be disappointed.

"Captain Scoresby has already communicated to the public, through the medium of the Wernerian Natural History Society's Memoirs, several very interesting meteorological journals, kept by himself during voyages from Whitby to Greenland. He has, also, in the same work, described, and for the first time, accurately figured, the Great Northern or Greenland whale, the *balæna mysticetus* of naturalists. This latter communication is the more valuable, as,

* From Blackwood's Edinburgh Magazine, 1818.

in fact, zoologists have hitherto been perfectly unacquainted with the true proportions and appearance of this monarch of the deep; Mr. Scoresby's figure being the only one which is allowed by competent judges to give a true representation of it. The drawing of it was executed by himself, and he had an opportunity of proving its accuracy by the fact that, it agrees, in all respects, with those individuals, of the same species, which he has since met with in the Arctic Ocean. The dimensions of this valuable animal have either greatly decreased since former times, or the accounts which have been handed down to us are much exaggerated. The largest whale, which Captain Scoresby has ever heard of being killed, in the Greenland Seas, did not exceed seventy feet, and out of about two hundred, which he has seen taken, not one measured sixty-five feet in length. In the same paper there are some interesting remarks on a subject, of which, *a priori*, we should scarcely have credited the existence,—the maternal affection of whales, besides other particulars in their history.”

“We shall now proceed to give a short account of the paper which has induced us to make the preceding observations, and this we do, more with the hope and intention of exciting, than of satisfying, the curiosity of those who may feel an interest in such subjects. The following passage conveys, in few words, an impressive idea of the general character of the Greenland landscape, and of its most remarkable inhabitant.

“The LAND is, of itself, a sublime object; its stupendous mountains, rising by steep acclivities from the very margin of the ocean to an immense height, terminating in rigid, conical, or pyramidal, summits; its surface, contrasting its native protruding dark-coloured rocks with its burthen of purest snow; the whole, viewed under the density of a gloomy sky, forms a picture impressive and grand. Its most remarkable inhabitant is the White or Polar Bear, which, indeed, also occurs on the ice. This ferocious animal seems to be the natural lord of these regions. He preys, indiscriminately, on quadrupeds, fowl, reptile, and fish; all behold him with dread, and flee his presence. The seals signify their fear of him by their constant watching, and betake themselves precipitately to the water on his approach. Carrion, therefore, (of which the carcase of the whale is, at a certain season, the most plentiful,) affords him a passive, sure, and favourite food. His sense of smelling is peculiarly acute; in his march, he is frequently observed to face the breeze, to rear his head, and snuff the passing scent, whereby he can discover the nearest route to his odorous banquet, though the distance be incredibly great.”

“Captain Scoresby then describes the various kinds of ice, and defines the terms used by those who frequent the Greenland Seas, to distinguish it under all its various forms. It appears that, during the progress of freezing, the salt of sea-water is separated from the crystals of ice, which accounts for the circumstance, at first view so extraordinary, and which probably induced Buffon and others to deny, altogether, the freezing of the sea, that sea-ice, when dissolved, generally yields fresh water. Sea-ice is porous and opaque, and whatever salt it contains is lodged between the parts of which it is composed; and hence results the peculiarity, long since observed by Daines Barrington, that when melted without being washed, the water was saltish; but, if held under the spout of a pump-well, for some time before it was dissolved, it yielded fresh water.”

“The polar ice formed from fresh water is distinguished by its greater transparency and beauty. It may be formed into lenses, capable of producing a considerable quantity of heat; sufficient, for instance, to burn wood, fire gun powder,

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powder, melt lead, and light the sailors' tobacco-pipes. This last experiment Captain Scoresby used to try, to the great admiration of his men, who could not devise how so great a heat could be produced by such extraordinary means, or how the ice itself should remain unmelted, while the heat emerged from it.*

"In regard to the generation of enormous plains of ice, called **FIELDS**, Captain Scoresby seems to be of opinion that they derive their origin, primarily, from water frozen from the surface of the sea, and are annually increased in size by the freezing of snow-water above and of salt-water below. Other fields again, particularly such as are very rugged on the surface, are produced by packs, or many pieces of ice of smaller dimensions, frozen together by the intervention of new ice. It is a singular circumstance, that the ice has a constant tendency to drift to the south-westward. Even during the prevalence of the most variable winds, they have been observed to drift in that direction a hundred miles in the space of a month. By this many are annually dissolved.

"It is probable that, the most terrific and sublime spectacle in nature is the concussion of these enormous fields. It would, indeed, be difficult for the human imagination to conceive any thing more awful and impressive than the sensations produced on the minds of the crew of one solitary ship, working her way through the regions of eternal frost, under a dark and lurid atmosphere, and the sun obscured by dense vapours, when the still and utter silence which had reigned around is suddenly and fearfully interrupted by the meeting of two enormous fields, revolving in opposite directions, and advancing against each other at the rate of several miles an hour; the one is broken and destroyed, or forced in part above the other, with a loud and terrible dissonance, resembling the voice of thunder, or the roaring of cannon. During this terrible contest, huge masses of ice are raised with tremendous force above the surface of the water, and projected upon the further surface of the superincumbent field. These disrupted masses are known under the name of hummocks. In one instance they were thrown up to the height of twenty feet from the surface of the field, extending fifty or sixty yards in length, and formed a mass of about 2000 tons in weight.

"The majestic unvaried movement of the ice; the singular noise by which it was accompanied; the tremendous power exerted; and the wonderful effects produced; were calculated to excite sensations of novelty and grandeur, in the mind of even the most careless spectator."

It would be impossible to conceive any chance of escape or safety on the part of those who were unfortunate enough to be enclosed between such irresistible powers. Destruction and total ruin would be the inevitable consequence of such a direful calamity, and we cannot conceive a more awful termination of this mortal life. "It may easily be imagined," says Captain Scoresby, "that the strongest ship can no more withstand the shock of the contact of two fields, than a sheet of paper can stop a musket-ball. Numbers of vessels, since the establishment of the fishery, have been thus destroyed; some have been thrown upon the ice, some have had their hulls completely thrown open, and others have been buried beneath the heaped fragments of the ice.

"When ice is of recent growth, ships are sometimes able to withstand the

* "We understand that Dr. Brewster, when examining the optical properties of ice, has found that even large masses, two or three inches thick, formed upon the surface of standing water, are as perfectly crystallized as rock crystal or calcareous spar; all the axes of the elementary crystals corresponding with the axes of the hexadral prisms, being exactly parallel to each other, and perpendicular to the horizontal surface."—Brande's Journal, Vol. iv. p. 155.

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shock of two adverse fields. Of this we have an instance in the following catastrophe, which befel Captain Scoresby himself.

"In the year 1804, I had a good opportunity of witnessing the effects produced by the lower masses in motion. Passing between two fields of bay-ice, about a foot in thickness, they were observed rapidly to approach each other, and before our ship could pass the strait, they met with a velocity of three or four miles an hour; the one overlaid the other, and presently covered many acres of surface. The ship proving an obstacle to the course of the ice, it squeezed up on both sides, shaking her in a dreadful manner, and producing a loud grinding, or lengthened acute tremulous noise, according as the degree of pressure was diminished or increased, until it has risen as high as the deck. After about two hours, the velocity was diminished to a state of rest, and soon afterward the two sheets of ice receded from each other nearly as rapidly as they before advanced. The ship, in this case, did not receive any injury, but had the ice been only half a foot thicker, she would probably have been wrecked.

"The motion of ice is occasioned chiefly by currents or the pressure of other ice; the wind also has the effect of driving all ice to leeward, with a velocity nearly in the inverse proportion to its depth under water. Light ice consequently drives faster than heavy ice, and loose ice than fields; loose ice meeting the side of a field in its course, becomes deflected, and its reaction causes a circular motion of the field.

"Those sublime features in the scenery of northern countries, called icebergs, or ice-mountains, derive their origin from two different sources. When detached from the place in which they had grown, they are known under the name of ice-islands, and are then subject, in a great measure, to the same powers which affect other floating ice; but, when situated in valleys on the land, they are as permanent as the rocks on which they rest.

"I have seen," says Captain Scoresby, "those styled the Seven Icebergs, situated in the valleys of the north-west coast of Spitzbergen; their perpendicular front may be about 300 feet in height, the green colour and glittering surface of which form a pleasing variety, in prospect, with the magnificence of the encompassing snow-clad mountains, which, as they recede from the eye, seem to rise, crag above crag, in endless perspective.

"These beautiful icy cliffs are, in common with every species of ice, very fragile during the summer months; they frequently, by the weight of superincumbent snows, &c. assume an overhanging form, and are precipitated into the sea. Water, also, by its expansion in secret cavities during the process of freezing, frequently detaches these icebergs with tremendous force. They are thus, and by other means, converted into floating bergs, or ice-islands.

"The floating icebergs of Greenland, on the east, are much inferior, both in size and number, to those of Baffin's Bay. The largest which Captain Scoresby ever saw, in the former country, was about 1000 yards in circumference, nearly square, with an elevation of twenty feet; it must have been 150 or 160 feet in thickness, and in weight about two millions of tons. In Davis's Strait, however, they have been met with, possessing an area of five or six square miles, elevated thirty yards above the sea, and running aground in water of 100 fathoms. Captain Scoresby calculated that the weight of such a mass of ice must have been upwards of 2000 millions of tons.

"It has been already noticed, that the origin of ice-bergs is two-fold. The greater number are supposed to derive their origin in the deep narrow bays, so frequent

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"In regard to mention the journey in the year 1714, persons, left the longitude 139° E. and, journeying 77th or 78th degree of rugged ice, to the continuance of ice to return, being several of which Having travelled nineteen days.

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frequent in Old Greenland. Others, again, are generated on the land, by the congelation of snow, accumulated during a long period of years. The land of Spitzbergen, particularly on the western side, possessing few sheltered spots, is much less favourable to the formation of icebergs than Old Greenland. The following is the abstract of Captain Scoresby's remarks on the formation of icebergs in the Greenland Sea :

"That some ice-mountains, or icebergs, are derived from the icebergs generated on the land, between the mountains of the sea-coast; and are, consequently, the product of snow, or of rain-water.

"That a more considerable portion may probably be formed in the deep sheltered bays abounding on the eastern coast of Spitzbergen. These have their beds in the waters of the ocean, and are partly the product of sea-water, and partly that of snow and rain-water: and, it is highly probable that, a continent of ice-mountains may exist in regions near the Pole, yet unexplored, the nucleus of which may be as antient as the earth itself, and its increase derived from the sea and atmosphere combined."

Captain Scoresby concludes his observations on these magnificent objects by the following beautiful remark :

"Navigating amongst icebergs, in the gloom of night, has sometimes been attended with fatal consequences; occurring far from land, and in unexpected situations, the danger would be extreme, were they not providentially rendered visible by their natural effulgence, which enables the mariner to distinguish them at some distance, even in the darkest night, or during the prevalence of the densest fog."

"It has long been a subject of dispute, even among those well versed in general hydrography and meteorology, whether ice is ever formed on the wide sea, or requires the proximity of land? On such a point, the opinion of Captain Scoresby is, necessarily, invaluable, and may be considered as setting the question at rest, at least in so far as concerns the operations of nature at the present period. As to ice, in general, he observes, "That, however dependent the ice may have been on the land, from the time of its first appearance to its gaining an ascendancy over the waves of the ocean, sufficient to resist their utmost ravages, and to arrest the progress of maritime discovery, at a distance of, perhaps, from 600 to 1000 miles from the Pole; it is now evident that, the proximity of land is not essential, either for its existence, its formation, or its increase."

"In regard to the existence of ice at a great distance from land, we may mention the journey recorded by Muller, and quoted by Captain Scoresby. In the year 1714, one named Alexi Marcoff, a cossack, accompanied by eight persons, left the mouth of the Yana, a Siberian river, situate in latitude 71° N. longitude 139° E. He travelled upon the ice in a sledge, drawn by dogs; and, journeying due North, he proceeded for seven days, till he reached the 77th or 78th degree of latitude. He was then stopped by immense mountains of rugged ice, to the top of which he climbed, and perceived nothing but a continuance of ice and snow, without any appearance of land; he was obliged to return, being much straightened for provisions, both for himself and dogs, several of which died during their return, and served as food for the others. Having travelled 800 miles, he reached the Siberian shore, after an absence of nineteen days.

"We are next presented with some curious remarks on the great and sudden increase of the ice around the coast of East Greenland, already alluded to; and

and some valuable observations connected with the Whale-Fishery, and the most usual haunts of the whales; the effects of seasons on the southern boundaries of the ice, and other very important subjects.

The singular movements and changes in the position of the different kinds of polar ice are next commented on. It is of the utmost importance to the whale-fishers to be able to determine whether certain openings in the ice are in the course of increasing or diminishing. Those openings are distinguished by the name of *veins* of water; and it is a valuable remark that, birds are observed instinctively to leave the closing spaces, and fly in search of such as are in the course of opening.

"The amazing changes," Captain Scoresby observes, "which take place in the most compact ice, are often unaccountable. They astonish even those who are accustomed to their occurrence. Thus, ships immoveably fixed, with regard to the ice, have been known to perform a complete revolution in a few hours; and two ships *beset*, a few furlongs apart, within the most compact pack, have sometimes been separated to the distance of several leagues, within the space of two or three days, notwithstanding that the apparent continuity of the pack remained unbroken.

"In confirmation of these extraordinary changes in the position of the polar ice, Captain S. quotes the following passage from his father's journal.

"N.B. I cannot, from the topgallant-mast-head, see over the flat ice to the N.E., into which the ship is frozen; and yet, in fifty hours, it has revolved from the S.S.W. westerly, to North, and carried the ship, with a semi-circular motion, 15 or 20 leagues. On the 10th instant, we were within one mile and a half of the land, whereas our distance is now ten leagues, and our advance to the northward even greater. The Volunteer is drifted out of sight in the S.W. quarter.

"We have already mentioned the remarkable tendency of the ice to drift to the south-westward. Near the western coast of Spitzbergen, this peculiarity is not observed, but rather the contrary, which may result from the effects of the tide, or of partial currents. Captain Scoresby, however, has adduced several very striking examples, to show that, at a distance from land, it prevails, with the exception of a few variations.

"The effects of the polar ice on the climate and the phenomena of the atmosphere are considerable. It affects the colour of the sky, diminishes the violence of the wind, and equalises the temperature of the air. Thus a storm will frequently blow on one side of a field for a considerable time before it becomes perceptible on the other; and the cold of the 80th degree of North latitude, during the prevalence of a northerly wind, at the edge of the main body of the ice, is not sensibly greater than in the 70th degree, with the wind blowing from a similar direction. The destruction of field-ice, by a *grown* swell, is exceedingly rapid, and produces a striking change on the appearance and character of the surrounding landscape.

"Instead of a sheet of ice, expanding unbroken to the verge of the horizon on every side, an undulating sea relieves the prospect, wherein floats the wreck of the ice, reduced, apparently, to a small fraction of its original bulk! This singular occurrence I have, more than once, been witness to."

The actual destruction of the ice, however, is caused, chiefly, by the friction which takes place among the smaller pieces; the effect of a swell being merely to rend the larger pieces asunder.

The concluding part of Captain Scoresby's paper contains an account of various

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various approximations to the Poles, and remarks on the possibility of reaching the North Pole, by traversing the ice in a sledge drawn by rein-deer or dogs.

The enlightened Editor of the work to which we are indebted for these extracts has said, and every friend to knowledge will concur in the sentiment, "Whether we consider the novelty of the subject, or the distinct and intelligent manner in which the information is conveyed, Captain Scoresby is alike entitled to our gratitude and respect."

*On the COLOUR of the GREENLAND SEA, &c. by Captain Scoresby.**

"The colour of the Greenland Sea varies from ultramarine-blue to olive-green, and from the most pure transparency to great opacity. These appearances are not transitory, but permanent; not depending on the state of the weather, but on the quality of the water. Hudson, when he first visited this quarter, in the year 1607, noticed the changes in the colour of the sea, and made the observation that the sea was blue where there was ice, and green where it was most open. This circumstance, however, was merely accidental. Captain Phipps does not appear to have met with any of the green water. This kind of water occurs in considerable quantity; forming, perhaps, one-fourth part of the surface of the Greenland Sea, between the parallels of 74° and 80°. It is liable to alterations in its position, from the action of the current, but still it is always renewed, near certain situations, from year to year. Often it constitutes long bands or streams, lying north and south, or N.E. and S.W. but of very variable dimensions: sometimes I have seen it extend two or three degrees of latitude in length, and from a few miles to ten or fifteen leagues in breadth. It occurs very commonly about the meridian of London, in high latitudes. In the year 1817, the sea was found to be of a blue colour and transparent, all the way from 12° East, in the parallel of 74° or 75°, to the longitude of 0° 12' East in the same parallel. It then became green and less transparent. The colour was nearly grass-green, with a shade of black. Sometimes the transition between the green and blue water is progressive, passing through the intermediate shades in the space of three or four leagues; at others, it is so sudden that the line of separation is seen like the rippling of a current, and the two qualities of the water keep apparently as distinct as the waters of a large muddy river on first entering the sea. In 1817, I fell in with such narrow strips of various coloured water, that we passed streams of pale green, olive-green, and transparent blue, in the course of ten minutes' sailing.

The food of the whale occurs chiefly in the green-coloured water: It therefore affords whales in greater numbers than any other quality of the sea, and is constantly sought after by the fishers. Besides, whales are more easily taken in it than in blue water, on account of its great obscurity's preventing the whales from seeing distinctly the approach of their enemies.

Nothing particular being observed in this kind of water, sufficient to give it the remarkable colour it assumes, I, at first, imagined that this appearance was derived from the nature of the bottom of the sea. But, on observing that the water was very imperfectly transparent, insomuch that the tongues of ice, two or three fathoms under water, could scarcely be discerned, and were sometimes invisible, and that the ice floating in the olive-green sea was often marked about the edges with an orange-yellow stain, I was convinced that it must be occasioned by some yellow substance, held in suspension by the

* Edinburgh Phil. Journal, Vol. II.

water, capable of discolouring the ice, and of so combining with the natural blue of the sea as to produce the peculiar tinge observed.

For the purpose of ascertaining the nature of the colouring substance, and submitting it to a future analysis, I procured a quantity of snow from a piece of ice that had been washed by the sea, and was greatly discoloured by the deposition of some peculiar substance upon it. A little of this snow, dissolved in a wine-glass, appeared perfectly nebulous; the water being found to contain a great number of semi-transparent spherical substances, with others resembling small portions of fine hair. On examining these substances, with a compound microscope, I was enabled to make the following observations.

The semi-transparent globules appeared to consist of an animal of the medusa kind. It was from one-twentieth to one-thirtieth of an inch in diameter. Its surface was marked with twelve distinct patches, or nebulæ, of dots, of a brownish colour: these dots were disposed in pairs, four pairs, or sixteen pairs, alternately, composing one nebula. The body of the medusa was transparent. When the water containing these animals was heated, it emitted a very strong odour, in some respects resembling the smell of oysters when thrown on hot coals, but much more offensive. The fibrous or hair-like substances were more easily examined, being of a darker colour. They varied in length from a point to one-tenth of an inch, and, when highly magnified, were found to be beautifully moniliform. In the longest specimens, the number of bead-like articulations was about thirty; hence their diameter appeared to be about the one-threethundredth part of an inch. Some of these substances seemed to vary their appearance; but, whether they were living animals, and possessed of loco-motion, I could not ascertain. From one of the larger specimens, I observed some fine collateral fibres. They possessed the property of decomposing light; and, in some cases, showed all the colours of the spectrum very distinctly. The size of the articulations seemed equal in all, the difference in length being occasioned by a difference in the number of articulations. The whole substance had an appearance very similar to the horns, or antennæ, of shrimps, fragments of which they might possibly be, as the squillæ are very abundant in the Greenland Sea.

I afterwards examined the different qualities of sea-water, and found these substances very abundant in that of an olive-green colour; and also occurring, but in less quantity, in the bluish-green water. The number of medusæ in the olive-green sea was found to be immense. They were about one-fourth of an inch asunder. In this proportion, a cubic inch of water must contain sixty-four, a cubic foot 110,592, a cubic fathom 23,887,872; and a cubical mile about 23,888,000,000,000,000! From soundings made in the situation where these animals were found, it is probable that the sea is upwards of a mile in depth; but whether these substances occupy the whole depth is uncertain. Provided, however, the depth to which they extend be but 250 fathoms, the above immense number of one species may occur in a space of two miles square. It may give a better conception of the amount of medusæ in this extent, if we calculate the length of time it would be requisite, with a certain number of persons, for counting this number. Allowing that one person could count a million in seven days, which is barely possible, it would have required that eighty thousand persons should have started at the creation of the world to complete the numeration at the present time.

What a stupendous idea this fact gives of the immensity of creation, and of the bounty of Divine Providence, in furnishing such a profusion of life in a region so remote from the habitations of men! But, if the number of animals in a

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space of two miles square be so great, what must be the amount requisite for the discoloration of the sea through an extent of perhaps 20,000 or 30,000 square miles!

These animals are not without their evident economy; as, on their existence, possibly depends the being of the whole race of mysticete, and some other species of cetaceous animals. For, the minute medusæ apparently afford nourishment to the sepia, actinia, cauri, helices, and other genera of mollusca and aptera, so abundant in the Greenland Sea; while these latter constitute the food of several of the whale-tribe, inhabiting the same region; thus producing a depending chain of animal life, one particular link of which, being destroyed, the whole must necessarily perish.

Besides the minute medusæ and moniliform substances, the water of the Spitzbergen Sea, taken up in the latitude 77° 30', was found to contain several species of animalculæ. Of these I discovered three kinds, full of animal life, but invisible to the naked eye.

There can be no doubt, I think, after what has been advanced, that the medusæ and other minute animals that have been described, give the peculiar colour to the sea, which is observed to prevail in these parts; and that, from their profusion, they are, at the same time, the occasion of that great diminution of transparency which always accompanies the olive-green colour. For, in the blue water, where few of the little medusæ exist, the sea is uncommonly transparent. Captain Wood, when attempting the discovery of a N.E. Passage, in the year 1676, sounded near Nova-Zemlia, in 80 fathoms water, where the bottom was not only to be seen, but even the shells lying on the ground were clearly visible.

Never having been in a very high latitude, during any part of the year when the sun sets, I have never observed whether the Greenland Sea possesses the property of shining in the dark. There is, however, great reason to believe that, as the luminousness of the sea is often derived from small animals of the medusæ kind, that the green-coloured water, found in the Greenland Sea, would be strongly phosphorescent."

To the prose description of the Northern Ocean, we now add the beautiful picture drawn by a POET, not less distinguished as such than as the friend of virtue and liberty.

'Tis SUNSET: to the firmament serene,
The Atlantic wave reflects a gorgeous scene;
Broad in the cloudless west, a belt of gold
Girds the blue hemisphere; above, unroll'd,
The keen clear air grows palpable to sight,
Embodied in a flush of crimson light.
Through which the evening star, with milder gleam,
Descends to meet her image in the stream.
Far in the east, what spectacle unknown
Allures the eye to gaze on it alone?
—Amidst black rocks, that lift on either hand
Their countless peaks, and mark receding land;
Amidst a tortuous labyrinth of seas,
That shine around the arctic Cyclades;
Amidst a coast of dreariest continent,
In many a shapeless promontory rent;
—O'er rocks, seas, islands, promontories, spread,
The ICE-BLINK rears its undulated head;

On which the sun, beyond the horizon shrin'd,
 Hath left his richest garniture behind:
 Pill'd on a hundred arches, ridge by ridge,
 O'er fix'd and fluid, strides the Alpine bridge,
 Whose blocks of sapphire seem, to mortal eye,
 Hewn from cerulean quarries of the sky;
 With glacier battlements, that crowd the spheres,
 The slow creation of six thousand years.
 Amidst immensity it towers sublime,
 —Winter's eternal palace, built by Time:
 All human structures by his touch are borne
 Down to the dust;—mountains themselves are worn
 With his light footsteps; *here* for ever grows,
 Amid the region of unmelting snows,
 A monument, where ev'ry flake that falls
 Gives adamantine firmness to the walls.
 The sun beholds no mirror, in his race,
 That shows a brighter image of his face;
 The stars, in their nocturnal vigils, rest,
 Like signal-fires, on its illumined crest;
 The gliding moon around the ramparts wheels,
 And all its magic lights and shades reveals;
 Beneath, the tide with idle fury raves,
 To undermine it through a thousand caves;
 Rent from its roof, though thundering fragments oft
 Plunge to the gulf, immoveable aloft,
 From age to age, in air, o'er sea, on land,
 Its turrets brighten, and its piers expand.

Midnight hath told his hour; the moon, yet young,
 Hangs in the argent west her bow unstrung;
 Larger and fairer, as her lustre fades,
 Sparkle the stars amidst the deep'ning shades;
 Jewels more rich than night's regalia gem,
 The distant ice-blink's spangled diadem;
 Like a new morn from orient darkness, there
 Phosphoric splendours kindle in mid-air,*
 As though from heav'n's self-op'ning portals came
 Legions of spirits in an orb of flame,
 —Flame that, from ev'ry point an arrow sends,
 Far as the concave firmament extends:
 Spun with the tissue of a million lines,
 Glist'ning like gossamer, the welkin shines:
 The constellations, in their pride, look pale
 Through the quick trembling brilliance of that veil:
 Then, suddenly converg'd, the meteors rush
 O'er the wide south; one deep vermilion blush
 O'erspreads ORION, glaring on the flood,
 And rabid Sirius foams through fire and blood:
 Again the circuit of the pole they range,
 Motion and figure ev'ry moment change,
 Through all the colours of the rainbow run,
 Or blaze like wrecks of a dissolving sun;

* The Aurora-Borealis.

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Wide ether burns with glory, conflict, flight,
 And the glad ocean dances in the light.
 The seaman's jealous eye, askance, surveys
 This pageantry of evanescent rays;
 While, in the horror of misgiving fear,
 New storms already thunder on his ear,
 But morning comes, and brings him sweet release;
 Day shines and sets; at evening all is peace.

(Montgomery's 'Greenland,' p. 61.)

III. THE CURRENTS OF THE NORTHERN OCEAN.

It is a well-established fact, that, a current in the spring and summer generally *sets* from the entrances of Hudson's Bay and Davis's Strait into the Atlantic Ocean, towards the Banks of Newfoundland, and more to the eastward.

The principal evidence of this current arises from the existence of ice-bergs, or islands of ice, which are found in the spring, and the months of June, July, and August, on the Banks. They are often very extensive, and of great magnitude, being frequently aground in 40 and 50 fathoms water. In thick weather, they are very dangerous, but may be distinguished, at a distance, by the blink or brightness of the sky above, and the noise of the breakers about them.

Mr. Henry Ellis, in his voyage to Hudson's Bay, states, that he encountered ices in summer, from 1500 to 1800 feet above the level of the sea; and he observed, with surprise, in 1746-7, that the tides (or currents) were from the north, and were accelerated, instead of retarded, in proportion to the latitude. This fact supports the supposition that the sources of this current are in the polar regions, and proceed from the effusion or melting of the ices in the north.

These ices, therefore, detached from the immense fields in the regions of the north, are concluded to prove the existence of a southerly current, during that part of the year, at least, in which they may be found.* As to the formation of ice-bergs, on the coast of Labrador, see Note 4, page 43.

Mr. Ellis, in his narrative of the expedition of the Dobbs and California, to Hudson's Bay, in 1746, has thrown much light upon different obscurities of the polar regions. In the words of an intelligent friend, "Ellis was a man who had a mind of his own, which has irradiated science by its reflections." He says, "On the 5th of July we began to fall in with those mountains of ice which are always met with near Hudson's Straits. This mountainous ice is of prodigious size; and if I should say that we sometimes find it 500 or 600 yards thick, I am thoroughly satisfied that I should not exceed the truth."

Mr. Ellis had previously fallen in with great quantities of low ice, in latitude 58° 30', to the eastward of the southern promontory of Greenland, with very foggy weather; and some time after this, he observes, they sailed through abund-

* On the 21st of June, 1794, in latitude 45° 18', on the eastern steep edge of the Great Bank of Newfoundland, in a thick fog, at nine a. m., his Majesty's frigates *Dædalus* and *Ceres* were suddenly involved amidst some very high and dangerous islands of ice. The weather was so thick, that objects were not visible at fifty yards distant. The *Dædalus*, commanded by Sir Charles Henry Knowles, hauled up and passed close to the stern of a ship that lay stranded upon one of the ice-islands, and sailed to windward of it through a great quantity of drift-ice, and to leeward of another ice-island. The *Ceres*, Captain Thomas Hamilton, passed in the same track, and saw the wreck a quarter of an hour after the *Dædalus*. The course was east, the wind S.W., the sea very high, as the wind blew hard the night preceding from the southward.

ance of drift-wood, that is, pieces of timber, floating at sea; a circumstance which excited his particular notice, because no satisfactory account had been given from whence this drift-wood should come. "All the accounts we have from Greenland, of the Coasts of Davis, and of Hudson's Straits, however they may differ in other things, agree in this, that no timber grows to the size of this drift-wood in any of those parts; and, therefore, it has been judged that, wherever it comes from, it could not be from any of them. Some have persuaded themselves that it must be driven hitherto from Norway, and others from the east coast of Labrador; but, I must own, neither of these accounts appear probable to me: for, as the north-westerly winds prevail much in these parts, they would prevent its coming from Norway; as, on the other hand, the strong currents setting out of Davis's and Hudson's Straits, southward, must hinder its passage from the coast of America into these seas."

There can be no longer any doubt that this drift-wood came down from the northward between Iceland and the coast of East Greenland. This was conjectured by Mr. Ellis; and the supposition seems confirmed by the observations on the south-westerly or southerly current near Iceland, described by Captain Scoresby.—See page 56.

Lieutenant Chappell, in his recent narrative of a voyage to Hudson's Bay, on approaching Southern Greenland, says, "As an indication of our drawing near to some land, we this morning picked up a broken tree, about 18 feet long, of the yellow pine species. Although we could not have been less than 300 miles from the nearest land, it certainly had not been long in the water. After night-fall we were gratified with a most brilliant display of the *aurora borealis*." (P. 36.)

"Entering Hudson's Straits, it is a necessary precaution to keep close in with the northern shore; as the currents out of Hudson's and Davis's Straits meet on the south side of the entrance, and carry the ice, with great velocity, to the southward, along the coast of Labrador."—(P. 40.)

From the entrance of Davis's Strait there seems little reason to doubt that the predominating current sets to the eastward. We have hazarded this remark before as a conjecture, but it seems to have been realized by the course of the bottles thrown into the sea from the ships commanded by Captain Ross and Lieutenant Parry, in 1818: of these, one was found, dated 24th May, on the Isle Bartragh, Killala Bay, Ireland; another, dated 29th May, about three miles from Innisowen Head, near Urris, on the West of Ireland; another, dated 3d June, was found at Balnarnald, North Uist, one of the western isles of Scotland. The times in which these were found were June, July, and August, 1819: it is impossible to describe the course of the bottles, or how they were impelled by the winds; and the facts are recorded here merely from want of better data.

Mr. Bain, in his Essay on the Variation of the Compass, has said, "When in the Greenland Seas, in 1814, I boarded a number of ships employed in the whale fishery, whose masters all agreed in maintaining that, they experienced strong S. E. currents on their return home, and were often confounded at making the coast of Norway, when they expected to make that of Shetland. Now, I have no hesitation in saying, that, if the same difference in the variation is to be found on board a Greenland ship as that which was found to exist on board the *Sybille* and *Princess Carolina*, the idea of a strong S. E. current is unfounded, and is merely resorted to, to account for the error in the dead reckoning, arising from not allowing a sufficiency of westerly variation in running from the ice to the south-west. A degree of longitude is soon lost or gained in those high

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“The Princess Carolina, as well as Sybille, experienced the same currents which the masters of the Greenland ships supposed to exist; for, when we made Shetland, by Arnold’s chronometer, No. 1981, to a mile, our dead reckonings were nearly 6 degrees to the westward in both ships; and, when we made the North Cape, by the same chronometer, (which was under my own care,) the longitude in both ships, by account, was 4° to the westward also.* The one error was occasioned by not allowing a sufficiency of westerly variation in running to the south-west, and the other, by allowing too much in running to the north-east.” (P. 104.)

There can be no doubt that an erroneous allowance has often been made for variation, and that the consequence has often been dangerous; but, we repeat that, we believe the predominant current sets to the eastward, south of the parallel of 61°, not only in the ocean, but also in the North-Sea.

The following paragraph appeared in November 1819. “A priest, named Theling, at Ræd-oe, has communicated to the Norwegian government, that a sealed bottle was found, on the 21st of September last, near the mouth of a river a little above Ræd-oe. It contained a report from the captain of the English ship Hecla, which is on an expedition towards the arctic pole. This report is dated May, 22d, 1819, at 2 p. m., lat. 59° 4′, long. 6° 55′ W. all in good health,” &c.†

What may be the general direction of the predominating current, from and about the north cape, we cannot say; but we are certain that, it is very common for ships to be far astern of the reckoning; and that, in proceeding towards the White Sea, in the spring, they meet with great drifts of ice from that sea, &c., as shown in the directions hereafter.—See likewise the note on Spitzbergen, page 27. Immense ice-bergs were seen off the coast of Denmark, in January, 1820: supposed to be fragments of larger masses rent from the North.

SECTION III.

PARTICULAR DESCRIPTIONS OF THE COASTS AND ISLANDS; WITH DIRECTIONS FOR SAILING, &c.

I. THE EASTERN COAST OF GREAT BRITAIN.

FOR PARTICULAR DESCRIPTIONS of the coast and harbours, between the Thames and the Orkney Islands, with SAILING DIRECTIONS for the same, the reader is respectfully referred to our Book of Directions for the North-Sea; in which, as we trust, he will find the most satisfactory information.

* Here Mr. Bain refers to his Chart; upon examining which, the North Cape appears to be placed nearly 3° too far to the west, or in 23°, instead of 26° E.

† The river mentioned in this notice is, we presume, the Fosen Strom, between Ræd-oe and Fosen-oe, in latitude 60° 45′, long. 4° 54′ E. The spot into which the bottle was thrown, on the 22d of May, was to the north of Lewis’ Island. Hence, had the bottle traversed in a direct line, the true course and distance would be E.N.E. $\frac{1}{2}$ E., more than 360 miles; passing on the south of Shetland, and over the northern part of the North-Sea.

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It is gratifying to perceive, on referring to the new Chart of the same sea, that, within a very few years, many improvements have been added to the facilities of navigation on the British coast, as light-houses, beacons, &c. In the south, under the direction of the Corporation of Trinity-House; in the north, under that of the COMMISSIONERS for the NORTHERN LIGHT-HOUSES. Among them are several durable monuments to the honour of those by whom they were planned and executed. It may please the reader to see them noticed; and we shall, therefore, here enumerate all the light-houses and light-vessels on our eastern coast, in the order in which they occur from the Thames, northward.

Firstly, Within the estuary of Thames, is the NORE-LIGHT-VESSEL, having two large lantern-lights, placed horizontally, on a single mast. Its situation is the extremity of the Nore-sand; and it is, therefore, to be left, by vessels sailing outward, on the right or starboard hand.

2. A LIGHT-VESSEL off the N. E. end of the sand called the SUNK, at the entrance of the King's Channel; it exhibits ONE light in the night, and a flag at the mast-head during the day; and, in foggy weather, a bell is rung every half hour, which strikes six times in ten minutes, so as to distinguish this from other vessels. By those sailing outward, this vessel is passed, or left, on the right or starboard hand.

3. A LIGHT-VESSEL on the south end of the sand called the GALLOPER, which exhibits two lights placed horizontally, but supported by separate masts. This was originally placed, by order of the Admiralty, in 1804, and its intended removal was announced in 1816; but, as it is very useful, it has been taken under the protection of the Trinity-House, in order to be permanently continued.

4. LIGHTHOUSES of HARWICH.—The present lighthouses, constructed on a new and improved plan, were first lighted in the night of the 31st March, 1818. The tower of the high lighthouse is elevated nearly 40 feet above its light-room, so as to be a better day-mark for the harbour. The lights in a line bear, by compass, N.W. by N. (See the new Chart of the Harbour and Environs of Harwich, mentioned in note 2, page 11.)

5. LIGHTHOUSES ON ORFORDNESS, two; these serve as marks for the inner channel to Orfordness, and for clearing Aldborough Knaps, &c. They bear, when in a line, N. E. by E. $\frac{1}{4}$ E. and S.W. by W. $\frac{1}{4}$ W. by compass. The upper lighthouse is a handsome round tower, as represented on the Chart of the North Sea.

6. LIGHTHOUSES on the NESS of LOWESTOFF, at the entrance of the Stanford Passage, and originally intended to lead clear of the sand called the Holm; but, as this sand has lately extended itself to the southward, the lights in one and bearing N. $\frac{1}{4}$ E. by compass, now lead upon it, as shown in Mr. Holditch's Chart of the Eastern Coast. The buoy of the Stanford was shifted accordingly in August 1819.

7. LIGHT-VESSEL in the STANFORD PASSAGE.—This vessel was first placed on the eastern side of the Stanford Passage; within the sand called the Holm, in August, 1815. It exhibits two lights, placed horizontally, and is very useful to vessels sailing to and from Yarmouth Roads.

8. LIGHT-VESSEL off the north end of the sand called the NEWARP, first established by the Trinity-House in 1790. It exhibits two lights, and is, with the lighthouses of Hasborough, of the greatest utility to vessels passing through Hasborough Gat, &c.

9. The LIGHTHOUSE of WINTERTON, formerly two, useful for ascertaining by its bearings, the situation of the neighbouring shoals.

10. The LIGHTHOUSE represented on the Chart bearing N.W. $\frac{1}{4}$ W. through Gat.

11. CROMER LIGHTHOUSE, new Chart of the coast.

12. HUNSTON LIGHTHOUSE, Well, &c.

13. A LIGHTHOUSE on the right or starboard hand.

14. LIGHTHOUSE on the Humber.—These lights are occasionally lighted.

15. LIGHTHOUSE first lighted in 1818, bears red. It exhibits two lights.

[The TIDE-LIGHT description, not mentioned.]

16. LIGHTHOUSE on the pier-head of Sudbury, throughout the year, during the time that the tide is out.

17. TWO LIGHTHOUSES, in a line, on the south side of the harbour.

18. TINMOUTH LIGHTHOUSE, full once in every year.

19. The STAPLE LIGHTHOUSE, on the island of Staple, detector every half hour, the Sound. The lights by compass. See page 11.

20. LIGHTHOUSE on the order of the lights lighted on the 1st of February, resembling a star of compass, in clear weather.

21. INCH-KEY LIGHTHOUSE, the 1st of February, light, without colour, once in every minute.

22. The BELL LIGHTHOUSE, page 12, the light is shown in the space of three hours, from low water, seen, from a ship's mast.

23. The LIGHTHOUSE, day only.

10. The LIGHTHOUSES of HASBOROUGH, first lighted in 1790, stand and appear as represented on Mr. Holditch's Chart of the Eastern Coast. When in a line, bearing N.W. $\frac{1}{4}$ W. by compass, they lead directly through the fairway of Hasborough Gat.

11. CROMER LIGHTHOUSE, on Foulness, stands and appears as shown on the new Chart of the North-Sea. The light is bright, and revolves once in a minute.

12. HUNSTANTON LIGHTHOUSE.—An oil-light, with fourteen lamps, for Lynn Well, &c.

13. A LIGHT-VESSEL moored on the western side of the sand called the Dudgeon. It exhibits two lights, and is passed, by those bound to the Humber, on the right or starboard hand.

14. LIGHTHOUSE and SWAPE, or LIGHT-BEACON, on the SPURN POINT, of the HUMBER.—These, in a line, bear, by compass, N.W. $\frac{3}{4}$ N.: but the Swape may be occasionally shifted, according to the shifting of the sands about the point.

15. LIGHTHOUSE ON FLAMBOROUGH HEAD.—This important structure was first lighted in 1806. Its light is revolving, with three faces, of which one appears red. It exhibits a face every two minutes.

[The TIDE-LIGHTS of SCARBOROUGH, &c., do not fall within the scope of our description, not being kept lighted throughout the night.]

16. LIGHTHOUSE of SUNDERLAND.—This lighthouse stands upon the north pier-head of Sunderland. It is nearly 90 feet in height, and exhibits a light throughout the night: besides which, upon the south pier, a light is kept during the time that vessels may pass over the bar into the harbour.

17. TWO LIGHTHOUSES at NORTH SHIELDS, within the Bar of the Tyne.—These, in a line, lead in the best of the water, which is close to the Herd Sand, on the south side.

18. TINMOUTH CASTLE exhibits a bright revolving light, which shows its face full once in every minute.

19. The STAPLES' LIGHTHOUSE, on Brownsman Isle, and the FARN LIGHTHOUSE, on the isle of that name, both revolve, and show the full face of a reflector every half minute. A third or low light on Farn Island leads through the Sound. The lights of the Staples and Farn Islands, in a line, bear W.S.W. by compass. See the new Chart of Lieut. Johnson, mentioned in Note 3, page 11.

20. LIGHTHOUSE ON MAY ISLAND.—This is a new lighthouse, erected under the order of the Commissioners of the Northern Lighthouses, and was first lighted on the 1st of February, 1816. The light is steady and uniform, resembling a star of the first magnitude; it may be seen from all points of the compass, in clear weather, at the distance of about 7 leagues.

21. INCH-KEITH LIGHTHOUSE, for the Channels to Leith Roads, &c. From the 1st of February, 1816, this lighthouse has exhibited a bright revolving light, without colour, which may be seen full, from all points of the compass, once in every minute.

22. The BELL-ROCK LIGHTHOUSE.—Of this structure, already noticed in page 12, the light is revolving, and appears red and bright, alternately, in the space of three minutes. It is situated at the height of about 115 feet from low water, of spring-tides. The light is very powerful, and has been seen, from a ship's deck, full 20 miles from the rock.

23. The LIGHTHOUSES ON BUTTON-NESS are for leading over the bar of the Tay only.

24. The Lighthouse on KINNAIRD'S HEAD is on the modern construction, being one of those erected by the commissioners of the Northern lighthouses. See note on the Bell Rock lighthouse, in the Book of Directions for the North Sea.

25. LIGHTHOUSES on the PENTLAND SKERRIES.—These stand upon the Great Skerry; they are 60 feet distant, and bear, when in a line, N.N.E. by compass. The high light is 90 feet high; the low light 48 feet. These, also, are on the improved principle, with argand lamps and reflectors, which produce a very bright and conspicuous light.

26. START POINT of SANDA, in Orkney.—The lighthouse upon this point was first illuminated on the 1st of January, 1806. The light is revolving; exhibiting its full face every two minutes, and is elevated above the level of the sea, at high water of spring-tides, 100 feet.

27. A lighthouse on Sumbro' Head, Shetland, was in contemplation when this work was sent to press in January, 1820: but the particulars were not known to the Editor at that time.

II. THE ISLANDS OF ORKNEY.

THE islands distinguished by the name of ORKNEY (the ORCADES of the ancients) are situated between the parallels of $58^{\circ} 40'$ and $59^{\circ} 29'$, as shown by the Charts. Under the general name thirty are enumerated, and of these twenty-six are inhabited; the others, called Holms, are used for pasturage only. The isles are variegated; some are sandy; others marshy; some mountainous; others plain. Hence some of the headlands are high and prominent, while others are low and undistinguishable. The land to the northward is the lowest; particularly the Islands of Sanda and North-Ronaldsha, which can be seen at a short distance only. The population amounts to about 24,000.

The chief town of ORKNEY is that named KIRKWALL, on the larger island called MAINLAND: it contains about 300 houses, and has an antient but stately cathedral. The chief exports of this place are beef, pork, butter, tallow, hides, calf-skins, rabbit-skins, salted fish, oil, feathers, linen-yarn, coarse linen cloth, and kelp. The chief imports are wood, flax, coal, sugar, spirits, wines, tobacco, snuff, flour, biscuit, soap, leather, hardwares, broad cloth, printed linens and cottons. In most parts of MAINLAND the soil is good, though shallow, with a calcareous bottom. The horses are small, but spirited; and the cows, though also small, yield excellent milk. Sheep are numerous, and swine, of a diminutive size, abound. The sea-fowl, as may be imagined, are innumerable.

The highest hill of the Orkneys is that called the Ward Hill of Hoy. Its height is 1620 feet, and it stands on the N.W. of that island.

Although the islands are, at present, deficient in wood, trunks of antient trees have been found, of which some have been thirty feet in length. There are yet a few hazel, willow, and ash, trees.—Mr. Pinkerton has expressed his surprise that, "in the present progress of every art, numerous experiments have not been made to discover some tall tree, which can endure the spray of the ocean; for, if a fence of such were first reared, many other kinds might flourish under its protection. The mountain-ash, or the birch, which is, in Lapland, the last offspring of expiring vegetation, may, perhaps, be found to answer to this description."*

* "Modern Geography."—Art. Scotland.

For the position, see page 10, and the description of Sanda, see page 11. For a description of the Sea; so that it is not to be feared that, the western coast of those on the east of the island, coming in from the NUN BAN HEAD forms the much resorted to. In sailing from the rocky shoal, called Mainland, and the bank around the NUN BAN described in note with fish.

FAIR ISLE, lying in page 15. The probably be exaggerated. Shores, high and the eastern side,

THE ISLANDS are more sterile and the scene of rugged, or shrub is to be seen. Sometimes, however, of the traveller, to the barren he presents many arising from the beaten precipice danger.

"The coasts are in places, scenes of dreadfully rugged, tempestuous ocean. In others, has exhibited magnificence, and affect every one."

"The eastern coast, but the western most mountains have more power than run in three ridges of little height. In Mainland."*

For the positions of the different points of these islands, see the Table, page 10, and the corresponding Notes. For the lighthouse on the Start Point of Sanda, see page 66. Particular directions for the different harbours, and a description of the tides, are given in the Book of Directions for the North-Sea; so that it is unnecessary to repeat them here. We, therefore, only add that, the western points of the islands may be more readily distinguished than those on the east; because Hoy Head will always be the first land made in coming in from the west. HOY-MOUTH, the sound, or inlet, of which HOY HEAD forms the southern point, leads to STROMNESS, an excellent harbour, much resorted to by strangers, and the best for vessels bound out to the west. In sailing from Hoymouth to the northward, the only danger to be feared is a rocky shoal, called the *North Shoal*, which lies upon a bank to the N.W. of Mainland, and nearly N. by E. $\frac{1}{4}$ E. by compass, 16 miles, from Hoy Head. The bank around it generally abounds with cod and ling.

The NUN BANK and ROCK, to the westward of Mainland, have already been described in note 14, page 14. It is probable that this bank, also, abounds with fish.

FAIR ISLE, lying between Orkney and Shetland, has likewise been noticed in page 15. The population, as there given by Captain Krusenstern, may probably be exaggerated. Mr. Laing gives it as about 170 persons, in 1806. Shores, high and rugged: tide running with great velocity, and forming, on the eastern side, a considerable eddy.

III. THE ISLANDS OF SHETLAND.

THE ISLANDS of SHETLAND are similar to those of Orkney, but are more sterile and desolate. "On viewing these islands, in general, a wonderful scene of rugged, black, and barren, rocks, presents itself to our view; no tree or shrub is to be seen, to relieve the eye in wandering over these dreary scenes. Sometimes, however, a few scanty portions of cultivated ground catch the eye of the traveller, exciting emotions of pleasure, and forming a striking contrast to the barren heath-covered mountains which skirt them. The western part presents many scenes as wild and sterile as can be conceived; gray rocks rising from the midst of marshes or pools, and shores bounded by awful sea-beaten precipices, do not fail to raise in the mind ideas of desolation and danger.

"The coasts are, in general, rugged and precipitous; presenting, in many places, scenes truly grand and impressive, vast rocks of various heights, dreadfully rugged and broken, opposing their rude fronts to all the fury of a tempestuous ocean; which, in some places, has formed great detached pillars; in others, has excavated grand natural arches and caverns that mock all human magnificence, and strike the beholder with that awe and wonder, which must affect every one on viewing these amazing wrecks of nature.

"The eastern side of Mainland and the other isles is comparatively low, but the western lofty and rugged. This is well known to be the case with most mountains and islands, because the winds and tempests from the west have more power than those from the opposite quarter. The hills in Mainland run in three ridges, from north to south; they are generally round and of little height. RONA, the highest, stands detached in the N.W. corner of Mainland."*

* Jameson's Mineralogy of the Scottish Isles, 8vo. pages 2 and 3.

The climate of the Shetland Isles is variable. The atmosphere is, in general, moist. There are heavy snows, but they seldom lie long on the ground, as the frosts are not severe. Dreadful storms of wind, rain, and thunder, are frequent, and so violent, that the water is agitated even to the bottom of the sea.

The corruscations of the Aurora Borealis, as already shown in page 45, illuminate the long gloom of winter, and delight the inhabitants, who call them the *Merry Dancers*. The arable land is mostly near the coast, and produces a coarse kind of oats and bigg. Potatoes are commonly cultivated; but turnips, parsnips, and carrots, are mostly confined to the gardens of gentlemen.

The inhabitants are computed at more than 22,000. Their chief food consists of fish and various kinds of sea-fowl which cover the rocks. The women of Shetland are, in general, ignorant of making cheese; but their butter, when manufactured for sale, is excellent. The cattle are rather larger than those of Orkney. The sheep, which are numerous, are likewise very small, but many of the fleeces are remarkably fine. They may be had at from four to seven shillings each. The swine are singularly small, short-backed, and easily fed. A pig, ready for the spit, is often sold for two shillings. The horses, familiar to us by the name of *Shelties*, are very numerous, and seldom more than nine or ten hands high. They are handsome, though covered with long hair, and are remarkably strong and spirited, travelling over the most rugged paths with a steadiness that is surprising. The cows are very small, and give but little milk, owing to the scarcity of fodder. Hares and foxes are unknown, but of rabbits there are plenty.

The islands abound with many kinds of birds, as curlews, snipes, grouse, green-plovers, red-shanks, herons, and other *waders*. The cliffs impending over the ocean are the haunts of eagles, falcons, ravens, hawks, hooded-crows, &c. The Erne-eagles, which are very ravenous, and destructive among the lambs, possess the most exalted precipices, and, like the falcons, will not admit of any society. Small birds are numerous. The tame fowl are geese, ducks, pigeons, dunghill-fowl, and some turkeys. To the winding bays resort swans, dunter, clack, and soland, geese; seal, Greenland doves, kittiwakes, gulls, cormorants, &c.

In the islands of Unst and Foula is bred a bird of the web-footed kind, called Skua, about two feet long, having its claws sharp, strong, and hooked, like those of a kite. It preys on the lesser water-fowl, like a rapacious land-bird, and is so remarkably courageous, and fierce in defending its young, that it will repel the eagle from its haunts. The guillemot is common here, as well as the stormy-petrel. The latter is of a black and white colour, with a black bill much hooked at the end. It breeds commonly among the loose stones on the shore; and bounding into the water, often affrights the superstitious fishermen, who take it to be an omen of some impending disaster.

The seas abound with cod, turbot, haddock, ling, and two species of northern fish, called torsk and opah. Lobsters, crabs, oysters, &c. are also very plentiful. The herrings appear off Shetland, in vast columns, in the month of June, altering the very appearance of the ocean, which ripples like a current. These columns have been computed to extend five or six miles in length by three or four in breadth; and, in bright weather, reflect a variety of splendid colours, appearing like a spacious field of variegated gems. They afterwards divide to the east and west of Great Britain, furnishing a provident supply of food to many barren districts.

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The chief exports of Shetland are fish of various kinds, chiefly herrings, cod, ling, and torsk, or tusk; also, linen and woollen yarns, rugs, stockings, butter, oil, feathers, skins of various kinds, and kelp. The commodities imported are corn, oatmeal, spirits, tobacco, lines and hooks, salt, &c.

Here the Greenland ships are frequently served with mittens, night-caps, comforters, wigs, &c. The inhabitants are sure to come with their boats along-side such ships as happen to touch here. They bring with them fish, fowl, eggs, &c. for which they get beef, pork, flour, meal, or such provisions as they may wish to have. They choose rather to barter than sell for money, and have a skilful method of making a bargain.

The English language prevails in all these islands; but, as the isles were long subject to the kings of Norway, it is spoken with the accent of that country, and is mixed with a great many Norwegian words, especially in Foula. Neither here nor in the Orkneys is the Gaelic language known. English as well as Danish money is current; but neither is abundant.

There are only two towns, or rather villages, in the Shetland Isles, **LERWICK** on the east, and **SCALLOWAY** on the west. The latter is small and poor, but has an excellent harbour, and is distinguished by an antient castle, built by one of the Earls of Orkney. These villages are situate on the large island called **MAINLAND**, which is fifty miles (*nautic*) in length from north to south; and, in some parts, more than fifteen in breadth, but so shaped that no part lies above three miles from the sea. The N.W. part is called **NORTH-MAVEN**, and here stands the cloud-capt mountain of **RONA**, the highest in Shetland, of which the summit is 3944 feet above the level of the sea, and serves for a land-mark to fishers and vessels from the Northern Ocean. From the top of this lofty eminence the eye commands an extensive and pleasing prospect, comprehending fifty miles in every direction. On the summit of the mountain stands a structure, called the **Watch-house**, in which six or seven men can sit. It is constructed of four large stones, covered by two more for a roof, on the top of which is erected a pyramidal tower of small stones.

On the north side of the Bay of St. Magnus, to the west, is a curious islet called **Doreholm**, perforated by a vast arch, 70 feet in height, under which boats fish, having light from an opening at the top. On the same side, to the north of **Stennes**, or **Stone-ness**, is the **Maiden Skerry**, a rock so called from its having never been trodden on by man. The lofty rock called the **Ossa**, or **Ocean Skerry**, stands about two miles from this, and serves as a good mark for this part of the coast.

PAPA STOUR, or **GREAT PAPA**, on the S.W. side of St. Magnus' Bay, has a natural cave of three entrances, through which the tide ebbs and flows. It has several apartments, and is wide enough to admit a large boat with the oars at all length on each side. This gloomy cavern widens towards the centre, which nature has ornamented with a beautiful arch. Beyond this, the boat is directed by a small gleam of light from an aperture in the top.

FULO or **FOUL ISLAND**, more properly **Fowl Island**, from the number of birds, the westernmost of the Shetland Isles. Its situation is shown by the Table, page 10. The isle is about $2\frac{1}{2}$ miles long, by one and a quarter broad. It has a harbour on the eastern side, called **Ham**, which is much resorted to by fishermen. The high land may be descried, in clear weather, from the northern part of the Orkneys.

In **Fulo** are often found the remains of large trees, laid bare by the violence of a tempest which has carried away the stratum which covered them. At present, however, no kind of wood can be made to grow, and it is found extremely difficult to cultivate even the lowest and most common shrub.

At about $3\frac{1}{2}$ miles to the E. S. E. (*true*) from Fulo, lies the reef, called the *Havre de Grind Rocks*, having a depth of only 4 feet over it at low water.

EASTERN COAST of SHETLAND.—The position of Sumbro' Head, on the south of Mainland, has been given on page 10. This headland is six leagues to the southward of the isle of Bressay or Brassa, which forms the harbour of LERWICK, the principal town of Shetland.

LERWICK is an irregular village, about half a mile long, but containing some good houses, and a population of about 1800 persons. It is the seat of the courts held by the sheriff-depute, or steward-depute. Two packets, or traders, having good cabins, and tolerable accommodation for passengers, sail occasionally between this and Leith. The town derives its chief support from the courts of law, and from the vessels employed in the whale and herring fisheries, making this harbour their rendezvous. Near the north end stands Fort Charlotte, a fortification mounting 18 large guns, from 18 to 30-pounds, besides several very large field-pieces.

The figure and nature of Bressay Sound may be best understood by reference to the corrected Charts of the Shetland Isles and Harbour of Lerwick, published by Mr. Laurie, 1820. For sailing into and out of it, see the Book of Directions for the North-Sea. In running for the harbour, from the *southward*, there is nothing to fear, keeping nearly in mid-channel, and inclining a little to port; look out for a rocky point on the larboard bow; arriving abreast thereof, the town will appear. The best anchorage is beyond the town, near the fort, in 8, 9, or 10, fathoms. The isle of Bressay, which forms the sound and harbour, is about five miles long and two broad; on its eastern side is the small but fertile island called Noss, the S. E. cliff of which, called Hang-cliff, is not less than 480 feet in height. Opposite to the latter, at the distance of 96 feet, is another perpendicular holm, of the same height, quite level at the top, and producing excellent pasture for sheep, which are supported on it. For its position, see page 10.

The northernmost island of Shetland is that named Unst, distinguished by the useful harbour called Balta Sound, of which a particular plan is given on our Chart of the North-Sea. Mr. Laing says, "I went out with the Captain in one of the ship's boats, and sailed round some of the headlands of Unst. The scene was truly sublime; fogs immured their summits; the noise of the sea dashing against the rocks; and the screams of the eagles and other birds of prey, which there enjoy perfect security; combined with the sombre and terrific appearance exhibited by these bulwarks of nature, impressed us with awe, and a pleasing kind of astonishment."

The face of the country exhibits a prospect of black craggy mountains and marshy plains, interspersed with some verdant spots, which appear smooth and fertile. Neither tree nor shrub is to be seen, except the juniper and heath.

Throughout the horrid wild no tree was seen,
Earth, clad in russet, scorn'd the lively green.

This want of trees and shrubs is the more remarkable, as, in different parts of the islands, there are evident marks of their having once been a wooded country.†

UNST is about 5 miles long and $2\frac{1}{2}$ broad. A hill, called Vallafeld, rises at something more than a mile from its northern extremity, and extends, parallel

† Laing's Voyage to Spitzbergen, 2d edition, 1818, page 18. This is a small but valuable book, to which we have been indebted for several extracts, and which we recommend to the mariner for many interesting and instructive descriptions connected with the navigation of the Northern Seas.

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parallel to the western coast, to the very northern point. It is 600 feet high. At right-angles with this hill stands Cross-field, nearly in the middle of the island. To the north stands Saxaforth, which is 700 feet high: This is the highest in the island, and may be seen forty miles off. A hill, called Vordhill, extends in a parallel direction with the eastern coast. Among these hills are tracts of level fertile ground, and the highest hill is covered with black moss. The headlands rise to the height of 60 or 70 fathoms, but the shores of the bays are low and sandy. Around the coast are several curious natural caves. One at Ska has its roof supported by octagonal pillars. At Bura Frith, on the N.W. side, are many small caves, extending from the sea under the hills. One of these only is entered once a year, and robbed of the seals which frequent it. To the east of this, under an arm of the hill Saxaforth, is a magnificent natural arch, 300 feet long, and of considerable height, through which a boat may be rowed.

BALTA SOUND is described by Mr. Laing as in the middle of the eastern side of the island. Before its entrance is the narrow island named Balta, from which it takes its name, and which shelters it from all winds, thus forming a safe harbour or anchorage. If a ship be leaky, there are several very commodious beaches on which she may be laid until thoroughly repaired. This harbour was, formerly, the most frequented of any in Shetland, especially by ships bound for the Greenland and White Seas.—For the position, see page 11.

From want of knowing this harbour, many vessels have been lost on the coasts of Shetland. Eight ships were stranded upon these rugged shores in the winter of 1817. Captain Ramage has stated that, a stranger, having the Chart, may boldly run for the harbour, keeping the islet called Hoony on the larboard, and Balta on the starboard, hand. Should a southerly gale raise much sea between the islands, set lofty canvas, seaman-like; keep the jib up, and steer directly between the islands: here a pilot will, it is most likely, come on board; if not, shorten sail, and, according to the wind, run to the first place of anchorage marked on the Chart, keeping the eastern part of Fetlar open of the south point of Balta.

V. THE FISHING-BANKS OF SCOTLAND, particularly those about the ISLANDS OF ORKNEY and SHETLAND.

ABOUT the close of the year 1819, it was announced, in the public prints, that an important fishing-bank had been explored to the west of the Shetland islands, which was supposed to have a great extent to the south-westward. Not long after, through the medium of that excellent work, the 'EDINBURGH PHILOSOPHICAL JOURNAL,' we became acquainted with many particulars of this and the other banks. First from the pen of Robert Stevenson, Esq. F. R. S. E. Engineer to the Commissioners for Northern Lighthouses: Secondly, From that of Sam. Hibbert, M.D. M.W.S. &c. Both appeared on the 1st January, 1820.

Mr. Stevenson's paper is as follows:—

"Having been, for many years, conversant with the navigation of the Scottish Seas, I have, prior to the war with Holland, seen fleets of Dutch busses engaged in the herring-fishery off the northern parts of our coast. For a long time past, however, these industrious fishermen had not ventured to approach these shores, and they are now only beginning to re-appear.

"In the early part of August last, (1819,) while sailing along the shores of Kincardineshire, about ten miles off Dunottar Castle, the watch upon deck, at midnight,

midnight, called out, 'lights a-head.' Upon a nearer approach these lights were found to belong to a small fleet of Dutch fishermen, employed in the deep-sea fishing, each vessel having a lantern at her mast-head. What success these plodding people had met with, our crew had no opportunity of enquiring; but, upon arriving the next morning at Fraserburg, the great fishing station on the coast of Aberdeen, we found that about 120 boats, containing five men each, had commenced the fishing season here six weeks before, and had that night caught no less than about 1500 barrels of herrings, which, in a general way, when there is a demand for fish, may be valued at one pound sterling per barrel to the fisherman, and may be regarded as adding to the wealth of the country perhaps not less than £3000. In coasting along, between Fraserburg and the Orkney Islands, another fleet of Dutch fishermen was seen at a distance. The harbour and bay of Wick were crowded with fishing-boats and busses of all descriptions, collected from the Frith of Forth and southward, even as far as Yarmouth and Lowestoffe. The Caithness fishing was said to have been pretty successful, though not equal to what it has been in former years.

"In the Orkney and Shetland Islands one would naturally look for extensive fishing establishments, both in herrings and what are termed *white fish*, cod, ling, and tusk; but, it is a curious fact that, while the Dutch have long come from their own coast to these islands, to fish herrings, it is only within a few years that the people of Orkney, chiefly by the spirited and praise-worthy exertions of Samuel Laing, Esq., have given any attention to this important source of wealth. It has long been a practice with the great fishmongers of London to send their welled smacks to fish for cod, and to purchase lobsters around the Orkney Islands, and both are carried alive to the London market. This trade has done much good to these islands, and has brought a great deal of money to them; but still it is of a more circumscribed nature, and is less calculated to swell the national wealth, than the herring and white fishery in general.

"Hitherto the industry of the Orcadians has been chiefly directed to farming pursuits, while the Shetlanders have been almost exclusively occupied in the cod, ling, and tusk, fishing. It is doubtful, indeed, if, up to this period, there be a single boat, belonging to the Shetland Isles, which is completely equipped for the herring-fishery. But here, again, another fleet of Dutch doggers was seen collected in numbers off these islands, which is considered a rich harvest in Holland. So systematically do the Dutch pursue the fishing business upon our coasts, that their fleet of busses is accompanied by an hospital-ship. This vessel we now found at anchor in Lerwick Roads, and were informed that she paid weekly visits to the fleet, to supply medicine, and to receive any of the people falling sick or meeting with any accident.

"Though Shetland is certainly not so much an agricultural country as Orkney, yet it may be hoped that the encouragement judiciously held out by the Highland Society, for the production of green crops in Shetland, may eventually have the effect of teaching these insular farmers the practicability of providing fodder for their cattle in the spring of the year. For ages past this has been a great desideratum. The command of a month's or six weeks' fodder would enable the proprietors of that country to stock many of their fine verdant isles with cattle, and to employ their hardy tenantry more exclusively in the different branches of the fishery.

"It is well known that, next to the Newfoundland Banks, those of Shetland are the most productive of ling, cod, tusk, and other white fish, and, by the recent discovery of a bank trending many leagues to the south

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westward, the British merchants have made a vast accession to their fishing-grounds. In the small picturesque Bay of Scalloway, and in some of the other bays and voes, on the western side of the Mainland of Shetland, the fishing upon this new bank (which I humbly presume to term the *REGENT FISHING-BANK*, a name at once calculated to mark the period of its discovery and pay a proper compliment to the prince,) has been pursued with great success. Here small sloops, of from 15 to 25 tons burthen, and manned with eight persons, have been employed. In the beginning of August, they had this summer fished for twelve weeks, generally returning home with their fish once a week. On an average these vessels had caught 1000 fine cod-fish a week; of which about 600 in a dried state go to the ton, and these they would have gladly sold at about £15 per ton. So numerous are the fish upon the *Regent Fishing-Bank*, that a French vessel, belonging, it is believed, to St. Maloes, had sailed with her second cargo of fish this season; and, though the fishermen did not mention this, under any apprehension, as though there were danger of the fish becoming scarce, yet they seemed to regret the circumstance on account of their market being thus pre-occupied.

“Here, and at Orkney, we had the pleasure to see many ships arriving from the whale-fishing, and parting with a certain proportion of their crews. To such an extent, indeed, are the crews of the whalers made up from these islands, that, it is calculated, not less than £15,000 in cash are annually brought into the islands by this mean. With propriety, therefore, may the whale-fishery be regarded as one of the most productive sources of national wealth connected with the British fisheries.

“From the Orkney and Shetland islands, our course was directed to the westward. A considerable salmon-fishing seems to be carried on in the mouths of the rivers of Lord Reay's country, in Sutherlandshire. The fish are carried from this to Aberdeen, and from thence, in regular trading smacks, to London. We heard little more of any kind of fishing till we reached the Harris Isles. There, and throughout the numerous lochs and fishing-stations on the main land, in the districts of Gairloch, Applecross, Lochalsh, Glenelg, Moidart, Kuoidart, Ardnamurchan, Mull, Lorn, and Kintyre, we understood that there was a general lamentation for the disappearance of herrings, which, in former times, used to crowd into lochs, which they seem now to have, in some measure, deserted. This the fishermen suppose to be owing to the *schools* being broken and divided about the Shetland and Orkney Islands; and they remark that, by some unaccountable change in the habits of the fish, the greatest number now take the Eastern Coast of Great Britain. This is the more to be regretted, as, in Skye, the Lewis, Harris, and Uist, Islands, the inhabitants have, in late years, turned their attention much to fishing. Indeed this has followed as a matter of necessity, from the general practice of converting the numerous small arable farms, which were perhaps neither very useful to the tenants, nor profitable to the laird, into great sheep-walks; so that the inhabitants are now more generally assembled upon the coast. The large sums expended in the construction of the Caledonian Canal, have either directly or indirectly become a source of wealth to these people: they have been enabled to furnish themselves with boats and fishing-tackle; and, for one fishing-boat, which was formerly seen in the Hebrides (*Hebudes*) only twenty years ago, it may be safely affirmed that ten are to be met with now. If the same spirit shall continue to be manifested, in spite of all the objections which have been urged against the salt-laws, and the depopulating effects of emigration, the British fisheries in these islands, and along this coast, with a little encouragement, will be wonderfully extended, and we shall ere long see the Highlands and Islands of Scotland, in that state to which they are peculiarly adapted, and in which

alone their continued prosperity is to be looked for, viz. when their valleys, muirs, and mountains, are covered with flocks, and the people are found in small villages on the shores."

The following observations and description are those of Dr. Hibbert.

"The certain knowledge that a very extensive cod-bank existed to the west of the Shetland Islands, was the discovery of the summer of 1818, and it will form an important epoch in the annals of the British Fishery. The visit which I paid to Shetland last year, for the purpose of examining its geology, comprised a period when, from a mere suspicion of the existence of the bank, its reality was, as a point of fact, established. Aware of the importance of the discovery, in a national point of view, I omitted no opportunity afforded me of procuring all the information in my power, with regard to its situation, extent, and productiveness; and a very brief account of the result of my enquiry was communicated to the public in January 1818. The testimonies which I obtained, from various individuals, only disagreed on subordinate points; but these I have been enabled to correct and enlarge by the experience of another unprecedented season of successful fishing, conducted on the new bank.

"The Cod-Bank of Shetland is described by the fishermen as lying from twenty-five to thirty miles west of Foula. That its extent is very great, all who have fished upon it agree. The information politely given me by Mr. Sheriff Duncan, of Lerwick, fully corroborates the previous statement I had made on the subject last year. 'The fishing-vessels,' says this gentleman, 'spread themselves so widely over the bank, that it seldom happens that more than two or three are in sight of each other at the same time; yet they have never reached its utmost boundary.' I shall, however, communicate what is known of its extent, from the experience of a former season. The bank appears to commence near the cluster of islands bearing the name of Orkney: it is said to lie in, to the land, about sixteen miles. The fishermen refer to the west of Westra, as its origin; and from thence it is continued in a direction nearly north by west, having been variously entered upon, in steering from the east, even as far distant as about 20 miles N.W. of Shetland. If this information be correct, it would give to what is known of the extent of the bank a distance of about 140 miles.*

"Respecting the depth of water on the bank, I reported last year that it was from 28 to 47 fathoms; the information recently given me assigns to it a depth of from 40 to 50 fathoms. This discrepancy of opinion, which is not of material consequence, probably arises from the difference of observations taken near the origin of the bank at Orkney, or to the west of Foula, where its form becomes more definite. Its breadth has been reported to me as varying from 18 to 45 miles. Here, also, I have met with some little difference of opinion, which naturally arises from an indecision respecting the exact depth to which its boundaries or shelving sides may be referred, and which can be rectified only by extensive soundings. The surface of the bank is described as, in some places, rocky, and in others sandy, and as covered by buckies, muscles, and razor-fish.

"After recounting what is known of the bank, it may be proper to mention the speculations which have been made regarding its extent. That it is continuous with a cod-bank near the Faroe Islands (*Færoerne*) is contended for, not only from the general direction of the Shetland Bank, which bears, towards that very northerly and remote group of islands, but also from a similarity of character in the fish caught at each place. The cod, both of Shetland

* Say 120 nautic miles.—Ed.

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and Faroe, have been described to me, by a gentleman familiar with the fish, as gray-backed, spotted with black, and tinged with a ring, which is of a brownish colour, inclining to gray. This continuation, then, the existence of which is very problematical, may, perhaps, take place rather by a series of distinct banks, in a given direction, than by one that is uninterrupted.

“ In connection with the history of the bank, it may not be uninteresting previously to inquire if it were really known to those nations who cannot be accused of a supineness in the prosecution of their fisheries; and my inquiries will be principally directed to the Dutch, who, for nearly three centuries, have been the principal fishers frequenting the coast of Shetland.

“ In order to understand the history of the Shetland Fishery, we must distinguish between those nations who prosecuted it through the medium of the inhabitants of Shetland, and those who, avoiding such an intercourse, obtained the lucrative object of their visits by an equipment which rendered them independent of the people whose coasts they visited. The merchants, who prosecuted the Shetland Fishery through the medium of the natives of the place, were from Hamburg, Lubec, Bremen, and Denmark. They occupied booths or shops in the country, and trafficked with the Shetlanders chiefly for ling. This fish is caught in deep water, at a distance of thirty miles from land.* For this purpose, light six-oared boats are at present employed, eighteen feet in keel, and six in beam, the adventurous crews of which carry each a stretch of lines amounting to 6000 fathoms, with 1200 attached hooks. The German and Danish merchants, who had almost exclusively conducted the Shetland ling-fisheries for nearly two centuries, left these shores in consequence of the bounties granted for the exportation of fish from Great Britain, agreeably to the Acts of the years 1705 and 1714. To these visitors succeeded occasional companies of Scotch and English merchants, who were actuated by the new bounty; but eventually the fishery devolved to the Shetland landholders, whose policy it was to parcel out occupations to a number of individuals, involving, at the same time, in the conditions of their holdings, the obligation to supply them, at a stipulated rate, with all the ling they caught during the customary summer-season. The fish, when dried, were chiefly exported to the shores of the Mediterranean and to Ireland.

“ The second description of visitors to Shetland, for the purpose of prosecuting the fishery of the place, comprehended, as I stated, that people who, avoiding an intercourse with the natives of the shores which they rifled, obtained the lucrative object of their visits by an independent equipment: I here allude to the Dutch nation. An enquiry into the nature of their visits to Shetland will involve in it the question, whether the cod-bank, first generally made known to this country in the year 1818, was or was not previously resorted to by this reserved nation, who concealed from the rest of the world the fact of its existence; or, whether the knowledge of it, if really acquired by us, scarcely became an object of remembrance, owing to our proverbial supineness in every thing relating to the advancement of the British Fisheries? The independent system of the Hollanders, and their little communication with the natives of the country, the policy of which is obvious, is alluded to by Brand, in his tour to Shetland, in the year 1712. ‘The Dutch,’ he remarks, ‘cannot be said so properly to trade with the country as to fish upon their coasts.’ In fact, they purchased only fresh victuals from the natives and a few stockings.

“ The Dutch Fishery is first particularly noticed by Captain Smith, who, in 1633, by order of the Earl of Pembroke, and the British Fishery Company

* Along with ling is taken the torsk fish, or tusk.

of London, visited the Islands of Shetland: he saw 1500 sail of busses, of 30 tons each, taking herring on the coast of Shetland, with twenty wasters or ships of war, carrying 20 guns each, as convoys. But the confirmation, which he adds to this narrative, relating to a distinct establishment which the Dutch possessed, for the purpose of prosecuting the cod-fishery, is so remarkable, and is so involved in the question, of the importance of this new accession to our national resources, that I shall give Captain Smith's account in his own words. 'Besides 1500 sail of herring-busses and 20 wasters, there were, also,' he adds, 'a small fleet of dogger-boats, which were of the burthen of 60 tons and upward, which did fish only with hooks and lines for ling and cod. Many of these boats and busses came into several havens or sounds, to fit and trim themselves. *One thing was observable, that, within eight or ten days after the dogger-boats went to sea, they came into the sound again so full laden as they could swim.* The certain number of dogger-boats I could not learn, but the general report was about 400.* Upon the narrative of Captain Smith, I have certain remarks to make. The dogger-boats are stated in very general terms to fish for ling and cod; but which of those fish was the leading object of their pursuit, our early narrator does not, on this occasion, inform us. It is well known that the mode of prosecuting the whale-fishery, inasmuch as it has, for its leading object, the taking of cod or ling, differs in certain essential points. The ling is sought for in deep water; the cod, on the contrary, is taken in the greatest quantity upon banks, or on shoals. For the taking of ling, long lines, baited with many hundred hooks, are allowed to remain in deep water all night. Hence the intent of employing open boats, that they may not be driven to a distance from their lines. Cod, on the contrary, is caught by hand-lines, baited with single hooks, which are dropt into the water from the sides and stern of decked vessels.

"It is possible to conceive that the Dutch, in prosecuting the ling-fishery, by means of their doggers, had recourse to the expedient of a *drove-sail*, which, by restraining the motion of their vessels, prevented them from being driven far from the lines which they had laid. But, it may be remarked that, whenever the Dutch fleet of doggers is described, with regard to its particular object, it is distinctly stated to be intended for the *cod-fishery*. Thus, in Sir Robert Sibbald's description of Shetland, bearing the date of 1711, the following passage occurs:—'But the greatest advantages Shetland hath is from the fishing of herring and cod, which abounds so, that great fleets of the Hollanders come there, and begin to take herring upon St. John's day, with their busses. But,' the author adds, 'they, at the same time, employ hundreds of doggers, for taking of cod.'

"From what has been advanced, I am disposed to believe that, the antient importance of the Dutch Cod-Fishery of Shetland has been much underrated and overlooked, by confounding it with a fishery of a different kind; that of ling being, for the most part, conducted through the medium of the natives of Shetland.

"The second remark, which I have to make upon Captain Smith's early narration, refers to the success of the Dutch doggers. It may be observed, that, previous to the cod-bank being found out, in the year 1818, the fishery, which was conducted round every part of the Shetland coast, was highly desultory and uncertain; and it rarely happened that vessels of only 10 to 30 tons, after being employed a week in fishing, returned to their several harbours, like the Dutch doggers, described by Smith, 'so full laden as they could swim.' But Captain Smith tells us, that vessels capable of holding a much greater quantity of

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* Smith's 'England's Improvement revised.'

fish, and amounting to even 60 tons, came into the harbours, after an eight days' cruise, full laden. From the reasons thus given, I am strongly inclined to suspect that the bank was, two centuries ago, well known to the Dutch, and that the knowledge of it was either carefully withheld from this nation in particular, or, which is more probable, regarded by us with such an indifference, that, when the Dutch left our shores, owing to the interruption they experienced in our wars with them, it was soon forgotten that such a bank existed. In support of the latter opinion, a gentleman in Shetland last year informed me, that he had a distinct recollection of formerly seeing, in an old Dutch chart, the notice of a bank to the west of Foula, corresponding to the observations made in the year 1818.

"For nearly a century and a half after Captain Smith's visit, we find that the Dutch still continued to prosecute the cod-fishing on the coast of Shetland. In a manuscript tour of the late Rev. George Low, in my possession, made through Shetland in the year 1778, it appears, that this gentleman was present when Bressay Sound was filled with Dutch busses, preparing to set out for the herring-fishery. After describing, in a very particular manner, the arrangements and economy of this fleet, he adds, 'Besides the herring-busses, the Dutch send out many doggers on the cod-fishing. These are going and coming from early spring through the whole summer. Each dogger has ten men and two boys, the half of whom sleep while the other are employed in fishing.'

"The evidence yet to be given respecting the cod-fishery of Shetland, comprises the most recent circumstances relating to the bank, subsequently to the departure of the Dutch from our shores, and refers to visits which were made to the bank by the British: these were accidental. It appears from Mr. Low, in his *Fauna Orcadensis*, that a bank lying to the north-west of the Brough of Birsá, in Orkney, was well known in these islands; but, that it was a bank extending to the west of Foula, and even much farther north, was a circumstance to which the islanders seem to have been perfect strangers. 'The cod-fish,' he remarks, 'is found in swarms on the banks all round the coasts, but is very little sought after. Of old, this was not the case. Merchants from the south had their factors here, and many fish were yearly caught and transported from these isles. Now all is sunk in indolence and sloth.'

"Additional evidence relating to an accidental visit to the bank has been given me by Mr. Duncan, the intelligent gentleman whose communications I have before acknowledged. 'I recollect,' he informs me, 'that a vessel came into Bressay Sound several years ago, with her decks filled with cod. I was told, by the master of the vessel, that they had been caught to the northward of the Orkneys, during two or three hours of a calm. The master must, therefore, have been upon the bank when he fell in with the fish, since it stretches round the northward of these islands.'

"The next evidence I shall offer, on the subject of the bank, with reference to an historical order, will appear in an extract I shall make from an interesting tour through Orkney and Shetland, made by Mr. Neill, of this city, during the summer of 1804. It was not likely that an accidental and remarkably successful experiment, determining the productiveness of the Orkney fishing-ground, would escape the notice of this gentleman, whose ardour and superior information on all subjects connected with natural history is well known, and it is not without very great reason that he feels some impatience at the apathy with which we have long regarded our northerly sources of wealth. It may be premised that, any observations which Mr. Neill might make, regarding the fishery off the north of Orkney, would apply to the southerly commencement of the

cod-

'cod-bank' of Shetland. 'We weighed anchor,' says that gentleman, 'in the afternoon, and got under way with a gentle breeze. The sailors, being provided with strong lines, we here lay-to, and fished for cod and haddock. So abundant were these kinds of fish in this place, that, in an hour, our deck was strewed with about fifty fine firm cod-fish, besides some haddocks of a large size. This was not two miles distant from Papa Westray; yet we saw no boat engaged in this rich fishery! How supine is such conduct.'—(P. 67.)

"I am now glad to find that the too-well-founded charge of supineness is, for the first time, likely to be totally removed, by the exertions of the gentlemen of Shetland, which have been made in this season, and which are in the progress of being extended to an unprecedented degree.

"It is, I believe, about ten or twelve years since a few vessels, of from six to thirty-five tons burthen, and carrying from six to eight hands, first prosecuted a desultory and uncertain fishing for cod off the coasts of Shetland. They seldom went farther to look for fish than the immediate neighbourhood of Foula and Fair Isle; and their success, in general, was very limited. To some of the vessels thus employed, the discovery of the bank is due. The first knowledge of its existence is contended for by three or more parties; but the great probability is, that it was simultaneous; since the same cause, which was the uncommon fine spring of 1818, caused almost every vessel to seek for fish at a more than usual distance from the coasts of Shetland; and, finding a very abundant supply off the north of Orkney, in the vicinity of the place which attracted Mr. Neill's attention, they fell in with the track of the cod-bank. The priority of the discovery is, however, most in favour of the vessels of John Ross, Esq. of Weesdale, who are said to have fished upon the bank late in the autumn of 1817, and so aware were the crew of the advantage of the fishing-ground, that it became their constant station during the whole of the ensuing summer of 1818. When I visited Mr. Ross, on the conclusion of the fishing last year, so unexpected was the success which he experienced on the bank, that his preparations to cure the great quantity of fish taken not being sufficiently extensive, they were suffering from the want of beaches, upon which they might be dried. I believe, also, that a vessel from Scalloway, shared by six men, claims the merit of the discovery.

"Lastly, I am informed by Mr. Duncan, from the authority of another party, 'That the bank was not discovered, so as to excite attention, until last year; that a small fishing-vessel belonging to Lerwick, which had been forced off her usual fishing-ground, by unfavourable weather, fell in with it by accident.' I can certainly add, that, a little before leaving Shetland, early in the autumn of last year, the knowledge of the bank was far from being general; and an excellent opportunity was afforded me, in the island of Papa Stour, of witnessing, in the contrasted success of two vessels, engaged in the cod-fishery, a decided proof of the importance of the discovery. The skipper of one of the vessels obstinately persisted in looking for fish in the places to which other vessels had been previously accustomed to resort. The other skipper, who, having formerly belonged to the Royal Navy, was accustomed to adventure, boldly steered at a considerable distance from land to the fishing-bank, where he saw other vessels so profitably engaged. The consequent difference of success in each vessel was remarkable. Whilst sympathising in the disappointment which the proprietor of the two vessels experienced in the empty hatches of the first sloop which came into the harbour, the subsequent entrance of the other vessel, rich with the product of the new bank, amply compensated for the failure of the less adventurous crew.

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"The obstac chiefly refer to t fishermen consis large species of coast. These ar the country. N are often obliged they thus encount and cod-fishery, of lampreys, whi wards upon the r To hinder the would prevent th drove-sail, or on They can then pu

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" These are the circumstances I have to offer relating to the history of the bank, connected with its complete discovery. I have now to add, that, its productiveness is established, beyond a doubt, by the experience of two seasons. One boat last year, which fished nearly the whole season on the bank, or contiguously to it, took 11,000 fish, equal to 39 tons of wet fish, or 15 tons of dried fish. I was, indeed, informed that, upon one occasion, a vessel with six hands took, in a single tide, or day, 1200 fish. The general result of the fishery, however, of last year, could not fairly represent the productiveness of the bank, since the vessels which constantly resorted thither were comparatively few. Notwithstanding, thirteen vessels, from 10 to 35 tons burthen, and having from six to eight hands each, fished, upon an average of each, 12 tons of dried fish; when, in previous years, the average was three or four tons less. During this year, however, a fair trial of the bank was made. The fishing-season commenced in May, and terminated in August. The number of vessels on the bank were increased from thirteen to twenty-five, and were of various sizes, from 10 to 60 tons burthen, and manned with from six to twelve hands each, boys included. The average quantity of cod taken was much greater than that of previous years, being not less than 15 tons of dried fish for each vessel, when, prior to the year 1818, a sloop often took only 6 or 7 tons, and never, at the utmost, exceeded, in this respect, 12 tons. Some vessels, however, this year, are understood to have obtained from 20 to 25 tons each.

" Having now put on record every circumstance relating to the recent discovery of the cod-bank, connecting, at the same time, this information with what is historically known of the cod-fishing of the Dutch, nothing more remains for me to state, as concisely as possible, the obstacles, as well as encouragements, which appear to be incidental to the discovery.

" The obstacles incidental to the present mode of conducting the fishery, chiefly refer to the subject of proper bait. That which is used by the Shetland fishermen consists of the common muscle, the *Mytilus modiolus* or *yoags*, a large species of whelk, and other shell-fish common to almost every northern coast. These are found very abundantly in the numerous voes and inlets of the country. Now, the vessels depending for a supply of bait upon the coast are often obliged, when run short, to quit the fishing-bank with all expedition: they thus encounter a considerable loss. When the Dutch prosecuted the Shetland cod-fishery, they then depended for bait, in the first instance, upon a supply of lampreys, which they brought with them from their own coasts, and afterwards upon the nets which were intended for the same purpose to take herring. 'To hinder the too-rapid motion of the vessel,' says Mr. Low, 'which would prevent their lines from taking the bottom, each has what they call a *drove-sail*, or one which hangs under water, and effectually stops her way. They can then pursue their business at leisure.'

" With regard to the improvement of which the fishery is internally susceptible, it has been suggested that, in case of a weak demand for dried fish, the preparation of what is called *mud-fish* may be expedient. This preparation agrees with the Dutch method, when they fished off Shetland. Soon after a cod was caught, it was split, and laid in salt. When thus brought into the market, a barrel of cod-fish, in May 1778, fetched 30 to 40 guilders, when one of herrings would not bring six.

" It is evident, with regard to dried cod, that the fish prepared in Shetland will ever maintain its pre-eminence over the cod of other places. The Newfoundland fishermen are described as exposing their fish, after it has been salted, on standing flakes, made by a slight wattle, and supported by poles often 20

feet

feet from the ground. But the humidity is not near so well extracted from the fish as when, according to the Shetland method, they are carefully laid out upon dry beaches, the stones of which have been, during winter, exposed to the abrading action of the ocean, and are thus cleared from vegetable and animal matter.

"I am informed that the fishing-season for cod might be successfully prolonged. It regularly commences in May, and ends in August; but Mr. Duncan remarks that stout vessels might be employed the year round, as the cod is to be taken at all seasons.

"It has been suggested to me that, a serious injury may arise to the cod fishery of Shetland, if foreign nations are suffered to fish upon the bank, and thus be allowed to enter into a competition with us in continental markets; also, that the bank can never become an object of much importance, in a national point of view, unless an adequate bounty be paid on the quantity of fish caught, whilst no restrictions are imposed in allusion to any market to which it may be sent."

Dr. Hibbert's paper concludes with some just and patriotic observations on the national value of this bank, and the necessity of a complete and scientific survey of it; for which see the 'Edinburgh Philosophical Journal,' vol. II. page 149.

V. THE VOYAGE FROM ENGLAND TO THE WHITE SEA.

. The BEARINGS and COURSES by COMPASS are those included in Parentheses, as [E. S. E.]

On the voyage from England or Scotland to the White Sea, a commander will take his departure from Balta or Lambaness, the N. E. points of the Shetland islands, the situations of which are given in the Table, page 11. Captain Ramage, who has lately published some useful 'Directions for sailing towards the North-Cape,' &c. says, "On sailing from England, a fresh departure, *when practicable*, is taken from Shetland; but it would be well, were the reckoning on board of each ship so accurately kept that a second departure might be considered as a matter of course, though not of the first necessity; for, in consequence of thick fog, which frequently conceals these islands, it frequently happens that they cannot be distinguished with any certainty." In addition to an accurate reckoning, from the first sailing, Captain R. recommends the taking frequent casts of the lead on approaching this coast, especially in foggy weather. "By neglecting the lead, much valuable property, and many invaluable lives are lost to the country."

With Fair Island bearing N. N. W. $\frac{1}{2}$ W. [North] 6 leagues distant, the depth of water is 58 fathoms, fine yellow sand: Bearing N. W. by N. [N. $\frac{1}{2}$ W.] 5 leagues, 45 fathoms, brown sand mixed with shells.

With Sumbro' Head N. W. by N. [N. $\frac{1}{2}$ W.] 7 leagues, is a depth of 62 fathoms, fine dark sand. Between the same spot and Fair Isle, the general depth is 45 fathoms, in one place 36, the bottom mostly of brown sand, mixed with shells.

With Sumbro' Head S. W. by W. $\frac{1}{2}$ W. [West] 7 leagues, the depth is from 70 to 75 fathoms, very fine dark sand, inclining to mud: more to the eastward the bottom is oazy.

Abreast of fine gravel and

At five leagues distance, are 75 fathoms deep. With Unst S. b.

The situation is such as to give an opportunity should the wind diminish from the north, where, at present, it may be used but should not be

In approaching the coast, their reckoning is not to be trusted, especially in the winter, which has happened from a combination to pro

There are two capes; the one is from the Cape.

The headland called See the Plan of the cliffs are very un- usually useful, as and between the

When abreast of the coast, distant 6 leagues, remarkable as being

The North Cape detached from the main, the Mother, two smaller ones, semi-conical, being

In rounding the shore.

The headland called from the North Cape and Laxe Fiord.

Abreast of it, distant after appears com

DESCRIPTION

OMEGANG, the width of 1 1/2 leagues to the northward, is the quarters of a point from the Laxe Horn, or the cape, which is still high, but pl

Abreast of the Out-Skerries, at the distance of a few leagues, are 75 fathoms, fine gravel and small black pebbles.

At five leagues N. E. by E. $\frac{1}{2}$ E. [*East*] from the N. E. end of Unst, or Lamnerness, are 75 fathoms, coarse sand and shells: thence to the north-eastward the water deepens gradually: the bottom fine yellow sand, mixed with mud. With Unst S. by W. $\frac{1}{2}$ W. [*S.W.*] 100 miles, the depth is 120 fathoms.

The situation of the North Cape is given on page 18, and there is good reason for believing that it has been accurately determined. On the passage, no opportunity should be neglected for ascertaining the correct variation, which diminishes from Shetland, where it is 28° , or thereabout, to the North Cape, where, at present, it is about 10 degrees. The table of variations, given in page 66, may be useful, as an approximation, when observations are unattainable, but should not be implicitly depended on, as perfectly correct.

In approaching the North Cape, it is common for ships to be far astern of their reckoning; which is probably owing to a current setting to the west or S.W., especially in the spring of the year. It may, however, sometimes have happened from an improper allowance of variation. Or, both causes may have combined to produce the effect. See the Remarks on Currents, page 62.

There are two remarkable high and steep cliffs to the westward of the North Cape; the one at the distance of 7, and the other at the distance of 14, leagues from the Cape. These have frequently been mistaken for the North Cape, and the headland called the North Kyn, which lies 13 leagues to the eastward of it. (See the *Plan of the Environs of the North Cape, in the Chart.*) The two cliffs are very uniform in their appearance; and, when once known, are extremely useful, as points of departure, on proceeding towards the Cape. The land between them appears irregular, like islands, and of about half the height.

When abreast of the second high cliff, with the North Cape E. S. E. by compass, distant 6 leagues, the latter is, comparatively, low, level at top, and remarkable as being the *only table land* upon this coast.

The North Cape is distinguished by three remarkable islets or hummocks, detached from the coast, and called the Mother and Daughters. The central one, the Mother, bearing south, by compass, 6 leagues, appears between the two smaller ones, and higher than the land at the back of it. Its shape is semi-conical, being flat at the top, but varies under different bearings.

In rounding the Cape, &c. keep a moderate offing, there being frequent calms shore.

The headland called the NORTH KYN lies 13 leagues E. $\frac{1}{2}$ S. [*E. S. E. $\frac{1}{2}$ E.*] from the North Cape. Between are the great inlets called Porsanger Fiord and Laxe Fiord. The coast of North Kyn is high and steep, and when, from abreast of it, distant 6 leagues, the North Cape bears W.S.W. by compass, the latter appears comparatively low and level, as already described.

DESCRIPTION of the COAST between the NORTH KYN and ARCHANGEL.

OMEGANG, the western point of the great inlet called TANA FIORD, lies about $\frac{1}{2}$ leagues to the E. S. E. of North Kyn. The variation here is about three quarters of a point. The land between is high, steep, and craggy. From Tana Horn, or the eastern point of Tana Fiord, to Wardhuus Island, the land is still high, but plain, with the exception of a high hummock, upon the high

land, which is nearer to Wardhuus than to Tana Fiord, and appears like a country-house or castle.

The position of Wardhuus has already been given (page 18). There is a roadstead on the south side of this island, but better anchorage between it and the main.

On the eastern side of the north part of Fisceroe, or Fisher's Island, is the haven named Kegor, which affords anchorage. At the south end of the same island are three harbours, one on each side: the southernmost is the best, and vessels lie in it land-locked, and the bottom, all over, is clean sandy ground.

The island KILDUIN, in latitude $69^{\circ} 22'$, longitude about $34^{\circ} 10'$, forms a convenient harbour, of which a particular plan is given on the Chart. This harbour may be entered either from the east or the west. The island is inhabited, and the best anchorage is on the south side of it, to the westward of the huts, in 8 and 9 fathoms. The island of Kilduin may be known by the deep gap formed in the main land, a little to the N.W. of it, which is the entrance of the River Kola.

At about five leagues E. S. E. [*S. E. by E. $\frac{1}{2}$ E.*] from the eastern end of Kilduin Island, is the eastern point of Tieribieri River: this point so extends as to form a little bay, in which vessels may be sheltered from N.W. winds. In any part of the river large ships may anchor, on good sandy ground.

At about 11 leagues S. E. by E. from Tieribieri Point is the harbour of RINDO. Before this place, which consists of two small bays, lie four little islands. The best channel to go in at is between the southernmost island and the point of the main land. It is sufficiently wide and deep. When running in here, keep nearest to the main, in order to avoid a sunken rock, lying near the island. When within the islands, you may anchor at pleasure, as there is plenty of room and clear ground.

The SEM OSTROVA, or SEVEN ISLANDS, lie about 16 leagues S. E. by E. by compass from Tieribieri Point, and, by varying the appearance, serve to distinguish this part of the coast. In the same direction, at the distance of ten leagues from the Seven Isles, is the Island NAGEL, forming, on its S. E. side, a snug and convenient harbour, of which a particular plan is given on the Chart. For the position, see page 18.

From NAGEL to SWEETNOSE, (*Swijatoi-nos*), the bearing and distance are S. E. by E. 16 leagues. Here, near the coast, the variation diminishes to one degree west. Sweetnose is a very low rocky point, which forms the eastern boundary of a spacious bay and river, the western coast of which appears high over the gradually declining and rocky projection of Sweetnose. A particular plan of the bay of Sweetnose is given upon the Chart, by reference to which it will be seen that its water, in the open part, is deep; but there is shelter within its isles on the S. W. Within the river, on the south, is a fishing settlement, &c.

The Island LAMBUSKOI, or LUMBOVSK, is 8 leagues S. E. $\frac{1}{4}$ S. from the extremity of Sweetnose. The coast hence to the southward rounds, as shown on the Chart. Orlogenose, in latitude $67^{\circ} 13'$, makes, at a distance, like an island.

The THREE ISLANDS, in lat. $67^{\circ} 2'$, are easily made out. They are very small, very near together, and very near to the main land: immediately upon the off side of each island lies a small islet or rock, distinguished by crosses, which are fixed on them. The most southerly of these isles is near the entrance of the RIVER PONOI, which is remarkable, being narrow, with very steep banks, that, in slope and swell, exactly resemble each other.

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DIRECTIONS

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SOSNOVITZ, or CROSS ISLAND, which is 12 leagues to the S.W. by S. from the Mouth of the Ponoï, serves as the last point of departure on that coast to vessels bound to Archangel. This island may be readily known by several wooden crosses upon it. There is a channel between it and the main, wherein vessels may find good anchorage, in from 5 to 7 fathoms, ground of mud and blue clay, within half a mile of the north side of the island.

The Headland called KATSNES or BLUE-NOSE, forming the eastern side of the White Sea, presents a striking contrast to the northern shore. It is a steep cliff, surmounted with pine-trees, but having a beachy shore, and the shoal ground extends outward to a considerable distance.

To the southward and westward of Katsness, early in the season, there are some extraordinary rippings. Captain Ramage, who has noticed them, says that, they are not produced by unevenness of the ground, "but simply, as I suppose, by the stream of the great ocean rushing in to restore the level of the White Sea, much depressed, at this time, by the recent sudden removal of an immense portion of its frozen waters, exclusive of the astonishing evaporation which is peculiar to this cold atmosphere. These rippings, or rather circling eddies, appear like cats' skins, and ought to be avoided, if possible; for, if a ship be caught within their influence, although there may be a fine breeze aloft, and all the sails sleeping, she will reach the outer bounds of the eddy, then all at once go astern, and may be detained several hours in this perplexing situation, going a-head and astern alternately."

The deepest water to the south-westward of Cross Island is toward the Lapland shore. On nearing Katsness, with a free wind, it will be well to keep the hand-lead going, until you reach the bar of Archangel.

The KNOCK-JOHN.—Of this extensive and irregular bank, the best idea may be formed by reference to the Chart. The shoal ground has been variously represented, but we presume that it is given correctly in the late survey. The soundings given in the Chart, however, are not numerous, and it seems very likely that some dangerous spots may exist, which are not exhibited therein. Hence it should be approached with caution. The southern part is, evidently, the most dangerous. Between the bank and Sweetnose, the bottom is of fine white sand and white shells, which are in great abundance here; and, as they are not to be found elsewhere, in the navigation, these soundings serve as a sure guide. From the Knock-John to the Bar of Archangel, the bottom is, in general, of fine brown sand, but coarser on either shore.

DIRECTIONS for Sailing from the NORTH KYN to ARCHANGEL.

HAVING given, in the preceding description, the bearings and distances of the several points from each other, it is sufficient here to state that, in proceeding for the White Sea, a moderate offing should be given to the coast, in order to avoid calms which may exist under the high lands. If early in the season, and the wind be westerly, endeavour to fall in with the Seven Islands, or with Nagel, for the purpose of passing within the stream of ice now drifting from the White Sea, and forced a few miles off the land by the currents of several rivers, which are, at this period, very much increased by the melting of the snow; and which thus form an opening through which, with due attention, ships may be conducted as far as Sweetnose with little risk and inconvenience.

Having advanced thus far, they may safely come to and lie in the Bay of Sweetnose, until the ice be drifted clear of its point, and a passage to the southward fairly opened.

But,

But, if too great an offering be given to the land, a ship may happen to penetrate into, or be surrounded by, extensive fields of ice; and, if *not nipt*, will experience the usual damage on the bows and sides, besides the extraordinary labour and difficulty of extricating itself from peril.

Near Nagel, the depth of water is 73 fathoms, bottom of fine sand: in the fairway towards Sweetnose, the depth is 39 and 40 fathoms, mixed or speckled sand: With Sweetnose S. S. E. 5 leagues, the depth is 53 fathoms, coarse sand, like oatmeal; on the same bearing, at 7 leagues, 45 fathoms, similar bottom. The white sand and shells between Sweetnose and the Knock-John have been already described.

From off Sweetnose, in order to guard against the effects of foggy weather, so often prevalent here, steer for the Knock-John, by Chart, keeping the log and lead going until soundings be obtained upon the Knock, when you steer along the edge of it. With the wind adverse, you may turn to windward until you reach the lower part of the Knock, where the bottom will be found chiefly of fine white and fine yellow sand. Towards shore it is deeper and coarser.

You may stand off and on, from the shore to the Knock-John, in from 15 to 10 fathoms, approaching no nearer to the land than the former depth, nor to the bank than the latter, until you reach Orlogense. With this point W. $\frac{1}{2}$ S. distant 5 or 6 miles, a S. $\frac{1}{2}$ W. course will lead past the Three Islands, until the River Ponoï appears open. A S. W. course will thence lead directly to Sosnovitz or Cross Island, which we have already described.

The bearing and distance from Cross Island to Katsness or Blue-nose are S. by W. 21 leagues. Hence the regular course will be nearly S. S. W.; but as, in the spring, a current frequently sets strongly over to the eastward, towards the Gulf of Mezene, it will be more safe, at first, to steer S. W. by S. for 6 or 7 leagues, and then S. S. W. for Katsness or Blue-nose.

If, on advancing, you should fall in with ice, the best way is to keep nearer the Laplandish shore. In beating up, it is advisable to keep on the same, the tide being more favourable.

On advancing towards Archangel, after passing the Winter Hills, or what is generally called Blue-nose, you shape your course parallel with the land, keeping near to it, until off St. Nicolas' Point, thus passing the new tower and pilots' residence, which stand at two miles to the northward of that point. See the particular plan of the Mouth of the Dwina, on the Chart.

The tower above mentioned was finished in the year 1818: it is 84 feet in height from the base, and, being painted white, is a most useful mark: at the bottom of it is the house of the pilots of the port of Archangel; and here, therefore, a pilot will generally be obtained for the river.

Should a ship be driven from the coast to the westward, by an adverse wind or current, on returning to the east, St. Nicolas' tower should be brought to bear N. E. by N. With this bearing kept on, the outer buoy, at the bar of the river, will come in sight, and should be brought to the S. E. This is a large cone buoy, painted red, and having a flag-staff and vane. It lies with two masts on shore, serving as beacons, in one. Should it happen that a pilot cannot be obtained here, which can only be under particular circumstances, a vessel may proceed into the river, if the following description, &c. be strictly attended to.

Within the red cone buoy red buoys are placed on the sands, on the starboard side, and black buoys on the larboard, of the proper channel; and the direction therefore is, to leave the outer cone buoy at about $1\frac{1}{2}$ or 2 cables' length on the starboard hand, and thence proceeding between the other buoys to the

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south end of the island Mudoska, where you may come to an anchor. The course, if desirable, may be farther continued to the entrance of Port Lapominka, between beacons laid down to mark out the channel, and where the guardship is moored.

But it is strongly recommended to all strangers, not to attempt the river without a pilot, as the risk is much greater than it may appear from the face of the Chart. If, in consequence of a gale of wind, the pilots cannot come off from St. Nicolas' Tower, it will be much safer to cast an anchor in the outer road, with the tower N.E. by N., and the outer buoy S.E., where there is good ground in 6 fathoms.

The CITY of ARCHANGEL (ARCHANGHELSK) is 26 miles up the river, from the isle of Mudoska. It is the capital of the government of the same name, and has a government dock, with a court of admiralty. Here all the necessities of life, meat, game, and great varieties of excellent fish, are in the greatest plenty, and consequently cheap. There is a regular post between this city and Petersburg, and great quantities of mutton and beef are sent hence, during the winter, to Petersburg and other places. The country, generally, is cold, marshy, woody, and mountainous.

The tides are noticed hereafter.

DIRECTIONS for SAILING to ONEGA.

From CROSS ISLAND, which has been described in page 83, the direct bearing and distance to Cape Donega are S.W. $\frac{1}{4}$ W. 40 leagues: but, in order to allow for the general current, a more westerly course is required. CAPE DONEGA is high, covered with tall trees, and has a white sandy shore. The little isle ROVESTRA, which lies off the cape, is, also, of considerable height, and has a tower upon it. Here the pilots for Onega generally reside.

Between Cape Donega and Rovestra is a channel, in which the new charts exhibit 4 fathoms of water: but we cannot recommend a passage through it, having been informed that there is not more than half that depth, with rocky ground. The ground around the island is foul, and it is best not to advance within two miles of it.

Vessels opposed by contrary winds, and not having a pilot, may stand over to Anger Island, and come to on the northern side of it, where they may ride safely. The best anchorage is with the western end of the island S.W. by W., and the eastern hummock S. by E., at about a mile from shore.

The eastern end of Anger Island is 12 miles to the westward of Rovestra. Its length, east and west, is 10 miles, by a medial breadth of two. To the northward of the western part, distant $2\frac{1}{2}$ miles, are the sunken rocks, *Troitz Otamick*, having deep water around. Solovetskoi, the larger island westward of Anger, is high, irregular, and surrounded with foul ground. The small rock, named *Kemskoi Stamick*, lying 8 miles N.W. by W. from Solovetskoi, appears above water.

On the eastern side of Solovetskoi is the smaller island Muskalma, having an extensive reef stretching from it to the south-eastward.

From Rovestra towards Onega, the usual course is S.W. by S. towards Point Orlov, which is high. South of this point is the harbour and village named Puzlackta, a place affording commodious shelter, and frequented by vessels, which, arriving too late in the season, cannot proceed to Archangel. Directly opposite

opposite to this harbour, at the distance of a league, the Chart exhibits a shoal, with the nature of which we are unacquainted; but there is sufficient water around it, from 4 to 20 fathoms.

Point Kimenskoi, forming a little peninsula, lies 7 miles to the southward of Puzlackta. From the coast between extends a large bank of shoal ground. From Point Kimenskoi, the direct course into the Bay of Onega is S. E. by S. 18 leagues. The small island Purr-Luda may be passed on either side, as most convenient.

Before the entrance of the River Onega lies an islet named Kio, and without the bar are two others, the Shakloni: on passing westward of Purr Luda, endeavour to bring these in a line, or nearly so, bearing S. E. $\frac{1}{2}$ E. Thus you will arrive at the mouth of the river.

TIDES on the Coast of LAPLAND and in the WHITE SEA.

EASTWARD of the North Cape, the flood-tide sets from N. W. and N. N. W. and along the coast to Orlognose. At Tana Fiord it flows, on the days of full and change, at III h.; at Wardhuus it flows at IV h.; at Kilduin, at VII $\frac{1}{2}$ h.; and here the water rises about 12 feet. At the Seven Islands it flows at IX h.; at Sweetnose, in the Bay, VIII $\frac{1}{2}$; and here the water rises from 12 to 17 feet. At the Three Islands, it flows at II $\frac{1}{2}$ h., and the water rises about 16 feet. At Cross Island it flows at IV $\frac{1}{4}$ h., at Katsnose, V $\frac{1}{2}$ h. Between these places the flood sets to the S. W. by W.

At the Bar of Archangel it flows at VI h.; but here the rise is only 3 feet. At Cape Donega, at VI h.; and, at Onega, at VII $\frac{1}{2}$. Between Cape Donega and Onega, the flood sets along the land S. E. by S., at the rate of two miles an hour. Here the vertical rise is about 6 feet.

GENERAL CIRCULAR, from the Russian Consulate, respecting QUARANTINE, &c. 1818.

London, 29th March, 1818.

“THE undersigned Russian Consul-General, in order to fulfil the commands of his government, hereby makes known to the British Public, and to all persons whom it may concern, that, notwithstanding the Quarantine Regulations of the 25th May, 1816, have been published in this kingdom of Great Britain and Ireland, some foreign vessels, bound to the Russian ports, both in the Baltic and in the White Sea, have appeared without having brought the necessary certificates from Elsineur, of their being free from epidemical disorders.

“The positive news of Algerine corsairs, having the plague on board, stopping and visiting all the vessels they meet with, has induced the Imperial Government with the supreme approbation of his Imperial Majesty the Emperor, to adopt additional measures for preserving the Empire from any kind of infectious disorders.

“1, That vessels, coming to the Russian ports, without being furnished with certificates required by the regulations of the 25th May, 1816, will be proceeded with, in the strictest conformity to the same; whereof the foreign merchants will be informed by the Imperial ambassadors and consuls.

“2, That the Marine minister has to observe, that all ships or vessels, coming into the Baltic, and bound to Russian ports, without producing the necessary certificates of the Danish Quarantine, will not be admitted under any pretence whatsoever, but sent back under a military escort.

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“ 3. That all quarantine agents, as well as the commissioners of ports, and the coast-commanders, have new instructions, with respect to the most rigorous observation, that, no vessel whatsoever, which may have been subject to the visit of the corsairs, and have not been duly purified, under quarantine, will be allowed to proceed to the Russian ports.

(Signed.) “ A. DE DUBATCHEFSKY.”

For the regulations of the Russian Ports, in general, see the ‘RUSSIAN TARIFF,’ of which a translation has been lately published.

GEOGRAPHIC TERMS, DANISH and RUSSIAN, which frequently occur on the Charts.

1. DANISH.—The mile, Danish, is equal to four nautic or geographic miles; there being fifteen in a degree.

The Fod, or Foot, is longer than the English, in the proportion of $3^{\circ} 6' 28''$ nearly. The Favne, Fathom, contains six Danish feet.

Bierg, signifies a Mountain; Field, or Fell, a Hill; Hor, a Hummock; Bught, a Bay; Havn, a Harbour; Indlob, an Inlet; Fiord, a Frith; Sund, Sound; Kyst, Coast; Landstrakning, Extent of Coast; Lob, a Channel; Oe, Island; Oen, Islands; Holm, an Islet, or little Isle; Rehd, Road; Rende, a Strait, or Narrow Passage; Rev, Reef; Skær, Rock; Sand, Sand; Viig, or Vik, a Creek; Store, Great; Lille, Little.

Nord, signifies North; Syd, South; Ost, East; Langde, Longitude; Fyhr, a Light or Light-beacon; Fyhr-taarn, a Light-tower, or Light-house; Varde, a Beacon; Tunne, a Buoy.

Gaard signifies a large House; Huus, House; Kirke, a Church; Molle, a Mill; Mollen, Mills.

2. RUSSIAN.—The Verst or Werst is the common mile of Russia. One Verst is equal to 3508 feet one inch, English. In a degree of the meridian there are, consequently, 103.86 versts; and, in a geographic mile, 1.73.

The Archeen of Russia contains 28.0114 English inches; and the Verst contains 1500 Archeens.

Gora signifies a Mountain; Mora, or Moré, a Sea; Zemlia, Earth; Wooda, Water; Vaitur, Wind; Gouba, a Gulf; Zaliv, a Bay; Ostrov, an Isle; Nos or Noss, a Nose, or Ness, frequently applied to headlands, which are properly capes; Kosa, a Point; Gavan, a Port or Harbour; Gorod, a Fört.

Suver signifies North; Uge, South; Vostocka, East; Zapad, West. Peski, Lands; Verkhney, Upper; Stredney, Middle; Nijney, Lower; Staroy, Old; Novoy, New; Soukhoy, Dry; Mokroy, Wet; Solennoy, Salt; Tchernoy, Black; Bieloy, White; hence, Bieloy Moré, White Sea; Krasnoy, Red; Roudnia, a Mine; Pristan, a Wharf.

A very useful vocabulary of terms, English and Russian, is attached to an instructive work, entitled ‘A Journal from London to St. Petersburg, and thence to Moscow, &c. by George Green, Esq.’ Published by Mr. Boosey, of London, 1813. A more comprehensive work is the “Survey of the Russian Empire,” by Captain Pleschééf, translated by the Rev. James Smirnové, in one volume, London, 1792, and to which those may satisfactorily refer who wish to acquire the orthography and correct pronunciation of names peculiar to the Empire.

VI. *The VOYAGE from ENGLAND to SPITZBERGEN.*

HAVING already explained, in a preceding section, page 45, &c. the General Phænomena of the Northern Ocean; having, also, described the Islands of Scotland in a preceding division of the present Section, and those of Spitzbergen, with East-Greenland, &c. in the Notes to the Tables, pages 27 to 33, we shall here give a brief account of the two voyages made, for the purpose of exploring the Polar Regions, under the orders of the British Government: the first in the year 1773; the second in 1818.

1. THE VOYAGE OF CAPTAIN PHIPPS, IN 1773.

The voyage of the *Race-horse* and *Carcass*, in the year 1773, under the command of the Honourable Constantine John Phipps and Captain Skeffington Lutwyche, is delineated on the Chart. This voyage commenced on the 3d of June, 1773; the ships passed Sheerness on the 4th, and continued their voyage without any material occurrence till the 15th, when they lay-to, off Brassa, and purchased fish, &c. from the boats of Shetland.

After taking a departure from Hangcliff,* on the 16th, they were enveloped in a fog of almost pitchy darkness, during the continuance of which guns were fired and drums beaten, to enable the *Carcass* to keep company; while the consort ship was obliged to repeat the signals, lest, in the deep gloom, they should run foul of each other.

When the mist vanished, they found themselves, by observation, in $60^{\circ} 52' N.$ and immediately proceeded to the northward.

Having arrived in latitude $65^{\circ} 9'$, and the cold beginning to be very sensibly felt, the additional clothing, which had been liberally furnished by government, was delivered out to the officers and men. On the next day, being the 19th of June, the wind varied to every point of the compass; the commodore brought-to, and spoke his consort.

On the 20th, the two ships pursued their course with strong breezes and clear air. They were now within the polar circle; and, at midnight, by an observation of the sun, found their latitude to be $66^{\circ} 52' N.$ Here the *Race-horse* sounded with a lead of one hundred weight, and a line of 780 fathoms, to which was appended a thermometer of a new construction. They found no bottom, but it was ascertained, that the water was eleven degrees colder at that depth than on the surface.

On the following day they had light breezes and cloudy weather, and now they first observed a whale. The commodore, observing a whaling-snow, with Hamburg colours flying, fired a gun and brought her to. She was homeward-bound with seals.

On the 22d of June, the weather began to be piercing cold; being now in the 70th degree of latitude, and about 14 minutes of East longitude, the rain poured down in streams, and froze as it fell, and the air was thick and unpleasant.

* Captain Phipps has given the situation of Hangcliff as $60^{\circ} 9' N.$ and $0^{\circ} 56' 30''$; the latter, as is shown by our Table, page 10, is incorrect. The position of Flamboro' Head, as given in the account of the voyage, is $60^{\circ} 9' N.$ and $0^{\circ} 19' 15'' E.$ We have the latter, (page 9) in $54^{\circ} 7' 50'' N.$ and $0^{\circ} 2' 20'' W.$; varying, in longitude, from Captain Phipps, 21½ minutes.

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* The position of $33^{\circ} E.$ The Chart represented, from observ

The rain continued next day; and they heard three guns fired at a distance, but saw no ship or other object. On the 24th, the commodore changed his course to N. E., and amidst fogs, gales, sleet, and piercing cold, they advanced till they found themselves in latitude $74^{\circ} 17' N.$

On the 27th, they had light airs from the southward, and felt much warmer than on the preceding day. Indeed, the vicissitudes of heat and cold are much more frequent here than in the more southerly latitudes. It often changes from temperate to severe cold, almost in an instant. It should seem, likewise, that, in this latitude, the ice frequently shifts its place; for Captain Wood, about the same season of the year, in 1676, fell in with ice near this latitude, and found that it presented an impenetrable barrier against his farther progress.

On the 29th, being in latitude $78^{\circ} N.$ and in longitude $9^{\circ} 29' E.$, the ships came in sight of land, when a consultation was held concerning their future course. The appearance of the land lay from E. S. E. to N. E. Falling in with the Marquis of Rockingham, Greenlandman, she presented each of the ships with some venison, very well flavoured, but not burthened with fat. By this ship, which had just come from the ice, they learned, that three whalers had, the day preceding, been crushed to pieces by some floats of ice suddenly closing on them.

Pursuing their course, next morning, they saw Black Point, so called from its dark appearance, bearing eastward, at the distance of seven or eight leagues. Soon after, standing to the east, they sounded, and found ground at one hundred and fifteen fathoms.*

On the 1st of July, they had light breezes, with clear weather, at midnight, when the sun shone as bright as at noon. Early this morning they made Charles's Island, and saw some whalers at a distance.

Next day they lay-to, and took the altitude of a mountain, which they named Mount Parnassus. It was found to be 3960 feet from the level of the sea, wholly covered with snow, and at a distance resembled an antique building crowned with a turret.

The bottom of this mountain, and the adjacent hills, have sometimes a very fiery appearance, and the ice and snow on their sides, in various fantastic forms, glisten with a brilliancy that exceeds the splendour of the brightest gems. This appearance is the general prelude of a storm. Here they shot some sea-fowl, which had a very oily taste.

July 3d was a perfect calm. This day they spoke a Hollander, who predicted that, a degree or two farther north would be the extent of their progress this season. Having doubled Cape Cold, they anchored about three miles from the land, and sent the boats ashore for water, which they found in abundance, pouring down from the rocks.

On the succeeding day, by observation, the latitude was $79^{\circ} 34' N.$ and the longitude $8^{\circ} 10' E.$ The thermometer stood at 47° .

On the 5th, the ships were surrounded by a thick fog, in consequence of which, it was found necessary to fire guns, in order to keep in company. A dreadful cracking was now heard at a distance, which proved to be the dashing and grinding of the loose pieces of ice against each other.

* The position of Black Point, as given in the relation of the Voyage, is $78^{\circ} 13' N.$ and $10^{\circ} 33' E.$ The Chart represents it as shown in the Table, page 27. Hakluyt's Headland is represented, from observation, in $79^{\circ} 47' N.$ and $9^{\circ} 11' E.$

Next day, 6th July, the islands of ice began to appear, and, the fog thickening, the situation of the ships became alarming. About ten at night the commodore bore away from the ice, and soon lost sight of it; but next morning descried it again, stretching from E. by S. to N. by E.

The weather was cloudy on the 7th, and finding themselves beset by loose fragments of ice, which gave them incessant trouble, the ships stood to the westward: but it was with extreme difficulty that they could keep any course, for the ice came in such drifts as whirled them about in an astonishing manner.

Both vessels continued to be entangled by the ice on the following day, and the Carcass, being driven to leeward, hoisted out her long-boat to tow up with the commodore; but, the ice closing very fast, it was impossible for the boats to live. Orders were, therefore, given to stand to the southward; but the ships were unable to make head against the accumulation of ice that constantly surrounded them, and, therefore, were obliged to have recourse to their ice-anchors and poles. Towards evening, the ice beginning to open, they strained every nerve to extricate themselves from their perilous situation, which at last they effected, though with some loss.

It frequently happens, that ships, encompassed in this manner, by the ice, perish, by being dashed against the solid fields, or are crushed by the loose fragments suddenly coalescing. The greatest danger, however, is from the loose ice; for the whalers often moor their ships in security to the solid fields. In such situations it sometimes happens that, no loose ice is to be seen; yet, perhaps, in less than an hour's time, upon a change of wind, it will pour upon them with irresistible violence.*

Though it is allowed that, many of the largest fields of ice are bedded in the bottom of the sea, yet, it is equally certain that, they are often rent asunder by the raging billows, which produces the most terrible crash imaginable.

The excessive severity of the climate demanded all the exhilarants that Government had supplied for the comfort of the crews. Each man had now two quarts of porter and a pint of brandy for his daily allowance.

On the 10th, they sailed between numberless pieces of ice, among which they saw several whales. The ice soon becoming solid and compact, they were obliged to change their course; and the discovery of a passage to the Pole, in that direction, being judged impracticable, in the opinion of every officer on board, and the men almost worn out with continued labour, it was resolved to extricate themselves, as soon as possible, from the danger with which they were environed.

Next day, having, with infinite toil, worked out of the loose ice, they sailed along the main body, which appeared perfectly solid and compact. This immense mass extended as far as the eye could reach from the mast-head; but the sea was now tolerably clear. Early in the morning they saw land, which proved to be Cloven Cliff, in latitude $79^{\circ} 56' N.$

On the evening of the 12th, being four or five miles distant from the cliff, they sounded, and found a rocky bottom at fifteen fathoms; and saw several English and Dutch Greenlanders at anchor in the Norways, the isles so called, their usual place of rendezvous, for they never venture farther north. A breeze springing up, they made sail, and soon saw Hakluyt's Head, bearing westward about six or seven leagues distant; and by noon they found themselves in $80^{\circ} 2' N.$

* See the description of Captain Scoresby, page 53.

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On the following day they came to an anchor in Smeerenberg Harbour, where they remained several days, to take in fresh water, during which space that survey was made of which a plan is given on the Chart. The landscape here is described as being awfully romantic; full of mountains, precipices, and rocks. Between these are hills of ice, apparently generated from the melting of the snow on the sides of those towering elevations, which, being once congealed, are annually receiving an accumulation of gelid matter. The eye of fancy may see a thousand fantastic figures on these hills, representing trees, castles, ruins, and the different objects of animated nature.

Of these ice-hills, however, there are seven on the western coast, which more particularly attract notice: they are called the Seven Ice-bergs; and, when the sun shines full upon them, the prospect is inconceivably brilliant, assuming all the various hues and tints that the reflection of the solar orb on their rude surfaces can convey. Their lustre is too dazzling for the eye, and the air is filled with an astonishing brightness.

SMEERENBERG HARBOUR was first discovered by the Dutch. Here they erected sheds and conveniences for boiling the blubber of whales, instead of carrying it home in the gross. Allured by the hopes of gain, they also built a village here, and endeavoured to settle a colony; but all the people perished in the first winter. The remains of their village may still be traced; and their domestic utensils, and other implements, remained in the shape of solid ice, long after the substance was decayed.

Where every thing is new, a stranger must be at a loss to fix on the first objects of his admiration. The rocks here are certainly the most striking objects. Their summits are almost perpetually involved in clouds. Some appear one solid mass of stone, from top to bottom. Others consist of various fragments, differently veined, like marble, and red, white, and yellow; and, probably, were they sawed and polished, they might equal, if not excel, the finest specimens of Italy and Egypt.

On the southerly and westerly declivities of these rocks, grow all the indigenous plants, herbs, and mosses: on the two other sides the wind strikes so cold, that it destroys every principle of vegetation.

These plants arrive at maturity in a very short space. Till the middle of May the whole country is locked up in ice; about the beginning of July, however, the plants are in blossom; and, by the latter end of that month, or the commencement of the next, they have perfected their seed. The earth is fertilized, in a great measure, by the dung of fowls, which, after breeding their young here during the summer, repair to more favourable climes.

The plants most common in Spitzbergen, are scurvy-grass and crowsfoot: there are, besides, a species of house-leek, an herb resembling stone-crop, snake-weed, mouse-ear, wood-strawberry, perriwinkle, and a plant peculiar to the country, called the rock-plant. Its leaves are linguiform, about six feet long, and of a dull yellow. It is an aquatic, and therefore rises in height in proportion to the depth of water in which it is found. It smells somewhat like muscles. These are the principal plants and herbs: of flowers, the white poppy is predominant.

The rocks and precipices being full of fissures and cliffs, which afford convenient shelter for the birds, they breed there in immense numbers. Most of these are water-fowl, and draw their food from the sea. There are, however, some rapacious birds, that prey on their own kind, but these are few. The water-fowl have a strong and fishy flavour, and their fat is not to be endured.

They

They are so numerous, as sometimes to darken the air when they rise in flocks : and they scream so horribly, that the rocks ring with their noise.

There are a few small birds, like our snipes ; and a kind of snow-bird, but different from that found about Hudson's Bay.

The ice-bird is a very beautiful little bird, but very rare. He is, in size and shape, like a turtle-dove ; but his plumage, when the sun shines upon him, is of a bright yellow, like the golden ring in the peacock's tail, and almost dazzles the eye to look upon it.

The other tenants of this country are, white bears, deer, and foxes. How these creatures can subsist in the winter, when the whole earth is covered with snow, and the sea locked-up in ice, is hardly to be conceived. It has been said, indeed, that, when the ocean is all frozen over, and no sustenance is to be procured in this country, they travel southerly, to the warmer climates, where food, proper for them, abounds in the immense forests of the northern continent. But, whoever considers the vast distance between Spitzbergen and the nearest parts of the northern continent, will be as much at a loss to account for the subsistence of these creatures in their journey, as in the desolate region where they undoubtedly remain. The bear is by far the best accommodated to the climate of which he is an inhabitant. He is equally at home on land and water, and hunts diligently for his prey in both. In summer, he finds plenty of food from the refuse of the whales, sea-horses, and seals, which is thrown into the sea by the whalers, and covers the shores during the time of whaling ; and he has, besides, a wonderful sagacity in smelling out the carcasses of the dead, let them be ever so deeply buried in the earth, or covered with stones. But how he subsists in winter, is very difficult to be accounted for on any rational principle.

These creatures, as they differ in nothing but colour and size from those commonly shown in England, need no description.

The foxes differ little in shape from those we are acquainted with ; but in colour there is no similitude. Their heads are black, and their bodies white. As they are beasts of prey, if they do not provide in summer for the long recess of winter, it were, one would think, almost impossible for them to survive ; yet they are seen in plenty, though, by their subtilty and swiftness, they are not to be caught easily.

The most wonderful of all is, how the deer can survive an eight months famine. Like ours, they feed upon nothing that can be perceived, but the vegetables which the earth spontaneously produces ; and yet, for eight months in the year, the earth produces neither plant, herb, shrub, nor blade of any kind of grass whatever. They are, besides, but thinly clothed for so severe a climate ; and, what seems still worse, there is not a bush to be seen to shelter them, within the distance that man has yet discovered. The means of their subsistence must, therefore, remain among the secrets of nature, never to be disclosed ; as no human being can ever live here, so as to be able to trace these creatures to their winter's residence. It is known, however, that the reindeer, in Lapland, subsist on the lichen, which they scrape for to a great depth in the snow. Analogy may here supply the place of demonstration.

Amphibious creatures abound the most about the sounds and bays of Spitzbergen, and they seem best adapted to endure the climate. These are the seals, and morses, or sea-horses, (*walrus*,) of which the whalers avail themselves, when disappointed in completing their lading with the fat of whales.

The seal is sufficiently known ; but the walrus, or sea-horse, as it is a creature peculiar to high latitudes, is, therefore, more rare. It is not easy to say why

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why he is called a sea-horse; for, there is no more likeness between a sea-horse and a land-horse, than there is between a whale and an elephant. The sea-horse is not unlike the seal in shape. He has a large round head, larger than that of a bull; but shaped more like that of a pug-dog without ears, than any other animal we are acquainted with. He tapers all the way down to the tail, like the fish we call a lump, and his size is equal to that of the largest ox. His tusks close over his under-jaw, like those of a very old boar, and are, in length, from one foot to two, or more, in proportion to the size and age of the animal. His skin is thicker than that of a bull, and covered with short mouse-coloured hair, which is sleeker and thicker, just as he happens to be in or out of season when he is caught. His paws, before and behind, are like those of a mole, and serve him for oars when he swims, and for legs to crawl when he goes upon the ice, or on shore. He is a fierce animal, but, being unwieldy when out of the water, is easily overcome.

These animals are always found in herds, sometimes of many hundreds together; and if one is attacked, the rest make a common cause, and they stand by each other till the last gasp. If attacked in the water, they will fight desperately, and even attempt the boats of their pursuers, if any of them be wounded, and not mortally. Some have been known to make holes in the bottom of the boat with their tusks, in defence of their young. Their eyes are large; and they have two holes in the upper part of their neck, out of which they eject the water, like whales.

Though the sea about Spitzbergen is full of fish, yet they appear to be designed by Providence rather for the sustenance of one another, than for the food of man. The mackerel, of which there are no great plenty, seem not only to be the most wholesome and the most palatable, but also the most beautiful. These appear to be of a different species from those caught upon the British coast. The upper part of the back is of a vivid blue; the other part, as low as the belly, of a gem-like green on an azure ground. The colour of the belly is of a transparent white, and the fins shine like polished silver. All the colours glow, when alive in the sea, with such a richness, that fancy can hardly form to itself any thing in nature more beautiful. Almost all the other fish on this coast are of an oily nature, and of a very indifferent flavour.

The saw, or sword-fish, is remarkable, not only for the singularity of his shape, but also for his enmity to the whale. This fish takes his name from a broad flat bone, in length, from two to four feet, which projects from his nose, and tapers to a point. On each side it has teeth like a comb, at the distance of a finger's breadth asunder. He is also furnished with a double row of fins, and is of astonishing strength in the water. His length is from ten to twenty feet. He seems to be formed for war, and war is his profession. The conflict betwixt him and the whale is dreadful; yet, it seems, as if he never gives over till his sword is broken, or he comes off victorious.

The whale is a harmless fish, and is never known to fight but in his own defence; yet, when he is exasperated, he rages dreadfully. Though, from his magnitude, he may be called the sovereign of the seas, yet, he is liable to be vexed and hurt by the meanest reptiles. The whale's louse is a most tormenting little animal. Its scales are as hard as those of our prawns; its head is like the louse's head, with four horns, two that serve as feelers, the other two are hard and curved, and serve as clenchers to fix him to the whale. On his chest, underneath, he has two carvers, like scythes, with which he collects his food, and behind these are four feet, that serve him for oars. He has, moreover, six other clenchers behind, with which he can rivet himself so closely to his prey,

that

that he can no otherwise be disengaged, but by cutting out the whole piece to which it is fixed. He is jointed on the back like the tail of a lobster, and his tail covers him like a shield when he is feeding. He fixes himself on the tenderest parts of the whale's body, between his fins, on his sheath, and on his lips, and eats pieces out of his flesh.

No springs of fresh water were found in Spitzbergen; but in the valleys, between the mountains, many little rills, caused by the rain and melting of the snow in summer; and, from these rills, the ships are supplied. Some are of opinion that this water is unwholesome; but this does not appear to be the case. The whaling people have drank of it for ages, and have found no ill effects from the use of it. Ice, taken up in the middle of these seas, and thawed, yields also good fresh water, but it should be first washed.

In calm weather it was remarked that, the sea about the islands appeared uncommonly still and smooth; that it was not suddenly moved at the first approach of blowing weather; but that, when the storm continued, the waves swelled gradually, and rose to an incredible height. These swelling waves successively follow one another, and roll along before the wind, foaming and raging in a frightful manner; yet they are thought less dangerous than those that break short and are less mountainous.

It was observed, likewise, that the ice which rested on the ground was not stationary, but that it changed place; and the officers were informed, that, in some seasons, there was no ice, where, in this season, they were in danger of being embayed.

There does not, however, thence appear the least reason to conclude that *any practicable passage to the Indian Ocean can ever be found in this direction*; for, were it certain that the seas were always open under the Pole, yet great bulwarks of ice evidently surround it, sometimes at a less, and sometimes at a greater, distance. Moreover, were it possible that chance should direct some fortunate adventurer to an opening at one time, it would be more than a million to one if the same opening were passable to the next who should attempt it.

There are many harbours about Spitzbergen, besides that of Smeerenberg, where ships employed in the whale-fishery take shelter in stormy weather; and there are some islands, such as Charles's Island, the Clefted Rock, Red Hill, Hakluyt's Headland, &c. that serve as land-marks, by which seamen direct their course. These islands are full of the nests of birds; but their eggs are as nauseous as the flesh of the fowls that lay them. The sailors sometimes eat them, but they are filthy food. Even the geese and ducks, on the neighbouring islands, eat fishy and strong.

The air, about Spitzbergen, is never free from icicles. If a person looks through the sun-beams transversely, as he sits in the shade, or where the rays are confined in a body, instead of dark motes, as are seen in England, myriads of shining particles are observed, that sparkle like diamonds; and, when the sun shines hotly, as it sometimes does, so as to melt the tar in the seams of ships, these shining atoms seem to melt away and descend like dew.

It is seldom that the air continues clear for many days together in this climate; when that happens, the whalers are generally successful. There is no difference between night and day, in the appearance of the atmosphere about Spitzbergen, one being as light as the other; only when the sun is to the northward, he may be looked at with the naked eye, as at the moon, without dazzling. The fogs here come on so suddenly, that, from bright sun-shine, the deepest obscurity sometimes takes place in an instant.

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While the writer of this description was busy in making his observations, all belonging to the ships were differently and variously engaged, either on business or pleasure. The commanders and officers, with Mr. Lyon, the astronomer, were engaged in making observations, being furnished with an excellent apparatus. They landed their instruments on a small island in Vogel Sound, and had several opportunities, during their stay, of using them to advantage. Having erected two tents, the captains from the fishery frequently visited the observers, and expressed their admiration, not only at the perfection of the instruments, but likewise at the dexterity with which they were used.

The ice began to set in apace, yet the weather was hot. The thermometer, from 56° in the cabin, rose to 90° in the open air. It was still ten degrees higher on the top of a mountain to which it was carried. The island on which the experiments were made, they called Marble Island, from the rock by which it is formed. Having watered and finished their observations, the ships prepared to depart.

July the 19th, the commodore made the signal to weigh; at two in the afternoon the ships were under sail. At three they tacked and steered northward; and before four were again entangled in the loose ice, through which they sailed, directing their course along the main body, which lay from N.W. to S.S.E.

Next day they continued their course along the ice, but could discover no opening, though they searched every creek, and left no bay or turning unexamined. This day they observed, what the sailors call a mock-sun, a phenomenon well known.

On the 21st, the severity of the weather increasing, an additional quantity of brandy was served out to the people, and every comfortable refreshment afforded them, that they themselves could wish to acquire. The course of the ice this day lay N.E.

The two following days presented nothing remarkable. On the 25th, gentle breezes prevailed, with cloudy weather, and the ships were engaged among some pieces of ice, which kept them continually tacking and luffing. At length, they entered among mountains and islands of ice, which came upon them so fast, that it was with the utmost difficulty they could proceed; the Carcass having several times struck against them with such violence, as to raise her head four feet out of the water. They now imagined, from the solidity and extent of these islands, that the late strong gales had caused a separation from the main body; the commodore, therefore, changed his course, with a strong gale to the eastward. In the morning the weather became moderate.

Next day, at seven in the morning, they came in sight of Red-hill, (*see the Chart*.) a small mount, which commands an open plain, known by the name of Deer's Field, by reason of its fertile appearance, it being the only space on which they saw no drifts of snow. To the northward lay Mofsen Island. Captain Lutwyche sent out the long-boat, with orders to sound along the shore, and to examine the soil. This island is about a mile long, very low, and looks, at a distance, like a black speck. Though the soil is mostly sand and loose stones, and hardly so much as a green weed upon it, yet it is remarkable for the number of birds that resort to it in summer, to lay their eggs, which were so thick upon the ground, that the men, who landed, found it difficult to walk without filling their shoes.

While the crew of the boat, ten in number, with their officer at their head, were

were examining Moffen Island, after having sounded the shores, they observed two white bears making towards them, one upon the ice, the other in the water. The officer, who, it seems, was not distinguished for his courage, seeing the bears approach very fast, especially that which came in the water, ordered his men to fire, while yet the enemy was at a distance, as he did not think it prudent to hazard the lives of his little company in close fight. All of them pointed their muskets, and some of the party obeyed orders; but the greater part, judging it safer to depend upon a reserved fire, when they had seemingly discharged their pieces, pretended to retreat. The commander, being very corpulent, endeavoured to waddle after his companions; but being soon out of breath, and seeing the bear that came in the water had just reached the shore, thought of nothing now but falling the first sacrifice. His hair already stood on end; and, looking behind him, he saw the bear at no great distance, with his nose in the air snuffing the scent. He had all the reason in the world to believe it was him that he scented, and he had scarce breath enough left to call to his men to halt. In this critical situation he unfortunately dropped his gun, and, in stooping to recover it, stumbled against a goose-nest, fell squashed upon his belly into it, and had very nigh smothered the dam upon her eggs. Before he could well rise, the enraged gander came flying to the assistance of his half-smothered consort, and, making a dart at the eye of the assailant, very narrowly missed his mark, but discharged his fury plump upon his nose. The danger now being pressing, and the battle serious, the bear near, and the gander ready for a second attack, the men, who had not fled far, thought it high time to return to the relief of their leader. Overjoyed to see them about him, but frightened at the bear just behind him, he had forgotten the gander that was over his head, against which one of the men, having levelled his piece, fired, and he fell dead at the major's feet. Animated now, by the death of one enemy, he recovered his gun, and faced about to assist in the attack of the second. By this time the bear was scarcely ten yards from him, and beginning to growl; the officer dropped his accoutrements, and fell back. The crew, in an instant, had brought down the bear, and now it was time for their leader to do something great. Having recovered his arms, and seeing the poor beast grovelling on the ground, and growling out his last, he thrust his lance full four feet deep into the dying bear's belly. The cowardice of the chief was very entertaining to his party; he took to the boat, while a few of them remained to dispatch the other bear.

On this island they likewise killed a sea-horse. The sea-horse made a desperate defence, being attacked in the water; and had there been only one boat engaged in the combat, he certainly would have come off victorious; but the crew of the Race-Horse, having learnt that there were bears and sea-horses on this little spot, were willing to share in the sport of hunting them, as well as in the pleasure of tasting their flesh. They accordingly landed in their boats, and came in good time to assist in the conquest. It happened, however, that their ammunition being almost spent, one great bear came up to revenge the death of his fellows, and advanced so furiously, growling and barking, that he put the whole company to flight; and some of them, it is said, had no great reason to laugh at their leader.

On the 27th, the air being serene, and the weather moderate, the fish seemed to enjoy the temperature, and to express it by their sporting. The whales were seen spouting their fountains towards the skies, and the fin-fish following their example. This day they saw dolphins; the whole prospect, in short, was more pleasing and picturesque than they had yet beheld in this remote region. The very ice, in which they were beset, looked beautiful, and put

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forth a thousand glittering forms; and the tops of the mountains, which they could see like sparkling gems at a vast distance, had the appearance of so many silver stars illuminating a new firmament. But this flattering prospect did not continue long.

By an accurate observation, it was found that the ships had now advanced to latitude $80^{\circ} 47' N.$ and in longitude $21^{\circ} 10' E.$; and in sight of the Seven Islands, to the North, to which they directed their course.

Next day they had fresh easterly breezes, which, from the moderate weather of the day before, changed to piercing cold. At midnight, the west end of the Waygat or Hinloopen Strait bore S. by E., so that they were now on the very spot where Barentz had supposed an opening would be found into the Polar sea. Yet, so far from it, they could discover nothing from the mast-head but a continued continent of solid ice, excepting the islands already mentioned. On this ice, however, there were many bears, some of which came so near the ships, as to be shot dead by small-arms. The flesh of these bears is very good eating; and many of them are larger than the largest oxen. In most parts of their body they are musket-proof; and, unless they are hit upon the open chest, or on the flank, a blow with a musket-ball will hardly make them turn their backs.* Some of the bears killed in these encounters weighed from seven to eight hundred weight, and, it was thought that, the bear, which routed the sailors on Moffen Island, could not weigh less than a thousand weight. He was, indeed, a very monster!

On the 29th of July, in sailing among innumerable islands of ice, they found the main body too solid for the ships to make the least impression upon it; and, finding no opening, the commodore resolved to send a party, under the command of the first lieutenant, to examine the land, which, at a distance, appeared like a plain, diversified with hills and mountains, and exhibiting, in their situation, a tolerable landscape.

On trying the water, the officers say that it was found less salt than any seawater they had ever tasted.

On the succeeding day, the weather being clear, they ran close to the main body of the ice, and the sun continuing to shine, made them almost forget the climate they were sailing in; but it was not long before they had reason for severe recollection. In coasting along, they observed many openings, and were in hopes, from their distant appearance, that a passage might be made between them; but, upon trial, it was found that these appearances were deceitful. They were then about four miles distant from the nearest land.

On the last day of the month, July, the Carcass hoisted out her cutter, and filled her empty water-casks with water from the ice. On this ice lay great quantities of snow, and, so soon as a pit is dug, it fills with fine, soft, clear water, not inferior to that of many land-springs. At noon they sounded in ninety-five fathoms, the ground soft mud. This day a bear came over the ice to visit them, the first they had seen since they had left Moffen's Island. They saluted him with a volley of small-arms, and he returned the compliment, by turning his back upon them.

August the 1st proved a day of trial. Lying-to among the close ice, with the loose ice driving fast to shore, the commodore was desirous of surveying the westernmost of the Seven Islands, which appeared the highest, in order to judge, from the prospect on the hills, of the possibility of proceeding farther on the discovery. With this view, ice-anchors were carried out, and both ships made fast to the main body; a practice very common with the fishing-

ships

ships that annually frequent these seas. Of the reconnoitring party were the captains, the second lieutenants, one of the mathematicians, the pilots, and some chosen seamen, selected from both ships. They set out about two in the morning; and, sometimes sailing, sometimes drawing their boats over the ice, they with difficulty reached the shore, where the first objects they saw were a herd of deer, so very tame, that they might have been killed with the thrust of a bayonet; a proof that animals are not naturally afraid of man, till, by the fate of their associates, they are taught the danger of approaching him; a proof, too, that animals are not destitute of reflection, otherwise how should they conclude, that what has befallen their fellow-animals will certainly happen to them, if they run the like risk. The gentlemen, however, suffered only one of these fearless innocents to be fired at, and that was done by a sailor when they were absent on observation.

On this island they gathered some scurvy-grass; and, in many places, they could perceive the sides of the hills covered with verdure.

After having ascended the highest hills on the sea-coast, and taken a view of the country all around, the gentlemen descended, and, at about five in the afternoon, embarked again on their return to the ships, at which they safely arrived about ten, after an absence of twenty hours. They were greatly disappointed by the haziness of the weather on the tops of the mountains, which confined the prospect, and prevented their taking an observation with the instruments they had carried with them for that purpose.

Their situation now began to be serious; and it was discovered, too late, that, by grappling to the ice, as practised by the Greenlandmen, they had endangered the loss of the ships, the loose ice closing so fast about them, that they found it absolutely impossible to get them disengaged; and there was, besides, great reason to fear that one or both would soon be crushed to pieces. Great minds are ever most distinguished by their expedients on the most alarming occasions. The commodore set all hands to work, to form a dock in the solid ice, large enough to moor both ships in, and, by the alacrity with which that service was performed, the ships were preserved from the danger of immediate destruction. The ships being thus far secured, the officers, pilots, and masters, were all summoned on board the commodore, to consult on what farther was to be done in their present unpromising situation; when it was unanimously agreed that, their deliverance was hopeless, and that they must either provide for wintering on the adjacent islands, or attempt to launch their boats in the open sea, which was already at a considerable distance; for the loose ice had poured into the bay in which they were at anchor with so much rapidity, and in such astonishing quantities, that the open sea was already far out of sight. Before any thing farther was undertaken, the men were ordered to their quarters, that they might refresh themselves with sleep.

While a commander preserves his fortitude, the seamen never lose their courage. They arose in the morning with as much alacrity and unconcern as if they had been sailing with a fine breeze in the English channel.

Next day it was thought advisable to make one desperate attempt to extricate the ships, by cutting a channel to the westward into the open sea. The scooping out the dock, with so much expedition, by a party only of one ship, raised high expectations of what might be performed by the united labours of both the crews. No body of men undertook a work of such difficulty with so much cheerfulness and confidence of success, as the sailors displayed on this occasion. Their ice-saws, axes, sledges, poles, and the whole group of sea-tools, were in an instant all employed in facilitating the work; but, after cutting

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cutting through blocks of solid ice from eight to fifteen feet deep, and coming to others of many fathoms, that exceeded the powers of man to separate, this project was laid aside as hopeless.

On the 3d of August, after the men had again refreshed themselves with sleep, it was resolved to fit up the boats belonging to both the ships with such coverings as were most light and easily fitted; and, by skating them over the ice, endeavour to launch them in the open sea. Could this be effected, they hoped, that, by sailing and rowing to the southernmost harbour of Spitzbergen, they might arrive at that land before the departure of the last ships, employed on the fishery, for Europe.

While the boats were getting ready for this expedition, a second party was dispatched to the island, with orders to take the distance, as exactly as possible, to the nearest open sea. As all the people belonging to the ships were not to be engaged in these services, those, who were unemployed, diverted themselves in hunting and killing the bears, that now, attracted perhaps by the savory smell of the provisions dressed on board the ships, came every day over the ice to repeat their visits. Several of these were killed occasionally; and this day they fought a sea-horse; in which engagement the second lieutenant of the Carcass signalized his courage in a most desperate rencounter, in which, however, he succeeded, though his life was in imminent danger.

On the 4th, the artificers were still employed in fitting up the boats. The pilots, who the day before had been sent to make observations on the islands already mentioned, made their report that, the nearest water they had seen was about ten leagues to the westward; that, in their passage, they had met with great numbers of spars of pine-trees, floating about the island, some of them of considerable size. As there was neither tree nor shrub to be seen growing on any of the Seven Islands, nor upon any land that they had yet discovered in that latitude, nor for ten degrees farther south, it was evident the trees they had seen must have come from a great distance.*

Though there is nothing new in this observation, the like being annually observed by all the navigators who frequent these seas in the summer, and who collect their wood from those drifts, yet the country whence they proceed has hitherto been thought a mystery. But it being now certain that, many of the great rivers, that flow through the northernmost parts of Russia, empty themselves into the sea, and that there is an open communication throughout the different parts of it at different seasons of the year, there seems very little reason to doubt that those trees are torn up by land-floods, and are precipitated into the sea by the rapidity of the streams.

The ice still surrounding them, and appearing to grow more and more solid and fixed, those who had till now retained hopes that the S. E. wind would again disunite its substance, and open a passage for their deliverance, began to despair, as the wind had blown for twenty-four hours from that quarter from which alone they could have relief, and not the least alteration to be perceived.

Early in the morning of the 5th, the man at the mast-head of the Carcass gave notice that, three bears were making their way very fast over the ice, and that they were directing their course towards the ship. They had, without question, been invited by the scent of the blubber of the sea-horse killed a few days before, which the men had set on fire, and which was burning on the ice at the time of their approach. They proved to be a she-bear and her two cubs, nearly

* See, upon this subject, the note on Spitzbergen, page 29.

full grown. They ran eagerly to the fire, and drew out from the flames part of the flesh of the sea-horse that remained unconsumed, and eat it voraciously. The crew from the ship, by way of diversion, threw out great lumps of the flesh of the sea-horse which they had still left, which the old bear fetched away singly, laid each lump before her cubs as she brought it, and, dividing it, gave each a share, reserving but a small portion to herself. As she was fetching away the last piece they had to bestow, they levelled their muskets at the cubs, and shot them both dead; and, in her retreat, they also wounded the dam, but not mortally. It would have drawn tears of pity from any but unfeeling minds, to have marked the affectionate concern expressed by this poor beast in the dying moments of her expiring young. Though she was sorely wounded, and could but just crawl to the place where they lay, she carried the lump of flesh she had fetched away, as she had done the others before, tore it in pieces, and laid it down before them; and, when she saw that they refused to eat, she laid her paws first upon one, and then upon the other, and endeavoured to raise them up. All this while, she made the most pitiful moans. When she found she could not stir them, she went off, and when she had proceeded to some distance, looked back and moaned; and that not availing her, she returned, and smelling round them, began to lick their wounds. She went off a second time as before, and having crawled a few paces, looked again behind her, and for some time stood moaning. But still her cubs not rising to follow her, she returned to them again, and, with signs of inexpressible fondness, went round one and round the other, pawing them, and expressing her distress. Finding at last they were cold and lifeless, she raised her head towards the ship, and seemed to growl a curse upon the murderers; which they returned with a volley of musket-balls. She fell between her cubs, and died licking their wounds. If what is related by a voyager of credit in the last century be true, the filial fondness of these animals, however, is no less remarkable than the maternal.

On the 6th, they discovered that the drift of the ship, with the whole body of ice, inclined fast to the eastward; and that they were already embayed in the very middle of the Seven Islands. They therefore sent off the pilots of both ships, with a party of seamen, to the northernmost island, to see what discoveries could be made from the promontories there. They returned at night, after a fatiguing journey, with a dismal account, that nothing was to be seen from thence but a vast continent of ice, of which there was no end; and that the thought of wintering in such a situation, was more dreadful than that of perishing by instant death.

Next day the boats were all brought in readiness on the ice, fitted with weather cloths, in order to keep off the cold as much as possible, if by good fortune they should be able to launch them in an open sea. They were employed chiefly in preparing provisions for the intended voyage; and in packing up such necessaries as every one could take along with him. This being adjusted, when night approached they were all ordered on board to sleep.

At six in the morning, all hands were ordered to turn out; and a detachment of fifty men from each ship, headed by their respective officers, were appointed to begin the hard task of hauling the launches along the ice. The bravest and gallantest actions performed in war, do not so strikingly mark the true character of a commander, as the readiness and alacrity with which his orders are obeyed in times of imminent danger. Every one now strove who should have the honour to be enlisted in the band of haulers, of whom the commodore took the direction, leaving Captain Lutwyche to take care of both the ships, that, if any favourable turn should happen in the disposition of the ice, he might make use of the remaining part of both the crews to improve it. Upon a general

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consultation of officers, previous to this undertaking, it had been agreed, and an order issued accordingly, that no person on board, of whatever rank, should incur himself with more clothes than what he wore upon his back. Upon this occasion, therefore, the officers dressed themselves in flannels; and the men put on the clothes which the officers had thrown off. The two companies, to a man, still preserved their wonted composure. That headed by the commodore drew stoutly for the honour of their leader; and that headed by the lieutenants had their music to play to them, and displayed an equal degree of cheerfulness and alacrity.

In six hours, with the utmost efforts of human labour, they had proceeded only a single mile; and now it was time for them to dine, which they did in common.

They had just begun to renew their labour, when word was brought that the whole body of ice had changed its situation, and was moving to the westward; that the ships were both afloat; and that the ice was parting. The joy which this news diffused through the two companies of haulers, is easier to conceive than express. They instantly shook off their harness, ran to assist in working the ships, and once more to resume their proper employments. When they arrived at the ships, Captain Lutwyche, who was no less beloved by his men than the commodore, had, by his example and his judicious directions, done wonders. Both ships were not only afloat, with their sails set, but actually cut and warped through the ice nearly half a mile. This ray of hope, however, was soon darkened; the body of ice suddenly assumed its former direction to the eastward, and closed upon them again as fast as ever.

For the remainder of the evening, and till two in the morning, the drift continued eastward, and all the while the ships were in danger of being crushed by the closing of the channel in which they rode. They had now drifted two miles to the eastward; the men were worn out with fatigue in defending the ship with their ice-poles from being engulfed; and now nothing but scenes of horror and perdition were seen. But, in the very moment when every hope of deliverance seemed to have deserted them, the Omnipotent caused the winds to blow, and the ice to part, in an astonishing manner, rending and cracking with a tremendous noise, surpassing that of the loudest thunder. At this instant, the whole continent of ice, which before was extended beyond the reach of sight from the highest mountains, moved together in various directions, splitting and dividing into vast bodies, and forming hills and plains of various figures and dimensions. All hearts were now again revived, and the prospect of being once more released from the frozen chains of the north, inspired the men with fresh vigour. The sails were all spread in an instant, that the ships might have the full advantage of the breeze, to force them through the channels that were already opened, and to help them to pierce the clefts that were but just cracking.

While the major part of the crews were employed in warping the ships with ice-anchors, axes, saws, and poles, a party from both ships were dispatched to launch the boats. This was no easy task to accomplish. The ice, though split in many thousand pieces, was yet frozen like an island around the launches; and, though it was of no great extent, yet the boats were of a weight hardly to be moved by the small force that could be spared: they were, besides, by the driving of the ice, at more than five miles distant from the ships; and, at this time, no channels of communication were opened. But Providence again appeared in their favour; for the island, on which the launches stood, parted while the men were hauling them, and they escaped without the loss of a man, though the ice cracked, as it were, under their feet.

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The people on board had not been able to force their way with the ships much more than a mile, when the party in the launches joined them. And now, excited by what curiosity or instinct is not easy to determine, several bears came posting over the ice to be spectators of their departure, and advanced so near the ships, that they might have been easily mastered, had not the men been more seriously employed.

The breeze continuing fresh from the eastward, the ice seemed to open as fast as it had before closed, when the wind blew westerly, and from the north; a strong presumptive proof of the land to the eastward, which, stopping the current of the loose ice in driving from the N. and W., closes it in, of course, and renders it compact.

As the wind on the 10th was variable, the ships could make but little progress. The ice, in the morning early, seemed rather to close upon them than to divide. At about eight, the breeze sprang up fresh from the N. E. exceedingly cold, but opening the ice from the westward. They then made all the sail they could, driving with the loosening ice, and parting it wherever it was moveable, with their whole force. Towards noon they lost sight of the Seven Islands; and, in a very little time after, to their great joy, Spitzbergen was seen from the mast-head.

On the succeeding day, the 11th, the men began, after a little refreshment, to resume their wonted cheerfulness, and, before they arrived at the coast of Spitzbergen, there was not an individual on board with a serious face.

The ice, that had parted from the main body, was now become an object of admiration. The various shapes in which the broken fragments appeared, were indeed very curious and beautiful. One remarkable piece described a magnificent arch, so large and completely formed, that a sloop of considerable burden might have sailed through it without lowering her mast; another represented a church with windows, pillars, and domes; and a third, a table, with icicles hanging around it, like the fringes of a damask cloth, &c.

They continued all this day working through the loose ice, and Hakluyt's Headland at length bore south. In their course, a Dutch Greenlandman was seen.

On the 12th of August they cleared the ice, and bore away with all sails set for the harbour of Smeerenberg, in which they had before cast anchor. Here they found four Dutch Greenlandmen lying in readiness to depart. These Dutchmen acquainted the commodore that, all the English fishing-ships had set sail on the 10th of July, the day to which they were obliged, by contract, to stay, to entitle their owners to receive the bounty-money allowed by parliament for the encouragement of that fishery.

At about the same time the greatest part of the Dutch had, likewise, set sail from Spitzbergen, on their voyage home: but it is a practice with these last, to take it by turns to wait till the severity of the weather obliges them to leave the coast, in order to pick up such men as may by accident have lost their ships in the ice; and who, notwithstanding, may have had the good fortune to save their lives by means of their boats. This is a regulation that does credit to the Dutch Government.

The day of the ships' return to Smeerenberg Harbour being fine, the commodore ordered a tent to be raised on the lower point to the S.W., where there was a level plain for the space of two miles, and where all the mathematical apparatus were again taken on shore for a second trial.

On the examination of the vibration of the pendulum, it was ascertained that it differed from that at Greenwich, by Harrison's time-keeper, only two seconds

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in 48 hours, which time-keeper, at their arrival at Greenwich, varied only one second and a half from the time-pieces at the Observatory there.

The people were now fully employed in repairing the ships and rigging, and taking in water for the remainder of the voyage.

On the 17th, vast pieces of broken ice, supposed to have fallen from the icebergs, came floating into the harbour. When these pieces, which are undermined by the continual agitation of the sea in stormy weather, lose their support, they tumble with a crack that surpasses the loudest thunder; but they were told, that no other thunder was heard in this latitude. (*This accords with the description of Captain Scoresby, given in page 53.*)

During the six days in which the ships anchored here, to make observations, refresh the men, and refit, several excursions were made to the adjoining islands, where the birds appeared in astonishing numbers; it being the season for bringing forth their young. Of all the birds that breed in these islands, the burgermeister, or burgomaster, hereafter mentioned, is the largest and the most ravenous: he is so called by the Dutch, from his size and his authority, as he holds all the other birds in subjection. His bill is long and crooked, rather like that of the stork than of the hawk, and is of a yellow-colour. He has a red ring about his eyes; is web-footed, but has only three claws on each foot; his wings are of a beautiful pearl-colour, edged with white; his back a silver gray; his body white as snow, and his tail of the same colour, which, when he flies, he spreads like a fan. He builds his nest very high in the rocks, inaccessible either to bears or foxes. He preys upon all the other birds, and eats the carrion of fish or flesh, or whatever comes in his way. His cry is horrible; and, when he screams, the malle-muck, a bird as large as a duck, is so much intimidated, that it will sink down, and suffer him to devour her without opposition.

The clefts on the mountains are, like those on the ice, frequently impassable, but they are abundantly more hazardous, being sometimes concealed under the snow, so that a traveller is engulfed before he is aware. Many have been entombed in these clefts, and perished in the hearing of their companions, without a possibility of relief. To a contemplative mind, however, even the deformities of nature are not displeasing, the wisdom of the DIVINE CREATOR being manifest in ALL his works.

On the 19th of August, the ships unmoored, and the next day they cleared the harbour. Finding it impossible to make any further progress in the career of discovery, it was now resolved to return home. On the 22d, they were in latitude 80° 14' N. and longitude 5° 44' E. Next day, the Carcass, being the heaviest sailer, lost sight of the Commodore, but in the evening re-joined; and they pursued their voyage, without interruption, till the 11th of September, when a violent gale separated them, and they did not come in sight of each other until they arrived off Harwich.

2. THE VOYAGE OF CAPTAIN BUCHAN, IN 1818.

THE interest excited by the equipment of the late expedition towards the North Pole was of so general a nature, that there is scarcely an individual who is not fully in possession of its purport: but, as no narrative of this voyage has hitherto appeared before the public, the following account may not prove uninteresting.

The Dorothea and Trent, under the command of Capt. David Buchan, and Lieut. John Franklin, quitted England early in May 1818; and, with favourable winds, pursued their course to the northward. As they advanced, the weather

weather became considerably colder; and, ere they had reached the eightieth parallel of latitude, the ships were cased in ice. The continuation of the sun above the horizon, however, soon dispelled this severity of climate; and the thermometer fluctuated between 40° and 28° of Fahrenheit, during the remainder of the summer.

Few obstacles presenting themselves, the Island of Spitzbergen was approached on the 26th of May. Its shores at first present, as already shown, a true picture of dreariness and desolation: the principal objects which attract the attention, are craggy mountains, with their summits towering above the clouds; deep glens, filled with eternal snows; and stupendous icebergs. The eye, however, soon becomes familiarized to such a scene, and the mind is filled with admiration of the grandeur and magnificence of its objects.

It was along the western shore of this uninhabited island, that the ships pursued an almost uninterrupted course, until they reached Cloven Cliff, or its northern boundary, where they found that immense barrier of ice, described by Capt. Phipps, and which has hitherto frustrated every exertion to reach the Pole.

This vast body, composed principally of floes, that vary in thickness, from fifteen to sixty feet below the surface of the water, was what the ships had to contend with. Twice they were led into it by flattering prospects, and each time were beset in the ice. The first time they were within two miles of the shore, and in such shoal water, that the rocks were plainly to be seen. The second, after penetrating to 80° 14' N. the floes closed upon the ships, and they became immoveable.

These discouraging circumstances, though they threw a damp upon the most sanguine expectations, served but to redouble the ardour of every officer and seaman; and, finding the sails alone were insufficient to force a passage, the laborious operation of dragging the vessels through with ropes, and ice-anchors, was resorted to; an experiment never before made, and now attempted with the determination of leaving nothing undone that might afford the slightest prospect of accomplishing the important enterprise in view.

At first, this fatiguing duty was rewarded with some degree of success; difficulties, however, increased, as the vessels proceeded; till, at length, the compactness of the ice was such that they could neither advance nor recede. Thus closely wedged, on all sides, by boundless plains of ice, extending as far as the eye could reach, the greatest anxiety was manifested in looking forward to some change, that should either admit of the vessels' proceeding, or enable them to retrace their way, and seek a passage in some more favourable quarter.

None, however, appeared until the 25th of July, when some channels of water were descried to the southward, into which the ships, aided by a northerly wind, soon forced their way; and, after four days combating with the ice, against which they were frequently struck with a violence that caused them to recoil with the concussion, and which nothing but their extraordinary strength could withstand, the sea was announced from the mast-head, to the unspeakable joy of every one on board.

Thus, on the evening of the 29th of July, they again found themselves in clear water, after having penetrated full forty miles within the icy barrier, and having been twenty-two days beset among it; their situation frequently critical: the ice pressing with such force against the ships, that the compression raised many parts of the decks, and twisted the pannels of the doors in their

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Shortly after this period, the *Dorothea* and *Trent* were in an open sea, steering to the westward, elated with hopes of future success. A few hours, however, had scarcely elapsed, when the sea rose to a prodigious height, and a gale, that had long been gathering, raged with such unexampled fury, that every sail was furled. At this critical moment, the ice was seen so close to leeward, as to hold out little probability of weathering it; and it presented a prospect so truly terrific, that but slender hopes of saving the vessels were entertained. Every effort was, however, made to keep off; every sail was set that the vessels could possibly carry, and every little change of wind taken advantage of, but all would not avail. The ships, half buried in the sea, fast approached the margin of the ice, which presented a scene of horror far beyond the power of language to describe. From the violence of the waves, immense pieces of ice, of many hundred thousand tons weight, were tossed about in all directions, or hurled one against the other. Floes, of several acres in extent, were rent asunder, or crumbled to atoms; the sea, at the same time, broke over them with such fury, that the whole was buried in foam. This action of the sea, with the collision of the ice, and violence of the wind, occasioned such a noise, that no human voice could possibly be heard. Such was the formidable body the ships momentarily expected to encounter. To allow them to have been driven broadside on, would have instantly proved fatal to all on board: the only alternative that then remained was to place the bow between the outer pieces; and, by a press of sail, endeavour to force past them, and penetrate so far, that, in the event of the vessels' going down, the crews might save themselves upon the ice. This dreadful and only expedient being determined upon, the after-sail was lowered, the helm placed a-weather, and in less than a minute, the vessels came in tremendous contact with the margin of the ice; through which, by the strength of the wind, and violence of the sea, they forced a passage. Unfortunately, however, the next sea drove in with such violence against their sterns, as to bring them broadside to; where they remained for some time, being thrown from piece to piece; and striking so hard, that their rudders were smashed, the vessels stove, and their timbers cracking incessantly. In this situation, the provisions and boats were prepared for putting on the ice; when, after a short time, a more favourable change took place. A piece of ice, full twelve feet thick, which had impeded the progress of the *Trent* inward, was, by a blow of the stem, split in two, and the vessel passed between the fragments, where she received such protection as yet to hold out hopes of her safety.

By four in the afternoon the gale abated, and this ship forced her way out: the *Dorothea* had suffered too much to risk the trial. Nevertheless, both ships were in a clear sea early next morning; but being so shattered as to render their continuance at sea unsafe, steered for the port of *Smeerenberg*, where they anchored early on the morning of the 1st of August. This port not proving sufficiently safe to admit of the vessels' undergoing a repair in it, they were moved to a more favourable one, the *South Gat*, which was found by the boats dispatched for that purpose. This is the best harbour yet discovered in *Spitzbergen*: it is surrounded by lofty pyramidal mountains; the valleys between being filled with snow and icebergs. Here the largest one seen in *Spitzbergen* was formed: its width being upwards of a mile and a-half, its extent, backward, two or three more, and height full 300 feet. Its front, of a most beautiful berylline blue, was nearly perpendicular, and wrought into the most fanciful

forms. In one part was a cave of one hundred feet in width, fifty in height, and of a great depth.

The mountains, though they wear so barren an appearance at a distance, are, on a near approach, found to be covered with moss, on which grow several diminutive plants: none, however, exceed six inches in height. Amongst them were noticed ranunculusses, poppies, and scurvy-grass.

During the stay of the ships in this port, important observations were made; by which the length of a pendulum, vibrating seconds in so high a latitude, was obtained. The dip of the needle was found to exceed that in England 11° : the former being 82° , the latter 71° . The variation, ascertained to be $24^{\circ} 30' W.$, being very nearly the same as in England.* The latitudes and longitudes of the principal headlands were found by celestial observations; and a trigonometrical survey of the islands, and N.W. coast of Spitzbergen, was carefully taken.

By the 30th of August, the ships had undergone such temporary repair as to enable them to proceed to England, though not to prosecute the voyage. The breeze favouring, they sailed out through the southern passage, made the ice, and traced it along to the westward. On the 15th of September, they were so near to the coast of lost Greenland, (as laid down in the best charts,) that they momentarily expected to see it, having every indication of their near approach. The sea was smooth, and somewhat changed in colour; the sea-fowl were become more numerous, and several land-birds seen. The anxiety to make this coast, so many years bound in chains of ice, was truly great; but, to the mortification of every one, the thick fog, which for several days had enveloped the ships, continued: a gale, at the same time, came on, which obliged the ships, in their shattered condition, to bear up for England, and relinquish every further attempt to penetrate the barrier, with which they had so long contended.

The preceding account was, as we are informed, drawn up by the pen of Lieut. Beechey, of the Royal Navy, the son of that Sir William Beechey, whose admired talents have imparted honour to his country. It was originally printed as an explanation of the Panorama of Mr. Henry Aston Barker, exhibited in London, 1819, 1820; one of the most beautiful and impressive pictures of the face of nature ever seen, and which was composed from drawings taken, and liberally communicated, by Lieut. Beechey. The picture comprehends Gray Hook, Red Beach, Red Hill, Red Bay, the two islands called the Norways, Cloven Cliff, and Vogel-Sang. The RED HILL, so called from the colour of its soil, appears to be the extreme point reached by most voyagers. Captain Phipps, as already shown, after three attempts, succeeded in passing it. It was off this land that the Dorothea and Trent were *beset* in the ice for thirteen days.

On the S.W. side of Red Bay, are three magnificent icebergs; which, though inferior to one in the South-Gat, are worthy of admiration, being upwards of a mile in length, and 200 feet in height.

On the northern extremity of one of the islands, called the Norways, are 243 graves, with Dutch inscriptions; and near them are the ruins of places formerly used for boiling oil in.

CLOVEN CLIFF.—This remarkable promontory, so called by the earliest

* We have already expressed our belief that the true variation is less than $24^{\circ} 30'$. See Note on the Variation, page 34. ED.

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voyagers, from its cloven appearance, is the north-western extremity of Spitzbergen, and is that point of land to which the barrier of ice is usually connected. (*See View in the Chart.*)

VOGEL-SANG.—This island is, comparatively to the rest, luxuriant, being covered with a variety of lichens, affording nourishment to numerous reindeer. These elegant animals were found in very fine condition; the fat on their loins being seven inches in thickness. Over this part, a storm appeared to be rising, which the vessels encountered on the following day.

The **BARRIER OF ICE**, supposed to extend from Spitzbergen to Greenland, was distinguished by a yellow tint above it, extending to Gray Hook; being the phenomenon already described under the name of Ice-blink.

The birds and other animals seen were as follow :

1. *Larus Glaucus*, the elegant bird, by the Dutch called Burgermeister, which has been already noticed, as the master of all other sea-fowl within the Arctic Regions; it builds its nest in high cliffs, and preys on cetaceous fish and small birds. They seldom stray far from the land or ice, are almost continually on the wing, and are not often seen to associate with each other.

2. *Larus Arcticus*, the Boatswain, or Arctic Gull.—This bird feeds on fish that have been caught by other birds, whom it persecutes until they are obliged to drop their prey, which it catches with great dexterity before it reaches the water: they also display a good deal of cunning in watching the flight of the ducks from their nests, when they instantly occupy them, and devour the eggs.

3. *Alca Allé*, (Rotges, or Little Auk.)—These little birds are seen in such myriads in the Arctic Seas, as to baffle all description: they make a continual chirruping noise, which, from their numbers, may be heard for several miles. They are so stupid, and easily frightened, that they frequently fly to the danger they wish to avoid, and thus become an easy prey to the seals, and other animals inhabiting these regions.

4. *Alca Arctica*, the Puffin.—Described by Mr. Pennant, in his 'Arctic Zoology,' vol. ii. p. 511.

5. *Larus Eburneus*, or Ivory Gull.—This very beautiful bird, seldom seen far from the ice, is of the purest white, the primaries being slightly tinged with a delicate pink, the eye large, jet-black, and sparkling, fringed with a crimson lid.

6. *Sterna Hirundo*, or Common Tern.—This graceful little bird surpasses, in plumage, every other species of the feathered tribe found within the Arctic Regions. Nature has provided them with such sharp bills, and they are so remarkably active, that they fearlessly dart upon birds of much larger size, and, without ceremony, rob them of any food they may have collected, and may thus be said to tyrannize and lord it over every other kind of bird excepting the burgermeister. They have even courage enough to attack the human species, if their nests are molested by them.

7. Seals sporting on the ice (*Phoca*).—These amphibious animals are so well known, as to render any description unnecessary. We have read that, in 1817, a gentleman, in the neighbourhood of Burntisland, on the Frith of Forth, had completely succeeded in taming one of these animals. It appeared to possess all the sagacity of the dog, living in its master's house, and eating from his hand. He usually took it with him in his fishing excursions, upon which occasion it afforded no small entertainment. When thrown into the water, it would follow, for miles, the track of the boat; and, although thrust back by the

the oars, it never relinquished its purpose. Indeed, it struggled so hard to regain its seat, that it seemed as if its fondness for its master had entirely overcome the natural predilection for its native element.

8. Eider Ducks and Drakes (*Anas Mollissima*).—These birds are extremely numerous in the bays of Spitzbergen, to which place they migrate to breed. They are celebrated for their very luxurious down, which forms an extensive article of commerce in many parts of Europe.

9. Fulmar Petrel (*Procellaria Glacialis*).—This bird abounds every where within the Arctic circle; and has often been seen in the southern hemisphere by Cook, Flinders, and others. They keep chiefly on the high seas, feeding on dead whales, or whatever offers on the surface; but will, with their strong bills, pick the fat out of the backs of the living whales, especially of the wounded, whose bloody track they follow by hundreds, to watch its rising. See Penn. Arc. Zoo. vol. 2, p. 534.

10. *Colymbus Grillé*, Greenland Dove, a species of Diver.—Described by Mr. Pennant, in his 'Arctic Zoology,' vol. 2, p. 516.

11. Polar Bears, (*Ursus Maritimus*), already noticed. These animals have been known to grow to the enormous length of fourteen feet; and are found almost every where within the Arctic circle. They retire, during winter, to their icy dens, where they are supposed to live in a torpid state until the sun appears above the horizon, when they stalk forth, and devour every thing they meet with. The rein-deer, Arctic fox, and the different kinds of birds, at first supply them with food; but, this proving insufficient to satisfy their voracious appetites, they resort to the ice, and glut themselves on seals, young walruses, and the carcasses of dead whales. Nature has gifted them with an extraordinary power of scent. A piece of morse's fat, set on fire on board the ships on the late voyage, was sure of attracting some towards them. They are easily frightened; but, when attacked or wounded, become excessively fierce. In the voyage of Barentz, he tells us of some of his seamen being carried off and devoured by them. Their pace seldom exceeds that of a walk or trot; they go alike over hills or through valleys of ice, nor do they ever stop for pools of water, but plunge in and swim across them, when they proceed as before.

12. *Colymbus Troillé*, Foolish Guillemot, or Loon, a species of Diver.—Described by Mr. Pennant, in his 'Arctic Zoology,' vol. 2, p. 516.

13. Groups of Walruses, or Sea-Horses, described in pages 92, 93.—These hideous animals have been known to attain the length of eighteen feet, and girth twelve or thirteen; the head is small, and so connected to the neck, as to appear a continuation of the latter; the eyes are small, and sunk into the head; their lips fat, and beset with long bristles; the skin, which is about an inch thick, hangs in folds or wrinkles, particularly about the neck, and is covered with a short bristly hair, of a dirty yellow or greenish tint; their legs are short, and feet like those of the seal. These monsters are very numerous about Spitzbergen, and are generally seen collected in groups, on pieces of floating ice, where they lie huddled together, bellowing, or rather grunting like swine; some rolling, and others scratching themselves, sometimes the whole group fall asleep, with the exception of one, who is set on the watch; he, however, frequently doses, and at such times may be easily approached, and killed with a bayonet or lance. The mothers invariably provide for the safety of their young in preference to their own, by plunging it into the sea, even though they should be badly wounded. A striking instance of

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of affection was also manifested by a young one towards its mother, who, on seeing its parent killed by the crew, was so exasperated, that the little monster singly attacked the boat; and, though repeatedly wounded, would not desist, but crawled upon the ice after the men, until a lance, entering its heart, terminated its existence.*

VII. *The FÆROERNE, commonly called the FÆROE ISLANDS.*

The FÆROERNE, or FÆR ISLES, commonly called the Faroe Islands, consist, throughout, of rocks and hills, rising to a considerable height, and separated from each other by narrow valleys, or rather ravines. Although, however, these hills rise abruptly, there are often on their summits, or at different stages of their ascent, plains of considerable magnitude. They every where present to the sea perpendicular cliffs, broken into a thousand fantastic forms, and which, to those who sail along the coast, present, at every turn, the most picturesque and varied scenery. The highest peak is that of Skellingfell, in the island called Stromoe, which is supposed to rise to about 3000 feet above the sea. The rocks consist, generally, of trap, and exhibit little variety of composition, though they present some striking geological phenomena. Zeolites and chalcedonies, here collected, have long supplied the best specimens of these minerals to the cabinets of Europe. Mr. Allan (the mineralogist) was surprised to find these beautiful minerals so little prized in their native region, that no one in the capital could give him any idea where they were to be found. By his own search, however, he obtained some very splendid specimens, particularly of several rare species of zeolite.

The population of these islands, according to a statistical table, drawn up in 1812, amounted to 5209. Agriculture is in a very imperfect state; the infield, or cultivated land, being supposed to bear to the outfield, or uncultivated, the proportion of one to sixty. The plough is scarcely ever used, being, in fact, ill-suited to the rugged and uneven surface of which all the islands consist. The ground is, therefore, turned up with the spade, care being taken not to destroy the roots of the grass. Horses and cows are few in number, and the latter give very little milk, in consequence, probably, of the coarse hay upon which they are fed.

Sheep constitute the chief riches of the islanders, and the number possessed by them was calculated, in 1812, at 35,307. Some individuals have flocks of 200 or 300. These sheep are allowed to run about, both in summer and winter, without ever being housed; and, in severe seasons, suffer considerably. The wool is generally coarse, and is torn off the animals in so rough a manner, as often to lacerate the skin.

The fishery, which was once considerable, has been neglected, and is now of little consequence. The catching of the numerous birds, which build their nests upon the face of the cliffs, forms a great source of subsistence to the inhabitants. Those employed in this hazardous trade display great ingenuity and the most adventurous spirit. Sometimes the fowler, as at Shetland, &c. is let down from the top of the cliff by a rope fastened to his waist. At other times, where there is any footing at all, he climbs the steepest rocks; or, where that

* A more complete description of the animals and birds of the Arctic regions is contained in the Voyage of Mr. Laing, already noticed in page 70. See, also, on this subject, the Appendix to Mr. Fisher's Journal of the late Expedition to Baffin's Bay, the Voyage of Captain Ross, &c.

is impossible, has himself thrust up by poles made for the purpose. The puffin (*Alca Arctica*) is the most common of these birds, and the eider duck is here often shot for food.

The Danish Government has given the monopoly of the trade of these islands to a mercantile house at Copenhagen, (*Frische and Co.*) under the condition of supplying the inhabitants with a sufficient quantity of grain, at a constant fixed price. Should the market-price be such as to render this a losing transaction, the merchant is indemnified by government. This care of provisioning the islands is, probably, superfluous; and the natural bad effects of a monopoly are felt in the high price of other imported articles; a good jacket being often given for a few leaves of tobacco. The exports consist of hose, knit on the islands, to the annual amount of one hundred thousand pairs, tallow, fish, train-oil, feathers, skins, and butter.

In 1808, during the late war between Britain and Denmark, the fort of THORSHAVN was destroyed by Captain Baugh, lest it should afford harbour to privateers. A German adventurer, Baron Hompesch, commander of a privateer, under English colours, afterwards landed and plundered the place; but his conduct was handsomely disavowed by the British government, who even restored the value of the property of which the natives had been robbed. Finding, also, that the people, having lost their communication with Denmark, were in danger of suffering from famine, she permitted a limited intercourse to be carried on, under license, from Leith. The peace has since restored all things to their usual channel.

THORSHAVN, the principal village in the country, contains about 520 inhabitants. It is situate on the eastern coast of the island called Strom-oe, upon a narrow tongue of land, having creeks on each side, where ships may be safely moored. The houses are built of wood, and roofed with birch-bark, covered with turf, the greenness of which makes it impossible, at a very short distance, to distinguish the place from the surrounding fields.

The character of the people is generally marked by great simplicity of manners, kindness, and hospitality.—(*Encycl. Brit. Suppl.* 1820.)

We have already noticed (page 50) the effects of the powerful winds, which, at times, prevail about these islands. Mr. Pennant says that, the intervening currents are deep and rapid, and the sea around them turbulent. The whirlpool off the south end of Suder-oe is occasioned by a crater, 61 fathoms deep in the centre, and from 50 to 55 on the sides. The water forms four fierce circumgyrations. The point they begin at is on the side of a large basin, where commences a range of rocks running spirally, and terminating at the verge of the crater. This range is extremely rugged, and covered with water from the depth of 12 to 8 fathoms only. It forms four equi-distant wreaths, with a channel from 35 to 20 fathoms in depth between each. On the outside, beyond that depth, the sea suddenly sinks to 80 and 90. On the south border of the basin is the lofty rock called the Munken or Monk Rock, situated as shown in the Table, page 11, and noted for the number of birds which frequent it. On one side the water is only 3 or 4 fathoms deep; on the other, 15. The danger, at most times, especially in storms, is very great. Ships are irresistibly drawn in: the rudder loses its power, and the waves beat as high as the masts, so that an escape is almost miraculous; yet, at the reflux, and in very still weather, the inhabitants will venture in boats, for the sake of fishing.

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VIII. DESCRIPTION OF ICELAND.

THE determined positions of different points of this island, which is truly a land of wonders, have been given in page 27, with an explanatory note in page 33. For the following Descriptions, &c. we are indebted, chiefly, to Dr. Henderson's valuable Book, entitled "Iceland; or the Journal of a Residence in that Island, during the years 1814 and 1815," and to the preceding "Travels in Iceland" of Sir George Steuart Mackenzie, in 1810.

Though Iceland occupies a more southerly latitude, and presents a much greater extent of vegetation than the continent to the north and west, it has, nevertheless, been unfortunately doomed to bear a repulsive name, while the other has been favoured with a more pleasing and animating one. The imposition of these names was wholly arbitrary, according to the accidental circumstances of the individuals with whom they originated. The consequence has been that, the generality of those who inhabit more genial climates, have viewed Iceland as equally inhospitable with the most rigid of the Polar regions, and considered the natives as exposed to all the benumbing influence of relentless frosts, and perpetually immersed in ice and snow. This, however, is far from being the case. The climate is, perhaps, more unsettled, but it is very seldom that the cold is more intense, than in the south of Scandinavia. Dr. Henderson says, "At first, I confess, I shuddered at the idea of spending a winter in Iceland; but what was my surprise when I found the temperature of the atmosphere not only greater than that of the preceding winter in Denmark, but equal to that of the mildest I have lived in, either in Denmark or in Sweden!

"In the month of November, the mercury in Fahrenheit's thermometer did not sink lower than 20° , and it was nearly as often above the freezing point as below it. On the 6th of December, with clear weather, and a light breeze from the E.N.E., it sunk to $8^{\circ} 30'$, after which, especially towards the end of the year, the weather became remarkably mild, and continued in this state till near the middle of January; the thermometer, for the most part, between 34° and 40° . On the 10th and 11th of January it fell as low as $15^{\circ} 30'$, but rose again in a short time, and continued much more frequently above than below the point of congelation till the 7th of March, when we had a strong wind from the N.N.W., and the mercury, which had stood in the preceding day at between 30° and 34° , sunk in the morning to $9^{\circ} 30'$, at noon to 8° , and at nine o'clock, in the evening, it fell as low as $4^{\circ} 30'$, which was the strongest degree of frost we had the whole winter. The following evening it was at 6° ; on the 9th, it rose to 10° ; on the 10th, to 19° ; and so on till the 13th, when it rose again to 32° , and continued for the most part above it the whole of the month. On the 12th of April it fell to 19° , but otherwise kept varying between 32° and 52° . About the middle of May the atmosphere grew colder, occasioned, most probably, by the approach of some masses of Greenland ice; and, on the 18th, and several of the following days, the mercury was at 29° .

"The quantity of snow that fell during the winter was very considerable, especially in the northern parts of the island, where many of the peasants were reduced to circumstances of great distress, by the total consumption of the fodder they had provided for their cattle. The atmosphere was, on the whole, rather clear and serene, than darkened by mists, which is, in a great measure, to be ascribed to the prevalence of brisk land-winds, to which the mountainous nature of the country is extremely favourable.

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"It must, at the same time, be allowed that, the winter of 1814, as well as that which immediately preceded it, was considered by the Icelanders as uncommonly mild. In the course of the last century, the winters of 1717, 1742, 1784, and 1792, were excessively severe; and the salt-water itself was frozen to such an extent, that a communication was kept up for some time on the ice between the coasts on some of the principal bays, as also between the different islands in the *Breede Fiord*. The keenest frost ever experienced in Iceland was in the year 1348, when the ocean was congealed all around the island, so as to admit of the inhabitants riding on horseback, from the one promontory to the other, on the ice.

"Nothing so materially affects the climate of Iceland as the arrival of the floating ice from the opposite coast of Greenland. Generally towards the end of winter, and sometimes in the beginning of summer, it is seen moving towards the coast in immense masses, which are not unfrequently piled one above another, and more resemble islands with mountains, castles, and spires, than bodies of ice. They are so thick, that they have been known to run aground in eighty fathoms of water. Their motion is not so much accelerated by the wind as by the current; but their rapidity, when impelled by these two causes, conjointly, is so great, that no six-oared boat is able to keep up with them. When the sea is agitated by a storm, the ice-islands are dashed against each other in the most tremendous manner; the noise arising from the crash is heard at a great distance; and, as often happens, the drift-timber, jammed in between the masses, takes fire from the friction, presenting to the eye of the spectator a scene the most incongruous that can possibly be imagined. The quantity of floating ice is commonly so great, that it not only chokes up all the friths and bays, but extends to such a distance in the ocean, that its termination cannot be discovered from the summit of the highest mountain; and, in the year 1766, the whole of the vast strait, between Iceland and Greenland is said to have been entirely closed up with it. It principally infests the northern and part of the eastern coast, as likewise the western friths, but it is seldom that it surrounds the whole island.

"While the masses of ice remain in a state of fluctuation, sometimes at a distance, and sometimes nearer the coast, the weather is very unsettled, and the winds are cold and damp; but, when they are driven into the bays, and the salt-water freezes around them, the weather becomes more steady; the cold increases, and insalubrious fogs are carried over the whole island. The consequences are, that the winter snows are longer in melting; it is late before the frost leaves the ground; vegetation is more backward and scanty; and the summer is so short, that the peasants have great difficulty in getting home the small quantity of hay that may have been produced. Add to this, the devastations committed by the Greenland bears, which sometimes arrive in considerable numbers on the ice.* Fortunately for the natives, they have now

* It frequently happens that the natives of Iceland are pursued by the Polar bear, when he has been long at sea, and his natural ferocity has been strengthened by the keenness of hunger; yet, though unarmed, they generally make their escape. Observing him approach them, they simply throw down a mitten into the path, and the bear, on coming up to it, is so powerfully attracted by the operation of the smell of the perspiration on his olfactory nerves, that he instantly stops, and it is not till after he has turned the thumb and every finger inside out, that he recommences the pursuit. By this time the Icelanders have gained a considerable distance; and should he again threaten to overtake them, they have a fresh *corps de reserve*, and, by dropping one mitten after another, they may succeed in retarding his progress till they have effected their escape.

So soon as it is known that a bear has arrived on the island, the inhabitants of the district collect, and go with fire-arms in pursuit of him; and the individual who kills him is not only well paid for the skin, which is reckoned very valuable, but receives, besides, a considerable reward from the King of Denmark. (*Dr. Henderson.*)

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been three winters exempt from any quantity of drift ice, though many of them begin to be apprehensive lest this period of respite should be more than counterbalanced by the severity of the ensuing season.*

"The most striking aerial phenomenon, exhibited by an Icelandic winter, is doubtless the Aurora Borealis, or northern lights, which are here seen in all their brilliancy and grandeur. I had an opportunity of contemplating them almost every clear night in the whole winter, sometimes shooting across the hemisphere in a strait line, and presenting to the view, for a whole evening, one vast steady stream of light; but, more commonly, they kept running and dancing about, with amazing velocity, and a tremendous motion, exhibiting, as they advanced, some of the most beautiful curved appearances. On gaining one point of the hemisphere, they generally collected as if to muster their forces, and then began again to branch out into numerous ranks, which struck off to the greatest distances from each other as they passed the zenith, yet so as always to preserve the whole of the phenomenon in an oval shape; when they contracted nearly in the same way as they expanded; and, after uniting in a common point, they either returned in the course of a few minutes, or were lost in a stream of light, which grew fainter and fainter, the nearer it approached the opposite side of the heavens. They were mostly of a dunnish yellow, yet often assuming mixtures of red and green. When they are particularly quick and vivid, a crackling noise is heard, resembling that which accompanies the escape of the sparks from an electric machine. They almost always took their rise from the summit of *Mount Esian*, which is to the north-eastward of REIKIAVIIG or REYKIAVIK, and proceed in a south-west direction. When visible through the whole length of the hemisphere, they were uniformly strongest towards the North and N.E., and were always sure to be seen in that quarter, when they appeared no where else. Once or twice I observed them in the south, but they were very faint and stationary.

"In the days of superstition, these celestial wonders were viewed as portending certain destruction to nations and armies, and filled the minds even of the more enlightened with terror and dismay. At the present day, the Icelanders are entirely free from such silly apprehensions, and regards their uncommonly vivid appearance, as only predicting a hurricane or storm; an observation founded on experience, and which I frequently brought to the test, when it invariably turned out, that, in less than twenty-four hours after the northern lights were in great commotion, we had either sudden squalls, or a heavy gale of wind from the north."

Strictly speaking, there are only two seasons in Iceland, summer and winter, the former of which, short and precarious as it is, the natives must employ with assiduity, in order to make provision for the latter. From the 3d of February to the 12th of May, is what the Icelanders call the *ver-tima*, or fishing-season, at which period vast numbers of the inhabitants flock to the southern and western shores from the districts in the North and East, where the fishing is generally impracticable at this time, owing to the bays and creeks being filled with Polar ice. They provide themselves with a complete skin-dress, consisting of the *brok*, in the shape of small-clothes and stockings, all in one piece; the *stack*, or large jacket, which falls down, and is tied close over the *brok*, so

* I have since been informed that, a vast quantity of Greenland ice has been floated into the bays about Iceland in the spring of 1816, and a still greater quantity in 1817, which must have arisen from the breaking up of the immense barrier of ice by which the east coast of Greenland has been surrounded for the last four centuries. However, if this enormous mass should entirely have disappeared, there is every reason to anticipate a very considerable amelioration in the climate of Iceland. (*Dr. Henderson.*)

as to prevent the water from getting in between them; and tight-sitting shoes of the same material, below which are worn coarse woollen stockings, for greater warmth. The most of them live, almost entirely, during this period, on butter and fish. They breakfast about two hours before sun-rise, and taste nothing till they return from sea in the evening, excepting sometimes a little whey, which they take with them for the purpose of quenching their thirst. The boats are generally manned with six or eight hands, besides the steersman, and row sometimes to a great distance out to sea.

When they return from fishing, and land on the beach, the boat is hauled up, and the fish are thrown out, and heaped together in separate parcels, according to the number of men in the boat, with two additional shares, which belong to the boat, and are claimed by the owner for the use of it, and the fishing-lines and hooks, which are provided at his expense. The fishermen, being fatigued, repair immediately to their huts, and the splitting and carrying home of their fish is commonly left to the women and children.

The principal fish they catch in this way is the cod, which they spread out on the cliffs to dry, and, from this circumstance, it obtains the name of *kilp-fish*. They cut off the heads, which they also dry, and sell to the poorer part of the population; the bones are sometimes used for feeding their cattle with; and, in some parts of the island, they use them for fuel. When thus prepared, the fish are laid out on the cliffs on a large surface of flat stones on the beach, and there dried in the sun, while the utmost care is taken that they are not exposed to rain or damp. They dry in the course of three weeks, and afterwards are stacked upon the beach, and take no damage whatever from the rain.

Sometimes the fish are hung up and dried in houses called *hiallar*, which are so constructed, that the wind has a free passage through them, while they are sufficiently covered to keep out the rain. The fish dried in this way are called *hengi fiskar*, or hung fish, in distinction from the *flat fiskar*, dried on the rocks.

Besides supplying the natives with one of their most essential articles of food, they are thus provided by the sea with a valuable barter against foreign productions which they may need; and the Danish merchants not only supply, in a great measure, the North of Europe with dried cod-fish, but send cargoes of them to Spain, and the markets in the Mediterranean, where they are purchased for the use of the Catholics during Lent.

Rein-deer abound on the island; but they are not used for travelling or drawing sledges, as in Lapland.

The opinion that Iceland owes its formation to the operations of submarine volcanoes, is not only confirmed by analogical reasonings, deduced from the appearances presented by other islands, which are confessedly of volcanic origin, but increases with the progress of closer and more accurate investigation. In no quarter of the globe do we find, crowded within the same extent of surface, such a number of ignivomous mountains, so many boiling springs, or such immense tracts of lava, as here arrest the attention of the traveller. The general aspect of the country is the most rugged and dreary imaginable. On every side appear marks of confusion and devastation, or the tremendous sources of these evils, in the yawning craters of huge and menacing volcanoes. Nor is the mind of a spectator relieved from the disagreeable emotions arising from reflection on the subterraneous fires which are raging beneath him, by a temporary survey of the huge mountains of perpetual ice by which he is surrounded. These very masses, which naturally exclude the most distant idea of heat,

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heat, contain, in their bosom, the fuel of conflagration, and are frequently seen to emit smoke and flames, and pour down upon the plains immense floods of boiling mud and water, or red-hot torrents of devouring lava. Tracts of lava traverse the island in almost every direction.

The principal YÖKULS, or ice-mountains, and VOLCANOES, have been enumerated by Dr. Henderson: of these there are thirty, besides a great number of smaller cones and craters, from which streams of melted substances have been poured forth over the surrounding regions. Nine volcanoes have been active in the course of the last century; four of which are situate in the N.E. quarter of the island; the rest lie nearly in a direct line along the southern coast.

In a portion of the S.W. of Iceland are extensive tracts of melted rock, where scarcely any thing appears but one universal scene of desolation, and rents of upwards of a hundred feet in width are seen to stretch to the length of several miles. The divisions of Grimsness, Olfus, and Mossfell, exhibit greater or less quantities of lava throughout the whole of their surface; and between Reykiavik and Reykianæs are not fewer than six different streams, some of which appear to have been more than once in a state of fusion. In many parts of these lavas, the heat is still so great, that, in winter, when the vapour is prevented by the snow from making its escape from the general surface of the ground, it is impossible to enter any of the caverns, on account of the sulphureous smell which they emit. The FAXE FIORD abounds with lava (*hraun*); and the fishermen frequently find beds of it alternating with sand-banks, at various depths, from 8 to 40 fathoms. The islets off Reykianæs, called the ELLD-EYAR, consist entirely of submarine lava; and from these islets a number of dangerous rocks stretch, in a south-west direction, to the distance of many miles, which have been thrown up from time to time, from the bottom of the sea.

The lavas about MOUNT HEKLA, in the south, are well known; and the whole plain, between that volcano and the sea, is filled with the same substance, to within a few feet of the surface of the ground. The VESTMANNA ISLANDS are also of volcanic origin.

Besides the common lavas, Iceland abounds in other mineral masses, which sufficiently indicate their igneous origin. Of these, the more plentiful are, tuffa and submarine lava. Whole mountains of the former are found in every part of the island. The Obsidian, or Icelandic agate, which is nothing but black vitreous lava, abounds in many districts, especially near Myvatn, in the N. E., where there is a mountain, which takes its name from it.

Another proof of the universality of volcanic agency, and of the continued existence of subterraneous fires in Iceland, is the multiplicity of hot springs with which it abounds. Many of these springs throw up large columns of boiling water, accompanied by immense volumes of steam, to an almost incredible height into the atmosphere, and present to the eye of the traveller some of the grandest scenes to be met with on the face of the globe. The principal are the GEYSERS; the Reykiium springs in the district of Olfus, and the sulphur-springs of Krisuvik in the South; those of Reykiadal in the West; Hveravellir in the interior; and those of Reykiahverf and Krabla in the North.

Celebrated as this island has been for its volcanoes and hot springs, it is scarcely less remarkable on account of the enormous ice-mountains, which occupy a vast portion of its surface. To these mountains the natives give the name of Yökuls, which signify large masses of ice. They have generally terreous and rocky mountains for their bases; and, in many places, exhibit magnificent

nificent glaciers, which commence at a great height, and run down with a very rapid descent into the plains. The most extensive of all the Icelandic Yökuls is that called Klofa Yökul, in the eastern quarter of the island. It lies behind the Yökuls and other mountains, which line the south-east coast, and forms, with little or no interruption, a vast chain of ice and snow mountains, which are supposed to fill a space of not less than three thousand square miles. The rest of the ice-mountains in that division, all of which appear to be connected with Klofa Yökul, are distinguished by the names of Hof, Lon, Hofsfell, Svinafell, Myrar, Heinaberg, Kálfafell, Breidamark, Oræfa, Skeiderá, Skaptár, Kötlugjá, Myrdal, and Solheima, Yökuls. Of these, the last four, and the Oræfa, are volcanic Yökuls. Though covered with coats of ice, of an immense thickness, when the internal parts of the mountains become ignited, the mass of ice, or indurated snow, is cracked and rent by the explosion which ensues; a great quantity of it is melted by the flames, or the exudations of hot water; and the whole fields of ice are sometimes deposited on the neighbouring plains. Some of these Yökuls are remarkable for their vacillation; not remaining in a settled position, but moving forwards, and receding again at certain indefinite periods. In the southern division of the island lie the Eyafialla, Torfa, and Tindafialla Yökuls; to the west of the Hvitárvtu stretches the chain known by the name of Bald, Blaféll, Geitland, and Eirik Yökuls; Snæfell, Gláma, and Dránga, rise into view in the west; and in the north lies the Hof, or Harnarfell Yökul, the only considerable mountain of this description in that quarter of the island.

Numerous ridges of rugged and irregular mountains stretch across the interior; and, from these, other inferior mountains branch out towards the coasts, and, in many instances, terminate in high and steep promontories. Between these ridges, in the vicinity of the coasts, are rich and beautiful valleys, in which the inhabitants have erected their dwellings; and many of the low mountains are covered with coarse grass, which affords summer pasturage for the cattle. The most extensive tract of low country is that between the districts of Myrdal and Oræfa, where the traveller pursues his journey, for the period of four days, without seeing any thing like a mountain in the immediate vicinity. The whole of the interior, as far as it has been explored, consists of a vast inhospitable desert, transversed in various directions by barren mountains, between which are immense tracts of lava and volcanic sand, with here and there a small spot, scantily covered with vegetation.

It is evident, from antient Icelandic documents, that, on the arrival of the Norwegians, and for several centuries afterwards, extensive forests existed in different parts of the island, and furnished the inhabitants with wood both for domestic and nautical purposes. Owing, however, to their improvident treatment of them, and the increased severity of the climate, they have almost entirely disappeared; and what remains, scarcely deserves any other name than that of underwood; consisting, for the most part, of birch, willow, and mountain-ash; but this want of indigenous wood is, in some measure, supplied by the quantities of floating timber which are drifted upon the coast.

The island contains several large lakes, and numerous rivers of great magnitude, many of which supply the inhabitants with abundance of fresh-water fish.

On proceeding along the southern coast of Iceland, MOUNT HEKLA, with its three peaks, or summits, presents itself to the view. Its height is five thousand feet, or nearly an English mile above the level of the sea. It stands at about sixteen miles inland from the nearest coast; is neither so elevated nor

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so picturesque as several of the surrounding Icelandic mountains ; but has been more noticed than many other volcanoes of an equal extent, partly through the frequency of its eruptions, and partly from its situation, which exposes it to the view of many ships sailing to Greenland and Baffin's Bay. The surrounding territory has been so devastated by these eruptions, that it has been deserted.

To the south and west, the environs present the most afflicting results of frequent eruptions, the finest part of the territory being covered by torrents of melted stone, sand, ashes, and other volcanic matter ; notwithstanding which, between the sinuosities of the lava in different parts, some portion of meadows, walls, and broken hedges, may be observed. The devastation is still greater on the north and east sides, which present dreadful traces of the ruin of the country and its inhabitants. Neither plants nor grass are to be met with to the extent of two leagues round the mountain, in consequence of the soil being covered with stones and lava ; and, in some parts, where the subterraneous fire has broken out a second time, or where the matter which was not entirely consumed has again become ignited, the fire has contributed to form small red and black hillocks and eminences, from scoriæ, pumice-stones, and ashes. The nearer the mountain the larger are these hillocks, and there are some of them, the summits of which form a circular hollow, whence the subterraneous fire ejects the matter. On approaching Hekla, the ground becomes almost impassable, particularly near the higher branches of lava thrown from the volcano. Round the latter is a mountain of lava, consisting of large fused stones, from forty to seventy feet high, and in the form of a rampart or wall. These stones are detached, and chiefly covered with moss ; while between them are very deep holes, so that the ascent on the western side requires great circumspection. The rocks are completely reduced to pumice, dispersed in thin horizontal layers, and fractured in every direction, from which some idea may be formed of the intensity of the fire that has acted on them.

Sir Joseph Banks, Dr. Solander, Dr. James Lind, of Edinburg, and Dr. Van Troil, a Swede, were the earliest adventurous travellers who ascended to the summit of Mount Hekla. This was in 1772, and the attempt was facilitated by a preceding eruption in 1766, which had greatly diminished the steepness and difficulty of the ascent. On their first landing, they found a tract of land sixty or seventy miles in extent, entirely ruined by lava, which appeared to have been in a state of complete liquefaction. To accomplish their undertaking, they had to travel from three hundred to three hundred and sixty miles over uninterrupted tracts of lava. In ascending, they were obliged to quit their horses at the first opening from which the fire had burst ;—a spot, which they describe as presenting lofty glazed walls, and high glazed cliffs, differing from any thing they had ever seen before. At another opening above, they fancied they discerned the effects of boiling water ; and, not far from thence, the mountain, with the exception of some bare spots, was covered with snow. This difference of aspect they soon perceived to be occasioned by the hot vapour ascending from the mountain. The higher they proceeded, the larger these spots became ; and, about two hundred yards below the summit, a hole, about a yard and a half in diameter, was observed, whence issued so hot a stream, that they could not measure the degree of heat with a thermometer. The cold now began to be very intense. Fahrenheit's thermometer, which at the foot of the mountain was at 54°, fell to 24° ; while the wind became so violent, that they were sometimes obliged to lie down, from a dread of being blown into the most dreadful precipices. On the summit itself they experienced, at one and the same time, a high degree of heat and cold ; for, in the air, Fahrenheit's

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thermometer constantly stood at 24°, but when placed on the ground it rose to 153°.

Messrs. Olafsen and Povelsen, two naturalists, whose travels in Iceland were undertaken by order of his Danish Majesty, after a fatiguing journey up several small slopes, which occurred at intervals, and seven of which they had to pass, at length reached the summit of Mount Hekla at midnight. It was as light as at noon day, so that they had a view of an immense extent, but could perceive nothing but ice: neither fissures, streams of water, boiling springs, smoke, nor fire, were apparent. They surveyed the glaciers in the eastern part, and in the distance saw the high and square mountain of Hærdabreid, an antient volcano, which appeared like a large castle.

Sir G. S. Mackenzie, in his late travels in Iceland, ascended Mount Hekla; and, from his account, we extract the following interesting particulars. "In proceeding to the southern extremity of the mountain, he descended, by a dangerous path, into a valley, having a small lake in one corner; and the opposite extremity bounded by a perpendicular face of rock, resembling, in its broken and rugged appearance, a stream of lava. While advancing, the sun suddenly broke through the clouds, and the brilliant reflection of his beams, from different parts of this supposed lava, as if from a surface of glass, delighted our traveller by the instantaneous conviction that he had now attained one of the principal objects connected with the plan of his expedition to Iceland. He hastened to the spot, and all his wishes were fully accomplished in the examination of an object, which greatly exceeded the expectations he had formed. On ascending one of the abrupt pinnacles, which rose out of this extraordinary mass of rock, he beheld a region, the desolation of which can scarcely be paralleled. Fantastic groups of hills, craters, and lava, leading the eye to distant snow-crowned *yökuls*, the mist rising from a water-fall; lakes, embosomed among bare bleak mountains; an awful profound silence; lowering clouds; marks all around of the furious action of the most destructive of elements; all combined to impress the soul with sensations of dread and wonder. The longer himself and his companions contemplated this scene, the more unable they were to turn their eyes from it, and a considerable time elapsed before they could bring themselves to attend to the business which had tempted them to enter so frightful a district of the country.

"Having proceeded a considerable distance along the edge of a stream of lava, a narrow part of which they crossed, they gained the foot of the south end of Mount Hekla. While, in ascending, they had to pass over rugged lava, they experienced no great difficulty in advancing; but, when they reached the steepest part of the mountain, which was covered with loose slags, they sometimes lost at one step, by the yielding of these, a space which had been gained by several.

"Having passed a number of fissures, by leaping across some, and stepping along masses of slags, which lay over others, they at length reached the summit of the first peak. The clouds now became so thick, that they began to despair of being able to proceed any farther; it was, indeed, dangerous even to move; for the peak consists of a very narrow ridge of slags, not more than two feet broad, having a precipice on each side, several hundred feet in depth. One of these precipices forms the side of a vast hollow, which seems to have been one of the craters. At length the sky cleared a little, and enabled them to discover a ridge below, which seemed to connect the peak they had ascended, with the middle or principal one. They lost no time in availing themselves of this opportunity, and, by balancing themselves like rope-dancers, succeeded in

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passing along a ridge of slags, so narrow, that there was scarcely room for their feet. After a short, but very steep, ascent, they gained the highest part of this celebrated mountain.

"Its earliest eruption is said to have happened in 1004, since which time upwards of twenty have occurred. That of 1693 was the most dreadful, and occasioned terrible devastation, the ashes having been thrown over the island in every direction, to the distance of more than one hundred miles. In 1728, a fire broke out among the surrounding lava, and also in that to the west of the volcano, in 1754, which lasted for three days. There has not been any eruption of lava since 1766, but for some years after flames issued from the volcano."

Dr. Henderson, in describing his passage along the south coast, and towards Reikiavik, says, "The first view we obtained of *Iceland* was on the evening of the 12th of July. At the distance of 40 miles, we could discover some of the ice-mountains, towering to an immense height in the horizon, surrounded below with clouds, and completely covered with snow. From about the middle of the highest, a black rugged ridge commenced, which continued to dip gradually towards the west, till it was intercepted by two small conical snow-capped mountains, that bore the most perfect resemblance to sugar-loaves. When the tediousness of the voyage is taken into consideration, an allowance will easily be made for my attaching the idea of beauty to these masses of perennial snow, notwithstanding the revolting presentiment of cold, which necessarily forced itself into my mind. The weather becoming foggy, we lost sight of the land for the two following days; but, on the morning of the 15th, we descried a high land directly a-head, and, on its clearing up about nine o'clock, we were happy to find that we had made the south-west extremity of the island, or *Reykianess*, which it was necessary for us to pass, before we could reach *Reykiavik*, the place of our destination. On the left we had the *Elld-eyar*, or Fire Islands; so called from their having been thrown up at different periods by the agency of sub-marine volcanoes. They consist entirely of barren and precipitous rocks, and are almost always covered with sea-fowl, on which account the Danish traders have given them the name of *Fugleskierene*. Passing between the innermost of these rocks and the Cape, which is also of volcanic origin, and presents a very bold and rugged appearance, we were rapidly carried by the tide, into Faxè Fiord; and, having now got into smooth water, and both wind and current being in our favour, the close of our voyage was the most agreeable that can be imagined.

"As we sailed along, I was delighted by the successive opening of the creeks and bays on our right, and especially the discovery of *Hafnar Fiord*, the school of *Bessestad*, the *Ness*, and other places in the vicinity of *Reykiavik*. Nor was my curiosity less gratified by the survey of the *Esian*, *Akkra*, and other mountains, on the left side of the bay. Their lofty height, the beautiful girdle of silver clouds that surrounded them, considerably below the top, the magnificent appearance of the summit above, and the solemn gloom which covered the inferior regions, all conspired to impress the mind with reverential and admiring ideas of that POWER, which laid the foundations of the earth, and at whose wrath the mountains tremble and shake. About eight in the evening, we got our pilot on board, when a number of reciprocal enquiries took place; and, at a little past ten, we anchored before the town of *Reykiavik*, where the Danish flag was displayed from the tops of the mercantile houses, in honour of our arrival. The first act of kindness shown us by the natives, was their mounting us on their shoulders, and carrying us ashore from the boat. On landing, we were met by a crowd of men, women, and children, who filled the air with the exclamations, 'Peace! come in peace! the Lord bless you!'

you! &c.; salutations that were at once calculated to prepossess a stranger in favour of the religious disposition of the Icelanders. At the head of the beach we were met by the superior class of inhabitants, by whom we were welcomed to the island, and among whom I was happy to recognise some of my own countrymen. We then proceeded to the house of Mr. Knudsen, the partner of Mr. Petrus, where we made an excellent supper on fresh salmon, and returned on board about one o'clock in the morning."

REIKIAVIIG, or *Reykjavik*, which, about fifty years ago, consisted merely of a few houses, has lately risen into notice; having become the residence of the governor, the episcopal see, the seat of the supreme court of judicature, and the principal mercantile station on the island.* It is situate on the south side of a considerable inlet of the Faxè Fiord, upon a low marshy ground, between two eminences, that are partially covered with grass, and studded with a number of small cottages. It consists of two streets, the longer of which, built only on the one side, stretches along the shore, and is entirely occupied by the merchants; the other, which strikes off at the west end of the town, and runs almost in a direct line back to the margin of a small lake, contains the houses of the bishop, landfoged, and others not immediately engaged in trade. About the middle of this street, on the east side, lies the public burying-ground, which is nearly enclosed with a new earthen wall. At the east end of the town, behind the range of houses along the beach, and in a parallel line with them, are the houses of the governor and sysselmand or sheriff; and, a little behind these, to the S.W., is the church, which stands by itself, on a gentle rise of the green, occupying the space between the town and the lake.

On the rising ground at the end of the governor's house, from which it is separated by a small rivulet, stands the house of correction, a large white-washed stone building, which, at a distance, has the most respectable appearance of any about the place. The dwelling-houses, with two exceptions, are all constructed of wood, in the Norwegian fashion, and have generally a storehouse or two, and a small garden attached to them. On the height to the west is the observatory, a small building of wood; and, on the summit of the opposite eminence, stands the school-monument, which the students have raised, with much pains, from the calcined stones in the vicinity. At a short distance in the bay are several small islands, the principal of which is *Videy*, which, on account of its agreeable situation, the richness of its pasture, and the number of eider-ducks that annually frequent it, is reckoned superior to any other spot in the southern parts of the island. It was formerly famous for its monastery, founded in the year 1226, but belongs, at present, to the crown, and is occupied by the chief-justice, Stephenson. In many places it rests on beautiful pillars of basaltic lava, which, in conjunction with the crater a little to the west of the houses, leaves no room to doubt of its having been thrown up by a submarine volcano. Similar appearances are visible on the opposite coast, near Reykiavik, where are also some hot springs, from which the bay most probably derives its name.

* HOLUM, near the centre of the island, in the north, was erected into an episcopal see in the year 1106, and continued in possession of its dignity and importance for nearly seven centuries, till, by an order of government, this, with the bishopric of Skalholt, were combined, in 1797, and the seat of ecclesiastical jurisdiction was fixed in Reikiavig, now the residence of the bishop of Iceland. In consequence of the change, the once-respectable and far-famed Holum now begins to wear the appearance of a deserted village. This village is situated at the termination of a high mountain, called *Holarbyrde*, on each side of which a rich valley runs down into the river *Hialtadalf*, extending in a northerly direction to Holum, where it winds round to the west, and gradually opens into the Skaga-fiord, into which it is discharged.

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To the Icelanders belongs the honour of being the first discoverers of America and Greenland. The latter country has been seen by one Gunnbeörn, who had been driven out to sea in a storm, some time after the colonization of Iceland; but no attempt was made to find it again till the year 982, when Eirik the Red proceeded thither on a voyage of discovery. After spending the greater part of three years, exploring the coasts, and taking possession of such places as he deemed most suitable for occupation, he returned to Iceland, and spoke so highly in praise of the newly-discovered country, to which he had given the name of *Greenland*, in order to excite a favourable idea of it in the minds of his countrymen, that he prevailed on a great number of them to accompany him the following summer. Not fewer than twenty-five vessels left Iceland under his convoy; but of these only fourteen reached the place of their destination; the rest were either lost, or driven back to Iceland. As the distance between the two countries was little more than two hundred miles, a regular intercourse was established between them; and the number of settlers increased so rapidly, that, soon after the introduction of the Christian religion, about the year 1000, a number of churches were built along the east coast, and a bishop was appointed to superintend the ecclesiastical affairs of the colony. He had his residence at Gardé, and was a suffragan to the Archbishop of Drontheim, in Norway. A monastery, dedicated to St. Thomas, was also erected at another small town, called Albe; and, for the space of more than 350 years, a regular intercourse was carried on between that country and Denmark, or Norway. In the year 1408, the last bishop sailed for Greenland. Since then, the colony has not been heard of; and its loss is attributed to the wars which took place at that time between the Danes and the Swedes, which prevented the trading-vessels from putting to sea, and to the accumulation of ices around the coasts, by which they have been rendered totally inaccessible.

The fact that America was, also, first discovered by the Icelanders, though less generally known, is perfectly well authenticated by the northern historians. Biarni Heriulfson, on a voyage from Iceland to Greenland, to visit his father, in the year 1001, was driven, by a violent easterly gale, into the Atlantic Ocean; and, after sailing several days, he discovered a fine woody country, in general flat, and only diversified by small heights, which rose into view upon the coast. Not being able to persuade his men to land, he proceeded, with a S.W. wind, from Greenland, which he reached, after a voyage of six days. The description which he gave of the country, some time after, excited the curiosity of Leif Erikson, whose father had first taken possession of Greenland. This adventurer left Norway in a vessel navigated by thirty-five men, and made first a country to the S.W. of Greenland, which, from the description given of its ice-mountains, appears to have been Labrador. Leaving this inauspicious region, they proceeded southward, till they came to the flat woody country discovered by Biarni; but, as they wished to explore the coasts to a greater distance, they again set sail, with a N.E. wind, and came, in two days, to an island, separated by a strait from the continent. Having proceeded up this strait, they came to a fine fresh-water lake, on the shore of which they built a habitation for their winter residence. The lake abounded with the finest salmon, and the grass retained its verdure, in a great measure, the whole winter. The days were more of an equal length than in Greenland or Iceland; the sun being nine hours above the horizon at the shortest day. One of his men, who was from the south of Germany, having discovered that grapes grew there spontaneously, Leif gave to the country the approximate

name of Vinland, or Vineland, and returned, the following spring, to Greenland.

The American continent was afterwards visited by Thovald, a brother of Eirik's, who was killed in an engagement with the natives; and a colony of Norwegians was settled there in the course of time, and continued to trade with the natives for the period of nearly two centuries after the country had been discovered.

The population of Iceland is supposed to have been much greater in former times than it is at present. Numbers of the inhabitants were taken off by the plague, in the year 1402; and, in the years 1707 and 1708, not fewer than 16,000 persons were cut off by the small-pox. In the year 1801, at which time the last census was taken, the population amounted to 47,207; but is supposed to have received, since that time, an addition of at least 3000.

Dr. Henderson adds, "With respect to the personal character of the Icelanders, they are rather tall, of a frank open countenance, a florid complexion, and yellow flaxen hair. The women are shorter in proportion, and more inclined to corpulency, than the men; but many of them would look handsome in a modern European dress. In youth, both sexes are generally of a very weakly habit of body, which is the necessary consequence of their want of proper exercise, and the poorness of their living; yet it is surprising what great hardships they are capable of enduring in after-life.

"It has been said that, in general, the Icelanders are of a sullen and melancholy disposition; but, after paying the strictest attention to their appearance and habits, I must pronounce the statement inaccurate, and one which could only have been made by those who had little or no intercourse with that people. On the contrary, I have been surprised at the degree of cheerfulness and vivacity which I found to prevail among them, and that not unfrequently under circumstances of considerable external depression and want. Their predominant character is that of unsuspecting frankness, pious contentment, and a steady liveliness of temperament, combined with a strength of intellect and acuteness of mind seldom to be met with in other parts of the world. They have also been noted for the almost unconquerable attachment which they feel to their native island. With all their privations, and exposed as they are to numerous dangers from the operation of physical causes, they live under the practical influence of one of their common proverbs; *Island er hinn besta land sem solinn skinnar uppá*; 'Iceland is the best land on which the sun shines.'

"The Icelandic is justly regarded as the standard of the grand northern dialect of the Gothic language. While the Swedish and Danish, and even the Norwegian, which is a kind of middle dialect, have been more or less subject to the influence of the Teutonic or German branch, that, originally spoken in Scandinavia, has been preserved in all its purity in Iceland."

IX. WEST-GREENLAND, DAVIS'S STRAITS, and BAFFIN'S BAY.

THE high and precipitous coasts of Western Greenland, with their numerous islands, rocks, and peculiarities, have been so often described, that a detail here is not requisite; the less so, as we have given several copious notes, attached to the Table of Positions, pages 38 to 43, one of which includes Sir Charles Giesecké's Paper on the divisions of the country, and the present residences of the inhabitants.

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Here, therefore, we shall introduce an Account of the Voyage of Discovery, planned and executed under the Orders of the British Government, for the Exploration of the Coasts of Davis's Straits and Baffin's Bay. This voyage has, at length, determined, in a general, if not a *perfect*, manner, the existence and shape of the latter; and we have, at least, obtained a **GROUND-WORK**, upon which navigators may proceed with such future improvements as may be required.

In the construction of the Chart of Baffin's Bay, we have, as a matter of course, followed the description of Captain Ross. We are aware, and so should the Reader be, that many points of coast, denominated **CAPES**, &c., may possibly be **ISLANDS**: but this question, with another of greater moment, can be determined only by future surveys.

Of the voyage, two relations have been published; the one, which must be considered as official, by Captain Ross; the other, by Mr. Fisher, a surgeon, of the *Alexander*: each has its peculiar merits, and both have been made use of in the following abstract.

In the Introduction to his relation of the Voyage, Captain Ross has fully explained the grand object of the expedition. The two ships, the *Isabella*, of 385 tons, and the *Alexander*, of 252 tons, were commissioned on the 15th of January, 1818. On the same day were commissioned the *Dorothea*, of 382 tons, Captain Buchan, and the *Trent*, of 249 tons, Lieut. Franklin, for the Voyage already described, pages 103 to 109. The ships were most liberally supplied with every requisite, and many articles intended as presents to the natives of Greenland, &c.

Included with the crew of the *Isabella*, was John Sacheuse, an Esquimaux, native of South-East Bay, in Greenland (latitude 69°, and longitude 52°). This person had voluntarily left his country in May, 1816, which he again visited in 1817, and had again returned to Leith. He had been converted to Christianity by the missionaries, was exceedingly anxious to become acquainted with the scriptures and the art of drawing, and was, altogether, an extraordinary person. During his residence at Leith, in the winter of 1817, he had been taken notice of by Mr. Nasmyth, the artist, who introduced him to Sir James Hall. His wishes to accompany the ships were made known to the Admiralty, through Captain Basil Hall, and he was consequently engaged as an interpreter. He returned, like the rest of the crew, in perfect health, during the passage home; was protected by their lordships of the Admiralty, by whom he was sent to Edinburg for instruction; but died, of typhus fever, on the 14th of February, 1819, after a few days illness.

The two ships left Deptford on the 18th of April, 1818, and arrived at Lerwick, in Shetland, on the 30th, opposite to which, at Gardie, in Brassa, the observations were made, which we have already described in pages 10 and 16. On the 3d of May they quitted the harbour of Lerwick; and thence, passing through the Sound of Yell, proceeded directly to the westward, towards Cape Farewell.

On the 4th, as the *Isabella* had run considerably a-head of her consort, during a breeze that sprung up, almost approaching to a gale, she hove-to, when the weather moderated, and had leisure for sounding, but no bottom was found at 150 fathoms.*

* The ships' place at noon, of this and every day, is shown on the new Chart, with the variation, where ascertained.—ED.

Captain Ross says, "Continuing our course, we came, on the 8th of May, to the spot where a bank is laid down in Steel's Chart, as discovered by *Olof Kramer*, but we could find no soundings in 130 fathoms, any where on or near the place." On the 17th, at noon, "we found ourselves exactly in the latitude of the sunken land of Bus, as it is laid down in some Charts $57^{\circ} 28' N.$ and, being desirous of determining whether such a bank really existed in longitude $29^{\circ} 25'$, we altered our course, being then in $28^{\circ} 20'$ to N.W. for the purpose of ascertaining the fact. We made all sail a-head, kept a good lookout, with the lead constantly going; and, at sun-set, being near the spot, shortened sail, in order to sound; but found no bottom in 180 fathoms. This was repeated every four miles, with no better success; and when the *Alexander* came up with us, being then 30 miles past the spot marked out for this sunken bank, we made sail, but kept the lead constantly going.

"The existence of this bank has long been doubted by the masters of Greenlandmen, and certainly it is not to be found where laid down in the Charts. Various stories respecting it were related by the people on board; but it appeared, on comparing their testimonies, that no soundings had ever been actually found. I am more inclined to imagine that, when ships have been struck in this quarter by heavy seas, the shocks have erroneously been attributed to the sunken land of Bus.

"Early next morning the weather was fair, but, at about seven o'clock, the wind veered to the westward, and it grew hazy. We continued our soundings, but without finding ground; and held on constantly in the same parallel of latitude.* An uprooted tree, without branches, measuring three feet and seven inches in length, was picked up. It appeared to have been long at sea, and pieces of it were preserved."

On the 20th of May, a cormorant and a bird much like a duck were seen. On the 26th, a magnificent iceberg, covered with snow, was seen: this was supposed to be 40 feet in height, and 1000 in length. In the evening the weather was clear, and there was no ice in sight from the mast-head. During the afternoon the clouds near the horizon, towards the N.W., presented an unusual white appearance, in some places resembling snowy mountains rearing their summits out of the ocean. This day, and for several days before, the colour of the water appeared to be considerably changed; for, instead of that clear blue colour, which it had all the way from Shetland to the longitude of Cape Farewell, it seemed now to have a light brownish colour. During fair weather, and a turbid appearance when foggy or hazy, such as is commonly seen at the estuary of large rivers. The specific gravity of the sea-water was now found to be diminishing daily.

May 28th, weather thick and cloudy. Three icebergs were passed, the height of the largest of which was measured by Lieutenant Parry, by taking the angle it suspended and its bearings at two stations, the distance between being ascertained by the patent log: its height was found to be 51 feet. Around these bergs were a great number of birds, of different species, some of which followed the ships for a considerable distance. During the night, and on the following morning, several icebergs and smaller pieces of ice were passed. One

* We are not quite satisfied that *Kramer's Bank* does not exist, although not exactly in the situation assigned to it on the Charts. From the track of the *Isabella*, it seems probable that she may have passed to the southward of it. With respect to the sunken land of Bus, we had occasion, long ago, to show that there is no reason to suppose that any traces of it are to be found. See 'Memoir on the Atlantic Ocean,' third edition, page 169. The information given therein, on this subject, will be found hereafter.—ED.

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was the largest yet seen. On the top of it was an immense circular mass, resembling a tower, which appeared much whiter than any other part, probably from being covered with snow. The 29th afforded a good specimen of a northern summer, for it snowed and sleeted alternately during the whole of the day: of course the weather was thick, and a very vigilant look-out became necessary, to guard against running foul of the ice. During the last night the twilight was so strong, during the short time that the sun was under the horizon, that any object of considerable size might be seen nearly as distinctly as in the day.

May 30.—The rigour of the climate still increasing. Such part of the rigging and sails as were wet yesterday are now regularly frozen and decorated with isicles. Thermometer in the shade, at noon, $28\frac{1}{2}^{\circ}$. Temperature of the seawater, at the surface, as low as the freezing point. The smallest print could now be read at midnight. Another large iceberg was now in sight.

☉ May 31.—Several flocs of ice were seen, besides the large iceberg. The latter consisted, apparently, of three strata; the uppermost of indurated snow, the rest was opaque, except a blueish transparent vein, which intersected it horizontally: it presented, on one side, a precipice about 85 feet high from the water, gradually declining to about 15 feet: the circumference was about 1200 feet, and, except at the snowy top, it had much the appearance of limestone, with the peculiar blink or brightness which has been described. In some places, at a considerable distance from it, the sea broke with great violence, proceeding, as is supposed, from some tongues which projected beneath the surface of the water.

June 1.—Weather moderate and cloudy; but, towards evening, it fell quite calm, and became beautifully serene. Towards noon much field-ice to the north, and the course of the *Isabella* was twice changed to avoid it. The *Alexander* far astern. A great number of the whales called Finners, some seals, and many birds, were seen. In the forenoon of June 3, the ships were obliged to stand to the eastward, in order to keep clear of the ice, which, to the northward and westward, was scattered in patches and detached pieces as far as could be seen. The land, in the vicinity of Cocken Sound, was, on this day, indistinctly seen, and supposed to be 40 miles distant: but it presented a dismal aspect of snowy mountains, with black cliffs or precipices, on which neither snow nor ice could rest. On the next day, June 4, from the *Alexander*, the land was more distinctly seen, the weather being clearer. The summits of mountains appeared to extend considerably in-land. They seemed to be nearly of an equal height, terminating in peaks, and separated from each other by small valleys covered or filled with snow. The wind, from being moderate, became squally at noon. Tacked to avoid field-ice, and stood E. S. E. Saw a large iceberg aground to the W. S. W. Sounded and found bottom in 70 fathoms. At two, *p. m.* about 45 miles from land, sounded in 50 fathoms, and the mud-machine brought up a piece of coral. No current. Here the *aberration* of the compass appeared to be so great, that Captain Ross allowed six points for standing to the north and west, and only $4\frac{1}{2}$ for standing east and south. A deviation of two points in the *Alexander's* compasses was supposed to have been occasioned by the side-lamps having iron in their construction.

During the two following days, nothing particular occurred. The wind was adverse, and the ships forced to beat about nearly in one tract, between the land and the ice. The space between the former and the latter appeared to be 80 or 90 miles, and a sight of each was gained within every 24 hours. The

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approach to the ice was known by the *blink*, extending along the horizon, commonly forming the segment of a large circle, with its convex side uppermost. The middle part is usually of the height of about five degrees. Small straggling pieces were seen for miles before reaching the main body, which increased in proportion to the advance of the ships. On approaching the ice, the birds always appeared more numerously.

A stream of ice, in the forenoon of the 7th June, compelled the ships to steer E. by N. "At half-past four," says Captain Ross, "we had much difficulty in weathering a point of fixed ice; we succeeded, however, by means of pushing through several streams and packs of heavy ice, in the midst of a considerable swell, that added to the danger of our situation. A gale then came on, and we close-reefed top-sails. The land was seen about eleven, bearing S. E. by E. at a distance of forty miles; and, at midnight we sounded in 15 fathoms, when I judged that we were about seven leagues from the Savage Islands. There was the appearance of a tide; but, as it blew hard, we had no opportunity of trying its strength."*

8th June.—Strong gales; cloudy weather; courses various, in order to avoid ice and bergs. Proceeding northward, at four made out the Romel Port and Wild Islands. In a depth of 15 fathoms, the land seemed to be 25 miles distant. This depth continued for four hours. "At nine, seeing fixed ice from the mast-head extending from the land, we hauled to the northward by compass, that is, making a westerly course, and steered between grounded icebergs, among packs and streams of ice. One of the icebergs was 325 feet high, and 1200 feet in length; a torrent of water was running down its side."

9th June.—The ice was found to be so closely packed together, that it was impossible to get through it in any direction to the northward and westward, since it extended from the land directly across to the westward, as far as could be seen. After working about, among the loose ice, as far as the ships could proceed, they, at length, drew in towards the land, and made fast to a large iceberg, which was aground at about 3 or 4 miles off the shore, or rather off some islands between the ships and the main land. Some Esquimaux came off, and from them it was understood that the berg had remained aground since the last year.

During the night the rise and fall of water here, during neap tide, appeared to be four feet: the stream of ebb and flood set at the rate of about half a mile: the ebb sets to the south two hours before high water. The iceberg was neaped four feet, but there were marks of the water having reached four feet higher.

During the night, the ice began to close on the ships, so that they were obliged, on the following morning, to cast off from the iceberg, and make the best way into clear water, or rather to a sea everywhere interspersed with fragments of ice. On this day, for the first time, a black whale was seen. The ships continued all day and night beating to windward. The weather was moderate, but foggy, and the evening cloudy. Next day it continued moderate, but no clear water to the northward could be seen. This day a seal was shot, which weighed 846 pounds, and yielded 30 gallons of oil.

11th June.—Four ships in sight, which proved to be whalers, of Hull. One had taken seven fish. They had been as far to the north as Disco Island, westward of which they had found the sea open. The frost had been severe at the

* From Melish Channel, within the Wild or Savage Isles, lat. 67° 40' and upward, the tide sets very strongly to the westward and southward. See the Plan of these isles, &c. mentioned in note 4, page 39.—ED.

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commencement of the season; for they had, to the northward, found the sea frozen three different times.

The ships stood on a little, more to the west, then to the south; but, finding the ice firm, tacked and returned to their former position. At midnight, the weather being thick, they were again made fast to an iceberg.

12th June, at three *p. m.* the weather becoming clearer, with a breeze from N. E. cast off from the iceberg, and sailed to windward, among pieces of heavy ice. "In the evening," says Mr. Fisher, "the weather being clear and serene, both sky and water presented the most beautiful scene I ever beheld. The former, near the horizon, was interspersed with fleecy clouds, which decreased gradually in colour and density, according to their height, until, in the zenith, they disappeared entirely, and there the sky appeared of the most beautiful cerulean blue. The water, on the other hand, or, rather, the ice on its surface, presented a spectacle so superbly grand, that I know of no other scene in nature with which to compare it. Let any one fancy himself situated in the centre of an immense plain, extending farther than the eye can penetrate, filled with masses of ice, whiter than Parian marble, and presenting a greater variety of forms than the most fertile imagination can conceive, and as endless in size as in shape, from the stupendous icebergs which stood at least a hundred feet above the water, to those small fragments that were only discernible above the surface. Let a person fancy himself situated in the midst of a chaos of similar objects, and he will find it much easier to conceive than express the grandeur of such a scene. The sun, being at the time a few degrees only above the horizon, added much to the magnificence of this sublime prospect."

The island Disco was now plainly seen, with seven ships beset with ice in the S. E. or Fish Bay. On the following day, the ships were continually working through quantities of pack-ice; some of the pieces being full half an acre in extent, and drawing from 5 to 10 fathoms of water. Smaller pieces were more or less connected, having large interstices among them, and through these the ships were obliged to tack, warp, and tow, while the six strangers were employed in the same way. At length, with the centre of Disco to the N. E., the *Isabella* had clear water and clear weather, as far as could be discerned from the mast-head.

In the afternoon of June 14, the ships arrived off the WHALE ISLANDS, on the larger of which, KRON PRINS ISLAND, is a Danish settlement. Captain Ross says, "In the afternoon, we hoisted our colours and pendant, in compliment to the Danish flag. It fell calm as we passed close to them. A gun was fired from the *Isabella*, when the Governor, Inspector Flushe, a respectable looking young man, a native of Norway, came on board; from him we learnt, that the late winter had been uncommonly severe, the sea being frozen near his station early in December, when it was generally frozen about the middle of February. Love Bay, called by the Danes *Göd Hauben*, and also *Waygat* strait, were still frozen. He had been resident in Greenland eleven years, and had remarked that, the severity of the cold increased; he said, that he had heard from the Esquimaux, that, on a clear day, land, near the Woman's Islands, could be seen from the tops of the hills on the opposite end of the Straits. They had, this year, been reduced to great distress, from want of provisions, and had been obliged to kill dogs for food; owing to the impossibility of procuring seals during the winter for the Esquimaux to live on.

Kron Prins Island, situate as shown in the Table, page 34, has a good harbour, with three entrances. The inhabitants are the Governor, his wife and children,

children, six Danes, and one hundred Esquimaux, whose chief occupation consisted in the capture of whales and seals, but none had been taken this season.

The ships continued under the Whale Islands until the tide, which run at the rate of about a mile and a half an hour, became favourable. At 8 p. m. with a fresh breeze, they stood to the west, having, at the same time, a considerable swell from the N. E. At half a mile south of the Whale Islands, bottom was found at 100 fathoms,

On the following day, 15th June, the ships were working, with all sail, to the northward: Disco was in sight, and no ice, except the bergs, was to be seen. Several of the fishing ships were passed, some of them coming from the northward, having been unable to penetrate farther in that direction than the north end of the Waygat. Of three ships, one had taken only five, another three, and another two, fish.

On the 16th, a great number of very large icebergs were passed, some of them half a mile in length, and nearly 200 feet in height. From the deck of the Alexander, sixty-four were counted at one time; and the whole of the horizon, to the northward, appeared like one continued wall or barrier of ice.

Waygat Island now bore East [*S. E. by S.*]; and, as no water could be seen from the mast-head, either to the west or north, the ships hauled in. Here were found forty-five ships employed in the whale-fishery, all detained by the ice, and, in general, made fast to the icebergs along shore. "Such a sight," says Mr. Fisher, "bursting suddenly on our view, in these inhospitable regions, was highly gratifying; and, at the same time, afforded a striking proof of the enterprising spirit of our countrymen, in that particular branch of speculative commerce in which these ships are employed. All of those near to which we passed gave us three cheers, which were heartily returned. Shortly after we made fast to an iceberg on the N. E. side of the island. Here we were obliged to remain for five days, owing to the ice being so close to the northward, that it was in vain to attempt getting through it."

The interval was employed in making observations on shore, &c.; such as the transit of the sun over the meridian, and the number of oscillations made by the pendulum of the astronomical clock, in the course of twenty-four hours, or, rather, from the time of the sun's passing over the meridian one day, until its crossing the same on the day after. The dip and variation were also correctly ascertained.* It was found that the tide here rose and fell 10 feet on the third day after the full of the moon.

WAYGAT, or HARE ISLAND, is uninhabited, but the remains of huts were found, with several small pieces of worm-eaten wood, &c. It is perfectly barren, and such parts as are not covered with snow, present scarcely anything but a rugged surface of rock and loose stones. A few small shrubs were observed on the plains, just beginning to shoot up, but none were more than two inches in length, and these generally covered with a fine downy coat protecting them, in some measure, against the vicissitudes of temperature that daily occur, and this to such a degree as would be apt to stagger the belief of those who have not had an opportunity of being eye-witnesses of them. For, at night, when the sun is low, it constantly freezes even the sea-water; while, in the day-time, or when the sun is high, the thermometer, exposed to

* See note 7, page 39; and note on the variation, &c. page 42. The plan of Disco, &c. given on the Chart, has been made up from discordant elements, and is to be considered only an approximation to truth. ED.

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its beams, rises as high as 84°, and even higher on shore, in the valleys. The only quadrupeds seen here were two or three large white hares and one fox. Bears are said to frequent the island. Sterile as the island appears, it is supposed to contain a great variety of minerals.*

Captain Ross says, "We continued in our several occupations at Waygat till the 20th of June; and, in the evening of that day, the ice having loosened considerably, we determined to cast off from the iceberg, and use every effort to get forward, which we effected by dint of labour, all hands with the boats being employed in towing and warping the ships among packs of ice, through which it was frequently necessary to cut a passage. Many of the whalers followed our example.

"At two in the following morning, (Sunday,) we were again completely beset, and carried S. E. by the tide; but, after several hours, we managed to proceed slowly, by warping, until eight o'clock, when we were again beset, and carried to the N.W.; the boats were then hoisted up, and Sunday service performed. In the afternoon we made fruitless efforts to pursue our course, being carried to and fro by the tide, surrounded with heavy ice, in which the *Isabella* underwent extreme pressure; and the *Alexander*, which had escaped to the shore north of Waygat, was there hemmed in.

"The next morning, at four, a light breeze sprung up from the S. E., and the ice separating a little, we made all sail, in order to force through the masses, all the while warping, tracking, and cutting; and, at length, we succeeded in getting into a channel which led to the north. The *Alexander* was in company, and, at four o'clock, we arrived at Four Island Point, where we found the whalers, which had headed us, now stopped by the ice. Here we took advantage of an iceberg, and made fast to it.

"I landed and ascended a hill, but nothing except solid ice was to be seen. There is here a sort of Danish and some wretched Esquimaux huts, all apparently deserted.

"During the night it grew foggy, and, at high water, the iceberg to which we were moored, floated and drifted to the west; it was carried among the floes, with great violence, by the tide, which was running at the rate of two miles an hour. At eleven, the ice was partially cleared away by an easterly wind, and the ships were soon after moored to another iceberg. On the shore some traces of rein-deer were seen."

Mr. Fisher describes the land, on this side, as much higher than that of Waygat Island, but its general features and nature as nearly the same. Within view of the spot where the *Alexander* first anchored, or made fast, several cascades of water fell from the rocky precipices. He adds,

"It is particularly deserving of being remarked that, hitherto, we have always found the sea clearer of ice near the shore, than farther out at sea, which is rather at variance with the opinion of those who suppose the vicinity of land necessary to the formation of ice. But, it may be asked, Whether the loose floes and patches of ice, with which the sea in these latitudes is almost covered, were not, at the time of their formation, united to the land? May not the reflection of the sun's rays, from the mountains, tend, in a great measure, to dissolve the ice near the shore?"

Wednesday, June 24.—So soon as the tide became favourable, and the ice appeared to open, the ships cast off, and towing recommenced. Here the ice

* For the particulars, see the Journal of Mr. Fisher, which forms the first number of a collection of Voyages and Travels, now publishing, monthly, by Sir Richard Phillips, London.

compelled them to pass on within a musket-shot of the shore, and close upon some sunken rocks. At one, when both ships were in a very dangerous passage, a light wind from the N.W. put the ice suddenly in motion; when, in spite of every exertion, the *Isabella* was driven into 16 feet of water, and the *Alexander* was, for a few minutes, actually aground. The whalers, which were astern, sent their boats, and aided, by every means in their power, in delivering the ships from this perilous situation, which was accomplished by running hawsers out to the nearest berg, and heaving the ships through the besetting ice. The conduct of the masters of the *Egginton*, *Brothers*, *Ingria*, and *Thornton*, all of *Hull*, was highly meritorious, and entitles them to the warmest gratitude for their ready services. Mr. Fisher says, "Not only on this, but on several other occasions, we had much reason to cherish these sentiments towards the ships engaged in the fishery; having uniformly experienced the most prompt and liberal disposition in them to lend us the most effectual aid in their power: and, I may add, with justice, that the same friendly spirit actuated us, no less than it was our duty, to assist them in return. A few minutes after we had made fast, to day, the ship *Egginton*, being driven aground, by a floe of ice drifting against her in the manner above described, our boats were the first to assist her, and, fortunately, they, with those of the other ships, succeeded in getting her off, before she had sustained any damage."

Nothing remarkable occurred on Thursday the 25th, the weather having been, as it had been for some days past, perfectly calm, and the ice closed in all around. On the 26th, a light breeze sprung up in the forenoon from the eastward, which soon made an opening, by driving the ice to leeward, and the ships immediately got under way, in order, if possible, to obtain the opposite side of *Jacob's* or *N. E. Bay*; but, in the midst of the attempt, were again stopped by the ice. An inlet at the bottom of this bay is called *Jacob's Bight*: how far it extends into the interior is unknown. Some years ago, a ship, the *William*, of *Liverpool*, took several whales at a great distance up it; but, at present, like all the surface of the sea, in this quarter, it is covered with ice.

After beating about all night in search of, or rather waiting for, an opening, the ice was found so close, in all directions, that it was in vain to attempt getting through it. The ships, therefore, made fast to the land-ice, abreast of *Merchant's*, or unknown, *Island*; and here several good lunars, azimuths, and bearings of the land, were taken on the ice along-side the ship. The position of the island, as given by *Captain Ross*, is exhibited in our *Table*, page 35; but the result of the observations made in the *Alexander* were as follows:

Latitude $71^{\circ} 2' 22''$: Longitude, by mean of eight lunars, $54^{\circ} 16' 30''$; by chronometer, $54^{\circ} 8'$. Variation, by mean of four azimuths, $76^{\circ} 2'$.

In the evening, the ships cast off, and kept sailing about all night, ready to take advantage of an opening. On the following day, Sunday, the 28th, nothing occurred worthy of particular notice: the weather on this, and the following, day was remarkably fine: but, with the exception of occasional light airs, a dead calm prevailed. On this day *Captain Ross* sent *John Sacheuse* on shore, to communicate with the natives on the south side of the bay, and he returned with seven of them in their kajacks, or canoes, bringing a small supply of birds.

"Their village," according to *Captain Ross*, "lying on the south side of the bay, appeared to consist of a few huts made of seal-skins, sufficient for the residence of about fifty persons. Being desirous of procuring a sledge and dogs,

I offered to fetch the rifle till the sledge and boat was cast; that two of the natives were absent by accident, and they were

"We soon found a bin, where the dogs were taken, and they were with our sail

"*Sacheuse* had a good deal of officious knowledge of the natives. At the request of *His Majesty*, he was new; but *N* was more approving person, like a draughtsman and fisher of sea

"A daughter was far the best of the tentions; with a shawl, ornamented in a bashfully to reward his no possible on her heart

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dogs, I offered them a rifle-musket for one completely fitted, which they promised to fetch; with much honesty of principle, however, refusing to accept the rifle till they had brought the sledge. They soon returned, bringing the sledge and dogs in a boat managed by five women, dressed in deer-skins. The boat was called an umiack, and is rowed by the women standing. I found that two of these women, taller than the rest, were daughters of a Danish resident by an Esquimaux woman. One of the men also was the son of a Dane, and they were all of the colour of Mulattoes.

"We soon became intimate with our visitors, and invited them into the cabin, where they were treated with coffee and biscuit, and here their portraits were taken. After leaving the cabin, they danced Scotch reels on the deck with our sailors, to the animating strains of our musician.

"Sacheuse's mirth and joy exceeded all bounds; and, with a good-humoured officiousness, justified by the important distinction which his superior knowledge now gave him, he performed the office of master of the ceremonies. An Esquimaux master of ceremonies to a ball, on the deck of one of His Majesty's ships, in the icy seas of Greenland, was an office somewhat new; but Nash himself could not have performed his functions in a manner more appropriate. It did not belong even to Nash to combine in his own person, like Jack, the discordant qualifications of seaman, interpreter, draughtsman, and master of ceremonies to a ball, with those of an active fisher of seals, and a hunter of white bears.

"A daughter of the Danish resident, about eighteen years of age, and by far the best looking of the group, was the object of Jack's particular attentions; which, being observed by one of our officers, he gave him a lady's shawl, ornamented with spangles, as an offering for her acceptance. He presented it in a most respectful, and not ungraceful, manner to the damsel, who bashfully took a pewter ring from her finger, and presented it to him in return; rewarding him, at the same time, with an eloquent smile, which could leave no possible doubt on our Esquimaux's mind that he had made an impression on her heart.

"After the ball, coffee was again served, and at eight o'clock the party left us, well pleased with their entertainment, and promising to come back with a *skin-boat*, an article which, I conceived, might be useful on the ice. I permitted Sacheuse to escort them, chiefly that he might hasten their movements, and search for specimens of natural history.

"There was now a considerable change in the appearance of the mountains from the melting of the snow; and, in the morning, a light breeze arose. I was surprised that our Esquimaux and his countrymen did not appear, and stood towards the village at the foot of the mountain, firing guns, but to no purpose. At six o'clock, the breeze having freshened considerably, I sent a boat ashore to bring him off; when the poor fellow was found with his collar-bone broken, having, with the idea, as expressed by himself, of '*Plenty powder, plenty kill*,' overloaded his gun, and the violent recoil had caused this accident, which prevented his managing his canoe: he was brought on board, and the surgeon reported that it would be some time before he could be cured."

Mr. Fisher says, of the people of the country, that they appeared to be grave, modest, and unassuming; which justifies, in some measure, the compliment they pay themselves, when, approving the behaviour of a stranger, they say, "He is as modest as a Greenlander."

In the afternoon of July 2, a breeze from the south opened a passage through the ice along the north side of the bay. The zeal with which all the ships pushed through this opening, evinced the pleasure that the circumstance imparted; for upwards of thirty sail passed through so close to each other, that the space occupied by the whole was estimated at not more than a square mile. During the night, an immense number of icebergs appeared, so close together, that an attempt to reckon them was impracticable; but, on the most moderate computation, they must have exceeded a thousand. Some of them were stupendous masses, and presented the most fantastic shapes. At midnight, the ships passed the Black Hook, after threading several narrow and intricate channels; and, early in the morning, had passed safely through the second barrier: by mid-day, a degree of latitude had been made through a channel apparently void of current, wherein only a few icebergs and loose floes were to be seen. In this place, the neighbouring land was not so mountainous, and the faces of the hills, especially next the sea, were less covered with snow than those to the southward. The ships had now arrived abreast of Saunderson's Hope, (lat. $72^{\circ} 30'$), and in sight of the Woman's Islands; firm ice to the westward induced them to keep near shore, and they passed another immense chain of icebergs.

On the 4th of July, that remarkable instance of refraction occurred, which has heretofore been recorded. See page 49. This day the sea appeared to be full of that slimy matter which the seamen call 'whales' meat.' On the 5th, Sunday, in the morning, two of the natives of the Woman's Islands came alongside in their canoes, and stated that the sea was open to the northward. On the 6th, the ships passed the third great barrier, consisting of large icebergs in vast numbers, which were aground in depths varying from 63 to 100 fathoms. The height of one, stated to be aground in 123 fathoms, was found to be $125\frac{1}{2}$ feet above the surface of the water, which is nearly in the proportion of one to seven above water. Between the icebergs was a considerable quantity of thin ice. In the afternoon the water had an unusual yellowish muddy appearance; but neither its temperature nor specific gravity indicated any particular change; the former being 35° , and the latter 1026.6, which did not vary materially from what it had been found for several days past. Several of the fishing-ships were still in company, and one of them took a whale in the evening.

7th July.—After the clearing away of a thick fog, land was seen to the east. At eight, the Isabella passed in-shore near 'Three Islands,' described by Baffin, about nine miles from the land, and which formed a bay containing several smaller islands. The water deepened, on nearing the shore, from 65 to 150, and, within the islands, to 160, fathoms. The sun was not visible, but numerous birds, of various species, and three bears, were seen. The greatest part of the two following days was spent in traversing among the ice, but without making any progress to the northward.

Opposite to the islands above mentioned stands a remarkable hill, in form of a sugar-loaf; hence it is commonly called Sugar-loaf Hill: it stands on an island, or, rather, forms an island of itself.

The obstructing ice prevented the progress of the ships until the 15th. During the interval, many observations were made. In the forenoon of the 15th, with the water more clear towards the east, the Isabella stood round a floe, and beat to the N.E. In the evening, the ice appeared to be opening, and she passed a few miles westward of the 'Three Islands.' The weather was clear in the night, and the wind light and variable, until it shifted to the S.W., when

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all sail was made for a narrow opening, leading, but in a very crooked direction, about N. N. W. Forty sail of whalers were in company, and several large whales were seen, some of which were taken. The course was continued, with a fair wind; but the channel, every hour, became more narrow and intricate, until the ships were jammed in, with the tantalizing sight of open water not a hundred yards a-head. The *Isabella* underwent a very severe pressure, but without damage, although lifted several feet out of the water; the concussion lasted fifteen minutes; the floes then receded a little, and the ship was, by the greatest exertion, at length hove through. The *Alexander*, and some of the whalers, suffered in the same way, at about two miles more to the west.

The *Isabella* now ran three miles to the northward, and then lay-to for her consort, which came up at eight in the evening, and both proceeded under all sail until again impeded by the ice.

On this part of the passage, Mr. Fisher says that, the *Alexander* was detained, for two or three hours, by the meeting of two floes of ice, just as the *Isabella* got through, and precisely at the time when about to enter the lead, or opening, through which she passed. "It is deserving of remark that, we are frequently obstructed in this manner; for, whenever we have to pass through narrow openings, which is very commonly the case, the water displaced by the *Isabella* causes such an indraught, that the floes often meet before we get through, although, perhaps, we are not more than a hundred yards astern of her at the time. From this circumstance, I conceive that, if one or more ships are in company, working through the ice, the one which sails best has, in this particular, a decided advantage over the other."

The remarkable headland, called the Devil's Thumb, was passed this day, but not distinctly seen. On the next morning, when the weather was more clear for some time, the land could be seen, but no passage through the ice. In the early part of the day, a large bear was seen on the ice, to which chase was given by a party of officers and men, but it escaped by taking the water. About noon, the weather having cleared up, the land called the Horse's Head was visible, and several rocks, of a singular shape, were seen among the masses of ice that covered the land.

Sunday, July 19.—The ships were now surrounded by ice, which carried them to the northward. In the evening, it appeared to be decaying, and changed its course to the westward, but the ships were again beset. Fog and ice impeded their passage until the 23d, when twenty-four succeeding hours were wholly employed in tracking through the ice, a proceeding which becomes necessary when the channel is too narrow to allow a vessel to beat, or be towed, against the wind. In executing this service, the whole ship's company was sent on the ice, and a rope was thrown out to them, one end of which was fastened to the head of the foremast, for the purpose of keeping the bight clear of the uneven parts of ice usually found at the edge of the field. The men having hold of the other end, then pulled the ship ahead, marching to music, the musician always leading the way. As it sometimes happened that a hole, covered with snow, or a weak part was found, the men occasionally tumbled in; but, as they never let go the rope, they were instantly relieved. In this toilsome manner the two ships proceeded, while about thirty whalers were beset in the ice.

The *Isabella* and her consort had now advanced to Melville Bay, in which was seen a remarkable spiral rock, to which Captain Ross imparted the name of

of Melville's Monument. This bay was found to abound in whales, many of which were taken. On the 26th, the ships were beset, and again immovable. The weather was now exceedingly mild and perfectly calm.

In the morning of Wednesday, the 29th, the wind, having sprung up from the eastward, cleared away the ice a little. In the forenoon the ships passed a remarkable pointed hill. At noon, the latitude was $75^{\circ}29'$. There are, apparently, a number of islands along the coast here, as well as to the southward, which seem to be shut out from the land by what is called the land-ice, and are more rugged than the main land behind them, and, for the greater part, clearer of snow; some being, indeed, nearly black. The main land is almost entirely covered with snow, but distinguishable by its black cliffs.

Very high mountains of land and ice were seen on the north of Melville Bay, forming an impassable barrier; the precipices next the sea being from 1000 to 2000 feet high, many spots clear of snow, and exhibiting heaps of ruins accumulated at their bases in vast fragments.

31st July and 1st August.—The ships were now in a large pool of clear water, and surrounded by an extraordinary number of whales. It being calm, the noise of their blowing resembled, in some measure, the sound of distant artillery. They were, generally, about the edge of the land-floe, from beneath which they appeared to come out to breathe. Sometimes a dozen might be seen at once, blowing so close together, that the spouts of water, which they threw up, resembled, in some measure, the smoke from a small village on a calm day. Three or four of the fishing ships were now in sight, and were rewarded accordingly. A great number of birds were also seen.

Sunday, August 2.—Light airs and calms; the ships working to the north through a narrow channel, and considerable progress was made. In the next morning a small opening was discovered, covered with newly-formed or bay ice. The land opposite, to the east, presented a long continued glacier, near the sea. At the distance of six leagues the shore jutted out into black and sharp promontories, the main body of ice appearing to be continued from the interior into the sea, and terminating in steep perpendicular cliffs, from which many icebergs appeared, at no distant period, to have been separated. The ice around was full of bays and inlets, in which were myriads of rotges or little auks, (*alca allé,*) swimming on the water, and covering the ice, together with a vast number of whales and sea-unicorns.

August 4, in the morning, the seamen were sent out to track the ship, first along a floe, then on the land-ice; the bay-ice was so strong, that it became necessary to break it, by suspending a boat from the jib-boom: this being constantly rolled by two seamen, raised a wave ahead of the ship, that effected the purpose. About noon the breeze freshened considerably, with all sail, and, in one tack, the Isabella fetched into a channel leading along the land, which now took a W.N.W. direction; in the evening it continued to freshen, carrying the ships at the rate of 5 or 6 miles an hour, a velocity not experienced for several months before. A very high snowy mountain seemed to form the summit of the barrier of ice, which led to a lofty promontory, a little north of which, but projecting considerably, was a cape, now named Cape Melville.

Eastward of Cape Melville, Mr. Skene, officer of the watch, had discovered three small islands, which Captain Ross consequently named Skene's Islands. These were clear from snow. The rotges or little auks still continued to appear innumerable: many were shot, and much relished by the companies of the two ships; not having the fishy flavour that might be expected from their food, which consists commonly of small red shrimps.

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The ships proceeded with much labour and difficulty, after passing Cape Melville. The ice appeared to drift to the westward: at length the floes closed in, and the pressure was most severely felt. A floe on one side of the *Isabella* appeared to be fixed, while another, with a circular motion, was passing rapidly along. "The pressure," says Captain Ross, "continuing to increase, it became a trial of strength between the ship and the ice; every support threatened to give way; the beams in the hold began to bend; and the iron tanks settled together. At this critical moment, when it seemed impossible for the ship to sustain the accumulating pressure much longer, she rose several feet; while the ice, which was more than six feet thick, broke against her sides, curling back on itself. The great stress now fell upon her bow, and after being again lifted up, she was carried with great violence towards the *Alexander*, which ship had hitherto been, in a great measure, defended by the *Isabella*. Every effort to avoid their getting foul of each other failed; the ice-anchors and cables broke one after another, and the sterns of the two ships came so violently into contact, as to crush to pieces a boat that could not be removed in time. The collision was tremendous, the anchors and chain-plates being broken, and nothing less expected than the loss of the masts: but, at this eventful instant, by the interposition of Providence, the force of the ice seemed exhausted; the two fields suddenly receded, and we passed the *Alexander* with comparatively little damage. The last things that hooked each other were the two bower-anchors, which, being torn from the bows, remained suspended in a line between the two ships, until that of the *Alexander* gave way."

A clear channel soon after opened; and, by running into a pool, the ships escaped the more immediate danger, but were far from being in a safe condition; for the ice ran with such velocity, that, during the afternoon, and ensuing night, the officers were kept in a state of constant anxiety. Mr. Fisher says, "About midnight, the crews of both ships began to saw a dock in one of the floes; but, owing to the thickness of the ice, which was seven feet, they made so little progress, that the undertaking was abandoned after two hours' labour. Independently of this, that part of the floe on which they were at work, had, by this time, drifted very close to some icebergs to leeward, insomuch that, if the dock had been cut, it would not have been safe to get the ships into it, under these particular circumstances."

On the morning of Saturday, August the 8th, between four and five o'clock, a considerable space of clear water was made around the ships, by the opening of the floes. This favourable change relieved all apprehensions for a time; the ships were gotten under sail, and two watches of the company allowed to go to rest, of which they had much need, all hands having been on deck for upwards of twenty-four hours, and exposed, during the whole of that time, to the most inclement weather experienced since they came into these regions; for it blew very fresh, and snowed, without intermission, during the whole of the time. In fact, it was, in every respect, what would be considered a severe winter-day in England.

The weather having cleared up in the course of the morning, the ships were abreast of an island, in Prince Regent's Bay, which Captain Ross has named Bushnan's Island. In the afternoon, several of the officers of the *Isabella* went over the ice to this island, but did not meet with any thing to compensate them for so long a walk, it being at least five miles from the ships. Like several others on which they had landed, it appeared to have been once inhabited; for they found several graves on it, and a piece of stick, similar to those which, according to the information of Sacheuse, are used by his countrymen for stirring the oil and lichen in their lamps.

The ice being close to the westward, the ships made fast, in the afternoon, to the land-floe; and this afforded an opportunity of procuring a few fresh meals for the ships' companies; as, in the course of two or three hours, several hundred rotges or little auks had been shot.

To give some idea of the immense number of these birds found here, Mr. Fisher says, "I shall mention one circumstance, which will enable the reader to judge better of the prodigious flocks of them flying about, than any description of mine could convey. It is that, not less than fifty-six birds were killed by two discharges of a pair of fowling-pieces, thirty-two of them having been brought down by a single discharge. For some days past, I had observed that many of these birds had a swelling, or protuberance, in the under part of the neck. On examining several of them to day with this goitre, I found it to be a small bag, or repository, beneath the tongue, and which was filled with small red shrimps.

"On Sunday the 9th, in the morning, just as we were casting off from the floe, three sledges, drawn by dogs, were observed driving along the ice, towards the ships. There were four persons in them, two being in one sledge. After gazing for a little time at the ships, they fled with as much speed as if they had been pursued. They did not approach sufficiently near to enable us to form any thing like an accurate judgment of their appearance; but several on board were of opinion that, they were larger men than those we saw to the southward.

"In the hope of enticing them to return, provided we should be obliged to make any further stay at this place, or, at any event, with a view to spread among the natives along the coast a favourable report of us, Captain Ross put several strings of beads round the neck of one of the dogs we had procured from the Esquimaux in Jacob's Bight, and left the animal on the floe of ice from which we had cast off. One of the stools on which the compasses were placed, when taking observations on the ice, was also left, with strings of beads on it. As the ships sailed immediately after this was done, we could not assure ourselves whether they returned to pick up these articles or not; but it was probable that, the dog would, after a time, find out their habitations, and, by that mean, lead to a discovery of the rest of the presents left for them." After working to the westward the whole of the day, along the edge of the land-ice, it was found, in the evening, that there was not any passage round the point on the west: the ships, therefore, returned to the place they had started from in the morning, and there found the poor dog, together with the presents, which had been left untouched. They were all taken on board, and about midnight the ships again made fast to the floe, nearly at the spot from whence they had started in the morning.

On the following morning four sledges, drawn by dogs, were seen coming towards the ships; and, in order to induce those upon them to approach, Sacheuse was dispatched with presents to meet them. On his coming within a short distance of them, both parties stopped, apparently apprehensive of each other: Sacheuse, in the mean time, holding up the articles he had with him, with a view of convincing them of his pacific intentions. At length both parties mustered a little courage, and ultimately met; but, before the natives allowed Sacheuse to approach them, they cautioned him to be on his guard, as they had the means of killing him; brandishing their knives at the same time. After some conference, he at length succeeded in convincing them that no harm was intended, and assured them that they might come on board the ships with perfect safety, which, after some hesitation, they consented to.

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On their coming on board the *Isabella*, they appeared, for some time, lost in astonishment at the novelty of the scene by which they were surrounded; every object, in reality, attracting their attention. The height of the masts, in particular, seemed to excite their admiration; and, on their observing one of the seamen go aloft, their surprise exceeded all bounds. They gaped at him for a little time very silently, and then burst out into a most inordinate fit of laughter, which, indeed, appeared to be their general mode of expressing their surprise; for, when any thing attracted their attention in a particular manner, they constantly broke out into shouts of laughter, or rather what may be deemed exclamations of surprise, as *hy ah! hy ah!* or *heigh yaw!*

After their astonishment had subsided a little, they began to show their predilection for different things: wood and iron, in particular, seemed to be what they most valued. They appeared to be of that thievish disposition which characterises an uncivilized people; for one of them took up the armourer's sledge-hammer, and, having thrown it on the ice, immediately jumped after it, and picked it up; he then took to his heels, but, on finding himself pursued, threw it away, and did not return; a sufficient proof that he was aware of the impropriety of his conduct.

They were rather of a low stature, one of them, who was measured, being only five feet one inch and three-quarters high. Their features were rather broader than those of the natives in Jacob's Bight, to the southward. They all wore long beards, which were very thin; but, in almost every other respect, resembled the Southern Esquimaux. Their clothes were also of the same material; namely, seal-skins. Their frocks, or jackets, were indeed cut differently from those to the southward, they being provided with a flap before and behind. Their breeches, if what they wore can be said to deserve that name, were also different from those we had seen before; for they came no higher than the upper part of the thigh, the rest being covered by the flaps of the jacket, which, when they stooped to pick up any thing, left their posteriors exposed.

They appeared to be altogether in a state of nature; and so perfectly ignorant were they of whatever belongs to every part of the globe, except that which they inhabit, that they considered the countries which lie to the southward, to be less fit for men to inhabit than their own, from the quantity of snow and ice, which they said they could never pass, always to be seen in that direction. They stated that their proper country lay to the northward of this, at a considerable distance, where there is but very little snow or ice; and, according to Sacheuse's interpretation, *plenty of clear water*, that is, of sea. They said that, they come hither, in the summer season only, to hunt; and that, in a little time, they were to return to their own country, which they represented as being governed by a king whose name was Toolowah, or Tullowah, and the place of his residence Petowack. These people, as far as could be learned, entertained very imperfect notions, if any, of a Supreme Being.

It is plain that, they have never been much to the southward of this, for they never saw a ship before, nor even a canoe. From this it is evident that, they have not any communication with their countrymen to the southward. It is certainly remarkable that a people, inhabiting a sea-coast, and who procure a portion of what is essential to their existence from the ocean, as evinced by their clothes being made of seals' skins, and their spears of narwhal's or sea-unicorn's horns, should be unprovided with canoes. That such is the case, however, is beyond a doubt; since nothing seemed to surprise them more than a boat, which was launched from the ice into the water; and,

on being shown Sacheuse's canoe, they did not seem at all to comprehend the use of it. Their vessels, if they had any, must have been made of skins, as they have not any wood.

Among other proofs, if such were wanting, of their never having seen Europeans before, was the astonishment they expressed at the clothes; after feeling them, and smoothing them down for some time, they asked Sacheuse to what kind of a beast it was that these skins belonged; not doubting but that, like their own, they were made of the skin of some animal. Some other anecdotes, indicative of their utter ignorance of what regards civilization, might be adduced: one of them having been presented with a wine-glass, appeared to be very much astonished that it did not melt with the heat of his hand, no doubt from an idea that it was made of ice. A looking-glass seemed to surprise them equally, when they perceived their image reflected in it.

Their sledges were made entirely of bone, apparently of whale-bone. Each of the natives was provided with a kind of knife, made of small pieces of iron, which were set closely together in a groove made in a piece of narwhal's horn; the end-piece was rivetted, but the others were kept in their places merely by being driven tightly into the groove. Very diligent-inquiry was made as to where they found the iron of which these knives were composed; but all that could be learnt from them was, that they met with it near the shore, at some distance from this place. Hence it was supposed to be native iron, and that they were afraid of giving much information respecting it, from an apprehension of its being taken away. They promised, however, to pay another visit on the following day, and bring some of the iron with them.

The ice having opened a little on the morning of Tuesday, the 11th, the ships cast off, and stood to the westward, along the edge of the land-floe. Apprehensions were now entertained, that no more of the late visitors would be seen, but another detention by the ice reduced these apprehensions: more especially considering that a few presents had been made, consisting of nails, a hammer, some pieces of wood, with other articles.

During the greater part of the following day, the 12th of August, it blew pretty fresh, and snowed with little intermission; but, as the wind was chiefly from the southward, it had but little effect in clearing away the ice in the direction required. The ships were fast all the day to the edge of the land-ice, under the lee of an iceberg, from which a large piece of ice fell on the afternoon of yesterday, and crushed into thousands of fragments a considerable portion of a floe which was near to it, raising such a sea all around it as to be sensibly felt on board.

August 13.—Light airs to the eastward, and a rapid disappearance of the ice, seemed to promise a fair passage, and the ships ran about ten miles to the westward, along the edge of the land-floe, but were again stopped by a barrier of large floes and bergs. Land was seen from the mast-head, bearing W.S.W. Captain Ross says, the atmosphere was extremely clear, and all distant objects seemed wonderfully raised by refraction. The sun, passing in azimuth, served to delineate them on the horizon in a distinct and beautiful manner: the reflections of light on the icebergs were peculiarly splendid; the emerald, sapphire, and orange, being the prevailing colours. It was afterwards ascertained that the land seen from the mast-head must have been at the distance of, at least, 140 miles. The ice was now closing in; the weather had every appearance of a gale, and the ships again made fast.

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times came up alongside the ships; sea-unicorns were also seen; and, in the mornings and evenings, the pools of water were covered with little auks.

Soon after, three natives, at a distance, were seen, and the flagstaff, with a white flag, was again stuck in the ice. They were observed to take down the bag which was attached to it; but, after examining the contents, they restored them to their place, and returned to their sledges. Sacheuse was then furnished with presents, and sent to speak with them. He found, immediately, that they were not the persons with whom communication had been previously made, but others who had received a report from them, as to the ships, &c. Hence they approached with less timidity, and soon after went on board. Little persuasion was indeed necessary on this occasion, as they had heard of the kind reception of the former visitors. Those to day did not appear to be either so much amazed at what they saw, or so suspicious, as the first party; which arose, no doubt, from a greater confidence of personal safety. They evinced the same avidity for wood and iron as the former; and were gratified with a few pieces of each. They likewise received some other useful articles, such as needles, scissars, &c., for which, in return, they gave horns, one of their sledges, and a dog. They had knives, similar to those already described; and it appears, from what Sacheuse could gather from them, that they procure the iron, from which they are made, from a mass of native iron, distant, according to their information, about a day's journey to the eastward of this place. They likewise told him that their only object, in coming so far from their own country, which lies to the northward, is to procure some of this iron, which they break off, with great difficulty, by the means of stones, and then beat it out into the small plates of which the knives are made. On being more closely questioned respecting this iron, they described two masses of it, the largest of which they described as being about the size of the sky-light over Captain Ross's cabin, which is about four feet across: the other is considerably smaller. The place where these masses lie is called by them Soowilik, from Soowik, the name of iron in the Esquimaux language. Captain Ross says, *Sowallick*.

Mr. Fisher adds, "They entertained a singular notion respecting the place we are come from; it is no other than that we are from the moon. The reason they assigned for this whimsical idea is, that we are provided with so much wood, which, as they suppose, grows very abundantly there. They had several other ridiculous notions respecting our ships. On our first appearance they fancied each of the masts to be a tall man, come to destroy them; and so strongly were they impressed with the idea that the ships were animated beings, that one of the first questions they asked Sacheuse was, 'Whether they could fly as well as swim?'"

"The ice being still close to the westward, we were necessarily obliged to pass the whole of the day, Friday, the 14th, in the same place, since the idea of pushing out among the loose or drifting floes to the southward, was, it would appear, considered to be highly dangerous, after what we had latterly experienced from leaving the land-ice. The weather, for the last two days, had been, in general, thick, with occasional falls of snow, and a fresh breeze from the southward.

"We had, to day, another visit from the natives, whose number was greater than on the former occasions; there being nine in the party. They came, as usual, in their sledges, which they left, together with the dogs, on the ice, at the distance of about a mile from the ships." Notwithstanding these poor animals remained at this distance, without any one to watch them, still they never stirred from the spot; a strong proof, if any were needed, of the sagacity

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city of these faithful companions, or useful servants, of man. The number in each sledge varies, but is, generally, from five to seven. They are usually yoked in pairs, with a leader, or single one, before. They are guided by the means of reins, or thongs, made of the skins of the walrus, or what appeared to be so. On each sledge was an inflated seal-skin, which was supposed to be for the purpose of buoying up themselves and the sledge, when crossing that water which occasionally intervenes by the separation of the floes on which they may happen to be. Such a contrivance must, at times, be absolutely necessary to them; as they have no canoes.

The Esquimaux this day exhibited the manner in which the seals are caught on the ice; which is done by lying down, and grunting exactly like these animals, and hopping along, at the same time, on the elbows, with a motion so perfectly resembling that of a seal, that it is by no means a matter of surprise that these creatures should be deceived by it.

The number of little auks, or rotges, on the water around the ships, seemed, if possible, to have increased within the last two days: as a proof of their great abundance, with three muskets, the officers of the Alexander killed in one day, not less than 1263 in 5 or 6 hours; 93 of which were brought down by one discharge. A certain proportion of them had been generally served out to the ship's company for some time past, and the others were skinned and packed in casks, between layers of pounded ice, for future use.

The bay westward of Cape Melville, in which the natives first appeared, Captain Ross denominated PRINCE REGENT'S BAY; and, to the country between the latitudes of 76° and $77^{\circ} 40'$, longitude 60° to 72° , he imparted the name 'ARCTIC HIGHLANDS:' but, as the latter may, with propriety, be extended to all the country around the head of Baffin's Bay; the 'ARCTIC LANDS' of the old Charts, we have taken the liberty of so extending it on the new.

The land, which is here described by Captain Ross, is bounded on the south by an immense barrier of mountains covered with ice, taking its rise in lat. $74^{\circ} 30'$, and extending to 76° . As far as could be judged from its appearance, it is impassable; and, in many places, the solid ice extends for several miles into the sea from the precipices with which it is connected. The interior country presents an irregular group of mountainous land, declining gradually from the high ridge towards the sea, which it reaches in an irregular manner, and still at a considerable elevation; the sea-cliffs ranging from 500 to 1000 feet in height. This tract is almost entirely covered with ice. On the surface of the land, above the cliffs, an appearance of a scanty vegetation, of a yellow green colour, and sometimes of a heath brown, was to be seen; and, at the foot of the cliffs, similar traces of a wretched verdure were also apparent. Among the cliffs are seen deep ravines filled with snow, through which the marks of torrents were perceptible: these cliffs, in many places, form capes, and are skirted by islands, which are clear of sea-ice, and therefore washed by the waves. Hence, adds Captain Ross, it probably happens that the snow does not lie there, and thus they assume the appearance of the verdure just described. This coast is, therefore, the resort of wild fowl in the breeding season; and, from its exposure to the sea-winds, must be sooner and longer open than the more southern parts, which are narrower; and, where the water is shallower, from the same reason, it must be both sooner and later the resort of seals and sea-unicorns.

The vegetable productions of the country may be said to consist of heath, moss, and coarse grass. There is nothing like cultivation; nor does it appear that the natives make use of vegetable food. The moss, which is six or eight

eight inches or sea-unicorns, and war shelter for the stems of they manage

Captain Ross success in numerous, but season. "clean, can they are oftening so small or parsimony crews from their character remaining tw safety and ea solved.

" Besides as numbers catching ther sition as the which they d seal and the bear's teeth, procured for heads, pieces cheap and use and to that of

Captain Ross many of which maux.* The themselves to world was a Greenland, th the moment th maux, these a for, by their t be used in thei

On the 16th prospects, and of the ice, wh rived at the b ernmost land aground on ea water. The ed Cape York N. direction. four miles; at

eight inches in length, when dried and immersed in the oil or blubber of the seal or sea-unicorn, serves for a wick, and produces a comfortable fire for cooking and warmth, as well as for light. The heath and grass serve for food and shelter for the hares and game, which the natives say are in abundance; and the stems of heath, tied together, make a good handle for the whip with which they manage their dogs.

Captain Ross observes that, the whale-fishery might be pursued with great success in Prince Regent's Bay; the fish here being not only large and numerous, but easily taken: and he thinks that the Bay may be visited every season. "The circumstance of the ships employed in the fishery returning *clean*, can only be attributed to their leaving the bay before they ought. This they are often obliged to do from want of provision, and the practice of sending so small a supply, which is too often the case, either from the illiberality or parsimony of the owners; as it is, it not only prevents the masters and crews from standing a fair chance with those better provided, to the ruin of their character and employment, but to the imminent risk of their lives. By remaining twelve or fourteen days longer than the usual time, ships might, with safety and ease, reach these hordes, load, and return when the ice has dissolved.

"Besides this, it is probable that, a valuable fur-trade might be established; as numbers of black foxes were seen, and also the traps used by the natives for catching them. There can be no doubt that a people, of so harmless a disposition as the Arctic highlanders, might be easily instructed to collect these skins, which they do not seem to value, or to make so much use of as those of the seal and the bear. The ivory of the sea-unicorn, the sea-horse's teeth, and the bear's teeth, may also be considered as articles of trade. All these could be procured for European commodities, such as knives, nails, small harpoon-heads, pieces of iron, wood of any description, crockery-ware, and various cheap and useful utensils and tools; both to the great benefit of the merchant, and to that of this secluded race of human beings."

Captain Ross has given a vocabulary of many words collected by Sacheuse, many of which are, as he has shown, the same as those of the southern Esquimaux.* The people seem to know nothing of their own origin, and believed themselves to be the only inhabitants of the earth, and that all the rest of the world was a mass of ice. It is generally believed by the natives of South-Greenland, that they are themselves descended from a nation in the north; and the moment they were discovered, Sacheuse exclaimed, "These are *right* Esquimaux, these are *our* fathers!" Their having no canoes is easily accounted for, by their total want of wood, and the very short time that their canoes could be used in their seas.

On the 16th of August, the ships were again under sail, with more cheering prospects, and a fine breeze from the north. On proceeding along the margin of the ice, which appeared to be attached to the land, for two hours, they arrived at the barrier of icebergs, already described as stretching from the northernmost land in sight towards the west. These masses were found to be aground on each side of a shoal, having, on some spots, about 40 fathoms of water. The navigation again became intricate; but, at four, the ships rounded Cape York, (Point Sichilik of the natives), whence the land takes a W. by N. direction. The ships now stood along the coast, at the distance of about four miles; and, for the first time, the sea was seen to wash the rocks. The

* See the relation of the Voyage, quarto, page 122.

wind being light, a boat was sent to the shore, for the purpose of finding the habitations of the natives, and to make other observations. In the mean time, soundings were obtained, and shells, with other substances, brought up from the depth of 50 fathoms. At midnight the boat returned, with various specimens of grass, moss, and stones, but no natives nor habitations had been seen. Many black foxes were seen by the officers, and also some white and red-coloured, but none were taken.

On the 17th, the course was continued along the land, at the distance of 5 or 6 miles, among numerous bergs and pieces of ice. By the former, which were aground in 50 fathoms, it was found that the tide began to carry the ships to the eastward, and it was found that the stream ran about one mile in an hour. It was soon after discovered that the snow, on the face of the cliffs, presented a novel and interesting appearance, being apparently stained, or coloured, by some substance, which gave it a deep crimson colour. A party were sent on shore, to bring off some of it, and to procure specimens of the productions of the country. The boat arrived there nearly at low water, and it was found that the tide had fallen nine feet. No inhabitants were seen. The velocity of the tide, which was at the highest springs, was found to be one mile an hour, and its direction W.N.W. and E.N.E. The main body of solid ice appeared a few miles to the south-westward, and innumerable icebergs were seen in every direction.

In the evening of this day, Cape Dudley Digges was seen. This had been described by Baffin, as being easily known by a small island which is off it. The island is very rugged, but of a conical shape. It was perfectly clear of snow, and appeared to be about four miles distant from the pitch of the cape: bold on the outside, but having a rippling within, which indicated shallow water. The ice, from its situation, compelled the ships to pass very close to the island; the hand-lead was kept going, and a good look-out for rocks, from the jib-boom end and crow's nest. On proceeding, a considerable swell was met with, and soon after water, clear from ice, as far as could be distinguished from the mast-head.

August 18.—Cape Dudley Digges appeared to form a precipice about 800 feet in height; it was perfectly clear of snow, and presented a yellowish vegetation at the top, behind which, at the distance of about 18 miles, there appeared to be high mountains covered with snow. The land now appeared to trend to the northward, and to have several inlets, filled with glaciers, some extending to a considerable distance into the sea. The cliffs were, in most places, perpendicular, but there were chasms and ravines, in which were the marks of torrents. At about six miles to the northward of Cape Dudley Digges, a beautiful glacier was seen, filling a space about four miles square, and extending one mile into the sea; its height being, at least, 1000 feet. To the north of this several huts were plainly distinguished, which Captain Ross supposed to be Petowack.

Wolstenholme Island was now in sight to the northward, the ships were steering for it with a fine breeze, and the sea was almost clear of ice. A boat was sent out to examine Wolstenholme Sound, but recalled, in consequence of a fog. A remarkable rock was, nevertheless, seen, and called Dalrymple Rock, as were the points of the Sound, Cape Athol and Cape Stair.

On closing this part of his description of a tedious and toilsome progress through six hundred miles of ice, Captain Ross has given some general, but striking and useful, remarks on the atmospheric phenomena which he had ob-

served, and service.

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served, and on the treatment of those under his command during this period of service.

"We were occasionally visited," he says, "by fogs, which were, in general, extremely thick, and of a very white appearance, while in the zenith the blue sky was apparent. At this time, the thermometer is generally at the freezing point; the moment this fog touches the ropes of the ship, it freezes, and these are, in a very short time, covered with ice, to the thickness of a man's arm, and at every evolution of the ship it covers the deck with its fragments. In the absence of these fogs, we had sometimes the atmosphere most beautifully clear; the objects on the horizon were often most wonderfully raised by the powers of refraction, while others, at a short distance from them, were as much sunk. The use of the dip-sector was totally suspended, as no satisfactory result could be obtained from it. These objects were continually varying in shape; the ice had sometimes the appearance of an immense wall on the horizon, with here and there a space resembling a breach in it; icebergs, and even small pieces of ice, had often the appearance of trees; and while, on one side, we had the resemblance of a forest near us, the pieces of ice, on the other side, were so greatly lengthened, as to look like long low islands.

"We were often able to see land at an immense distance, and we have certain proof that the power of vision was extended beyond one hundred and fifty miles. I made many observations with my sextant on the phenomena just described, and often found the same object increase in its altitude half a degree in the course of a few minutes. The high rock off Cape Dudley Digges was observed to increase in altitude from 2° to 5° within an hour; in the course of the next half hour it decreased to the appearance of a speck on the water, and soon after it became like a long low island, in which state it remained for some hours, when it resumed its natural shape. While the moon was in sight, she had the appearance of following the sun round the horizon, and while these bodies were passing in azimuth along the tops of the mountains, the snow, which covered them, and which had naturally a yellow tinge, had then the lustre of gold, and the reflection of these upon the sky produced a rich green tint so delicately beautiful as to surpass description. On the other hand, the rays of the sun darting over the tops of the mountains, came in contact with the icebergs, which appeared like so many edifices of silver, adorned with precious stones of every variety.

"The rules and regulations, necessary to be attended to by the officers and crews of the expedition under his command, are given by Captain Ross, at the conclusion of his narrative. He adds, "It is, therefore, unnecessary for me to dwell on the subject of discipline, which is so essentially requisite, in order to preserve the health of the men. In the course of our tedious, and often laborious, progress through the ice, it became necessary to keep the whole of the crew at the most fatiguing work, sometimes for several days and nights without intermission. When this was the case, an extra meal was served to them at midnight, generally of preserved meat; and I found that this kind of nourishment, when the mind and body are both occupied, and aided, no doubt, by the continual presence of the sun, acted as a substitute for sleep, and they often passed three days in this manner without any visible inconvenience; after a meal of this kind, they returned to their labour on the ice, tracking and warping, or in the boats towing, quite refreshed, and continued at it without a murmur. No doubt the exercise was a considerable preventive to scurvy, which was the complaint most to be feared. As long as the vegetables lasted, no lime-juce was served; when the men got wet, which often happened, they were made to shift their clothes, and put

put on dry ones: caps of canvass, lined with flannel, were made for them; these were conical in shape, and made large enough to come over the shoulders, buttoning under the chin; they had the effect of keeping the neck and breast warm, and, being painted on the outside also, turned the water off effectually: they were made use of in rainy, snowy, or foggy, weather. With these precautions, and the men being all of good constitution, we never had a sick person, and when we arrived at this part of our voyage, no crews were ever in higher health or spirits."

THE NORTH-WESTERN AND WESTERN COASTS OF BAFFIN'S BAY.

By reference to the Chart, the course of the ships from Wolstenholme Sound, westward, will be clearly understood. The Sound appeared to be completely blocked up with ice; the land on each side to be habitable, but no habitations were seen. The entrances and general appearance accorded with the description of Baffin, as well as its bearing and distance from Cape Dudley Digges. After the *Isabella* had passed this Sound, on the 18th of August, a breeze, which had blown for some hours, gradually subsided into a calm; it was then ascertained that there was no current, and that the tide was small. The bottom was found to be rocky at the depth of 250 fathoms. Whale Sound was now seen in the distance, but the ice rendered it inaccessible: the land to the northward of this Sound appeared to be very mountainous, and to take a westerly direction. At nine *p. m.*, the weather being clear, Carey's Isles were discovered; these also agreed with the description of Baffin. The sea was now more clear of floes and loose ice than it had before been seen, but a vast number of very large icebergs were in sight; most of them aground in 250 fathoms, and they appeared to have been long washed by the waves. At eight, next morning, the *Isabella* was abreast of the westernmost of Carey's Islands, whence she stood to the N.E., in order to get a better view of the land. Here it was ascertained that there was no farther a passage to the north, and a course to the westward was resumed. At two, land was discovered to the S.W. Every object seemed to be much raised by refraction, and several observations confirmed what has been already said on that subject. The weather continued clear until near one in the morning, and the sun, passing in azimuth below the pole, along the tops of the mountains, afforded a distinct view of the bottom, or north side, of the bay. Smith's Sound, discovered by Baffin, was seen, and the capes forming its entrance were named after the two ships, *Isabella* and *Alexander*. Captain Ross estimated the Sound to be 18 leagues off, with its entrance completely blocked up with ice. A thick fog soon obscured it, and the ship hauled again to the westward.

On the next day the land was distinctly seen, forming a chain of mountains from Smith's Sound to the westward, and Captain Ross has stated that it was his intention to have examined this bay, which was evidently the northernmost, in order to determine its figure, but a firm field of ice occupied the whole of its surface, at the outer edge of which lay a ridge of large icebergs, apparently aground.

From observations now made, the rise and fall of the tide was found to be only four feet; its strength half a mile an hour; the flood setting to the north.

On the morning of the 21st, the *Isabella* shaped her course towards Cape Clarence. The land of this cape is exceedingly high, the mountains peaked, and generally covered with snow, the tops appearing above the clouds; the precipices only being black, as they had no slope for the snow to rest on.

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The preceding description of the passage over the bay, from Wolstenholme Sound to Cape Clarence, is an abstract from the voyage of Captain Ross: the following is another, from the journal of Mr. Fisher.

On Wednesday, the 19th, we came to a group, consisting of seven or eight islands, three of which were considerably large: these we supposed to be Baffin's 'Carey's Islands.' They lay, as nearly as we could estimate, off the coast, at about the distance he represents, 12 or 13 leagues. To the northward and eastward of them was a blank space, where no land was discernible; and this we supposed to be the entrance of Baffin's 'Whale Sound'. The centre of this opening bore N. 23° E. *true*, at noon. The land westward of it was seen very distinctly to a considerable distance; and, at about one o'clock, it was reported that land was seen N. W. by compass, (S. W. by S. *true*;) and from that point all round to the main-land to the eastward. "A report of such importance brought us all on deck immediately; but, for my own part, without trusting more to my imagination than to the evidence of my eyes, I could not venture to pronounce that I had seen any thing more than what is commonly called the 'loom of the land.' It was, indeed, said that a haze had come on soon after it was seen: but it is to be hoped that all doubts on this subject will soon be decided by ocular demonstration. As far as I can judge, every thing at present (midnight) seems favourable to this, as we have a fresh breeze from the southward and westward, by compass, and the sea is quite clear of ice, with the exception of a loose stream to the N. W. by compass, (S. W. by S. *true*.)

"Our latitude to-day, at noon, was 76° 29' 27", and longitude 73° 14'. The variation, by the mean of several azimuths, taken on board, was 101° 30' W. (*nine points*). The magnetic dip, as observed by Captain Sabine, on an iceberg, was 85° 44' 38". The Carey Islands bore at noon from N. 9° W. to N. 22° E. *true*; and the north-westernmost of them was estimated to be about 12 miles distant, which would make its latitude to be about 76° 41' 21", and its longitude 73° 22' 30". At four, *p. m.* we tried for soundings, with a line of 200 fathoms, without finding bottom. At seven o'clock, in the evening, the westernmost of the Carey Islands bore N. 64° E. *true*, about 9 or 10 miles.

"On Thursday, the 20th, at four *p. m.* the weather having cleared up, we saw very distinctly the west land, said to have been seen yesterday, extending from N. $\frac{1}{4}$ E. to N. E. by E., by compass, distant 9 or 10 leagues. The features of this land are quite different from those of the land we have lately passed, it being more rugged, more elevated, and terminating in sharp cliffs. It differs, also, from that lately seen, in being almost completely covered with snow. Soon after the west land was seen, one of the Carey Islands was observed to bear S. by W., by compass, (nearly E. *true*).

"During the remainder of the day, I passed the greater part of my time on deck, anxious to see whether the main-land to the eastward, that is, the coast of Greenland, and that to the westward, joined; but this I had not, at any time, the good fortune to see, although, from ten o'clock until midnight, the weather was remarkably fine and clear. It is probable that the chasm, or open space, to the northward, where not any land could be traced *by me*, might be that which Baffin calls Sir Thomas Smith's Sound; and if, agreeably to his relation, this is the 'deepest and largest sound in all this bay,' it is not likely that we should have seen the bottom of it at such a distance; as we estimate that we are twenty leagues from the northern extreme of the west land visible. By this estimation the latitude of the northernmost land seen will be about 77° 39'.

"Our latitude to-day, at noon, was $76^{\circ} 40' 52''$, and, at 50 minutes after 12, *a. m.*, being the time when we were farthest north, $76^{\circ} 46' 40''$. Our longitude at that time, by account, was $73^{\circ} 56'$. The magnetic dip was taken on an iceberg, in the afternoon, and found, by the mean of three observers, to be $86^{\circ} 8' 29''$. They found, also, at this iceberg, a tide setting E. by N. true, at the rate of one mile an hour: it was ebbing, but fell an inch or two only at the time they were there.

"We found soundings at night in 85 fathoms. There was then a remarkable difference in the specific gravity of the sea-water, it being 1027.1, (temperature 42°) which is greater than we had found it since the fifth day of July.

"Between eleven and twelve o'clock, *p. m.*, we made sail to the southward, and abandoned the search for a passage in this quarter, from a thorough conviction, I should hope, that not any such passage exists here.

"On Friday, the 21st, on the west land, nearly opposite to where we were last night, before we made sail, we saw an immense glacier, which extended from a large valley, at least two or three miles into the sea, and sloped gradually from the land towards its outer edge, which was, I think, fully three miles in breadth. I do not entertain any doubt but that the icebergs are fragments of these glaciers, when they break off from the land."

Captain Ross observes that, after leaving Wolstenholme Sound, the ice met with had assumed a very different character from any before met with; it had, generally, a green tint, and appeared to have been a long time at sea, without being in a state of decay. It appeared in huge irregular pieces, heaped upon each other by some tremendous force, and then frozen together. The land from the cape towards the west, presented some deep ravines, which were filled with ice, as already described. There was no appearance of vegetation, nor did the land appear habitable; very few birds were seen, and no whales, or any other living creatures than seals, which were, however, in abundance.

22d August.—A thick fog and calm until a few minutes before noon, when the sun appeared, and the latitude, with longitude, were determined. On the 23d, the weather was not foggy near the ships, but so thick around the horizon, that no land could be seen. Towards evening, however, the two points of land were discerned, which were supposed, from Baffin's description, to form the entrance of Jones's Sound. At midnight, a ridge of very high mountains was seen to extend nearly across the bottom of it, and joining another from the south, which was not quite so high. The bay was completely blocked with ice, in which were some very large icebergs; and, from the points of land, glaciers of solid ice were seen extending for many miles into the sea. Many seals were seen, and the tracks of bears were visible on the ice in many places. On the 24th, the weather being clear, the land about Jones's Sound was more distinctly seen, but a fog came on, so that even the passages through the ice could not be distinguished, and the *Isabella* was again made fast to an iceberg. This position was remarkable for variety in the depth of the water, and quality of the bottom. Where the ship made fast, the depth was 78 fathoms; soon afterwards, 160; then 85; then 200, 150, and 185, within a short distance from each other: in the shallowest part, the bottom was of muddy sand and shells; at one time a small piece of coral; at 85 fathoms, rocky; at 160, stones; at 200, mud; and, at 150, mixed blue and gray clay, with *worms in it*. A great number of seals were still in sight. The night was remarkable for being the first in which the sun had been observed to set since June 7; thus terminating a day, which consisted of 1,872 hours, and giving warning of the approach of winter.

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* Enshrined
compliment to
by Captain Ross
—Ed.

† Captain Ross

August

August 25 and 26.—Variable weather, with fog. The land was again seen at midnight of the 25th. A bay to the southward was named Lady Anne Bay, and mountains to the westward of it, the highest hereabout, Barnard's Mountains. As it became calm, all boats were employed in towing; and, passing through some heavy ice, came to some large icebergs, aground on the edge of a bank, over which was a depth of 57 fathoms. The *Isabella* again made fast to an iceberg, which was 104 feet high, 600 long, and 400 broad. Soundings were obtained in 60 fathoms, at several casts, stones and shells; at others, sand, mud, and worms. The icebergs here were only three-fourths under water: those to the south were five-sixths. On the 26th, the *Isabella* was under sail, keeping company with the *Alexander* by firing musketry. At intervals the land was seen, apparently within six miles. With the lead going, various soundings were taken; under 60 fathoms, rocky bottom; between 60 and 70, coral; above 70, mud; the shoalest water was 45, and the deepest 85, fathoms. This was on a bank extending in a north and south direction, at the distance of 5 or 6 leagues from the land: a vast number of icebergs were aground on it, surrounded by other ice. The shore was rendered inaccessible by the ice, which extended compactly about it. Numerous and immense glaciers extended outward for several miles. Off the southernmost point in sight a very remarkable conical rock, with a small one near it, of similar form, were seen; and, when abreast of it, a large bay, filled by a glacier, was discerned. This was named Coburg Bay; the headland Cape Leopold; the remarkable rock near it, Princess Charlotte's Monument.* Many seals, with some Ivory Gulls and Kittiwakes, were seen this day; but no rotges or little auks. Not a single whale had yet been seen on this side of the bay.

A southerly course was continued on the 27th, the wind easterly. Coburg Bay was found to be completely occupied by an impenetrable Glacier, and the inland chain of mountains continued uninterruptedly to the southward. The cape forming the southern boundary of Coburg Bay was named Horsburgh, in compliment to the Hydrographer of the East-India company. The land thence, southward, terminates in a high and bold promontory, now named Cape Cockburn. The latter is completely covered with snow, excepting where the precipices are too perpendicular for it to rest on. The valleys and ravines hereabout were filled with ice, and the coast rendered totally inaccessible by surrounding masses. Banks's Bay, south of Cape Cockburn, was, also, occupied by the ice. The ship's progress, during the last twenty-four hours, was accomplished with much difficulty, among innumerable masses of ice, care being taken to avoid the *tongues* beneath the water, which are known by its more green appearance, on keeping a good look-out.

LANCASTER'S SOUND.—On the 28th of August, Cape Charlotte, upon the north side of the entrance of Lancaster's Sound, was seen bearing S. S. W. † The land hereabout could not be approached nearer than to the distance of five leagues, the packed ice along it being impenetrable, although upon the sea, to the westward, from North to South, nothing but clear water was to be seen. The *Isabella* continued to beat along slowly to the southward. The mountains now appeared to be covered with snow only partially; and even at the very tops of them, above the clouds, black rocks were plainly seen: their

* Enshrined, as she is, in the memory of the British nation, it is unnecessary to add a compliment to the memory of the Princess Charlotte. The figures selected and represented by Captain Ross are so expressive, that they, once more, excite our sympathy and our tears.—ED.

† Captain Ross says, S. S. E., which is impossible. We presume that he meant S. S. W.—ED.

sides, towards the sea, were almost clear of snow, and a portion of the country appeared as habitable as that on the opposite side, which was found to be inhabited. Towards midnight a thick fog came on, which continued till the next day, at noon. At four, the ships were at a considerable distance from the edge of the ice, when the temperature of the water, on the surface, was found to be 36°. At 5 h. 30 m. the mountains near Cape Charlotte bore West. Shortened sail for the Alexander, and sounded in 210 fathoms. A swell from the S.S.E. At midnight the weather was thick and foggy.

Sunday, August 30.—The weather still thick and cloudy; but, at about ten, the land forming the northern side of Lancaster's Sound was seen, appearing in a chain of high mountains covered with snow. Soon after the south side was discovered, forming also a chain of very high mountains: but, in the space between West and S.W., the sky appeared yellow, and no land was seen, nor was there any ice on the water, excepting a few icebergs. Here, from good observations, the latitude and longitude were accurately determined, and the bearings of the land were taken. In the afternoon, after divine service, upon standing to the southward, Captain Ross says, "We had an excellent view of the most magnificent chain of mountains which I had ever beheld." These mountains, and the cape which terminates them, were named after Sir Byam Martin and his family. Taking their rise at the sea, on the east, and from a low plain near Catherine's Bay, on the west, they terminate in sharp lofty peaks; "the rocks which form them being, on one side or the other, and often on every side, too perpendicular for the snow to rest upon, are seen distinctly above it, displaying the most remarkable as well as wonderful appearances. In one place, nearly between Cape Fanshawe and Elizabeth's Bay, two rocks, resembling human figures of a gigantic size, were seen, in a sitting posture, on the highest peak; and, as it was considerably above the clouds, their appearance was both extraordinary and interesting. The snow appeared deep in the valleys of the interior, but the ravines next the sea were filled with it only partially, and the precipices near the foot of the mountains were perfectly bare. The low and level tract of land forming Catherine's Bay was, also, perfectly clear of snow, and was, to all appearance, the most habitable situation on the coast."

The rest of the day, in the Isabella, was spent in beating to the westward, under all sail. As the evening closed, the wind died away, the weather became mild and warm, the water much smoother, and the atmosphere clear and serene. Captain Ross now says, "For the first time we discovered that the land extended from the south two-thirds across this apparent strait; but the fog, which continually occupied that quarter, obscured its real figure." The temperature of the water, at four p. m., was 36½°, exactly in the centre of the mouth of the Strait. The close of the evening was remarkable, from the appearance of Capella, the first star seen for twelve weeks.

The ordinary indications of a passage had not yet been seen, "no appearance of a current, no drift-wood, no swell from the northward." Soon after midnight, the wind enabled the Isabella to stand directly up to the westward, under all sail; the Alexander being then considerably astern, or to the eastward. At a little before four, a. m., land was seen at the bottom of the inlet by the officers of the watch: but, Captain Ross says, "Before I got upon deck, a space of about seven degrees of the compass was obscured by the fog. The land which I then saw was a high ridge of mountains, extending directly across the bottom of the inlet. This chain appeared extremely high in the centre, and those towards the north had, at times, the appearance of islands, being insulated by the fog at their bases. At eight, the wind fell a little, and the

Alex-

Alexander bottom. was 29½° the Alexander variable, sanguine, came thick space. 7 and bearing

The Isabella on the north-northeast side of the Strait nearly on the S. E.

At about four cleared up round the which extended the distance leading to log. The moment of seven

The Isabella of eight r swell. A strong breeze not be seen ceased to water, the

At four noon, present. To the order to take specimens been seen high water distance from the mine, a officers returned, where the bed was and, at a distance from which flowers; snow. C with verdure been seen stream no was found

The journal says, "A

Alexander being far astern, I sounded, and found 674 fathoms, soft muddy bottom. There was, however, no current, and the temperature of the mud was $29\frac{1}{2}^{\circ}$. Soon after this the breeze freshened, and we carried all sail, leaving the Alexander, and steering directly up the bay. The weather was now variable, being cloudy and clear at intervals. Mr. Beverley, who was the most sanguine, went up to the crow's nest; and at twelve reported to me, before it came thick, that he had seen the land across the bay, except for a very short space. The land to the S.E. was very distinct, and I had an excellent transit and bearing of Cape Byam Martin and Cape Fanshawe."

The Isabella continued to stand up the bay; and, in proceeding, descried, on the north side, a remarkable conical rock, which Captain Ross has denominated Sir George Hope's Monument. At about one, the Alexander, being nearly out of sight, the Isabella hove-to for half an hour, and again made sail. The S.E. swell had now increased.

At about three *p. m.* Captain Ross, being on deck, states that the weather cleared up for about ten minutes, and that he then "distinctly saw the land, round the bottom of the bay, forming a connected chain of mountains with those which extended along the north and south sides. This land appeared to be at the distance of eight leagues; and Mr. Lewis, the master, and James Haig, leading man, being sent for, they took its bearings, which were inserted in the log. The water, on the surface, was at the temperature of 34° ." At this moment Captain Ross says that he also saw a continuity of ice, at the distance of seven miles, extending from one side of the bay to the other.

The Isabella now tacked to join the Alexander, which was at the distance of eight miles: this effected, they stood to the south-eastward against a heavy swell. At six *p. m.*, upon trial, no current was found. At about eight, a strong breeze came on, and it was so dark and thick that the Alexander could not be seen: the motion of the ship was now considerable; and the compasses ceased to act; but at about ten, with a south-westerly wind and smoother water, they again began to traverse.

At four *a. m.*, September 1.—Cape Byam Martin was in sight. Towards noon, preparations were made for landing in a small bay to the northward of it. To this spot two boats, under Lieutenant Parry, were dispatched, in order to take possession of the country. These returned at six *p. m.* with many specimens of the animal, vegetable, and mineral kingdoms. A white bear had been seen and wounded; the skeleton of a whale was found 500 yards above high water mark, and two small pieces of wood were found at a still greater distance from the sea. No traces of inhabitants were seen. The deer, fox, ermine, and white hare, were either seen, or proved to be in abundance. The officers reported that, they landed on a single beach, at the mouth of a small river, which was described to be 100 feet wide, and the water two feet deep: the bed was 12 feet deep, and several pieces of birch bark were found in it; and, at a little distance from these, a smaller river was discovered. The valleys from which these proceed were found to be covered with verdure and wild flowers; the mountains on each side were immensely high, and covered with snow. On the S.E. of the valley was a small plain, which was also covered with verdure, and the scenery, altogether, was more pleasing than any that had been seen during the voyage. The vertical rise of tide was four or five feet; stream not perceptible; the water deep close to the shore, and no anchorage was found.

The journalist of the Alexander, in alluding to the incidents of the 31st, says, "At this time our distance from the northern land was estimated at seven

or eight leagues, and from the southern, six or seven leagues; but, alas! the sanguine hopes and high expectations excited by this promising appearance of things were but of a short duration; for, about three o'clock in the afternoon, the *Isabella* tacked, very much to our surprise indeed, as we could not see any thing like land at the bottom of the inlet, nor was the weather well calculated at the time for seeing any object at a great distance, it being somewhat hazy. When she tacked, the *Isabella* was about three or four miles ahead of us; so that, considering the state of the weather, and a part of this additional distance, for we did not tack immediately on her tacking, but stood on towards her, some allowance is to be made for our not seeing the land all around. Ocular demonstration would certainly have been very satisfactory to us, on a point in which we were so much interested; but we must be content, as there cannot be any doubt but that all in the *Isabella* were fully convinced of the continuity of land at the bottom of this inlet, or, as I may now venture to call it, agreeably to Baffin, Sound.

"During the whole of the night we were running out of the inlet; and, in the morning of Sept. 1, were so clear of it, that the northern land was but very indistinctly seen. The sea was perfectly clear of ice, with a considerable swell, and the weather remarkably fine and clear."

Mr. Fisher afterwards, in describing the country about Possession Bay, says, "It would require an able botanist to describe the different vegetable productions we met with: some of them were extremely beautiful, but they were all of a dwarfish size, not any of them being larger than the creeping or ground willow, which seldom or ever exceeds the thickness of a man's finger. This sterility must certainly be owing to the rigour of the winter, as there was a considerable layer of soil along the banks of the stream. Throughout the whole of the valley, which was of considerable extent, not a particle of snow was to be seen. The tops of the hills were, indeed, covered with it, but their sides, for a considerable distance up, were as clear of it as the sea-shore. We were very much surprised at not finding any inhabitants in this place, which is, according to our ideas, the fittest for man to live in of any we have seen since we came to these regions. It appeared, indeed, to be but thinly inhabited by any of the animal creation."

In the evening were seen several large fish, having on the back a long fin, and supposed to be whales of the bottle-nose species.

Sept. 3 and 4.—The two ships were now proceeding to the southward: the weather frequently thick and foggy. In the morning of the 4th, two inlets were passed to the south of Cape Byam Martin. These had the appearance of harbours, but were found to be filled with impenetrable ice. A cape to the southward was named Cape Bathurst, and the bay between it and Cape Byam Martin was named Bathurst Bay. The coast hence trended S. E., and the interior presented an uninterrupted chain of mountainous land. At ten *p. m.*, with a light breeze from the N. E., the *Isabella* proceeded to the S. E., under all sail, taking every necessary precaution and heaving-to for the purpose of sounding, when sufficiently a-head of the *Alexander*. When the wind came fair this evening, great difficulty was found in shaping a course, as a thick fog came on; the ship had considerable motion, and all the compasses, for a time, ceased to act.

Sept. 5.—The ships were proceeding S. E. by S., and a high cape, now Cape Graham Moore, was seen. To the southward of this was a wide inlet, afterwards found to be occupied by a glacier, and named Pond's Bay. To the southward, two other capes, Bowen and M'Culloch, were seen; then Cape

Coutts,

Coutts, Coutts were more or less of those near points of land on coast, and had direction. T. mar petrels.

Sept. 6.—(1050 fathoms north, only 10 be exceedingly few stones appeared to be

Sept. 7.—(and variable, small islands, On tacking he is, nearly two considerably; with ice: it wind shifted to S. E. got up, compass. At On the 9th, v Adair, which Within six miles southward of named Ardrossan from that to shape at the top equally high,

Sept. 10.—the distance from a reef appeared snow on it, and A small island a landing being monument, is not at top, but rather short distance as the remainder indicated; the tide high water, to

Agnes' Monument a dangerous reef from the ship, the *Alexander* immediately at more than 113 fathoms.

Bruce Bay is snow: in the

Coutts, Coutts' Inlet and Cape Autrobus. The mountains in the interior were more completely covered with snow than those about Coburg Bay; the face of those near the coast were clear of snow, as were also some low projecting points of land. During this day, the ships had run down above 70 miles of the coast, and had seen several large icebergs, which were floating about in every direction. Two whales were seen off Coutts' Inlet, but no birds excepting Fulmar petrels.

Sept. 6.—Calm and variable. At 6 *p. m.* sounded, and found bottom at 1050 fathoms, the deepest found in Baffin's Bay. At 15 miles farther to the north, only 120 fathoms were found; therefore the bottom of the sea must here be exceedingly irregular or mountainous. The bottom was of soft mud, with a few stones and some sand. The nearest land was very high, and every inlet seemed to be filled with ice.

Sept. 7.—Cape Adair was seen at a great distance, the weather again calm and variable, with a shower of snow. The land still very high. The two small islands, Bell's and Maryanne's, seen, with many icebergs and glaciers. On tacking here, the aberration of the compass amounted to four points; that is, nearly two points on each side. At four *p. m.* an adverse breeze freshened considerably; the weather became thick, and the rigging was soon covered with ice: it was therefore necessary to get a better offing, especially as the wind shifted more to the eastward. Towards midnight the swell from the S. E. got up, and the ships made a great deal of drift; the wind being south by compass. At sun-set, on the 8th, the land about Hamilton Bay was seen. On the 9th, with a shift of wind to the north, a course was shaped for Cape Adair, which had been previously seen, and Cape Eglinton was discovered. Within six miles of the latter, bottom was found in 49 fathoms. A bay, to the southward of the Cape, which had the appearance of a good anchorage, was named Ardrossan Bay. This part of the coast assumed a different character from that to the north; the mountains being more detached, of a rounder shape at the top, and less covered with snow; but in the interior they were equally high, and had a similar appearance.

Sept. 10.—With the weather pretty fair, the ships bore up along the land to the distance from it of about three miles, and rounded a low point, from which a reef appeared to extend about one league into the sea. This point had no snow on it, and the mountains behind it seemed to have been only recently covered. A small island was now discovered, and taken possession of in the usual form, a landing being effected on its southern side. This island, now 'Agnes' Monument,' is nearly circular, about 40 feet above the level of the sea, and flat at top, but rather highest towards the N.W.: bold all round, excepting at a short distance from its N.W. and S. E. sides. It had been recently inhabited, as the remains of a temporary habitation, and several other particulars, indicated; the tracts of dogs were also seen. The tide was observed, at 10 o'clock, high water, to be setting to the southward at the rate of about one mile an hour.

Agnes' Monument is at the mouth of a deep inlet, now Bruce Bay, which has a dangerous reef stretching across its entrance. While the boat was absent from the ship, at this place, two large bears swam off from the coast, towards the Alexander, which they reached, though at six miles from land, but were immediately attacked, and one was taken. This animal, when dead, weighed more than 1130 pounds, and its skin was brought home for the British Museum.

Bruce Bay is bounded by high mountains; those in the interior covered with snow: in the bottom of it is a small river, now named the Clyde, and it contains

tains two small islands, Haigh's and Bute. Some large whales were seen off this coast, *running* towards the south.

Sept. 11.—The weather being clear, at day-light the land northward of Cape Adair was seen, though supposed to be 20 leagues off. Land bearing S. by E. was also seen at the same distance; and, at about S. by W. a very remarkable mountain, resembling a pyramid of great height, appeared detached from the other high land. The whole of this part of the coast is lower toward the sea than the coast to the northward, the mountains being inland, at a distance of 15 or 20 miles. Between these mountains deep valleys were seen, probably the channels of small rivers, falling into the bays and inlets.

At eight this morning the ships were seven leagues to the eastward of Agnes' Monument; and, at two miles to the eastward of the ships, was the largest iceberg seen at such a distance from land. This berg was examined by Lieut. Parry and other officers, who landed on it, but not without difficulty. The top was perfectly flat, and a white bear was found upon it, which, upon being hunted, plunged into the sea, from a height of 50 feet. By measurement this iceberg was found to be 4169 yards long, 3869 yards broad, and 51 feet high. It was aground in 61 fathoms of water, and had nine unequal sides. In appearance it was like the back of the Isle of Wight, and its cliffs exactly resembled the chalk-cliffs to the west of Dover. In the evening, the breeze, which had sprung up from the southward, freshened; and, so soon as the boats returned, the ships passed under the lee of the iceberg and stood off shore.

On the 12th of September the weather was clear, but the wind so adverse that no progress to the south could be made. In consequence, the ships proceeded eastward, and the more in order to ascertain whether any land existed in that direction. The wind blew fresh; much loose ice and many icebergs were seen, but no land was discovered in that direction; nor did any current appear to exist. On the 13th, the ships stood back to the westward; and, in passing some loose ice, a bear on one piece was seen, at the distance of about 100 miles from land. The succeeding night was dark and thick, and the sea very heavy.

At noon, on the 14th, by sounding, bottom was found in 570 fathoms, soft greenish mud. During the whole of this day there was much swell from the southward. Many icebergs and loose ice were still in sight. At seven *a. m.*, Sept. 15, a cluster of five islands was discovered, which were found to be about two leagues from the main land. These were, undoubtedly, the Salmon Islands of the old Charts. They were passed at the distance of three leagues. The land hereabout was low near the sea, and the mountains within were neither so high, nor so much covered with snow, as those to the northward. A low point was seen about noon, bearing S. by W.; and, from the end of it, a reef of icebergs, which appeared to be aground, denoted shoal water.

The existence of a bank was soon after ascertained: it had a depth over it of 18 fathoms, and extended to the eastward as far as could be discerned from the mast-head. The tide ran across it to the southward at the rate of two miles and a-half in an hour. Captain Ross says, "This shoal, which I named the Isabella Bank, must prevent the possibility of ships passing to the northward along this coast until late in the season: for the icebergs, which are aground on it, must support the floes which come down from the north; and, by preventing them from being carried to sea by the wind and tide, keep this part of the strait for a long time impassable." Near the north edge of the bank the water was deep, and the ships came suddenly into a rippling of the tide,

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Sept. 16.— southward by leagues: here embayed in ice. The tide, whi past ten, wher fathoms, on a named the Ale

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19th Septer about ten lea Raleigh. Bu evening the w the coast, no night continu be faintly dis to stand off t over to the ea Cape. In tr the highest er the whole of ing of the 23 and, sudden seen at the s of the polar the pole, ex seven, *p. m.*

Mount Ra tain is very h fathoms wer

over a depth of 35 and 20 fathoms, whence it became smooth. The centre of the bank is about 8 miles S. S. E. from the point now named Cape Kater. The quality of the soundings, in going over, was very various; sand, mud, stones, coral, and shells. The south edge was equally steep with the north, speedily deepening from 24 to 50 fathoms; after which no bottom was found in 100.

The little island named Wollaston Island was next seen: it was surrounded with ice. Hereabout it was observed that the tide changed at four o'clock, and then ran to the northward.

Sept. 16.—At day-light, it was found that the ships had been carried to the southward by the tide. At four, passed the land, at the distance of three leagues: here it formed a number of capes and inlets. The ships were again embayed in ice, through which a passage was forced, after many severe shocks. The tide, which had been setting rapidly to the southward, changed at half past ten, when the ice opened; and soundings were soon after found in 35 fathoms, on a bank, upon which some icebergs were aground. This shoal was named the Alexander Bank.

The ships continued to be impeded by the ice until five o'clock, when the sea was again open, and they ran along the edge of the land-ice until sun-set, when sail was shortened for the night. Observations on the tides confirmed those made yesterday. On the 17th, the headlands named Cape Broughton and Cape Searle were discovered. The bay between them, now Merchant's Bay, was full of ice. The inland chain of mountains still appeared to be uninterrupted, and now to rise from the sea. At the distance of 8 leagues from land was a depth of 180 fathoms. Several icebergs, but no loose ice, remained on the coast. At two *a. m.*, on the 18th, the ships tacked for the land; which, at day-light, was seen extending from N.W. to S.S.E. in very high and irregular mountains, quite clear of fog. A very remarkable rock, resembling a castle or tower, and forming the point of a large bay, was supposed to be Dyer's Cape; to the south of this is Exeter Bay, which was also discovered by Davis. At sun-set, hove to, and found bottom at the great depth of 1070 fathoms, very soft mud, of a rusty colour.

19th September.—Cape Walsingham was seen to the S.W., at the distance of about ten leagues. A high mountain was also seen, supposed to be Mount Raleigh. But the summits of the high lands were obscured by fog. In the evening the wind sprang up from the southward, and the ships stood off from the coast, not being able to make any progress against it. The succeeding night continued moderate but cloudy, and sometimes the aurora borealis could be faintly distinguished. An adverse wind still continuing, the ships continued to stand off the coast on the 21st, as shown on the Chart. They stood so far over to the eastward as to see the land of the eastern coast, about Queen Anne's Cape. In traversing back to the westward, many large icebergs were seen, the highest end of which was generally to windward. A gale continued during the whole of the 22d, and the weather was very unfavourable in all the morning of the 23d. A heavy fall of snow was, at last, succeeded by a thick fog; and, suddenly after, clear weather, when the land, the sun, and the moon, were seen at the same moment. In the evening the latitude was found by altitude of the polar star, and the meridian altitude of the moon was taken when *below the pole*, exactly on the arctic circle, which was crossed at 44 minutes past seven, *p. m.*

Mount Raleigh was seen bearing west, distant about 18 leagues. This mountain is very high and pyramidal in shape. Towards evening, on sounding, 290 fathoms were found, soft mud.

On the 24th and 25th, the weather was variable and foggy. The fog did not clear away till about noon of the 26th. After one o'clock, on this day, the nearest land appeared at the distance of nine leagues; but the top of Mount Raleigh was distinctly seen, appearing like an island, at about 18 leagues. The aurora borealis* was seen until near midnight, when the fog again commenced.

September 27 and 28.—Variable and hazy weather; but, at intervals, the land was seen. At four *p. m.* on the 29th, the *Isabella* was within four leagues of the land, in latitude 65° . A cape, which had been seen in the preceding evening, now seemed to be joined to the main by a narrow neck of land; to the N.E. of it appeared a bay, with three small islands, one round and flat, the others conical. To the southward of the cape the land was no less remarkable; near the southern extremity a high conical mountain was seen, bearing W.S.W., and a mountain, which resembled a martello tower, bore west; the latter was presumed to be the Saunderson's Tower of Davis.

30th September.—A gale and adverse weather. With the wind to the westward, the tide appeared to be setting to the N.E. At noon a number of very large icebergs were seen aground, on a bank of 80 fathoms, which extended N.E. by N. and S.W. by S. about 6 miles in length, but only one quarter of a mile broad. The tide set over it N.E. by N. at the rate of one mile and a half in an hour. Several points of the land about Cumberland Strait were seen this day, but at a great distance. At nine *p. m.* it appeared that the current had set the *Isabella* 25 miles to the N.E. during the last 24 hours.

On the 1st of October, the entrance of Cumberland Strait was passed, Captain Ross says, "As we approached the entrance of this, we found a strong tide, which, during the day, set around the compass, or in every direction. Several small islands were also seen to the north and south of the great entrance, which appeared to be between thirty and forty miles wide. In the morning the tide was observed to carry the ship to the westward, and, after noon, to the S.E., at the rate of two miles an hour.

The two ships were now on their way homeward; Resolution Island was seen, but at a great distance. A heavy gale on the 6th of October, and other adverse circumstances, prevented a sight of Cape Farewell, although at noon, on the 8th, the *Isabella* was supposed to have been only 18 miles to the south of that cape, according to the position given by Captain Upton: the weather, at the time, being so tempestuous that no object was visible at more than 4 or 5 miles off, from the foam and drift on the sea.

After a rough passage over the ocean, the two ships, which had parted company, safely arrived in the Sound of Brassa, or harbour of Lerwick. Here the *Isabella* anchored, on the 30th of October, when Captain Ross remarked, in his despatches, that, not an instance of punishment had occurred in the ship, nor had one officer or man been on the sick-list; and, that the expedition had returned without the loss of a man.

It appears that, in the season of 1819, several whalers followed the route of the *Isabella* and *Alexander*. The Overthorpe, Captain Hawkins, is stated to have reached $77^{\circ} 25'$ north: if this latitude be correct, the Overthorpe proceeded considerably higher than the *Isabella*. Land was seen to the east and

* For the remarks on the aurora borealis, see page 46.

est, which was open; no ice was seen; the land, an in the lower

Captain Blyth great quantity of ice seen uncommon

Captain Knill heavy, seven, ten

Captain Orton day, 68° to 69° ; increased during the day, having told reason.

Captain Brasne weather; wind to the east and west; level from the sea a passage to the season very severe; July, yet the co

REMARKS.—The summer weather; wind to the east and west; level from the sea a passage to the season very severe; July, yet the co

The summer weather; wind to the east and west; level from the sea a passage to the season very severe; July, yet the co

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Ships bound a berth of 90 or that headland a to proceed to t as 59° or 60° ; will be, in a gr

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west,

The fog did not clear, which was supposed to be islands; the sea to the northward appeared to be open; no ice, except bergs, which were aground; fine warm weather, foggy at times; Captain Hawkins thinks the country more clear of ice than last year; the land, in the highest latitude, appeared more fertile and bare of snow; again compared in the lowest.

Captain Blyth, of the Brunswick, who went no higher than $74^{\circ} 20'$; found a great quantity of ice, more and heavier than in former years: the season had been uncommonly severe in May and June, and much of the ice was formed in the preceding year.

Captain Knill, of the Ingria, went to 75° , very severe season; ice very heavy, seven, ten, and twelve, feet thick, and more ice than in former years.

Captain Orton, of the Andrew Marvell, made his fishery in the south-east bay, 68° to 69° , and severe weather, with strong northerly gales. The ice increased during his stay; but he thinks that the winter had been mild, the natives having told him that the country was several times broken during that season.

Captain Brass, of the Thomas, reached $77^{\circ} 30'$ (the parallel of Cape Mouat,) in fine weather; when there, thermometer 40° ; clear water; saw land both to the east and west; thinks the east land a continent, and the west islands; had a level from the southward current in the same direction; there appeared to be a passage to the north and west, but could not say how far it extended. The season very severe; bay-ice formed, in one night, an inch thick, in the middle of July, yet the country was clearer of ice than last year.

REMARKS.—It appears that the highest latitude attained by any of the whale-fishers, was $77^{\circ} 30'$, but probably a large deduction must be made from this, on account of the greater refraction made by the ice. Perhaps from $40'$ to $50'$. The longitudes of these ships are very uncertain, the masters being too much occupied by the business of the voyage to make necessary observations.

The summer has been much more severe than usual, but it seems probable that the winter was milder, not only by the account given to Captain Orton, of the Andrew Marvell, by the natives, but also from circumstances of the high latitudes being almost clear of floating ice. A greater quantity of ice was found in latitudes 68° , 72° , 73° —(*Newspaper*, 1819.)

X. HUDSON'S STRAIT AND HUDSON'S BAY.

THE following INSTRUCTIONS for HUDSON'S STRAITS AND HUDSON'S BAY were obligingly communicated by an officer of the Royal Navy, in 1814.

Ships bound to Hudson's Straits, on rounding Cape Farewell, should give it a berth of 90 or 100 miles, in order to avoid the ice, which commonly surrounds that headland and the southern part of Greenland: It is also recommended not to proceed to the northward of the parallel of 58° , until as far to the westward as 59° or 60° ; as, by this precaution, the ice from Hudson's and Davis's Straits will be, in a great measure, avoided.

On entering Hudson's Straits, Cape Resolution may be seen, in clear weather, at the distance of 10 leagues. The north shore should be kept on board, as it is very bold, and much the clearest of ice. We met icebergs at a considerable distance from the land, and also in the entrance of the Straits. At a short

short distance up we saw field-ice, but our progress was not impeded by it until we had advanced to abreast of Point Lookout, the narrowest part of the Straits, and where the breadth does not exceed 50 miles. At this spot the ice was so thick, that, with a fair wind, we were compelled to grapple to it and did not succeed in getting through until the lapse of seventeen days. Ships intended to proceed on this voyage should be furnished with ice-anchors, ice-axes, and poles. With these articles we were supplied by the ships under our convoy. The rudder also required an additional security against the blows it receives from the pieces of loose ice when the ship is grappled. It is therefore necessary to have a strong eye-bolt or ring-bolt on each side of the main piece of the rudder, placed about 3 feet from the surface of the water, to which bolts stout iron-chains must be affixed. These chains must lead across the back part of the rudder: they ought to be about 12 feet long, and fitted with pendants of 5-inch rope, which must be let in, on each side, through the third or fourth port from abaft; and, whenever the ship is grappled to the ice, the helm ought to be put amidships, and the rudder-pendants boused well taut. The copper chains used in the Navy are not strong enough for the purpose; neither are they placed sufficiently low.

On passing up the Straits, the Esquimaux Indians visited the ships, and traded with seal-oil and skins, but could not give us any refreshments. We obtained very good water from pools in the fields of ice. While we were grappled to the ice, we found a very strong current setting out of the Straits. The prevailing winds are from North to N. W.

After clearing the ice, we steered for Cape Digges, off which the ships usually part company, and seldom join again. The smaller proceed to James Bay, the others to Churchill and York, in Hudson's Bay. From Cape Digges, we steered for the N.E. end of Mansfield Island, which is very low, and cannot be seen more than 6 leagues off in clear weather. The course from the N.E. end of Mansfield Island to York River is W. by S. by compass, distant about 500 miles. On approaching York River, we gained soundings in 85 fathoms, at about thirty leagues from the land, and approaching which the depths gradually decreased. On making the land, we had not more than 10 fathoms of water.

There are flats or sands off the entrance of YORK RIVER, outside of which it is possible to anchor, for a short time, in 8 or 9 fathoms; but the situation is very insecure and dangerous, as it is exposed to all winds between North and S. E. to the eastward; and there is, generally, a heavy ground-swell. A ship that draws no more than 15 feet water, may pass over the flats at three-quarters flood, when she will get into an anchorage in 5 fathoms at high-water, and 16 feet at low-water, spring-tides: but even this is not secure, as there is very little room to swing; and, if the ship's stern once takes the ground, the force of the wind and tide taking her on the broadside, brings her anchor home, and she must, inevitably, go on shore. Whilst lying here, we found our cables much chafed by the large stones, which are said to be brought down the river by the ice in the winter season.

The tide flows at this anchorage at 11h. 15m. full and change; and its velocity, at spring-tides, is about 5 miles an hour; at neap-tides, about 3 miles: rise and fall, springs 14 feet, and neaps 10 feet.

About York the land is low and marshy, and the shore sandy: but the quantity of wood which covers it makes the land appear, from sea, much higher than it really is.

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While lying at anchor in Five-Fathoms Hole, we found the water alongside perfectly fresh at about two-thirds ebb, which enabled us to supply the ship for the passage home.

There is an extensive shoal to the northward of York River, called Port Nelson Shoal. Its situation we had not an opportunity of ascertaining; neither could we learn it from the officers of the Hudson's Bay Company's ships.

In the year 1813, the VARIATION of the COMPASS, from the meridian of 63° to that of 78° W. appeared to be from 48° to 49° West. It was thence found to diminish as follows: Lat. 62° 49', Long. 78° to 81°, Var. 48° W.: Lat. 62° 38', Long. 81° 15', Var. 46° W.: Lat. 62° 36', Long. 82° 0', Var. 44° W.: Lat. 62° 30', Long. 82° 45', Var. 38° W.: Lat. 62° 25', Long. 83° 0', Var. 36° W.: Lat. 62° 0', Long. 83° 30', Var. 33° W.: Lat. 61° 30', Long. 85° 0', Var. 28° W.: Lat. 60° 45', Long. 87° 0', Var. 22° W.: Lat. 59° 45', Long. 89° 0', Var. 19° W.: Lat. 59° 0', Long. 91° to 92°, Var. 11° W.: Lat. 58° 50', Long. 92° to 93°, Var. 5° W. These results may be compared with those of Captain Ross, in 1818, as given on the Chart.

For a particular description of the Coast and Navigation of Hudson's Bay, &c., the reader may satisfactorily consult the 'Voyage to Hudson's Bay, of Mr. Henry Ellis, already noticed on page 61. Information upon this subject, of recent date, is contained in the "Narrative of a Voyage to Hudson's Bay," by Lieut. Edw. Chappell, R. N., 1817; but the latter does not abound in nautical information. Indeed, the author says, "I shall merely state, on each day, the course and distance run by the ship in the preceding day, without making a dull account of latitude, longitude, bearings, and distances, allowances for leeway, currents, &c. &c., as all this farrago of nautical calculation, however necessary it may be to mariners, cannot fail to tire out the patience of a general reader; and the object of this publication is not so much to point out the track of the *Rosamond*, in her voyage to Hudson's Bay, [1814,] as to describe the manners and customs of the different tribes inhabiting the shores of that immense gulf." (P. 21.)

As a specimen, take "July 12th.—Course run N. W. by W. 62 miles. It blew strong all night; but we had a fine day; and towards noon the wind blew fair at south. We got a peep at the sun this day, and found we were in latitude 57° 15'.

"July 13.—Course run, W. $\frac{1}{2}$ N. 76 miles. In the morning the wind shifted to N. by E., and blew a moderate breeze. After night-fall we had a faint appearance of the *aurora borealis*, in the shape of a rainbow, which rendered it peculiarly interesting."

The longitude, in which these *important events* took place, is to be discovered by the ingenious reader.

"July 24.—This morning some slight indication appeared of a lasting fair wind. The fine mild weather that had prevailed for the last fortnight, was far from affording satisfaction to the commanders of the *Hudson's Bay ships*, as they prognosticated much more difficulty in getting through Hudson's Straits, the natural consequence of so much calm weather. It would have pleased them better to have encountered a few gales of wind, even if they had proved foul; as it requires strong winds to carry the drift-ice out of the straits, which is very likely otherwise to choke the passage. Entering Hudson's Straits, it is

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a necessary precaution to keep close in with the northern shore, as the currents out of Hudson's and Davis' Straits meet on the south side of the entrance, and carry the ice with great velocity to the southward, along the coast of Labrador."

This is *useful* information, and worthy of all acceptance.

Again, "*July 26.*—In the forenoon we took on board the chief-mate of the Prince of Wales, (one of the Hudson's Bay ships,) to act as pilot, or rather to instruct us in the management of our ship, amongst the ice in the straits. He immediately advised us to raise our anchors, lest the shocks of the heavier masses of ice should break the stocks: we also rove smaller braces to all the yards, that we might be able to manœuvre the ship with the greater facility. At noon, we were in latitude, by account, $59^{\circ} 11'$, and longitude $54^{\circ} 20'$. We now kept our course more to the northward, to prevent the possibility of our falling in with the ice to the southward; as there are always large quantities drifting out of Hudson's Straits, along the coast of Labrador. Ships do well, therefore, to keep to the northward, until they reach the latitude of Cape Resolution; and, when that is attained, they may haul in N. W., and keep close in to the north shore; thus making a semi-circle round the ice: but they should be particularly cautious not to keep too much to the north, until they reach the longitude of 54° , and are consequently quite clear of the coast of Greenland."

DESCRIPTION OF THE PASSAGE TO HUDSON'S BAY, in 1819. By an Officer of the Expedition, inland, towards the Arctic Ocean.

"*August 27, 1819.—At Sea.*

"After passing the southern point of Greenland, we met with much ice, but as it did not lie thick, little difficulty was experienced in forcing a way through it, nor did it prove so great an impediment as the contrary wind, which still continued to thwart us. Near the Greenland coast, the streams or fields of ice consisted of a collection of loose and comparatively flat pieces, more or less densely compacted together, according to the state of the weather; but, on approaching the shores of Labrador, we fell in with many icebergs, or large floating fields of ice. The variety of forms assumed by these masses, afforded us amusement, but occasionally we saw some of such an enormous size, that every other feeling gave place to astonishment. One of these larger bergs we estimated to be 200 feet high above the water, and above half a mile in length. Its surface was broken by mountains of no mean size, with deep valleys between. Enormous as these dimensions must appear, you will be more surprised when I inform you, that the part of an iceberg which projects above water, amounts only to a ninth part of the whole mass, that being the proportion of ice which floats above salt-water. Arthur's Seat, clothed in snow, would have formed only one pinnacle to this berg. When these bodies became familiar to us, from their frequency, we derived much pleasure from the various shades and gradations of colour they exhibited. The more compact parts were generally of a bright verdigris-blue; towards the base a fine sea-green prevailed; here and there a tint of red was seen, and the summits alone were snow-white. As the part of the ice which is covered by the sea, decays more rapidly than that which is in the air, it often happens that one of these islands become top-heavy, and tumbles over. We never saw one in the act of making this revolution, but most of them bore evident marks of having been overturned twice or thrice, the old water-lines, intersecting each other in various directions, being still deeply engraved on their surfaces.

"We first beheld the land (Resolution Island) during a fog, which soon became so thick, that we could not see the length of the ship. In consequence of this we were involved in a field of ice; then, to add to our distress, it fell
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calm, and although we could perceive that we were carried along by a violent current, yet the fog deprived us of ascertaining its direction, and the depth of water was too great to admit of our anchoring. After remaining in this situation for two or three hours, receiving occasionally some heavy blows from the ice, an alarm was given that we were close on the rocks. We all ran upon deck, and beheld a tremendous cliff, frowning directly over the mast-heads of the ship. It was perfectly perpendicular, covered in many places by sheets of ice, and its summit was so high, and shrouded in so thick a fog, that it could not be traced from the deck. We had scarcely time to make any useful exertions, for in a few minutes the ship fell broadside against the cliff, along the face of which she was violently hurried by the current, towards a ridge of broken rocks, which in a short time would have torn the stoutest vessel to pieces. The heavy swell which prevailed, caused the ship, in her passage, to beat against various rocky ledges, which projected under water. One of the blows she thus sustained, drove the rudder out of its place, but it fortunately hung suspended by a tackling, which had been employed to secure it on coming amongst the ice. At this instant, when all human exertions seemed perfectly fruitless, the current eddied off-shore, the land-breeze sprung up, a boat that we had put overboard succeeded in taking us in tow, and, what appeared almost miraculous, one of the last thumps the ship received, caused the rudder to fall back into its place. By this combination of favourable circumstances, we succeeded in getting round the point we so much dreaded; and, setting all sail, we steered from the land. Upon the first alarm of danger, the women and children, of whom we had a large number on board, going to Lord Selkirk's colony, rushed upon deck, much terrified. The officers, however, succeeded in calming their fears, and prevailed on them to go below, out of the way of the sailors; but scarcely had this been effected, when the current carried us against a large iceberg, which had grounded upon a ridge of sunken rocks, that lay at some distance from the shore. The crash of the masts and yards, together with the grinding of the ship's side against the ice, terrified them more than ever, but we speedily got clear of this second danger, without receiving further damage. Our troubles were not, however, at an end; the ship had received so much damage, whilst on the rocks, that, on examination, a great deal of water was found in the hold. All hands were instantly set to the pumps, but, to our mortification, we found that the water rushed in faster than we could, with every exertion, discharge it. Affairs now wore a gloomy aspect; the water in the hold increased to upwards of five feet, and the men were getting tired of the pumps, when fortunately the weather cleared up a little, and we saw the Eddystone, one of the vessels that accompanied us, at no great distance; we bore down, and informed them of our situation. Every assistance in their power was promptly supplied; they sent twenty men, and two carpenters. The services of the latter were invaluable, as our own carpenter had died in the earlier part of the voyage. With this fresh accession of strength, we kept the leak from gaining upon us; and, after some time, the carpenters succeeded in discovering and patching up the broken parts, so as sensibly to diminish the influx of water. Their operations were, however, slow, and it was not till the evening of the second day, that we succeeded in getting all the water out of the ship. During the whole of this time, not only the officers and men worked hard, but many of the women, recovering their spirits, proved eminently useful at the pumps. As the water decreased, the carpenters were enabled the more readily to repair the damage that had been sustained: and they ultimately succeeded so well, that one pump proved sufficient to discharge the water as fast as it leaked in. In this state we have continued ever since.

“In these straits the Hudson’s Bay vessels are generally visited by a tribe of Esquimaux, who frequent the shores during summer, and come off to the ships for the purpose of bartering their whole wealth, which consists in whale and seal blubber, for iron, which has become an article of the first consequence to them. Accordingly, one day when we were above 20 miles from the shore, these poor creatures ventured off in their skin-canoes, pulling with the utmost anxiety to reach the vessels. It sometimes happens, when the ships have a fair wind, that they run past the Esquimaux haunts, without stopping; in the present instance, however, we were detained by light contrary winds, which enabled them to overtake us, and when they did so, they expressed so much joy and exultation, that it was easy to conceive how great their disappointment must have been when they missed us. In a short time we were surrounded by 30 or 40 canoes, each carrying one man, with his small cargo of merchandise, which, to their great satisfaction, they speedily exchanged for pieces of iron, hoops, knives, saws, hatchets, and harpoons, and tin-pots. The wind continuing contrary during the remainder of the day, we stood in towards the land, and gave the women of the tribe an opportunity to come off, which they did, in five large canoes, framed, like the small one, of skins, but open, and each capable of carrying from 20 to 30 people. The oars were pulled by women, but there was an old man in each boat, to direct them. As they brought off a great many children, I suppose we saw the whole tribe, amounting to nearly 200 souls.

“The features of the Esquimaux are not the most regular in the world; but it was pleasing to see their flat fat greasy faces. When they had disposed of their articles of trade, we presented the women and children with a few needles, beads, and other trinkets, and sent them away highly delighted. Since that time we have been contending against contrary winds; but, by perseverance, have succeeded in getting within a few days sail of York Factory, at which place I shall conclude and dispatch.

“August 31, York Factory.

“We have landed here in safety; find the country more pleasant than we expected, and have been told that the difficulties of travelling in this country have been much exaggerated.”—J. R.

(Blackwood’s Edinburgh Magazine, Dec. 1819.)

SECTION IV.

DESCRIPTION of the ROCKS and SHOALS in the NORTHERN OCEAN, and of the Authorities on which they have been inserted in the Chart.

BRASIL ROCK, in lat. M. Bellin, in his memoir of 1742, states that this 51° 10', and long. 16°. rock is marked in latitude 51°, and longitude 19° 30' from Paris, according to Brouage, hydrographer, and Laisne, a pilot. It has been variously represented in different charts, although its existence has been doubted. Messrs. Verdun and Borda have added to their remarks upon this rock, that they do not believe it to exist. It was, however,

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however, seen in the year 1791, by the company and master of an English merchant-ship, the commander of which favoured the editor of the present work with a description of it, stating that it is really a high rock, or islet, apparently bold-to, and to which he passed so near, that he could have cast a biscuit on shore. The longitude, according to his computation, was about 16° W., but we suspect that it is rather more to the westward.

AITKIN'S ROCK, to the West of the N. W. of Ireland. The original notice relative to this danger was published at Whitehaven, 12th September, 1740, and is as follows: On the 16th of July last, at seven o'clock at night, in our passage from Virginia, on board the *Friendship*, of Ayr, John Aitkin master, James Lockhart mate, coming in at the N. W. channel of Ireland, going under reefed-foresail, wind at N. N. W., steering E. by S., saw by the weather-leech of our foresail, a rock under water, about 4 feet, distant 40 or 50 yards, to the best of our judgement, our ship running 6 knots by log, with a heavy swell from the N. W.; all hands being on deck saw it plainly; next morning made the land betwixt Insterhul and Tory Island, at about eight o'clock; and, at twelve, made the mouth of Derry-loch, bearing S. W. by S., distant 10 leagues; Ilay bearing E. by S., distant 6 leagues: and, by making these lands next morning, I find the rock lies in the latitude of $55^{\circ} 18' N.$, and longitude, from the meridian of London, $11^{\circ} 14' W.$ It lies from Island Tory West, distant 94 miles, without allowance of variation. At the time we saw the said rock, it was an hour's ebb. Island Tory is falsely laid down in the books: instead of $55^{\circ} 8' N.$ latitude, it should be laid down in $55^{\circ} 20' N.$ *

A second advertisement relative to this rock was published by Mr. F. Cumming, of New York, in 1793. It states that, "As doubts remain with many navigators respecting the existence of Aitkin's Rock, to the westward of Tory, I think it a duty to make public the following information relative to it, communicated to me by the Rev. John Stewart, a passenger with me in the *Enterprize*, from New York to Greenock, on Thursday, Aug. 9th, 1792.

"Ship *Nestor*, of Greenock, Capt. ———, from New York, bound to Greenock, being in latitude, per observation, of $55^{\circ} 19' N.$, and longitude, per account, of $9^{\circ} 53' W.$ of London. The officers, passengers, and ship's company, who were then on deck, perceived a rock about four feet below the surface of the water, not five fathoms from the weather-beam of the ship, in the form of a horse-shoe, with one side longer than the other; the mate instantly threw an empty barrel overboard; the yawl was got out as soon as possible, and the mate, four hands, and two passengers, went in the boat, and were absent near two hours in search of the rock; but, owing to the ship's drift, and a dark cloud which then obscured the atmosphere, they could neither find rock nor barrel. Mr. Stewart was then a passenger in the *Nestor*, and saw the rock plainly, with the tangle growing on it.

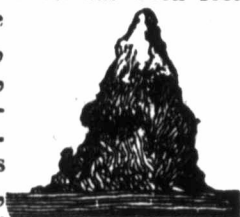
"FORTESCUE CUMMING,
"Master of the Ship *Enterprize*, of New York."

Our friend, Mr. Lamont, of Greenock, has lately informed us that the mean of different accounts which he has received, relative to this rock, places it as described, due west of Tory, (in lat. $55^{\circ} 17'$) and more to the westward than is assigned in the original notice. Its true longitude is yet a desideratum.

* Captain Huddart places Tory Island in lat. $55^{\circ} 17\frac{1}{2}'$.

ROKOL, in lat. $57^{\circ} 30' 32''$, long. $13^{\circ} 31' 16''$. This is a large and high rock, of a conical or sugar-loaf shape, the summit or upper part of which is perfectly white, from an immense quantity of birds' dung, with which it is covered. The rock has been seen

many times, but its true situation was unknown till the year 1810, when it was ascertained by Mr. T. Harvey, master, and the other officers of the *Endymion*, frigate, commanded by the Hon. T. B. Capel. By the observations made by these gentlemen, on the 8th of July, it appeared that the longitude, by mean of 11 lunars, was $13^{\circ} 30' W.$, and the latitude, by meridian altitude, $57^{\circ} 40' 10''$. On the 8th of August, the longitude, by mean of three chronometers, appeared to be $13^{\circ} 29' 30''$; by mean of 5 lunars, $13^{\circ} 34' 19''$: and the latitude, by meridian altitude, $57^{\circ} 38' 54''$. Hence the mean latitude and longitude is assumed as $57^{\circ} 39' 32''$, and $13^{\circ} 31' 16''$.



Appearance of Rokol, 2 miles distant, as taken by Mr. Harvey, now Commander of the Favourite, of Margate.

With the rock bearing N. by W., broken water appeared about a mile to the N.E. of it; and, on approaching nearer, a rock, on which the water broke, appeared just at the water's edge. When due South of Rokol, the breakers were in a line with the eastern part of it. The variation of the compass, at this time, was $33^{\circ} 35\frac{1}{2}' W.$

The following remarks on Rokol were communicated to the public by Mr. Richard Peacock, in 1809. "This rock appears almost like a ship at a distance, and is steep close to on the north side. I have passed it at the distance of about 50 fathoms; but, to the southward, or nearly S. E. by E. from the rock, there lies a long reef of sunken rocks for about 3 miles. On this reef, with gales of wind, the sea breaks very heavily.

"Captain Osborn, of Workington, told me that, on his passage from Quebec, in 1806, it was with the utmost difficulty he escaped getting among the breakers. Captain Magee, of Greenock, also informed me that he had seen the sea break to the distance of nearly three miles in a S. E. direction from the rock."

VIGIA to the S.W. of Rokol, lat. $56^{\circ} 40'$, long. $17^{\circ} 16'$. A shoal is exhibited hereabout on a chart of 1751, but of which no certain information can be traced. It appears, from its assigned situation, to be the bank next described.

LION'S BANK. in lat. $56^{\circ} 40'$, long. $17^{\circ} 45'$. This bank was sounded by Lieutenant Richard Pickersgill, in the brig *Lion*, in 1776, who found upon it from 290 to 320 fathoms. A vast quantity of sea-fowls were over it; and it probably abounds with fish. The position annexed is that given in the Requisite Tables. Dr. Forster says, on the 29th of June, with 320 and 290 fathoms, Pickersgill found a sandy bottom in $56^{\circ} 38' N.$ and $17^{\circ} 44' W.$ which induced him to call that spot the Lion's Bank; and particularly so, as he found there, what is usually seen on all banks at sea, a vast quantity of sea-fowl, such as gulls, dumdivers, &c. Soon after this, he could no longer get any soundings, nor were there any more fowls to be seen.

KRAMER'S BANK.—This Bank appeared in M. Bellin's chart, of 1751, and was probably copied from the Dutch charts of the Greenland Seas, which represented it as of considerable extent. It is said to have been discovered by Capt. *Alof Kramer*, but whether dangerous or otherwise we know not. Captain Ross sought for this bank, but unsuccessfully, in 1818. See page 124.

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ROCK in lat. $55^{\circ} 24'$, In the French chart of the Northern Ocean, of 1751, in latitude $55^{\circ} 24'$, and longitude $24^{\circ} 40'$, is represented a rock, high above water, with these words —“Rock, 1746.” No account of this rock can, however, be traced in any English or Dutch chart. We suppose it to have been an iceberg, and it has, therefore, been omitted in the Chart.

LAND of BUS.—M. Bellin's chart of 1751, represents an imaginary island, called the *Land of Bus*, to the southward of Iceland, about latitude $58^{\circ} 2'$, and longitude $29^{\circ} 55'$. It again appeared on the chart of 1768, at 10 minutes more to the East. This, on the old charts of Van Keulen, is the situation of the western part of a coast which occupies many leagues of extent, with an inscription of which the following is a translation: “The Land of Bus has been overflowed, and is not at present more than a league round, when the sea is high. There was, many years ago, a large island, named Friesland, here, which was full 100 leagues in circumference, on which were many villages.” This land is really represented as a large island on several charts of the Atlas of Mercator, of the *Arcano del Mare*, in Bleau's and other more antient charts, with particulars of towns, villages, &c., which might tend to persuade us that it formerly existed. Whether it ever existed or not, we are certain that it exists no more. The ship *La Flore*, in the voyage of Messrs. Verdun, Borda, and Pingré, passed over the place where it is exhibited on the old charts, and never perceived the smallest trace of it. To this we shall add, that Anderson, in his history of Iceland, Greenland, &c. says, that a very expert captain of a ship did his utmost to discover the supposed remains of this island, and purposely employed two months in cruising on all sides, within 50 leagues round: he discovered no trace of land, but in every part a depth of 100 fathoms. The sea was agitated to that degree, that its waters were always higher there than any where else; they were greenish, and filled with a prodigious quantity of marine substances. Mr. Anderson is of opinion, that there were sources of hot water at the bottom of the sea in this place. The Remarks of Captain Ross, on this imaginary shoal, have been given in page 124.

N. E. LEDGE of BELLE ISLE.—Captain Cook, in his directions, which accompany the North-American Pilot, has observed, “that ships steering for this island should be careful to avoid a ledge of rocks that bears about N. by E. from the east point of the island, distant 2 miles. Part of these rocks appear above water, and the sea always breaks upon them. You will have 20 fathoms close to them, and 56 between them and the island. All about this island are irregular soundings; but you will not find less than 20 fathoms home to the island, excepting on a small bank, lying N. W. four miles from the N. E. end, whereon it is said are only 5 fathoms.” Upon these rocks, &c. the icebergs are frequently aground, and completely impede the navigation of the Strait.

DANGERS IN THE VICINITY OF LAND, have already been described in the former parts of this work, as the **VICTORIOUS ROCK** and **BOQUHAN REEF**, in page 39, and the **NUN ROCK** and Bank, page 14. With regard to the latter, we may, however, add that, in the Chart of the North-west Coast of Scotland, a rock is exhibited as discovered in 1785, and *seen at three-quarters ebb*. Its position, according to the Chart, is 5 miles S. W. by W. [$W. \frac{1}{4} S.$] from the assigned position of the Nun Rock: we are not, therefore, quite certain that it is the same, although it has, generally, been supposed to be so.

(11th March, 1820.)

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THE COAST OF NORWAY.

IN the Note 3, page 18, the Reader is referred to the Directions for the Coast of Norway, from Drontheim to the Southward. At the time that page was printing, it was our intention to have given abridged directions for the coast, not being then aware that our limits would not admit them: for, it has since been found that proper directions for these coasts would, of themselves, form a volume.

There is no lack of material for the purpose, Mr. Laurie having caused the whole of the Danish descriptions and directions to be translated. The Charts he has already republished; and if there should appear to be a demand for the directions, adequate, in a certain proportion, to the expense of publication, they will hereafter appear as a separate work.

We, therefore, here conclude, by cautioning the mariner not to make too free with a coast, crowded with a thousand islands, islets, rocks, and blind ridges; and upon which the currents set vehemently, commonly to the East and North, more especially between the latitudes of 62 and 64 degrees.

CAPTAIN ROSS'S RULES for FINDING the POINT of CHANGE in ABERRATION; which has been explained in Section the First.

Rule 1.—To find the Point of Change.

LET the bearing of one distant object, or the transit of two distant objects, (whose true bearing from the ship, or from each other, is known,) be taken, with the ship's head at several points of the compass; if they all agree, the ship has no aberration; but, if not, the one which is found to agree is the point of change.

Rule 2.—To find the Aberration for the Point steered.

Let the bearing of the same object be taken with the ship's head on the point of the course steered; and add, or subtract, the difference between them, as it increases, or decreases, the variation.

To find the aberration at sea, when a distant object is in view, whose true magnetic bearing is not known:—Let a boat be sent out of the ship's attraction, to take the bearing of the object, and then the bearing of it is to be taken from the ship, in the manner before described. But, even when no distant object is in view, it can be done in fine weather, with smooth water, by veering a boat (copper-fastened) astern with the compass. The ship is then to steer on different courses, (the boat always keeping her masts in one,) until the compasses of the ship and boat agree. If there is no difference between them on any point, the ship has no aberration. But, whatever difference is found between them, on any point, that is the ship's aberration for that particular point, and must be added, or subtracted, to correct the ship's course on that point, according to the true magnetic course of the boat: and, in like manner, the respective differences, found on the several points, are to be applied to each. On whatever point the courses of the boat and the ship agree, when her masts are in one, that is the ship's point of change. The result of observations made with the ship's head on this point will give the true variation of the compass; but, if observed on any other points, the error of variation will be according to the amount of aberration, or differences found on those points respectively, between the course of the ship and boat, and must be applied, more or

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or *less*, as the case may require, to correct it. The variation may be observed either before or after this process, for finding the ship's point of change and aberration; and, if amplitudes, or azimuths, are taken at different parts of the ship, the difference between the azimuth compass (wherever it may stand) and the compass the ship steers by, ought always to be taken, and applied in like manner, to obtain the *true* variation.

It would be a great benefit to navigation, if the bearings of remarkable headlands and other objects, on the coasts of different countries, were *correctly* taken, and inserted in published charts: for, a ship, able to approach near enough to take the transit-bearing of any two such objects, whose relative situations were exactly true, could thus know, at once, her *aberration*, on whatever course she was steering, (if the true variation was on the Chart,) since it would be the difference between *it* and the true transit-bearing laid down on the Chart; taking into consideration, at the same time, the known variation. For instance, supposing a ship to be steering West by compass, along a coast where two remarkable objects are situated, true North or South of each other, and the variation laid down on the Chart is 29° West. On setting these objects in one from the ship, they are found to bear, by compass, N. 24° E., making a difference of 5° for her aberration on the *west* point. So that, if she had now to steer a correct *magnetic* west course, it must be shaped W. 5° S.; or, to make a *true* west course, W. 24° N., according to the variation of 29° West.

If, again, with her head N. by E., she finds the transit-bearing of the two objects to be N. 29° E. by compass, agreeing with that laid down on the Chart; according to the variation, then, *that* is the point of change, because there is *no aberration*.

Again, if, in steering E. by compass, she finds the transit-bearing of the two objects to be N. 34° E. by compass, the difference between it and that on the Chart, according to the variation, being 5° ; therefore, to shape a correct magnetic East course, she must steer E. 5° S.; or, to make a true East course, E. 34° S.

Men of war, and, indeed, all ships, should, at every opportunity, try the aberration, and ascertain their points of change; and, after it is found, the metallic matter ought not, in any quantity, to be removed.

ERRATA, &c.

The Reader is requested to correct, with his pen, the following errata.

Page 34, line 14, Sweerenberg to be	... Smeerenberg.
42, .. 2,	Tahtarean Tahtarian.
44, .. 7,	from bottom, Cartright Cartwright.
47, .. 5,	from bottom, Maupertius Maupertuis.
48, .. 15,	from bottom, apply in, apply, in.
51, .. 15,	jambed jammed.

Since the part was printed in which the intended LIGHTHOUSE ON SUMBRO' HEAD is mentioned, (page 66,) we have been informed, on the *best authority*, that the lighthouse is expected to be completed before the close of the year 1820.

THE END.