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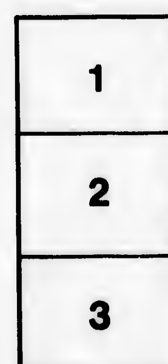

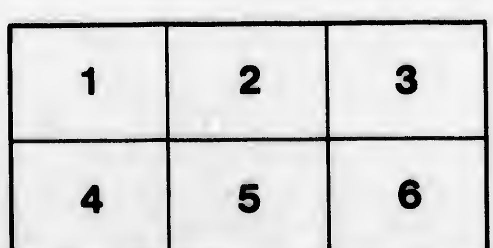

Drawn by H N Head. Engraved by E Finden

SITUATION OF H.M. SHIPS HECLA & FURY.
AUGUST 1 1825.

Published June 1826 by John Murray London

JOURNAL

OF A

THIRD VOYAGE FOR THE DISCOVERY OF A

NORTH-WEST PASSAGE

FROM THE ATLANTIC TO THE PACIFIC;

PERFORMED IN THE YEARS 1824—25,
IN HIS MAJESTY'S SHIPS

HECLA AND FURY,

UNDER THE ORDERS OF

CAPTAIN WILLIAM EDWARD PARRY, R.N., F.R.S.,
AND COMMANDER OF THE EXPEDITION.

ILLUSTRATED BY PLATES AND CHARTS.

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*PUBLISHED BY AUTHORITY OF THE LORDS COMMISSIONERS
OF THE ADMIRALTY.*

LONDON:

JOHN MURRAY,
PUBLISHER TO THE ADMIRALTY, AND BOARD OF LONGITUDE.

MDCCCXXVI.

TO

THE RIGHT HONOURABLE THE

LORD VISCOUNT MELVILLE,

FIRST LORD COMMISSIONER FOR EXECUTING THE OFFICE OF LORD HIGH ADMIRAL OF GREAT BRITAIN AND IRELAND,

&c. &c. &c.

THIS VOLUME,

CONTAINING

THE JOURNAL OF A THIRD VOYAGE FOR THE DISCOVERY OF A NORTH-WEST PASSAGE FROM THE ATLANTIC TO THE PACIFIC,

UNDERTAKEN AND EXECUTED UNDER THE AUSPICES OF HIS LORDSHIP,

IS INSCRIBED

WITH THE GREATEST RESPECT AND GRATITUDE,

BY HIS OBLIGED AND FAITHFUL SERVANT,

WILLIAM EDWARD PARRY.

ADMIRALTY, *June*, 1826.

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NATURAL HISTORY.

INTRODUCTION.

Notwithstanding the want of success which had attended the efforts of the late Expedition to the Polar Seas, the encouragement held out by Captain Franklin's description of the navigable state of the sea on some parts of the northern coast of America, together with that of the Russians to the westward towards Icy Cape, induced His Majesty's Government to cause another attempt to be made for the purpose of effecting a passage by sea, between the Atlantic and Pacific oceans; and the Lords Commissioners of the Admiralty being pleased once more to honour me with the command, I was appointed to His Majesty's Ship the Hecla on the 17th of January, 1824; Captain Henry Parkyns Hoppner having received his commission for the Fury on the same day. The William Harris, transport, of 342 tons, Lieutenant J. W. Pritchard, agent, was appointed to carry a portion of our heavy stores across the Atlantic, and to return to England after discharging her cargo in Davis' Strait.

The equipment of this Expedition was, in most respects, so similar to the last, that it will only be necessary here to notice the few alterations and additions which experience now led us to adopt. The principal of these consisted in placing Sylvester's warming-stove, before described as so effectual, in the very bottom of the ships' holds, the whole being enclosed within a strong bulk-head. The main or direct volume of warm air escaped through a sliding brass register upon the lower-deck; while the flues, which passed through the cabins of the officers into that of the commander, were made to run along the lower part or floor, and nearly close to the ship's sides, which are usually the coldest parts. By this improved method, an increased rapidity in the current of air was produced, and therefore an additional warmth to the cabins most distant from the stove.

In the selection of provisions, our chief endeavour on this occasion was to vary as much as possible the kinds of meat, and to increase to the utmost extent our vegetables and anti-scorbutics. With this view a small quantity of salt beef was substituted for a part of the pork, and a much larger supply of newly-corned beef was furnished. The meats preserved in tin consisted of beef, mutton, and veal, some seasoned and some plain; a pound of preserved carrots or parsnips per week for each man was substituted for a pint of gravy soup, and the supply of lemon-juice was increased by one-third. For the use of the sick, some salmon and cream, preserved in tin cases by Messrs. Morrison and Company, were also furnished; the pickles consisted of onions, beet-root, and cabbage, which are by far the best kinds. In order to make the most of our stowage, binns were built for the pease and cocoa, in the store-room passages, and with the same view *split*-pease were furnished, instead of whole ones. For the use of travelling-parties, we were supplied with a small quantity of beef-*pemmican*, made by pounding them eat with a certain portion of fat, as described by Captain Franklin.

To the list of instruments before furnished, were added na invariable pendulum, and several hygrometers on Mr. Daniell's ingenious construction. Six chronometers were supplied by government to the Hecla *, and four to the Fury; but several of the makers, with their accustomed emulation, sent out watches on trial, making the Hecla's whole number amount to twelve. In addition to our former establishment, Lieutenant Henry Foster was appointed to the Hecla; nominally as assistant-surveyor, but in fact to perform the duties of Astronomer to the Expedition, for which he was fully qualified.

It being customary to record the names of the officers employed on voyages of this nature, a Table is here annexed, shewing the whole establishment on board each ship.

* One of these was Mr. Murray's No. 816, which gained one of the annual prizes of 300*l*. at the Royal Observatory, for its superior performance.

RANK.	ON BOARD THE HECLA. Officers' Names.	No.	ON BOARD THE FURY. Officers' Names.	No.
Commander	William Edward Parry	1	Henry Parkyns Hoppner	1
Lieutenants	John Land Wynn Joseph Sherer Henry Foster	3	Horatio Thos. Austin James Clark Ross	2
Surgeon	Samuel Neill, M.D.	1	Allan M'Laren	1
Purser	William Harvey Hooper	1	James Halse	1
Assistant-Surgeon	William Rowland	1	Thomas Bell	1
Midshipmen	John Brunton Francis R. M. Crozier Charles Richards Horatio Nelson Head	4	Berkley Westropp Chas. Crump Waller Edward Bird	3
Clerk	James Harrison	1	William Mogg	1
Gunner	John Brothers	1	James Moore	1
Boatswain	William Smith	1	William Wentworth	1
Carpenter	George Fiddis	1	Charles Purfer	1
Greenland Master	John Allison	1	George Crawford	1
Ditto Mate	George Champion	1	Thomas Donaldson	1
Cook		1		1
Leading Men		4		4
Quarter-Master		1		1
Gunner's Mate		1		1
Boatswain's Mate		1		1
Carpenter's Mates		2		2
Armourer's Mate		1		1
Sailmaker		1		1
Captain's Steward		1		1
Able Seamen		25		25
MARINES.				
Serjeant	Charles Wise	1	John Morrison	1
Corporal		1		1
Privates		5		5
	Total	62		60

In the course of our equipment, the ships were frequently visited by Sir Thomas Byam Martin, Comptroller of His Majesty's Navy, and subsequently by Viscount Melville, and the other Lords Commissioners of the Admiralty. Early in May, we were ready to proceed down the Thames, having now received, as on each former occasion, all possible assistance from the Navy and Victualling Boards, and from Captain Hill, Commissioner of the Victualling Depôt at Deptford, in every arrangement which could in the slightest degree contribute to the success of our enterprise, or to our individual health and comfort.

In performing the duty which has, by their Lordship's directions, once more devolved upon me, of drawing up an account of our proceedings, I have considered it expedient to avoid all minute and technical description of our first season's operations, which, whatever labour and vexation they may have cost ourselves, would probably have afforded little interest or amusement to the public. In the circumstances attending our second season's navigation, and particularly those relating to the loss of the Fury, I have deemed it right to enter more into detail; considering, on the one hand, that the loss of one of His Majesty's ships is an event too serious to be lightly disposed of; and on the other, that I could thus alone do justice to the unwearied zeal and exertions of Captain Hoppner, our officers, and men, on that occasion.

The nautical, astronomical, and other observations, together with the meteorological registers, and the description of the specimens of natural history brought home in the Hecla, have been thrown into an Appendix, constituting the latter half of the present volume. Our observations upon atmospheric refractions in high latitudes, and on the diurnal variation, and change of intensity of the magnetic needle, together with Lieutenant Foster's experiments with an invariable pendulum, have been communicated to, and read before, the Royal Society; and as I understand it to be the intention of that learned body to honour these several papers by giving them a place in their Transactions, the general results alone have, by the kind permission of the President and Council, been mentioned in this volume *.

The labours of Lieutenant Foster, in the various and multiplied branches of useful science to which his attention is at all times directed, and for which his talents so eminently qualify him, will in themselves best serve to do him the justice which he merits. I should, however, be ill requiting Lieutenant Foster for the assistance (and I am happy to acknowledge the instruction) I have received from him in the course of this voyage, if I omitted to bear my

* Pages 52, 53, 56, 57.—Appendix No. XVII.

testimony to the unceasing zeal and assiduity with which he devoted himself to every species of observation and experiment, which could promote the several objects of the Expedition, or contribute to the interests of general science.

To Professors Jameson and Hooker I beg leave once more to offer my warmest acknowledgments for their kindness in undertaking to examine and describe the geological and botanical specimens now brought home. The memoir by the former gentleman in the Appendix, will be found to contain a valuable and comprehensive account of the geological character of all the lands visited in the course of our discoveries in the Polar Regions during the last eight years. To the zeal and industry of Dr. Neill, who entirely superintended the public collection of specimens of Natural History, and has furnished a variety of important geological notices, the public are very highly indebted; and the Zoological Appendix by Lieutenant Ross will furnish ample evidence of the attention paid by that gentleman to this department of science, in addition to the immediate duties of his station.

I cannot close these introductory remarks, without once more attempting to do justice to the merits of those whom it has been my good fortune to command on this and the former occasions of a similar kind. To Captain Hoppner, who has been my constant companion from the very commencement of these enterprises, I feel every possible obligation for his steady and persevering zeal in this service, and for his advice and assistance on every occasion. To the officers, seamen, and marines, my best acknowledgements are also once more due, for the zealous support I have at all times received from them in the course of this service; and I am happy to repeat my conviction that, had it depended on their conduct and exertions, our most sanguine expectations would, long ere this, have been crowned with complete success.

OFFICIAL INSTRUCTIONS.

By the Commissioners for executing the Office of Lord High Admiral of the United Kingdom of Great Britain and Ireland, &c.

Lord Viscount Melville having communicated to the King the proceedings of the late Expedition into the Arctic Seas, and His Majesty having been graciously pleased to express his commands that another Expedition should be fitted out, for the purpose of pursuing the attempt to discover a passage by sea between the Atlantic and Pacific Oceans, and of ascertaining the geography of the Northern boundaries of the American continent;

We have thought proper to appoint you to the command of the Expedition, and you are hereby required and directed to put to sea in His Majesty's ship Hecla, under your command, with His Majesty's ship Fury, whose Commander has been placed under your orders; and taking with you the William Harris transport, which the Navy Board has been directed to place at your disposal, for the purpose of carrying a proportion of your provisions and stores across the Atlantic, you are to proceed, as quickly as may be consistent with a due care not to part company, up Davis's Strait, and, having arrived at the latitude in which you may think it advisable to cross over to the Western side of that strait, you will take the first favourable opportunity of clearing the transport of the stores and provisions with which she is charged for the use of the Expedition; and, having so done, you are to send the transport back to England, so as to prevent her incurring any danger from the ice, reporting, by that opportunity, your proceedings to our Secretary, for our information, and then making the best of your way with His Majesty's ships, in the prosecution of your orders.

The experience of your former voyages seems to prove that the two channels which afford the most reasonable prospect of a passage for the ships into the sea, which bounds the north coast of America, are that round Cockburn's Island, near which your last voyage terminated, and Prince Regent's Inlet, which you discovered in your former.

Several considerations, but particularly the obstacles which you found in Prince Regent's Inlet in 1819, might have induced us to give the preference to the attempt to make a passage round Cockburn's Island; but the strong opinion which you have conveyed to us in favour of the attempt through Prince Regent's Inlet, the confident hope which you express that the ice, which, at the period of the year in which you visited the inlet, obstructed your passage, was likely to be removed by circumstances of season and weather within the navigable part of the year; and the confidence which we are justified in placing in your judgment and experience, determine us to authorize and direct you to pursue the course which you consider the most promising, namely, through Prince Regent's Inlet.

You will, therefore, after you have despatched the transport home, make the best of your way to Lancaster Sound, and, proceeding through Barrow's Strait, endeavour to make, through Prince Regent's Inlet, your passage into the sea which bounds the continent, and thence westward to the Pacific.

Should you succeed, in this first attempt of passing through Prince Regent's Inlet, it is probable, from what has been already discovered of these parts, that you may find different courses opening to you. The decision as to that most likely to conduce to the objects of the Expedition, must be referred to your own judgment, on a view of the existing circumstances of your own former proceedings, and of the discoveries of Captain Franklin (with a copy of whose account of his proceedings you are furnished), at the mouth, and to the eastward, of the Coppermine River.

If you should be so successful as to find a practicable passage down to the coast of America, you are to make the best of your way in accomplishing the main object of the Expedition, without stopping to examine that coast, or for any other object not of imperious importance; but whenever the ships may be checked in their progress by ice, or unavoidable circumstances, you will take every opportunity of examining the coasts and islands in the neighbourhood, and of making all useful observations relating to them.

His Majesty's government having appointed two Land

Expeditions for exploring the North Coast of America, the one under Captain Lyon, to proceed from Repulse Bay across the Isthmus towards Akkoolee, and thence along the coast towards the Coppermine River; the other, under Captain Franklin, to proceed from Mackenzie's River to the Icy Cape: it would be desirable, if you should reach any part of the coast, that you should mark your progress by erecting flag-staffs on a few of the most distinguishable points which you may successively visit, and you are to bury at the foot of each staff a bottle, containing such information as you think may be useful to the Land Expeditions, and any particulars relative to your own proceedings, which you may think proper to add.

As one of the great difficulties under which Captain Franklin's last expedition suffered, was the want of provisions, you are also to bury at the foot of the flag-staffs such proportion and kind of provision as you may think advisable. And, as it is possible that the flag-staff may be removed by natives, you should surround it by a pile of stones, conspicuous from some point of the shore, which may guide the Land Expeditions to the depôts there left.

It is unnecessary to give you any detailed directions as to the concert of signals with them, as you have informed us that you have made arrangements of that nature with Captains Lyon and Franklin, respectively; and if you should meet with these officers, or their parties, and that they should be desirous of coming on board, you are to receive them, bearing them as supernumeraries.

Should you happily reach the Pacific, you are to proceed to Kamtschatska, for the purpose of delivering to the Russian governor duplicates of the journals and other documents which the passage may have supplied, with a request that they may be forwarded overland to St. Petersburgh, to be conveyed from thence to London. From Kamtschatska you will proceed to the Sandwich Islands, or Canton, or such other place as you may think proper, to refit the ships and refresh the crews; and if, during your stay at such place, a safe opportunity should occur of sending papers to England, you should send duplicates by such conveyance. And, after having refitted and refreshed, you are to lose no time in returning to England by such route as you may deem most convenient.

It may happen that your progress along the North Coast of the American Continent may be so slow as to render it desirable that, if you should not be able to accomplish your passage into the Pacific earlier than the autumn of 1827, you should be assured of finding a depôt of provisions at that period, in the most advanced situation to which they can safely be conveyed.

In the event, then, of our not receiving from you such intelligence as may render the measure unnecessary, we shall, about the close of the year 1826, direct the Commander-in-chief on the South-American station, to despatch a vessel with a supply of provisions and stores, so as to be at Behring's Straits about August or September 1827. The commander of this vessel will be directed to make the best of his way round Cape Prince of Wales, where he may expect, as we are informed, to find an inlet in latitude 68° 30′, in which Captain Kotzebue is stated to have found anchorage a few years since. He will be directed to lie in that anchorage, or in the nearest good anchorage he may find to that latitude; and he will be ordered to erect, in the most prominent and visible situation, a flag-staff for your direction. As it is possible that you may touch at the Sandwich Islands, this officer will be directed to call at Owhyhee, in order that, if you should have passed to the southward, he may not be put to the inconvenience of going on to Cape Prince of Wales: and this affords a reason of preference for your touching at Owhyhee. And you, on your part, if you should first reach the neighbourhood of Captain Kotzebue's anchorage, should erect a flag-staff, or a pile of stones, in some conspicuous place, and bury a bottle with a paper, which may acquaint the said officer of your having passed. This vessel will be directed to remain in that neighbourhood as long in the autumn of 1827 as the season will admit; and when she is obliged to leave it, her commander will bury, under a pile of stones, in some conspicuous place, directions where you may find a depôt of provisions, of such species as he may judge likely to be most useful to you, and that he may be able to spare.

Whenever the season shall be so far advanced as to make it unsafe to navigate the ships, on account of the long nights having set in, and the sea being impassable on account of ice, you are, if you should have so far advanced as to prevent your return to England, to use your best endeavours to discover a sheltered and safe anchorage, where the ships may be placed for the winter; taking such measures for the health and comfort of the people under your command, as the materials with which you are supplied for housing-in the ships, or hutting-in the men on the shore, may enable you to do. And when you find it expedient to resort to this measure, if you should meet with any inhabitants, either Esquimaux or Indians, near the place where you winter, you are to endeavour, by every means in your power, to cultivate a friendship with them, by making them presents of such articles as you may be supplied with, and which may be useful or agreeable to them. You will, however, take care not to suffer yourself to be surprised by any attack from them, but use every precaution, and be constantly on your guard against any hostility.

You will endeavour to prevail on them by such reward, and to be paid in such manner as you may think best to answer the purpose, in the event of your making progress to the westward, to carry to any of the settlements of the Hudson's Bay Company an account of your situation and proceedings; with an urgent request that it may be forwarded to England with the utmost possible despatch.

If you should, on your arrival at Prince Regent's Inlet, find the passage to be impracticable, you are at liberty either to seek any other opening in that quarter, or to wait in the inlet for any change in the state of the ice which you may have reason to expect; but if your expectations in this particular should be disappointed, and if you should find yourself unable, during the favourable season, to effect a passage to the southward and westward, it is evident that nothing can be gained by wintering in a situation which may in any year be reached from England before the passage can be practicable; and we, therefore, order and direct that you do not, under such circumstances, attempt to winter out, but that if you find yourself prevented from proceeding, with some prospect of ultimate success further in that direction than has been already explored, you are to take care to ensure your return to England at the end of the present season.

We deem it right to caution you against suffering the two vessels placed under your orders to separate, except in the event of accident or unavoidable necessity; and we desire you to keep up the most unreserved communications with the commander of the Fury, placing in him every proper confidence, and acquainting him with the general tenor of your orders, and with your views and intentions, from time to time, in the execution of them, that the service may have the full benefit of your united efforts, and that in the event of unavoidable separation, or of any accident to yourself, Captain Hoppner may have the advantage of knowing, up to the latest period, all your ideas and intentions relative to a satisfactory completion of the undertaking.

We also recommend that as frequent an exchange take place as conveniently may be, of the observations made in the two ships; that any scientific discovery made by the one be, as quickly as possible, communicated for the advantage and guidance of the other, and to increase the chance of the observations of both being preserved.

We have caused a great variety of valuable instruments to be put on board the ships under your orders, of which you will be furnished with a list, and for the return of which you will be held responsible; and we have appointed Lieutenant Foster, as assistant surveyor, an officer well skilled in astronomy, mathematics, and various branches of knowledge, to assist you in making such observations and experiments as may tend to the improvement of geography and navigation, and the advancement of science in general. We deem it unnecessary to specify these objects, a detail of which you have already been furnished with, in our instructions for your guidance in your late Expeditions, and to, which we refer you; not doubting from the zeal and ability with which you have conducted the former Expeditions, that you will on this be equally diligent in collecting information yourself; and you will impress on the minds of Captain Hoppner and all the officers under your command, the importance and necessity of each respectively using his best exertions to promote the several scientific objects of the Expedition.

From Captain Hoppner we have every reason to expect drawings of the land, of natives, and their various implements, and of objects of natural history, in which he will be assisted by Mr. Head, who has received an appointment as Admiralty Midshipman, principally with this view. You are to direct Lieutenant Foster to be particularly careful to keep an accurate register of all the observations that shall be made, in the same form, and according to the same arrangement, that were followed by Captain Sabine and Mr. Fisher on the late voyages; and you are to place in the charge of Lieutenant Foster the several chronometers with which you have been supplied for the Hecla.

You are to avail yourself of every opportunity of collecting and preserving specimens of such objects of natural history as may be new, rare, or interesting; and you are to instruct Captain Hoppner, and all the other officers, to use their best diligence in increasing the collections in each ship; the whole of which must be understood to belong to the public.

The knowledge which Doctor Neill, surgeon of the Hecla, has been represented to us to possess in this department of science, will be of material service to you in arranging the collections of, and making notes upon, the various subjects of natural history. In the event of any irreparable accident happening to either of the two ships, you are to cause the officers and crew of the disabled ship to be removed into the other, and with her singly to proceed in prosecution of the voyage, or return to England, according as circumstances shall appear to require; understanding that the officers and crews of both ships are hereby authorized and required to continue to perform their duties, according to their respective ranks and stations, on board either ship to which they may be so removed. Should unfortunately your own ship be the one disabled, you are in that case, to take the command of the Fury; and, in the event of any fatal accident happening to yourself, Captain Hoppner is hereby authorized to take the command of the Expedition, either on board the Hecla or Fury, as he may prefer, placing the officer of the Expedition who may then be next in seniority to him, in command of the second ship; also in the event of your own inability, by sickness or otherwise, at any period of this service, to continue to carry these instructions into execution, you are to transfer them to Captain Hoppner, or to the surviving officer then next in command to you, who is hereby required to execute them in the best manner he can, for the attainment of the several objects in view.

In the event of England becoming involved in hostilities with any other power during your absence, you are nevertheless clearly to understand that you are not on any account to commit any hostile act whatsoever; the Expedition under your orders being only intended for the purpose of discovery and science, and it being the practice of all civilized nations to consider vessels so employed as excluded from the operations of war. And, confiding in this general feeling, we should trust that you would receive every assistance from the ships or subjects of any Foreign Power, which you may fall in with; but special application to that effect has been made to the respective governments.

You are, whilst executing the service pointed out in these instructions, to take every opportunity that may offer of acquainting our secretary, for our information, with your progress: and, on your arrival in England, you are immediately to repair to this office, in order to lay before us a full account of your proceedings in the whole course of your voyage; taking care before you leave the ship, to demand from the officers, petty officers, and all other persons on board, the logs and journals they may have kept, together with any drawings or charts they may have made, which are all to be sealed up; and you will issue similar directions to Captain Hoppner and his officers, &c.; the said logs, journals, or other documents, to be thereafter disposed of as we may think proper.

Given under our hands, the 12th of May, 1824.

MELVILLE,
WM. JOHNSTONE HOPE,
G. COCKBURN,
G. CLERK,
W. R. K. DOUGLAS.

To

WILLIAM EDWARD PARRY, ESQ.,
Captain of His Majesty's Ship the Hecla.

By Command of their Lordships

J. W. CROKER.

ADDITIONAL INSTRUCTIONS.

Admiralty Office, 12*th May*, 1824.

Sir,

In reference to that part of your general orders which relates to the ship intended to be sent in the autumn of 1827 to meet you, I am commanded by my Lords Commissioners of the Admiralty to communicate to you the following additional information :—

It is thought advisable, with a view of assisting the objects of Captain Franklin's Expedition, that the vessel intended to meet you in 1827 should endeavour to meet him in 1826.

Her commander will, therefore, be directed to reach those latitudes in the summer of 1826, to make such discoveries and observations as may open themselves to him, and to look out for Captain Franklin, or even for you, if you should be so fortunate as to accomplish the passage in that year.

He will remain in that neighbourhood as late as the season will admit, and will then repair to the Sandwich Islands, or to the nearest place where he may be able to replenish his provisions; when he will, as early as possible in the year 1827 (if you should not have already met him), proceed to act in the manner detailed in your instructions.

He will mark his proceedings in 1826 by the erection of flag-staffs, or piles of stones; and with notices where may be found a depôt of provisions, which he will leave on his departure that year, as well as in 1827.

I am, Sir,

Your very obdient Servant,

J. W. Croker.

Captain Parry, *Hecla*.

THIRD

VOYAGE FOR THE DISCOVERY

OF A

NORTH-WEST PASSAGE.

CHAPTER I.

PASSAGE TO THE WHALE-FISH ISLANDS, AND REMOVAL OF STORES FROM THE TRANSPORT—ENTER THE ICE IN BAFFIN'S BAY—DIFFICULTIES OF PENETRATING TO THE WESTWARD—QUIT THE ICE IN BAFFIN'S BAY—REMARKS ON THE OBSTRUCTIONS ENCOUNTERED BY THE SHIPS, AND ON THE SEVERITY OF THE SEASON.

THE equipment of the Hecla and Fury, and the loading of the William Harris transport, being completed, we began to move down the river from Deptford on the 8th of May, and on the 10th, by the assistance of the steam-boat, the three ships had reached Northfleet, where they received their powder and their ordnance stores. Two days were here employed in fixing, under the superintendence of Mr. Barlow and Lieutenant Foster, the plate invented by the former gentleman for correcting the deviation of the compass, produced by the attraction of the ships' iron; and the continuance of strong easterly winds prevented our getting to the Nore till the 16th. During our stay at 1824. May.

1824. May. Northfleet, the ships were visited by Viscount Melville, and the other Lords Commissioners of the Admiralty, who were pleased to approve of our general equipment and arrangements.

Tuesday 18. On the 18th Commissioner Cunningham came on board, to pay the ships' companies their arrears of river wages, and also three months in advance. Our few remaining wants were readily supplied, by the kindness of Vice Admiral Sir Benjamin Hallowell, our kind friend Commissioner Cunningham, and Commodore Sir Edward Owen; and at three
Wed. 19. A.M. on the 19th, we weighed and stood to sea. On the following morning we fell in with his Majesty's sloop Brisk; when her commander, Captain Hope, came on board, and it being his intention shortly to put into Yarmouth for water, he kindly offered to accompany us for a day or two, to take our pilots and letters. The Sylvia, revenue cutter, joining us the same day, Lieutenant White, her commander, who was immediately bound to Harwich, received our letters, with which he parted company the same evening. Light and unfavourable winds prevented our finally clearing the sands
Tuesday 25. till the 25th, when Captain Hope received our pilots, and also our despatches and letters, giving us the usual salutation of three hearty cheers, as he bore up for Yarmouth. Light and variable winds still obstructed our progress, but, by a singular coincidence, we passed through the Pentland
Sunday 30. Firth on the 30th, being the same day that we had taken

our departure from the Orkneys three years before. I wrote to the Secretary of the Admiralty, informing him of the progress of the expedition thus far, and having committed our letters to the charge of the pilot, to be landed at Thurso, bore up to the westward with a favourable breeze. The variation of the magnetic needle, observed with Mr. Barlow's plate, was 28° 12′ W., corresponding, within a few minutes, with that observed at Long-Hope in 1819. In passing Bara and Rona on the morning of the 31st, our observations placed the west end of the former island in latitude 59° 06′ 45″, longitude by chronometers 6° 11′. 1824. May. Monday 31.

During our passage across the Atlantic, and afterwards on our way up Davis's Strait, we threw overboard daily a strong copper cylinder, containing the usual papers, giving an account of our situation. We also took every opportunity afforded by light winds, to try the temperature of the sea at different depths, as compared with that at the surface, of which an account will be given in another place. June.

On the 12th, as we began to approach the meridian of Cape Farewell, we met, as usual, with flocks of sheerwaters, (*procellaria puffinus*,) which have received their popular name from the uniformity with which they are here seen. From the 12th to the 16th, being between the parallels of 58° and 61½°, and the meridians of 37° and 56°, we passed seven pieces of drift-wood, from four to sixteen feet in length, all appearing like the root-end of the trunks of small trees that had Satur. 12.

1824. June. Wed. 16. been a good while in the water. On the 16th we saw the first iceberg, being in latitude $60\frac{3}{4}°$, longitude 55°; and after that time we fell in with those bodies of ice almost daily. The temperature of the sea, which was 50° soon after our leaving Orkney, experienced little alteration, in our passage across the Atlantic, till we had reached the longitude of 33°; it then pretty gradually decreased to 32°, about the meridian of 56°, in latitude $63\frac{1}{2}°$. Its temperature from this time, as usual in the Polar Seas during the summer, varied from 28° to 36°, according to our proximity to ice, or the contrary. On entering Davis' Strait, we had a long succession of thick weather, which prevented our obtaining an observation for the latitude during a whole week; but as this was accompanied by south-easterly winds, our progress was a

Mon. 21. rapid one. On the 21st, at noon, we observed three miles to the southward of the Arctic Circle, being in the longitude of 57° 06′ 31″; and after running thirty miles on a N.$\frac{1}{4}$W. course, we made the packed ice, which had, for several hours before, been distinctly indicated by a clear bright "blink," assuming the form of a low well-defined arch, extending over the whole western horizon. On hauling up a few points to the eastward, we soon lost sight of it, and early on the following morning passed Reef-koll, in twenty-five fathoms' water, at the distance of ten or twelve miles, sailing among a number of grounded icebergs, which usually announce a ship's approach to this headland. There is said to be a dry shoal off Reef-koll (or Riskol, as it is called in some charts), at the distance of ten miles; but I have never met with it, and can obtain no good information respecting it. 1824. June.

I now determined, as the quickest and most secure mode of clearing the transport, to anchor at the Whale-fish Islands, rather than incur the risk of hampering and damaging her among the ice. Fresh gales and thick weather, however, prevented our doing so till the 26th, when we anchored Sat. 26. at eight A.M., in seventeen fathoms, mooring the ships by hawsers to the rocks, and then immediately commenced our work. In the mean time, the observatory and instruments were landed on a small island, called, by the Danes, Boat Island, where Lieutenant Foster and myself carried on the magnetic and other observations, during the stay of the Expedition at this anchorage, of which a survey was also made.

We received great attention and civility from the Danish authorities at this place, as well as at Lievely, in the Island of Disko, to which settlement Captain Hoppner and myself went in a boat on the 30th. Wed. 30. We found there, besides the inspector, Mr. West, and the other officers resident in the colony, First Lieutenant Graah of the Danish navy, who had for some time past been employed in surveying the coast of Greenland, in the neighbourhood of the settlements, and who kindly shewed us the charts he was engaged in constructing. Among other information, he communicated to

1824. June.

us the situation of a dangerous newly-discovered rock, dry at low water, and bearing from the flag-staff on Lievely point S. 43° W., distant $7\frac{1}{4}$ miles *. After dining with the inspector, we returned to the ships in the afternoon, accompanied by that gentleman and Lieutenant Graah, receiving, as we left the harbour, a salute of twelve guns. The latitude of Lievely, by Lieut. Graah's observations, the result of which he unreservedly communicated, is 69° 14′ 32″, the longitude 53° 42′ west of Greenwich, and the variation of the magnetic needle 72° westerly.

The harbour of Lievely is excellent for small vessels, having a good depth of water, and being quite land-locked; but it appears rather narrow for ships of three or four hundred tons. The settlement is principally situated on the south shore of the harbour, where there are several tolerably-built wooden houses, among which that of the inspector is a good-looking and convenient one. There are but six or seven Danes, besides the officers, belonging to the establishment; and most of the Esquimaux were, at this season, absent in the interior, for the purpose of killing rein-deer, from which occupation they do not usually return till September or October, when their services begin to be required for the whale-fishery, the latter being carried on here only during the winter months. A small schooner lying

* I find, since my return to England, that Lieutenant Graah has done me the kindness to distinguish this rock by my name, on his chart.

in the harbour, is sent every summer to bring the oil from the northern settlements, in readiness for the arrival of the vessels which come annually for the purpose of taking that article to Copenhagen, and at the same time bringing out supplies of provisions and other stores. On our return to the ships, we found arrived there Lieutenant Holboll, of the Danish navy, a gentleman much attached to the pursuits of natural history, who was engaged in making a collection of specimens of the animal kingdom, principally birds, with which he was shortly about to return to Copenhagen. He was accompanied by a clergyman and another gentleman belonging to one of the southern establishments, who came on board our ships to pay us a visit. We did not fail to shew them every attention, in return for their civilities, and they returned on shore much pleased with their reception. On the following day, when the gentlemen left us for Lievely, we returned their salute with an equal number of guns; and I gladly take this opportunity of remarking how much we were gratified by our intercourse with them. To Mr. Plûm, the principal officer at the Whale-fish Islands, I also feel particularly obliged for his attentions, and for the offer of every assistance in his power.

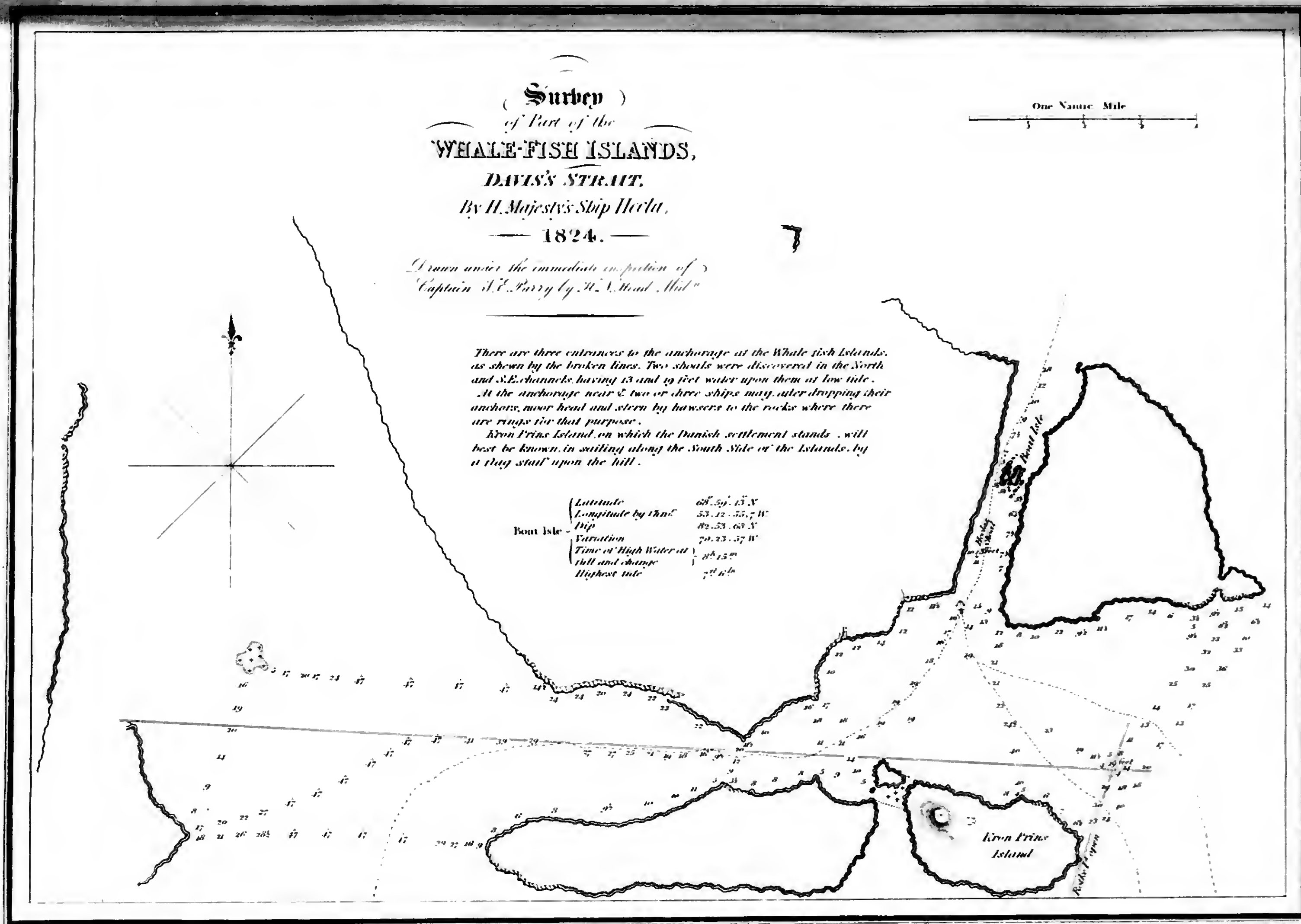
1824. June.

July. Thurs. 1.

Early on the morning of the 3rd of July, the whole of our stores being removed, and Lieutenant Pritchard having received his orders, together with our despatches and letters for England, the William Harris weighed with a light wind

Satur. 3.

1824. July. from the northward, and was towed out to sea by our boats. The day proving calm, we employed it in swinging the Hecla, in order to obtain the amount of the deviation of the magnetic needle, and to fix afresh the iron-plate for correcting it. On the following morning, the wind being southerly, the pilots came on board, and the Hecla weighed to run through the north passage; in doing which, she grounded on a rock lying directly in the channel, and having only thirteen feet upon it at low water, which our sounding boats had missed, and of which the pilot was ignorant. The tide being that of ebb, we were unable to heave the ship off immediately, and at low water she had sewed three feet forward. It was not till half-past one, P.M., that she floated, when it became necessary to drop her down between the rock and the shore with hawsers; after which we made sail, and, being soon after joined by the Fury, which came out by the other channel, we stood round the islands to the northwards. This rock was not the only one found by our boats which may prove dangerous to ships going in and out of this harbour, and with which our pilots were unacquainted. Another, as shewn in the plan, was discovered by Mr. Head, about one-third of the distance across from Kron Prins Island to the opposite shore of the S.E. entrance, and has not more than eighteen feet water on it at low tide; it lies very much in the way of ships coming in at that channel, which is the most commonly



Published as the Act directs June 1826 by John Murray Albemarle Street London

J. & C. Walker Sculp.

used. The latitude of the island on which the observations were made, called by the Danes Boat Island, is 74° 28′ 15″; its longitude, by our chronometers, 53° 12′ 56″; the dip of the magnetic needle, 82° 53′, 66; and the variation, 70° 23′ 57″ westerly. The time of high water, at new moon, on the 26th of June, was a quarter past eight, the highest tides being the third and fourth after the conjunction, and the perpendicular rise seven feet and a half. 1824. July.

For the following remarks on the geological character of these islands I am indebted to Dr. Neill. "Four of the islands belonging to this groupe, which we examined during our stay, are composed of well-defined gneiss, intersected by veins of red feldspar, and beautiful quartz, nearly approaching to rose-quartz, the strata dipping towards the N.N.E., at an angle of 23°. In the composition of the rock, the quartz predominates; the mica, which is nearly black, is next abundant, and the feldspar most sparing. On examining a recent fracture, the feldspar is scarcely perceptible; it is only on surfaces that have been long exposed to the influence of the weather that it seems evidently to compose part of this rock. In one place we noticed a detached mass of greenstone, containing a number of crystals of glassy actynolite, but, unfortunately, the mass was so tough that it could not be broken without destroying the crystals."

The ships standing in towards Lievely on the afternoon Mon. 5.
of the 5th, Lieutenant Graah very kindly came off to the

1824. July. Fury, which happened to be the nearest in-shore, for the purpose of taking leave of us. On his quitting the ship, a salute of ten guns was fired at Lievely, which we returned with an equal number; and I sent to Lieut. Graah, by a canoe that came on board the Hecla, an account of the situation of the rocks we had discovered. Light northerly winds, together with the dull sailing of our now deeply laden ships, prevented our making much progress for several days, and kept us in the neighbourhood of numerous ice-bergs, which it is dangerous to approach when there is any swell. We counted from the deck, at one time, no less than one hundred and three of these immense bodies, some of them from one to two hundred feet in height* above the sea; and it was necessary, in one or two instances, to tow the ships clear of them with the boats. We had occasion, about this time, to remark the more than usual frequency of fogs with a northerly wind, a circumstance from which the whalers are accustomed to augur a considerable extent of open water in that direction.

In standing off to the westward, we made the main ice in the longitude of 58½°, scarcely differing five miles from its position in 1819 in the same latitude, and about the same season. The land of Disko was high above the horizon, and quite distinct at the distance of three-and-twenty leagues.

* We had occasionally the means of guessing, with tolerable precision, the height of the ice-bergs, by the Fury passing close to them.

On the evening of the 13th, being in latitude 71° 02′, and longitude 58° 36′, the ice was observed, on the clearing up of a fog, to be slack for a considerable distance within the margin of the "pack." Though it was my intention to have attempted the passage across it to the westward, in a latitude one or two degrees higher, the favourable appearance it now assumed, combined with a fair wind and its unusual accompaniment, clear weather, induced me at once to enter it, which was accordingly done, and the ships pushed several leagues within the margin. 1824. July. Tues. 13.

The ice soon beginning to close around us, our progress became so slow that, on the 17th, we saw a ship at the margin of the "pack," and two more on the following day. We supposed these to be whalers, which, after trying to cross the ice to the northward, had returned to make the attempt in the present latitude; a supposition which our subsequent difficulties served to strengthen. From this time, indeed, the obstructions from the quantity, magnitude, and closeness of the ice, were such as to keep our people almost constantly employed in heaving, warping, or sawing through it; and yet with so little success, that, at the close of the month of July, we had only penetrated seventy miles to the westward, or to the longitude of about 62° 10′. Here, while closely beset, on the 1st of August, we encountered a hard gale from the south-east, which, pressing the ice together in every direction, by mass overlaying mass for hours together, the Sat. 17. August. Sun. 1.

1824. August. Hecla received several very awkward "nips," and was once fairly laid on her broadside by a strain which must inevitably have crushed a vessel of ordinary strength. In such cases, the ice is forced under a ship's bottom, on one side, and on the other up her side, both powers thus acting in such a manner as to bring her on her "beam-ends." This is, in fact, the most favourable manner in which a ship can receive the pressure, and would perhaps only occur with ice comparatively not very heavy, though sufficiently so, it is said, to have run completely over a ship in some extreme and fatal cases. With ice of still more formidable dimensions, a vessel would, probably, by an equal degree of pressure, be absolutely crushed, in consequence of the increased difficulty of sinking it on one side, and causing it to rise on the other*.

This gale, which commenced on the 31st of July, was the only strong or even fresh breeze we experienced in the course of that month; and the indications of the barometer, during its continuance, deserve to be noticed. On the morning of the 31st, about the time the breeze commenced, the mercury began to rise from 29,255, and reached 30,271 on the evening of the 1st of August, when the breeze moderated, the

* It has more than once occurred to me, under such stress of materials as this, that, independently of the absolute strength of our ships, the circumstance of their being *quite full*, and stowed with minute attention to closeness in every part of their holds, might have contributed something towards their withstanding such enormous pressure.

weather cleared up, and the barometer again began to fall. 1284. August.
Neither in the strength nor the direction of the wind, nor in the state of the atmosphere, did the mercury indicate the weather we should have anticipated from it; for the breeze, soon after the fall of the barometer, shifted to the northward, with a clear, dry atmosphere, whereas the column had continued to rise steadily during thirty hours of strong southerly wind, accompanied by thick and wet weather.

While thus detained, there was not the smallest appearance of any clear water to the westward, and I remarked, moreover, that contrary to what had hitherto been the case, we had not drifted in that direction, notwithstanding the strength and duration of the gale. I determined, on this account, to direct our endeavours more to the northward, in hopes of there finding the ice less compact. By dint of constant and extreme labour, and at the expense of some of our Thurs. 19.
westing, we gained the latitude of 72° 34′ on the 19th of August, where the ice still presented as impenetrable a barrier as before. Continuing our efforts to push to the Sun. 29.
northward, we had, on the 29th of August, arrived in latitude 73° 15′, on the meridian of 63° 40′, in which situation, from our experience in 1819, we had reason to expect there would scarcely have been any ice at this season. The obstructions, however, continued nearly the same, notwithstanding our Sept. Wed. 8.
being much favoured by south-easterly winds, till the 8th of September, in latitude 74° 07′, and longitude 69° 54′, or about one hundred and ten miles to the W.N.W. of the situation

1824. Sept. Thurs. 9. in which we cleared the "pack" in the year 1819. Here the ice became more slack, but it was not till the following day that, having forced our way about forty miles farther, or to the latitude of 74° 14', and longitude 72° 25', we at length succeeded in releasing ourselves from the more than ordinary barrier of ice in the middle of Baffin's Bay.

I shall, doubtless, be readily excused for not having entered in this journal, a detailed narrative of the obstacles we met with, and of the unwearied exertions of the officers and men to overcome them, during the tedious eight weeks employed in crossing this barrier. I have avoided this detail, because, while it might appear an endeavour to magnify ordinary difficulties, which it is our business to overcome rather than to discuss, I am convinced that no description of mine, nor even the minute formality of the log-book, could convey an adequate idea of the truth. The strain we constantly had occasion to heave on the hawsers, as springs to force the ships through the ice, was such as, perhaps, no ships ever before attempted; and by means of Phillips's invaluable capstan*, we often separated floes of such magnitude as must

* I cannot omit this opportunity of expressing my admiration of this ingenious contrivance in every trial to which we put it in the course of this voyage. By the perfect facility with which the machinery is made to act, or the contrary, it is easily altered and applied to any purpose, in ten or fifteen seconds; and the slowness and consequent steadiness of the power, render it infinitely less trying to the hawsers than any purchase we were before enabled to adopt on board a ship.

otherwise have baffled every effort. In doing this, it was next to impossible to avoid exposing the men to very great risk, from the frequent breaking of the hawsers. On one occasion three of the Hecla's seamen were knocked down as instantaneously as by a gun-shot, by the sudden flying out of an anchor, and a marine of the Fury suffered in a similar manner when working at the capstan; but providentially they all escaped with severe contusions. A more serious accident occurred in the breaking of the spindle of the Fury's windlass, depriving her of the use of the windlass-end during the rest of the season. 1824. Sept.

In considering the causes of this our bad success, it will not be difficult to shew, by comparison with what we experienced on former occasions, that it was to be attributed to an extremely unfavourable season, both as regarded the quantity and closeness of the ice, as well as the actual temperature, and the general state of the weather during the month of August, the very best of the year for navigation in these seas. It has already been seen that the main body of ice reached one hundred and fifty miles farther to the W.N.W., in the parallel of about 74°, than it did in 1819, while the eastern margin, where we entered it, was found precisely in the same meridian as usual at that season; so that the actual breadth of the barrier appears to have been fifty leagues greater than before. In the absence of actual observations during the preceding winter, it is not easy to

1824. Sept. conjecture whether this circumstance arose from the unusual severity of that dreary season in 1823 and 1824, or from the tardiness of the returning summer's warmth in dissolving the ice produced during the winter; either of which causes, but more particularly both combined, would sufficiently account for it. That the summer was a wretched one we had too much reason to know; and the following comparative view of the temperature of August, 1824, with that of the five preceding and one following year, will afford very striking evidence of the fact:—

		Temperature.		
Year.	*Latitude.*	*Max.*	*Min.*	*Mean.*
1819	74° to 75°	+42	+28	+33°.7
1820	74 to 75	45	22	32.6
1821	65 to 66½	48	28	36.6
1822	About 69½	50	27	33.7
1823	69½ to 66½	55	24	37.3
1824	71 to 73¾	36.5	16	29.7
1825	72½ to 73¼	51	25	35.8

Not less remarkable than the temperature of August was the extraordinary weather which accompanied it, and which, indeed, may perhaps be considered as its cause; for of the thirty-one days in that month, there was actually but one in which we had not a deposit of snow, sleet, rain, or fog, during some part of the twenty-four consecutive hours; and a northerly wind, which is the usual harbinger of a clear, dry, wholesome atmosphere, was just as thick as any other. For ten weeks in July, August, and September, though we were constantly watching for an opportunity of airing the ships' companies' bedding on deck, we could only venture to do so once. 1824. Sept.

When a considerable fall of snow in light flakes takes place at a low summer temperature, the formation of young ice is, of course, very greatly accelerated, and this was so much the case in the present instance, that on several days, even in the middle of August, the ships could scarcely be dragged through it; whereas that obstruction, the most tedious and vexatious we have to contend with, never occurred to us before, till full a month later than this. The appearance around us, under these circumstances, was sometimes a curious, and, to our prospects of advancement, rather an alarming one; for the water and the air being both too cold to dissolve the snow, it remained floating upon the surface till every pool was entirely covered with it, so that the sea, which just before had been diversified with alternate light and dark patches, was immediately converted into one uniform surface of white. This phenomenon, to the extent in which it now occurred, was to me a new one; and there can be no doubt that, had the temperature continued low for two or three days together, while the sea was thus covered, a sheet of ice would have been formed, too solid to have been again dissolved during the same season. It was impossible, therefore, not to apprehend at times, that a continuance of weather so unseasonable might expose us to the unpleasant

1824. Sept. dilemna of being frozen up during a winter in the middle of Baffin's Bay.

During our passage across the ice, the temperature of the sea-water at the surface differed at times from 28° to 32°, this change evidently depending on the quantity of ice which was dissolving and covering the surface at the time; but during colder weather, when little or no dissolution was going on, the temperature of 28° almost invariably prevailed. On our leaving the western margin of the ice, it rose, at eight leagues' distance, to 32°, then fell immediately to 31° and 30°, which continued for sixty miles on a westerly course, and then gradually decreased to 28°, on approaching Sir James Lancaster's Sound. In the year 1819 its temperature remained at 37°, for a run of sixty-three miles in the same direction. Our detention in the ice afforded occasional opportunities of trying the temperature and specific gravity of the sea-water at different depths; an account of these experiments, together with a few others subsequently obtained, will be given in one concise view, at the close of this season's narrative.

Our soundings, in crossing Baffin's Bay, increased with tolerable regularity as we advanced to the westward. When only a few miles within the eastern margin of the ice, on the 15th and 16th of July, we had from two hundred and thirty-five to two hundred and eighty fathoms, muddy bottom. On the 18th, the depth had increased to three hundred and fifty-five fathoms, and on the 21st no soundings could be gained with four hundred and seventy. Advancing still farther to the northward and westward, a line of seven hundred to seven hundred and fifty fathoms did not reach the ground. 1824. Sept.

The constant besetment of the ships, and our daily observations for latitude and longitude, afforded a favourable opportunity for ascertaining precisely the set of any currents by which the whole body of ice might be actuated. By attending very carefully to all the circumstances, it was evident that a daily set to the southward obtained, when the wind was northerly, differing in amount from two or three, to eight or ten miles per day, according to the strength of the breeze; but a northerly current was equally apparent, and fully to the same amount, whenever the wind blew from the southward. A circumstance more remarkable than these, however, forced itself strongly upon my notice at this time, which was, that a *westerly* set was very frequently apparent, even against a fresh breeze blowing from that quarter. I mention the circumstance in this place, because I may hereafter have to offer a remark or two on this fact, in connexion with some others of a similar nature noticed elsewhere.

With respect to the dimensions of the ice through which we had now scrambled our way, principally by warping and towing, a distance of between three and four hundred miles, I remarked that it for the most part increased, as well in the thickness as the extent of the floes, as we advanced westward about the parallel of 71°. During our subsequent pro-

1824. Sept. gress to the north, we also met with some of enormous dimensions, several of the floes, to which we applied our hawsers and the power of the improved capstan, being at their margin more than twenty feet above the level of the sea; and over some of these we could not see from the mast-head. Upon the whole, however, the magnitude of the ice became somewhat less towards the north-west, and within thirty miles of that margin the masses were comparatively small, and their thickness much diminished. Bergs were in sight during the whole passage, but they were more numerous towards the middle of the "pack," and rather the most so to the southward.

The birds we saw were rotges *(Alca Alle)*, looms *(Uria Brunnichii)*, dovekies *(Colymbus Grylle)*, and ivory gulls *(Larus Eburneus)*; but the rotges were by far the most numerous, occurring, at times, in considerable flocks, and occupying the small pools of open water between the floes, especially to the westward. A flock of ducks, appearing generally of the eider species, was also now and then observed, and even as early as the middle of August these were always flying to the south-eastward. A few solitary seals, and two or three bears, were all that we saw besides, only one or two whales occurring till after we had entered Sir James Lancaster's Sound.

CHAPTER II.

ENTER SIR JAMES LANCASTER'S SOUND—LAND AT CAPE WARRENDER—MEET WITH YOUNG ICE—SHIPS BESET AND CARRIED NEAR THE SHORE—DRIVEN BACK TO NAVY-BOARD INLET—RUN TO THE WESTWARD, AND ENTER PRINCE REGENT'S INLET—ARRIVAL AT PORT BOWEN.

All our past obstacles were in a moment forgotten, when 1824. Sept.
we once more saw an open sea before us; but it must be confessed that it was not so easy to forget that the middle of September was already near at hand, without having brought us even to the entrance of Sir James Lancaster's Sound. That not a moment might be lost, however, in pushing to the westward, a press of canvass was crowded, and being happily favoured with an easterly breeze, on the morning of
the 10th, we caught a glimpse of the high bold land on the Frid. 10.
north side of the magnificent inlet up which our course was once more to be directed. From the time of our leaving the main body of ice, we met with none of any kind, and the entrance of the Sound was, as usual, entirely free from it, except here and there a berg, floating about in that solitary grandeur, of which these enormous masses, when occurring in the midst of an extensive sea, are calculated to convey so sublime an idea.

1824. Sept. Sat. 11.

On the morning of the 11th, the ships being taken a-back with a fresh westerly breeze, when near Cape Warrender, I landed in a small bay close to the westward of it, accompanied by several of the officers, in order to examine the country, and to make the necessary observations. Dr. Neill observed, on landing, that "the beach was covered with fragments of flesh-coloured feldspar, closely studded with red garnets, varying in size from that of a garden pea to that of a walnut. We could with difficulty determine the nature of the formation of the coast, the surface of the ground being almost entirely covered, either with snow, luxuriant rein-deer moss, or *debris* from the neighbouring hills. In one place, however, we observed a small part of the rock *in situ*, and could with certainty determine it to be of gneiss formation. Feldspar, in large plates, thickly set with garnets, composed the greater part of the rock: these plates were separated by thin layers of quartz and mica, closely blended together, the strata dipping in a northerly direction, at an angle of thirty degrees. We found on the beach several nodules of clay-ironstone, but could not observe from whence they were detached."

The vegetation was scanty, but a few plants were added to our collection by the gentlemen who accompanied me. Our party was successful in killing three rein-deer out of a small herd, the only one seen; these gave us one hundred and ninety-two pounds of venison, exclusive of the heads, hearts, &c., which, as usual, became the perquisites of the successful sportsmen. The latitude observed at our landing-place, which was on the eastern side of a bay, three-quarters of a mile wide, and close to Cape Warrender, was 74° 28′ 16″, the longitude by chronometers, 81° 51′ 12″.9*, and the variation of the magnetic needle, 104° 48′ 30″ westerly. 1824. Sept.

A narrow stream of water ran down the centre of the bay, communicating with a small lagoon, just within the beach; and on the steep side of a hill at the back of a considerable space of level ground, fronting the bay, was an immense mass of snow and ice, containing strata of muddy-looking soil, the rudiments, perhaps, of some huge ice-berg, which, ages hence, may here be tumbled into the ocean.

On the morning of the 12th we were once more favoured with a breeze from the eastward, but so light and unsteady, that our progress was vexatiously slow; and on the 13th, when within seven leagues of Cape York, we had the mortification to perceive the sea a-head of us covered with young ice, the thermometer having, for two days past, ranged only from 18° to 20°. On reaching it we had, as usual, recourse to "sallying," breaking it with boats a-head, and various other expedients, all alike ineffectual without a fresh and free Sunday 12.

* This latitude will be found to agree exactly, and the longitude within one mile of the position assigned to Cape Warrender in our chart of 1819, and obtained by the intersection of astronomical bearings taken at a considerable distance from the coast.

1824. Sept. breeze furnishing a constant impetus; so that after seven or eight hours of unsuccessful labour in this way, we were obliged to remain as we were, fairly and immovably beset.

It now appeared high time to determine as to the propriety of still continuing our efforts to push to the westward, or of returning to England, according to my instructions on that head, under particular circumstances. As the crossing of the ice in Baffin's Bay had of itself unexpectedly occupied nearly the whole of one season, it could not, of course, be considered that the attempt to penetrate to the westward, in the manner directed by their Lordships, had as yet been made, nor could it, indeed, be made during the present year. I could not, therefore, have a moment's hesitation as to the propriety of pushing on as far as the present season would permit, and then giving a fair trial, during the whole of the next summer, to the route I was directed by my instructions to pursue. In order, however, to confirm my own opinion on this subject, I requested to be furnished with that of Captain Hoppner; and finding that his views entirely agreed with my own, I resolved still to pursue our object by all the means in our power.

The next breeze sprung up from the westward, drawing also from the southward, at times, out of Prince Regent's
14th to 16th. Inlet, and for three days we were struggling with the young ice to little or no purpose, now and then gaining half a mile of ground to windward in a little "hole" of open water, then

losing as much by the necessity of bearing up, or wearing, (for the ice was too strong to allow us to tack) sallying from morning to night with all hands, and with the watch at night, two boats constantly under the bows; and after all, rather losing ground than otherwise, while the young ice was every hour increasing in thickness. 1824. Sept.

On the 17th, when we had driven back rather to the eastward of Admiralty Inlet, an easterly breeze again enabled us to make some progress. The sea was now, for the most part, covered with young ice, which had become so thick as to look white throughout its whole extent. The holes of water could now, therefore, be more distinctly seen, and by taking advantage of these, we succeeded in making a few miles of westing, the "leads" taking us more in-shore, towards Admiralty Inlet, than before. Towards sun-set we became more and more hampered, and were eventually beset during the night. A breeze sprung up from the westward, which increasing to a fresh gale, we found ourselves, at daylight, far to the eastward, and also within two miles of the land, near a long low point, which, on the former voyages, had not been seen. The sea was covered with ice between us and the shore, all of this year's formation, but now of considerable thickness and formidable appearance. The wind continuing strong, the whole body was constantly pressed in upon the land, bearing the ships along with it, and doubling one sheet over another, sometimes to a hundred thicknesses. Friday 17.

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We quickly shoaled the water from seventy to forty fathoms, the latter depth occurring about a mile from the beach; and after this we drifted but little, the ice being blocked up between the point and a high perpendicular berg lying a-ground off it.

The sails being furled, and the top-gallant yards got down, we now considered ourselves fortunate in our situation; for had we been only a quarter of a mile further out, we should have been within the influence of a current that was there sweeping the whole body of ice to the eastward, at the rate of a mile and a half an hour. Indeed, at times, this current was disposed to approach us still nearer, carrying away pieces of ice close to our quarter; but by means of long hawsers, secured to the heaviest and most compact of the small floes in-shore of us, we contrived to hold on. Under such circumstances, it evidently became expedient to endeavour, by sawing, to get the ships as close in-shore as possible, so as to secure them either to grounded ice, or by anchoring within the shelter of a bay, at no great distance inside of us; for it now seemed not unlikely that winter was about to put a premature stop to all further operations at sea for this season. At all events it was necessary to consult the immediate safety of the ships, and to keep them from being drifted back to the eastward. I, therefore, gave orders for endeavouring to get the ships in towards the bay, by cutting through what level floes still remained. At the same time an officer

was despatched to examine the shore, which was found safe, 1824. Sept.
with regular soundings in every part. So strong had been Monday 20.
the pressure while the ice was forcing in upon us, that after liberating the Hecla on one side, she was as firmly cemented to it on the other, as after a winter's formation, and we could only clear her by heavy and repeated "sallying." After cutting in two or three hundred yards, while the people were
at dinner on the 21st, our canal closed, by the external Tuesday 21.
pressure coming upon the parts which we had weakened, and in a few minutes the whole was once more in motion, or, as the seamen not inaptly expressed it, "alive," mass doubling under mass, and raising those which were uppermost to a considerable height. The ice thus pressed together was now about ten feet in thickness in some places, and, on an average, not less than four or five, so that while thus forced in upon a ship, although soft in itself, it caused her to tremble exceedingly; a sensation, indeed, commonly experienced in forcing through young ice of considerable thickness. We were now once more obliged to be quiet spectators of what was going on around us, having, with extreme difficulty, succeeded in saving most of our tools that were lying on the ice when the squeezing suddenly began. Towards evening we made fast to a stationary floe, at the distance of one mile from the beach, in eighteen fathoms, where we remained tolerably quiet for the night, the ice outside of us, and as far as we could see, setting constantly, at a great rate, to the

1824. Sept. eastward. Some of our gentlemen, who had landed in the course of the day, and who had to scramble their way on board over the ice in motion, described the bay as deeper than it appeared from the offing. Dr. Neill "found, on such parts of the beach as were not covered with ice or snow, fragments of bituminous shale, flinty slate, and ironstone, interspersed amongst a blue-coloured limestone gravel. As far as he was able to travel inland, the surface was composed of secondary limestone, partially covered with a thin layer of calc-sinter. From the scantiness of the vegetation here, the limestone seemed likely to contain a large proportion of magnesia. Dr. Neill was about to examine for coal, which the formation led him to expect, when the ice was observed to be in motion, obliging him hastily to return on board." Lieutenant Ross "found, about two-thirds up a small peaked insulated hill of limestone, between three and four hundred feet above the level of the sea, several pieces of coal, which he found to burn with a clear bright flame, crackling much, and throwing off slaty splinters."

Hares' burrows were numerous on this hill; Lieutenant Ross saw two of these animals, one of which he killed. A fox was also observed, in its summer dress; and these, with a pair of ravens, some wingless ducks, and several snow-buntings, were all the animals noticed at this place.

Wed. 22. A sudden motion of the ice, on the morning of the 22nd, occasioned by a change of wind to the S.E., threatened to carry us directly off the land. It was now, more than ever, desirable to hold on, as this breeze was likely to clear the shore, and, at the same time, to give us a run to the westward. Hawsers were, therefore, run out to the land-ice, composed of some heavy masses, almost on the beach. With the Hecla this succeeded, but the Fury being much further from the shore, soon began to move out with the whole body of ice, which, carrying her close to the large berg off the point, swept her round the latter, where, after great exertion, Captain Hoppner succeeded in getting clear, and then made sail to beat back to us. In the mean time the strain put upon the Hecla's hawsers being too great for them, they snapped, one after another, and a bower-anchor was let go, as a last resource. It was one of Hawkins's, with the double fluke, and immediately brought up, not merely the ship, but a large floe of young ice, which had just broken our stream-cable. All hands were sent upon the floe to cut it up a-head, and the whole operation was a novel, and at times a fearful one; for the ice, being weakened by the cutting, would suddenly gather fresh-way astern, carrying men and tools with it, while the chain-cable continued to plough through it in a manner which gave one the idea of something alive, and continually renewing its attacks. The anchor held surprisingly, and after this tremendous strain had been put upon it for above an hour, we had fairly cut the floe in two, and the ship was riding in clear water about half a mile from the shore.

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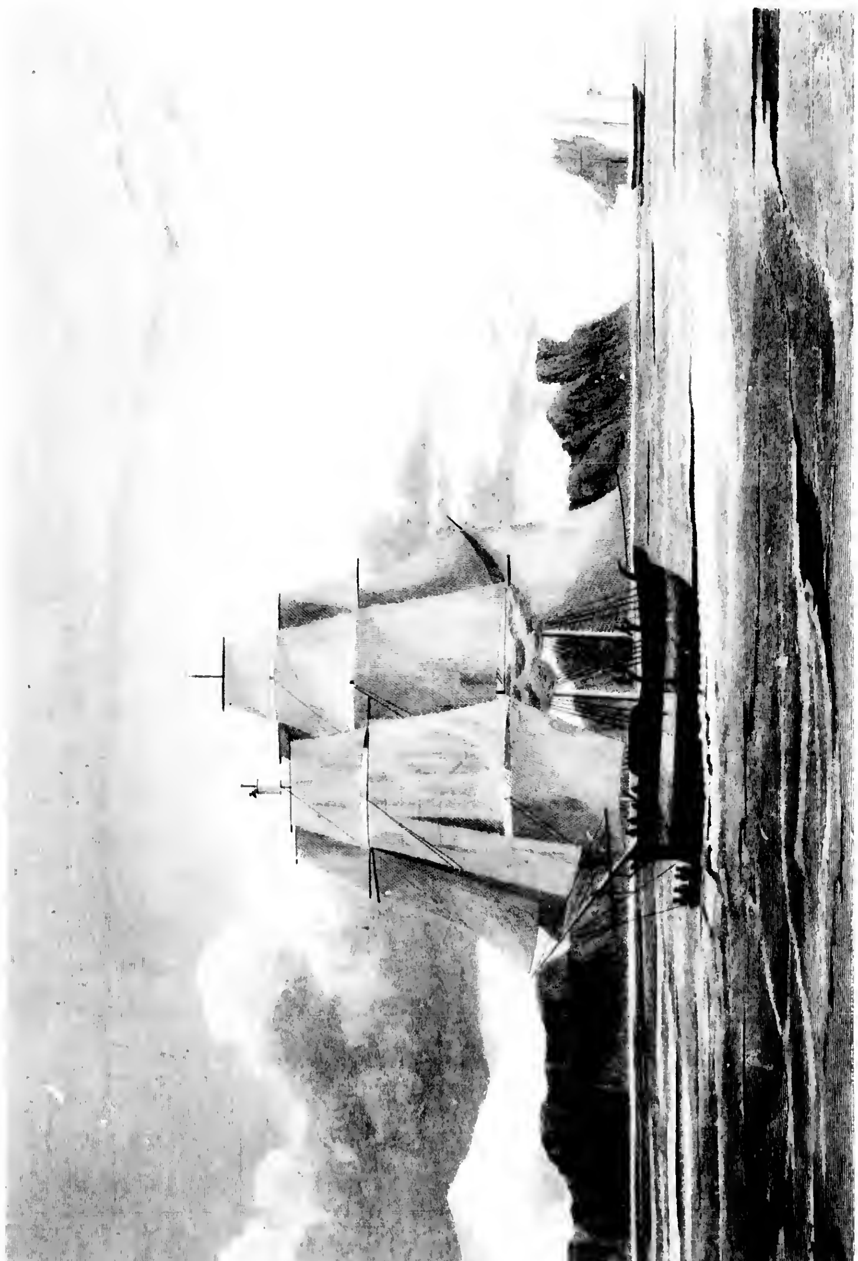
I was now in hopes we should have made some progress, for a large channel of clear water was left open in-shore; a breeze blew off the land, and the temperature of the atmosphere had again risen considerably. We had not sailed five miles, however, when a westerly wind took us a-back, and a most dangerous swell set directly upon the shore, obliging me immediately to stand off the land; and the Fury being still to the eastward of the point, I ran round it, in order to rejoin her before sunset. The current was here setting very fast to the eastward, not less, I think, in some places, than two miles an hour, so that, even in a clear sea, we had little chance of stemming it, much less beset as we were in young ice during an unusually dark night of nine or ten hours' duration, with a heavy fall of snow. The consequence was, that when we made the land on the morning of the 23rd, we had been drifted the incredible distance of eight or nine leagues during the night, finding ourselves off the Wollaston Islands at the entrance of Navy Board Inlet. We stood in under the islands to look for anchorage during the night, but the water being everywhere too deep close to the shore, we made fast at sunset to some very heavy ice upon a point, which we took to be the main-land, but which Captain Hoppner afterwards found to be upon one of the islands, which are at least four in number.

Here we found the current still setting to the eastward, and at one time during the night it was so strong against a fresh easterly wind, that we were obliged to set our top-sails a-back, to keep the ships clear of the ice. At length, on the morning of the 24th, before daylight, one of the anchors slipped out by the sheering of the ship, and the other hawser immediately breaking, we made sail off the land. At daylight, the easterly wind having freshened to a gale, and dispersed almost the whole of the young ice, I made the Fury's signal to join us as soon as she had saved our hawsers, and we then bore up along the land to the westward. We had a fine run during the day, but towards evening met with a great deal of young ice packed together by the breeze now blowing. We also met here with some "old ice", one floe of which, or rather field, was immensely heavy, and too extensive to see over. About Cape Craufurd it led us close in with the land, which is all so bold in this neighbourhood as to leave nothing to fear in that respect, and after running till eleven at night, we hove-to for daylight, some ice being seen a-head. The wind died away at midnight, and was succeeded soon after by a contrary breeze, the thermometer gradually falling from 28° in the morning to 17° at night, so that our enemy, the young ice, once more began to exert its influence. Being off Eardley Bay, towards sunset, and observing that the current still set to the eastward, I went in-shore in a boat, to look for some place of tolerable security in which the ships might hold on during the night, but without success. We were, therefore, under the necessity of taking our chance

1824. Sept. Friday 24.

Satur. 25.

1824. Sept. under-way, if the latter term may be applied to ships that, for eight hours, did not move ten times their own length Sun. 26. through the young ice. I was glad to find in the morning, however, that we had lost little or no ground, by which it appeared that the current, which, on the evening before, was setting to the eastward in-shore, at the rate of not less than a knot and a half, did not extend to the deeper water in the offing. On the 26th we were favoured with an easterly breeze, which, gradually freshening, promised, in earnest, to take us into Prince Regent's Inlet. We sailed through many miles of tough young ice, with a heavy press of canvass, keeping two boats a-head, by ropes attached to the bowsprit, till it was dangerous to do so any longer, and in a few hours found ourselves within the inlet, and in perfectly clear water in-shore, the breeze having driven all the young ice off the land, as well as a body of old floes, which just left us room to sail within it. The wind came in extremely hard gusts out of every ravine and valley, with which this coast abounds, obliging us to lower our small sails frequently; and soon after dark a gale came on so suddenly as scarcely to give us time for taking in our canvass. Having reduced to the maintop-sail and storm-sails, and the sea not being heavy, in consequence of the wind being well off the land, we passed the night without accident, though in constant anxiety, from the expectation of meeting with the main body of ice under our lee. The weather was, in truth, most inclement, being



extremely dark, and small snow being drifted off the hills in such continued clouds as to make it impossible to look to windward, and rendering both the atmosphere and the sea extremely thick. 1824. Sept.

After midnight the wind began to moderate, and by degrees also drew more to the southward than before. At daylight, therefore, we found ourselves seven or eight miles from the land; but no ice was in sight, except the "sludge," of honey-like consistence, with which almost the whole sea was covered. A strong blink, extending along the eastern horizon, pointed out the position of the main body of ice, which was farther distant from the eastern shore of the inlet than I ever saw it. Being assisted by a fine working breeze, which, at the same time, prevented the formation of any more ice to obstruct us, we made considerable progress along the land, and at noon were nearly a-breast of Jackson Inlet, which we now saw to be considerably larger than our distant view of it on the former voyage had led us to suppose. We found also that what at a distance appeared an island in the entrance, was, in reality, a dark-looking rocky hill, on the south side. A few more tacks brought us to the entrance of Port Bowen, which, for two or three days past, I had determined to make our wintering-place, if, as there was but little reason to expect, we should be so fortunate as to push the ships thus far. My reasons for coming to this determination, in which Captain Hoppner's opinion also served to confirm me, Mon. 27.

1824. Sept.

will be sufficiently gathered from the operations of the preceding fortnight, which convinced me that the precarious chance of making a few miles more progress could no longer be suffered to weigh against the evident risk now attending further attempts at navigation: a risk not confined to the mere exposure of the ships to imminent danger, or the hazard of being shut out of a winter-harbour, but to one which, I may be permitted to say, we all dreaded as much as these,—the too obvious probability of our once more being driven back to the eastward, should we again become hampered in the young ice. Joining to this the additional consideration that no known place of security existed to the southward on this coast, I had not the smallest hesitation in availing myself of the present opportunity to get the ships into harbour. Beating up, therefore, to Port Bowen, we found it filled with "old" and "hummocky" ice, attached to the shores on both sides, as low down as about three-quarters of a mile below Stoney Island. Here we made fast in sixty-two fathoms' water, running our hawsers far in upon the ice, in case of its breaking off at the margin.

On entering Port Bowen, I was forcibly struck with the circumstance of the cliffs on the south side of the harbour being, in many places, covered with a layer of blue transparent-looking ice, occasioned undoubtedly by the snow partially thawing there, and then being arrested by the frost, and presenting a feature very indicative of the late cold summer.

The same thing was observed on all the land to which we made a near approach on the south side of Barrow's Strait this season, especially about Cape York and Eardley Bay; but as we had never been close to these parts of the shore in 1819, it did not occur to me as any thing new, or worthy of notice. At Port Bowen, however, which, in that year, was closely examined, I am quite certain that no such thing was to be seen, even in the month of August, the cliffs being then quite clear of snow, except here and there a patch of drift.

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Though it was evident that we could not possibly get the ships round Stoney Island, into the proper anchorage (neither indeed was it desirable, on account of our prospects of an early release in the spring), yet it was expedient to remove them immediately from the sea-margin of the ice, by cutting a canal into the floe as far as was necessary for their security; a work that was accordingly commenced on the following day. The labour proved extremely heavy for the men, the floe being thick and full of large hummocks; but considerable progress had been made on the morning of the 29th, when a gale came on from the eastward, which for six or seven hours blew in gusts, and with a violence I never remember to have seen exceeded, occasioned probably by the high lands between which we were lying. Masses of ice constantly breaking off from the edge of the floe, kept us in continual apprehension of our hawsers being snapped

1824. Sept. by the additional strain thus occasionally brought upon them, in which case we should have been driven to sea, and probably into the old ice, which had been in sight all day off the harbour. Happily, however, we held on, and

Thurs. 30. were enabled to resume our work the following day, the canal already cut being now scarcely perceptible, from the washing away of the ice composing its sides. On the evening

October. Friday 1. of the 1st of October, we had accomplished enough for our purpose, and the ships were warped into their winter-stations, which we had the satisfaction to think were extremely favourable for an early release in the spring.

We lay here in fifty-three fathoms water, over a bottom of very soft mud. The sea, soon after, being covered on the outside with a floe of young ice, which was not again removed for the winter, we suffered no further disturbance; but the easterly winds were occasionally so violent for several days after this, that I did not consider the ships sufficiently secure for commencing the winter arrangements, until the bower-cables were carried out from each, and taken round large hummocks of ice, as far up the harbour as possible. After these precautions had been taken, we were finally settled about the middle of October.

Late as we had this year been in reaching Sir James Lancaster's Sound, there would still have been time for a ship engaged in the whale-fishery to have reaped a tolerable harvest, as we met with a number of whales in every part of it, and even as far as the entrance of Port Bowen. The number registered altogether in our journals is between twenty and thirty, but I have no doubt that many more than these were seen, and that a ship expressly on the look-out for them would have found full occupation for her boats. Several which came near us were of large and "payable" dimensions. I confess, however, that had I been *within* the Sound, in a whaler, towards the close of so unfavourable a season as this, with the young ice forming so rapidly on the whole extent of the sea, I should not have been disposed to persevere in the fishery under circumstances so precarious, and to a ship unprepared for a winter involving such evident risk. It is probable, however, that on the *outside* the formation of young ice would have been much retarded by the swell; and I am inclined to believe that a season so unfavourable as this will be found of rare occurrence.

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We observed a great many narwhals in different parts of Barrow's Strait, and a few walruses, and should perhaps have seen many more of both, but for the continual presence of the young ice.

I shall close this season's narrative with the result of a few experiments made at different times on the specific gravity and temperature of the sea-water at various depths below the surface.

1824. DAY.	TIME.	WATER BROUGHT UP: From a depth of	WATER BROUGHT UP: Specific Gravity.	Temperature when Weighed	Temperature when Brought up	Temperature of Surface Water.	Temperature of Atmosphere.	REMARKS.
		Fathoms		+ °	+ °	+ °	+ °	
June 24.	8 P.M.	46	. .	. .	32	34	32	
July 8.	10.30AM	109	. .	. .	33	37	37.5	Whole depth 112 fathoms.
		Surface	1.0039	57				
		½	1.0204	67				
		1½	1.0190	71				
		10	1.0230	75				
18.	A.M.	20	1.0247	73	. .	31.5	31 to 33	Closely surrounded by extensive bodies of ice.
		30	1.0261	66				
		100	1.0257	72				
		215	1.0267	57				
		215	. .	. .	30	30.5	35	
		Surface	1.0018	55				
		2	1.0191	59.5				
		10	1.0256	57				
		20	1.0257	61				
25.	P.M.	30	1.0267	59.5	. .	32.5	34.5	Ditto.
		50	1.0267	59.5				
		100	1.0264	55.5				
		200	1.0271	56				
		300	1.0270	58				
		400	1.0263	59.5				
Sept. 12.	A.M.	5	1.0255	52	30	28.5	16	Very little ice in sight: whole depth of water 305 fathoms.
		300	1.0275	52				
13.	A.M.	200	1.0262	61	28.5	28.5	20	Whole depth 210 fathoms.
18.	. .	Surface	1.0087	50	. .	. .	. .	Dissolved from young salt-water ice, an inch thick, containing a brown vegetable substance.
19.	. .	. .	1.0011	47	. .	. .	. .	From a part of a berg, dissolved on board for drinking.
Oct. 2.	P.M.	54	. .	. .	29	28	18.5	

CHAPTER III.

WINTER ARRANGEMENTS—IMPROVEMENTS IN WARMING AND VENTILATING THE SHIPS—MASQUERADES ADOPTED AS AN AMUSEMENT TO THE MEN—ESTABLISHMENT OF SCHOOLS—MAGNETIC AND ASTRONOMICAL OBSERVATIONS—METEOROLOGICAL PHENOMENA.

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Our present winter-arrangements so closely resembled, in general, those before adopted, that a fresh description of them here would prove little more than a repetition of that already contained in the narratives of our former voyages. On each succeeding occasion, however, some improvements were made which, for the benefit of those hereafter engaged in similar enterprises, it may be proper to record. For all those whose lot it may be to succeed us, sooner or later, in these inhospitable regions, may be assured that it is only by rigid and unremitted attention to these and numberless other "little things," that they can hope to enjoy the good state of health which, under the divine blessing, it has always been our happiness, in so extraordinary a degree, to experience.

In the description I shall offer of the appearances of nature, and of the various occurrences, during this winter, I

1824. October. know not how I can do better than pursue a method similar to that heretofore practised, by confining myself rather to the pointing out of any *difference* observed in them now and formerly, than by entering on a fresh description of the actual phenomena. To those who read, as well as to those who describe, the account of a winter passed in these regions can no longer be expected to afford the interest of novelty it once possessed; more especially in a station already delineated with tolerable geographical precision on our maps, and thus, as it were, brought near to our firesides at home. Independently, indeed, of this circumstance, it is hard to conceive any one thing more like another than two winters passed in the higher latitudes of the Polar regions, except when variety happens to be afforded by intercourse with some other branch of "the whole family of man." Winter after winter, nature here assumes an aspect so much alike, that cursory observation can scarely detect a single feature of variety. The winter of more temperate climates, and even in some of no slight severity, is occasionally diversified by a thaw, which at once gives variety and comparative cheerfulness to the prospect. But here, when once the earth is covered, all is dreary monotonous whiteness—not merely for days or weeks, but for more than half a year together. Whichever way the eye is turned, it meets a picture calculated to impress upon the mind an idea of inanimate stillness, of that motionless torpor with which our feelings have nothing congenial; of anything, in short, but life. In the very silence there is a deadness with which a human spectator appears *out of keeping*. The presence of man seems an intrusion on the dreary solitude of this wintry desert, which even its native animals have for a while forsaken. 1824. October.

As this general description of the aspect of nature would suit alike each winter we have passed in the ice, so also, with very little variation, might our limited catalogue of occurrences and adventures serve equally for any one of those seasons. Creatures of circumstance, we act and feel as we did before on every like occasion, and as others will probably do after us in the same situation. Whatever difference time or events may have wrought in individual feelings, and however different the occupations which those feelings may have suggested, they are not such as, without impertinence, can be intruded upon others; with these "the stranger intermeddleth not." I am persuaded, therefore, that I shall be excused in sparing the dulness of another winter's diary, and confining myself exclusively to those facts which appear to possess any scientific interest, to the few incidents which *did* diversify our confinement, and to such remarks as may contribute to the health and comfort of any future sojourners in these dreary regions.

It may well be supposed that, in this climate, the principal desideratum which art is called upon to furnish for the

1824. October. promotion of health, is warmth, as well in the external air as in the inhabited apartments. Exposure to a cold atmosphere, *when the body is well clothed*, produces no bad effect whatever beyond a frost-bitten cheek, nose, or finger. As for any injury to healthy lungs from the breathing of cold air, or from sudden changes from this into a warm atmosphere, or *vice versâ*, it may with much confidence be asserted that, with due attention to external clothing, there is nothing in this respect to be apprehended. This inference, at least, would appear legitimate, from the fact that our crews, consisting of one hundred and twenty persons, have for four winters been constantly undergoing, for months together, a change of from eighty to a hundred degrees of temperature, in the space of time required for opening two doors, (perhaps less than half a minute) without incurring any pulmonary complaints at all. Nor is a covering for the mouth at all necessary under these circumstances, though to most persons very conducive to comfort; for some individuals, from extreme dislike to the condensation and freezing of the breath about the "comforter" generally used for this purpose, have never worn any such defence for the mouth; and this without the slightest injurious effect or uncomfortable feeling beyond that of a cold face, which becomes comparatively trifling by habit.

In speaking of the external clothing sufficient for health in this climate, it must be confessed that, in severe exposure, quite a *load* of woollen clothes, even of the best quality, is insufficient to retain a comfortable degree of warmth; a strong breeze carrying it off so rapidly that the sensation is that of the cold piercing through the body. A jacket made very long, like those called by seamen "pea-jackets," and lined with fur throughout, would be more effectual than twice the weight of woollen clothes, and is indeed almost weather proof. For the prevention of lumbago, to which our seamen are especially liable, from their well-known habit of leaving their loins imperfectly clothed, every man should be strictly obliged to wear, under his outer clothes, a canvas belt a foot broad, lined with flannel, and having straps to go over the shoulder *.

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It is certain, however, that no precautions in clothing are sufficient to maintain health during a polar winter, without a due degree of warmth in the apartments we inhabit. Most persons are apt to associate with the idea of warmth, something like the comfort derived from a good fire on a winter's evening at home; but in these regions the case is inconceivably different: here it is not simple comfort, but health, and therefore ultimately life, that depends upon it. The want of a constant supply of warmth is here immediately followed by a condensation of all the moisture, whether from the breath, victuals, or other sources, into abun-

* Most Greenland sailors use these; but many persons, both officers and men, have an absurd prejudice against what they call, "wearing stays."

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dant drops of water, very rapidly forming on all the coldest parts of the deck. A still lower temperature modifies, and perhaps improves the annoyance by converting it into ice, which again an occasional increase of warmth dissolves into water. Nor is this the amount of the evil, though it is the only visible part of it; for not only is a moist atmosphere thus incessantly kept up, but it is rendered stagnant also by the want of that ventilation which warmth alone can furnish. With an apartment in this state, the men's clothes and bedding are continually in a moist and unwholesome condition, generating a deleterious air which there is no circulation to carry off; and whenever these circumstances combine for any length of time together, so surely may the scurvy, to say nothing of other diseases, be confidently expected to exhibit itself.

With a strong conviction of these facts, arising from the extreme anxiety with which I have been accustomed to watch every minute circumstance connected with the health of our people, it may be conceived how highly I must appreciate any means that can be devised to counteract effects so pernicious. Such means have been completely furnished by Mr. Sylvester's warming apparatus, a contrivance of which I scarcely know how to express my admiration in adequate terms. The alteration adopted on this voyage of placing this stove in the very bottom of the hold, produced not only the effect naturally to be expected from it, of increasing the rapidity of the current of warm air, and thus carrying it to all the officers' cabins with less loss of heat in its passage; but was also accompanied by an advantage scarcely less important, which had *not* been anticipated. This was the perfect and uniform warmth maintained during the winter in both the cable-tiers, which, when cleared of all the stores, gave us another habitable deck, on which more than one-third of the men's hammocks were birthed; thus affording to the ship's companies, during seven or eight months of the year, the indescribable comfort of nearly twice the space for their beds, and twice the volume of air to breathe in. It need scarcely be added, how conducive to wholesome ventilation, and to the prevention of moisture below, such an arrangement proved; suffice it to say that we have never before been so free from moisture, and that I cannot but chiefly attribute to this apparatus the unprecedented good state of health we enjoyed during this winter. 1824. October.

The mean daily temperature upon the Hecla's lower-deck during the winter is given in the meteorological abstracts; in the tiers it was generally about 60°, and never below 56°, and that of my cabin (hitherto much the coldest part of the ship,) was 63°, from December to April inclusive. The two coldest of the officers' cabins, which were those at the foot of the after-ladder, varied between 50° and 60°, the mean being about 56°, and all the others were several degrees higher. Mr. Daniell's hygrometer

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was tried on several occasions in different parts of the ship. The following examples will show how great a degree of dryness was maintained below:—

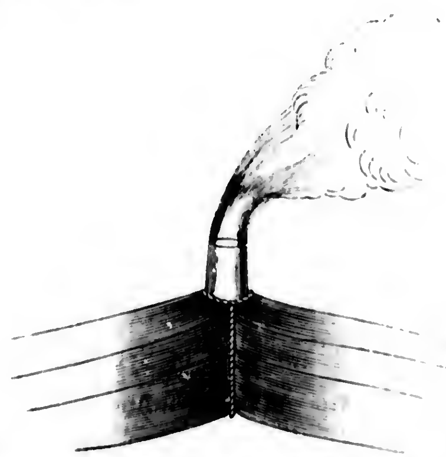
Day.	Temp. of the Ext. Air.	Part of the Ship.	Temp. of the Apartment	The Dew Point.	Remarks.
Jan. 9, 11 h. 30 m. a.m.	−22°	Middle of lower-deck	+67°.5	+53°.5	All the people had been on the lower-deck for an hour and a half previously, but were off the deck *at the time.*
Apr. 5, 11 30	−20°	Captain's cabin . .	+64	+48	A few people below; the coppers boiling, and meat taking out.
		Gun-room	+64.2	+50	
		Middle of lower-deck	+63.5	+55	
— 11, 9 30 p.m.	+6°	. . . Ditto . . .	+66	+55	The ship's company in bed.

I must add to these remarks, which the vital importance of the subject has alone induced me to continue to such a length, that no means for the production of internal warmth will prove sufficient, without the most minute attention to the stopping of every crevice communicating with the external air. There should, on this account, be no openings whatever, but those for the stove pipes and the two ladders; the sides and upper-deck should be lined with thick cork, the former being defended also externally by a high and broad bank of snow, and the latter by a thick covering of snow and sand, especially over the closed hatchways, where it is extremely difficult to prevent an accumulation of moisture below. I have heard a doubt expressed whether, with all these precautions, there is not a risk of not admitting *enough* fresh air for healthy respiration, and to afford draught to the fires. But I do not think there is any reason for this apprehension; enough, and, without great care, more than enough, for these purposes will always gain admission by the frequent opening of the doors; for it should be remembered that the more warmth is produced below, the more forcibly will the cold air from above find its way in to supply the place of that which is rarefied. A constant struggle is thus going on between the two; and that wholesome ventilation, whereby a warm and dry atmosphere can alone be maintained in a crowded apartment in *any* climate, and in most temperate ones is best promoted by a free admission of atmospheric air, is here most effectually ensured by due care not to let the cold preponderate. It was found a great improvement, during the winter, to turn the fore-ladder "fore and aft," so that whatever cold air came down in opening the doors, immediately passed towards the galley-fire, by this means preventing, for the first time, any condensation of vapour at the foot of the ladder. We also derived great advantage from leading the pipe of Sylvester's stove, and that in the sick-bay, into the galley-funnel, thus getting rid of all but one chimney, which being a large one, was quite sufficient for ventilation.

1824. October.

The ventilation which goes on upon a ship's lower-deck,

1824. October. especially when assisted by the excellent means above alluded to, exhibits itself curiously in cold weather, by the quantity of vapour which is always visibly ascending through the galley-funnel, like a dense column of smoke, and which is most dense at night, when everybody is below, and there is no fire in the range; because the vapour is then most abundant and most rapidly condensed in its ascent. Another curious phenomenon generally takes place in the day-time, when the fires are clear, and very little besides aqueous vapour is escaping. The smoke (for such it appears to be) is divided into two separate streams, one at each side of the cylinder, as you look at it, while in the centre nothing is perceptible.



The explanation suggested by Dr. Neill is quite satisfactory. The cold iron condenses the vapour in immediate contact with it into a visible form, while that in the centre is held in solution by the warm air at a distance from the metal; and as the spectator always looks through several strata of this condensed vapour at the sides, and only through one in the middle, the effect becomes that above described. 1824. October.

One very healthy comfort which I had long wished to establish for the ship's company, but could never till now venture to attempt, was that of providing the conveniences for a certain number of men daily to wash themselves from head to foot in tubs of hot water, throughout the winter. For this purpose, a portion of one of the tiers was skreened off every morning, and the practice was continued during our whole stay in winter-quarters, without the slightest annoyance from moisture; so capable was the atmosphere below of holding this additional vapour in solution.

Every attention was, as usual, paid to the occupation and diversion of the men's minds, as well as to the regularity of their bodily exercise. Our former amusements being almost worn threadbare, it required some ingenuity to devise any plan that should possess the charm of novelty to recommend it. This purpose was completely answered, however, by a proposal of Captain Hoppner, to attempt a *masquerade*, in which officers and men should alike take a part, but which, without imposing any restraint whatever, would leave every one to their own choice, whether to join in this diversion or not. It is impossible that any idea could

1824—5. have proved more happy, or more exactly suited to our situation. Admirably-dressed characters of various descriptions readily took their parts, and many of these were supported with a degree of spirit and genuine humour which would not have disgraced a more refined assembly; while the latter might not have disdained, and would not have been disgraced by, copying the good order, decorum, and inoffensive cheerfulness which our humble masquerades presented. It does especial credit to the dispositions and good sense of our men that, though all the officers entered fully into the spirit of these amusements, which took place once a month, alternately on board each ship, no instance occurred of any thing that could interfere with the regular discipline, or at all weaken the respect of the men towards their superiors. Ours were masquerades without licentiousness — carnivals without excess.

But an occupation not less assiduously pursued, and of infinitely more eventual benefit, was furnished by the re-establishment of our schools, under the voluntary superintendence of my friend Mr. Hooper in the Hecla, and of Mr. Mogg in the Fury. By the judicious zeal of Mr. Hooper, the Hecla's school was made subservient, not merely to the improvement of the men in reading and writing (in which, however, their progress was surprisingly great), but also to the cultivation of that religious feeling which so essentially improves the character of a seaman, by furnishing the highest motives for increased attention to every other duty. Nor was the benefit confined to the eighteen or twenty individuals whose want of scholarship brought them to the school-table, but extended itself to the rest of the ship's company, making the whole lower-deck such a scene of quiet rational occupation as I never before witnessed on board a ship. And I do not speak lightly when I express my thorough persuasion that to the moral effects thus produced upon the minds of the men, were owing, in a very high degree, the constant yet sober cheerfulness, the uninterrupted good order, and even, in some measure, the extraordinary state of health which prevailed among us during this winter. 1824–5.

Immediately after the ships were finally secured, we erected the observatory on shore, and commenced our arrangements for the various observations to which our attention was to be directed during the winter. The interest of these, especially of such as related to magnetism, increased so much as we proceeded, that the neighbourhood of the observatory assumed, ere long, almost the appearance of a scattered village, the number of detached houses having various needles set up in them, soon amounting to seven or eight. The details of these observations being given in the proper tables, it is only my intention to offer here a brief account of the subjects on which we were principally engaged, together with the general conclusions at which the experiments enabled us satisfactorily to arrive.

1824—5. The first observations on the variation of the magnetic needle, on our arrival at Port Bowen, discovered to us the interesting fact of an increase in that phenomenon, since our former visit in 1819, amounting to about nine degrees, namely, from one hundred and fourteen to one hundred and twenty-three degrees. By employing delicately *suspended*, instead of *supported* needles, we also found a diurnal variation to an amount, and having a regularity, of which we had before no idea. The maximum variation westerly was observed to occur between the hours of ten, A.M., and one, P.M.; and the minimum between eight, P.M., and two, A.M.*; the quantity being seldom less than $1\frac{1}{2}°$ to $2°$, and sometimes amounting to five, six, and even to seven degrees.

In connexion with these observations we subsequently instituted a regular series of hourly experiments on the magnetic intensity, with a suspended needle of a peculiar construction, which admitted of the intervals of vibration being observed with minute accuracy; by which means we found a diurnal change of intensity, subject, indeed, to occasional anomalies, but in the mean of a number of days exhibiting a regular increase of intensity from the morning to the afternoon, and as regular a decrease from the afternoon to the morning. It also appeared that the sun, and, as we had

* The exact time of diurnal maximum variation, deduced from a mean of one hundred and twenty days, or about four months' observations, was 11h. 49m., A.M. That of the minimum variation was 10h. 01m., P.M.

reason to believe, the relative position of the sun and moon, with reference to the magnetic sphere, had a considerable influence both on the intensity and diurnal variation, although the exact laws of this influence may still remain to be discovered. 1824—5.

While unassisted Nature was thus developing, on a large scale, some curious facts on the subject of magnetism, Lieutenant Foster was besides engaged in repeating the interesting and important experiments of Messrs. Barlow and Christie (detailed in the *Philosoph. Trans.* for 1823, part ii.) upon a needle having its position modified, and its directive power reduced, by the application of artificial magnets. A very curious and remarkable result soon repaid his labour, namely, that the *true* bearing upon which a needle exhibits its *minimum* variation (we might, perhaps, venture to call it none), is the same at Port Bowen as at Woolwich, or about S. 38° E. *, which would almost lead to a conclusion that this is a constant line all over the world. A similar coincidence seemed to obtain, with respect to the magnetic bearing of the line of *maximum* variation, which here appeared to be about N. 66° E., agreeing very nearly with that determined in England by Mr. Barlow.

We did not succeed in obtaining, during the winter, any satisfactory results *directly* tending to establish the fact of a

* Or S. 85° W. at Port Bowen (magnetic). See Mr. Barlow's Essay.

1824—5. regular diurnal variation in the dip, either with a dipping-needle having its magnetic intensity weakened by the influence of artificial magnets, or otherwise; although, from the ever-varying changes of intensity by which a horizontal needle is solicited, it would appear that correspondent alterations in the dip must necessarily be going on.

I have purposely deferred to this place the few remarks I shall offer, in my journal, respecting Mr. Barlow's plate for correcting the effect of local attraction on board a ship. Previously to the expedition leaving the river Thames, and when all the stores had been received, the plate on board the Hecla was fixed by experiment, under Mr. Barlow's personal superintendence, at Northfleet, in such a manner as would undoubtedly have afforded a correction, if not quite absolute, at least sufficiently so for every practical purpose, in all but the polar regions of the earth. On our passage up Davis' Strait, however, it was observed that, in certain positions of the ship's head, of course principally those approaching to east or west, a considerable and increasing error was still occasioned by the attraction of the iron. A little consideration served to shew that this might *à priori* have been anticipated, on account of the extreme minuteness with which, under a directive power very greatly diminished, it would be necessary to determine the true position of the plate; for instance, an error in position not at all to be detected by observation at Northfleet would, in Davis'

Strait, discover itself to the amount perhaps of several degrees, inasmuch as the whole phenomenon is there exhibited on a larger scale, proportionate to the decrease of directive energy. During our stay at the Whale-fish Islands, therefore, we gladly availed ourselves of the opportunity to obtain the correct position of the plate. In doing this, we followed the simple method recommended and adopted by Mr. Barlow, swinging the ship round successively on the different points, and thus obtaining the deviation by magnetic back-bearings taken simultaneously on the land; and afterwards finding, by experiments on shore, that position of the plate which correctly represented the same amount of deviation. The plate thus placed was now to undergo a severe trial on the ship's arrival in Barrow's Strait, and Prince Regent's Inlet, where, from the extraordinary increase of dip, and the consequently augmented effect of the ship's iron upon the magnetic needle, the compasses had before been rendered wholly useless on board ship. Never had an invention a more complete and satisfactory triumph; for, to the last moment of our operations at sea, did the compass indicate the true magnetic direction, requiring, of course, at times, a considerable degree of tapping with the hand, merely to relieve the needle from friction. And even at Port Bowen, where the dip is eighty-eight degrees, and the magnetic intensity acting on a horizontal needle extremely weak in consequence, the azimuth compass on

1824—5.

1824—5. board actually gave the same variation as that observed on shore, within the fair and reasonable limits of error of observation under such circumstances. Such an invention as this, so sound in principle, so easy of application, and so universally beneficial in practice, needs no testimony of mine to establish its merits; but when I consider the many anxious days and sleepless nights which the uselessness of the compass in these seas has formerly occasioned me, I really should esteem it a kind of personal ingratitude to Mr. Barlow, as well as great injustice to so memorable a discovery, not to have stated my opinion of its merits, under circumstances so well calculated to put them to a satisfactory trial*.

The amount of atmospheric refraction at low temperatures was the subject which, next to magnetism, appeared the most interesting to investigate. The extreme difficulty attending the use of the repeating-circle during intense cold, rendering it next to impossible to obtain with that instrument observations of a star *having quick motion*, with the minute accuracy requisite for this purpose, we were led to adopt the simple method of observing the setting of a star behind a horizontal board fixed edgewise on a neighbouring hill, the altitude of the board being obtained at leisure, by repeated observations with the circle. The numerical de-

* On repeating the experiments at Northfleet, on the return of the Hecla to England, the plate was found to remain equally efficacious.

tails of these observations being given in the proper Tables, I shall only add in this place, that they make the refraction at low temperatures, and from the altitude of $4\frac{1}{2}°$ to $7\frac{1}{2}°$, as computed from the Table in the Nautical Almanac, considerably *in defect*. 1824—5.

The rest of our time was chiefly occupied in the observations for latitude and longitude, the former by Mr. Bailey's very useful tables and formula for the Pole star*; the latter by the several methods of occultations, eclipses of Jupiter's satellites, the moon's transit, and by lunar distances, the chronometrical longitude being also taken into account. Lieutenant Foster also omitted no opportunity of observing the transits of the several small stars given in the "Astronomische Nachrichten," for comparison with the moon in right ascension, for the purpose of obtaining the absolute longitude.

A six-pounder gun was placed at the head of the bay, a distance of nearly thirteen thousand feet, or about two nautical miles, in order to ascertain the rate at which sound travels at different temperatures and pressures of the atmosphere. Our observations appear to indicate a decided decrease of velocity with an increased density of the atmosphere; the rate of travelling decreasing from one thousand and ninety-eight feet per second, at a pressure of 30.118 in. and temperature + 33.5°, to one thousand and fourteen

* Published in the *Philosophical Magazine*, June, 1822.

1824—5. feet per second at a pressure of 30.398, and temperature —38.5°; all other circumstances being alike.

The extreme facility with which sounds are heard at a considerable distance, in severely cold weather, has often been a subject of remark; but a circumstance occurred at Port Bowen, which deserves to be noticed as affording a sort of measure of this facility, or at least conveying to others some definite idea of the fact. Lieutenant Foster having occasion to send a man from the observatory to the opposite shore of the harbour, a measured distance of 6696 feet, or about one statute mile and two-tenths, in order to fix a meridian mark, had placed a second person half-way between, to repeat his directions; but he found on trial that this precaution was unnecessary, as he could without difficulty keep up a conversation with the man at the distant station. The thermometer was at this time — 18°, the barometer 30.14 inches, and the weather nearly calm, and quite clear and serene.

The meteorological phenomena observed during this winter, like most of its other occurrences, differed so little in character from those noticed on the former voyages, as to render a separate description of each wholly unnecessary. It will, therefore, be sufficient for me to give one general and concise account of the whole, confining myself to such facts as were either new to us, or appear in other respects to merit a distinct notice.

The Aurora Borealis, which constitutes one of the peculiar features of a polar winter, occurred with nearly the same frequency as on former occasions. The number of nights on which it is registered, are— 1824—5.

Two	in	October,
Five	,,	November,
Seven	,,	December,
Fifteen	,,	January,
Thirteen	,,	February,
Five	,,	March,

being in the whole forty-seven, from October to March. It may have appeared faintly on a few other occasions, not noticed in our journals, and unquestionably would have been seen more frequently, but for the height of the land on the south side of Port Bowen, which intercepted our view to the altitude of five or six degrees. By far the greater part of these phenomena assumed one general character, and occupied nearly the same position. It usually consisted of an arch, sometimes tolerably continuous, but more frequently broken into detached irregular masses or nebulæ of light, extending from about West to S.E. (true), which bearings correspond with N.E.b.N., and W.b.S. (magnetic.) It sometimes, however, extended a few points beyond these bearings, but very rarely occupied any of the northern part of the heavens. Its termination to the S.E. was never exactly visible, owing to the height

1824—5. of the land in that quarter; but, upon the whole, the arch seems to have been more frequently bisected by the plane of the magnetic, than by that of the true, meridian. The altitude of the upper margin of a permanent arch seldom exceeded ten or fifteen degrees, and from this coruscations were generally observed to be shooting towards the zenith. In a few instances the arch itself passed as high as the zenith, and on a single occasion; on the 28th of January, its direction was from true north to south. The lower edge of the arch was generally well defined and unbroken, and the sky beneath it appeared, by contrast, so exactly like a dark cloud (to me often of a brownish colour), that nothing at the time of viewing it could well convince one to the contrary, if the stars shining there with undiminished lustre did not discover the deception.

This winter certainly afforded but few brilliant displays of the Aurora. The following notice includes all that appear to me to require a separate description.

Late on the night of the 21st of December, the phenomenon appeared partially, and with a variable light, in different parts of the southern sky, for several hours. At seven on the following morning, it became more brilliant and stationary, describing a well-defined arch, extending from the E.S.E. horizon to that at W.N.W., and passing through the zenith. A very faint arch was also visible on each side of this, appearing to diverge from the same points in the horizon*, and separating to twenty degrees' distance in the zenith. It remained thus for twenty minutes, when the coruscations from each arch met, and after a short but brilliant display of light gradually died away. Early on the morning of the 15th of January, the Aurora broke out to the southward, and continued variable for three hours, between a N.W. and S.E. bearing. From three to four o'clock, the whole horizon from south to west was brilliantly illuminated, the light being continuous almost throughout the whole extent, and reaching several degrees in height. Very bright vertical rays were constantly shooting upwards from the general mass. At half-past five, it again became so brilliant, as to attract particular notice, describing two arches passing in an east and west direction, very near the zenith, with bright coruscations issuing from it; but the whole gradually disappeared with the returning dawn. At dusk the same evening, the Aurora again appeared in the southern quarter, and continued visible nearly the whole night, but without any remarkable feature. 1824—5.

About midnight on the 27th of January, this phenomenon broke out in a single compact mass of brilliant yellow light, situated about a S.E. bearing, and appearing only a short distance above the land. This mass of light, notwithstanding its general continuity, sometimes appeared

* I am aware that this appearance is usually referred to the effect of viewing the phenomenon in perspective; but I here describe *appearances* only.

1824—5. to be evidently composed of numerous pencils of rays, compressed, as it were, laterally into one, its limits both to the right and left being well defined and nearly vertical. The light, though very bright at all times, varied almost constantly in intensity, and this had the appearance (not an uncommon one in the Aurora) of being produced by one volume of light overlaying another, just as we see the darkness and density of smoke increased by cloud rolling over cloud. While Lieutenants Sherer and Ross, and myself, were admiring the extreme beauty of this phenomenon from the observatory, we all simultaneously uttered an exclamation of surprise at seeing a bright ray of the Aurora shoot suddenly downward from the general mass of light, *and between us and the land*, which was there distant only three thousand yards. Had I witnessed this phenomenon by myself, I should have been disposed to receive with caution the evidence even of my own senses, as to this last fact; but the appearance conveying precisely the same idea to three individuals at once, all intently engaged in looking towards the spot, I have no doubt that the ray of light actually passed within that distance of us.

About one o'clock on the morning of the 23rd February, the Aurora again appeared over the hills in a south direction, presenting a brilliant mass of light, very similar to that just described. The rolling motion of the light laterally was here also very striking, as well as the increase of its intensity thus occasioned. The light occupied horizontally about a point of the compass, and extended in height scarcely a degree above the land, which seemed, however, to conceal from us a part of the phenomenon. It was always evident enough that the most attenuated light of the Aurora sensibly dimmed the stars, like a thin veil drawn over them. We frequently listened for any sound proceeding from this phenomenon, but never heard any. 1824—5.

On several occasions which seemed the most favourable for the purpose, the electrometer with gold-leaf was applied to the chain, but without the slightest perceptible effect. The chain was attached to the sky-sail mast-head by glass rods, precisely in the manner described on our last voyage, the pointed end of the upper link being considerably above the mast-head, and one hundred and fifteen feet from the level of the sea. That the atmosphere during the winter-months was favourable to the excitement of electricity, appeared from the facility with which a small electrical machine, constructed by Mr. Rowland, was found to act. The sparks given out by this machine, of which the cylinder was only six inches long, and five in diameter, Dr. Neill considered as large as are usually elicited from apparatus of much larger dimensions in England. Our variation-needles, which were extremely light, suspended in the most delicate manner, and from the weak directive

1824—5. energy susceptible of being acted upon by a very slight disturbing force, were never in a single instance sensibly affected by the Aurora, which could scarcely fail to have been observed at some time or other, had any such disturbance taken place, the needles being visited every hour for several months, and oftener, when any thing occurred to make it desirable.

The meteors called Falling-stars were much more frequent during this winter than we ever before saw them, and particularly during the month of December. On the 8th, at a quarter past seven in the evening, a particularly large and brilliant meteor of this kind fell in the S.S.W., the weather being very fine and clear overhead, but hazy near the horizon. On the following day, between four and five P.M., another very brilliant one was observed in the north, falling from an altitude of about thirty-five degrees till lost behind the land; the weather was at this time clear and serene, and no remarkable change took place. On the 12th, no less than five meteors of this kind were observed in a quarter of an hour, and as these were attended with some remarkable circumstances, I shall here give the account furnished me by Mr. Ross, who with Mr. Bell observed these phenomena. "From 7 to 9 P.M. the wind suddenly increased from a moderate breeze to a strong gale from the southward. At ten it began to moderate a little; the haze which had for several hours obscured every star, gradually sinking towards the horizon, and by eleven o'clock the whole atmosphere was extremely clear above the altitude of five or six degrees. The thermometer also fell from $-5°$ to $-9°$ as the haze cleared away. At a quarter past eleven my attention was directed by Mr. Bell to some meteors which he observed, and in less than a quarter of an hour five were seen. The two first, noticed only by Mr. Bell, fell in quick succession, probably not more than two minutes apart. The third appeared about eight minutes after these, and exceeded in brilliancy any of the surrounding stars. It took a direction from near β Tauri, and passing slowly towards the Pleiades left behind it sparks like the tail of a rocket, these being visible for a few seconds after the meteor appeared to break, which it did close to the Pleiades. The fourth meteor made its appearance very near the same place as the last, and about five minutes after it. Taking the course of those seen by Mr. Bell, it passed to the eastward, and disappeared half way between β Tauri and Gemini. The fifth of these meteors was seen to the eastward, passing through a space of about five degrees from north to south parallel to the horizon, and moving along the upper part of the cloud of haze which still extended to the altitude of five or six degrees. It was more dim than the rest, and of a red colour like Aldebaran. The third of these meteors was the only one that left a tail behind it, as above de-

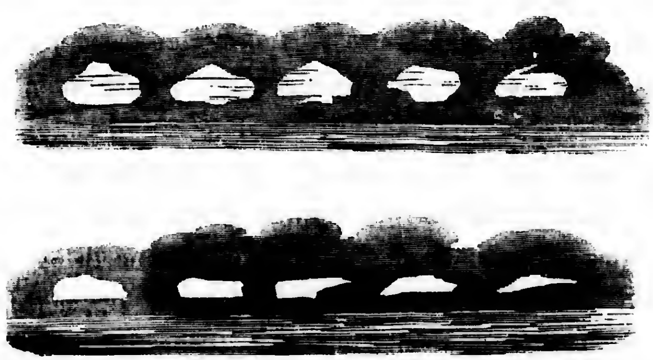
1824—5.

K

1824—5. scribed. There was a faint appearance of the Aurora to the westward near the horizon."

On the 14th of December several very bright meteors were observed to fall between the hours of five and six in the evening, at which time the wind freshened from the N.W. by N. in a very remarkable manner. On this occasion, as well as on the 12th of December, there appeared to be an evident coincidence between the occurrence of the meteors and the changes of the weather at the time.

On the 7th of January, the weather being clear and cold, the moon was curiously distorted by refraction, for several minutes before setting, into the shapes, and according to the order shewn in the annexed sketch by Mr. Head.



Haloes appeared very frequently round the moon, particularly about the times of her opposition, and when there was any haze in the atmosphere. Two or three times an indistinct paraselena was seen on each side, situated, as usual, upon the halo, and at the angular distance of about twenty-three degrees from the moon. In one instance only, the paraselenæ were slightly coloured with a faint red tint. In the autumn and spring, particularly the latter, haloes and parhelia were very frequently about the sun, the measurement of their angular distance from that luminary being always between twenty-two and twenty-three degrees. None of these phenomena were such as to deserve further notice, except one on the 29th of March, when at 9.30, A.M., an imperfect halo appeared around the sun, with a faint parhelion on each side. On the part of the halo directly over the sun, was seen a segment of an inverted circle, faintly coloured; and again above this, at the distance of 46° 40″ from the sun, was a short segment of another inverted circle, coloured like a brilliant rainbow. A circle of broad but faint white light could be traced completely round the heavens, passing through the sun and parhelia, and parallel to the horizon; and situated on this circle, at the distance of 114¼° on each side of the sun, was a large white spot. The phenomenon exhibited a part of that described at Melville Island, on the 19th of April, 1820, the circles now seen, besides the halo, corresponding with those marked *x d v*, *m f n*, and *t u*, in the diagram accompanying that descrip- 1824—5.

1824—5. tion*. Minute particles of snow were at this time falling in great abundance.

Particular attention was paid to the changes in the barometer during this winter, to which much encouragement was given by the excellence of the instruments with which we were now furnished†. The times of register *at sea* had been three and nine, A.M., and P.M.; those hours having been recommended as the most proper for detecting any horary oscillations of the mercurial column. When we were fixed for the winter, and our attention could be more exclusively devoted to scientific objects, the register was extended to four and ten, and subsequently to five and eleven o'clock. The most rigid attention to the observation and correction of the column, during several months, discovered an oscillation, amounting only to ten thousandth-parts of an inch. The times of the maximum and minimum altitude appear, however, decidedly to lean to four and ten o'clock, and to follow a law directly the reverse, as to time, of that found to obtain in temperate climates, the column being *highest at four*, and *lowest at ten o'clock*, both A.M. and P.M. The whole of the

* Narrative of the Voyage of 1819—20, p. 164.

† For this circumstance we are indebted to the kindness and well-known scientific zeal of Mr. Daniell, who himself superintended the construction of our barometers, and especially of one excellent instrument, by Newman, to be used as a standard with which the others could be compared. We owe a similar abligation to Mr. Daniell, with respect to thermometers.

observations being comprised in the Meteorological Abstracts, with the general results stated at the bottom of each, can be consulted with great convenience; and the Table which follows the Abstract for the month of April 1825, will afford one comprehensive view of six months' observations on this interesting subject. 1824—5.

The barometer did not appear to indicate beforehand the changes of the weather with any degree of certainty. Indeed the remark that we had always before made, that alterations in the mercurial column more frequently accompany than precede the visible changes of weather in these regions, was equally true of our present experience; but on one or two occasions hard gales of considerable duration occurred without the barometer falling at all below the mean altitude of the column in these regions, or even rose steadily during the continuance of the gale. During one week of almost constant blowing weather, and two days of very violent gales from the eastward, in the month of April, the barometer remained considerably above thirty inches the whole time. It is necessary for me here to remark that the unusual proportion of easterly winds registered in our journals during this winter must, in my opinion, be attributed to the local situation of our winter-quarters, which alone appears to me sufficient to account for the anomaly. The lands on each side of Port Bowen, running nearly east and west, and rising to a height of six to nine hundred feet above the sea, 1824—5. with deep and broad ravines intersecting the country in almost every direction, may be supposed to have had considerable influence on the direction of the wind. In confirmation of this supposition, indeed, it was usually noticed that the easterly winds were with us attended with clear weather, while the contrary obtained with almost every breeze from the west and north-west, thus reversing in this respect also the usual order of things. It was moreover observed that the clouds were frequently coming from the N.W., when the wind in Port Bowen was easterly. I must however, except the *gales* we experienced from the eastward, which were probably strong enough to overcome any local deflection to which a light breeze would be subject; and indeed these were always accompanied with overcast weather and a high thermometer. After the middle of October the gales of wind were very few till towards the middle of April, when we experienced more blowing weather than during the whole winter.

The mean temperature of this season we considered rather high, as compared with that of our former winters, in proportion to the latitude of the station, as will appear from inspection of the annexed Table, containing a comparative view of the mean temperature during six winter-months at each station, arranged according to the latitudes of the respective places.

1824—5.

MONTHS.	Mean Temperature of the Atmosphere at				REMARKS.
	Melville Island, Lat. 74½° 1819—20.	Port Bowen, Lat. 73¼° 1824—5.	Igloolik, Lat. 69⅓° 1822—3.	Winter Island Lat. 66¼°, 1821—2.	
	°	°	°	°	The temperatures contained in this Table for Melville Island, Igloolik, and Winter Island are those given in the Narrative of the Voyage of 1821—2—3, with the deduction of 3° for the warm atmosphere of the ship. This correction, which can only be a mean approximation to the truth, perhaps makes the temperature of Melville Island rather too high, and that of Igloolik somewhat too low.
October . .	−6.46	+10.85	+9.79	+9.51	
November .	−23.6	−5	−22.37	+4.75	
December . .	−24.79	−19.05	−30.8	−15.94	
January . .	−33.09	−28.91	−20.07	−25.96	
February . .	−35.19	−27.32	−23.41	−27.97	
March . .	−21.10	−28.37	−22.75	−14.64	
Mean . . .	−24.04	−16.30	−18.27	−11.71	

The *distribution* of the cold, if I may so call it, was now also somewhat different, the coldest month being January, next March, and then February. The difference, however, in the mean temperature of these three months was remarkably small, ranging only from −27°. 3, to −28°. 9. The thermometer did not rise above zero till the 11th of April, having remained below that point of the scale for one hundred and thirty-one successive days, the only instance of this kind we have ever known. So low a mean temperature for three successive months would, if considered separately, have appeared to form a season of great severity, and certainly, with respect to personal comfort, did so; but viewed in connexion with the three preceding months, seems only to furnish a compensation for the unusual mildness of the early part of the winter.

CHAPTER IV.

METEOROLOGICAL PHENOMENA CONTINUED—RE-EQUIPMENT OF THE SHIPS—SEVERAL JOURNIES UNDERTAKEN—OPEN WATER IN THE OFFING—COMMENCE SAWING A CANAL TO LIBERATE THE SHIPS—DISRUPTION OF THE ICE—DEPARTURE FROM PORT BOWEN.

1824—5. THE height of the land about Port Bowen deprived us longer than usual of the sun's presence above our horizon. Some of our gentlemen, indeed, who ascended a high hill for the purpose, caught a glimpse of him on the 2nd of February; on the 15th it became visible at the observatory, but at the ships not till the 22nd, after an absence of one hundred and twenty-one days. It is very long after the sun's re-appearance in these regions, however, that the effect of his rays, as to warmth, becomes perceptible; week passes after week with scarcely any rise in the thermometer except for an hour or two during the day; and it is at this period more than any other, perhaps, that the lengthened duration of a polar winter's cold is most wearisome, and creates the most impatience. Towards the third week in March, thin flakes of snow lying upon black painted wood or metal, and exposed to the sun's direct rays in a sheltered situation, readily melted. In the second week of April any very light covering of sand or ashes upon the snow close to the ships might be observed to make its way downward into holes: but a coat of sand laid upon the unsheltered ice, to the distance of about two-thirds of a mile, for dissolving a canal to hasten our liberation, produced no such sensible effect till the beginning of May. Even then the dissolution was very trifling till about the first week in June, when pools of water began to make their appearance, and not long after this a small boat would have floated down it. On shore the effect is in general still more tardy, though some deception is there occasioned by the dissolution of the snow next the ground, while its upper surface is to all appearance undergoing little or no change. Thus a greater alteration is sometimes produced in the aspect of the land by a single warm day in an advanced part of the season, than in many weeks preceding; in consequence of the last crust of snow being dissolved, leaving the ground at length entirely bare. We could now perceive the snow beginning to leave the stones from day to day, as early as the last week in April. Towards the end of May a great deal of snow was dissolved daily, but owing to the porous nature of the ground which absorbed it as fast as it was formed, it was not easy to procure water for drinking on shore, even as late as the 10th of June. In the ravines, however, it could be heard trickling under stones before that time, and about the 18th, many considerable streams were formed, and constantly

1824—5.

1824—5. running both night and day. After this, the thawing proceeded at an inconceivably rapid rate, the whole surface of the floes being covered with large pools of water rapidly increasing in size and depth.

We observed nothing extraordinary with respect to the sun's light about the shortest day; but as early as the 20th of November Arcturus could very plainly be distinguished by the naked eye, when near the south meridian at noon. About the first week in April the reflection of light from the snow became so strong as to create inflammation in the eyes, and notwithstanding the usual precaution of wearing black crape veils during exposure, several cases of snow-blindness occurred shortly afterwards.

During this, as in each preceding winter passed in the polar regions, we failed to obtain, even in the severest cold, any absolute hygrometrical expression for the state of the atmosphere, although we had now the advantage of being furnished with the excellent hygrometers on Mr. Daniell's construction. By the experiments given in the Meteorological Abstracts, it appears that, below an atmospheric temperature of + 6°, we failed in obtaining any deposit upon the bulb of the instrument, though on some occasions the ether was frozen in the attempt. On several days during the winter, a haze, or more properly a fog, occurred, of such density as to obscure objects at the distance of a quarter of a mile, when there was no perceptible fall or drift of snow to have occasioned this appearance. It always happened, indeed, during serene weather, and generally consisted only of a stratum reaching one or two hundred feet above the sea, over which we could see from the observatory, while it seemed to occupy the whole of the harbour below. That the atmosphere was extremely dry, however, during the winter, appears probable from the circumstance noticed on the former voyages, of ropes becoming quite slack by an increase, or rather by a continuance of cold. For instance, a worn whale-line sixteen hundred and forty-four feet in length, being stretched quite tight between the Hecla and the shore, for the purpose of marking the road in dark weather or snow-drift, relaxed so much during the coldest months, that forty-nine feet were hauled in from time to time, to keep it in its place upon the snow-pillars by which it was supported. I have already noticed the readiness with which electricity was excited by a very small machine, a facility which the medical gentlemen attributed to the dryness of the atmosphere. It would also appear that something like evaporation is going on, from the fact repeatedly noticed even in the most severe part of the season, that a brass instrument entirely sheltered from the wind may one day be seen covered with numberless minute snow-crystals adhering firmly to the metal, and the next perfectly clean and bright, without any possible assistance from wind, or artificial heat. The same thing sometimes occurs also with 1824—5.

1824—5. the thin film of ice which collects upon the eye-glass of a telescope, occasioned by the vapour of the body. The drying of our washed clothes in the open air could be performed in part, for the first time, about the beginning of April, by hanging them against a sheltered snow-wall facing the south, and having a black painted canvas cloth suspended along it.

There was no want of well-defined clouds this winter; these were almost entirely of the kind called cirro-stratus, or approaching to that modification. Cumuli and cirro-cumuli occurred only with the advance of spring. The sky in this respect differed from that of our winter at Melville Island, and also from those at Winter Island and Igloolik, clouds occurring much more frequently than at the former, and more rarely than at the two latter stations. This difference seems to have coincided nearly with the state of the sea in the offing at each wintering-place, clouds occurring with more frequency in proportion to the extent of open water in our neighbourhood. At Port Bowen we had occasionally lanes of clear water in the offing as late as the 22nd of January, and the ice could be heard in motion till the 11th of February, but the water was of small extent after the first month subsequent to our arrival in winter-quarters. The occasional occurrence of fog, and the appearance of a dark water-sky to the northward, frequently observed from the hills during the winter, render it extremely probable that Barrow's Strait was never entirely closed,—a probability confirmed by the appearance of it at all times of the year in which it is accessible by ships. 1824—5.

There are perhaps few things more difficult to obtain than a comparative measure of the quantity of snow that falls at different places, owing to the facility with which the wind blows it off a smooth surface, such as a floe of level ice, and the collection occasioned by drift in consequence of the smallest obstruction *. Thus, its mean depth at Port Bowen, measured in twenty different places on the smooth ice of the harbour, was three inches on the 5th of April, and on the 1st of May it had only increased to four and a half inches, while an immense bank fourteen feet deep had formed on one side of the Hecla, occasioned by the heavy drifts. The crystals were, as usual, extremely minute during the continuance of the cold weather, and more or less of these were always falling, even on the clearest days.

Lieutenant Ross tried the thickness of the salt-water ice during different periods of the winter, by digging holes in

* If even a fair measure of the *depth* could be obtained, it would not immediately determine the comparative *quantity*; for a cubic foot of snow so minute as that which falls in high latitudes, and in the compact state in which it lies upon the ground, would probably weigh much more, and produce a great deal more water, than the same measure in a less severe climate, where it usually falls in larger flakes. The weight of a cubic foot of snow at Port Bowen, dug out of a drift, and weighed by Mr. Rowland, was thirty pounds, being the mean of several experiments, all agreeing very nearly.

1824—5. that formed upon the canal by which the ships had entered, and found it to have increased in the following ratio:—

Date.	Whole Thickness, in inches.	Thickness above the Sea, in inches.	Proportion of that above to that below, the latter being = 100.
November 20th, 1824,	30.5	3.8	14.23
December 13th, —	38.5	4.4	12.90
January 1st, 1825,	45.3	5.2	12.97
February 2nd, —	55.9	6	12.02
March 2nd, —	73	7.1	10.77
April 2nd, —	82.5	7.8	10.44
May 4th, —	86.5	8	10.19

The animals seen at Port Bowen may now be briefly noticed. The principal of these seen during the winter were bears, of which we killed twelve from October to June, being more than during all the other voyages taken together; and several others were seen. One of these animals was near proving fatal to a seaman of the Fury, who having straggled from his companions when at the top of a high hill, saw a large bear coming towards him. Being unarmed, he prudently made off, taking off his boots to enable him to run the faster, but not so prudently precipitated himself over an almost perpendicular cliff, down which he was said to have rolled or fallen several hundred feet; here he was met by some of the people in so lacerated a condition, as to be in a very dangerous state for some time after *.

A she-bear killed in the open water on our first arrival at

* The men applying his name to the hill, called it Mount Cotterell, by which it is distinguished in the chart, for the sake of reference in our measurement of its height.

Port Bowen, afforded a striking instance of maternal affection 1824—5.
in her anxiety to save her two cubs. She might herself easily have escaped the boat, but would not forsake her young, which she was actually "towing" off, by allowing them to rest on her back, when the boat came near them. A second similar instance occurred in the spring, when two cubs having got down into a large crack in the ice, their mother placed herself before them, so as to secure them from the attacks of our people, which she might easily have avoided herself.

This unusual supply of bear's flesh was particularly serviceable, as food for the Esquimaux dogs we had brought out, and which were always at work in a sledge; especially as, during the winter, our number was increased by the birth of six others of these useful animals.

One or two foxes (*Canis Lagopus*) were killed, and four caught in traps during the winter, weighing from four pounds and three-quarters to three pounds and three-quarters. The colour of one of these animals, which lived for some time on board the Fury, and became tolerably tame, was nearly pure white till the month of May, when he shed his winter-coat, and became of a dirty chocolate colour, with two or three light-brown spots. Only three hares (*Lepus Variabilis*) were killed from October to June, weighing from six to eight pounds and three quarters.

1824—5. Their fur was extremely thick, soft, and of the most beautiful whiteness imaginable. We saw no deer near Port Bowen at any season, neither were we visited by their enemies the wolves. A single ermine and a few mice *(Mus Hudsonius)*, complete, I believe, our scanty list of quadrupeds at this desolate and unproductive place.

Of birds, we had a flock or two of ducks occasionally flying about the small lanes of open water in the offing, as late as the third of October; but none from that time till the beginning of June, and then only a single pair was occasionally seen. A very few grouse were met with also after our arrival at Port Bowen; a single specimen was obtained on the 23rd of December, and another on the 18th of February. They again made their appearance towards the end of March, and in less than a month about two hundred were killed; after which we scarcely saw another, for what reason we could not conjecture, except that they might possibly be on their way to the northward, and that the utter barrenness of the land about Port Bowen afforded no inducement for their remaining in our neighbourhood.

Lieutenant Ross, who paid great attention to ornithology, and who has himself drawn up the zoological notice given in the Appendix, remarked that the grouse met with here are of three kinds, namely the ptarmigan *(Tetrao Lagopus)*, the rock-grouse *(Tetrao Rupestris)*, and the willow-partridge

(*Tetrao Albus*). Of these only the two former were seen in the spring, and by far the greater number killed were of the first-mentioned species. They usually had in their maws the leaves of the *Dryas Integrifolia*, buds of the *Saxifraga Oppositifolia*, *Salix Arctica*, and *Draba Alpina*, the quantities being according to the order in which the plants have here been named. A few leaves, also, of the *Polygonum Viviparum* were found in one or two specimens. The snow-bunting, with its sprightly note, was, as usual, one of our earliest visitants in the spring; but these were few in number, and remained only a short time. A very few sandpipers were also seen, and now and then one or two glaucous, ivory, and kittiwake gulls. A pair of ravens appeared occasionally during the whole winter here, as at most of our former winter stations. 1824—5.

The following temperatures of animals, mostly killed during the winter, were furnished me by Mr. Mogg, by whom and Lieutenant Ross they were taken.

Date.			Animals.	Temperature of the Animal	Air.
October	17th,	1824	Artic Fox	+105°	+19°
November	9th,	—	ditto	106	+ 7
January	4th,	1825	ditto	104	−28
March	27th,	—	Ptarmigan	102	−11
April	4th,	—	ditto	102	−15
"	6th,	—	ditto	102	−19
"	14th,	—	ditto	102	− 6
"	"	—	ditto	102	− 6
"	16th,	—	White Bear	100	+11
"	"	—	ditto	99	+11
"	29th,	—	ditto	99.5	− 1
June	21st,	—	Glaucous Gull	100	+37

1824—5. With a view to extend our geographical knowledge as much as our means permitted, three land journeys were undertaken as soon as the weather was sufficiently warm for procuring any water. The first party, consisting of six men under Captain Hoppner, were instructed to travel to the eastward, to endeavour to reach the sea in that direction, and to discover the communication which probably exists there with Admiralty Inlet, so as to determine the extent of that portion of insular land on which Port Bowen is situated. They returned on the 14th, after a very fatiguing journey, and having with difficulty travelled a degree and three-quarters to the eastward of the ships, in latitude 73° 19′, from which position no appearance of the sea could be perceived. Captain Hoppner described the ravines as extremely difficult to pass, many of them being four or five hundred feet deep and very precipitous. These being numerous and running chiefly in a north and south direction, appearing to empty themselves into Jackson's Inlet, preclude the possibility of performing a quick journey to the eastward. During the whole fortnight's excursion, scarcely a patch of vegetation could be seen. Indeed, the hills were so covered in most parts with soft and deep snow, that a spot could seldom be found on which to pitch their tent. A few snow-buntings and some ivory-gulls were all the animals they met with, to enliven this most barren and desolate country; and nothing was observed in the geological character differing from that about Port Bowen.

In the bed of one of the ravines, Captain Hoppner noticed some immense masses of rock, thirty or forty tons in weight, which had recently fallen from above, and he also passed over several avalanches of snow piled to a vast height across it *. 1824—5.

The two other parties, consisting of four men each, under the respective commands of Lieutenants Sherer and Ross, were directed to travel, the former to the southward, and the latter to the northward, along the coast of Prince Regent's Inlet, for the purpose of surveying it accurately, and of obtaining observations for the longitude and variation at the stations formerly visited by us on the 7th and 15th of August, 1819. I was also very anxious to ascertain the state of the ice to the northward, to enable me to form some judgment as to the probable time of our liberation.

These parties found the travelling along shore so good as to enable them, not only to reach those spots, but to extend their journeys far beyond them. Lieutenant Ross returning on the 15th, brought the welcome intelligence of the sea being perfectly open and free from ice at the distance of twenty-two miles to the northward of Port Bowen, by which I concluded—what, indeed, had long before been a matter

* Captain Hoppner gave a very favourable report of a tent made of a patent cloth composed of two parts of cambric, with caoutchouc (elastic gum) between. It is the manufacture of Mr. Mackintosh, of Glasgow, and is quite impervious to water.

1824—5. of probable conjecture,—that Barrow's Strait was not permanently frozen during the winter. From the tops of the hills about Cape York, beyond which promontory Lieutenant Ross travelled, no appearance of ice could be distinguished. Innumerable ducks, chiefly of the king, eider, and long-tailed species, were flying about near the margin of the ice, besides dovekies, looms, and glaucous, kittiwake, and ivory gulls. Lieutenant Sherer returned to the ships on the evening of the 15th, having performed a rapid journey as far as 72¼°, and making an accurate survey of the whole coast to that distance. In the course of this journey a great many remains of Esquimaux habitations were seen, and these were much more numerous on the southern part of the coast. In a grave which Lieutenant Sherer opened, in order to form some idea whether the Esquimaux had lately been here, he found the body apparently quite fresh; but as this might, in a northern climate, remain the case for a number of years, and as our board erected in 1819 was still standing untouched and in good order, it is certain these people had not been here since our former visit. Less numerous traces of the Esquimaux, and of older date, occur near Port Bowen, and in Lieutenant Ross's route along shore to the northward, and a few of the remains of habitations were those used as winter residences. I have since regretted that Lieutenant Sherer was not furnished with more provisions and a larger party, to have enabled him to travel round Cape Kater, which is probably not far distant from some of the northern Esquimaux stations mentioned in my Journal of the preceding voyage. 1824—5.

The longitudes observed by Lieutenants Sherer and Ross at the two stations laid down in 1819, by actual observation on the spot, were found to be from fourteen to seventeen minutes to the eastward of the positions assigned to them in the former chart. A difference of fourteen minutes the same way also occurs at Port Bowen; it is probable, therefore, that the whole of our former discoveries to the westward of Prince Regent's Inlet will be subject to a correction in the longitude of about fourteen or fifteen minutes. That this error does not extend to the eastern part of Barrow's Strait, appears certain from the near coincidence, already mentioned*, between our longitude observed on this voyage at Cape Warrender, and that in which it was placed in the survey of 1819. A corrected chart of the whole of Prince Regent's Inlet is now given, the eastern coast, from Cape York to Cape Kater, being constructed principally from the surveys made by Lieutenants Sherer and Ross, and the longitudes accurately deduced from the meridian of Port Bowen.

The variation of the magnetic-needle now observed by our travellers, at the stations before visited in 1819, was found to have changed in the same way, though not pre-

* Page 23.

1824—5. cisely to the same amount, as at Port Bowen; the observations of Lieutenant Sherer giving, to the southward, an increase in that phenomenon, from 118° 24′ to 123° 47′; and those of Lieutenant Ross, to the northward, from 115° 37′ to 116° 52′, the elapsed interval being nearly six years. These differences in the amount of change may in part be owing to the sluggish traversing of the compasses, and partly to the observations having been made at different times of day.

The whole of the coast travelled over by our parties consists of secondary limestone; that to the southward becoming gradually lower, and more shelving next the sea; but to the northward continuing generally high and precipitous. At a place near Cape York, Lieutenant Ross observed that the strata, which are chiefly horizontal, or nearly so, dipped to the N.W., at an angle of about ten degrees, the cliffs overhanging in a fearful manner at that part. In a mass of limestone recently fallen from the cliffs near the same spot, were also found some crystals of rhomb-spar, containing a portion of bitumen.

As soon as the thermometer began permanently to keep up to the freezing point, the observatory was prepared for the reception of the clock and pendulum; and after trying various means of keeping up a regular temperature during the times of observation, the experiments were commenced towards the middle of June, and three series were completed by Lieutenant Foster before we went to sea. The result of these experiments, with some account of the method of conducting them, will be found in the Appendix. 1824—5.

The heights of two hills above the sea were measured trigonometrically and barometrically; and one of them (Mount Cotterell) was also accurately levelled, by way of comparing, though necessarily on a small scale, the results given by those three modes of measurement*.

The great depth of water in which we lay at Port Bowen prevented our observing the rise and fall of the tides during the winter, by the usual method of a pole moored to the bottom. In the spring, however, when the fire-hole alongside the ship could be kept constantly open, we adopted another plan, which it may be useful to describe. A stone of about three hundred weight was let down the fire-hole to the bottom, having a whale-line attached to it. The line was rove through a block fixed to an outrigger from the ship's side, and to its other end was fastened a weight of fifty pounds. By this means, the line was kept quite tight, and a marked pole being attached to it, served to indicate with great accuracy the perpendicular rise and fall of the water. The observations being given at length in

* The height of Mount Cotterell,	by	trigonometrical operation,		701.460 ft.
,,	,,	barometer	,,	695.500
,,	,,	levelling	,,	702.500

1824—5. the tide-table, I shall only here mention the fact, that during nine weeks in the months of April, May, and June, the morning tides were found, almost invariably, to rise several inches higher than those of the evening.

Towards the end of June, the dovekies (*Colymbus Grylle*) were extremely numerous in the cracks of the ice at the entrance of Port Bowen, and as these were the only fresh supply of any consequence that we were able to procure at this unproductive place, we were glad to permit the men to go out occasionally with guns, after the ships were ready for sea, to obtain for their messes this wholesome change of diet; while such excursions also contributed essentially to their general health and cheerfulness. Many hundreds of these birds were thus obtained in the course of a few days. On the evening of the 6th of July, however, I was greatly shocked at being informed by Captain Hoppner that John Cotterell*, a seaman of the Fury, had been found drowned in one of the cracks of the ice, by two other men belonging to the same party, who had been with him but a few minutes before. We could never ascertain precisely in what manner this accident happened, but it was supposed that he must have over-reached himself in stooping for a bird

* It is remarkable that this poor man had, twice before, within the space of nine months, been very near death; for, besides the accident already mentioned, of falling down the hill which bears his name, he was also in imminent danger of dying of dropsy during the winter.

that he had killed. His remains were committed to the earth on Sunday the 10th, with every solemnity which the occasion demanded, and our situation would allow; and a tomb of stones, with a suitable inscription, was afterwards erected over the grave.

In order to obtain oil for another winter's consumption, before the ships could be released from the ice, and our travelling parties having seen a number of black whales in the open water to the northward, two boats from each ship were, with considerable labour, transported four miles along shore in that direction, to be in readiness for killing a whale and boiling the oil on the beach, whenever the open water should approach sufficiently near. They took their station near a remarkable peninsular piece of land on the south side of the entrance to Jackson's Inlet, which had, on the former voyage, been taken for an island. Notwithstanding these preparations, however, it was vexatious to find that on the 9th of July the water was still three miles distant from the boats, and at least seven from Port Bowen. On the 12th, the ice in our neighbourhood began to detach itself, and the boats under the command of Lieutenants Sherer and Ross being launched on the following day, succeeded almost immediately in killing a small whale of "five feet bone," exactly answering our purpose. Almost at the same time, and as it turned out very opportunely, the ice at the mouth of our harbour detached itself at an old crack,

1825. July. and drifted off, leaving only about one mile and a quarter between us and the sea. Half of this distance being occupied by the gravelled canal, which was dissolved quite through the ice in many parts, and had become very thin in all, every officer and man in both ships were set to work without delay to commence a fresh canal from the open water, to communicate with the other. This work proved heavier than we expected, the ice being generally from five to eight feet, and in many places from ten to eleven, in thickness. It was continued, however, with the greatest cheerfulness and alacrity from seven in the morning till seven in the evening daily, the dinner being prepared on the ice, and eaten under the lee of a studding sail erected as a tent.

Tuesday 19. On the afternoon of the 19th, a very welcome stop was put to our operations by the separation of the floe entirely across the harbour, and about one-third from the ships to where we were at work. All hands being instantly recalled by signal were, on their return, set to work to get the ships into the gravelled canal, and to saw away what still remained in it to prevent our warping to sea. This work, with only half an hour's intermission for the men's supper, Wed. 20. was continued till half-past six the following morning, when we succeeded in getting clear. The weather being calm, two hours were occupied in towing the ships to sea, and thus the officers and men were employed at very laborious work for twenty-six hours, during which time there were, on one occasion, fifteen of them overboard at once; and indeed several individuals met with the same accident three times. It was impossible, however, to regret the necessity of these comparatively trifling exertions, especially as it was now evident that to have sawed our way out, without any canal, would have required at least a fortnight of heavy and fatiguing labour. 1825. July.

Previously to commencing my journal of our operations at sea, I shall here close our account of Port Bowen, in which we had been imprisoned between nine and ten months, with Dr. Neill's remarks on the geological character of this coast, and with an abstract of the most material nautical and other observations made during our stay there.

"All the eastern shore of Prince Regent's Inlet which we had an opportunity of observing, is formed of secondary limestone, distinctly stratified in horizontal beds. The lowest stratum is very soft and friable, of a dull yellow colour, and contains a large quantity of the fragments of shells of marine animals. Over this occur several strata more compact than the former, varying in colour from gray to black. These alternate with each other in long undulated streaks several hundred feet in length, varying in thickness from that of a line to several feet, and containing many bivalve shells, lepides, &c. When struck with a hammer, the limestone emits a disagreeable smell, and it

1825. July. burns nearly snow white; by chemical tests, it was found to contain from twenty to thirty per cent. of carbonate of magnesia, with a little sulphur and bitumen. Over this lies a stratum of a brick-red colour, more compact than the other, and hard enough to give sparks with steel; it contains a considerable proportion of siliceous earth, red oxide of iron, and carbonate of magnesia. This stratum always extends to the surface, and is frequently from two to three hundred feet in thickness; from its superior hardness and durability, it frequently overhangs the less compact subjacent strata. From its brick-like appearance, and being formed by the action of the weather into various romantic shapes, as of broken arches, decayed walls, niches, and turrets, it does not require any great fertility of imagination to trace in it the ruins of ancient castles, or stately palaces.

"Extensive beds of coral and madrepore rise from unknown depths to the summits of the highest hills, and intersect the before-mentioned strata. They occupy at their base a space equal to the former, if not greater, but gradually narrow towards their summits, and have their sides pressed upon by the neighbouring strata. These beds contain caverns partly filled with broken shells, and fragments of madrepore and limestone cemented together by calcareous matter, their walls being incrusted with well-formed crystals of calcareous spar, possessing little lustre or transparency, on account of the quantity of red oxide of iron they contain.

The beds of madrepore, from their resisting the destroying effects of the weather better than the neighbouring strata, often reach a greater elevation, their flat tops being sometimes raised seven or eight hundred feet above the level of the sea. This circumstance gives to the land a very rugged hilly appearance, when seen from a ship inshore, but it is very different at a distance in the offing, or a few miles inland, when the country appears as it really is, very level, but intersected by some deep precipitous ravines. 1825. July.

"The low ledges on the coast are strewed over with rolled masses of granite, gneiss, syenite, mica-slate, clay-slate, hornblende-slate, and old red sandstone; the first three are very abundant, the others less frequent. They vary in size from that of pebbles to masses of several hundred tons in weight; by those who travelled in-land, these were observed to be very few in number, quite small, and much rounded. It is moreover worthy of remark that these boulders were found only on the surface, not an instance having occurred of any being observed to protrude from the precipices or the sides of ravines; thus affording strong reason to conclude that they were brought from the westward, subsequently to the formation of the present land, by a current of water, or some other unknown agent.

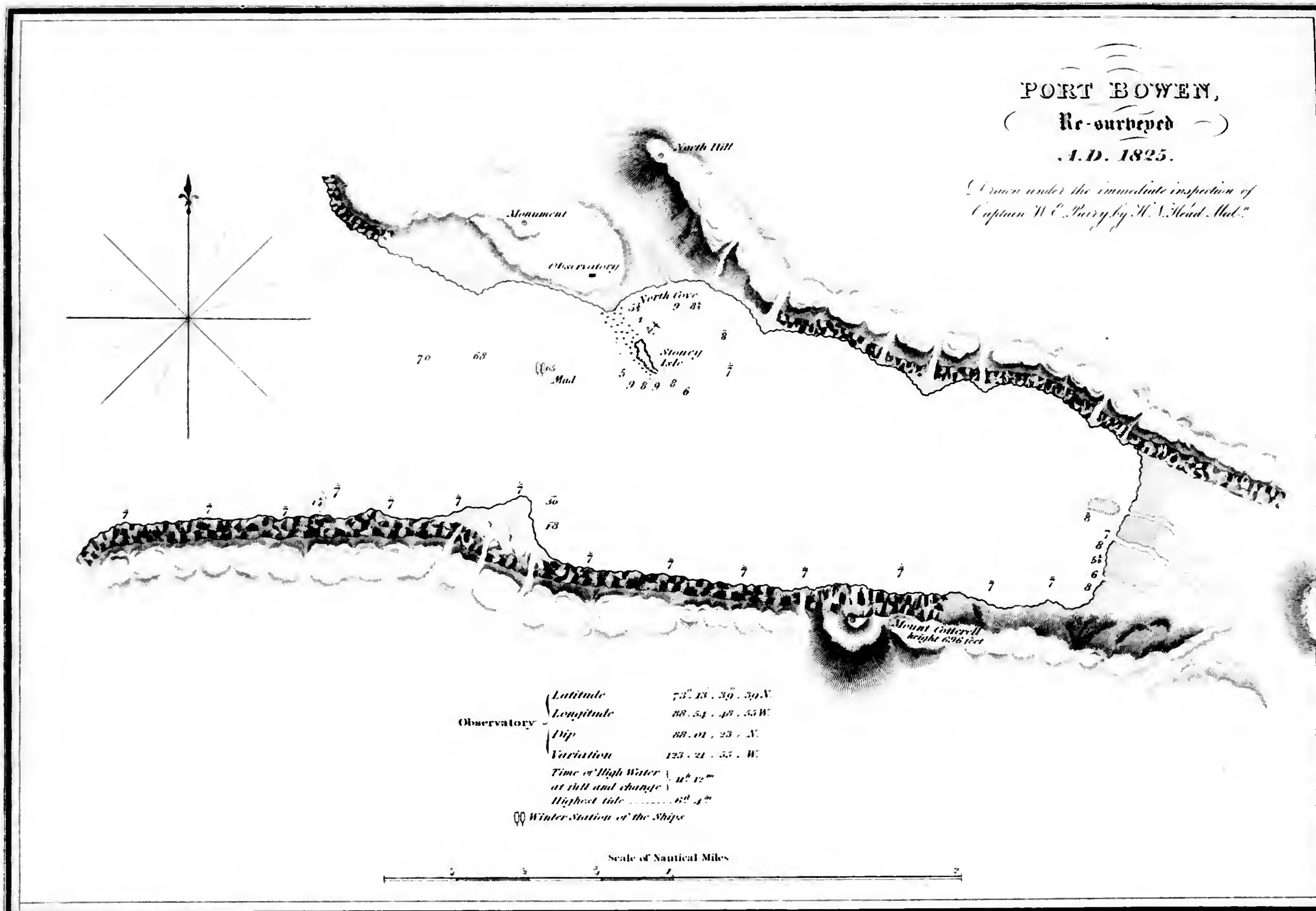
"The limestone of Port Bowen and its vicinity contains also vesicular quartz, flint, jasper, red and brown hematite, and Lydian-stone. Small pieces of black wood-stone and

1825. July.

bituminous shale were found on the beach, the latter bearing the impression of the bark of one of the palm tribe."

		°	′	″	
Mean latitude of the Observatory at Port Bowen, by 93 observations of the stars, with the repeating circle		73	13	39.39	N.
Mean Longitude of ditto by	Six occultations of fixed stars by the moon	88	54	52.4	W.
	Twenty-three transits of the moon . .	88	57	30.99	„
	Twenty-one eclipses of Jupiter's satellites	88	52	08.85	„
	Six hundred and twenty lunar distances (*viz.* 310 ✱ East, and 310 ✱ West of the moon)	88	54	22.41	„
	Nine chronometers	88	55	08.1	„
Received longitude, being the Mean of the above . . .		88	54	48.55	„
Mean dip of the magnetic needle		88	01	,23.	N.
Mean variation of ditto		123	21	55	W.

Mean time of high water on full and change days . . .	11h.	12m.
Highest Spring-tide	6ft.	4 in.
Lowest Neap-tide	1	1½.



Published as the act directs June 1826 by John Murray, Albemarle Street, London

J. & C. Walker Sculp.

CHAPTER V.

SAIL OVER TOWARDS THE WESTERN COAST OF PRINCE REGENT'S INLET—STOPPED BY THE ICE—REACH THE SHORE ABOUT CAPE SEPPINGS—FAVOURABLE PROGRESS ALONG THE LAND—FRESH AND REPEATED OBSTRUCTIONS FROM ICE—BOTH SHIPS DRIVEN ON SHORE—FURY SERIOUSLY DAMAGED—UNSUCCESSFUL SEARCH FOR A HARBOUR, FOR HEAVING HER DOWN TO REPAIR.

On standing out to sea, we sailed, with a light southerly wind, towards the western shore of Prince Regent's Inlet, which it was my first wish to gain, on account of the evident advantage to be derived from coasting the southern part of that portion of land called in the chart "North Somerset," as far as it might lead to the westward; which, from our former knowledge, we had reason to suppose it would do as far at least as the longitude of 95°, in the parallel of about 72¾°. After sailing about eight miles, we were stopped by a body of close ice lying between us and a space of open water beyond. By way of occupying the time in further examination of the state of the ice, we then bore up with a light northerly wind, and ran to the south-eastward, to see if there was any clear water between the ice, and the land in 1825. July. Wed. 20.

1825. July. that direction; but found that there was no opening between them to the southward of the flat-topped hill laid down in the chart, and now called MOUNT SHERER. Indeed, I believe that, at this time, the ice had not yet detached itself from the land to the southward of that station. On standing back, we were shortly after enveloped in one of the thick fogs which had, for several weeks past, been observed almost daily hanging over some part of the sea in the offing, though we had scarcely experienced any in Port Bowen, until the water became open at the mouth of the harbour.

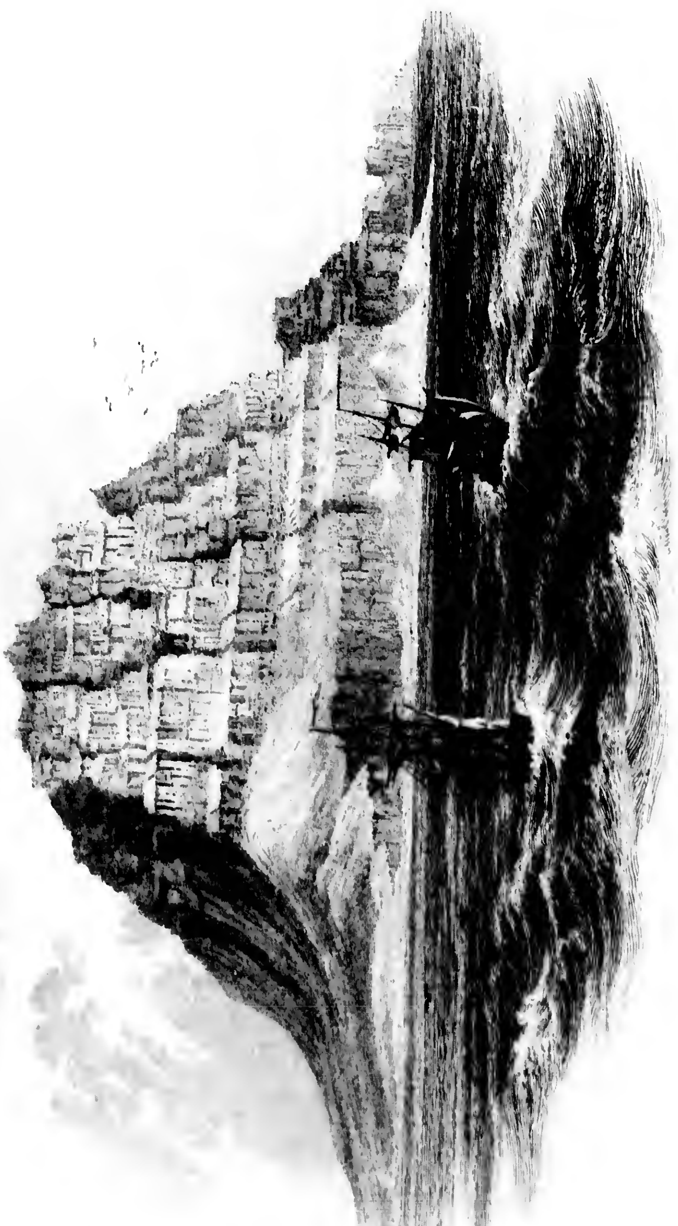
Thurs. 21. On the clearing up of the fog on the 21st, we could perceive no opening of the ice leading towards the western land, nor any appearance of the smallest channel to the southward along the eastern shore. I was determined, therefore, to try at once a little further to the northward, the present state of the ice appearing completely to accord with that observed in 1819, its breadth increasing as we advanced from Prince Leopold's Islands to the southward. As, therefore, I felt confident of being able to push along the shore if we could once gain it, I was anxious to effect the latter object *in any part,* rather than incur the risk of hampering the ships by a vain, or at least a doubtful attempt to force them through a body of close ice several miles wide, for the sake of a few leagues of southing, which would soon be regained by coasting.

Light winds detained us very much, but being at length

favoured by a breeze, we carried all sail to the north-west, 1825. July.
the ice very gradually leading us towards the Leopold Isles. Having arrived off the northernmost, on the morning of the 22nd, it was vexatious, however curious, to observe the Friday 22.
exact coincidence of the present position of the ice with that which it occupied a little later in the year 1819. The whole body of it seemed to cling to the western shore, as if held there by some strong attraction, forbidding, for the present, any access to it. We now stood off and on, in the hope that a southerly breeze, which had just sprung up, might serve to open us a channel. In the evening, the wind gradually freshened, and before midnight had increased to a strong gale, which blew with considerable vio- Satur. 23.
lence for ten hours, obliging us to haul off from the ice, and to keep in smooth water under the eastern land until it abated; after which not a moment was lost in again standing over to the westward. After running all night, with light and variable winds, through loose and scattered ice, we suddenly found ourselves, on the clearing up of a thick fog through which we had been sailing on the morning of the 24th, within one-third of a mile of Cape Seppings, the land Sunday 24.
just appearing above the fog in time to save us from danger, the soundings being thirty-eight fathoms, on a rocky bottom. The Fury being apprized by guns of our situation, both ships were hauled off the land, and the fog soon after dispersing, we had the satisfaction to perceive that the late

1825. July. gale had blown the ice off the land, leaving us a fine navigable channel from one to two miles wide, as far as we could see from the mast-head along the shore. We were able to avail ourselves of this but slowly, however, in consequence of a light southerly breeze still blowing against us.

We had now an opportunity of discovering that a long neck of very low land runs out from the southernmost of the Leopold Islands, and another from the shore to the southward of Cape Clarence. These two had every appearance of joining, so as to make a peninsula, instead of an island, of that portion of land which, on account of our distance preventing our seeing the low beach, had in 1819 been considered under the latter character. It is, however, still somewhat doubtful, and the Leopold Isles, therefore, still retain their original designation on the chart. The land here, when closely viewed, assumes a very striking and magnificent character, the strata of limestone, which are numerous, and quite horizontally disposed, being much more regular than on the eastern shore of Prince Regent's Inlet, and retaining nearly their whole perpendicular height, of six or seven hundred feet, close to the sea. The south-eastern promontory of the southernmost Island is particularly picturesque and beautiful, the heaps of loose debris lying here and there up and down the sides of the cliff giving it the appearance of some huge and impregnable fortress, with immense buttresses of masonry supporting the walls. Near



Cape Seppings, and some distance beyond it to the southward, we noticed a narrow stratum of some very white substance, the nature of which we could not at this time conjecture. I may here remark that the whole of Barrow's Strait, as far as we could see to the N.N.E. of the islands, was entirely free from ice; and, from whatever circumstance it may proceed, I do not think that this part of the Polar Sea is at any season very much encumbered with it. 1825. July.

It was the general feeling, at this period, among us, that the voyage had but now commenced. The labours of a bad summer, and the tedium of a long winter, were forgotten in a moment, when we found ourselves upon ground not hitherto explored, and with every apparent prospect before us of making as rapid a progress as the nature of this navigation will permit, towards the final accomplishment of our object.

Early on the morning of the 25th, we passed the opening in the land delineated in the former chart of this coast, in latitude 73° 34′, which we now found to be a bay about three miles deep, but apparently open to the sea. I named it after my friend Hastings Elwin, Esq., of Bristol, as a token of grateful esteem for that gentleman. The wind falling very light, so that the ships made no progress, I took the opportunity of landing in the forenoon, accompanied by a party of the officers, and was soon after joined by Captain Hoppner. We found the formation to consist wholly of Monday 25.

1825. July. lime, and now discovered the nature of the narrow white stratum observed the day before from the offing, and which proved to be gypsum, mostly of the earthy kind, and some of it of a very pure white. A part of the rock near our landing-place contained a quantity of it in the state of selenite in beautiful transparent laminæ of a large size. The abundance of gypsum hereabouts explained also the extreme whiteness of the water near the whole of this part of the coast, which had always been observed in approaching it, and which had at first excited unnecessary apprehensions as to the soundings along the shore. This colour is more particularly seen near the mouths of the streams, many of which are quite of a dirty milk colour, and tinge the sea to the distance of more than a mile, without any alteration in the depth, except a gradual diminution in going in. The vegetation in this place was, as usual, extremely scanty, though much more luxuriant than on any of the land near our winter-quarters, and no animals were seen. The latitude of our landing-place was 73° 27′ 23″, the longitude by chronometers 90° 50′ 34″.6, and the variation of the magnetic needle 125° 34′ 42″ westerly. From half-past nine A.M. till a quarter past noon, the tide fell two feet three inches; and as it was nearly stationary at the latter time, it was probably near low-water.

A breeze enabling us again to make some progress, and an open channel still favouring us, of nearly the same breadth as before, we passed during the night a second bay, about the same size as the other, and also appearing open to the sea; it lies in latitude (by account from the preceding and following noon) 73° 19′ 30″, and its width is one mile and a half. It was called BATTY BAY, after my friend CAPTAIN ROBERT BATTY, of the Grenadier Guards. We now perceived that the ice closed completely in with the land a short distance beyond us, and having made all the way we could, were obliged to stand off and on during the day in a channel not three-quarters of a mile wide. This channel being still more contracted towards the evening, we were obliged to make fast to some grounded land-ice upon the beach, in four fathoms' water, there to await some change in our favour. We here observed traces of our old friends the Esquimaux, there being several of their circles of stones, though not of recent date, close to the sea. We also found a more abundant vegetation than before, and several plants familiar to us on the former voyages, but not yet procured on this, were now added to our collections. The geological character of the land was nearly the same as before, but we found here some gypsum of the fibrous kind, occurring in a single stratum about an inch and a half wide. About a mile to the north of us was a curious cascade or spout of water, issuing from a chasm in the rock, and falling more than two hundred feet perpendicular. Our gentlemen, who visited the spot, described it as rendered the more

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Tuesday 26.

1825. July. picturesque by innumerable kittiwakes having their nests among the rocks, and constantly flying about the stream. The latitude was 73° 06′ 17″; the longitude by chronometers 91° 19′ 52″.3; the dip of the magnetic-needle 88° 02′.1; and the variation 128° 23′ 17″ westerly.

Wednes. 27. The ice opening in the afternoon of the 27th, we cast off and run four or five miles with a northerly breeze. This wind, however, always had the effect of making the ice close the shore, while a southerly breeze as uniformly opened it, so that on this coast, as on several others that I have known, a contrary wind—however great the paradox may seem—proved, on the whole, the most favourable for making progress. This circumstance is simply to be attributed to the greater abundance of open water in the parts we have left behind (in the present instance the open sea of Barrow's Strait) than those towards which we are going. We were once more obliged to make fast, therefore, to some grounded ice close to the beach, rather than run any risk of hampering the ships, and rendering them unable to take advantage of a change in our favour.

Thurs. 28. A light southerly breeze on the morning of the 28th gradually cleared the shore, and a fresh wind from the N.W. then immediately succeeded. We instantly took advantage of this circumstance, and casting off at six A.M. ran eight or nine miles without obstruction, when we were stopped by the ice, which, in a closely packed and impenetrable body, stretched close into the shore, as far as the eye could reach from the crow's nest. Being anxious to gain every foot of distance that we could, and perceiving some grounded ice which appeared favourable for making fast to, just at a point where the clear water terminated, the ships were run to the utmost extent of it, and a boat prepared from each to examine the depth of water at the intended anchoring place. Just as I was about to leave the Hecla for that purpose, the ice was observed to be in rapid motion towards the shore. The Fury was immediately hauled in by some grounded masses, and placed to the best advantage; but the Hecla being more advanced was immediately beset in spite of every exertion, and after breaking two of the largest ice-anchors in endeavouring to heave in to the shore, was obliged to drift with the ice, several masses of which had fortunately interposed themselves between us and the land. The ice slackening around us a little in the evening, we were enabled, with considerable labour, to get to some grounded masses, where we lay much exposed, as the Fury also did. In this situation, our latitude being 72° 51′ 51″, we saw a comparatively low point of land three or four leagues to the southward, which proved to be near that which terminated our view of this coast in 1819. 1825. July.

On the 29th, the ice being slack for a short distance, we shifted the Hecla half a mile to the northward, into a less insecure birth. I then walked to a broad valley facing the Friday 29.

1825. July. sea near us, where a considerable stream discharged itself, and where, in passing in the ships, a large fish had been observed to jump out of the water. In hopes of finding salmon here, we tried for some time with several hand-nets, but nothing was caught or seen. In this place were a number of the Esquimaux stone circles, apparently of very old date, being quite overgrown with grass, moss, and other plants. In the neighbourhood of these habitations, the vegetation was much more luxuriant than anything of the kind we had seen before during this voyage. The state of this year's plants was now very striking, compared with those of the last, and afforded strong evidence, if any had been wanting, of the difference between the two seasons. I was particularly struck with the appearance of some moss collected by Mr. Hooper, who pointed out to me upon the same specimen the last year's miserable seeds just peeping above the leaves, while those of the present summer had already shot three-quarters of an inch beyond them. Another circumstance which we noticed about this time, and still more so as the season advanced, was the rapid progress which the warmth had already made in dissolving the *last* year's snow, this being always easily known by its dingy colour, and its admixture with the soil. Of the past winter's snow not a particle could be seen, at the close of July, on any part of this coast. These facts, together with the beautiful weather we had enjoyed for many weeks past, all

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tended to shew that we were now favoured with an unusually fine summer. We found in this place, in the dry bed of an old stream, innumerable fossils in the limestone, principally shells and madrepore. On a hill abreast of the Hecla, and at an elevation of not less than three or four hundred feet above the sea, one particular spot was discovered, in which the same kind of shells first found in Barrow's Strait in 1819, occurred in very great abundance and perfection, wholly detached from the lime in which, for the most part, they were found imbedded in other places on this coast. Indeed, it was quite astonishing, in looking at the numberless fossil animal remains occurring in many of the stones, to consider the countless myriads of shell-fish and marine insects which must once have existed on this shore. The cliffs next the sea, which here rise to a perpendicular height of between four and five hundred feet, were continually breaking down at this season, and adding, by falls of large masses of stone, to the slope of debris lying at their foot. The ships lay so close to the shore as to be almost within the range of some of these tumbling masses, there being at high water scarcely beach enough for a person to walk along the shore. The time of high water, near the opposition of the moon this night, was between half-past eleven and midnight, being nearly the same as at Port Bowen at full and change.

The ice opening for a mile and a half alongshore on the

1825. July. Satur. 30. 30th, we shifted the Hecla's birth about that distance to the southward, chiefly to be enabled to see more distinctly round a point which before obstructed our view, though our situation, as regarded the security of the ship, was much altered for the worse. The Fury remained where she was, there being no second birth even so good as the bad one where she was now lying. In the afternoon it blew a hard gale, with constant rain, from the northward, the clouds indicating an easterly wind in other parts. This wind, which was always the troublesome one to us, soon brought the ice closer and closer, till it pressed with very considerable violence on both ships, though the most upon the Fury, which lay in a very exposed situation. The Hecla received no damage but the breaking of two or three hawsers, and a part of her bulwark torn away by the strain upon them. In the course of the night we had reason to suppose, by the Fury's heeling, that she was either on shore, or still heavily pressed by the ice from without.

Sunday 31. Early on the morning of the 31st, as soon as a communication could be effected, Captain Hoppner sent to inform me that the Fury had been forced on the ground, where she still lay; but that she would probably be hove off without much difficulty at high water, provided the external ice did not prevent it. I also learned from Captain Hoppner that a part of one of the propelling wheels had been destroyed, the chock through which its axis passed being forced in considerably, and the palm broken off one of the bower anchors. Most of this damage, however, was either of no very material importance, or could easily be repaired. A large party of hands from the Hecla being sent round to the Fury towards high water, she came off the ground with very little strain, so that, upon the whole, considering the situation in which the ships were lying, we thought ourselves fortunate in having incurred no very serious injury. The Fury was shifted a few yards into the best place that could be found, and the wind again blowing strong from the northward, the ice remained close about us. A shift of wind to the southward in the afternoon at length began gradually to slacken it, but it was not till six A.M. on the 1st of August that there appeared a prospect of making any progress. There was, at this time, a great deal of water to the southward, but between us and the channel there lay one narrow and not very close stream of ice touching the shore. A shift of wind to the northward determined me at once to take advantage of it, as nothing but a free wind seemed requisite to enable us to reach this promising channel. The signal to that effect was immediately made, but while the sails were setting, the ice, which had at first been about three-quarters of a mile distant from us, was observed to be closing the shore. The ships were cast with all expedition, in hopes of gaining the broader channel before the ice had time to shut us up. So rapid, however, was the

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August. Monday 1.

1825. August. latter in this its sudden movement, that we had but just got the ships' heads the right way, when the ice came bodily in upon us, being doubtless set in motion by a very sudden freshening of the wind almost to a gale in the course of a few minutes. The ships were now almost instantly beset, and in such a manner as to be literally helpless and unmanageable. In such cases, it must be confessed that the exertions made by heaving at hawsers or otherwise are of little more service than in the occupation they furnish to the men's minds under circumstances of difficulty; for when the ice is fairly acting against the ship, ten times the strength and ingenuity could in reality avail nothing.

The sails were, however, kept set, and as the body of ice was setting to the southward withal, we went with it some little distance in that direction. The Hecla, after thus driving, and now and then forcing her way through the ice, in all about three-quarters of a mile, quite close to the shore, at length struck the ground forcibly several times in the space of a hundred yards, and being then brought up by it, remained immoveable, the depth of water under her keel abaft being sixteen feet, or about a foot less than she drew. The Fury continuing to drive was now irresistibly carried past us, and we escaped, only by a few feet, the damage invariably occasioned by ships coming in contact under such circumstances. She had however scarcely past us a hundred yards, when it was evident, by the ice pressing her in, as well as along the shore, that she must soon be stopped like the Hecla; and having gone about two hundred yards further she was observed to receive a severe pressure from a large floe-piece forcing her directly against a grounded mass of ice upon the beach. After setting to the southward for an hour or two longer, the ice became stationary, no open water being anywhere visible from the mast-head, and the pressure on the ships remaining undiminished during the day. Just as I had ascertained the utter impossibility of moving the Hecla a single foot, and that she must lay quite aground fore and aft as soon as the tide fell, I received a note from Captain Hoppner informing me that the Fury had been so severely "nipped" and strained as to leak a good deal, apparently about four inches an hour; that she was still heavily pressed both upon the ground and against the large mass of ice within her; that the rudder was at present very awkardly situated; and that one boat had been much damaged. As the tide fell, the Fury's stern which was aground was lifted several feet, and the Hecla, at low water, having sewed five feet forward and two abaft, we presented altogether no very pleasing or comfortable spectacle. However, about high water, the ice very opportunely slacking, the Hecla was hove off with great ease, and warped to a floe in the offing to which we made fast at midnight. The Fury was not long after us in coming off the ground, when I was in hopes of finding that any twist or

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1825. August. strain by which her leaks might have been occasioned, would, in some measure, have closed when she was relieved from pressure and once more fairly afloat. My disappointment and mortification, therefore, may in some measure be imagined, at being informed by telegraph, about two A.M. on the 2nd, that the water was gaining on two pumps, and that a part of the doubling had floated up. The Hecla having, in the mean time, been carried two or three miles to the southward, by the ice which was once more driving in that direction, I directed Captain Hoppner by signal to endeavour to reach the best security inshore which the present slackness of the ice might permit, until it was possible for the Hecla to rejoin him. Presently after, perceiving from the mast-head something like a small harbour nearly abreast of us, every effort was made to get once more towards the shore. In this the ice happily favoured us, and after making sail, and one or two tacks, we got in with the land, when I left the ship in a boat to sound the place, and search for shelter. I soon had the mortification to find that the harbour which had appeared to present itself so opportunely, had not more than six or seven feet of water in any part of it, the whole of its defences being composed of the stones and soil washed down by a stream which here emptied itself into the sea. From this place, indeed, where the land gradually became much lower in advancing to the southward, the whole nature of the soundings entirely

Tuesday 2.

altered, the water gradually shoaling in approaching the beach, so that the ships could scarcely come nearer in most parts than a quarter of a mile. At this distance, the whole shore was more or less lined with grounded masses of ice; but after examining the soundings within more than twenty of them, in the space of about a mile, I could only find two that would allow the ships to float at low water, and that by some care in placing and keeping them there. Having fixed a flag on each berg, the usual signal for the ships taking their stations, I rowed on board the Fury, and found four pumps constantly going, to keep the ship free, and Captain Hoppner, his officers and men almost exhausted with the incessant labour of the last eight and forty hours. The instant the ships were made fast, Captain Hoppner and myself set out in a boat to survey the shore still further south, there being a narrow lane of water about a mile in that direction; for it had now become too evident, however unwilling we might have been at first to admit the conclusion, that the Fury could proceed no further without repairs, and that the nature of those repairs would in all probability involve the disagreeable, I may say the ruinous, necessity of heaving the ship down. After rowing about three-quarters of a mile, we considered ourselves fortunate in arriving at a bolder part of the beach, where three grounded masses of ice, having from three to four fathoms water at low tide within them, were so disposed as to afford, with the assist-

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1825. August. ance of art, something like shelter. Wild and insecure as, under other circumstances, such a place would have been thought, for the purpose of heaving a ship down, we had no alternative, and therefore as little occasion as we had time for deliberation. Returning to the ships, we were setting the sails in order to run to the appointed place, when the ice closed in and prevented our moving, and in a short time there was once more no open water to be seen. We were, therefore, under the necessity of remaining in our present births, where the smallest external pressure must inevitably force us ashore, neither ship having more than two feet of water to spare. One watch of the Hecla's crew were sent round to assist at the Fury's pumps, which required one-third of her ship's company to be constantly employed at them.

I now received from Captain Hoppner the following more detailed account of the Fury's accident, which it is proper for me here to record.

" We had scarcely driven clear of the Hecla at 10.30. A.M. on the 1st, before a heavy floe-piece pressed against our larboard quarter, and forced the ship against a high mass of grounded ice which threatened to tear everything away. The ship received so severe a " nip," that she trembled violently, whilst the beams and timbers cracked, and a crash like the report of a musket was heard under the larboard quarter by two or three persons who chanced to be below.

The rudder was forced hard over to starboard, and but very little more pressure seemed requisite to tear it from the stern-post. Finding, after a short time, that the ice did not ease again outside of us, everybody was employed in securing the boats and anchors, which had already suffered materially, and had narrowly escaped being torn to pieces in passing the high ice. While we were thus employed, the carpenter reported the ship to be making water rapidly. From a wish not to create any unnecessary sensation, and to make our situation appear as favourable as possible, it was at first treated lightly, and the pumps not set to work till after dinner, when the water had risen to four feet in the well, and after trying one and two of the pumps, it was found necessary to set all four to work to keep her free, it being computed that she made about three feet per hour.

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"At the time we were first driven in, it wanted about an hour of high-water, and the ship had then barely her draught of water abaft; so that when the tide fell she sewed more than six feet abaft, whilst her bow, which was very much depressed, just took the ground. As it seemed probable that the same floe-piece which had caused all the injury, might assist to drag us off when it again set from the land, the stream-cable and a six-inch hawser were secured to it; but unfortunately it began moving about low water, and the ship being too firmly fixed, the ropes broke after bearing a heavy strain. It was not until midnight that the ship

1825. August. floated, when we hove off, and were again driven to the southward amongst the body of ice; all our exertions being directed to getting hold of a large piece outside, with the hope that it would drag us off the land. This, however, we were unable to effect, and were in momentary expectation of again driving on shore. The Hecla was now driving fast from us, and as our people were nearly exhausted, I communicated our situation to Captain Parry by signal; and a breeze springing up soon after from the land, opened the ice sufficiently to enable the ships to join."

Wednes. 3. The ice coming in with considerable violence on the night of the 2nd, once more forced the Fury on shore, so that at low water she sewed two feet and a half. Nothing but the number and strength of the Hecla's hawsers prevented her sharing the same fate, for the pressure was just as much as seven of these of six inches, and two stream-cables would bear. The Fury floated in the morning, and was enabled to haul off a little, but there was no opening of the ice to allow us to move to our intended station. The more leisure we obtained to consider the state of the Fury, the more apparent became the absolute, however unfortunate, necessity of heaving her down. Four pumps were required to be at work without intermission, to keep her free, and this in perfectly smooth water, shewing that she was in fact so materially injured as to be very far from sea-worthy. One-third of her working men were constantly employed, as before remarked, in this laborious operation, and some of their hands had become so sore from the constant friction of the ropes, that they could hardly handle them any longer without the use of mittens, assisted by the unlaying of the ropes to make them soft. When, in addition to these circumstances, the wet state of the decks and the little room left, as well as the reduced strength for working the ship or heaving at hawsers among the ice, be considered, I believe that every seaman will admit the impracticability of pursuing this critical navigation till the Fury had been examined and repaired. As, therefore, not a moment could be lost, we took advantage of a small lane of water deep enough for boats, which kept open within the grounded masses along the shore, to convey to the Hecla some of the Fury's dry provisions, and to land a quantity of heavy ironwork, and other stores not perishable; for the moment this measure was determined on, I was anxious, almost at any risk, to commence the lightening of the ship as far as our present insecurity and our distance from the shore would permit. 1825. August.

The wind blowing fresh from the northward, which always increased our difficulties on this coast, the ice pressed so violently upon the ships as almost to force them adrift during the night, employing our people, now sufficiently harassed by their work during the day, for two or three hours, in still further increasing our security by addi- Thursday 4.

1825. August. tional hawsers. We continued landing stores from the Fury on the 4th, and at night a bower-cable was passed round one of the grounded masses alongside of her; for if either ship had once got adrift, it is difficult to say what might have been the consequence.

Friday 5. At two A.M. on the 5th, the ice began to slacken near the ships, and as soon as a boat could be rowed alongshore to the southward, I set out, accompanied by a second from the Fury, for the purpose of examining the state of our intended harbour since the recent pressure, and to endeavour to prepare for the reception of the ships by clearing out the loose ice. On my arrival there, the distance being about a mile, I found that one of the three bergs had shifted its place so materially by the late movements of the ice, as not only to alter the disposition of these masses, on which our whole dependence rested, very much for the worse, but also to destroy all confidence in their stability upon the ground. Landing upon one of the bergs, to shew the appointed signal for the ships to come, I perceived, about half a mile beyond us to the southward a low point forming a little bay, with a great deal of heavy grounded ice lying off it. I immediately rowed to this, in hopes of finding something like a harbour for our purpose, but on my arrival there, had once more the mortification to find that there was not above six feet of water at low tide in any part of it, and within the grounded ice not more than twelve. Having assured myself that no security or shelter was here to be found, I immediately returned to the former place, which the Hecla was just reaching. The Fury was detained some time by a quantity of loose ice which had wedged itself in, in such a manner as to leave her no room to move outwards; but she arrived about seven o'clock, when both ships were made fast in the best births we could find, but they were still excluded from their intended place by the quantity of ice which had fixed itself there. Within twenty minutes after our arrival, the whole body of ice again came in, entirely closing up the shore, so that our moving proved most opportune.

1825. August.

CHAPTER VI.

FORMATION OF A BASIN FOR HEAVING THE FURY DOWN—LANDING OF THE FURY'S STORES, AND OTHER PREPARATIONS—THE SHIPS SECURED WITHIN THE BASIN—IMPEDIMENTS FROM THE PRESSURE OF THE ICE—FURY HOVE DOWN—SECURITIES OF THE BASIN DESTROYED BY A GALE OF WIND—PREPARATIONS TO TOW THE FURY OUT—HECLA RE-EQUIPPED, AND OBLIGED TO PUT TO SEA—FURY AGAIN DRIVEN ON SHORE—RE-JOIN THE FURY; AND FIND IT NECESSARY FINALLY TO ABANDON HER.

1825. August. Friday 5, *continued.*

As there was now no longer room for floating the ice out of our proposed basin, all hands were immediately employed in preparing the intended securities against the incursions of the ice. These consisted of anchors carried to the beach, having bower-cables attached to them, passing quite round the grounded masses, and thus enclosing a small space of just sufficient size to admit both ships*. The cables we proposed floating by means of the two hand-masts and some empty casks lashed to them as buoys, with the intention of thus making them receive the pressure of the ice a foot or two below the surface of the water. By uncommon exertions on the part of the officers and men, this laborious work was completed before night as far as was practicable

* See the diagram, p. 121.

Drawn by H.N. Head

Engraved by E. Finden

LANDING THE FURY'S STORES,

AUGUST [illegible]

until the loose ice should set out; and all the tents were set up on the beach for the reception of the Fury's stores. 1825. August.

The ice remaining quite close on the 6th, every individual in both ships, with the exception of those at the pumps, was employed in landing provisions from the Fury, together with the spars, boats, and everything from off her upper deck. The ice coming in, in the afternoon, with a degree of pressure which usually attended a northerly wind on this coast, twisted the Fury's rudder so forcibly against a mass of ice lying under her stern, that it was for some hours in great danger of being damaged, and was indeed only saved by the efforts of Captain Hoppner and his officers, who, without breaking off the men from their other occupations, themselves worked at the ice-saw. On the following day, the ice remaining as before, the work was continued without intermission, and a great quantity of things landed. The two carpenters, Messrs. Pulfer and Fiddis, took the Fury's boats in hand themselves, their men being required as part of our physical strength in clearing the ship. The armourer was also set to work on the beach in forging bolts for the martingales of the out-riggers. In short every living creature among us was somehow or other employed, not even excepting our dogs, which were set to drag up the stores on the beach; so that our little dock-yard soon exhibited the most animated scene imaginable. The quickest method of landing casks, and other things not too weighty, was that adopted by Captain Hoppner, and consisted of a hawser

Saturday 6.

Sunday 7.

1825. August. secured to the ship's main mast-head, and set up as tight as possible to the anchor on the beach; the casks being hooked to a block traversing on this as a jack-stay, were made to run down it with great velocity. By this means more than two were got on shore for every one landed by the boats, the latter, however, being constantly employed in addition. The Fury was thus so much lightened in the course of the day, that two pumps were now nearly sufficient to keep her free, and this number continued requisite until she was hove down. Her spirit-room was now entirely clear, and on examination the water was found to be rushing in through two or three holes that happened to be in the ceiling, and which were immediately plugged up. Indeed, it was now very evident that nothing but the tightness of the Fury's diagonal ceiling had so long kept her afloat, and that any ship not thus fortified within could not possibly have been kept free by the pumps.

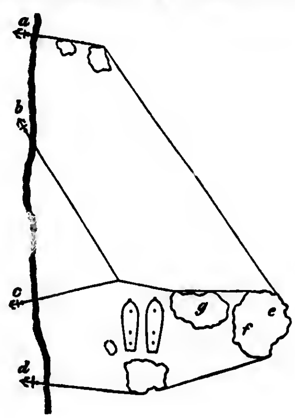
At night, just as the people were going to rest, the ice began to move to the southward, and soon after came in towards the shore, again endangering the Fury's rudder *, and pressing her over on her side to so alarming a degree, as to warm us that it would not be safe to lighten her much more in her present insecure situation. One of our bergs,

* I have mentioned the endangering of the rudders so frequently about this time, that seamen may ask why they were not unshipped. It will give a tolerable idea of the critical situations in which we had for several days past been placed, to state that we had never had sufficient depth of water (about twenty-five feet) for doing so.

also shifted its position by this pressure, so as to weaken our confidence in the pier-heads of our intended basin; and a long "tongue" of one of them forcing itself under the Hecla's fore-foot, while the drift-ice was also pressing her forcibly from astern, she once more sewed three or four feet forward at low water, and continued to do so, notwithstanding repeated endeavours to haul her off, for four successive tides, the ice remaining so close and so much doubled under the ship, as to render it impossible to move her a single inch. Notwithstanding the state of the ice, however, we did not remain idle on the 8th, all hands being employed in unrigging the Fury, and landing all her spars, sails, booms, boats, and other top-weight. In the afternoon, we carried a third bower-anchor to the beach, and secured another cable to the bight of the former ones, on the north side of the basin, as shewn at *b* in the annexed diagram, which will give the best idea of the nature of the harbour we were forming.

1825. August.

Monday 8.



R

1825. August. This was the more necessary, on account of the long bight of the cable from *c* to *g*, which any pressure would be sure to bring home upon the ships, and also because the ice always exerted the greatest force from that side. Indeed, the whole space we could hope to render secure was so extremely contracted, that we could not afford to lose a single foot of it; and having made these preparations, we anxiously looked for the ice slackening, that we might clear out our harbour, and have an opportunity of trying its efficacy for our intended purpose.

Tuesday 9. The ice still continuing very close on the 9th, all hands were employed in attempting, by saws and axes, to clear the Hecla, which still grounded on the tongue of ice every tide. After four hours' labour, they succeeded in making four or five feet of room astern, when the ship suddenly slided down off the tongue with considerable force, and became once more afloat. We then got on shore the Hecla's cables and hawsers for the accommodation of the Fury's men in our tiers during the heaving down, struck our top-masts which would be required as shores and outriggers, and, in short, continued to occupy every individual in some preparation or other. These being entirely completed at an early hour in the afternoon, we ventured to go on with the landing of the coals and provisions from the Fury, preferring to run the risk which would thus be incurred, to the loss of even a few hours in the accomplishment of our present object. As it very opportunely happened, however, the external ice slackened to the distance of about a hundred yards outside of us, on the morning of the 10th, enabling us, by a most tedious and laborious operation, to clear the ice out of our basin piece by piece. The difficulty of this apparently simple process consisted in the heavy pressure having repeatedly doubled one mass under another, a position in which it requires great power to move them, and also by the corners locking in with the sides of the bergs. Our next business was to tighten the cables sufficiently by means of purchases, and to finish the floating of them in the manner and for the purpose before described. After this had been completed, the ships had only a few feet in length, and nothing in breadth to spare, but we had now great hopes of going on with our work with increased confidence and security. The Fury, which was placed inside, had something less than eighteen feet at low water; the Hecla lay in four fathoms, the bottom being strewed with large and small fragments of limestone.

1825. August. Wed. 10.

While thus employed in securing the ships, the smoothness of the water enabled us to see, in some degree, the nature of the Fury's damage; and it may be conceived how much pain it occasioned us plainly to discover that both the stern-post and fore-foot were broken and turned up on one side with the pressure. We also could perceive, as far as we were able to see along the main-keel, that it was

1825. August. much torn, and we had therefore reason to conclude that the damage would altogether prove very serious. We also discovered that several feet of the Hecla's false keel was torn away abreast of the fore-chains, in consequence of her grounding forward so frequently.

Thurs. 11. The ships being now as well secured as our means permitted from the immediate danger of ice, the clearing of the Fury went on with increased confidence, though greater alacrity was impossible, for nothing could exceed the spirit and zealous activity of every individual, and as things had turned out, the ice had not obliged us to wait a moment, except at the actual times of its pressure. Being favoured with fine weather, we continued our work very quickly, so
Friday 12. that on the 12th every cask was landed, and also the powder; and the spare sails and clothing put on board the
Satur. 13. Hecla. On the 13th we found that a mass of heavy ice which had been aground within the Fury, as shewn by the dotted lines in the diagram, had now floated off alongside of her at high water, still further contracting our already narrow basin, and leaving the ship no room for turning round. At the next high water, therefore, we got a purchase on it, and hove it out of the way, so that at night it drifted off altogether. The coals and preserved meats were the principal things now remaining on board the Fury, and these we continued landing by every method we could devise as the most expeditious. The tide rose so considerably at

night, new moon occurring within an hour of high water, that we were much afraid of our bergs floating: they remained firm, however, even though the ice came in with so much force as to break one of our hand-masts, a fir-spar of twelve inches in diameter. As the high tides and the lightening of the Fury now gave us sufficient depth of water for unshipping the rudders, we did so, and laid them upon the small berg astern of us, for fear of their being damaged by any pressure of the ice. 1825. August.

Early on the morning of the 14th, the ice slackening a little in our neighbourhood, we took advantage of it, though the people were much fagged, to tighten the cables, which had stretched and yielded considerably by the late pressure. It was well that we did so; for in the course of this day we were several times interrupted in our work by the ice coming with a tremendous strain on the north cables, the wind blowing strong from the N.N.W., and the whole "pack" outside of us setting rapidly to the southward. Indeed, notwithstanding the recent tightening and re-adjustment of the cables, the bight was pressed in so much, as to force the Fury against the berg astern of her, twice in the course of the day. Mr. Waller, who was in the hold the second time that this occurred, reported that the coals about the keelson were moved by it, imparting the sensation of a part of the ship's bottom falling down; and one of the men at work there was so strongly impressed with that Sunday 14.

1825. August. belief, that he thought it high time to make a spring for the hatchway. From this circumstance it seemed more than probable that the main keel had received some serious damage near the middle of the ship.

From this trial of the efficacy of our means of security, it was plain that the Fury could not possibly be hove down under circumstances of such frequent and imminent risk: I therefore directed a fourth anchor, with two additional cables, to be disposed as at *a e* in the diagram, with the hope of breaking some of the force of the ice by its offering a more oblique resistance than the other, and thus by degrees turning the direction of the pressure from the ships. We had scarcely completed this new defence, when the largest floe we had seen since leaving Port Bowen came sweeping along the shore, having a motion to the southward of not less than a mile and a half an hour; and a projecting point of it, just grazing our outer berg, at *e*, threatened to overturn it, and would certainly have dislodged it from its situation, but for the cable recently attached to it. A second similar occurrence took place with a smaller mass of ice, about midnight, and near the top of an unusually high spring-tide, which seemed ready to float away every security from us. For three hours about the time of this high water, our situation was a most critical one, for had the bergs, or indeed any one of them, been carried away or broken, both ships must inevitably have been driven on shore by the very next mass of ice that should come in. Happily, however, they did not suffer any further material disturbance, and the main body keeping at a short distance from the land until the tide had fallen, the bergs seemed to be once more firmly resting on the ground. The only mischief, therefore, occasioned by this disturbance was the slackening of our cables by the alteration in the positions of the several grounded masses, and the consequent necessity of employing more time, which nothing but absolute necessity could induce us to bestow, in adjusting and tightening the whole of them afresh. 1825. August.

The wind veering to the W.N.W. on the morning of the 15th, and still continuing to blow strong, the ice was forced three or four miles off the land in the course of a few hours, leaving us a quiet day for continuing our work, but exciting no very pleasing sensations, when we considered what progress we might have been making, had we been at liberty to pursue our object. The land was, indeed, so clear of ice to the southward, that Dr. Neill, who walked a considerable distance in that direction, could see nothing but an open channel inshore to the utmost extent of his view *. We took advantage of this open water to send the Monday 15.

* In coasting the high and more precipitous land to the northward of our present station, the wind always was observed to blow along it, except occasionally in passing a ravine or valley. The moment we opened this lower shore, on our first arrival, we found the wind draw three or four points off it. Low land is, on this account, much more favourable for coasting in these seas, than

1825. August. launch for the Fury's iron-work left at the former station; for though the few men thus employed could very ill be spared, we were obliged to arrange everything with reference to the ultimate saving of time; and it would have occupied both ships' companies more than a whole day, to carry the things round by land.

Tuesday 16. The Fury being completely cleared at an early hour on the 16th, we were all busily employed in "winding" the ship, and in preparing the outriggers, shores, purchases and additional rigging. Though we purposely selected the time of high water for turning the ship round, we had scarcely a foot of space to spare for doing it, and indeed, as it was, her fore-foot touched the ground, and loosened the broken part of the wood so much as to enable us to pull it up with ropes, when we found the fragments to consist of the whole of the "gripe" and most of the "cutwater." The strong breeze continuing, and the sea rising as the open water increased in extent, our bergs were sadly washed and wasted; every hour producing a sensible and serious diminution in their bulk. As, however, the main body of ice still kept off, we were in hopes, now that our preparations were so near completed, we should have been enabled in a few hours to see the extent of the damage, and repair it sufficiently to allow us

that which is very high. At Melville Island, as another instance, we met with comparatively few and trifling difficulties till we came to high land, which I have no doubt was one cause at least of our being stopped.

to proceed. In the evening we received the Fury's crew on board the Hecla, every arrangement and regulation having been previously made for their personal comfort, and for the preservation of cleanliness, ventilation, and dry warmth throughout the ship. The officers of the Fury, by their own choice, pitched a tent on shore for messing and sleeping in, as our accommodation for two sets of officers was necessarily confined. On the 17th, when every preparation was completed, the cables were found again so slack, by the wasting of the bergs in consequence of the continued sea, and possibly also in part by the masses having moved somewhat inshore, that we were obliged to occupy several hours in putting them to rights, as we should soon require all our strength at the purchases. One berg had also, at the last low water, fallen over on its side, in consequence of its substance being undermined by the sea, and the cable surrounding it was thus forced so low under water as no longer to afford protection from the ice should it again come in. In tightening the cables, we found it to have the effect of bringing the bergs in towards the shore, still further contracting our narrow basin; but anything was better than suffering them to go adrift. This work being finished at ten P.M., the people were allowed three hours' rest only, it being necessary to heave the ship down at or near high water, as there was not sufficient depth to allow her to take her distance at any other time of tide. Every preparation being

1825. August.

Wednes. 17.

1825. August. Thurs. 18.

made, at three A.M. on the 18th, we began to heave her down on the larboard side, but when the purchases were nearly a-block, we found that the strops under the Hecla's bottom, as well as some of the Fury's shore-fasts, had stretched or yielded so much, that they could not bring the keel out of water within three or four feet. We immediately eased her up again, and re-adjusted everything as requisite, hauling her further inshore than before by keeping a considerable heel upon her, so as to make less depth of water necessary; and we were then in the act of once more heaving her down, when a snow storm came on and blew with such violence off the land, as to raise a considerable sea. The ships had now so much motion as to strain the geer very much, and even to make the lower masts of the Fury bend in spite of the shores; we were, therefore, most unwillingly compelled to desist until the sea should go down, keeping everything ready to re-commence the instant we could possibly do so with safety. The officers and men were now literally so harassed and fatigued as to be scarcely capable of further exertion without some rest; and on this and one or two other occasions, I noticed more than a single instance of stupor amounting to a certain degree of failure in intellect, rendering the individual so affected quite unable at first to comprehend the meaning of an order, though still as willing as ever to obey it. It was therefore perhaps a fortunate necessity which produced the

intermission of labour which the strength of every individual seemed to require. 1825. August.

The gale rather increasing than otherwise during the whole day and night of the 18th, had on the following morning, when the wind and sea still continued unabated, so destroyed the bergs on which our sole dependence was placed, that they no longer remained aground at low water; the cables had again become slack about them, and the basin we had taken so much pains in forming had now lost all its defences, at least during a portion of every tide. It will be plain too, if I have succeeded in giving a distinct description of our situation, that, independently of the security of the ships, there was now nothing left to sea-ward by which the Hecla could be held out in that direction while heaving the Fury down, so that our preparations in this way were no longer available. After a night of most anxious consideration and consultation with Captain Hoppner, who was now my messmate in the Hecla, it appeared but too plain, that, should the ice again come in, neither ship could any longer be secured from driving on shore. It was therefore determined instantly to prepare the Hecla for sea, making her thoroughly effective in every respect; so that we might at least push *her* out into comparative safety among the ice, when it closed again, taking every person on board her, securing the Fury in the best manner we could, and returning to her the instant we were able to do so, to Friday 19.

1825. August. endeavour to get her out, and to carry her to some place of security for heaving down. If, after the Hecla was ready, time should still be allowed us, it was proposed immediately to put into the Fury all that was requisite, or at least as much as she could safely carry, and towing her out into the ice, to try the effect of "foddering" the leaks by sails under those parts of her keel which we knew to be damaged, until some more effectual means could be resorted to.

Having communicated to the assembled officers and ships' companies my views and intentions, and moreover given them to understand that I hoped to see the Hecla's top-gallant-yards across before we slept, we commenced our work; and such was the hearty good-will and indefatigable energy with which it was carried on, that by midnight the whole was accomplished, and a bower-anchor and cable carried out in the offing, for the double purpose of hauling out the Hecla when requisite, and as some security to the Fury if we were obliged to leave her. The people were once more quite exhausted by these exertions, especially those belonging to the Fury, who had never thoroughly recovered their first fatigues. The ice being barely in sight, we were enabled to enjoy seven hours of undisturbed rest; but the wind becoming light, and afterwards shifting to the N.N.E., we had reason to expect the ice would soon close the shore, and were, therefore, most anxious to continue our work.

On the 20th, therefore, the re-loading of the Fury commenced with recruited strength and spirits, such articles being in the first place selected for putting on board as were essentially requisite for her re-equipment; for it was my full determination, could we succeed in completing this, not to wait even for rigging a topmast, or getting a lower yard up, in the event of the ice coming in, but to tow her out among the ice, and there put everything sufficiently to rights for carrying her to some place of security. At the same time, the end of the sea-cable was taken on board the Fury, by way of offering some resistance to the ice, which was now more plainly seen, though still about five miles distant. A few hands were also spared, consisting chiefly of two or three convalescents, and some of the officers, to thrum a sail for putting under the Fury's keel; for we were very anxious to relieve the men at the pumps, which constantly required the labour of eight to twelve hands to keep her free. In the course of the day, several heavy masses of ice came drifting by with a breeze from the N.E., which is here about two points upon the land, and made a considerable swell. One mass came in contact with our bergs, which, though only held by the cables, brought it up in time to prevent mischief. By a long and hard day's labour, the people not going to rest till two o'clock on the morning of the 21st, we got about fifty tons' weight of coals and provisions on board the Fury, which, in case of

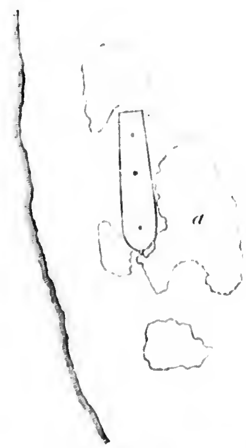
1825. August. Satur. 20.

1825. August. necessity, we considered sufficient to give her stability. While we were thus employed, the ice, though evidently inclined to come in, did not approach us much; and it may be conceived with what anxiety we longed to be allowed one more day's labour, on which the ultimate saving of the ship might almost be considered as depending. Having hauled the ships out a little from the shore, and prepared the Hecla for casting by a spring at a moment's notice, all the people except those at the pumps were sent to rest, which, however, they had not enjoyed for two hours, when Sunday 21. at four A.M. on the 21st, another heavy mass coming violently in contact with the bergs and cables, threatened to sweep away every remaining security. Our situation, with this additional strain, the mass which had disturbed us fixing itself upon the weather-cable, and an increasing wind and swell setting considerably on the shore, became more and more precarious; and indeed, under circumstances as critical as can well be imagined, nothing but the urgency and importance of the object we had in view—that of saving the Fury if she was to be saved—could have prevented my making sail, and keeping the Hecla under way till matters mended. More hawsers were run out, however, and enabled us still to hold on; and after six hours of disturbed rest, all hands were again set to work to get the Fury's anchors, cables, rudder, and spars on board, these things being absolutely necessary for her equipment, should we be able to get her out. At two P.M. the crews were called on board to dinner, which they had not finished when several not very large masses of ice drove along the shore near us at a quick rate, and two or three successively coming in violent contact either with the Hecla or the bergs to which she was attached, convinced me that very little additional pressure would tear everything away, and drive both ships on shore. I saw that the moment had arrived when the Hecla could no longer be kept in her present situation with the smallest chance of safety, and therefore immediately got under sail, despatching Captain Hoppner with every individual except a few for working the ship, to continue getting the things on board the Fury, while the Hecla stood off and on. It was a quarter past three P.M. when we cast off, the wind then blowing fresh from the north-east, or about two points upon the land, which caused some surf on the beach. Captain Hoppner had scarcely been an hour on board the Fury, and was busily engaged in getting the anchors and cables on board, when we observed some large pieces of not very heavy ice closing in with the land near her; and at twenty minutes past four P.M., being an hour and five minutes after the Hecla had cast off, I was informed by signal that the Fury was on shore. Making a tack inshore, but not being able, even under a press of canvass, to get very near her, owing to a strong southerly current which prevailed within a mile or two of the land, I per-

1825. August

1825. August. ceived that she had been apparently driven up the beach by two or three of the grounded masses forcing her onwards before them, and these, as well as the ship, seemed now so firmly aground as entirely to block her in on the sea-ward side. We also observed that the bergs outside of her, marked *f* and *g* in the diagram, had been torn away and set adrift by the ice. As the navigating of the Hecla with only ten men on board required constant attention and care, I could not at this time with propriety leave the ship to go on board the Fury. This, however, I the less regretted, as Captain Hoppner was thoroughly acquainted with all my views and intentions, and I felt confident that, under his direction, nothing would be left undone to endeavour to save the ship. I, therefore, directed him by telegraph, "if he thought nothing could be done at present, to return on board with all hands until the wind changed;" for this alone, as far as I could see the state of the Fury, seemed to offer the smallest chance of clearing the shore, so as to enable us to proceed with our work, or to attempt hauling the ship off the ground. About seven P.M. Captain Hoppner returned to the Hecla, accompanied by all hands, except an officer with a party at the pumps, reporting to me that the Fury had been forced aground by the ice pressing on the masses lying near her, and bringing home, if not breaking, the sea-ward anchor, so that the ship was soon found to have sewed from two to three feet fore and aft.

The several masses of ice had moreover so disposed them- 1825.
selves, as shewn in the annexed figure, as almost to sur- August.
round her on every side where there was sufficient depth of water for hauling her off.



With the ship thus situated, and masses of heavy ice constantly coming in, it was Captain Hoppner's decided opinion, as well as that of Lieutenants Austin and Ross, that to have laid out another anchor to sea-ward would have only been to expose it to the same damage as there was reason to suppose had been incurred with the other, without the most distant hope of doing any service; especially as the ship had been driven on shore, by a most unfortunate coincidence, just as the tide was beginning to fall. Indeed, in the present state of the Fury, nothing short of chopping and sawing up a part of the ice under her stern, could by

1825. August. any possibility have effected her release, even if she had been already afloat. Under such circumstances, hopeless as for the time every seaman will admit them to have been, Captain Hoppner judiciously determined to return for the present, as directed by my telegraphic communication; but being anxious to keep the ship free from water as long as possible, he left an officer and a small party of men to continue working at the pumps so long as a communication could be kept up between the Hecla and the shore. Every moment, however, decreased the practicability of doing this; and finding, soon after Captain Hoppner's return, that the current swept the Hecla a long way to the southward while hoisting up the boats, and that more ice was drifting in towards the shore, I was under the painful necessity of recalling the party at the pumps, rather than incur the risk, now an inevitable one, of parting company with them altogether. Accordingly Mr. Bird with the last of the people came on board at eight o'clock in the evening, having left eighteen inches water in the well, and four pumps being requisite to keep her free. In three hours after Mr. Bird's return, more than half a mile of closely-packed ice intervened between the Fury and the open water in which we were beating, and before the morning this barrier had increased to four or five miles in breadth.

Monday 22. We carried a press of canvas all night, with a fresh breeze from the north, to enable us to keep abreast of the

Fury, which, on account of the strong southerly current, we could only do by beating at some distance from the land. The breadth of the ice inshore continued increasing during the day, but we could see no end to the water in which we were beating, either to the southward or eastward. Advantage was taken of the little leisure now allowed us, to let the people mend and wash their clothes, which they had scarcely had a moment to do for the last three weeks. We also completed the thrumming of a second sail for putting under the Fury's keel, whenever we should be enabled to haul her off the shore. It fell quite calm in the evening, when the breadth of the ice inshore had increased to six or seven miles. We did not, during the day, perceive any current setting to the southward, but in the course of the night we were drifted four or five leagues to the south-westward, in which situation we had a distinct view of a large extent of land which had before been seen for the first time by some of our gentlemen who walked from where the Fury lay. This land trends very much to the westward, a little beyond the FURY POINT, the name by which I have distinguished that headland near which we had attempted to heave the Fury down, and which is very near the southern part of this coast seen in the year 1819. It then sweeps round into a large bay formed by a long, low beach several miles in extent, afterwards joining higher land, and running

1825. August.

Tues. 23.

1825. August. in a south-easterly direction to a point which terminated our view of it in that quarter, and which bore from us S. 58° W. distant six or seven leagues. This headland I named Cape Garry, after my worthy friend Nicholas Garry, Esq., one of the most active members of the Hudson's Bay Company, and a gentleman most warmly interested in everything connected with northern discovery. The whole of the bay, (which I named after my much esteemed friend, Francis Cresswell, Esq.,) as well as the land to the southward, was free from ice for several miles, and to the southward and eastward scarcely any was to be seen, while a dark water-sky indicated a perfectly navigable sea in that direction; but between us and the Fury there was a compact body of ice eight or nine miles in breadth. Had we now been at liberty to take advantage of the favourable prospect before us, I have little doubt we should without much difficulty have made considerable progress.

A southerly breeze enabling us to regain our northing, we ran along the margin of the ice, but were led so much to the eastward by it, that we could approach the ship no nearer than before during the whole day. She appeared to us at this distance to have a much greater heel than when the people left her, which made us still more anxious to get near her. A south-west wind gave us hopes of the
Wed. 24. ice setting off from the land, but it produced no good

effect during the whole of the 24th. We, therefore, beat again to the southward, to see if we could manage to get in with the land anywhere about the shores of the bay; but this was now impracticable, the ice being once more closely packed there. We could only wait, therefore, in patience, for some alteration in our favour. The latitude at noon was 72° 34′ 57″, making our distance from the Fury twelve miles, which by the following morning had increased to at least five leagues, the ice continuing to "pack" between us and the shore. The wind, however, now gradually drew round to the westward, giving us hopes of a change, and we continued to ply about the margin of the ice, in constant readiness for taking advantage of any opening that might occur. It favoured us so much by streaming off in the course of the day, that by seven P.M. we had nearly reached a channel of clear water which kept open for seven or eight miles from the land. Being impatient to obtain a sight of the Fury, and the wind becoming light, Captain Hoppner and myself left the Hecla in two boats, and reached the ship at half-past nine, or about three-quarters of an hour before high water, being the most favourable time of tide for arriving to examine her condition.

1825. August.

Thurs. 25.

We found her heeling so much outward, that her main channels were within a foot of the water; and the large floe-piece (in the diagram, p. 137, marked *a*), which was still alongside of her, seemed alone to support her below

1825. August.

water, and to prevent her falling over still more considerably. The ship had been forced much farther up the beach than before, and she had now in her bilge above nine feet of water, which reached higher than the lower-deck beams. On looking down the stern-post, which, seen against the light-coloured ground, and in shoal water, was now very distinctly visible, we found that she had pushed the stones at the bottom up before her, and that the broken keel, stern-post, and dead-wood had, by the recent pressure, been more damaged and turned up than before. She appeared principally to hang upon the ground abreast the gangway, where, at high water, the depth was eleven feet alongside her keel; forward and aft from thirteen to sixteen feet; so that at low-tide, allowing the usual fall of five or six feet, she would be lying in a depth of from five to ten feet only. The first hour's inspection of the Fury's condition too plainly assured me that exposed as she was, and forcibly pressed up upon an open and stony beach, her holds full of water, and the damage of her hull to all appearance and in all probability more considerable than before, without any adequate means of hauling her off to seaward, or securing her from the further incursions of the ice, every endeavour of ours to get her off, or *if* got off, to float her to any known place of safety, would be at once utterly hopeless in itself, and productive of extreme risk to our remaining ship.

Being anxious, however, in a case of so much importance, 1825. August.
to avail myself of the judgment and experience of others, I directed Captain Hoppner, in conjunction with Lieutenants Austin and Sherer, and Mr. Pulfer, carpenter, being the officers who accompanied me to the Fury, to hold a survey upon her, and to report their opinions to me. And to prevent the possibility of the officers receiving any bias from my own opinion, the order was given to them the moment we arrived on board the Fury.

Captain Hoppner and the other officers, after spending several hours in attentively examining every part of the ship, both within and without, and maturely weighing all the circumstances of her situation, gave it as their opinion that it would be quite impracticable to make her sea-worthy, even if she could be hauled off, which would first require the water to be got out of the ship, and the holds to be once more entirely cleared. Mr. Pulfer, the carpenter of the Fury, considered that it would occupy five days to clear the ship of water; that if she were got off, all the pumps would not be sufficient to keep her free, in consequence of the additional damage she seemed to have sustained; and that, if even hove down, twenty days' work, with the means we possessed, would be required for making her sea-worthy. Captain Hoppner, and the other officers, were, therefore, of opinion, that an absolute necessity existed for abandoning the Fury. My own opinion being

1825. August. thus confirmed as to the utter hopelessness of saving her, and feeling more strongly than ever the responsibility which attached to me of preserving the Hecla unhurt, it was with extreme pain and regret that I made the signal for the Fury's officers and men to be sent for their clothes, most of which had been put on shore with the stores*.

The Hecla's bower-anchor, which had been placed on the beach, was sent on board as soon as the people came on shore; but her remaining cable was too much entangled with the grounded ice to be disengaged without great loss of time. Having allowed the officers and men an hour for packing up their clothes, and what else belonging to them the water in the ship had not covered, the Fury's boats were hauled up on the beach, and at two A.M. I left her, and was followed by Captain Hoppner, Lieutenant Austin, and the last of the people in half an hour after.

The whole of the Fury's stores were of necessity left either on board her or on shore, every spare corner that we could find in the Hecla being now absolutely required for the accommodation of our double complement of officers and men, whose cleanliness and health could only be maintained by keeping the decks as clear and well ven-

* The written reports and opinions of Captain Hoppner, the two lieutenants, and the carpenter, are inserted in this part of my original Journal, lodged at the Admiralty; but it has not been considered necessary to print them in detail.

tilated as our limited space would permit. The spot where the Fury was left is in latitude 72° 42′ 30″; the longitude by chronometers is 91° 50′ 05″; the dip of the magnetic needle 88° 19′,22; and the variation 129° 25′ Westerly. 1825. August.

When the accident first happened to the Fury, I confidently expected to have been able to repair her damages, in good time to take advantage of a large remaining part of the navigable season in the prosecution of the voyage; and while the clearing of the ship was going on with so much alacrity, and the repairs seemed to be within the reach of our means and resources, I still flattered myself with the same hope. But as soon as the gales began to destroy, with a rapidity of which we had before no conception, our sole defence from the incursions of the ice, as well as the only trust-worthy means we before possessed of holding the Hecla out for heaving the Fury down, I confess that the prospect of the necessity then likely to arise for removing her to some other station, was sufficient to shake every reasonable expectation I had hitherto cherished of the ultimate accomplishment of our object. Those expectations were now at an end. With a twelvemonth's provision for both ships' companies, extending our resources only to the autumn of the following year, it would have been folly to hope for final success, considering the small progress we had already made, the uncertain nature of this navigation, and the advanced period of the present season.

1825. August. I was, therefore, reduced to the only remaining conclusion, that it was my duty, under all the circumstances of the case, to return to England, in compliance with the plain tenor of my instructions. As soon as the boats were hoisted up, therefore, and the anchor stowed, the ship's head was put to the north-eastward, with a light air off the land, in order to gain an offing before the ice should again set inshore.

CHAPTER VII.

SOME REMARKS UPON THE LOSS OF THE FURY—AND ON THE NATURAL HISTORY, &c. OF THE COAST OF NORTH SOMERSET—ARRIVE AT NEILL'S HARBOUR—DEATH OF JOHN PAGE—LEAVE NEILL'S HARBOUR—RE-CROSS THE ICE IN BAFFIN'S BAY—HEAVY GALES—AURORA BOREALIS—TEMPERATURE OF THE SEA—ARRIVAL IN ENGLAND—CONCLUDING REMARKS ON SOME NATURAL PHENOMENA PECULIAR TO THE POLAR SEAS—ON THE DISCOVERIES OF THE OLD BRITISH NAVIGATORS—AND ON THE NORTH-WEST PASSAGE.

1825. August. Friday 26.

THE accident which had now befallen the Fury, and which, when its fatal result was finally ascertained, at once put an end to every prospect of success in the main object of this voyage, is not an event which will excite surprise in the minds of those who are either personally acquainted with the true nature of this precarious navigation, or have had patience to follow me through the tedious and monotonous detail of our operations during seven successive summers. To any persons thus qualified to judge, it will be plain that an occurrence of this nature was at all times rather to be expected than otherwise, and that the only real cause for wonder has been our long exemption from such a catastrophe. I can confidently affirm, and I trust that, on such an occasion, I may be permitted to make the remark, that the mere safety of the ships has never been more than a

1825. August. secondary object in the conduct of the expeditions under my command. To push forward while there was any open water to enable us to do so, has uniformly been our first endeavour; it has not been until the channel has actually terminated, that we have ever been accustomed to look for a place of shelter, to which the ships were then conducted with all possible despatch: and I may safely venture to predict that no ship acting otherwise will ever accomplish the North-west Passage. On numerous occasions, which will easily recur to the memory of those I have had the honour to command, the ships might easily have been placed among the ice, and left to drift with it, in comparative, if not absolute security, when the holding them on has been preferred, though attended with hourly and imminent peril. This was precisely the case on the present occasion; the ships might certainly have been pushed into the ice a day or two, or even a week before-hand, and thus preserved from all risk of being forced on shore; but where they would have been drifted, and when they would have been again disengaged from the ice, or at liberty to take advantage of the occasional openings inshore, (by which alone the navigation of these seas is to be performed with any degree of certainty) I believe it impossible for any one to form the most distant idea. Such, then, being the necessity for constant and unavoidable risk, it cannot reasonably excite surprise, that, on a single occasion, out of so many in which the same accident seemed, as it were, impending, it should actually have taken place. 1825. August.

These remarks I conceive to be the more necessary, because I believe that our former successes in this navigation, and our entire exemption from serious damage, had served to beget a very general, but erroneous notion, that our ships were proof against any pressure to which they might be subject. This belief extended even in a certain degree to those employed on this service, who almost began to consider our ships as invulnerable; and, for my own part, I confess that, though a moment's reflection would at any time contradict such a notion, I often experienced a feeling of confidence in their strength too nearly approaching to presumption. We have now learned by experience that a body of ice of no very heavy kind, when bearing in a particular manner, and with its whole force, upon a ship touching the ground, is quite sufficient to set every combination of wood and iron at defiance, even when disposed, as in the Fury and Hecla, with all the skill and strength which art can suggest. In truth, a ship, like any other work of man, sinks, and must ever sink, into insignificance, when viewed in comparison with the stupendous scale on which Nature's works are framed,, and her operations performed; and a vessel of whatever magnitude, or whatever strength, is little better than a nut-shell, when obliged to withstand the

1825. August. pressure of the unyielding ground on one side, and a moving body of ice on the other.

These truths, however well I might have been before aware of them, it would not have become me to touch upon, under almost any other circumstances than those I have now detailed. On no other occasion, indeed, should I have considered it either necessary or justifiable to dwell even for a moment upon them. I have done so now with the hope of shewing that, while we trust it will appear that our own endeavours have never been wanting to preserve, as far as was consistent with our duty, the ships committed to our charge, we also feel and acknowledge that it has not been "our own arm," nor "our own strength," to which we have so long owed their preservation.

The ice we met with after leaving Port Bowen, previously to the Fury's disaster, and for some days after, I consider to have been much the lightest as well as the most broken we have ever had to contend with. During the time we were shut up at our last station near the Fury, one or two floes of very large dimensions drifted past us; and these were of that heavy "hummocky" kind which we saw off Cape Kater in the beginning of August, 1819. On the whole, however, Mr. Allison and myself had constant occasion to remark the total absence of floes, and the unusual lightness of the other ice. We thought, indeed, that this latter circumstance might account for its being almost incessantly in motion on this coast; for heavy ice, when once it is pressed home upon the shore, and has ceased to move, generally remains quiet until a change of wind or tide makes it slacken. But with lighter ice, the frequent breaking and doubling of the parts which sustain the strain, whenever any increase of pressure takes place, will set the whole body once more in motion till the space is again filled up. This was so often the case while our ships lay in the most exposed situations on this unsheltered coast, that we were never relieved for a moment from the apprehension of some new and increased pressure.

1825. August.

The summer of 1825 was, beyond all doubt, the warmest and most favourable we had experienced since that of 1818. Not more than two or three days occurred, during the months of July and August, in which that heavy fall of snow took place which so commonly converts the aspect of nature in these regions, in a single hour, from the cheerfulness of summer into the dreariness of winter. Indeed, we experienced very little either of snow, rain, or fog; vegetation, wherever the soil allowed any to spring up, was extremely luxuriant and forward; a great deal of the old snow, which had lain on the ground during the last season, was rapidly dissolving even early in August; and every appearance of nature exhibited a striking contrast with the last summer, while it seemed evidently to furnish an extraordinary compensation for its rigour and inclemency.

1825. August. We have scarcely ever visited a coast, on which so little of animal life occurs. For days together, only one or two seals, a single sea-horse, and now and then a flock of ducks were seen. I have already mentioned, however, as an exception to this scarcity of animals, the numberless kittiwakes which were flying about the remarkable spout of water; and we were one day visited, at the place where the Fury was left, by hundreds of white whales sporting about in the shoal water close to the beach. No black whales were ever seen on this coast. Two rein-deer were observed by the gentlemen who extended their walks inland; but this was the only summer in which we did not procure a single pound of venison. Indeed, the whole of our supplies obtained in this way during the voyage, including fish, flesh, and fowl, did not exceed twenty pounds per man.

During the time that we were made fast upon this coast, in which situation alone observations on current can be satisfactorily made, it is certain that the ice was setting to the southward, and sometimes at a rapid rate, full seven days out of every ten on an average. Had I now witnessed this for the first time in these seas, I should probably have concluded that there was a constant southerly set at this season; but the experience we had before obtained of that superficial current which every breeze of wind creates in a sea encumbered with ice, coupled with the fact that while this set was noticed we had an almost continual prevalence of northerly winds, inclines me to believe that it was to be attributed, chiefly at least, to this circumstance; especially as, on one or two occasions, with rather a light breeze from the southward, the ice did set slowly in the opposite direction. It is not by a few unconnected observations that a question of this kind is to be settled, as the facts noticed during our detention near the west end of Melville Island in 1820 will abundantly testify; every light air of wind producing, in half an hour's time, an extraordinary change of current setting at an incredible rate along the land. 1825. August.

The existence of these variable and irregular currents adds, of course, very much to the difficulty of determining the true direction of the flood-tide, the latter being generally much the weaker of the two, and therefore either wholly counteracted by the current, or simply tending to accelerate it. On this account, though I attended very carefully to the subject of the tides, I cannot pretend to say for certain from what direction the flood-tide comes on this coast: the impression on my mind, however, has been upon the whole in favour of its flowing from the southward. The time of high water on the full and change days of the moon is from half past eleven to twelve o'clock, being nearly the same as at Port Bowen; but the tides are so irregular at times, that in the space of three days the retardation will occasionally not amount to an hour. I observed, however, that as the days of full and change, or of the moon's quarter

1825. August. approached, the irregularity was corrected, and the time rectified, by some tide of extraordinary duration. The mean rise and fall was about six feet.

The weather continuing nearly calm during the 26th, and the ice keeping at the distance of several miles from the land, gave us an opportunity of clearing our decks, and stowing the things belonging to the Fury's crew more comfortably for their accommodation and convenience. I now felt more sensibly than ever the necessity I have elsewhere pointed out, of both ships employed on this kind of service being of the same size, equipped in the same manner, and alike efficient in every respect. The way in which we had been able to apply every article for assisting to heave the Fury down, without the smallest doubt or selection as to size or strength, proved an excellent practical example of the value of being thus able, at a moment's warning, to double the means and resources of either ship in case of necessity. In fact, by this arrangement, nothing but a harbour to secure the ships was wanted, to have completed the whole operation in as effectual a manner as in a dock-yard; for not a shore, or outrigger, or any other precaution was omitted, that is usually attended to on such occasions, and all as good and effective as could anywhere have been desired. The advantages were now scarcely less conspicuous in the accommodation of the officers and men, who in a short time became little less comfortable than in their own ship; whereas, in a smaller vessel, comfort, to say nothing of health, would have been quite out of the question. Having thus experienced the incalculable benefit of the establishment composing this expedition, I am anxious to repeat my conviction of the advantages that will always be found to attend it, in the equipment of any two ships intended for discovery. 1825. August.

A little snow, which had fallen in the course of the last two or three days, now remained upon the land, lightly powdering the higher parts, especially those having a northern aspect, and creating a much more wintry sensation than the large broad patches or drifts, which, on all tolerably high land in these regions, remain undissolved during the whole of each successive summer. With the exception of a few such patches here and there, the whole of this coast was now free from snow before the middle of August.

A breeze from the northward freshening up strong on the 27th, we stretched over to the eastern shore of Prince Regent's Inlet, and this with scarcely any obstruction from ice. We could, indeed, scarcely believe this the same sea which, but a few weeks before, had been loaded with one impenetrable body of closely-packed ice from shore to shore, and as far as the eye could discern to the southward. We found this land rather more covered with the newly-fallen snow than that to the westward; but there was no ice, except the grounded masses, anywhere along the shore. Having a Satur. 27.

1825. August. great deal of heavy work to do in the re-stowage of the holds, which could not well be accomplished at sea, and also a quantity of water to fill for our increased complement, I determined to take advantage of our fetching the entrance of Neill's Harbour to put in here, in order to prepare the ship completely for crossing the Atlantic. I was desirous also of ascertaining the depth of water in this place, which was wanting to complete Lieutenant Sherer's survey of it. At one P.M. therefore, after communicating to the officers and ships' companies my intention to return to England, I left the ship, accompanied by Lieutenant Sherer in a second boat, to obtain the necessary soundings for conducting the ship to the anchorage, and to lay down a buoy in the proper birth. Finding the harbour an extremely convenient one for our purpose, we worked the ship in, and at four P.M. anchored in thirteen fathoms, but afterwards shifted out to eighteen, on a bottom of soft mud. Almost at the moment of our dropping the anchor, John Page, seaman of the Fury, departed this life: he had for several months been affected with a scrofulous disorder, and he was gradually sinking for some time. This being the only case of disease which proved fatal in either ship of this expedition, I shall here insert the following brief account of it, with which I have been favoured by Mr. M'Laren, surgeon of the Fury.

" In the beginning of March this poor man received an injury over the lower part of the spine, by a fall while descending a hill at Port Bowen, where he had been employed with a party at work. The accident at first appeared so trifling, that for some days he took no notice of it, and did not complain till the 11th, when the part had become so swelled and inflamed that he could not walk. Resolution was in vain attempted; an abscess formed, and was opened on the 17th, when about six ounces of strumous matter was discharged, which discovered the injury to be more deeply-seated and serious than was at first apprehended; particularly as it occurred in a subject that from his white hair, fair skin, and delicate appearance, too certainly indicated a scrofulous habit. On the 19th, by an unfortunate fall in his hammock, the head-screw by which it was suspended giving way, the hurt received fresh injury, and so deranged the constitution, that sympathetic fever supervened, and continued till the 24th, when he again began to shew symptoms of amendment; soon after the sore assumed a healing aspect, and he was able to walk about without pain or difficulty. These favourable appearances lasted but a short time; the discharge increased, and the surrounding parts became covered with inflamed spots, which afterwards suppurated, and separately communicated internally with the original abscess. He now daily became weaker; on the 13th of August hectic fever came on, and he expired on the 27th."

1825. August.

The funeral of the deceased took place after Divine ser-

1825. August. Sunday 28. vice had been performed on the 28th; the body being followed to the grave by a procession of all the officers, seamen and marines of both ships, and every solemnity observed which the occasion demanded. The grave is situated near the beach close to the anchorage, and a board was placed at the head as a substitute for a tomb-stone, having on it a copper plate with the usual inscription.

This duty being performed, we immediately commenced landing the casks and filling water; but notwithstandingthe large streams which, a short time before, had been running into the harbour, we could hardly obtain enough for our purpose by sinking a cask with holes in it. I have no doubt that this rapid dissolution of all the snow on land so high as this, was the result of an unusually warm summer. This work, together with the entire re-stowage of all the holds,
29 and 30. occupied the whole of the 29th and 30th, during which time Lieutenant Sherer was employed in completing the survey of the harbour, more especially the soundings, which the presence of ice had before prevented. These arrangements had just been completed, when the north-easterly wind died away, and was succeeded, on the morning
Wed. 31. of the 31st, by a light air from the north-west. As soon as we had sent to ascertain that the sea was clear of ice on the outside, and that the breeze which blew in the harbour was the true one, we weighed and stood out, and before noon had cleared the shoals at the entrance.

Neill's Harbour, the only one on this eastern coast of

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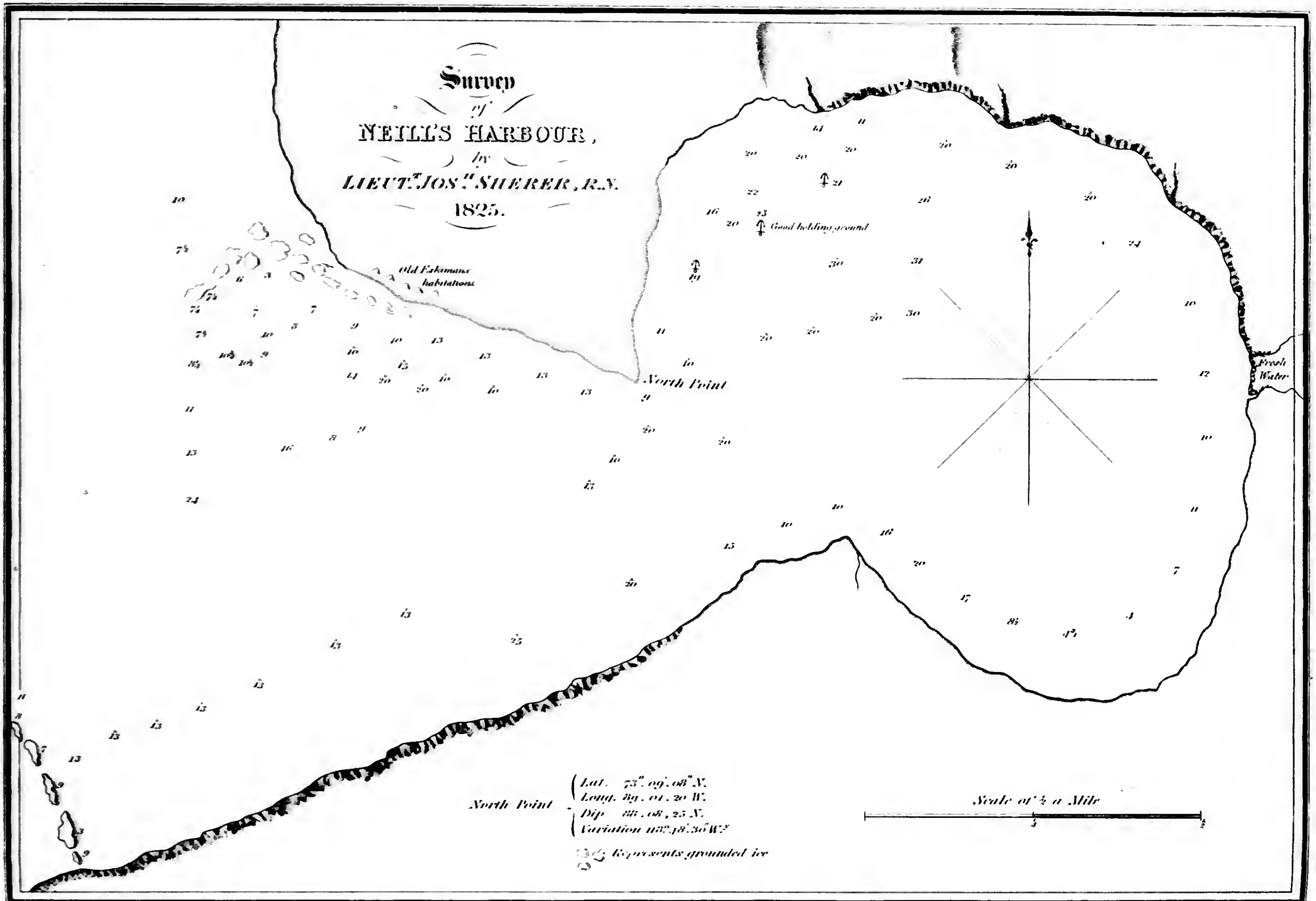

Published as the Act directs June 1826 by John Murray Albemarle Street London.

J. & C. Walker Sculpt

Prince Regent's Inlet except Port Bowen, to which it is far superior, corresponds with one of the apparent openings seen at a distance in 1819, and marked on the chart of that voyage as a "valley or bay." We found it not merely a convenient place of shelter, but a most excellent harbour, with sufficient space for a great number of ships, and holding-ground of the best quality, consisting of a tenacious mud of a greenish colour, in which the flukes of an anchor are entirely imbedded. A great deal of the anchoring ground is entirely land-locked, and some shoal points which narrow the entrance would serve to break off any heavy sea from the eastward. The depth of water in most parts is greater than could be wished, but several good births are pointed out in the accompanying survey made by Lieutenant Sherer. The beach on the west side is a fine bold one, with four fathoms within twenty yards of low-water mark, and consists of small pebbles of limestone. The formation of the rocks about the harbour is so similar to that of Port Bowen, that no description of them is necessary. The harbour may best be known by its latitude; by the very remarkable flat-topped hill eight miles south of it, which I have named after Lieutenant Sherer, who observed its latitude; by the high cliffs on the south side of the entrance, and the comparatively low land on the north. The high land is the more peculiar, as consisting of that very regular horizontal stratification appearing to be sup-

1825. August.

1825. August. ported by buttresses, which characterizes a large portion of the western shore of Prince Regent's Inlet, but is not seen on any part of this coast so well marked as here. It is a remarkable circumstance, and such as, I believe, very rarely occurs, that from the point of this land forming the entrance of the harbour to the southward, and where the cliffs rise at once to perpendicular height of not less than five or six hundred feet, a shoal stretches off to the distance of one-third of a mile, having from three to eight fathoms upon it. I have reason to think, indeed, that there is not more than from ten to fourteen fathoms, anywhere across between this and the low point on the other side, thus forming a sort of bar, though the depth of water is much more than sufficient for any ship to pass over. The latitude of Neill's Harbour is 73° 09′ 08″; the longitude by chronometers 89° 01′ 20″.8; the dip of the magnetic needle 88° 08′.25, and the variation 118° 48′ westerly.

I have been thus particular in describing Neill's Harbour, because I am of opinion that at no very distant period the whalers may find it of service. The western coast of Baffin's Bay, now an abundant fishery, will probably, like most others, fail in a few years; for the whales will always, in the course of time, leave a place where they continue, year after year, to be molested. In that case, Prince Regent's Inlet will undoubtedly become a rendezvous for our ships, as well on account of the numerous fish there, as the facility with which any ship, having once crossed the ice in Baffin's Bay, is sure to reach it during the months of July and August. We saw nine or ten black whales the evening of our arrival in Neill's Harbour; these, like most observed hereabouts, and I believe on the western coast of Baffin's Bay generally, were somewhat below the middle size. 1825. September.

Finding the wind at north-west in Prince Regent's Inlet, we were barely able to lie along the eastern coast. As the breeze freshened in the course of the day, a great deal of loose ice in extensive streams and patches came drifting down from the Leopold Islands, occasioning us some trouble in picking our way to the northward. By carrying a press of sail, however, we were enabled, towards night, to get into clearer water, and by four A.M. on the 1st of September, Thursday 1. having beat to windward of a compact body of ice which had fixed itself on the lee-shore about Cape York, we soon came into a perfectly open sea in Barrow's Strait, and were enabled to bear away to the eastward. We now considered ourselves fortunate in having got out of harbour when we did, as the ice would probably have filled up every inlet on that shore in a few hours after we left it.

The wind heading us from the eastward on the 2nd, Friday 2 with fog and wet weather, obliged us to stretch across the Sound, in doing which we had occasion to remark the more than usual number of icebergs that occurred in this place, 1825 September. which was abreast of Navy Board Inlet. Many of these were large and of the long flat kind, which appear to me to be peculiar to the western coast of Baffin's Bay. I have no doubt that this more than usual quantity of icebergs in Sir James Lancaster's Sound was to be attributed to the extraordinary prevalence and strength of the easterly winds during this summer, which would drive them from the eastern parts of Baffin's Bay. They now occurred in the proportion of at least four for one that we had ever before observed here.

Saturday 3. Being again favoured with a fair wind, we now stretched to the eastward, still in an open sea; and our curiosity was particularly excited to see the present situation of the ice in the middle of Baffin's Bay, and to compare it with that in 1824. This comparison we were enabled to make the more fairly, because the season at which we might expect to come to it coincided, within three or four days, with that in which we left it the preceding year. The temperature 4th and 5th of the sea-water now increased to 38°, soon after leaving the Sound, where it had generally been from 33° to 35°, whereas at the same season last year it rose no higher than 32° anywhere in the neighbourhood, and remained even so high as that only for a very short time. This circumstance seemed to indicate the total absence of ice from those parts of the sea which had last Autumn been wholly covered by it. Accordingly, on the 5th, being thirty miles beyond the spot in

1825. September. Tuesday 6.

which we had before contended with numerous difficulties from ice, not a piece was to be seen, except one or two solitary bergs; and it was not till the following day, in latitude 72° 45', and longitude 64° 44', or about one hundred and twenty-seven miles to the eastward of where we made our escape on the 9th of September, 1824, that we fell in with a body of ice so loose and open as scarcely to oblige us to alter our course for it. At three P.M. on the 7th, being in latitude 72° 30', and longitude 60° 05', and having, in the course of eighty miles that we had run through it, only made a single tack, we came to the margin of the ice, and got into an open sea on its eastern side. In the whole course of this distance the ice was so much spread, that it would not, if at all closely "packed," have occupied one-third of the same space. There were at this time thirty-nine bergs in sight, and some of them certainly not less than two hundred feet in height.

The narrowness and openness of the ice at this season, between the parallels of 73° and 74°, when compared with its extent and closeness about the same time the preceding year, was a decided confirmation, if any were wanting, that the summer of 1824 was extremely unfavourable for penetrating to the westward about the usual latitudes. How it had proved elsewhere we could not of course conjecture, till, on the 8th, being in latitude 71° 55', longitude 60° 30', and close to the margin of the ice, we fell in with the

1825. September. Alfred, Ellison, and Elizabeth, Whalers of Hull, all running to the northward, even at this season, to look for whales. From them we learned that the Ellison was one of the two ships we saw, when beset in the "pack" on the 18th of July, 1824; and that they were then, as we had conjectured, on their return from the northward, in consequence of having failed in effecting a passage to the westward. The master of the Ellison informed us that, after continuing their course along the margin of the ice to the southward, they at length passed through it to the western land without any difficulty, in the latitude of 68° to 69°. Many other ships had also crossed about the same parallels, even in three or four days; but none, it seemed, had succeeded in doing so, as usual, to the northward. Thus it plainly appeared (and I need not hesitate to confess that to me the information was satisfactory) that our bad success in pushing across the ice in Baffin's Bay in 1824, had been caused by circumstances neither to be foreseen nor controlled; namely, by a particular position of the ice which, according to the best information I have been able to collect, has never before occurred during the only six years that it has been customary for the Whalers to cross this ice at all, and which, therefore, in all probability, will seldom occur again.

If we seek for a cause for the ice thus hanging with more than ordinary tenacity to the northward, the comparative coldness of the season indicated by our meteorological ob-

servations may perhaps be considered sufficient to furnish it. 1825. September.
For as the annual clearing of the northern parts of Baffin's Bay depends entirely on the time of the disruption of the ice, and the rate at which it is afterwards drifted to the southward by the excess of northerly winds, any circumstance tending to retain it in the bays and inlets to a later period than usual, and subsequently to hold it together in large floes, which drive more slowly than smaller masses, would undoubtedly produce the effect in question. There is, at all events, one useful practical inference to be drawn from what has been stated, which is, that, though perhaps in a considerable majority of years a northern latitude may prove the most favourable for crossing in, yet seasons will sometimes intervene, in which it will be a matter of great uncertainty whereabouts to make the attempt with the best hope of success.

As the whaling-ships were not homeward bound, having as yet had indifferent success in the fishery, I did not consider it necessary to send despatches by them. After an hour's communication with them, and obtaining such information of a public nature as could not fail to be highly interesting to us, we made sail to the southward; while we observed them lying to for some time after, probably to consult respecting the unwelcome information with which we had furnished them as to the whales, not one of which, by some extraordinary chance, we had seen since leaving

1825. September. Neill's Harbour. As this circumstance was entirely new to us, it seems not unlikely that the whales are already beginning to shift their ground, in consequence of the increased attacks which have been made upon them of late years in that neighbourhood.

Satur. 10. On the 10th we had an easterly wind, which gradually freshening to a gale, drew up the Strait from the southward, and blew strong for twenty-four hours from that quarter. In the course of the night, and while lying-to under the storm-sails, an iceberg was discovered by its white appearance under our lee. The main-topsail being thrown aback, we were enabled to drop clear of this immense body, which would have been a dangerous neighbour in a heavy sea-way. Sunday 11. The wind moderated on the 11th, but on the following day Monday 12. another gale came on, which for nine or ten hours blew in most tremendous gusts from the same quarter, and raised a heavy sea. We happily came near no ice during the night, or it would scarcely have been possible to keep the Tuesday 13. ship clear of it. It abated after daylight on the 13th, but continued to blow an ordinary gale for twelve hours longer. It was remarkable that the weather was extremely clear overhead during the whole of this last gale, which is very unusual here with a southerly wind. Being favoured with Thurs. 15. a northerly breeze on the 15th, we began to make some way to the southward. From nine A.M. to one P.M., a change of temperature in the sea water took place from 37° to 33°.

This circumstance seemed to indicate our approach to some ice projecting to the eastward beyond the strait and regular margin of the "pack" which was at this time not in sight. The indication proved correct and useful; for after passing several loose pieces of ice during the night, on the morning of the 15th, just at day-break, we came to a considerable body of it, through which we continued to run to the southward. We were now in latitude 68° 56′, and in longitude 58° 27′, in which situation a great many bergs were in sight, and apparently aground. We ran through this ice, which was very heavy, but loose and much broken up, the whole day; when, having sailed fifty-three miles S.S.E., and appearances being the same as ever, we hauled to the E.S.E., to endeavour to get clear before dark, which we were just enabled to effect after a run of thirty miles in that direction, and then bore up to the southward. After this we saw but one iceberg, and one heavy loose piece, previous to our clearing Davis' Strait.

1825. September. Friday 15.

On the 17th at noon we had passed to the southward of the Arctic Circle, and from this latitude to that of about 58°, we had favourable winds and weather; but we remarked on this, as on several other occasions during this season, that a northerly breeze, contrary to ordinary observation, brought more moisture with it than any other. In the course of this run, we also observed more drift-wood than we had ever done before, which I thought might possibly be owing

Satur. 17.

1825. September. to the very great prevalence of easterly winds this season driving it further from the coast of Greenland than usual. We saw very large flocks of kittiwakes, some of the whales called finners, and, as we supposed, a few also of the black kind, together with multitudes of porpoises.

Satur. 24. On the morning of the 24th, notwithstanding the continuance of a favourable breeze, we met, in the latitude of $58\frac{1}{2}°$, so heavy a swell from the north-eastward as to make the ship labour violently for four-and-twenty hours. The northerly wind then dying away was succeeded by a light air from the eastward with constant rain. A calm then followed for several hours, causing the ship to roll heavily in the hollow of the sea. Sunday 25. On the morning of the 25th we had again an easterly wind, which in a few hours reduced us to the close-reefed topsails and reefed courses. At eight P.M. it freshened to a gale, which brought us under the main-topsail and storm-staysails, and Monday 26. at seven the following morning it increased to a gale of such violence from N.E.b.N. as does not very often occur at sea in these latitudes. The gusts were at times so tremendous as to set the sea quite in a foam, and threatened to tear the sails out of the bolt-ropes. It abated a little for four hours in the evening, but from nine P.M. till two the following morning blew with as great violence as before, with a high sea, and very heavy rain, constituting altogether as inclement weather as can well be conceived, for about eighteen hours. The wind gradually drew to the westward, with dry weather, after the gale began to abate, and at six A.M. we were enabled to bear up and run to the eastward with a strong gale at N.W. 1825. September.

The indications of the barometer previous to and during this gale deserve to be noticed, because it is only about Cape Farewell that, in coming from the northward down Davis' Strait, this instrument begins to speak a language which has ever been intelligible to us *as a weather glass*. As it is also certain that a "stormy spirit" resides in the neighbourhood of this headland, no less than in that of more famed ones to the south, it may become a matter of no small practical utility for ships passing it, especially in the autumn, to attend to the oscillations of the mercurial column. It is with this impression alone, that I have detailed the otherwise uninteresting circumstances of the inclement weather we now experienced here, and which was accompanied by the following indications of the barometer. On the 24th, notwithstanding the change of wind from north to east, the mercury rose from 29.51 on that morning, to 29.72 at three A.M. the following day, but fell to 29.39 by nine P.M. with the strong but not violent breeze then blowing. After this it continued to descend very gradually, and had reached 28.84, which was its minimum, at three P.M. on the 26th, after which it continued to blow tremendously hard for eleven or twelve hours, the mercury uniformly, though slowly ascending to 28.95 during that inter-

1825. October. val, and afterwards to 29.73, as the weather became moderate and fine in the course of the three following days.

After this gale the atmosphere seemed to be quite cleared, and we enjoyed a week of such remarkably fine weather as seldom occurs at this season of the year. We had then a succession of strong southerly winds, but were enabled to continue our progress to the eastward, so as to make Mould Head, towards the north-west end of the Orkney Islands, at Monday 10. daylight on the 10th of October; and the wind becoming more westerly, we rounded North Ronaldsha Island at noon, and then shaped a course for Buchaness.

In running down Davis' Strait, as well as in crossing the Atlantic, we saw on this passage, as well as in all our former autumnal ones, a good deal of the Aurora Borealis. It first began to display itself, on the 15th of September, about the latitude of 69½°, appearing in the (true) south-east quarter as a bright luminous patch five or six degrees above the horizon, almost stationary for two or three hours together, but frequently altering its intensity, and occasionally sending up vivid streamers towards the zenith. It appeared in the same manner, on several subsequent nights, in the south-west, west, and east quarters of the heavens; and on the 20th a bright arch of it passed across the zenith from S.E. to N.W., appearing to be very close to the ship, and affording so strong a light as to throw the shadow of objects on the deck. The next brilliant display, however, of this beautiful phenomenon which we now witnessed, and which far surpassed anything of the kind observed at Port Bowen, occurred on the night of the 24th of September, in latitude $58\frac{1}{2}°$, longitude $44\frac{1}{2}°$. It first appeared in a (true) east direction, in detached masses like luminous clouds of yellow or sulphur-coloured light, about three degrees above the horizon. When this appearance had continued for about an hour, it began, at nine P.M. to spread upwards, and gradually extended itself into a narrow band of light passing through the zenith and again downwards to the western horizon. Soon after this the streams of light seemed no longer to emanate from the eastward, but from a fixed point about one degree above the horizon on a true west bearing. From this point, as from the narrow point of a funnel, streams of light resembling brightly-illuminated vapour or smoke, appeared to be incessantly issuing, increasing in breadth as they proceeded, and darting with inconceivable velocity, such as the eye could scarcely keep pace with, upwards towards the zenith, and in the same easterly direction which the former arch had taken. The sky immediately under the spot from which the light issued, appeared, by a deception very common in this phenomenon, to be covered with a dark cloud, whose outline the imagination might at times convert into that of the summit of a mountain, from which the light proceeded, like the flames of a volcano. The streams of light, as they were projected

1825. October.

1825. October. upwards, did not consist of continuous vertical columns or streamers, but almost entirely of separate, though constantly-renewed masses, which seemed to *roll* themselves laterally onward, with a sort of undulating motion, constituting what I have understood to be meant by that modification of the Aurora called the " merry-dancers," which is seen in beautiful perfection at the Shetland Islands. The general colour of the light was yellow, but an orange and a greenish tinge were at times very distinctly perceptible, the intensity of the light and colours being always the greatest when occupying the smallest space. Thus the lateral margins of the band or arch seemed at times to roll themselves inwards so as to approach each other, and in this case the light just at the edges became much more vivid than the rest. The intensity of light during the brightest part of the phenomenon, which continued three-quarters of an hour, could scarcely be inferior to that of the moon when full.

We once more remarked, in crossing the Atlantic, that the Aurora often gave a great deal of light at night, even when the sky was entirely overcast, and it was on that account impossible to say from what part of the heavens the light proceeded, though it was often fully equal to that afforded by the moon in her quarters. This was rendered particularly striking, on the night of the 5th of October, in consequence of the frequent and almost instantaneous changes which took place in this way, the weather being rather dark and gloomy, but the sky at times so brightly illuminated, almost in an instant, as to give quite as much light as the full moon similarly clouded, and enabling one distinctly to recognise persons from one end of the ship to the other. We did not, on any one occasion, perceive the compasses to be affected by the Aurora Borealis. 1825. October.

Some of the changes in the temperature of the sea-water, which occurred during this passage, appear to me sufficiently remarkable to require a more distinct notice than is contained in the Meteorological Abstracts; and as these changes might be of service to ships making the passage, I here insert in one concise view the gradual alterations which took place, both on the outward and homeward bound passage:—

1825.
October.

CHANGES IN THE TEMPERATURE OF THE SEA-WATER.

Day.	Hour.	Latitude N.	Longitude W.	Temperature of the Sea changed to	REMARKS.
1824.		° ′	° ′	°	
From June 1st till Noon 7th.		59 28 to 60 47	9 31 to 22 36	48 to 49	
June 7th	1 P.M.	60 06	22 40	52	
„ 8th	3 A.M.	58 27	23 20	49 to 50	
„ 10th	3 P.M.	58 42	28 33	48	
„ 11th	9 A.M.	58 23	32 04	47	
„ „	3 P.M.	58 07	33 16	46	
„ „	9 P.M.	58 00	34 21	45	
„ 12th	9 A.M.	57 57	36 57	41	
„ „	3 P.M.	58 04	38 05	43	
„ 13th	5 A.M.	58 11	41 25	41	
„ „	7 P.M.	58 19	43 13	40	Near the meridian of Cape Farewell.
„ 14th	3 A.M.	58 24	43 27	39	
„ „	3 P.M.	58 48	45 41	38	
„ 15th	9 P.M.	59 59	52 30	37	
„ 16th	9 A.M.	60 33	54 46	36	
„ „	9 P.M.	60 50	55 27	35	
„ 17th	9 A.M.	60 40	57 13	34 to 35	And for a few hours at 36°.
„ 20th	3 P.M.	64 21	56 22	33	
„ 21st	3 A.M.	65 41	57 09	30½ to 31½	
1825.					
Sept. 16th	7 P.M.	67 46	57 47	32	Near the ice.
„ „	Midnight.	67 32	57 15	34	No ice in sight.
„ 17th	1 A.M.	67 27	57 05	36	do.
„ „	5 A.M.	67 09	56 42	37	do.
„ „	9 A.M.	66 47	56 26	37.5	do.
„ „	11 A.M.	66 31	56 11	38	do.
„ „	1 to 3 P.M.	66 14	55 55	36	Probably nearer some ice.
„ „	5 P.M.	65 56	55 27	37	
„ „	9 P.M.	65 38	55 10	38	
„ 18th	9 P.M.	64 40	55 04	39	
„ 19th	9 A.M.	64 09	55 15	40	
„ „	1 P.M.	64 07	55 13	41	
„ „	7 P.M.	63 51	55 04	41.5	
„ „	9 P.M.	63 47	55 01	42	
„ 20th	7 P.M.	62 41	56 44	43	
„ 23rd	3 A.M.	59 43	50 52	44	
„ „	About 5 PM.	59 03	47 45	45	
„ 24th	5 A.M.	58 22	43 41	45.5	
„ „	0 P.M.	58 18	43 35	46	
„ 27th	1 P.M.	56 30 About the Cape	42 30 meridian of Farewell.	49	Changed from 46° to 49° from 11 A.M. to 1 P.M.
„ 28th	11 A.M.	57 06	38 31	51	Ditto to 51° from 9 to 11 A.M.
„ 30th	11 A.M.	58 17	31 43	52	
October 1st	9 A.M.	58 33	29 14	53	
„ 3rd	9 A.M.	59 03	23 28	54 to 54.5	

As we approached the Orkneys, I demanded from the officers, in compliance with my instructions from my Lords Commissioners of the Admiralty, all the logs, journals, drawings and charts, which had been made during the voyage. After rounding the north end of the Orkneys on the 10th of October, we were, on the 12th, met by a strong southerly wind, when off Peterhead. I, therefore, immediately landed (for the second time) at that place, and setting off without delay for London, arrived at the Admiralty on the 16th. 1825. October.

Notwithstanding the ill success which had attended our late efforts, it may in some degree be imagined what gratification I experienced at this time in seeing the whole of the Hecla's crew, and also those of the Fury (with the two exceptions already mentioned) return to their native country in as good health as when they left it eighteen months before. The Hecla arrived at Sheerness on the 20th of October, where she was detained for a few days for the purpose of Captain Hoppner, his officers, and ship's company being put upon their trial (according to the customary and indispensable rule in such cases) for the loss of the Fury; when, it is scarcely necessary to add, they received an honourable acquittal. The Hecla then proceeded to Woolwich, and was paid off on the 21st of November.

Having now brought to a close my Narrative of this our third unsuccessful attempt to decide the question of a North-West Passage from the Atlantic to the Pacific, I shall here beg to offer, in conclusion, a few remarks on this and one or two other subjects, which have engaged much of my attention during eight successive summers that I have been employed on this service.

I shall first mention a circumstance which has particularly forced itself upon my notice in the course of our various attempts to penetrate through the ice in these regions; which is, that the eastern coast of any portion of land, or, what is the same thing, the western sides of seas or inlets, having a trending at all approaching to north and south, are, at a given season of the year, generally more encumbered with ice than the shores which have an opposite aspect. The four following instances may be adduced, in illustration of this fact, and cannot but appear somewhat striking when considered in viewing a map which exhibits the relative position of the shores in question.

It is well known that, in the extensive northern sea, reaching from latitude 60° to 80°, bounded on the east by Lapland and Spitzbergen, and on the west by Greenland, the whole of the latter coast is blocked up by ice throughout the summer, so as to make it at least a matter of no easy enterprize to approach it; while the navigation of the eastern portion of that sea may be annually performed without difficulty, even to a very high latitude, and at an early part of the season. A second equally well-known instance occurs in the navigation of Davis's Strait, which, from about Resolution Island in latitude $61\frac{1}{2}°$ to the parallel of at least 70°, is usually inaccessible as late as the month of August, and a great deal of it in some summers not accessible at all; while a broad and navigable channel is found open on the eastern side of the Strait (that is, on the western coast of Greenland) many weeks before that time. We experienced a third and very striking example of this kind in coasting the eastern shore of Melville Peninsula, in the years 1822 and 1823, the whole of that coast being so loaded with ice as to make the navigation extremely difficult and dangerous. Now, on the eastern side of Fox Channel, there is reason to believe, as well from the account of that navigator in 1631 and that of Baffin in 1615, as from our own observation, that there is little or no ice during the summer season. In the course of Fox's progress along the shore, from the Trinity Islands to his furthest north, no mention whatever is made in his journal of any obstruction from ice, which would hardly have been the case had he met with any; and in our own passage, as well as that of Baffin, from Trinity Islands towards the middle of Southampton Island, little or no obstruction was met with from it till well within sight of the latter coast. The last instance of the same kind which I shall mention is that of Prince Regent's Inlet, and of which the events of this voyage furnish too striking a proof, the ice appearing always to cling to the western shore in a very remarkable manner, while the opposite coast is comparatively free from it.

These facts, when taken together, have long ago impressed me with an idea, that there must exist in the Polar regions some general motion of the sea towards the west, causing the ice to set in that direction, when not impelled by contrary winds, or local and occasional currents, until it butts against those shores which are actually found to be most encumbered by it. In confirmation of this idea, I am enabled to adduce some more definite observations, which would appear to tend to the same result. In the Narrative of the Voyage of 1821 to 1823, I have shewn in how remarkable a manner the ships were, in two separate instances, set to the westward, towards Southampton Island, instead of being carried in the direction opposite to a strong wind; and how closely the packed ice was found to cling to the same land, even against a fresh breeze blowing directly off the shore *. During the time of our "besetment" in Baffin's Bay, in the month of August, 1824, a set to the westward, even against a strong breeze in that direction, has already been noticed in the present Narrative†; and a similar circumstance occurred on our last return. In all

* Pp. 78, 481, 482. † p. 19.

these instances, the opportunities were as favourable for detecting a current as can ever occur at sea, the daily observations for latitude and longitude not admitting the possibility of any material error in our actual place, and the ships being, in three instances out of four, either immoveably "beset" in the ice, or firmly attached to it, and therefore wholly independent of dead reckoning.

Whether the circumstances I have above stated may have any reference to the well-known fact of the western shores of lands enjoying a climate considerably more temperate than the eastern ones in a corresponding latitude, I do not presume even to conjecture; nor indeed do I feel myself competent to offer any decided opinion as to the cause of the phenomena in question. Having stated the facts precisely as they have occurred to my notice, I shall only, therefore, add to these remarks by suggesting, for the consideration of others, whether such a tendency of the sea as that above noticed may not have some connexion with the motion of the earth on its axis.

In the effect produced by the ice upon the strength of the wind, there is something so remarkable, that although I have already cursorily alluded to it in the course of my Narratives, yet as I have never met with any explanation of it, I am desirous of once more drawing to this subject the attention of those who are competent judges of the cause of this phenomenon. The fact to which I allude is the decrease of wind which invariably takes place in passing under the lee, not merely of a close and extensive body of high and heavy ice, but even of a stream of small pieces, so loose as almost to allow a ship to pass between them, and not one of them reaching a foot above the surface of the sea. So immediate, indeed, is this effect, that the moment a ship comes under the lee of such a stream, if under a press of sail, she rights considerably, the difference being at least equal to what seamen would estimate a "reef in the topsails," or sometimes more. Anything like mere mechanical shelter must of course, in such a case, be wholly out of the question; which is still more apparent from the fact, that even a coat of "sludge" of the consistence of honey, covering the surface of the sea, will, though in a less degree, produce a similar effect. I have several times, under these circumstances, watched the thermometer, to see if any sensible change took place in the temperature of the atmosphere; but if the phenomenon be in any respect due to this cause, its amount is certainly too small to be thus detected.

Another remarkable feature observable in the Polar regions, at least in those parts which are encumbered with ice, is the total absence of heavy or dangerous squalls of wind. There is, of course, an exception to this in the neighbourhood of land, especially such as is intersected by valleys and ravines; but in a ship fairly at sea, I cannot call to my recollection a single instance, in the Polar regions, of such squalls as, in other climates, oblige the seaman to lower his topsails during their continuance.

In re-visiting many of the spots discovered by our early British navigators in the Polar regions, and in traversing the same tracks which they originally pursued, I have now and then, in the course of my Narratives, had occasion to speak of the faithfulness of their accounts, and the accuracy of their hydrographical information. I should, however, be doing but imperfect justice to the memory of these extraordinary men, as well as to my own sense of their merits, if I permitted the present opportunity to pass without offering a still more explicit and decided testimony to the value of their labours. The accounts of Hudson, Baffin, and Davis are the productions of men of no common stamp. They evidently relate things just as they saw them, dwelling on such nautical and hydrographical notices as, even at this day, are valuable to any seaman going over the same ground, and describing every appearance of nature, whether on the land, the sea, or the ice, with a degree of faithfulness which can alone perhaps be duly appreciated by those who succeed them in the same regions, and under similar circumstances. The general outline of the lands they discovered was laid down by themselves with such extraordinary precision, even in longitude, as scarcely to require correction in modern times; of which fact the oldest maps now extant of Baffin's Bay, and the Straits of Hudson and Davis, constructed from the original materials, will afford sufficient proof. The same accuracy is observable in their accounts of the tides, soundings, and bearings, phenomena in which the lapse of two hundred years can have wrought but little change. It is, indeed, impossible for any one personally acquainted with the phenomena of the icy seas, to peruse the plain and unpretending narratives of these navigators, without recognising in almost every event they relate some circumstance familiar to his own recollection and experience, and meeting with numberless remarks which bear most unequivocally about them the impress of truth.

While thus doing justice to the faithfulness and accuracy with which they recorded their discoveries, one cannot less admire the intrepidity, perseverance, and skill with which, inadequately furnished as they were, those discoveries were effected, and every difficulty and danger braved. That any man, in a single frail vessel of five-and-twenty tons, ill-found in most respects, and wholly unprovided for wintering, having to contend with a thousand real difficulties, as well as with numberless imaginary ones, which the superstitions then existing among sailors would not fail to conjure up,—that any man, under such circumstances, should, two hundred years ago, have persevered in accomplishing what our old navigators did accomplish, is, I confess, sufficient to create in my mind a feeling of the highest pride on the one hand, and almost approaching to humiliation on the other:

of pride, in remembering that it was *our* countrymen who performed these exploits; of humiliation, when I consider how little, with all our advantages, *we* have succeeded in going beyond them.

Indeed, the longer our experience has been in the navigation of the icy seas, and the more intimate our acquaintance with all its difficulties and all its precariousness, the higher have our admiration and respect been raised for those who went before us in these enterprises. Persevering in difficulty, unappalled by danger, and patient under distress, they scarcely ever use the language of complaint, much less that of despair; and sometimes, when all human hope seems at its lowest ebb, they furnish the most beautiful examples of that firm reliance on a merciful and superintending providence, which is the only rational source of true fortitude in man. Often, with their narratives impressed upon my mind, and surrounded by the very difficulties which they in their frail and inefficient barks undauntedly encountered and overcame, have I been tempted to exclaim with all the enthusiasm of Purchas, "How shall I admire your heroicke courage, ye marine worthies, beyond names of worthiness!"

On a subject which has, for many years past, excited so strong and general an interest as that of the North-West Passage, a subject which has called forth so much warm British feeling in every British heart, it may perhaps be expected that, charged as I have been with three several attempts at its accomplishment, I should, ere I close this volume, once more offer an opinion. This I am enabled to do the more briefly, because the question evidently rests nearly where it did before the equipment of the late expedition, and I have, therefore, little to offer respecting it, in addition to what I have already said at the close of my last Narrative *. The views I then entertained on this subject, of the nature and practicability of the enterprise, of the means to be adopted, and the route to be pursued for its accomplishment, remain wholly unaltered at the present moment; except that some additional encouragement has been afforded by the favourable appearances of a navigable sea near the south-western extremity of Prince Regent's Inlet. To that point, therefore, I can, in the present state of our knowledge, have no hesitation in still recommending that any future attempt should be directed.

I feel confident that the undertaking, if it be deemed advisable at any future time to pursue it, will one day or other be accomplished; for, setting aside the accidents to which, from their very nature, such attempts must be liable, as well as other unfavourable circumstances which human foresight can never guard against, nor human power control, I cannot but believe it to be an enterprise well within the reasonable limits of practicability. It may be tried

* Pp. 487—491.

often, and often fail, for several favourable and fortunate circumstances must be combined for its accomplishment; but I believe nevertheless that it *will* ultimately be accomplished. That it is not to be undertaken lightly, nor without due attention to every precaution which past or future experience may suggest, our recent failures under such advantages of equipment as no other expedition of any age or country ever before united, and we trust also our own endeavours to effect something worthy of so liberal an outfit, will at least serve to shew. I am much mistaken, indeed, if the North-West Passage ever becomes the business of a single summer; nay, I believe that nothing but a concurrence of very favourable circumstances is likely even to make a single *winter* in the ice sufficient for its accomplishment. But this is no argument against the possibility of final success; for we now know that a winter in the ice may be passed not only in safety, but in health and comfort. I would only, therefore, in conclusion, urge those who may at any future time be charged with this attempt, to omit no precaution* that can in the slightest degree contribute to the strength of the ships, the duration of their resources, the wholesomeness and *freshness* of their provisions, the warmth, ventilation, and cleanliness of the inhabited apartments, and

* That none of our past experience may be lost in any future attempts of this kind in either hemisphere, I am preparing a book intended to be lodged at the Admiralty, containing directions under each separate head, for the whole equipment of ships about to be employed on this service.

the comfort, cheerfulness, and moral discipline of their crews.

Happy as I should have considered myself in solving this interesting question, instead of still leaving it a matter of speculation and conjecture, happy shall I also be if any labours of mine in the humble, though it would seem necessary, office of pioneer, should ultimately contribute to the success of some more fortunate individual; but most happy should I again be, to be selected as that individual. May it still fall to England's lot to accomplish this undertaking, and may she ever continue to take the lead in enterprises intended to contribute to the advancement of science, and to promote, with her own, the welfare of mankind at large! Such enterprises, so disinterested as well as useful in their object, do honour to the country which undertakes them, even when they fail; they cannot but excite the admiration and respect of every liberal and cultivated mind; and the page of future history will undoubtedly record them as every way worthy of a powerful, a virtuous, and an enlightened nation.

END OF THE NARRATIVE.

NOTE.—The following are the terms in which the Court-Martial upon Captain Hoppner for the loss of the Fury, was pleased to express the sentence.

"—— And having heard the evidence adduced, and also the statement of Captain Henry Parkyns Hopner, the Court is of opinion that no blame whatever attaches, on that occasion, to Captain Henry Parkyns Hoppner, his officers, or ship's company; and doth, in consequence thereof, adjudge the said Captain Henry Parkyns Hoppner, his officers, and ship's company, to be fully acquitted.

"And the said Captain Henry Parkyns Hoppner, his officers, and ship's company are hereby fully acquitted accordingly.

"And the court in justice to the services of Captain Parry, the officers, and ship's company of his Majesty's sloop Hecla, as well as those of Captain Hoppner, the officers, and ship's company of His Majesty's sloop Fury, to save His Majesty's said sloop Fury, cannot omit this opportunity of expressing the high opinion they entertain of their very distinguished exertions."

APPENDIX.

I.

ABSTRACT OF THE METEOROLOGICAL JOURNAL KEPT ON BOARD HIS MAJESTY'S SHIP, HECLA, FROM JUNE, 1824, TO SEPTEMBER, 1825.

THE LATITUDES AND LONGITUDES MARKED * ARE BY DEAD RECKONING.

ABSTRACT of the METEOROLOGICAL JOURNAL kept on BOARD

DATE.	Noon.		Barometer corrected for Temperature, Neutral Point, and Capacity.					Daniell's Hygrometer.								
			A.M.		P.M.		Mean of 24 hours.	9 A.M.			3 P.M.			9 P.M.		
1824.	North Latitude.	West Longitude.	3h.	9h.	3h.	9h.		Temp.	Dew Pt.	Diff.	Temp.	Dew Pt.	Diff.	Temp.	Dew Pt.	Diff.
	° ′ ″	° ′ ″	Inches.	Inches.	Inches.	Inches.	Inches.	°	°	°	°	°	°	°	°	°
June 1	59 28 17	9 30 39	. .	29.978	30.156	30.283	30.172	52.5	49	3.5	55	49	6	52.5	49.5	3
„ 2	*59 59 30	12 03 58	30.266	30.127	.041	.012	.111	53	52	1	54	53.5	0.5	51	51	0
„ 3	60 08 49	13 47 35	29.995	.040	29.968	.033	.009	53	51	2	54	54	0	53	53	0
„ 4	60 29 31	16 13 59	30.018	.159	30.246	.320	.186	54	53	1	55	52	3	53	53	0
„ 5	60 47 31	18 15 06	.404	.433	.438	.377	.413	53	51	2	53	52	1	53	52	1
„ 6	60 22 36	*20 21 01	.305	.243	.157	.093	.199	53	51	2	52.5	52.5	0	52	52	0
„ 7	60 05 31	22 36 23	.031	.055	.029	.036	.038	. .	. .	. .	59	54.5	4.5	53	50	3
„ 8	59 49 51	*24 08 44	.031	.047	.078	.117	.076	53	53	0	53	53	0	51	51	0
„ 9	59 30 20	25 33 53	.123	.184	.171	.177	.164	55	52	3	54	52	2	53	53	0
„ 10	*58 54 55	28 21 01	.132	.140	.120	.102	.123	52	52	0	52	52.	0	52	52	0
„ 11	*58 15 28	*32 41 07	.028	29.977	29.870	29.797	29.920	50	50	0	50	50	0	48	48	0
„ 12	*58 00 37	*37 31 58	29.728	.707	.747	.781	.741	47.5	47.5	0	47	47	0	45.5	45.5	0
„ 13	*58 13 52	*42 21 07	.774	.837	.855	.897	.841	44.5	44.5	0	46	46	0	43	43	0
„ 14	*58 40 13	*45 04 40	.885	.857	.749	.645	.784	42.5	42.5	0	42	42	0	41.5	41.5	0
„ 15	*59 28 00	50 58 33	.547	.532	.564	.640	.571	42	42	0	42	42	0	41	41	0
„ 16	60 43 15	54 51 27	.710	.735	.695	.602	.685	39.5	39.5	0	37	37	0	34	34	0
„ 17	60 43 05	56 59 30	.529	.482	.449	.410	.467	36	31.5	4.5	37	32	5	. .	. .	.
„ 18	61 03 27	56 04 00	.451	.536	.645	.758	.597	36.5	32	4.5	38	33	5	. .	. .	.
„ 19	61 35 17	55 41 18	.804	.828	.834	.822	.822	38.5	33	5.5	38.5	33	5.5	37	33	1
„ 20	63 58 29	56 33 18	.772	.700	.585	.587	.661	38	36	2	37.5	34.5	3	36	36	0
„ 21	66 29 30	57 09 09	.547	.582	.680	.775	.646	34	34	0	. .	. .	. .	34	33	1
„ 22	*68 27 08	*53 58 21	.858	.911	.865	.730	.856	. .	. .	. .	. .	. .	. .	. .	. .	.
„ 23	*68 57 00	54 33 22	. .	.759	.924	.968	.881	35	35	0	36.5	36.5	0	34	34	0
„ 24	69 08 35	54 10 23	.946	30.018	30.090	30.066	30.030	35	32.5	2.5	35.5	35.5	0	32	32	0
„ 25	69 09 25	*54 05 20	30.036	.018	29.961	29.917	29.983	. .	. .	. .	. .	. .	. .	39.5	34.5	5
„ 26			29.863	29.851	.886	.925	.881	40.5	34.5	6	. .	. .	. .	. .	. .	.
„ 27	At the Whale-	fish Islands	.926	. .	. .	.879	.902	. .	. .	. .	. .	. .	. .	. .	. .	.
„ 28	68 59 07	53 13 06	.870	. .	29.875	.887	.877	. .	. .	. .	. .	. .	. .	. .	. .	.
„ 29			.938	29.971	.990	.961	.966	. .	. .	. .	. .	. .	. .	. .	. .	.
„ 30			.931	.906	.877	.845	.890	. .	. .	. .	. .	. .	. .	. .	. .	.
		Mean	29.909	29.9148	29.9153	29.918	29.916	45.1	43.4	1.7	46.75	45.14	1.6	45.	41.2	0.8

PRESSURE of the ATMOSPHERE in June, 1824, as observed at						Moisture of the Atmosphere. Mean of the Month.			Mean Temperature of the Sea-Water at the Surface.	DIRECTION OF WINDS. Number of Days at							
	3 h. A.M.	9 h. A.M.	3 h. P.M.	9 h. P.M.	During the Month.	Temp. of the Air.	Dew Point.	Diff.		North.	N.E.	East.	S.E.	South.	S.W.	West.	N.W.
	Inches.	Inches.	Inches.	Inches.	Inches.	°	°	°	°								
Maximum	30.404	30.433	30.438	30.377	30.438												
Minimum	29.529	29.532	29.449	29.410	29.410					½	2	11	1	8½	3	0	2
Mean . .	29.909	29.9148	29.9153	29.918	29.916	45.6	44.2	1.4	40.35	and two from S. by W. round the Compass.							

HIS MAJESTY'S SHIP, HECLA; during the Month of June, 1824.

SEA-WATER.						Temperature of the Atmosphere, registered every two hours.			Prevailing Winds.		PREVAILING WEATHER AND OTHER REMARKS.
Temp. A.M.		Temp. P.M.		Specific Gravity.	Temp. when weighed.						
3h.	9h.	3h.	9h.	(Noon.)		Maximum	Minimum.	Mean.	Direction.	Velocity.	
° 49	° 50	° 49.5	° 49	. .	° . .	+° 56	+° 50	+° 52.7	S.W.	Moderate.	Cloudy.
49	49	49	48.5	. .	. .	55	50	51.8	South.	Fresh.	Hazy.
48.5	48.5	50	48.5	1.0262	58	54	49	52.4	S.W.b.S.	Fresh.	Cloudy; rain.
46	48	48	48	1.0262	57	56	52	53.8	S.S.W.	Fresh.	Cloudy; small rain in the evening.
48	48	48	48	1.02615	54	57	51	53.2	South.	Moderate.	Cloudy.
48	49	49	49	1.0271	56.5	58	51.5	52.9	South.	Moderate.	Cloudy.
49	49	52	50	1.0270	56.5	60	51	54.2	Southerly.	Very light.	Hazy, with small rain.
49	49	49	49	1.0271	55	53	50	51.8	East.	Light.	Thick foggy weather.
49	50	51	50.5	1.0276	49	56	51	53.5	Easterly.	Light.	Hazy, with small rain; calm at times.
49	49	48	48	1.0274	46	53	51	51.7	E.S.E.	Moderate.	Hazy, with rain.
48.5	47	46	45	1.0273	48.5	52	48	50	E.b.N.	Fresh.	Hazy; rain at night.
45	44	43	43.5	1.0273	48.5	51	45.5	47.8	E.b.N.	Moderate.	Thick fog, with occasional small rain.
40	40.5	41	40	1.0283	46	46	43	43.8	E.N.E.	Moderate.	Thick fog.
39	39	38	38	1.0273	48	43	41	42	East.	Fresh.	Thick fog, with occasional rain.
38.5	38.5	38	37	1.0271	45	43	40	41.6	E.N.E.	Fresh.	Ditto ditto.
36.5	36	36	35	1.0266	51	40	34	37.4	A.M. N.E. P.M. North.	Moderate.	Hazy, with rain and sleet.
35	34	35.5	35.5	1.0266	50.5	39	34	36.2	N.W.	Fresh.	A.M. Cloudy. P.M. Clear.
34.5	35	34.5	34.5	1.0266	50	40.5	34.5	36.9	N.W.	Fresh.	Fine clear weather.
35	36	36	36	1.0267	47	42	35	38.2	S.W.	Light.	Fine.
34.5	35	32.5	33	1.0257	59	40	35	37.2	S.E.	Fresh.	A.M. Clear. P.M. Cloudy, with rain.
30.5	31.5	. .	30.5	1.0261	58	35.5	33	34	S.b.W.	Moderate.	A.M. Hazy, with rain; P.M. Fine.
30	32	33	34	1.0261	56.5	38	33	35.2	S.S.E.	Fresh.	Cloudy, with much rain.
. .	32	32.5	33	1.0256	59.5	36.5	34	35.3	S. round by W. to N.W.	Light.	Variable winds and thick fog.
32	33	33	33	1.0256	59	41	32	34.6	Round the Compass.	Light.	Ditto ditto.
33	35	35	34	1.0257	58.5	43	31	35.2	Easterly.	Light.	A.M. Foggy; P.M. Fine.
35	. .	33.5	33	. .	. .	40	36	37.7	Southerly.	Light.	Hazy; occasionally small rain in the afternoon.
32	. .	. .	33	. .	. .	44	37	41.3	Easterly.	Light.	Fine.
34	34	34	33	. .	. .	56	44	48.1	A.M. N.E.ly. P.M. S.ly	Very light	Fine.
33	33	34	34	. .	. .	50	38.5	44.1	N.Easterly.	Very light.	Fine.
33	33.5	34	34	. .	. .	48.5	41	45.4	Easterly.	Light.	A.M. Fine; P.M. Cloudy, with small rain.
40.1	40.6	40.8	39.9	. .	. .	60	31	44.3			

GENERAL REMARKS.

A great prevalence of rain and fog. Southerly winds prevailed in the early part of the month; but towards the end the weather became finer, with light winds from the Eastward. The ship having changed her geographical position so materially during the month, the Observations can scarcely be considered as comparative; and therefore no conclusions have been drawn from them.

ABSTRACT of the METEOROLOGICAL JOURNAL kept on BOARD

DATE. 1824.	NOON. North Latitude.	NOON. West Longitude.	BAROMETER corrected for Temperature, Neutral Point, and Capacity. A. M. 3^h.	A. M. 9^h.	P. M. 3^h.	P. M. 9^h.	Mean of 24 hours.	DANIELL'S HYGROMETER. 9 A. M. Temp.	9 A. M. Dew Pt.	9 A. M. Diff.	3 P. M. Temp	3 P. M. Dew Pt.	3 P. M. Diff.	9 P. M. Temp.	9 P. M. Dew Pt.	9 P. M. Diff
	° ′ ″	° ′ ″	Inches.	Inches.	Inches.	Inches.	Inches.	°	°	°	°	°	°	°	°	°
July 1			29.869	29.937	29.957	29.975	29.934	. .	. .	. .	. .	. .	. .	. .	. .	. .
,, 2	At the Whale- 68 59 07	fish Islands 53 13 06	.950	.960	.905	.906	.930	. .	. .	. .	. .	. .	. .	. .	. .	. .
,, 3			.893	.926	.927	.937	.921	. .	. .	. .	. .	. .	. .	. .	. .	. .
,, 4			.936	981	.960	.885	.941	. .	. .	. .	.	. .	. .	. .	. .	. .
,, 5	69 08 45	*53 50 30	.873	.827	.774	.839	.828	. .	. .	. .	. .	. .	. .	. .	. .	. .
,, 6	*69 10 15	*54 30 00	.748	.822	.851	.864	.821	. .	. .	. .	. .	. .	. .	. .	. .	. .
,, 7	69 17 39	*54 42 00	.849	.854	.870	.910	.871	. .	. .	. .	. .	. .	. .	. .	. .	. .
,, 8	69 10 17	56 33 46	.955	.991	30.001	.975	.981	35	35	0	39	39	0	40	38	2
,, 9	69 41 36	56 46 26	.903	.833	29.760	.744	.810	38	36	2	40	35	5	36	33	3
,, 10	69 54 55	58 37 15	.724	.862	.826	.894	.826	34	32	2	35	32	3	34	30	4
,, 11	70 14 39	58 57 57	.918	.957	.949	.905	.932	37.5	33	4.5	37	33	4	33	30	3
,, 12	70 48 37	58 52 34	.848	.804	.792	.819	.816	36	34	2	36.5	35	1.5	35	34	1
,, 13	70 59 59	*58 30 37	.819	.879	.944	.990	.908	36.5	36	0.5	36	36	0	36	36	0
,, 14	71 15 25	59 22 10	30.006	.996	.971	.950	.981	38	37	1	39	36	3	36.5	33	3.5
,, 15	71 13 31	59 28 16	29.892	.884	.931	.975	.921	37	33	4	38	34	4	36	33.5	2.5
,, 16	71 11 22	59 47 07	30.028	30.108	30.146	30.133	30.104	37	33	4	36	32	4	36	32	4
,, 17	71 03 06	59 58 43	.051	29.954	29.842	29.745	29.898	36	31	5	34	31	3	32.5	31	1.5
,, 18	70 55 47	60 10 31	29.710	.747	.794	.866	.779	34	31.5	2.5	35	34	1	35	35	0
,, 19	*70 57 00	*60 15 46	.869	.870	.802	.738	.819	33	33	0	35	33	2	33	33	0
,, 20	70 56 50	60 39 37	.658	.651	.655	.690	.663	34	34	0	35.5	35	0	29.5	29.5	0
,, 21	71 01 34	60 36 33	.687	.879	688	.696	.687	34	34	0	29	29	0	27.5	27.5	0
,, 22	70 57 51	60 44 14	.677	.721	.788	.823	.752	33	33	0	33	33	0	33	32	1
,, 23	70 56 51	60 49 51	.846	.884	.889	877	.874	36	33	3	35	34	1	33.5	32	1.5
,, 24	70 57 32	60 55 50	.838	.810	.789	.773	.802	33.5	33.5	0	34	34	0	33	33	0
,, 25	70 56 01	60 52 20	.721	.687	.640	.626	.669	34	32	2	. .	. .	. .	. .	. .	. .
,, 26	70 54 11	61 04 31	.620	.650	.723	.745	.684	35	33	2	36	35	1	35	35	0
,, 27	70 57 05	*61 08 26	.693	.573	.531	.558	.589	33.5	33.5	0	33	33	0	34	34	0
,, 28	*71 00 00	*61 42 46	.509	.471	.433	.424	.459	34	34	0	34	34	0	33	33	0
,, 29	*71 02 00	*61 43 46	.433	.452	.546	.609	.510	33.5	33.5	0	34	34	0	31.5	31.5	0
,, 30	71 05 28	62 09 08	.571	.531	.404	.301	.452	34.5	34.5	0	36	35	1	36	34	2
,, 31	71 07 58	*62 08 46	.267	.310	.359	.443	.345	35	35	0	35	35	0	33	33	0
MEANS			29.7858	29.7939	29.7886	29.7940	29.7906	35.08	33.65	1.43	35.41	33.89	1.52	34	32.74	1.26

	PRESSURE of the ATMOSPHERE as observed at 3 A.M.	9 A.M.	3 P.M.	9 P.M.	During the Month.	Moisture of the Atmosphere. Mean of the Month. Temp of the Air.	Dew Point.	Diff.	Mean Temperature of the Sea Water at the Surface.	DIRECTION of the WINDS. Number of Days at North.	N.E.	East.	S.E.	South.	S.W.	West.	N.W.
	Inches.	Inches.	Inches.	Inches.	Inches.	°	°	°	°								
Max. . .	30.051	30.108	30.146	30.133	30.146												
Min. . .	29.267	29.310	29.359	29.301	29.267												
Mean. .	29.7858	29.7939	29.7886	29.7940	29.7906	34.84	33.46	1.38	33.09	9½	5	½	5	2½	1½	1½	5½

HIS MAJESTY'S SHIP, HECLA; during the Month of July, 1824.

SEA WATER. Temp. A.M. 3h.	SEA WATER. Temp. A.M. 9h.	SEA WATER. Temp. P.M. 3h.	SEA WATER. Temp. P.M. 9h.	SEA WATER. Specific Gravity.	SEA WATER. Temp. when weighed.	Temperature of the Atmosphere registered every two hours. Maximum.	Minimum.	Mean.	Prevailing Winds. Direction.	Prevailing Winds. Velocity.	PREVAILING WEATHER.
33°	34°	34°	34°	. . .	. .	44°	36°	40°.33	S.S.W.	Moderate.	Fog.
34	37	36	35	. . .	. .	53	38.5	44.71	A.M. NE P.M. NNW.	Light.	Fine.
36.5	40	42	42	. . .	. .	52	40	48.33	A.M. WSW. P.M. NW.	Light.	Variable winds, fine weather.
40.5	38.5	39	41	1.0269	51	46	37	42.42	S.Wy.	Light.	Fog.
44	47	46	43	1.0267	52.5	49	41	44.98	Westerly.	Light.	Fine.
38.5	38.5	36	35.5	1.0257	50.5	46.5	37	41.68	A.M. Ey. P.M. NNW.	Light.	Fog.
35	41	35	35	1.0264	52.5	44.5	32	36.14	N.W.	Moderate.	Fog
35	36	38.5	35	1.0264	47.5	39	31	35.58	N.N.W.	Light.	A.M. Fog.—P.M. Fine.
33.5	35	37	32.5	1.0261	49.5	39.5	31.5	37.00	N.N.W.	Moderate.	Fine.
31	29	31	30	1.0257	49	35.5	31	33.21	N.W.	Moderate.	Fine.
29.5	31	31	32	1.0251	51	37.5	31.5	34.12	N.W.	Light.	Fine.
32	31.5	32	33	1.0247	60	37	31	34.92	N.W.	Light.	Cloudy.
34	34	34	32	1.0249	58	38	32	35.12	S.Easterly.	Light.	Fog.
31	29.5	33	31.5	1.0003	63	38	33	36.12	S.Easterly.	Light.	Cloudy. Small rain, A.M.
30.5	30	30	30	. . .	. .	38	32	35.25	A.M. Ny. P.M. N.Ey.	Light.	Fine.
29	29	29	30	. . .	. .	38	33	35.45	A.M. N.Ey. P.M Ny.	Light.	Fine.
30.5	30	31.5	30.5	. . .	. .	36	32	33.83	N.N.W.	Moderate	Fine.
30	31.5	32	32	1.0039	57	34.5	30	32.46	A.M. Ny. P.M. N.Ey.	Mod.Light.	Fine. Towards midnight, fog.
31	30.5	31	31	. . .	. .	35	32	33.30	A.M. S.S.E. P.M. N.Ey.	Light.	Fog.
31	31	34	33	. . .	. .	35.5	29	32.58	S.Easterly.	Light.	Fog.
32	31.5	. .	31	. . .	. .	35	26.5	32.29	A.M. S.E. P.M. N.Wy.	Light.	Fog.
29	30.5	31.5	31.5	. . .	. .	33	26.5	30.83	N.N.W.	Light.	Fog.
29.5	31.5	31.5	31.5	. . .	. .	38	29	33.92	N. Easterly	Light.	A.M. Fine.—P.M. Hazy.
30.5	32	32	33	. . .	. .	34	29.5	32.42	N. Easterly.	Light.	Fog.
31	31	32	33	. . .	. .	36	29	32.73	N.byW.	Light.	A.M. Hazy.—P.M. Fine.
32	32	32	32.5	. . .	. .	36	33	34.85	Southerly.	Light.	Fog, occasional rain.
33	32.5	30	30	. . .	. .	34.5	33	33.58	Northerly.	Moderate.	Fog; rain towards midnight.
31	30	31	30	. . .	. .	34	33	33.37	Northerly.	Light.	Fog.—P.M. Continued rain.
31	30.5	30	32	. .	. .	34	30	32.50	A.M. NWy. P.M. SWy.	Light.	Thick fog, and rain.
29.5	31.5	32	32	. . .	. .	36.5	29.5	33.88	A.M. S.Ey. P.M. N.Ey.	Lt. Fresh.	A.M. Fog.—P.M. Clear.
30	32	31	30	. .	. .	35.5	33	34.42	S.E.	Fresh.	Hazy, with rain.
32.51	33.19	33.51	33.15	. . .	. .	53	26.5	35.81			

General Remarks.——Throughout July the winds were remarkably light and variable, accompanied by much fog. It will be seen, that the oscillations of the mercurial column in the Barometer were small during the month, and scarcely appear to have been influenced by any correspondent change in the atmosphere; it is observable, however, that in the only fresh wind which occurred (on the 31st), the Barometer had arrived at its minimum at the commencement of the breeze; from which time it continued to rise with the wind, and stood at its maximum about 4 P.M. on the following day, when the gale had also reached its highest: the wind gradually moderating, and veering to the Northward as the Barometer fell again.

ABSTRACT of the METEOROLOGICAL JOURNAL kept on BOARD

DATE. 1824.	NOON. North Latitude.	NOON. West Longitude.	BAROMETER corrected for Temperature, Neutral Point, and Capacity. A.M. 3h.	A.M. 9h.	P.M. 3h.	P.M. 9h.	Mean of 24 hours.	DANIELL'S HYGROMETER. 9 A.M. Temp.	9 A.M. Dew Pt.	9 A.M. Diff.	3 P.M. Temp.	3 P.M. Dew Pt.	3 P.M. Diff.	9 P.M. Temp.	9 P.M. Dew Pt.	9 P.M. Diff.
	° ′ ″	° ′ ″	Inches.	Inches.	Inches.	Inches.	Inches.	°	°	°	°	°	°	°	°	°
Aug. 1	71 20 08	*61 59 45	29.520	29 544	29.619	29.600	29.571	34	34	0	35.5	35.5	0	34	34	0
„ 2	71 21 12	62 06 27	.386	.315	.352	.458	.378	36	32	4	36	33	3	33.5	33	0.5
„ 3	*71 21 10	*62 05 45	.518	.585	.648	.647	.599	32.5	32.5	0	32.5	32.5	0	30	30	0
„ 4	71 31 19	61 55 07	.639	.569	.479	.449	.534	32	32	0	33	33	0	34	33	1
„ 5	71 27 15	*61 58 45	.432	.473	.602	.631	.534	33	33	0	34	34	0	32	32	0
„ 6	*71 30 00	*61 59 46	.632	.650	.666	.707	.664	34	34	0	34	34	0	33.5	33.5	0
„ 7	71 35 30	61 59 55	.781	.902	.978	30.040	.926	32	31	1	33	32	1	29	29	0
„ 8	71 33 27	61 57 30	30.065	30.062	30.011	29.938	30.019	30	29	1	29.5	29	0.5	30	29	1
„ 9	71 42 33	*62 01 45	29.868	29.782	29.702	.642	.748	33	33	0	36	33	3	34.5	33	1.5
„ 10	*71 45 00	*61 45 45	.668	.713	.737	.731	.712	33.5	33.5	0	33	33	0	33	33	0
„ 11	*71 53 30	*61 47 50	.704	.706	.857	.991	.814	33	33	0	30.5	30.5	0	30	29	1
„ 12	72 02 06	61 50 27	.960	.951	.908	.847	.916	30	28	2	34.5	30	4.5	32	31	1
„ 13	72 21 16	61 05 07	.716	.575	.520	.500	.578	32	32	0	34	29	5	29	27	2
„ 14	72 23 23	61 13 00	.493	.511	.542	.551	.524	33	29	4	35	29	6	31.5	31	0.5
„ 15	72 26 17	61 17 00	.561	.549	.516	.570	.549	34	29	5	34	29	5	29	28	1
„ 16	72 28 01	61 26 30	.664	.738	.760	.765	.732	24	24	0	27	26	1	23.5	23	0.5
„ 17	72 26 11	61 29 48	.725	.679	.621	.532	.649	22.5	22.5	0	23.5	23.5	0	23	23	0
„ 18	72 24 06	61 32 25	.454	.414	.386	.463	.429	23.5	23	0.5	26	26	0	27.5	26	1.5
„ 19	72 34 06	61 54 40	.550	.668	.772	.849	.710	34	31	3	34.5	31	3.5	31.5	31	0.5
„ 20	72 34 17	62 07 38	.881	.903	.929	.910	.906	32	30	2	32	32	0	29	29	0
„ 21	72 29 30	62 11 58	.838	.741	.632	.609	.705	28	28	0	30	30	0	24	24	0
„ 22	72 25 11	*62 18 47	.578	.553	.474	.437	.510	26	25	1	24	24	0	22.5	22.5	0
„ 23	72 22 50	*62 11 31	.443	.503	.564	.624	.533	26	26	0	30	30	0	29	29	0
„ 24	72 37 52	62 36 14	. . .	.745	.769	.795	.770	28.5	26.5	0	32	31	1	29	29	0
„ 25	72 50 46	63 09 09	29.801	.821	.828	.840	.822	31	31	0	28.5	28.5	0	20	20	0
„ 26	72 53 48	63 13 13	.830	.820	.772	.760	.795	24	24	0	29	25	4	16	16	0
„ 27	*72 58 00	*63 19 30	.749	.759	.765	.751	.756	30	30	0	29	29	0	29	29	0
„ 28	*73 05 00	*63 19 30	.677	.610	.534	.421	.560	33	33	0	34	34	0	33.5	33.5	0
„ 29	73 15 12	63 40 10	.336	.309	.371	.417	.358	33	33	0	33	33	0	31	31	0
„ 30	73 24 17	*64 00 00	.445	.515	.512	.367	.460	31	31	0	32	32	0	31	31	0
„ 31	73 43 59	64 43 43	.361	.364	.463	.463	.563	29	27	2	28	27	1	26.5	26.5	0
MEANS			29.6426	29.6461	29.6545	29.6582	29.6503	30.56	29.74	0.82	31.51	30.27	1.24	29.07	28.68	0.39

	PRESSURE of the ATMOSPHERE as observed. 3 A.M.	9 A.M.	3 P.M.	9 P.M.	During the Month.	Moisture of the Atmosphere. Mean of the Month. Temp. of the Air.	Dew Point.	Diff.	Mean Temperature of the Sea Water at the Surface.	DIRECTION of the WINDS. Number of Days at North.	N.E.	East.	S.E.	South.	S.W.	West.	N.W.	Round the Compass
	Inches.	Inches.	Inches.	Inches.	Inches.	°	°	°	°									
Max.	30.065	30.062	30.011	30.040	30.065													
Min.	29.336	29.309	29.352	29 367	29.309													
Mean	29.6426	29.6461	29.6545	29.6582	29.6503	30.38	29.56	0.82	28.99	3½	1½	3	7	3½	2½	1½	7	1½

HIS MAJESTY'S SHIP, HECLA; during the Month of August, 1824.

Sea Water. Temp. A.M. 3h.	Sea Water. Temp. A.M. 9h.	Sea Water. Temp. P.M. 3h.	Sea Water. Temp. P.M. 9h.	Temperature of the Atmosphere registered every two hours. Maximum.	Minimum.	Mean.	Prevailing Winds. Direction.	Velocity.	Prevailing Weather.
30°	30°	30°.5	30°.5	35°.5	32°	33°.87	S.E.byS.	Strong.	Hazy with rain.
30	30.5	30.5	30	36.5	32	34.46	N.N.E.	Moderate.	Cloudy, latter part rain and sleet.
29.5	30	30	29	32.5	29	31.35	S.S.E.	Fresh.	Thick fog, occasional rain and sleet.
29	30	30.5	30.5	35	29	32.29	A.M. S.E. P.M. N.	Light.	Fog.
30.5	30	30	30.5	34	30.5	32.79	S.S.W.	Light.	Thick fog, small rain.
31	30.5	32	32	34	33	33.50	S.S.E. N.N.E.	Light.	Thick fog and rain.
29	28.5	30	30	34	25	31.50	N.W.	Moderate.	Fog with rain.
28	29	28.5	30	31	23.5	28.79	S.Easterly.	Moderate.	Fog with sleet.
29	30	31	30	38	31	33.15	S.E.byE.	Moderate.	Cloudy, fog at intervals.
30	30	29.5	29.5	33.5	33	33.18	S.E. N.E.	Light.	Fog, continued rain.
30	30	28.5	28.5	34	28.5	31.58	Nearly Calm. W.	Moderate.	Rain, sleet, and snow; fog at intervals.
26	28.5	29	29	35	26	30.96	Round the Compass.	Very Light.	Cloudy, occasional fog, and heavy snow.
29	29	29	28.5	34	29	30.87	W.N.W. S.W.	Moderate.	Cloudy, continued snow till noon.
28.5	30	31	31	35	29.5	31.91	S.Ey. N.Ey.	Very Light.	Hazy with snow, fog in the Horizon.
29	29.5	29	29	35.5	26	31.33	N.Westerly.	Light.	Cloudy, showers of snow.
28.5	28	29	28	27.5	21	24.50	N.Westerly.	Light.	Thick fog.
28	28	28	28	25	20	22.54	N.W.	Light.	Thick fog and snow.
28	28	28	28	27.5	20	24.12	N.W. S.W.	Moderate.	A.M. Fog.—P.M. Cloudy with snow.
28	28	29	28.5	35	27	31.79	E.N.E.	Moderate.	Fine weather.
29	29	30	28	32	27	30.58	North.	Moderate.	A.M. Fine.—P.M. Fog and snow.
28	28	28	28	32	24	26.42	N.W.	Moderate.	Fog, occasional sleet and snow.
28	28	28.5	28.5	26	22.5	24.17	N.W.	Moderate.	Fog, continued snow.
28	28	28	28	30	18	25.08	S.W.	Moderate.	Hazy, small sleet.
28	28	29	29	32	27	29.29	S.S.E.	Moderate.	Hazy with snow.
28	29	28	28	31	19	27.21	N.Ey. N.Wy.	Very Light.	Thick fog.
28	28	28	28	31	16	22.63	Northerly. S.Wy.	Light.	Fog, fine about noon.
28	28	28.5	28	31	19	27.33	S.S.E.	Moderate.	Cloudy, occasional fog.
28	29	28.5	20	34	30	32.75	E.S.E.	Fresh.	Fog, rain, and snow.
29	28.5	28.5	28	34	31	32.83	E.S.E.	Moderate.	Fog and rain.
29	28.5	29	29	32	31	31.87	S.Easterly.	Moderate.	Thick fog, drizzling rain, and snow.
28	28	28	28	30	25	27.08	Westerly. S.Ey.	Light.	Fog.
28.77	28.95	20.2	29.03	36.5	16	29.72			

General Remarks.—The month of August was remarkable, as much for the quantity of fog, rain and snow which fell, as for the extraordinary low temperature of the atmosphere. Of the former, it is a striking fact that there was only one day in the whole month, in which the consecutive twenty-four hours were clear, or in which there was not actually a very considerably deposit, generally of snow or sleet. The low temperature will be sufficiently evident by a reference to the table given in p. 16 of the Narrative, shewing the comparative temperatures of the month of August, in the Polar Regions, for the five years immediately preceding, and the one subsequent to this.

The winds were generally light during the month, and the changes in the Barometer small; the Minimum of the Mercurial Column occurred after a fresh breeze from the E.S.E., with fog, rain, and snow; and it is observable that it attained its Maximum under very similar circumstances, viz.: a moderate breeze from the South-Eastward, with fog and sleet.

ABSTRACT of the METEOROLOGICAL JOURNAL kept on BOARD

DATE. 1824.	NOON. North Latitude.	NOON. West Longitude.	BAROMETER corrected for Temperature, Neutral Point, and Capacity. A.M. 3h.	A.M. 9h.	P.M. 3h.	P.M. 9h.	Mean of 24 hours.	DANIELL'S HYGROMETER. 9 A.M. Temp.	9 A.M. Dew Pt.	9 A.M. Diff.	3 P.M. Temp.	3 P.M. Dew Pt.	3 P.M. Diff.	9 P.M. Temp.	9 P.M. Dew Pt.	9 P.M. Diff.
	° ′ ″	° ′ ″	Inches.	Inches.	Inches.	Inches.	Inches.	°	°	°	°	°	°	°	°	°
Sept. 1	*73 49 00	*65 01 00	29.632	29.689	29.675	29.595	29.648	26	26	0	31	31	0	29	29	0
„ 2	*73 50 00	*64 58 00	.506	.454	.445	.495	.475	31	31	0	31	31	0	31	31	0
„ 3	*73 51 00	*65 07 00	.528	.563	.617	.675	.601	29	29	0	32	32	0	30	30	0
„ 4	74 27 15	66 00 22	.706	.760	.830	.829	.781	33	32	1	30	30	0	30	30	0
„ 5	*74 26 00	*66 07 10	.731	.664	.619	.585	.650	32	32	0	32	32	0	31	31	0
„ 6	*74 20 00	*66 52 15	.534	.432	.284	.141	.348	31	31	0	31	31	0	31	31	0
„ 7	*74 17 00	*68 22 20	.078	.147	.151	.116	.123	30	30	0	31	31	0	31	31	0
„ 8	74 07 00	69 54 24	.058	.030	.051	.167	.078	31	31	0	30	30	0	27	27	0
„ 9	74 15 02	73 24 40	.247	.313	.341	.353	.313	31	31	0	31.5	31.5	0	28	28	0
„ 10	74 11 48	79 03 00	.423	.456	.516	.580	.494	27.5	27.5	0	29	27.5	1.5	25.5	25	0.5
„ 11	74 24 00	81 50 36	.591	.669	.723	.828	.703	26	24	2	23	23	0	20	20	0
„ 12	74 12 44	*83 01 00	.815	.811	.783	.741	.787	19	19	0	20	18	2	18	18	0
„ 13	*73 58 30	*85 48 00	.659	.622	.574	.562	.604	. .	. .	. .	19	12	7	20	14	6
„ 14	73 59 32	*85 45 00	.552	.536	.542	.532	.540	24	18	6	21	11	10	21	21	0
„ 15	73 56 00	85 11 18	.516	.533	.554	.600	.551	22	22	0	22	20	2	22	20	2
„ 16	73 58 00	*84 55 00	.610	.669	.705	.731	.679	19.5	19	0.5	20	14	6	. .	. .	. .
„ 17	73 57 00	*83 57 30	.753	.768	.746	.744	.753	23	19	4	24	24	0	. .	. .	. .
„ 18			.704	.627	.606	.652	.647	17	14	3	19	14	5	. .	. .	. .
„ 19	Beset in Lan	caster's Sound	.710	.771	.858	.903	.810	22	16	6	24.5	21	3.5	. .	. .	.
„ 20	73 42 44	82 32 20	.935	.956	.991	30.011	.973	27	26	1	27	25	2	. .	. .	. .
„ 21			30.002	.988	.987	29.956	.983	28	24	4	28	26	2	.	. .	. .
„ 22			29.910	.879	.896	.933	.904	23	13	10	27	20	7	. .	. .	. .
„ 23	*73 50 30	*81 10 15	.944	.940	.965	.976	.956	26	26	0	26.5	26.5	0	. .	. .	. .
„ 24	*73 47 00	*82 32 40	.910	.787	.642	.642	.745	27	26	1	31.5	26	5.5	. .	. .	. .
„ 25	*73 52 40	*87 32 15	.963	.969	30.184	30.349	30.116	25	25	0	20.5	20.5	0	. .	. .	. .
„ 26	73 48 49	*87 25 10	30.422	30.437	.326	.083	.317	20.5	18.5	2	25.5	15	10.5	. .	. .	. .
„ 27	Off Port	Bowen.	29.901	29.834	29.773	29.746	29.814	32	32	0	34	34	0	. .	. .	. .
„ 28			.752	.849	.972	30.045	.904	31.5	27	4.5	28.5	27	1.5	. .	. .	. .
„ 29	In Port	Bowen.	30.091	30.035	.847	29.608	.895	25	24	1	27.5	24	3.5	. .	. .	. .
„ 30			29.515	29.430	.431	.516	.473	27.5	27.5	0	28	28	0	. .	. .	. .
MEANS			29.6899	29.6879	29.6878	29.6898	29.6888	26.43	24.84	1.59	26.83	24.53	2.30	26.3	25.73	0.57

	PRESSURE of the ATMOSPHERE as observed at 3 A.M.	9 A.M.	3 P.M.	9 P.M.	During the Month.	Moisture of the Atmosphere. Mean of the Month. Temp. of the Air.	Dew Point.	Diff.	Mean Temperature of the Sea-Water at the Surface.	DIRECTION of the WINDS. Number of Days at North.	N.E.	East.	S.E.	South.	S.W.	West.	N.W.	Calm
	Inches.	Inches.	Inches.	Inches.	Inches.													
Max.	30.422	30.437	30.326	30.349	30.437													
Min.	29.058	29.030	29.051	29.116	29.030	°	°	°	°									
Mean	29.6899	29.6879	29.6878	29.6898	29.6888	26.52	25.03	1.49	28.16	1½	1½	4½	9	0	2	9	1½	1

HIS MAJESTY'S SHIP HECLA; during the Month of SEPTEMBER, 1824.

SEA-WATER.				Temperature of the Air in the Shade, registered every two hours.			PREVAILING WINDS.		PREVAILING WEATHER.
A.M.		P.M.							
3^h.	9^h.	3^h.	9^h.	Maximum.	Minimum.	Mean.	Direction.	Velocity.	
° 28	° 28	° 28	° 28	° 31	° 25	° 27.88	S.Easterly.	A.M. Mod. P.M. Str.	Occasional rain.
28	28	28	28	32	30	31.04	S.Easterly.	A.M. Str. P.M. Mod.	Constant snow.
28	28	28	28	32	28	30.25	S.Easterly.	Moderate.	Fog.
28	28.5	28	28	33	25	30.04	S.E^{y}. N.E^{y}.	Mod. Light.	Cloudy; latter part fog.
28	28	28	28	32	30	31.00	S.E.	Light.	With sleet and rain.
28	28	28	28	31	30	30.79	S.E^{y}	A.M. Lt. P.M. Str.	Constant snow.
28	28	28	28	31	30	30.29	S.E.	Strong. Mod.	Hazy, with sleet.
28	28	28	28	31	26	29.12	N.E. S.E.	Light.	Thick, with constant snow.
28	30	32	30	32	27	29.62	N.E. North.	Light. Fresh.	Hazy, constant snow.
31	31	29	29	29	25	27.25	North. Easterly.	Mod. Light.	Cloudy, with small rain.
29	29	28	28	26	20	23.46	Westerly.	Moderate.	Fine.
28	28	28	28	20	18	18.96	N.W^{y}. Calm.	Very Light.	Cloudy, small snow.
28	28	28	28	20	19	19.77	North. N.W.	Light.	Cloudy.
28	28	28	28	24	20	21.42	W.N.W.	Mod. Fresh.	A.M. Fine.—P.M. Cloudy.
28	28	28	28	23	21	21.67	W.S.W.	Fresh. Mod.	Cloudy, with showers of snow.
28	[illegible]	28	28	20	19	19.79	West. S.W^{y}.	Light.	Cloudy.
28	[illegible]	[illegible]	28	24	19	22.14	Calm. Westerly.	Light.	Thick, small snow.
28	[illegible]	[illegible]	28	21	16	18.79	Westerly.	Mod. Strong.	Cloudy.
28	28	28	28	25	19	22.33	W.S.W.	Fresh. Mod.	Cloudy.
28	28	28	28	28	23	26.12	S.W. W.S.W.	Moderate.	Cloudy.
28	28	28	28	31	24	26.96	W.S.W.	Moderate.	Cloudy.
28	28	28	28	27	23	25.05	S.W^{y}. Westerly.	Mod. Light.	Cloudy, small snow.
28	28	28	28	28	24	26.21	Easterly.	Light. Fresh.	Cloudy, with snow.
28	28	28	28	31.5	25	28.17	E.N.E.	Fresh.	Cloudy, with small snow.
28	28	28	28	29	17	23.08	Westerly.	Moderate.	Cloudy.
28	28	28	28	29	16	22.61	S.E^{y}.	Light. Strong.	A.M. Fine.—P.M. Constant snow.
28	28	28	28	34	30	32.75	S.E^{y}.	Fresh. Mod.	Cloudy; snow, sleet, and rain.
28	28	28	28	31.5	26	29.17	S.W^{y}. Easterly.	Fresh. Mod.	Cloudy, sleet at times.
28	28	28	28	28	21	24.78	E.S.E.	Fresh. Strong.	Cloudy; violent squalls at night.
28	28	28	28	28	19.5	25.96	Easterly. N.W^{y}.	Moderate.	Constant snow.
28.13	28.22	28.17	28.10	34	16	25.883			

REMARKS.—Fresh winds and much squally weather prevailed throughout September. A gale that occurred on the 6th was indicated by a gradual fall of the Barometer on the preceding day, the Mercury continuing to fall until 3^h. A.M., on the 7th, at which time the weather moderated, and the Barometer rose .073 inches in the next twelve hours; it then again descended; and in eighteen hours more stood .048 inches lower than the minimum of the former depression, although the weather continued quite moderate. Several other gales which occurred were marked by a simultaneous depression of the Mercurial Column, which generally continued to fall twenty-four hours after the weather had become moderate.

ABSTRACT of the METEOROLOGICAL JOURNAL kept on BOARD HIS

DATE. 1824.		Barometer corrected for Temperature, Neutral Point, and Capacity. A. M. 3h.	A. M. 9h.	P. M. 3h.	P. M. 9h.	Mean of 24 hours.	Temperature of the Atmosphere registered every two hours. Maximum.	Minimum.	Mean.
		Inches.	Inches.	Inches.	Inches.	Inches.	°	°	°
October	1	29.548	29.534	29.497	29.448	29.507	+ 18	+ 13.5	+ 16.87
„	2	.417	.399	.388	.409	.402	+ 18	+ 13	+ 15.46
„	3	.433	.444	.459	.491	.457	+ 15	+ 5	+ 10.04
„	4	.509	.472	.491	.495	.492	+ 25	+ 13	+ 21.25
„	5	.493	.499	.495	.465	.488	+ 27	+ 25	+ 26.21
„	6	.396	.399	.438	.644	.469	+ 31.5	+ 18	+ 25.96
„	7	.733	.606	.461	.442	.560	+ 26	+ 9.5	+ 20.04
„	8	.824	.787	30.005	30.105	.880	+ 21	+ 13	+ 14.86
„	9	30.081	.919	29.794	29.798	.898	+ 22	+ 12	+ 18.08
„	10	29.933	30.083	30.174	30.211	30.100	+ 18.5	+ 13	+ 15.62
„	11	30.214	.177	.152	.103	.161	+ 19	+ 11	+ 15.50
„	12	29.920	29.827	29.815	.073	29.934	+ 19	+ 11	+ 14.71
„	13	30.144	30.157	30.114	29.988	30.101	+ 23	+ 8.5	+ 15.71
„	14	29.933	29.906	29.899	.887	29.906	+ 29	+ 18.5	+ 24.83
„	15	.883	.886	.910	.930	.902	+ 21	+ 15	+ 17.83
„	16	.955	30.009	30.052	30.051	30.017	+ 25	+ 20	+ 21.50
„	17	30.029	.014	29.998	29.980	.005	+ 21	+ 9	+ 15.62
„	18	29.970	.006	30.088	30.240	.076	+ 18	+ 7.5	+ 13.42
„	19	30.193	.163	.188	.204	.187	+ 8	+ 4	+ 6.37
„	20	.227	.205	.187	.166	.196	+ 4	0	+ 1.83
„	21	.164	.122	.118	.067	.118	+ 5	+ 2	+ 3.96
„	22	.061	.045	.094	.122	.080	+ 4	− 4	+ 2.08
„	23	.161	.203	.241	.261	.216	+ 5	− 1	+ 2.96
„	24	.268	.265	.265	.273	.268	+ 7.5	+ 4	+ 5.87
„	25	.292	.306	.327	.321	.309	+ 10	+ 3	+ 6.17
„	26	.354	.358	.362	.380	.364	+ 8.5	+ 3	+ 5.17
„	27	.372	.381	.391	.367	.378	+ 3	− 1	+ 1.00
„	28	.349	.314	.265	.192	.278	− 3	− 12	− 7.87
„	29	.101	.020	29.993	.011	.031	+ 1	− 10.5	− 4.50
„	30	.051	.070	30.085	.095	.075	− 5	− 11	− 8.92
„	31	.068	29.993	29.932	29.901	29.973	+ 1	− 8	− 1.29
MEANS . .		29.9635	29.9539	29.9604	29.9716	29.9623	+ 31.5	− 12	+ 10.85

PRESSURE of the ATMOSPHERE as observed at

	3 A.M.	9 A.M.	3 P.M.	9 P.M.	During the Month.
	Inches.	Inches.	Inches.	Inches.	Inches.
Maximum . . .	30.372	30.381	30.391	30.380	30.391
Minimum . . .	29.396	29.399	29.383	29.409	29.383
Mean	29.9635	29.9539	29.9604	29.9716	29.9623

MAJESTY'S SHIP, HECLA, at PORT BOWEN; during the Month of OCTOBER, 1824.

Prevailing Winds. Direction.	Prevailing Winds. Velocity.	PREVAILING WEATHER.
N.W. NE.	Light.	Cloudy; small snow.
E.S.E.	Light.	Hazy; small snow.
E.S.E.	Light.	Fine.
E.S.E.	Light. Fresh.	Fine. Squally at night.
N.Easterly.	Strong.	Hazy; drift and snow.
N.E. Easterly.	Fresh.	Hazy; snow.
N.N.E.	Moderate.	Fine; occasional squalls.
E.S.E.	Fresh.	Heavy drift; clear over head.
E.byN. to S.W.	Moderate.	Hazy; snow.
S.S.W.	Moderate. Fresh.	Constant snow.
S.E.	Fresh. Light.	Hazy.
S.Easterly.	Light.	Hazy.
S. Easterly.	Light.	Cloudy; wind variable.
S.E.	Light.	A.M. Cloudy—P.M. Clear.
E.S.E.	Moderate.	Fine.
S.E. N.N.E.	Moderate.	Cloudy, with squalls.
Northy. Easty.	Light.	Fine.
Northy. N.W	Light.	Hazy.
N.Westerly.	Light.	Fine, occasional haze.
S.Easterly.	Light.	Fine.
East.	Light.	Hazy.
E.S.E.	Light.	Hazy.
East.	Light.	Hazy.
Easty. W.N.W.	Light.	Hazy.
N.Westerly.	Light.	Hazy.
N.N.W.	Moderate.	Cloudy.
N.N.E.	Light.	Hazy.
Easterly.	Moderate.	Fine.
N.Westerly.	Moderate.	Fine.
N.W.	Moderate.	Fine; occasional drift.
S.E.	Light.	Hazy.

REMARKS.

During the month of October, there occurred a prevalence of easterly and south-easterly winds; which, however, were generally light and unaccompanied by any marked changes in the Barometer. A gale of wind also occurred (on the 6th), without producing any material depression of the Mercurial Column, the mean height of which was considerably above that of the four preceding months.

The daily observations of the Hygrometer were discontinued, on account of the difficulty and uncertainty in making them in severely cold weather. An endeavour to ascertain the degree of moisture in the atmosphere was occasionally made throughout the winter, and these are noted as they occurred.

DIRECTION of the WINDS.

Number of Days at

North.	N.E.	East.	S.E.	South.	S.W.	West.	N.W.	Round the Compass.
4	2½	10½	6½	1	0	½	5	1

ABSTRACT of the METEOROLOGICAL JOURNAL kept on BOARD HIS

DATE. 1824.	BAROMETER corrected for TEMPERATURE, NEUTRAL POINT, and CAPACITY. A.M. 3h.	A.M. 4h.	A.M. 9h.	A.M. 10h.	P.M. 3h.	P.M. 4h.	P.M. 9h.	P.M. 10h.	Mean of 24 hours.	No. 514 lower than No. 80.
	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	
Nov. 1	29.889	29.887	29.878	29.885	29.917	29.917	29.915	29.915	29.900	.011
„ 2	.916	.931	.892	.907	.913	.899	.908	.905	.909	.011
„ 3	.933	.942	.941	.939	.959	.947	.970	.972	.950	.011
„ 4	30.017	30.030	30.060	30.067	30.085	30.084	30.090	30.077	30.064	.014
„ 5	.043	.043	.036	.029	.032	.036	.065	.090	.047	.012
„ 6	.206	.215	.291	.283	.343	.361	.404	.406	.314	.022
„ 7	.420	.446	.424	.429	.467	.470	.486	.496	.455	.915
„ 8	.445	.465	.363	.335	.192	.203	.217	.220	.306	.005
„ 9	.241	.243	.168	.146	.003	29.980	29.827	29.799	.051	.005
„ 10	29.690	29.690	29.662	29.636	29.611	.600	.535	.531	29.619	.012
„ 11	.521	.522	.511	.524	.580	.585	.715	.744	.588	.019
„ 12	.807	.812	.837	.842	.850	.853	.885	.892	.847	.011
„ 13	.926	.940	.951	.954	30.007	30.005	30.055	30.055	.987	.016
„ 14	30.120	30.115	30.142	30.120	.079	.080	29.921	29.856	30.054	.010
„ 15	29.725	29.700	29.680	29.663	29.638	29.631	.626	.624	29.661	.011
„ 16	.645	.654	.657	.671	.700	.740	.711	.716	.687	.011
„ 17	.738	.744	.701	.689	.688	.658	.598	.558	.672	.012
„ 18	.533	.534	.510	.505	.535	.521	.504	.446	.516	.011
„ 19	.489	.491	.544	.540	.624	.625	.692	.710	.589	.012
„ 20	.796	.819	.880	.886	.966	.966	.972	.978	.908	.012
„ 21	.966	.968	.938	.928	.881	.854	.797	.763	.887	.011
„ 22	.713	.686	.640	.622	.653	.666	.716	.707	.675	. .
„ 23	.783	.801	.834	.810	.867	.850	.787	.739	.809	. .
„ 24	.750	.753	.798	.805	.868	.869	.907	.908	.832	. .
„ 25	.925	.953	30.016	30.028	30.094	30.108	30.128	30.132	30.048	. .
„ 26	30.151	30.156	.169	.153	.067	.039	29.881	29.868	.060	. .
„ 27	29.879	29.878	29.874	29.861	29.812	29.791	.772	.757	29.828	. .
„ 28	.808	.814	.839	.943	30.010	30.022	30.002	.995	.929	. .
„ 29	.936	.927	.856	.852	29.827	29.815	29.801	.794	.851	. .
„ 30	.808	.810	.866	.860	.934	29.939	30.025	30.034	.909	. .
MEANS	20.8943	29.8990	29.8986	29.8971	29.9067	29.9037	20.8971	29.8909	29.8984	.0124

PRESSURE of the ATMOSPHERE as observed at

	3h. A.M.	4h. A.M.	9h. A.M.	10h. A.M.	3h. P.M.	4h. P.M.	9h. P.M.	10h. P.M.	During the Month.
	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Max.	30.455	30.465	30.424	30.429	30.467	30.170	30.486	30.496	30.496
Min.	29.489	29.491	29.510	29.505	29.535	29.521	29.504	29.488	29.488
Mean	29.8943	29.8990	29.8986	29.8971	29.9067	29.9037	29.8971	29.8900	29.8984

DIRECTION of the WINDS.

Number of Days at

N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Round the Comp.
2	„	8½	8	„	2⅓	1½	5½	2

MAJESTY'S SHIP, HECLA, at Port Bowen, during the Month of November, 1824.

Temperature of the Atmosphere, registered every two hours.			Prevailing Winds.		Prevailing Weather and Other Remarks.
Maximum.	Minimum.	Mean.	Direction.	Velocity.	
+ 5°	− 4°	− 1.17°	East.	Light.	Overcast.
+ 5	+ 1	+ 2.92	S.E.	A.M. Lt. P.M. Fresh.	Hazy; latter part squally.
+ 6.5	+ 4	+ 5.28	S.E.b.E.	Strong.	Hazy; drift.
+10	+ 4.5	+ 7.08	S.Easterly.	Moderate.	Overcast; drift.
+12	+ 1	+ 9.50	A.M. S.Ey. P.M. S.W.	Moderate.	Overcast; squally.
− 1	− 7	− 3.54	N.W.	Moderate.	Overcast.
− 8	−18	−13.12	A.M. N.W. P.M. Ey.	Light.	Fine.
+ 2	−17	− 6.25	Round the Compass.	Moderate.	Hazy; frequent squalls and drift.
+ 8	− 1	+ 4.62	S.Easterly.	A.M. Lt. P.M. Fresh.	Hazy. P.M. Heavy squalls.
+10	+ 2	+ 5.58	S.E.	Fresh.	Hazy, with drift and heavy squalls.
+ 4	− 4	+ 1.12	A.M. E.S.E. P.M. N.N.W.	Light. Strong.	Hazy, with snow.
+ 8.5	−13	−11.04	N.W.	Fresh.	Much drift; clear overhead.
− 9	−11	− 9.79	N.N.W.	Moderate.	Clear.
+ 5	−14	− 6.29	Easterly.	Moderate.	Clear.
+ 8	+ 2	+ 5.08	S.Westerly.	Moderate.	Hazy; occasional squalls and small snow.
− 5	−17.5	−13.21	N.W.	Moderate.	Clear.
− 8.5	−14	−11.29	N.W.	Moderate.	Clear; occasional squalls. Aurora brilliant in the morning about 45° above the horizon.
− 9	−18.5	−13.04	N.W.	Moderate.	Clear. Aurora faint in the W.S.W. at night.
−11	−21	−18.04	Round the Compass.	Light.	Clear.
−12.5	−23	−19.42	A.M. Ey. P.M. Wy.	Light.	Clear.
− 3.5	−17	−11.96	Westerly.	Light.	Clear; hazy at night.
− 6	−18	−13.54	Easterly. E.S.E.	Light. Fresh.	Clear; occasional drift.
− 2	−19	−13.08	Easterly.	Light.	A.M. Clear. P.M. Hazy; wind variable.
+ 1	−15.5	− 6.83	E.S.E.	Light.	Hazy.
−10	−23.5	−16.92	S.Easterly.	Light.	Clear. Aurora to the Southward at night in faint arches.
+ 7	−26	−16.12	E.S.E.	Light.	Clear; hazy at night. Aurora forming an irregular arc from S.S.E. to N.W.b.N.; sometimes very brilliant, with pencilled rays shooting towards the Zenith, seen at 6 A.M.
+17	+ 7	+12.12	S.Easterly.	Mod., with strong squalls.	Hazy, with drift. At 7 A.M. the Aurora faint from E.S.E. to N.N.W.
+10.5	− 8	+ 1.92	E.S.E.	Moderate.	Clear.
+ 6	− 3	+ 2.00	A.M. S.Ey. P.M. N.	Light.	Hazy.
+ 3	− 8	− 2.46	S.Westerly.	Moderate.	Ditto.
+17	−26	− 4.996			

General Remarks.—In the monthly abstracts preceding this, the height of the Mercurial Column is that registered by a marine Barometer by Jones (No. 514), which on examination in London had been found the most accurate of the marine Barometers supplied. The ships being now frozen up and free from motion, a mountain Barometer, by Newman (No. 80), which Mr. Daniell had examined and recommended as a standard, was employed instead; and three weeks' comparative observations were made of this instrument with 514, in order to ascertain their differences. By these it was found that the marine Barometer always stood lower than No. 80: the mean daily difference is shewn in the foregoing abstract, indicating a mean correction of +.012, which has, accordingly, been added to the observations registered in the Abstracts from June to October inclusive.

With a view of ascertaining, if possible, the horary oscillations of the Mercurial Column, the Barometer was more frequently registered during the winter months, selecting the hours particularly recommended for this purpose. The abstracts will best shew the result of these observations. The changes of the Barometer did not appear accompanied by any correspondent change either in the degree or direction of the wind, or in the actual state of the weather. A much greater proportion of easterly and south-easterly winds than is usual in the winter of these latitudes, prevailed throughout November, accompanied generally by overcast hazy weather. This was, perhaps, occasioned by local circumstances alluded to in the Narrative.

ABSTRACT of the METEOROLOGICAL JOURNAL kept on BOARD HIS

DATE. 1824.	BAROMETER corrected for TEMPERATURE, NEUTRAL POINT, and CAPACITY. A.M. 3h.	A.M. 4h.	A.M. 9h.	A.M. 10h.	P.M. 3h.	P.M. 4h.	P.M. 9h.	P.M. 10h.	Mean of 24 hours.	Mean Temperature of the Lower Deck.
	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	°
December 1	30.095	30.097	30.141	30.137	30.182	30.175	30.165	30.168	30.145	+72.5
„ 2	.169	.180	.146	.146	.085	.083	.003	29.988	.100	69.7
„ 3	29.910	29.901	29.793	29.759	29.655	29.642	29.537	.509	29.713	73.3
„ 4	.491	.481	.515	.522	.629	.650	.749	.753	.599	73.7
„ 5	.814	.825	.986	.942	30.008	30.009	30.044	30.038	.958	73.7
„ 6	30.030	30.021	.974	.971	29.897	29.893	29.783	29.768	.917	72.7
„ 7	29.722	29.718	681	.669	.660	.630	.591	.583	.657	74.0
„ 8	.572	.582	.566	.566	.592	.578	.624	.479	.570	73.5
„ 9	.698	.731	.822	.822	.826	.811	.769	.760	.780	75.0
„ 10	.718	.717	.692	.684	.609	.660	.636	.646	.670	73.7
„ 11	.663	.667	.636	.640	.674	.687	.813	.811	.699	75.0
„ 12	.877	.895	.901	.887	.840	.840	.773	.779	.849	74.0
„ 13	.853	.853	.958	.979	30.067	30.066	30.129	30.135	30.005	72.2
„ 14	30.160	30.196	30.205	30.207	.235	.233	.282	.290	.226	73.7
„ 15	.332	.339	.395	.395	.421	.414	.400	.395	.386	72.4
„ 16	.368	.380	.316	.296	.253	.248	.178	.159	.275	74.7
„ 17	.089	.087	.039	.035	.024	.030	29.973	29.968	.031	71.2
„ 18	29.902	29.891	29.863	29.825	29.810	29.769	.711	.705	29.809	68.7
„ 19	.665	.660	.575	.587	.534	.528	.493	.491	.567	71.2
„ 20	.561	.530	.553	.556	.841	.656	.747	.757	.625	71.7
„ 21	.827	.833	.818	.832	.853	.856	.917	.916	.856	67.0
„ 22	.941	.953	.958	.962	.943	.951	.917	.908	.942	69.7
„ 23	.909	.904	.909	.908	.910	.908	.917	.916	.910	69.3
„ 24	.699	.898	.880	.881	.854	.855	.850	.843	.870	71.3
„ 25	.861	.851	.911	.909	.948	.977	30.012	30.016	.936	74.0
„ 26	30.046	30.072	30.087	30.078	30.084	30.089	.080	.074	30.076	68.7
„ 27	.063	.062	29.978	29.975	29.907	29.889	29.834	29.800	29.938	70.3
„ 28	29.745	29.744	.676	.649	.626	.625	.603	.578	.656	69.7
„ 29	.568	.594	.620	.638	.723	.738	.819	.777	.685	71.2
„ 30	.791	.788	.730	.738	.728	.716	.723	.718	.741	71.2
„ 31	.711	.730	.735	.736	.730	.749	.782	.780	.744	75.0
MEANS .	29.8726	29.8767	29.8729	29.8687	29.8693	29.8695	29.8663	29.8551	29.8689	+72.1

PRESSURE of the ATMOSPHERE as observed at

	3 A.M.	4 A.M.	9 A.M.	10 A.M.	3 P.M.	4 P.M.	9 P.M.	10 P.M.	During the Month.
	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Max.	30.368	30.380	30.395	30.395	30.421	30.414	30.400	30.395	30.421
Min.	29.491	29.481	29.515	29.522	29.534	29.528	29.493	29.491	29.481
Mean	29.8726	29.8767	29.8729	29.8687	29.8693	29.8695	29.8663	29.8551	29.8689

DIRECTION of the WINDS.

Number of Days at

N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Round the Compass
4	1	15	4½	„	1	1½	2	2

MAJESTY'S SHIP, HECLA, at PORT BOWEN, during the Month of DECEMBER, 1824.

Temperature of the Atmosphere, registered every two hours. Maximum.	Minimum.	Mean.	Prevailing Winds. Direction.	Velocity.	Prevailing Weather and Other Remarks.
−11°	−20°.5	−16°.42	S.Wly. Easterly.	Moderate.	Clear. Aurora faintly seen in the morning.
16	21	18.37	S.Easterly.	Moderate.	A.M. Clear. P.M. Overcast.
12	16	14.25	Northerly.	Moderate.	Hazy.
16	20	18.17	Northerly.	Light.	Hazy.
20	24	21.58	Northerly.	Light.	Clear.
11.5	22	18.17	E.S.E.	Light.	Clear.
4.5	12.5	9.25	N.Easterly	Very light.	Clear; wind variable.
10	19.5	13.83	Nly. Easterly.	Light.	Clear. At 7 P.M. a meteor was observed in S.S.W.
7	21	15.25	E.S.E.	Light.	Clear. At 6 P.M. a meteor seen to the northward.
9.5	20	15.58	Round the Compass.	Very light.	Clear; hazy about the horizon.
6.5	14	11.13	N.Westerly.	Moderate.	Hazy, with snow-drift.
5	17	10.58	Easterly.	Light.	Overcast.
12	23	20.01	S.S.W. to N.W.	Light.	Clear, partially overcast; wind variable.
23	26.5	25.29	N.Westerly	Moderate.	Clear. Between 5 and 6 A.M. several brilliant meteors seen.
26	34.5	30.54	Westerly. Easterly.	Very light.	Clear.
30	25	33.21	E.S.E.	Light.	Clear. At 7 A.M. the aurora was visible from E.S.E. to W.S.W.
25.5	31	27.96	E.S.E.	Moderate. Fresh.	Overcast.
18.5	26	22.08	S.E.	Strong.	Hazy; heavy snow-drift.
13	17.5	14.83	S.Easterly.	Strong. More Mod.	Hazy; much snow-drift.
14	28	19.54	S.Ely. Northerly.	Light.	Overcast. The aurora borealis was frequently seen in these five days; sometimes brilliant, and forming well-defined arcs, with rays shooting towards the zenith, and at other times appearing as a luminous blotch or cloud.
25	33	29.17	Round the Compass.	Very light.	Clear.
25	30	26.67	N.E. to S.E.	Light.	Clear.
25	33	30.04	Easterly.	Light.	Clear.
11	30	17.83	Easterly. S.Wly.	Light.	Overcast.
14	26	20.58	S.Easterly.	Light.	Clear.
22.5	27	25.71	Easterly.	Moderate.	Clear.
12	22	16.92	E.S.E.	Fresh.	Overcast; much snow-drift.
8	11	9.21	E.S.E.	Fresh.	Overcast; heavy squalls, with much drift.
8.5	16.5	11.79	E.S.E.	Fresh. Moderate.	A.M. Heavy squalls. P.M. Clear.
9.5	18	12.29	E.S.E.	Moderate.	Overcast.
11	22	11.21	E.S.E.	Light.	Overcast.
− 4.5	−35	−19.05			

GENERAL REMARKS.—Much fine weather, with light and moderate breezes, occurred in December. The general prevalence of easterly and south-easterly winds continued, and was probably to be attributed to some local modification of their true direction.

Two experiments to ascertain if any moisture existed in the atmosphere were made in the course of this month, with Mr. Daniell's hygrometer; but none could be detected. On the 21st, the wind being light from the northward, with a perfectly clear sky, the instrument was exposed until both thermometers indicated the temperature of the atmosphere, which was − 30°; and the freezing mixture (muriate of lime and snow) being then applied to the covered ball, the ether soon became frozen, and the thermometer immersed in it indicated − 46°, without the slightest appearance of deposit. Mr. Foster repeated this experiment on the 25th with very similar results, the temperature of the atmosphere being then −25°.5, with calm and clear weather.

ABSTRACT of the METEOROLOGICAL JOURNAL kept on BOARD HIS

DATE. 1825.	MOUNTAIN BAROMETER, No. 80, corrected for TEMPERATURE, NEUTRAL POINT, and CAPACITY. A. M. 3h.	A. M. 4h.	A. M. 9h.	A. M. 10h.	P. M. 3h.	P. M. 4h.	P. M. 9h.	P. M. 10h.	Mean of 24 hours.	Mean Temperature of the Lower Deck.
	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	°
January 1	29.825	29.823	29.854	29.861	29.889	29.893	29.924	29.928	29.875	+76
„ 2	.971	.973	.975	.969	.965	.958	.935	.927	.950	69
„ 3	.917	.931	.924	.915	.920	.919	.903	.900	.916	71.5
„ 4	.853	.960	.763	.742	.628	.604	.510	.489	.694	68.5
„ 5	.455	.446	.428	.419	.453	.449	.458	.450	.445	72
„ 6	.451	.432	.404	.384	.367	.371	.436	.449	.409	69
„ 7	.501	.542	.598	.596	.634	.636	.641	.605	.594	68.7
„ 8	.548	.533	.480	.479	.488	.484	.470	.439	.490	66.7
„ 9	.400	.385	.469	.481	.581	.614	.755	.784	.559	67.3
„ 10	.913	.922	30.020	30.017	30.072	30.086	30.156	30.169	30.041	71
„ 11	30.222	30.237	.282	.274	.250	.253	.222	.190	.241	69.7
„ 12	.142	.144	.120	.100	.078	.074	.014	.007	.085	67.5
„ 13	29.914	29.917	29.798	29.796	29.705	29.680	29.576	.569	29.748	71.5
„ 14	.534	.530	.486	.477	.490	.481	.630	.580	.526	70
„ 15	.818	.638	.694	.701	.786	.803	.830	.824	.737	69.2
„ 16	.842	.844	.836	.827	.845	.810	.841	.827	.838	70.7
„ 17	.806	.808	.760	.738	.725	.719	.698	.691	.743	69.5
„ 18	.668	.669	.675	.657	.684	.654	.618	.643	.660	69
„ 19	.674	.660	.676	.707	.722	.725	.744	.739	.706	69
„ 20	.702	.702	.627	.604	.523	.496	.411	.403	.533	66
„ 21	.341	.340	.330	.321	.328	.337	.385	.335	.333	68.5
„ 22	.334	.352	.358	.373	.444	.454	.489	.490	.412	68
„ 23	.575	.576	.620	.618	.711	.722	.757	.769	.672	70.2
„ 24	.831	.833	.882	.877	.910	.912	.936	.934	.889	66.7
„ 25	.942	.933	.918	.908	.891	.882	.862	.854	.899	67.2
„ 26	.836	.838	.609	.807	.791	.798	.834	.835	.818	65.9
„ 27	.852	.859	.864	.854	.938	.921	.937	.934	.895	69.5
„ 28	.960	.952	.911	.939	.868	.851	.890	.886	.011	69.2
„ 29	.905	.902	.898	.896	.912	.911	.943	.962	.916	70
„ 30	30.017	30.025	30.060	30.069	30.092	30.096	30.074	30.060	30.062	69.2
„ 31	.035	.039	29.948	29.939	29.936	29.932	29.940	29.940	29.989	67
MEANS .	29.7610	29.7660	29.7580	29.7511	29.7614	29.7599	29.7677	29.7617	29.7612	+69.13

PRESSURE of the ATMOSPHERE as observed at

	3 A.M.	4 A.M.	9 A.M.	10 A.M.	3 P.M.	4 P.M.	9 P.M.	10 P.M.	During the Month.
	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Max.	30.222	30.237	30.282	30.274	30.250	30.253	30.222	30.190	30.282
Min.	29.334	29.340	29.330	29.321	29.328	29.337	29.335	29.335	29.321
Mean	29.7610	29.7660	29.7580	29.7541	29.7614	29.7599	29.7677	29.7617	29.7612

DIRECTION of the WINDS.

Number of Days at

N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Round the Compass
3	2½	18	1½	0	0	0	3	3

BOARD HIS

Y. Mean of 24 hours.	Mean Temperature of the Lower Deck.
Inches. 29.875	+76°
.959	69
.916	71.5
.694	68.5
.445	72
.409	69
.591	68.7
.490	66.7
.559	67.3
30.041	71
.241	69.7
.085	67.5
29.748	71.5
.526	70
.737	69.2
.838	70.7
.743	69.5
.660	69
.706	69
.533	66
.333	68.5
.412	68
.672	70.2
.889	66.7
.899	67.2
.818	65.9
.895	69.5
.911	69.2
.916	70
30.062	69.2
29.989	67
29.7612	+69.13

he WINDS.

ys at

W.	W.	N.W.	Round the Compass
0	0	3	3

MAJESTY'S SHIP HECLA, at PORT BOWEN; during the Month of JANUARY, 1825.

Temperature of the Atmosphere registered every two hours.			Prevailing Winds.		Prevailing Weather, and other Remarks.
Maximum.	Minimum.	Mean.	Direction.	Velocity.	
−22°	−27°	−24.17°	Easterly.	Light.	Clear.
25	28	26.62	E.S.E.	Light.	Clear.
26	32	28.62	Easterly.	Moderate.	Clear. Aurora faint to the Southward.
27	32.5	29.58	Round the Compass.	Light.	Clear; wind variable.
31.5	36	33.54	Easterly.	Light.	Clear.
27	34	31.92	Round the Compass.	Light.	Clear; hazy in horizon.
32.5	35	33.87	Easterly.	Light.	Clear. Aurora brilliant in the W.N.W. at 6 P.M.; seen faintly all the evening.
21.5	32	28.46	E.S.E.	Moderate. Fresh.	Cloudy; latter part squally, with much snow-drift.
20.5	24.5	22.42	E.S.E.	Strong.	Hazy; heavy snow-drift.
25.5	36	31.54	E.S.E.	Moderate.	Clear.
35	38	36.87	N.Easterly.	Light.	Clear. Aurora forming an arc from S.E. to N.W.
37.5	39	38.08	Easterly.	Light.	Clear. Aurora rather bright in the morning.
15	38	24.04	Round the Compass.	Light.	Overcast.
15	20	18.08	S.Easterly.	Fresh.	Overcast; small snow falling.
20.5	28	25.67	Easterly.	Light.	Clear. The Aurora seen frequently during these days, having a tendency to form arches; generally from S.E. to S.W.: it was sometimes observed to shoot out brilliant pencilled rays, and sometimes vivid coruscations towards the zenith.
27	34	29.58	E.S.E.	Moderate.	Clear.
25	33	28.29	E.S.E.	Fresh.	Overcast.
20	25	21.92	E.S.E.	Strong.	Clear.
14.5	19.5	17.67	N.Easty. S.Easty.	Strong. Light.	Overcast.
20	27.5	24.17	Easterly.	Light.	Clear; wind variable.
25	31	28.50	Northerly.	Fresh.	Overcast and squally; dense fog from half-past 2 till 4 P.M.
23	31	27.58	Northerly.	Moderate.	Hazy.
23	32.5	27.83	Northerly.	Moderate.	Hazy, and squally.
34	38	36.21	E.S.E.	Light.	Clear.
37	42.5	40.12	Easterly.	Light.	Clear.
25.5	42.5	38.00	Easterly.	Light.	Clear; a breeze from the W.S.W. at 2 P.M. brought a dense fog, which cleared away on the wind changing soon after.
24	29	26.50	N.Westerly.	Moderate.	Clear.
22	37	30.37	N.Westerly.	Light.	Cloudy. Aurora faintly seen.
27	31	28.25	N.W.	Moderate.	Hazy.
25	32	26.37	N.Easterly.	Light.	Hazy.
30	34	31.50	E.S.E.	Fresh.	Hazy, with snow drift.
−14.5	−42.5	−28.914			

GENERAL REMARKS.—Clear and fine weather prevailed during the greater part of the month of January. A prevalence of easterly winds was also observable as in the preceding months, and seems to leave no doubt of their having been influenced by local causes. A very slight depression of the Mercurial Column was observable on each occasion that the wind became fresh; but several of the changes of the Barometer occurred without any material alteration in the state of the atmosphere. Mr. Daniell's Hygrometer was twice tried during the month. On the 3d, the temperature being −30°, and the instrument subjected to the same process as before, the ether froze without producing any deposit; the wind at this time was light from the eastward, the sky perfectly clear, excepting to the westward, where a dense haze indicated the vapour arising from open water in that direction On the 24th, the temperature of the atmosphere −35°, the sky clear, with the exception of a few thin clouds near the horizon to the eastward, and the wind light from the north, the Experiment was repeated, and when the ether became frozen, the thermometer immersed in it, indicated −50°, without the slightest appearance of deposit on the coloured ball.

ABSTRACT of the METEOROLOGICAL JOURNAL kept on BOARD HIS MAJES

DATE. 1825.	MOUNTAIN BAROMETER No. 80, corrected for TEMPERATURE, NEUTRAL POINT, and CAPACITY. A.M. 3h.	4h.	5h.	9h.	10h.	11h.	P.M. 3h.	4h.	5h.	9h.	10h.	11h.	Mean of 24 hours.	Mean Temperature of the lower deck.
	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	°
Feb. 1	29.952	29.956	29.954	29.941	29.938	29.931	29.952	29.945	29.950	29.963	29.956	29.968	29.950	+68.3
„ 2	30.030	30.037	30.048	30.089	30.119	30.137	30.227	30.289	30.268	30.336	30.340	30.351	30.185	66.5
„ 3	.393	.426	.409	.460	.440	.451	.452	.468	.432	.441	.441	.439	.438	66.5
„ 4	.452	.453	.417	.360	.341	.340	.256	.224	.204	.076	.069	.038	.269	67.7
„ 5	29.932	29.900	29.882	29.792	29.760	29.754	29.681	29.674	29.645	29.595	29.567	29.563	29.729	68
„ 6	.517	.509	.515	.528	.438	.448	.473	.470	.473	.509	.502	.507	.491	71.7
„ 7	.533	.535	.530	.562	.577	.591	.635	.648	.662	.725	.732	.733	.622	68
„ 8	.771	.783	.779	.796	.802	.809	.822	.815	.821	.854	.865	.874	.816	70.7
„ 9	.926	.945	.940	.973	.964	.983	30.045	30.039	30.057	30.116	30.111	30.118	30.018	70
„ 10	30.184	30.188	30.189	30.211	30.200	30.216	.228	.230	.237	.231	.225	.224	.214	70.3
„ 11	.239	.246	.245	.244	.247	.251	.259	.260	.256	.250	.231	.230	.246	68.7
„ 12	.210	.198	.197	.145	.118	.121	.074	.037	.023	29.962	29.916	29.915	.076	67.5
„ 13	29.874	29.850	29.829	29.759	29.718	29.708	29.660	29.644	29.633	.606	.594	.587	29.705	70.3
„ 14	.589	.601	.602	.636	.644	.655	.708	.709	.717	.746	.749	.740	.677	69.7
„ 15	.753	.760	.758	.757	.755	.752	.756	.771	.786	.790	.792	.797	.769	66.5
„ 16	.825	.833	.837	.826	.822	.824	.831	.836	.826	.811	.796	.787	.821	67.7
„ 17	.734	.717	.710	.659	.643	.630	.618	.597	.597	.586	.580	.586	.638	69.7
„ 18	.602	.609	.608	.608	.608	.618	.645	.660	.666	.700	.706	.712	.645	67.7
„ 19	.728	.717	.737	.743	.753	.756	.752	.759	.765	.799	.797	.787	.760	68.3
„ 20	.798	.796	.801	.790	.786	.779	.751	.757	.746	.724	.717	.708	.763	68.2
„ 21	.692	.692	.683	.688	.685	.691	.727	.734	.759	.770	.760	.753	.719	65.0
„ 22	.760	.777	.772	.791	.798	.813	.883	.898	.904	.920	.921	.913	.816	66.5
„ 23	.910	.896	.895	.891	.833	.811	.768	.760	.761	.647	.733	.731	.803	66
„ 24	.735	.730	.718	.789	.791	.790	.823	.830	.837	.856	.858	.858	.801	69.7
„ 25	.930	.941	.951	.996	30.006	30.014	30.004	30.085	30.095	30.105	30.115	30.100	30.029	70.2
„ 26	30.096	30.075	30.049	.997	29.967	29.926	29.899	29.902	29.880	29.827	29.803	29.804	29.935	69.5
„ 27	29.856	29.856	29.852	.853	.819	.867	.861	.869	.877	.888	.896	.894	.868	66.5
„ 28	.954	.971	.984	30.006	30.001	30.005	30.029	30.031	30.019	29.990	.966	.957	.993	65.7
MEANS	29.8921	29.8938	29.8830	29.8889	29.8788	29.8811	29.8864	29.8890	29.8899	29.8865	29.8835	29.8812	29.8867	+68.25

PRESSURE of the ATMOSPHERE as observed at

	3 A.M.	4 A.M.	5 A.M.	9 A.M.	10 A.M.	11 A.M.	3 P.M.	4 P.M.	5 P.M.	9 P.M.	10 P.M.	11 P.M.	During the Month.	N.	N.E.
	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.		
Max. .	30.452	30.453	30.417	30.460	30.440	30.451	30.452	30.468	30.432	30.441	30.441	30.439	30.468		
Min. .	29.517	29.509	29.515	29.528	29.438	29.448	29.473	29.470	29.473	29.509	29.502	29.507	29.438		
Mean .	29.8921	29.8938	29.8890	29.8880	29.8788	29.8811	29.8864	29.8890	29.8899	29.8865	29.8835	29.8812	29.8867	3	2

MAJESTY'S SHIP, HECLA, at PORT BOWEN; during the Month of FEBRUARY, 1825.

Mean Temperature of the lower deck.	Temperature of the Atmosphere, registered every two hours. Maximum.	Minimum.	Mean.	PREVAILING WINDS. Direction.	Velocity.	PREVAILING WEATHER AND OTHER REMARKS.
°	°	°	°			
+68.3	−31	−36	−32.87	E.S.E.	Fresh.	Overcast; drift.
66.5	35	40	38.29	E.S.E.	Light.	Clear. Sun seen from the hills for the first time.
66.5	25	39.5	33.12	E.S.E.	Fresh.	A.M. Clear. P.M. Hazy.
67.7	18	27	22.83	E.S.E. E.N.E.	Fresh and squally.	Hazy; clear at times. A meteor seen N.E. at 7 P.M.
68	21	25	22.96	Northerly.	Moderate squally.	Overcast.
71.7	13	20	15.83	N.Westerly.	Fresh. Squally.	Hazy; snow drift.
68	16	29	21.50	Northerly.	Light.	Clear. A meteor seen N.W. at 1.40 A.M.
70.7	28	39	33.54	Easterly.	Light.	Clear.
70	37.5	39	38.17	Easterly.	Light.	Clear.
70.3	31	38	35.96	N.E.	Light.	Clear.
68.7	25	34	30.00	Easterly.	Light.	Clear; occasional haze. Aurora seen at night.
67.5	8	20	12.54	E.S.E.	Fresh.	Overcast.
70.3	10	22.5	14.00	Easterly. N.W[ly].	Moderate squally.	Overcast.
69.7	22	32.5	25.79	N.W[ly]. Easterly.	Moderate.	Occasional haze.
66.5	29	34	31.12	N.Easterly.	Light.	Overcast. Aurora borealis faintly visible on each morning of these days.
67.7	22	37	32.50	Easterly. N.W[ly].	Light.	Clear.
69.7	15	23	18.25	W.N.W.	Light.	Overcast.
67.7	26	34	28.96	Easterly.	Light.	Clear.
68.3	27	40	33.25	Calm.	Light.	Clear.
68.2	37	42	39.42	N.N.E.	Light.	Clear.
63.0	35	45	40.35	Easterly.	Light.	Clear.
66.5	29	36	31.92	E.S.E.	Light.	Occasl. Haze. Aurora seen faintly on each night, and on the morning of the 23d it presented a brilliant and well-defined arch with numerous bright spots or nebulæ, from which vivid coruscations shot towards the zenith
66	25	28	26.46	Easterly.	Fresh and squally.	Clear.
69.7	25	28.5	26.71	E.S.E.	Strong.	Overcast.
70.2	27	32	30.37	Easterly.	Moderate.	Clear.
69.5	8.5	26	17.17	Easterly.	Fresh.	Overcast.
66.5	8	13	10.17	Easterly.	Light.	Hazy; small snow.
65.7	9	32	20.92	Easterly.	Light.	Hazy.
+68.25	− 8	−45	−27.32			

DIRECTION of the WINDS.

Number of Days at

N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm.
3	2	18½	0	0	0	1	2½	1

GENERAL REMARKS.—In the Meteorological Abstracts for the three months preceding this, it may be observed that although the horary oscillations of the Barometer are extremely minute, the Maximum and Minimum pressure appear to incline rather to the hours of 4 and 10 than to those of 3 and 9. With a view, therefore, of pursuing this investigation further, the Barometer was also registered at the hours of 5 and 11, during this and the two following months; the abstracts themselves will best shew the result. Mr. Daniell's Hygrometer was again tried on two occasions during this month, at the temperature of − 39° and − 28°.5, and the ether frozen without any deposit being observable.

ABSTRACT of the METEOROLOGICAL JOURNAL kept on BOARD HIS

MOUNTAIN BAROMETER, No. 80, corrected for TEMPERATURE, NEUTRAL POINT, and CAPACITY.

DATE.	A. M.						P. M.						Mean of
1825.	3h.	4h.	5h.	9h.	10h.	11h.	3h.	4h.	5h.	9h.	10h.	11h.	24 hours.
	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
March 1	29.915	29.928	29.910	29.945	29.951	29.975	30.053	30.084	30.121	30.157	30.177	30.183	30.033
" 2	30.289	30.310	30.323	30.378	30.373	30.378	.397	.398	.393	.363	.358	.351	.353
" 3	.304	.284	.267	.134	.119	.080	29.935	29.934	29.910	29.857	29.850	29.850	.044
" 4	29.861	29.877	29.865	29.895	29.891	29.894	.932	.932	.925	.903	.895	.886	29.896
" 5	.874	.886	.899	.949	.953	.960	30.029	30.030	30.035	30.041	30.033	30.023	.976
" 6	.980	.984	.964	.921	.909	.913	.049	.078	.115	.229	.239	.249	30.053
" 7	30.309	30.322	30.326	30.319	30.296	30.286	.249	.231	.226	.173	.157	.142	.253
" 8	.108	.109	.095	.098	.093	.080	.103	.102	.106	.121	.127	.129	.106
" 9	.159	.174	.174	.207	.207	.205	.243	.244	.256	.288	.282	.290	.227
" 10	.324	.322	.329	.352	.346	.358	.401	.406	.409	.444	.441	.439	.381
" 11	.461	.472	.475	.508	.491	.490	.434	.473	.466	.443	.417	.411	.462
" 12	.375	.354	.336	.263	.242	.224	.151	.135	.109	.077	.055	.038	.196
" 13	29.966	29.972	29.959	29.932	29.919	29.912	29.901	29.896	29.897	29.898	29.880	29.886	29.919
" 14	.889	.862	.892	.865	.861	.848	.852	.851	.860	.885	.896	.905	.874
" 15	.972	.983	.988	30.034	30.033	30.033	30.069	30.077	30.088	30.100	30.099	30.108	30.049
" 16	30.139	30.151	30.150	.139	.138	.141	.096	.083	.081	.039	.033	.022	.101
" 17	.014	.019	.027	29.999	29.984	29.989	29.980	29.978	29.988	29.961	29.961	29.962	29.982
" 18	29.964	29.966	29.960	.983	.977	.967	.967	.969	.970	.933	.919	.900	.956
" 19	.881	.890	.883	.813	.797	.767	.774	.754	.747	.725	.710	.709	.788
" 20	.696	.703	.710	.709	.708	.723	.708	.711	.703	.658	.635	.624	.691
" 21	.636	.651	.618	.713	.714	.742	.840	855	.765	.951	.966	.983	.789
" 22	30.055	30.076	30.076	30.146	30.160	30.177	30.236	30.258	30.264	30.308	30.315	30.319	30.199
" 23	.338	.341	.353	.355	.348	.349	.344	.313	.330	.320	.330	.324	.340
" 24	.343	.351	.355	.390	.382	.385	.386	.378	.380	.391	.394	.379	.376
" 25	.388	.392	.397	.393	.409	.396	387	.400	.393	.377	.382	.387	.391
" 26	.388	.381	.380	.365	.351	.353	.334	.322	.323	.295	.292	.291	.339
" 27	.265	.267	.247	.203	.190	.192	.176	.166	.163	.120	.122	.122	.187
" 28	.122	.135	.125	.132	.126	.128	.104	.105	.090	.079	.077	.056	.107
" 29	.069	.067	.074	.084	.078	.076	.106	.098	.108	.113	.112	.108	.091
" 30	.115	.114	.119	.105	.094	.082	.066	.042	.035	.025	.025	.031	.071
" 31	.037	.056	.060	.084	.083	.083	.093	.092	.090	.068	.069	.066	.071
MEANS .	30.1044	30.1103	30.1088	30.1101	30.1041	30.1028	30.1095	30.1105	30.1079	30.1080	30.1049	30.1025	30.1079

PRESSURE of the ATMOSPHERE as observed at

	3 A.M.	4 A.M.	5 A.M.	9 A.M.	10 A.M.	11 A.M.	3 P.M.	4 P.M.	5 P.M.	9 P.M.	10 P.M.	11 P.M.	During the Month.
	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Maximum	30.461	30.472	30.475	30.508	30.491	30.490	30.434	30.473	30.466	30.444	30.441	30.439	30.508
Minimum	29.636	29.651	29.618	29.709	29.708	29.723	29.708	29.711	29.703	29.658	29.635	29.624	29.624
Mean . .	30.1044	30.1103	30.1088	30.1101	30.1041	30.1028	30.1095	30.1105	30.1079	30.1080	30.1049	30.1025	30.1079

MAJESTY'S SHIP, HECLA, at PORT BOWEN; during the Month of MARCH, 1825.

Temperature of the Atmosphere, registered every two hours. Maximum.	Minimum.	Mean.	Mean Temperature of the Lower Deck.	Prevailing Winds. Direction.	Velocity.	Prevailing Weather and other Remarks.
° −22	° −44	° −31.46	° +66	Round the Comp.	Light.	Hazy.
36	47.5	42.96	66.7	Easterly.	Light.	Clear.
23	40	29.29	65.7	Easterly.	Fresh.	Hazy; drift.
27	35	31.29	66.7	Easterly.	Light.	Clear.
26	33.5	29.33	63.7	Westerly.	Light.	Occasional haze, and small snow.
20	39	29.58	64.3	S.Westerly.	Fresh.	Hazy; snow-drift.
32	39	35.29	65.2	N.Westerly.	Light.	Hazy.
21	33	28.37	67	Easterly.	Light.	Hazy.
21	33.5	27.92	67	Easterly.	Moderate.	Clear. Aurora bright in the S.W. at night.
22	36.5	30.08	64.4	Easterly.	Light.	Clear.
25	38.5	31.04	66.2	Easterly.	Light.	Clear.
21	37	32.21	66	Easterly.	Light.	Clear. } Aurora in the morning forming a band of bright light parallel to the horizon, and about 45° above it, between W.N.W. and S.W.
21	36	30.46	64.5	Easterly.	Light.	Clear.
23	38	32.29	62.7	Easterly.	Light.	Clear.
18	38	27.62	64.2	N.Westerly.	Light.	Clear, occasional haze.
25	28	25.50	67	N.Westerly.	Fresh.	Squally and overcast.
21	27.5	24.38	69	N.W.	Strong.	Overcast, and much drift.
11	29.5	23.04	67.3	N.W.	Moderate.	Occasional haze.
15.5	25.5	21.50	68	S.Westerly.	Light.	Hazy; wind variable.
20	27	22.29	69	W.N.W.	Fresh.	Hazy, with drift.
20	29	22.33	60.2	N.W.	Light.	Hazy.
16	37.5	29.17	67	Easterly.	Light.	Clear; wind variable.
20	38	30.40	68.7	Easterly.	Light.	Clear.
23	40	33.50	65.6	Easterly.	Light.	Clear.
26	42	33.54	65.2	Easterly.	Light.	Clear, occasional haze.
20	29	23.92	64.7	N.W.	Fresh.	Overcast, and squally.
9	27	18.00	67	N.Wᵣ. N.Eᵣ.	Mod. Light.	Hazy; clear.
13	32	22.75	67	Easterly.	Light.	Clear.
18	30	23.42	68.7	Easterly.	Light.	Clear, occasional haze.
16	32	24.92	67.9	Easterly.	Light.	Clear.
21	35	28.71	67.7	Easterly.	Light.	Clear.
−9	−47.5	−28.375	+66.43			

DIRECTION of the WINDS.

Number of Days at

North.	N.E.	East.	S.E.	South.	S.W.	West.	N.W.	Round the Compass.
0	½	18	0	0	2	2	7½	1

GENERAL REMARKS.—The minimum temperature of this winter (−47.°5) occurred on the 2d of March; and the mean temperature of the month is considerably lower than might have been anticipated from former experience, being even colder than that of February, and only half a degree higher than the mean temperature of January. The Mercury in the Barometer underwent very few changes during this month, and was not perceptibly influenced by any alteration in wind or weather; its mean height was considerably above that of any former month of this winter.

ABSTRACT of the METEOROLOGICAL JOURNAL kept on BOARD HIS MAJES

DATE. 1824.	MOUNTAIN BAROMETER, No. 80, corrected for TEMPERATURE, NEUTRAL POINT, and CAPACITY. A.M. 3h	4h.	5h.	9h.	10h.	11h.	P.M. 3h.	4h.	5h.	9h.	10h.	11h.	Mean of 24 hours.	Temperature registered: Maximum.
	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	°
April 1	30.049	30.047	30.035	30.039	30.024	30.015	30.010	29.998	29.988	29.966	29.967	29.957	30.009	-20
„ 2	29.941	29.943	29.938	29.907	29.901	29.889	29.881	.879	.875	.853	.842	.838	29.891	-17
„ 3	.826	.828	.812	.768	.754	.749	.732	.730	.729	.726	.709	.702	.755	-11
„ 4	.710	.728	.726	.732	.728	.731	.762	.771	.776	.812	.814	.820	.759	-11.5
„ 5	.849	.857	.867	.907	.903	.908	.965	.973	.986	30.031	30.031	30.034	.943	-17.5
„ 6	30.068	30.085	30.087	30.085	30.092	30.090	30.104	30.104	30.096	.081	.072	.062	30.085	-19
„ 7	.048	.053	.040	.030	.029	.033	.032	.032	.038	.053	.056	.058	.012	-12
„ 8	.101	.117	.127	.174	.166	.177	.209	.215	.223	.243	.243	.245	.187	-11
„ 9	.247	.266	.262	.248	.249	.242	.236	.221	.227	.227	.230	.228	.240	- 9.5
„ 10	.240	.241	.244	.245	.243	.244	.227	.216	.215	.163	.132	.119	.211	- 6
„ 11	.126	.119	.140	.184	.177	.187	.233	.237	.242	.260	.251	.253	.201	+ 8
„ 12	.223	.216	.214	.185	.165	.151	.101	.088	.081	.071	.065	.060	.135	+19
„ 13	.030	.029	.016	.027	.014	.030	.043	.054	.066	.068	.060	.055	.041	+ 4.5
„ 14	.082	.095	.101	.106	.100	.111	.152	.150	.157	.159	.154	.150	.127	- 6
„ 15	.143	.146	.137	.110	.101	.123	.102	.089	.081	.066	.053	.012	.100	- 5
„ 16	.055	.062	.051	.064	.066	.063	.096	.106	.107	.126	.122	.120	.066	+11
„ 17	.128	.142	.135	.141	.133	.126	.130	.138	.157	.166	.151	.161	.142	+11
„ 18	.197	.198	.195	.198	.199	.194	.190	.180	.187	.155	.143	.140	.181	+ 9
„ 19	.130	.141	.131	.088	.074	.063	.040	.028	025	.009	29.999	29.982	.039	+ 4
„ 20	29.986	29.991	29.984	.002	.003	.014	.041	.058	.060	.115	30.112	30.117	.040	+13
„ 21	30.165	30.187	30.183	.234	.228	.256	.291	.296	.308	.356	.346	.347	.267	+20
„ 22	.362	.368	.376	.348	.353	.375	.371	.366	.361	.316	.304	.286	.319	+20
„ 23	.218	.209	.190	.075	.040	.004	29.972	29.964	29.958	29.943	29.913	29.907	.033	+11
„ 24	29.885	29.887	29.882	29.879	29.867	29.876	.876	.873	.881	.886	.879	.887	29.880	+ 7
„ 25	.896	.896	.900	.910	.914	.921	.937	.934	.939	.951	.945	.950	.924	+14
„ 26	.958	.968	.976	.995	.994	.998	30.030	30.035	30.041	30.069	30.065	30.079	30.017	+ 9
„ 27	30.097	30.110	30.112	30.122	30.117	30.115	.125	.120	.117	.111	.105	.102	.113	+12
„ 28	.102	.101	.090	.077	.076	.077	.079	.066	.067	.062	.053	.054	.075	+11
„ 29	.027	.026	.008	29.980	29.974	29.971	29.963	29.963	29.971	29.994	.002	.006	29.990	+14
„ 30	.028	.035	.050	30.100	30.097	30.090	30.161	30.156	30.174	30.179	.178	.187	30.120	+ 7
MEANS .	30.0639	30.0697	30.0670	30.0653	30.0594	30.0610	30.0698	30.0681	30.0712	30.0739	30.0665	30.0619	30.066	+20

PRESSURE of the ATMOSPHERE as observed at

	3 A.M.	4 A.M.	5 A.M.	9 A.M.	10 A.M.	11 A.M.	3 P.M.	4 P.M.	5 P.M.	9 P.M.	10 P.M.	11 P.M.	During the Month.
	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Max. .	30.362	30.368	30.376	30.348	30.353	30.373	30.371	30.366	30.361	30.356	30.346	30.347	30.376
Min. .	29.710	29.728	29.726	29.732	29.728	29.731	29.732	29.730	29.729	29.726	29.709	29.702	29.702
Mean .	30.0639	30.0697	30.0670	30.0653	30.0594	30.0610	30.0698	30.0681	30.0712	30.0739	30.0665	30.0619	30.066

MAJESTY'S SHIP, HECLA, at PORT BOWEN; during the Month of APRIL, 1825.

Temperature of the Atmosphere, registered every two hours. Maximum.	Minimum.	Mean.	Mean Temperature of the lower deck.	Prevailing Winds. Direction.	Velocity.	Prevailing Weather and other Remarks.
−20°	−37°	−29.58°	+66.2°	E.S.E.	Moderate.	Clear.
−17	−36	−27.75	70	E.S.E.	Moderate.	Clear.
−11	−31	−23.08	65.5	Easterly.	Light.	Hazy.
−11.5	−34	−23.67	65.2	Easterly.	Light.	Hazy.
−17.5	−36	−28.51	66	Easterly.	Light.	Clear.
−19	−36	−28.25	66.5	E.S.E.	Light.	Clear.
−12	−35	−25.04	66.6	East.	Light.	Clear.
−11	−29	−20.88	66.2	East.	Fresh.	Clear.
− 9.5	−26	−16.79	67.7	East.	Moderate.	Overcast.
− 6	−19	−10.67	64.5	E.S.E.	Strong.	Hazy; much drift.
+ 8	− 5	+ 2.46	65	E.S.E.	Strong.	Hazy; heavy squalls and much drift snow.
+19	+ 5	+12.29	66.7	E.S.E.	Moderate.	Hazy and squally, with drift.
+ 4.5	−11	− 1.42	65.7	Easterly. N'ly.	Moderate. Fresh.	Hazy; latter part squally, with drift.
− 6	−14	− 9.54	65.2	N.Westerly.	Fresh.	Hazy and squally.
− 5	−14	−10.42	68	Northerly.	Light.	Hazy.
+11	−17	− 1.83	64	Westerly.	Light.	Clear; wind variable.
+11	−14	− 2.92	66.7	Round the Comp.	Light.	Clear.
+ 9	−14.5	− 2.71	65.2	Easterly.	Light.	Clear.
+ 4	−12	− 1.71	66	E.S.E.	Moderate.	Clear; hazy at times.
+13	− 1.5	+ 6.67	67	E.S.E.	Fresh.	Hazy and squally, with snow and drift.
+20	+ 3	+10.87	67.2	E.S.E.	Fresh. Light.	Cloudy, with snow and drift.
+20	− 2	+ 8.08	68	E.S.E.	Light.	Hazy.
+11	+ 2	+ 6.87	69.2	Northerly.	Moderate.	Hazy, with snow.
+ 7	+ 1.5	+ 3.17	66.5	Westerly.	Moderate.	Hazy.
+14	+ 1.5	+ 6.92	65.2	N.Westerly.	Light.	Hazy.
+ 9	− 6	+ 2.21	64	Westerly.	Light.	Hazy; small snow.
+12	− 9	+ 3.54	63	S.Easterly.	Light.	Hazy; small snow.
+11	− 6	+ 3.67	. .	S.Easterly.	Light.	Hazy, with snow.
+14	− 9	+ 0.96	. .	E.S.E. N.W.	Light.	Clear.
+ 7	− 2.5	+ 2.21	. .	Westerly.	Light.	Clear; occasional haze.
+20	−37	− 6.496	+66			

DIRECTION of the WINDS.

Number of Days at

N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Round the Compass.
2½	0	18	2	0	0	4	2½	1

ABSTRACT.

THE mean result of six months' observations, in which the barometer was registered at the hours of 3, 4, 9, and 10, are here collected into one table; and in a second table is given a comparative view of three months' observations, in which it was registered at the additional hours of 5 and 11. On reference to these tables, it will be seen that the general tendency seems to indicate high barometer at four o'clock, and low at ten in the morning. The evening tide, though less regular, is also highest at four, but lowest at eleven o'clock. The changes, however, are in themselves so extremely minute (amounting only to the hundredth part of an inch), that a sudden alteration in the atmosphere causing the barometer to rise or fall rapidly on any one day, is sufficient to introduce an anomaly sensibly affecting the mean result of a whole month.

COMPARATIVE VIEW of the MEAN PRESSURE of the ATMOSPHERE at the Hours of 3, 4, 9, and 10 A.M. and P.M., during six successive Months, 1824-25.

During the Month of	MEAN PRESSURE of the ATMOSPHERE at							
	3 A.M.	4 A.M.	9 A.M.	10 A.M.	3 P.M.	4 P.M.	9 P.M.	10 P.M.
	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
1824. November . .	29.8943	29.8990	29.8986	29.8971	29.9067	29.9037	29.8971	29.8909
December . .	29.8726	29.8767	29.8729	29.8687	29.8698	29.8695	29.8663	29.8551
1825. January . .	29.7610	29.7668	29.7580	29.7511	29.7614	29.7599	29.7677	29.7617
February . .	29.8921	29.8938	29.8889	29.8788	29.8864	29.8890	29.8865	29.8635
March . . .	30.1064	30.1103	30.1101	30.1041	30.1095	30.1105	30.1080	30.1049
April . . .	30.0639	30.0697	30.0653	30.0594	30.0698	30.0681	30.0739	30.0665
Means . . .	29.9317	29.9359	29.9323	29.9270	29.9338	29.9334	29.9332	29.9271

COMPARATIVE VIEW of the MEAN PRESSURE of the ATMOSPHERE at the Hours of 3, 4, 5, 9, 10, and 11 A.M. and P.M., during three successive Months, 1825.

During the Month of	MEAN PRESSURE of the ATMOSPHERE as observed at											
	3 A.M.	4 A.M.	5 A.M.	9 A.M.	10 A.M.	11 A.M.	3 P.M.	4 P.M.	5 P.M.	9 P.M.	10 P.M.	11 P.M.
	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Feb.	29.8921	29.8938	29.8890	29.8889	29.8768	29.8811	29.8864	29.8890	29.8899	29.8865	29.8835	29.8812
Mar.	30.1064	30.1103	30.1088	30.1101	30.1041	30.1028	30.1095	30.1105	30.1079	30.1080	30.1049	30.1025
April	30.0639	30.0697	30.0670	30.0653	30.0594	30.0610	30.0698	30.0681	30.0712	30.0739	30.0665	30.0649
Means	30.0208	30.0246	30.0216	30.0214	30.0141	30.0150	30.0219	30.0225	30.0230	30.0228	30.0183	30.0162

Twice in the month of April Mr. Foster succeeded in obtaining a deposit on the coloured ball of Mr. Daniell's hygrometer. On the 21st, the temperature of the atmosphere being + 15°, the sky partially clear, with large well-defined clouds to the westward, a broad white belt of frozen vapour appeared on the instrument coincident with the surface of the ether, on the temperature being reduced to − 4°. On the 25th, the temperature of the atmosphere being + 6°, and the sky densely overcast, a similar deposit took place on the coloured ball, on the ether being reduced to the temperature of − 1°.5.

ABSTRACT of the METEOROLOGICAL JOURNAL kept on BOARD HIS MAJESTY'S SHIP, HECLA, at PORT BOWEN; during the Month of MAY, 1825.

DATE. 1825.	MOUNTAIN BAROMETER, No. 80, Corrected for Temp., Neutral Point, and Capacity. A. M. 3h.	A. M. 9h.	P. M. 3h.	P. M. 9h.	Mean of 24 hours.	Temperature of the Atmosphere, registered every two hours. Maximum.	Minimum.	Mean.	Mean Temperature of the Lower Deck.	PREVAILING WINDS. Direction.	Velocity.	PREVAILING WEATHER.
	Inches.	Inches.	Inches.	Inches.	Inches.	°	°	°	°			
May 1	30.207	30.220	30.205	30.145	30.194	+11	− 5	+ 5.12	+63.3	N.Wy.	Light.	Cloudy.
„ 2	.064	29.992	29.932	29.900	29.972	11	+ 2.5	5.88	58.7	Easterly.	Lt. Fh.	Clear, overcast, & squally.
„ 3	29.798	.716	.619	.744	.727	8	+ 3	5.58	. .	ESE. SW.	Fresh.	Hazy, with drift.
„ 4	.870	30.085	30.333	30.515	30.201	15	− 3	4.84	. .	S.S.W.	Moderate.	Cloudy.
„ 5	30.621	.675	.683	.653	.659	11	− 7.5	3.16	61	N.Wy.	Light.	Clear.
„ 6	.620	.539	.469	.402	.507	26	+ 1.5	13.33	58.8	RoundComp.	Light.	Hazy.
„ 7	.351	.319	.282	.227	.295	25	+ 6	16.04	57	Ey. Wy.	Light.	Cloudy.
„ 8	.168	.107	.089	.062	.107	28	+11	19.25	57.3	Ey. Wy.	Light.	Hazy; dense fog over land.
„ 9	.042	29.973	29.908	29.856	29.945	30	+13.5	22.29	58.7	Ey. Wy.	Light.	Hazy, and constant snow.
„ 10	29.837	.855	.878	.825	.849	24	+ 3	11.00	59.7	Ey. N.Wy.	Lt. Fh.	Hazy, small snow, squally.
„ 11	.962	.938	30.030	30.039	30.007	9.5	+ 4	6.29	58.2	N.Wy.	Fresh.	Overcast and squally.
„ 12	30.056	30.072	.055	.039	.055	17	+ 1	8.25	59	N.Wy.	Moderate.	Overcast, with much snow.
„ 13	.011	.033	.058	.093	.058	17	+ 6	11.62	55.7	N.Wy.	Moderate.	Hazy, with snow.
„ 14	.126	.142	.122	.059	.112	28.5	+ 1.5	17.75	58.2	Ey. N.Wy.	Light.	Hazy.
„ 15	.015	29.988	29.980	29.970	29.988	33	+15	23.27	58.7	N.Wy.	Light.	Overcast, and small snow.
„ 16	29.972	.968	.922	.865	.932	23.5	+11.5	18.50	58.3	Ey. Ny.	Light.	Hazy, with small snow.
„ 17	.716	.724	.700	.697	.717	26	+17	21.96	58.7	Ny. N.Ey.	Fresh.	Cloudy, squally, with snow.
„ 18	.635	.593	.547	.536	.578	25	+17	21.17	56.5	N.Ey. Ny.	Moderate.	Cloudy and squally.
„ 19	.582	.697	.855	.974	.777	23.5	+17	20.21	. .	Easterly.	Moderate.	Clear.
„ 20	30.110	30.267	30.335	30.416	30.282	31	+16	20.08	. .	E.S.E.	Moderate.	Cloudy.
„ 21	.487	.419	.337	.258	.363	36	+15.5	22.33	60	Ey. Ny.	Light.	Cloudy.
„ 22	.175	.176	.158	.112	.155	24	+17	21.01	63.5	N.Easterly.	Fresh.	Clear.
„ 23	.033	29.960	29.934	29.953	29.970	22.5	+16.5	20.50	. .	NEy. NWy.	Fh. Lt.	Hazy, constant snow; P.M. Clear, occasional clouds.
„ 24	29.977	30.027	30.051	30.017	30.018	25	+ 7	16.87	. .	Ey. Wy.	Very light.	Clear.
„ 25	.964	29.908	29.827	29.749	29.862	27	+13	21.50	. .	Northerly.	Moderate.	Cloudy.
„ 26	.715	.710	.845	.959	.807	33	+21	27.25	. .	Ny. Wy.	Light.	Hazy, and small snow.
„ 27	30.090	30.192	30.284	30.326	30.225	37.5	+22	26.75	. .	Southerly.	Light.	Overcast.
„ 28	.423	.461	.473	.405	.410	39	+23	31.87	. .	Southerly.	Light.	Overcast, with snow.
„ 29	.324	.174	.037	29.895	.108	26	+23	23.83	. .	S.Easterly.	Strong.	Hazy, with much snow-drift.
„ 30	29.826	29.813	29.840	.845	29.838	31.5	+24	28.71	. .	E.S.E.	Str. Mod.	Hazy; latter part fine.
„ 31	.821	.832	.819	.833	.826	34	+26	30.25	. .	Easterly.	Light.	Cloudy.
MEANS	30.0520	30.0511	30.0528	30.0112	30.0508	39	− 7.5	+17.65	+59			

PRESSURE of the ATMOSPHERE as observed at

	3 A.M.	9 A.M.	3 P.M.	9 P.M.	During the Month.
	Inches.	Inches.	Inches.	Inches.	Inches.
Max. .	30.624	30.675	30.683	30.653	30.683
Min .	29.582	29.593	29.547	29.536	29.536
Mean	30.0520	30.0541	30.0528	30.0412	30.0508

DIRECTION of the WINDS.

Number of Days at

N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Round the Compass
3	3	9½	1	3	1	2	7½	1

GENERAL REMARKS.

Much overcast weather, with falling snow, occurred throughout the month of May. The Barometer, which rose rapidly on the 4th, attained on the 5th a maximum height of 30.683 inches, being higher than at any former period of this voyage.

ABSTRACT of the METEOROLOGICAL JOURNAL kept on BOARD HIS MAJESTY'S SHIP, HECLA, at PORT BOWEN; during the Month of JUNE, 1825.

DATE. 1825.	MARINE BAROMETER, No. 514, Corrected and reduced to Mountain Barometer, No. 80. A. M. 3h.	A. M. 9h.	P. M. 3h.	P. M. 9h.	Mean of 24 hours.	Temperature of the Atmosphere, registered every two hours. Maximum.	Minimum.	Mean.	PREVAILING WINDS. Direction.	Velocity.	PREVAILING WEATHER.
	Inches.	Inches.	Inches.	Inches.	Inches.	°	°	°			
June 1	29.828	29.708	29.786	29.793	29.801	+42	+26	+32.46	Ny. Wy.	Light.	Overcast.
„ 2	.823	.881	.899	.978	.895	39	25	29.92	N.W.	Moderate.	Cloudy.
„ 3	30.026	30.116	30.121	30.113	30.096	42.5	23.5	33.46	N.Wy.	Light.	Fine and clear.
„ 4	.097	.117	.117	.091	.106	36	25	31.83	E.S.E.	Moderate.	Fine.
„ 5	.093	.143	.170	.191	.150	45	25	35.29	Easterly.	Light.	Very fine.
„ 6	.146	.083	.060	29.918	.037	48	27	36.67	Ey. N.Wy.	Light.	Fine and clear.
„ 7	29.850	29.857	29.833	.782	29.830	45	32	36.29	Easterly.	Moderate.	Overcast; rain in the afternoon.
„ 8	.750	.781	.766	.800	.774	47	33	36.86	Easterly.	Moderate.	Cloudy, occasional rain.
„ 9	.805	.804	.765	.761	.784	41.5	32.5	36.42	E.S.E.	Light.	Cloudy.
„ 10	.757	.751	.773	.792	.769	37	31	33.79	S.Easterly.	Moderate.	Overcast. occasional snow.
„ 11	.801	.745	.652	.665	.716	35	30	32.50	E.S.E.	Fresh.	Constant snow.
„ 12	.754	.849	.890	.879	.843	43	31.5	35.25	S.Westerly.	Moderate.	Hazy; with snow.
„ 13	.910	.909	.941	.952	.928	38	30.5	33.96	S.W.	Light.	Hazy; with snow.
„ 14	.965	.999	30.027	30.016	30.002	41.5	27.5	35.21	Southerly.	Light.	Cloudy.
„ 15	30.042	30.023	29.965	29.960	29.998	40	23	31.92	Easterly.	Moderate.	Fine and clear.
„ 16	29.948	29.913	.971	.966	.957	42	34	37.96	E.S.E.	Moderate.	Overcast and cloudy.
„ 17	.971	.970	.982	30.000	.981	47	33.5	38.83	Easterly.	Light.	Cloudy.
„ 18	.996	30.057	30.083	.082	30.054	45	32	38.25	Easterly.	Light.	Fine.
„ 19	30.043	29.987	29.940	29.921	29.973	43	32.5	37.58	S.Ey. S.Wy.	Light.	Fine.
„ 20	29.909	.926	.929	.937	.925	40.5	33	35.02	Easterly.	Light.	Variable winds, and cloudy.
„ 21	.902	.863	.876	.956	.899	41	34	36.54	N.Easterly.	Moderate.	Hazy; thick fog in the offing.
„ 22	.855	.890	.883	.861	.872	44	35	38.17	S.Westerly.	Light.	Cloudy, with fog.
„ 23	.863	.863	.922	.973	.905	44	36	39.50	Northerly.	Moderate.	Clear.
„ 24	922	30.041	30.063	30.050	30.036	41	34	38.25	N.Wy.	Light.	Clear and fine.
„ 25	30.069	.057	.040	29.993	.040	42	32.5	37.29	Westerly.	Light.	Fine.
„ 26	29.950	29.907	29.872	.802	29.878	43	32	37.42	Westerly.	Light.	Fine.
„ 27	.761	.787	.796	.768	.779	45	38	41.50	S.Easterly.	Moderate.	Cloudy, small rain in the afternoon.
„ 28	.757	.730	.711	.699	.724	41	36	39.25	E.S.E.	Moderate.	Cloudy.
„ 29	.651	.581	.502	.491	.531	42	35	37.87	S.Westerly.	Moderate.	Variable, with occasional fog and rain.
„ 30	.343	.357	.406	.410	.379	42	35	36.42	Southerly.	Light.	Overcast.
MEANS	29.8890	29.8940	29.8886	29.8840	29.8889	+47	+23	+36.12			

PRESSURE of the ATMOSPHERE as observed at	3 A.M.	9 A.M.	3 P.M.	9 P.M.	During the Month.
	Inches.	Inches.	Inches.	Inches.	Inches.
Mean .	30.146	30.143	30.170	30.194	30.194
Min. .	29.343	29.357	29.406	29.491	29.343
Mean .	29.8890	29.8940	29.8886	29.8840	29.8889

DIRECTION of the WINDS. Number of Days at

N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm.
1½	1	12½	2½	2	4½	2½	3½	0

GENERAL REMARKS.

The ships being again fitted for sea, the pressure of the atmosphere was registered by the Marine Barometer (514), and a correction of .012 added, to make the observations comparative with those registered by No. 80. The first rain fell on the afternoon of the 7th of June, after which the snow disappeared very rapidly from the hills, and all the ravines were pouring large streams of water into the sea.

ABSTRACT of the METEOROLOGICAL JOURNAL kept on Board His Majesty's Ship, HECLA, during the Month of July, 1825.

DATE. 1825.	NOON. North Latitude.	NOON. West Longitude.	Marine Barometer, No. 514, corrected and reduced to Mountain Barometer, No. 80. A.M. 3h.	A.M. 9h.	P.M. 3h.	P.M. 9h.	Mean of 24 hours.	Temperature of the Atmosphere, registered every two hours. Max.	Min.	Mean.	Prevailing Winds. Direction.	Velocity.	PREVAILING WINDS and OTHER REMARKS.
			Inches.	Inches.	Inches.	Inches.	Inches.	°	+°	+°			
July 1			29.397	29.386	29.387	29.392	29.390	42	34	37.58	S.E^{y}.	Light.	Cloudy, with occasional snow and rain.
„ 2			.364	.358	.470	.611	.453	41.5	31	37	S.E^{y}.	Mod.	Squally, with rain and sleet.
„ 3			.644	.683	707	.717	.688	43	33	37.75	W^{y}.	Light.	Cloudy; occasional fog.
„ 4			.707	.710	.720	.738	.719	37	34	34.92	W^{y}.	Light.	Cloudy; rain and fog.
„ 5			.751	.776	.799	.821	.787	38	32	35.29	W^{y}.	Light.	Cloudy; occasional fog.
„ 6			.850	.836	.857	.852	.849	40.5	34	36.25	W^{y}.	Light.	Over^{t}, fog near the horiz^{n}.
„ 7			.849	.851	.849	.839	.847	43	32	37.67	W^{y}.	Light.	Fine; occasional clouds and fog hanging over the hills.
„ 8			.881	.907	.913	.916	.904	41	33	35.58	W^{y}.	Light.	Clear.
„ 9			.754	.805	.798	.788	.786	41	34	36.50	S.W^{y}.	Light.	Clear and fine.
„ 10	In Port Bowen.		.882	.889	.890	.889	.885	41	33	37.92	W^{y}.	Light.	Clear and fine; occasional thin clouds.
„ 11			.906	.922	.939	.928	.924	41	35	38.12	W^{y}.	Light.	Clear and fine.
„ 12			.930	.877	.915	.901	.906	44	37	40.08	W^{y}.	Light.	Clear and fine; occasional haze to the westward.
„ 13			.834	.851	.846	.840	.843	47.5	37	41.17	N.W.	Light.	Fine.
„ 14			.851	.874	.887	.876	.873	40.5	32	37.08	W^{y}.	Light.	Fog, with showers of rain.
„ 15			.868	.851	.847	.819	.846	41	33	36.12	W^{y}.	Light.	Fine.
„ 16			.781	.776	.782	.785	.781	41	36	38.37	W^{y}.	Light.	Fog.
„ 17			.791	.823	.833	.842	.822	45	36	40.50	N^{y}.	Light.	Occasional fog and haze; clear in zenith.
„ 18			.841	.850	.818	.843	.845	41	32	37.58	N.W^{y}.	Light.	Occasional fog and rain.
„ 19			.868	.875	.910	.955	.902	37	32	33.92	N.W^{y}.	Mod.	Fine; dense fog near horizon.
„ 20	73° 17' 20"	89° 18' 20"	.936	.959	.931	.894	.931	37	32.5	35	N.W.	Light.	Clear; occasional fog.
„ 21	*73 18 30	*89 10 15	.880	.863	.949	.825	.879	39	30	35.50	N^{y}.	Very L^{t}.	Fine; occa^{l}. fog and haze.
„ 22	*73 47 30	*89 18 00	.822	.782	.763	.668	.759	42	33.5	37.83	S.E^{y}.	Mod.	Hazy; fog and rain at times.
„ 23	*73 40 30	*88 15 30	.600	.632	.744	.691	.667	50	36	41.58	S.E.	Fresh.	Cloudy.
„ 24	*73 48 10	*90 09 00	.915	.778	.723	.732	.787	40.5	35	36.79	S^{y}.	Light.	Hazy; occa^{l}. thick fog.
„ 25	73 27 15	90 47 35	.906	.947	.976	.977	.951	39	33	35.98	S.S.W.	Light.	Cloudy; occasional fog; latter part fine.
„ 26	73 08 40	*91 15 30	.989	.946	.876	.844	.911	39	32.5	36.17	N^{y}.	Very L^{t}.	Cloudy; constant rain.
„ 27	73 08 15	91 19 52	.822	.810	.867	.928	.864	49	34	39.37	S.E^{y}.	Light.	Overcast; rain occasionally; wind variable.
„ 28	72 51 51	91 40 19	30.000	30.053	30.081	30.084	30 054	44	34	39.46	S.W^{y}.	Light.	Fine; occa. clouds; wind varia.
„ 29	72 52 35	91 38 45	.074	.076	.067	29.999	.054	46	32.5	39.17	S.W^{y}.	Light.	A.M. Cloudy. P.M. Fine.
„ 30	*72 51 40	*91 42 00	29.895	29.720	29.689	.661	29.729	38.5	32.5	34.29	N^{y}.	L^{t}. F^{h}.	Hazy; heavy rain and sleet.
„ 31			.719	.717	.688	.596	.687	40.5	31	35.42	N.E^{y}.	Mod.	Squally; cloudy; occasional snow and sleet.
MEANS			29.8165	29.8140	29.8230	29.8145	29.8170	50	30	37.29			

PRESSURE of the ATMOSPHERE as observed at

	3 A.M.	9 A.M.	3 P.M.	9 P.M.	During the Month.
	Inches.	Inches.	Inches.	Inches.	Inches.
Max.	30.074	30.076	30.081	30.084	30.084
Min.	29.364	29.358	29.387	29.392	29.358
Mean	29.8165	29.8140	29.8230	29.8145	29.8170

DIRECTION of the WINDS.

Number of Days at

N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.
4	1	0	5	2	3	12	4

GENERAL REMARKS.—Westerly winds were more prevalent in July, previous to our leaving Port Bowen, than at any former period of our stay there; and the weather was generally fine throughout the month.

ABSTRACT of the METEOROLOGICAL JOURNAL kept on BOARD HIS

DATE. 1825.		NOON. Latitude, North.	NOON. Longitude, West.	BAROMETER, Corrected for Temperature, Neutral Point, and Capacity. A. M. 3h.	A. M. 9h.	P. M. 3h.	P. M. 9h.	Mean of 24 hours.	DANIELL'S HYGROMETER. 9 A.M. Temp. of the Air.	9 A.M. Dew Point.	9 A.M. Diff.	3 P.M. Temp. of the Air.	3 P.M. Dew Point.	3 P.M. Diff.
		° ′ ″	° ′ ″	Inches.	Inches.	Inches.	Inches.	Inches.	°	°	°	°	°	°
Aug.	1	*72 50 55	91 43 24	29.530	29.564	29.619	29.651	29.591	38	31	7	38.5	30	8.5
„	2			.663	.657	.660	.676	.661	37	34	3	39	33	6
„	3	72 47 43	*91 48 15	.689	.713	.743	.772	.729	34	33	1	40	33	7
„	4			.788	.776	.811	.828	.801	39	35	4	37.5	35	2.5
„	5			.804	.781	.725	.661	.743	..	..	..	..	..	..
„	6			.639	.666	.696	.719	.680	..	..	..	..	..	..
„	7			.743	.780	.776	.778	.769	37	38	1	35	34	1
„	8			.750	.763	.777	.807	.774	43	36	7	38	37	1
„	9			.824	.798	.741	.683	.762	41	33	8	..	..	..
„	10			.611	.616	.622	.661	.627	46	38	8	..	..	..
„	11			.680	.707	.719	.697	.701	41	38	3	38	36	2
„	12			.698	.715	.744	.773	.731	37	34	3	40.5	32	8.5
„	13	72 46 30	91 50 05	.797	.839	.869	.862	.842	..	..	..	..	..	..
„	14			.818	.848	.848	.834	.844	45	40	5	48	42	6
„	15			.805	.784	.752	.727	.767	..	..	..	50	42	8
„	16			.680	.662	.580	.518	.610	39	37	2	38	36	2
„	17			.570	.703	.733	.717	.681	39	32	7	37	32	5
„	18			.624	.569	.564	.604	.590	34	34	0	36.5	29	7.5
„	19			.622	.595	.621	.614	.613	..	..	..	..	..	..
„	20			.612	.575	.527	.478	.518	..	..	..	..	..	..
„	21			.483	.431	.412	.387	.428	..	..	..	..	..	..
„	22	72 45 19	*91 24 15	.381	.394	.432	.453	.415	31.5	30	1.5	34	31	3
„	23	*72 37 00	*91 52 00	.486	.535	.555	.582	.539	33	32	1	..	..	..
„	24	72 34 57	*91 38 00	.663	.684	.698	.679	.681	33	32	1	34	32	2
„	25	*72 35 00	*91 19 30	.764	.831	.886	.900	.815	33	32	1	31.5	31	0.5
„	26	72 55 13	*91 09 20	.900	.904	.908	.928	.910	35	28	7	..	..	..
„	27	*73 10 30	*89 13 00	.883	.787	.718	.668	.764	32	31	1	34	31	3
„	28	Neill's	Harbour.	.613	.630	.650	.641	.641	35	32	3	..	..	..
„	29	73 09 08	89 01 20.8	.655	.670	.710	.735	.694	..	..	..	..	..	..
„	30			.735	.738	.712	.697	.720	26.5	23	3.5	29.5	29.5	0
„	31	73 10 15	*89 09 40	.614	.527	.429	.335	.476	33	32	1	30	30	0
MEANS				29.6833	29.6854	29.6853	29.6795	29.6833	36.6	33.2	3.4	37.3	33.4	3.9

	PRESSURE of the ATMOSPHERE as observed at 3 A. M.	9 A. M.	3 P. M.	9 P. M.	During the Month.	Moisture of the Atmosphere. Daniell's Hygrometer. Temp. of the Air.	Dew Point.	Diff.	Mean Temperature of the Sea-Water.	DIRECTION of the WINDS. Number of Days at N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm.	Round the Compass
	Inches.	Inches.	Inches.	Inches.	Inches.														
Max.	29.900	29.944	29.908	29.928	29.928														
Min.	29.381	29.394	29.412	29.335	29.335	°	°	°	°										
Mean	29.6833	29.6854	29.6853	29.6795	29.6833	36.95	33.3	3.65	31.30	9	8¼	1	0	1½	2¼	1½	7	0	0

MAJESTY'S SHIP HECLA, at Sea, during the Month of AUGUST, 1825.

TEMPERATURE registered every TWO HOURS. Atmosphere. Max.	Atmosphere. Min.	Atmosphere. Mean.	Sea-water at Surface. Max.	Sea-water at Surface. Min.	Sea-water at Surface. Mean.	Prevailing Winds. Direction.	Prevailing Winds. Velocity.	Prevailing Weather, and other Remarks.
+°	+°	+°	+°	+°	+°			
39	31	35.68	31	30	30.45	N.E. South.	Fresh. Mod.	A.M. Fine.—P.M. Hazy, with snow.
41	34	36.50	31	30	30.58	N.Easterly.	Light.	Fine and clear.
44	34	38.62	31	30	30.67	N.N.E.	Moderate.	Cloudy.
42	34	38.50	32	30	31.04	N.Easterly.	Fresh.	Clear.
47	35	41.83	32	30	30.96	N.N.E.	Moderate.	Clear.
38.5	34	36.17	32.5	31	31.79	Northerly.	Moderate.	Cloudy; occasional rain.
37	33	34.46	33	30	31.25	N.Easterly.	Fresh.	Cloudy, with small rain.
40	33	35.50	32	30	31.17	N.N.E.	Light.	Cloudy.
44.5	37	40.83	33	31	32.17	Northerly.	Light.	Fine and clear.
43	40	41.73	33	31	31.69	N.Westerly.	Light.	Fine and clear.
44	31.5	37.42	34	31.5	32.41	Northerly.	Light.	Cloudy; fog at times.
40.5	34	37.46	34	31	32.33	Northerly.	Light.	Fine.
44	37	40.54	34	31	32.62	N.Westerly.	Moderate.	Cloudy.
48	38	42.50	32	31	31.62	N.Westerly.	Moderate.	Cloudy.
51	39	44.79	32.5	31.5	31.92	W.N.W.	Fresh.	Cloudy.
48	35	39.67	32.5	31	31.83	S.Westerly.	Moderate.	Cloudy.
38	30	34.67	32	31	31.50	N.Westerly.	Fresh.	Cloudy, snow, and sleet.
36.5	28	32.58	32	31	31.40	N.Westerly.	Strong.	Squally, with snow and sleet.
36	30	33.00	32	31	31.21	N.W.	Fresh.	Clear and fine.
36	30.5	32.92	31.5	31	31.20	N.N.E.	Light.	Cloudy.
36	31	32.95	32	31	31.30	N.N.E.	Fresh.	Cloudy.
35	30	31.92	32	30.5	31.25	N.Easterly.	Light.	Fine.
33	31.5	32.29	33	31.5	32.20	S.Westerly.	Moderate.	Hazy.
34	32	32.96	33	32	32.33	S.S.W.	Moderate.	Cloudy.
33	29	31.75	33	31	31.79	S.Westerly.	Moderate.	Cloudy.
42	29	33.37	32.5	30	31	Westy. N.Easty.	Light.	Variable winds, fine.
34	28	33.54	32	31	31.42	N.Easterly.	Fresh.	Cloudy.
36	32	33.83	32	31	31.33	E.N.E.	Moderate.	Cloudy.
34	32	32.58	33	30	31.21	N.Easterly.	Fresh.	Cloudy, with squalls.
29	25	27.50	29	28.5	28.80	N.E.	Moderate.	Cloudy, and very squally.
31	29	30.79	31	29	29.83	N.Westerly.	Moderate.	Cloudy, small snow.
51	25	35.77	34	28.5	31.36			

GENERAL REMARKS.

The oscillations of the mercurial column were very small throughout this month; the only one, during the voyage, in which it did not reach the height of 30 inches. The mean temperature of the atmosphere (35°.77), is full two degrees higher than any former August in these latitudes; and a comparative view of the last three months, with the same months of former years, seems to indicate a more than usually high temperature during the summer of 1825.

ABSTRACT of the METEOROLOGICAL JOURNAL kept on BOARD

DATE. 1825.	NOON. Latitude, North.	NOON. Longitude, West.	BAROMETER corrected for Temperature, Neutral Point, and Capacity. A.M. 3h.	A.M. 9h.	P.M. 3h.	P.M. 9h.	Mean of 24 hours.	DANIELL'S HYGROMETER. 9 A.M. Temp.	9 A.M. Dew Pt.	9 A.M. Diff.	3 P.M. Temp.	3 P.M. Dew Pt.	3 P.M. Diff.
	° ′ ″	° ′ ″	Inches.	Inches.	Inches.	Inches.	Inches.	°	°	°	°	°	°
Sept. 1	74 01 10	85 13 00	29.297	29.183	29.216	29.241	29.231	31	28	3	..	..	.
„ 2	73 58 15	82 18 06	.292	.297	.320	.279	.297	33	33	0	33	33	0
„ 3	73 58 13	82 35 00	.160	.160	.151	.231	.175	31	31	0	34	30	4
„ 4	73 56 19	74 16 36	.321	.434	.460	.522	.435	34.5	33	1.5	37.5	33	4.5
„ 5	73 40 08	71 13 38	.597	.623	.631	.629	.620	39.5	33	6.5	38.5	33	5.5
„ 6	72 56 03	65 31 31	.615	.633	.750	.851	.712	35	33	2	35	33	2
„ 7	72 27 56	60 49 08	.905	.928	.946	.973	.938	32.5	31	1.5	33.5	33	0.5
„ 8	71 58 13	60 55 45	.959	.971	.987	30.031	.985	32	32	0	33.5	33	0.5
„ 9	71 36 44	60 05 28	30.023	.990	.953	29.819	.956	..	..	.	32.5	32	0.5
„ 10	70 25 32	60 00 10	29.758	.623	.568	.555	.626	36	36	0	..	..	.
„ 11	70 45 20	58 24 58	.591	.759	.796	.821	.742	37	37	0	39	39	0
„ 12	70 01 38	58 34 10	.781	.625	.478	.468	.586	38	38	0	..	..	.
„ 13	70 18 02	57 40 00	.789	30.014	30.107	30.133	30.011	38	38	0	38	38	0
„ 14	71 07 05	58 26 40	30.216	.285	.329	.362	.298	38	35	3	38	35	3
„ 15	70 18 22	58 28 17	.355	.309	.252	.241	.289	37	35	2	34.5	33	1.5
„ 16	68 11 27	58 27 28	.265	.314	.325	.298	.298	32	32	0	32	32	0
„ 17	66 24 19	56 05 48	.244	.191	.154	.160	.187	33.5	33	0.5	35	35	0
„ 18	65 08 05	55 25 54	.186	.216	.182	.114	.174	35.5	35.5	0	..	..	.
„ 19	63 59 51	55 11 05	.059	.060	.038	.068	.056	38	38	0	39.5	39.5	0
„ 20	62 59 52	56 58 15	.060	.119	.120	.149	.112	41.5	41.5	0	42	37.5	4.5
„ 21	61 49 46	56 03 48	.071	.051	.032	.026	.045	39	38	1	39.5	38	1.5
„ 22	60 39 44	53 21 50	29.982	29.952	29.852	29.772	29.890	37	36	1	38	38	0
„ 23	59 18 44	49 06 43	.687	.635	.450	.473	.561	39	36	3	41.5	39	2.5
„ 24	58 22 02	44 45 04	.526	.495	.600	.699	.580	42	39.5	2.5	..	..	.
„ 25	57 58 32	44 24 19	.732	.671	.565	.406	.593	..	..	.	..	..	.
„ 26	57 26 20	43 58 19	.196	.053	28.840	28.942	.008	43	43	0	42	42	0
„ 27	58 28 46	42 50 23	28.959	.095	29.060	29.215	.082	40.5	40.5	0	44	41	0
„ 28	57 06 27	38 31 10	29.262	.352	.420	.559	.398	43	43	0	44	44	0
„ 29	57 55 14	33 58 43	.664	.719	.717	.743	.711	..	..	.	47	38	9
„ 30	58 17 12	31 40 48	.710	.695	.728	.694	.707	47	39	8	48	40	8
MEANS			29.7423	29.7487	29.7338	29.7498	29.7435	37.16	35.85	1.31	38.31	36.33	1.98

	PRESSURE of the ATMOSPHERE as observed at 3 A.M.	9 A.M.	3 P.M.	9 P.M.	During the Month.	Daniell's Hygrometer. Moisture of the Atmosphere. Temp. of Air.	Dew Pt.	Diff.	Mean Temperature of the Sea-Water at the Surface.	DIRECTION of the WINDS. Number of Days at N.	N.E.	E.	S.W.	S.	S.E.	W.	N.W.	Calm	Round the Comp.
	Inches.	Inches.	Inches.	Inches.	Inches.														
Max.	30.355	30.314	30.329	30.302	30.302														
Min.	28.959	29.033	28.840	28.942	28.840	°	°	°	°										
Mean	29.7423	29.7487	29.7338	29.7498	29.7435	37.48	36.09	1.39	39.52	1½	3	3½	1	5½	3	4½	8	0	0

HIS MAJESTY'S SHIP HECLA, at Sea, during the Month of SEPTEMBER, 1825.

Temperature of the Atmosphere, registered every two hours.			Temperature of the Sea-Water at Surface.			Prevailing Winds.		Prevailing Weather and Other Remarks.
Maximum.	Minimum.	Mean.	Maximum.	Minimum.	Mean.	Direction.	Velocity.	
°	°	°	°	°	°			
35	28	30.92	33.5	30	31.7	Westerly.	Moderate.	Cloudy.
33.5	32	32.67	34	32	33.1	N.Easterly.	Moderate.	Hazy, occasional squalls and snow.
33	30	31.67	36	33	33.7	Nly. Wly.	Moderate.	Hazy; snow.
37.5	33	34.90	38	34	35.7	N.W.	Moderate.	Clear.
39.5	35	37.50	. .	. .	38	S.W.	Light.	Clear and fine.
35	33.5	34.60	34.5	34	34.2	S.Westerly.	Moderate.	Cloudy.
34	32.5	33.30	. .	. .	34.5	Southerly.	Moderate.	Overcast and hazy.
33.5	32	33.50	. .	. .	35	Southerly.	Fresh.	Overcast.
35	32.5	33.50	. .	. .	. .	A.M. S. P.M. E.	Light. Mod.	Thick foggy weather.
36	36	36.07	38	34	35.8	S.Easterly.	Strong.	Thick, hazy, and rain.
39	37	38.04	38.5	38	38.2	S.b.E.	Fresh.	Hazy; heavy squalls.
40	37	38.42	38	37.5	37.9	S.Easterly.	Strong.	Hazy, with rain.
38	35	37.08	37	35.5	36.2	Southerly.	Strong.	Hazy.
40.5	34	35.62	37.5	36	36.9	Southerly.	Light.	Fine.
36	32	34.17	37	33	34.6	N.N.W.	Moderate.	Fine.
34	32	32.35	34	32	32.8	N.W.b.N.	Moderate.	Clear.
37	33	34.71	38	36	37.1	North.	Fresh.	Hazy.
38	34	36.25	39	37.5	38.1	Easterly.	Light.	Cloudy, with rain.
41	37.5	39.04	42	38	40.3	E.N.E.	Moderate.	Constant rain.
43	40.5	41.29	43	41.5	42.1	Easterly.	Light.	Cloudy.
41.5	38	39.25	43	42	42.5	N.Westerly.	Moderate.	Cloudy.
38.5	37	37.71	43	42	42.9	N.Westerly.	Fresh.	Cloudy; rain at times.
42	38	40.21	45	43	44.2	N.N.W.	Fresh.	Cloudy.
42.5	39	41.50	46	44	45.3	N.N.W.	Fresh. Light.	Cloudy.
42.5	41	41.58	45.5	41	45.1	N.E.	Strong.	Hazy.
43	41	41.92	47	45	46	N.E.	Strong.	Thick, hazy.
45	40	42.62	49	46	47.4	N.W.	Fresh.	Constant rain.
45	43	44.08	51	48	49.6	Westerly.	Fresh.	Cloudy, with showers of rain.
47	43	45.04	52	49.5	50.7	West.	Moderate.	Cloudy.
50	42.5	46.04	52	50.5	51.4	Westerly.	Light.	Fine.
52	28	37.54	52	30	39.52			

GENERAL REMARKS.—The changes of position occurring throughout the month of September preclude any comparison with the observations of former months. In a gale of wind which occurred on the 25th and 26th, the barometer fell rapidly as the wind increased; and by 3h A.M., on the 26th, stood at 29.196 inches. The wind still continuing violent, the Barometer began to rise, but in a few hours again fell considerably, and continued to fall till 3h P.M., when it had reached a minimum of 28.840 inches. Shortly after this, the gale began to abate; and the mercury, slowly ascending, reached 29 inches by eight A.M., on the 27th. From this time, the weather gradually moderated, and the Barometer rose more rapidly.

II.

ACCOUNT OF THE CHRONOMETERS EMBARKED ON BOARD HIS MAJESTY'S SHIP, HECLA.

ELEVEN Chronometers were embarked on board the Hecla, of which seven were box, and four pocket, watches.

Four of the box, and two of the pocket Chronometers were the property of Government, the others belonged to private individuals, viz.:

Murray	No.	816	Box	belonging to	Government.
Lancaster	„	552	„	„	„
Lancaster	„	566	„	„	„
Parkinson and Frodsham	„	228	„	„	„
Parkinson and Frodsham	„	423	Pocket	„	„
Arnold	„	2109	„	„	„
Murray	„	518	Box (eight day)	„	the maker.
Henry Frodsham	„	1	„	„	„
Parkinson and Frodsham	„	259	„	„	Capt. Parry.
Parkinson and Frodsham	„	510	Pocket	„	Lieut. Wynn.
Arnold	„	2	„	„	the maker.

The Chronometers were received on board on the 6th of May; the error of each on mean Greenwich time having been carefully noted that day at noon, and annexed to a memorandum of their respective mean rates. They were suspended from the beams of the deck in canvass cots lined with green-baize; the pocket watches, with the exception of 510, being occasionally taken on shore, or upon the ice, for making observations. Each day at noon they were wound up and compared, by Lieutenant Foster and Mr. Hooper.

The ships having reached the Whale-fish Islands, in Davis' Strait, about the end of June, 1824, the rates of the Chronometers were then determined by four days' observations. No other opportunity of determining their rates occurred until the arrival of the Expedition at Port Bowen, when observations were immediately obtained, which were afterwards transferred by trigonometrical measurement to the meridian of the observatory; and the mean daily rate of each Chronometer determined by further observations after a three weeks' interval.

In Table I. is exhibited the mean daily rate of each Chronometer when first embarked; the mean daily rate found at the Whale-fish Islands; and also the mean daily rate of each, for three weeks after the Expedition reached Port Bowen.

In Table II. is shewn the weekly errors and mean daily rate of each Chronometer upon 816, which was employed as a standard or comparing watch*; from which the actual daily rate, averaged in weeks, of each Chronometer upon every one of the others may easily be deduced.

While the daily comparisons of the Chronometers served to shew any aberrations that occurred in the going of either, they also furnished the means of selecting those which had gone most steadily and uniformly, to be used in the determination of the longitudes.

Nos. 816, 228, 510, 1, 566, and 2, observed such uniform rates, that a mean between the rate sent with each, and the rate found at the Whale-fish Islands, was employed from the time of sailing until the 1st of July; and a mean between the Whale-fish Island rates and those ascertained at Port Bowen, were assigned from the 1st of July until the Expedition reached winter-quarters. Nos. 518, 259, and 552 changed their rates so considerably, as to render a more frequent correction of them necessary; and in order to effect this, a mean Greenwich time was deduced from the foregoing six Chronometers, and from thence the daily rate of each of these three, for the first week in each month, determined as follows, viz.:

Chron.	Daily rate when embarked.	Daily Rate on the first Week in				Daily Rate at Port Bowen.
		June.	July.	August.	September.	
	s.	s.	s.	s.	s.	s.
No. 518	l. 0.5	l. 0.832	l. 13.419	l. 13.631	l. 13.620	l. 15.179
" 259	l. 2.0	g. 3.029	g. 5.009	g. 7.223	g. 7.527	g. 8.106
" 552	g. 2.98	g. 7.242	g. 7.227	g. 9.035	g. 9.380	g. 10.868

* This Chronometer had gained the prize given by Government for the best-going Chronometer, on twelvemonths' trial at the Royal Observatory, Greenwich.

No. 518's acceleration of rate being principally between the 12th and 18th of June, a mean rate between that found the first week in June and that with which it was embarked, was employed until the 15th of June; and a mean of those shewn the first week in July, August, and September, and that found at Port Bowen, was its assigned rate from the 15th of June, until the end of the navigable season. The accelerations of 259 and 552 were more gradual, and their rates have accordingly been increased on the 1st of each month; assigning to them for May a mean between the rate sent with them and the rate shewn the first week in June; for June, a mean of the rates shewn the first week in June and the first week in July, and so on to the end of the season.

Nos. 423 and 2109 did not go with sufficient steadiness to be used for the determination of the longitudes.

In Table III. is exhibited the weekly error of each watch employed in the determination of the longitudes upon mean Greenwich time, beginning with the errors noted on the 6th of May, and allowing the rates deduced as above-mentioned, up to the 30th of September. The error of each watch upon mean time at the observatory at Port Bowen is also given for that day, and consequently the longitude of Port Bowen observatory by each chronometer respectively.

The mean longitude thus deduced (88° 55′ 08″.1) is so near the longitude afterwards determined by celestial observations, as not only to render further correction unnecessary, but also to furnish unequivocal testimony to the excellence of these chronometers.

On the 10th of December, 423 was accidentally let fall, by which its rate was so much increased as to render it unserviceable as a chronometer for the remainder of the voyage. In consequence of this accident, and on account of 2109's rate continuing too irregular to be depended upon for making observations, an exchange was effected of this latter chronometer for 649, a pocket watch by Parkinson and Frodsham, also the property of government, and embarked on board the Fury. Numbers 2 and 649 were employed at the observatory during the whole winter in making observations, exposed to the external atmosphere frequently for hours together, without any material alteration in their rates being produced by the vicissitudes of temperature to which they were thus subjected.

Table IV. shews the weekly error and mean daily rate of each chronometer upon mean time at Port Bowen, from the end of September, 1824, until the

14th of July, 1825, a few days previous to the expedition leaving winter-quarters. The stoppage of 552 during the months of May and June, was owing to a defective part in the chain, eventually preventing its going altogether. The other stoppages, including the letting down of nearly the whole of the chronometers on the 6th of June, were accidental; but as there was nothing at this time dependent upon them, and no ill consequences followed, it is unnecessary further to detail the cause.

The error of each chronometer respectively on Greenwich mean time, on the 14th of July, was determined by assuming $5^{h.}\ 55^{m.}\ 39^{s.}.24$ (being the mean result of all the observations) as the absolute longitude of Port Bowen; and again on the 28th of August by observations at Neill Harbour, whose difference of meridian from Port Bowen was ascertained very accurately by trigonometrical survey as well as observation. These errors, with the mean daily rate of each chronometer during the interval, are exhibited in Table V.

Previously to Captain Parry's landing at Peterhead on the 12th of October, comparisons of all the chronometers with each other were made; and No. 2, as well as a remarkably steady-going pocket-watch belonging to Mr. Foster, were conveyed to London for the sake of comparison at Greenwich. This was obtained on the 16th, and by allowing the respective rates of these watches back for the four days, the actual error of each chronometer on Greenwich mean time on the 12th of October was deduced, and is also shewn in Table V.

Table VI. shews the weekly error and mean daily rate of each chronometer upon 816 (the comparing watch) during the navigation of 1825; by which, as well as by the changes in the respective mean rates shewn in the first and second intervals of Table V., it will be observed that several of the chronometers deviated very considerably in the latter period of the season; but as no part of the survey depended on this interval, and the maximum error up to the 12th of October amounted only to 58 seconds, it has not been considered necessary to add any further correction.

TABLE I.

Exhibiting the MEAN DAILY RATE of each of the HECLA'S CHRONOMETERS when first embarked, also at the WHALE-FISH ISLANDS, and again at PORT BOWEN.

	Murray.		Parkinson and Frodsham.			H. Frodsham.	Lancaster.		Arnold.
	816.	518.	228.	259.	510.	1.	552.	566.	2.
	s.	s.	s.	s.	s.	s.	s.	s.	s.
Rates on their embarkation, May 6th, 1824 . . .	l. 2.98	l. 0.5	l. 0.67	l. 2.0	l. 0.5	g. 1.5	g. 2.98	g. 0.42	l. 2.23
Rates found at the Whale-fish Islands, June 28 to July 2d, 1824	l. 3.185	l. 13.310	g. 0.065	g. 5.09	l. 0.933	l. 0.185	g. 7.515	g 1.315	l. 2.36
Rates for three weeks after the Hecla's arrival at Port Bowen, October, 1824	l. 3.230	l. 15.179	g. 0.606	g. 8.106	l. 0.099	g. 0.701	g. 10.868	g. 1.23	l. 1.94

TABLE II.—Exhibiting the WEEKLY ERRORS and MEAN DAILY RATES of the

Season of

WEEK ending	MURRAY.		PARKINSON and FRODSHAM.							
	518.		228.		259.		423.		510.	
	Fast.		Fast.		Fast.		Fast.		Fast.	
1824.	H. M. S.	S.	H. M. S.	S.	H. M. S.	S.	H. M. S.	S.	H. M. S.	S.
May 13	0 0 12.5		0 0 45.5		0 0 53		0 1 04.8		0 1 15.5	
		g. 2.33		g. 2.14		g. 3.29		g. 4.03		g. 1.19
„ 20	0 0 28.8		0 1 00.5		0 1 16		0 1 33		0 1 23.8	
		„ 2.06		„ 2.29		„ 4.36		„ 6.74		l. 0.09
„ 27	0 0 43.2		0 1 16.5		0 1 46.5		0 2 20.2		0 1 23.2	
		„ 1.93		„ 2.50		„ 5.79		„ 5.09		g. 0.36
June 3	0 0 56.7		0 1 34		0 2 27		0 2 55.8		0 1 25.7	
		„ 0.90		„ 2.50		„ 7.21		„ 6.24		„ 1.01
„ 10	0 1 03		0 1 51.5		0 3 17.5		0 3 39.5		0 1 33	
		l. 5.69		„ 2.64		„ 7.71		„ 5.93		„ 2.14
„ 17	0 0 23.2		0 2 10		0 4 11.5		0 4 21		0 1 48	
	Slow.	„ 11.17		„ 2.07		„ 7.86		„ 6.93		„ 1.71
„ 24	0 0 55		0 2 24.5		0 5 06.5		0 5 09.5		0 2 00	
		„ 9.12		„ 3.12		„ 8.05		„ 6.62		„ 1.62
„ 28	0 1 36.5		0 2 37		0 5 38.7		0 5 36		0 2 06.5	
		„ 10.125		„ 3.25		„ 8.275		„ 7.875		„ 2.25
July 2	0 2 17		0 2 50		0 6 11.8		0 6 07.5		0 2 15.5	
		„ 10.50		„ 3.00		„ 8.53		„ 8.08		„ 2.00
„ 8	0 3 20		0 3 08		0 7 03		0 6 56		0 2 27.5	
		„ 10.50		„ 3.21		„ 9.36		„ 8.29		„ 1.79
„ 15	0 4 33.5		0 3 30.5		0 8 08.5		0 7 51		0 2 40	
		„ 10.50		„ 3.36		„ 9.79		„ 6.71		„ 2.60
„ 22	0 5 47		0 3 54		0 9 17		0 8 41		0 2 58.2	
		„ 10.71		„ 3.36		„ 9.79		„ 8.00		„ 2.19
„ 29	0 7 02		0 4 17.5		0 10 25.5		0 9 37		0 3 13.5	
		„ 10.71		„ 3.36		„ 10.07		„ 7.79		„ 2.93
Aug. 5	0 8 17.5		0 4 41		0 11 36		0 10 31.5		0 3 34	
		„ 10.86		„ 3.21		„ 9.79		„ 7.81		„ 3.86
„ 12	0 9 33.5		0 5 03.5		0 12 44.5		0 11 26.2		0 4 01	
		„ 10.64		„ 3.21		„ 10.36		„ 6.83		„ 3.79
„ 19	0 10 48		0 5 26		0 13 57		0 12 14		0 4 27.5	
		„ 10.86		„ 3.71		„ 10.64		„ 6.36		„ 4.07
„ 26	0 12 04		0 5 52		0 15 11.5		0 12 58.5		0 4 56	
		„ 10.29		„ 3.57		„ 10.86		„ 6.50		„ 3.89
Sept. 2	0 13 16		0 6 17		0 16 27.5		0 13 44		0 5 23.2	
		„ 9.86		„ 3.64		„ 11.21		„ 8.79		„ 4.00
„ 9	0 14 25		0 6 42.5		0 17 46		0 14 45.5		0 5 51.2	
		„ 11.00		„ 3.53		„ 11.29		„ 9.36		„ 3.54
„ 16	0 15 42		0 7 07.2		0 19 05		0 15 31		0 6 16	
		„ 11.50		„ 3.83		„ 10.71		„ 7.71		„ 3.14
„ 23	0 17 02.5		0 7 34		0 20 20		0 16 45		0 6 38	
		„ 12.43		„ 3.50		„ 11.00		„ 7.14		„ 2.83
„ 30	0 18 29.5		0 7 58.5		0 21 37		0 17 35		0 6 57.8	

* No. 566 was accidentally let down on the 18th of July; by a careful comparison with the other Chronometers,

HECLA'S CHRONOMETERS, upon No. 816, the COMPARING-WATCH, during the Navigation, 1824.

HENRY FRODSHAM.		LANCASTER.				ARNOLD.		TEMPERATURE.	
1.		552.		566.		2.		Maximum.	Minimum.
Fast.		Fast.		Fast.		Slow.			
H. M. S.	S.	H. M. S.	S.	H. M. S.	S.	H. M. S.	S.	°	°
0 1 21		0 2 28.2		0 0 52.2		0 0 52.5		. .	. .
0 1 51	*g.* 4.29	0 3 28	*g.* 8.54	0 1 28	*g.* 5.11	0 0 49.5	*g.* 0.43	65	52
0 2 19.5	„ 4.07	0 4 34	„ 9.43	0 1 56	„ 4.00	0 0 46.5	„ 0.43	68	55
0 2 46.8	„ 3.90	0 5 44	„ 10.00	0 2 25.5	„ 4.21	0 0 41.5	„ 0.71	67	56
0 3 12.2	„ 3.63	0 6 56.2	„ 10.31	0 2 59	„ 4.79	0 0 44	*l.* 0.36	66	58
0 3 32	„ 2.83	0 8 07.5	„ 10.19	0 3 35	„ 5.14	0 0 49	„ 0.71	64	50
0 3 46.5	„ 2.07	0 9 17	„ 9.93	0 4 12	„ 5.29	0 0 50	„ 0.14	59	44
0 3 58	„ 2.87	0 9 57.7	„ 10.17	0 4 30.5	„ 4.62	0 0 42.3	*g.* 1.92	61	52
0 4 10	„ 3.00	0 10 40.5	„ 10.70	0 4 48.5	„ 4.50	0 0 39	„ 0.82	63	52
0 4 28	„ 3.00	0 11 43	„ 10.42	0 5 14	„ 4.25	0 0 28.5	„ 1.75	64.5	51
0 4 50	„ 3.14	0 12 58	„ 10.71	0 5 43	„ 4.14	0 0 21	„ 1.07	62	44
0 5 15	„ 3.57	0 14 14.5	„ 10.93	Slow 4 12 02	„ 4.14	0 0 26	*l.* 0.71	60	48
0 5 38.5	„ 3.36	0 15 35.5	„ 11.57	4 11 37	„ 3.57	0 0 30	„ 0.57	59	47
0 6 02	„ 3.36	0 16 59.5	„ 12.00	4 11 11	„ 3.71	0 0 32	„ 0.29	58	44
0 6 27	„ 3.57	0 18 25	„ 12.21	4 10 45	„ 3.71	0 0 34	„ 0.29	58	45
0 6 52	„ 3.57	0 19 59.5	„ 12.21	4 10 17	„ 4.00	0 0 36.5	„ 0.36	57	43
0 7 18	„ 3.71	0 21 18	„ 12.50	4 9 48	„ 4.14	0 0 37	„ 0.07	56	41
0 7 45.5	„ 3.93	0 22 47	„ 12.71	4 9 20	„ 4.00	0 0 32.8	*g.* 0.60	60	42.5
0 8 15	„ 4.21	0 24 15.5	„ 12.61	4 8 53	„ 3.86	0 0 27.5	„ 0.76	60	45
0 8 40.5	„ 3.64	0 25 46.5	„ 13.00	4 8 23.5	„ 4.21	0 0 30	*l.* 0.36	60	38
0 9 06	„ 3.64	0 27 16	„ 12.79	4 7 54	„ 4.21	0 0 15	*g.* 2.14	56	40
0 9 30.5	„ [illegible]	0 28 40.5	„ 12.93	4 7 22	„ 4.57	Fast. 0 0 05.5	„ 2.93	57	36

· on its being wound up and set a-going, it was found to have stopped (allowing its rate for the interval) 4^h. 18^m. 14^s.

Table III.—SHEWING the WEEKLY ERROR of each of the HECLA'S CHRONOMETERS used in the Determination of the Longitude, upon Mean Greenwich Time, during the Season of 1824; and also the Error of each upon Mean Time at Port Bowen, on the 30th of September, 1824.

DATE.		Murray.		Parkinson and Frodsham.			H. Frodsham.	Lancaster.		Arnold.
		816.	518.	228.	259.	510.	1.	552.	566.	2.
1824.		Slow. H. M. S.	Slow. H. M. S.	Slow. H. M. S.	Slow. H. M. S.	Fast. H. M. S.	Fast. H. M. S.	F H. M. S.	Slow. H. M. S.	Slow. H. M. S.
May	6	0 0 33.4	0 0 34	0 0 04.5	0 0 00.5	. . . .	0 0 12	0 1 01.3	0 0 05.4	0 1 34.2
,,	13	0 0 55	0 0 38.7	0 0 08.6	Fast. 0 0 03.1	0 0 18	0 0 16.6	0 1 37.1	Fast. 0 0 00.6	0 1 50.2
,,	20	0 1 16.6	0 0 43.3	0 0 08.8	0 0 06.7	0 0 13	0 0 21.2	0 2 12.9	0 0 06.7	0 2 06.3
,,	27	0 1 38.1	0 0 48	0 0 10.9	0 0 10.3	0 0 08	0 0 25.8	0 2 48.6	0 0 12.8	0 2 22.3
June	3	0 1 59.7	0 0 52.6	0 0 13	0 0 24.4	0 0 02.9	0 0 30.4	0 3 30.8	0 0 18.9	0 2 38.3
,,	10	0 2 21.3	0 0 57.3	0 0 15.1	0 0 52.5	Slow. 0 0 02.1	0 0 35	0 4 21.4	0 0 24.9	0 2 54.3
,,	17	0 2 42.9	0 1 27.6	0 0 17.2	0 1 20.7	0 0 07.1	0 0 39.6	0 5 12.1	0 0 31	0 3 10.4
,,	24	0 3 04.5	0 3 05.3	0 0 19.3	0 1 48.8	0 0 12.1	0 0 44.2	0 6 02.7	0 0 37.1	0 3 26.4
July	1	0 3 26	0 4 43	0 0 21.4	0 2 19	0 0 17.1	0 0 48.8	0 6 54.9	0 0 43.1	0 3 42.4
,,	8	0 3 48.5	0 6 20.8	0 0 19.1	0 3 01.8	0 0 20.8	0 0 50.6	0 7 51.2	0 0 52	0 3 57.5
,,	15	0 4 10.9	0 7 58.5	0 0 16.8	0 3 44.7	0 0 24.4	0 0 52.4	0 8 48.4	0 1 00.9	0 4 12.5
	22	0 [illegible] 33.4	0 9 36.2	0 0 14.4	0 4 27.5	0 0 28	0 0 54.2	0 9 45	Slow. 4 17 04.2	0 4 27.6
,,	29	0 4 55.8	0 11 14	0 0 12.1	0 5 10.3	0 0 31.6	0 0 56	0 10 41.9	4 16 55.3	0 4 42.6
August	5	0 5 18.3	0 12 51.7	0 0 09.7	0 5 59.4	0 0 35.2	0 0 57.8	0 11 44.2	4 16 46.3	0 4 57.7
,,	12	0 5 40.7	0 14 29.4	0 0 07.4	0 6 51	0 0 38.8	0 0 59.6	0 12 48.7	4 16 37.4	0 5 12.7
,,	19	0 6 03.2	0 16 07.2	0 0 05	0 7 42.6	0 0 42.5	0 1 01.4	0 13 53.1	4 16 28.5	0 5 27.8
,,	26	0 6 25.6	0 17 44.9	0 0 02.7	0 8 34.3	0 0 46.1	0 1 03.2	0 14 57.6	4 16 19.6	0 5 42.8
September	2	0 6 48.1	0 19 22.6	0 0 00.2	0 9 26.8	0 0 49.7	0 1 05	0 16 03.8	4 16 10.7	0 5 57.9
,,	9	0 7 10.5	0 21 00.4	Fast. 0 0 02	0 10 21.5	0 0 53.3	0 1 06.9	0 17 14.7	4 16 01.8	0 6 12.9
,,	16	0 7 33	0 22 [illegible]8.1	0 0 04.4	0 11 16.2	0 0 56.9	0 1 08.7	0 18 25.6	4 15 52.9	0 6 28
,,	23	0 7 55.4	0 24 15.8	0 0 06.7	0 12 10.9	0 1 00.6	0 1 10.5	0 19 36.4	4 15 44	0 6 43
,, 30 Error on Greenw. M. Time		Slow. 0 8 17.[illegible]	Slow. 0 25 53.5	Fast. 0 0 09	Fast. 0 13 05.6	Slow. 0 1 04.2	Fast. 0 1 12.3	Fast. 0 20 47.3	Slow. 4 15 35.1	Slow. 0 6 58.1
,, 30 Error on M. Time, at the Observatory, P. Bowen		Fast. 5 47 [illegible]2.9	Fast. 5 29 13.4	Fast. 5 55 41.4	Fast. 6 09 19.9	Fast. 5 54 40.7	Fast. 5 57 13.4	Fast. 6 16 29.4	Fast. 1 40 20.9	Fast. 5 47 48.1
Diff. of Meridians, or Long. in Time		5 56 00.7	5 55 06.9	5 55 32.4	5 56 14.3	5 55 44.9	5 56 01.1	5 55 42.1	5 55 56	5 54 46.5

RECAPITULATION OF THE LONGITUDES.

No.	816	. . . .	5 56 00.7		
,,	518	. . . .	5 55 06.9		
,,	228	. . . .	5 55 32.4		
,,	259	. . . .	5 56 14.3		
,,	510	. . . .	5 55 44.9	Mean	H. M. S. 5 55 40.54 = 88° 55′ 08″.1 W.
,,	1	. . . .	5 56 01.1		
,,	552	. . . .	5 55 42.1		
,,	566	. . . .	5 55 56		
,,	2	. . . .	5 54 46.5		

TABLE IV.

SHEWING THE WEEKLY ERROR AND MEAN DAILY RATE OF THE HECLA'S CHRONOMETERS, FROM THE 30th SEPTEMBER, 1824, TO 14th JULY, 1825.

WEEKLY ERROR and MEAN DAILY

WEEK ENDING.	MURRAY.				PARKINSON AND FRODSHAM.					
	816.		518.		228.		259.		649.	
	Fast.		Fast.		Fast.		Fast.		Fast.	
1824.	H. M. S.	s.	H. M. S.	s	H. M. S.	s.	H. M. S.	s.	H. M. S.	s.
Sept. 30	5 47 42.88		5 29 13.38		5 55 41.38		6 09 19.88		....	
Stopped . . .	17 20 46.04	−3.197		−14.631		+0.469		+ 8.083		...
Oct. 7	0 28 34.46		27 30.96		44.66		10 16.46		....	
		3.209		15.480		0.634		7.949		...
„ 14	0 26 12.1		25 42.60		49.10		11 12.10		....	
		3.284		15.427		0.716		8.287		...
„ 21	0 25 49.11		23 54.61		54.11		12 10.11		....	
		3.454		15.954		0.474		7.903		...
„ 28	0 25 24.93		22 02.93		57.43		13 05.43		....	
		3.576		16 719		0.210		7.567		...
Nov. 4	0 24 59.90		20 05.90		58.90		13 58.40		....	
		3.217		15.360		0.640		8.569		...
„ 11	0 24 37.38		18 18.38		5 56 03.38		14 58.38		....	
		3.011		14.654		1.131		8.703		...
„ 18	0 24 16.30		16 35.80		11.03		15 59.30		....	
		2.673		11.673		1.399		9.327		...
„ 25	0 23 57.59		15 14.09		21.09		17 04.59		....	
		2.353		10.710		2.361		7.790		...
Dec. 2	0 23 41.12		13 59.12		37.62		18 13.12		....	
		2.521		11.236		1.979		9.836		...
„ 9	0 23 23.47		12 40.47		51.47		19 21.97		....	
		2.937		11.009		1.810		9.634		...
„ 16	0 23 02.91		11 23.41		5 57 04.41		20 29.41		6 24 15.91	
		2.681		11.610		1.819		9.247		+4.717
„ 23	0 22 44.14		10 02.14		17.14		21 34.14		24 49.14	
		2.377		10.949		2.051		10.337		4.551
„ 30	0 22 27.5		08 45.5		31.5		22 46.35		25 21	
1825.		2.253		10.167		1.819		10.390		1.676
Jan. 6	0 22 11.73		07 32.23		44.23		23 59.23		25 53.73	
		2.329		10.886		1.700		10.600		1.700
„ 13	0 21 55.43		06 16.03		56.13		25 13.43		26 26.63	
		2.065		10.515		1.822		10.747		5.285
„ 21	0 21 38.91		04 51.91		5 58 10.71		26 39.41		27 08.91	
		2.100		10.767		1.933		10.650		5.483
„ 27	0 21 26.31		03 47.31		22.31		27 43.31		27 41.81	
		2.243		10.957		2.043		10.543		4.099
Feb. 3	0 21 10.61		02 30.61		36.61		28 57.11		28 10.5	
		2.280		10.137		2.006		11.077		3.927
„ 10	0 20 54.65		01 19.65		50.65		30 14.65		28 37.99	
		2.121		9.179		2.307		11.236		5.031
„ 17	0 20 39.80		00 13.3		5 59 06.8		31 33.3		29 13.21	
		2.686		10.429		2.057		11.071		...
„ 24	0 20 21		4 59 00.3		21.2		32 50.8		....	
		2.589		9.703		2.526		11.340		...
March 3	0 20 02.88		57 52.38		38.88		34 10.18		30 34.08	
		2.529		9.771		2.471		11.643		4.014
„ 10	0 19 45.18		56 43.98		56.18		35 31.68		31 02.18	
		2.424		10.539		2.147		11.904		6.660
„ 17	0 19 28.21		55 30.21		6 00 11.21		36 55.01		31 18.8	
		2.128		9.837		2.306		12.191		6.981
„ 24	0 19 13.35		54 21.35		27.35		38 20.35		32 32.79	
		2.166		10.207		2.320		12.263		2.673
„ 31	0 18 58.18		53 09.9		43.59		39 46.10		32 51.5	
		2.251		9.781		2.485		12.034		2.133

RATE of the CHRONOMETERS.

		HENRY FRODSHAM.		LANCASTER.				ARNOLD.		Temperature.	
510.		1.		552.		566.		2.		Maximum.	Minimum.
Fast.		Fast.		Fast.		Fast.		Slow.			
H. M. S.	S.	H. M. S.	S.	H. M. S.	S.	H. M. S.	S.	H. M. S.	S.	°	°
5 51 40.68	+0.010	5 57 13.38	+0.654	6 16 29.3	+10.154	1 40 20.88	+0.940	5 47 48.38	−2.131	57	36
40.96	−0.194	17.96	0.734	17 40.46	11.231	27.46	+1.520	33.46	−1.266	61	38
39.60	−0.143	23.10	0.716	18 39.10	11.216	38.10	. . .	24.6	−2.427	59	34
38.61	−1.526	26.1	0.260	20 17.61	11.331	Let down. 9 10 32.11	+2.260	07.61	−0.740	55	39
27.93	−1.790	29.93	0.139	21 36.93	12.353	47.93	+2.710	2.43	−0.290	58.5	33
15.40	−1.717	30.90	0.497	23 03.40	11.426	9 11 06.9	+2.069	0.40	−0.360	53	29
03.38	−1.083	34.38	0.946	24 23.38	11.560	21.38	+1.989	46 57.88	−0.511	61	33
53 55.80	+0.470	41.00	1.727	25 44.30	10.684	35.30	+1.541	54.3	−0.316	60	32
59.09	+0.361	53.09	2.647	26 58.09	11.147	46.09	+1.290	52.09	. . .	66	47
54 01.62	+0.693	5 58 11.62	2.479	28 16.12	11.121	55.12	+0.907	Stopped. 5 55 37.12	−1.236	66	51
6.47	+0.991	28.97	2.706	29 33.97	11.491	9 12 01.47	+0.063	28.47	−2.22[illegible]	68	51
13.41	+0.033	47.91	2.390	30 54.41	12.104	01.91	+0.033	12.91	−1.067	66	55
13.64	+0.480	5 59 04.64	2.837	32 19.14	12.409	2.14	−0.377	5 54 59.14	−0.734	66	37
17	+1.147	24.5	2.961	33 46	12.319	9 11 59.5	−0.339	54	−3.253	70	40.5
25.03	+0.914	45.23	2.857	35 12.23	12.600	57.13	−0.786	31.23	−2.114	67	49
31.43	+1.185	6 00 05.23	3.122	36 40.43	13.222	51.63	+0.160	16.43	. . .	68	49
40.91	+1.483	30.21	3.350	38 26.21	13.767	52.91	+0.183	Stopped. 5 10 30.91	−6.017	67.5	49
49.81	+0.971	50.31	2.971	39 48.81	13.686	51.81	+0.529	09 54.81	. . .	66	40
56.61	+1.149	01 11.11	3.291	41 24.61	13.577	48.11	+0.566	Let down. 4 57 08.66	−5.780	63	51
55 04.65	+2.593	34.15	3.950	42 59.65	14.093	44.15	+1.121	56 28.2	+4.271	69	42.5
22.8	+1.886	02 01.8	3.171	44 38.3	13.529	36.3	−0.471	55 58.3	−5.643	70	54.5
36	+2.697	02 24	3.383	46 13	13.697	33	−1.760	18.8	−6.560	67	53
52.88	+2.471	47.68	. . .	47 48.88	13.329	20.68	−1.357	54 32.88	−8.163	70	64
56 10.18	+2.219	Let down. 2 09 43.18	2.933	49 22.18	13.719	11.18	−1.853	53 35.73	−7.761	71	56
25.71	+2.091	10 03.71	3.283	50 58.21	13.591	9 10 58.21	−0.409	52 41.41	−6.966	66.5	53.5
40.35	+2.406	26.55	3.420	52 33.35	13.077	55.35	. . .	51 52.65	−7.280	72.5	53.5
57.19	+2.320	50.19	3.849	54 11.19	14.249	Stopped. 9 06 07.19	+1.577	01.69	−6.180	66	51

WEEKLY ERROR and MEAN DAILY RATE

WEEK ending	MURRAY. 816. Fast.		MURRAY. 518. Fast.		PARKINSON and FRODSHAM. 228. Fast.		PARKINSON and FRODSHAM. 259. Fast.		PARKINSON and FRODSHAM. 649. Fast.	
1825.	H. M. S.	S.	H. M. S.	S.	H. M. S.	S.	H. M. S.	S.	H. M. S.	S.
April 7	0 18 42.13		4 52 01.43		6 01 01.13		6 41 10.43		6 33 06.43	
„ 14	18 24.10	−2.619	50 52.1	− 9.904	16.8	+2.239	42 35.1	+12.006	22.1	+2.221
„ 21	18 06.7	2.489	49 48.2	9.414	01 34.7	+2.557	44 00.4	12.186	41.2	2.729
„ 28	17 50.94	2.251	48 42.4	9.114	53.9	+2.743	45 25.4	12.143	34 00.1	2.700
May 5	17 34.96	2.283	47 34.16	9.749	02 11.46	+2.509	46 51.46	12.294	34 11.86	1.680
„ 12	17 19.2	2.251	46 24.4	9.966	02 28	+2.363	48 17.9	12.349	....	...
„ 19	17 03.5	2.243	45 14	10.057	02 43.7	+2.243	49 48.1	12.886	34 44.68	2.341
„ 26	16 48.3	2.171	44 03.3	10.100	02 58.8	+2.157	51 19.3	13.029	....	...
June 2	16 33.3	2.143	42 54.6	9.786	03 13.8	+1.143	52 51.8	13.214	35 02.4	...
„ 6	Let down. Slow 1 57 56.4	...	42 10.8	11.000	Let down. 2 18 07.6	...	Let down. 5 51 30.6	....	....	...
„ 10	58 01	1.25	41 31	9.950	18 18	+2.600	52 26.5	13.975	....	...
„ 16	58 13	2.00	40 26	10.833	18 31	+2.167	53 50.2	13.950	36 01.8	...
„ 20	58 19.5	1.625	39 40.5	11.375	18 30.5	−0.125	54 46.5	14.075	36 20.7	4.725
„ 23	58 24.2	1.567	39 05.5	11.667	18 24.5	−2.000	55 28.8	14.100	36 35.8	5.033
„ 27	58 29.4	1.300	38 20.1	11.350	18 33.3	+2.200	56 24.1	13.825	36 56.9	5.275
„ 30	58 32.95	1.183	37 45.35	11.583	18 40.05	+2.250	57 05.05	13.650	37 11.75	1.950
July 4	58 38.46	1.378	37 01.54	10.852	18 50.04	+2.498	58 00.44	13.848	37 31.54	5.097
„ 7	58 42.15	1.037	36 28.85	10.897	18 56.35	+2.770	58 43.65	14.403	37 41	2.157
„ 11	58 48.61	1.615	35 44.1	11.187	19 07.8	+2.362	59 38.2	13.637	37 43.9	0.725
„ 14	58 53.4	1.597	35 09.6	11.500	19 16.1	+2.767	6 00 20.1	13.967	37 46.8	0.967
P. Bowen Slow of Greenwich.	5 55 39.24	...	5 55 39.24	....	5 55 39.24	...	5 55 39.24	....	5 55 39.24	...
Errors on Greenwich M. Time on the 14th of July, 1825.	Slow 7 54 32.64	...	Slow 1 20 29.64	....	Slow 3 36 23.14	...	Fast 0 01 40.81	....	Fast 0 42 07.56	...

of the **CHRONOMETERS**—*continued.*

		HENRY FRODSHAM.		LANCASTER.				ARNOLD.		TEMPERATURE.	
510.		1.		552.		566.		2.			
Fast.		Fast.		Fast.		Fast.		Slow.		Maximum.	Minimum.
H. M. S.	S.	H. M. S.	S.	H. M. S.	S.	H. M. S.	S.	H. M. S.	S.	°	°
5 57 13.43	+2.424	2 11 17.43	+3.353	6 55 50.93	+14.053	9 00 18.23	+0.624	4 50 18.43	−4.761	67	54
30.4	2.429	40.09	3.757	57 29.3	14.229	22.6	+0.543	49 45.01	5.057	70.5	52.5
47.4	2.857	12 07.2	3.957	59 08.9	13.857	26.4	−0.043	49 09.7	4.800	71	57
58 07.4	2.337	34.9	3.791	7 00 45.9	14.080	21.9	−0.563	48 36.1	5.191	73	55
25.16	1.577	13 01.46	3.534	02 21.46	13.820	17.96	−0.609	47 59.76	5.294	72.5	39.5
36.2	1.729	26.2	3.443	04 01.2	13.943	13.7	−0.171	47 22.7	5.171	69	54
48.3	1.500	50.3	3.457	[illegible] .8	. . . .	12.5	+0.657	46 46.5	5.743	69	52
58.8	1.743	14 14.5	3.429	Stopped. 1 06 25.9	14.129	17.1	−0.757	46 06.3	5.000	70	55
59 11 Let down.	. . .	38.5	2.075	1 04 47 Let down.	. . . .	11.8	. . .	45 31.3 Let down.	. . .	69.5	53.5
2 47 35.4	1.775	46.8	2.200	. . . .	. . . .	0 44 21.1	−0.650	5 51 37.1	. . .	67	47.5
42.5	1.700	55.6	1.733	48 36	. . . .	21.5	−0.214	. . . .	4.710	69	55
52.7	1.950	15 06	2.375	. . . .	. . . .	20	−1.000	50 50	7.075	73	53
2 48 00.5	1.233	15 5	2.183	. . . .	. . . .	16	+0.333	50 21.7	7.133	65.5	54
04.2	1.775	22.5	2.217	. . . .	. . . .	17	+0.275	50 00.3	6.750	63	53
11.3	1.817	30.92	. . .	43 24.3	13.417	18.1	−0.253	49 33.3	6.317	64	53
16.75	1.698	38.25	. . .	44 04.55	13.122	17.35	0.0	49 14.35	6.052	65.5	53
23.54	1.937	. . . .	. . .	44 57.04	13.937	17.34	+0.123	48 50.14	2.830	68.5	54
29.35	1.637	54.89	2.625	45 38.85	13.062	18.01	+0.575	48 41.65	3.312	64	55
35.9	1.567	2 16 05.39	3.237	46 31.1	13.100	20.4	+0.333	48 28.4	2.933	64.5	53.5
40.6		15.1		47 10.4		21.4		48 19.6	. . .	64	56
5 55 39.24	. . .	5 55 39.24	. . .	5 55 39.24	. . . .	5 55 39.24	. . .	5 55 39.24		. .	. .
Slow 3 06 58.64	. . .	Slow 3 39 24.14	. . .	Slow 3 08 28.84	. . . .	Slow 0 48 42.16	. . .	Slow 0 07 19.64	. . .	. .	. .

TABLE V.

Shewing the ERRORS of the HECLA'S CHRONOMETERS upon GREENWICH MEAN TIME at three distinct Periods of the Season of Navigation, 1825; with their Mean Daily Rates in the Intervals.

DATE.	MURRAY.				PARKINSON AND FRODSHAM.						H. FRODSHAM.		LANCASTER.				ARNOLD.	
	816.		518.		228.		259.		510.		1.		552.		566.		2.	
	Error on Greenwich Mean Time.	Mean Daily Rate.	Error on Greenwich Mean Time.	Mean Daily Rate.	Error on Greenwich Mean Time.	Mean Daily Rate.	Error on Greenwich Mean Time	Mean Daily Rate.	Error on Greenwich Mean Time.	Mean Daily Rate.	Error on Greenwich Mean Time.	Mean Daily Rate.	Error on Greenwich Mean Time.	Mean Daily Rate.	Error on Greenwich Mean Time	Mean Daily Rate.	Error on Greenwich Mean Time	Mean Daily Rate.
1825.	Slow.		Slow.		Slow.		Fast.		Slow.		Slow.		Slow.		Fast.		Slow.	
	H. M. S.	s.	H. M. S.	s.	H. M. S.	s.	M. S.	s.	H. M. S.	s.	H. M. S.	s.	H. M. S.	s.	M. S.	s.	M. S.	s.
July 14	7 54 32.6		1 20 29.6		3 36 23.1		04 40.8		3 06 58.6		3 39 24.1		3 08 28.8		48 42.1		07 19.6	
		–		–		+		+		+		+		+		+		–
		1.982		10.315		2.996		14.409		2.040		3.918		13.333		1.002		2.238
Aug. 28	7 56 01.8		1 28 13.8		3 34 08.3		15 29.2		3 05 26 8		3 36 27.8		2 58 28.3		49 27.2	–	09 00.3	
		2.44		11.395		0.871		13.116		2.304		2.482		. . .		0.907		5.007
Oct. 12	7 57 51 6		1 36 46.6		3 33 29.1		25 19.4		3 03 43.1		3 34 36.1		Stopped.		49 17.9		12 45.6	

III.

LONGITUDE BY CHRONOMETERS FOR DETERMINING THE POSITION OF LANDS, &c. 1824 AND 1825.

Note.—The initials in the column of "Observer" in these or any other Tables of the Appendix, are as follows:

P	Captain Parry.
F	Lieut. Foster.
S	Lieut. Sherer.
R	Lieut. Ross.
H	Mr. Hooper.
$\underline{\odot}$	denotes Observation by Artificial Horizon, lower limb
$\overline{\odot}$	" " upper limb
$\ominus$	" " both limbs.

OBSERVATIONS for LONGITUDE by CHRONOMETERS, used in DETERMINING the POSITION of LANDS, &c. during the Season of 1824.

DATE.		Time by 816.	816's Correction to Mean Greenwich Time.	Observed Altitude.		Dip of the Horizon.	Observer.	Apparent Time.	Latitude, North.	Longitude, West. By 816.	Longitude, West. By Mean of 9 Chronometers.	BEARINGS OF LAND, &c.
1824.		H. M. S.	M. S.	° ′ ″		′ ″		H. M. S.	° ′ ″	° ′ ″	° ′ ″	
June	27	22 50 47.9	+3 16.76	57 20 56.5	$\ominus$	. .	P.	19 18 13.5	68 59 13	53 15 38.4		
,,	,,	22 55 27.7	3 16.76	58 10 45	$\ominus$	. .	H.	19 22 53.55	. . . . .	53 15 23.2		
,,	28	22 27 13.3	3 19.8	53 03 01	$\ominus$	. .	F.	18 54 30.05	. . . . .	53 15 39.6		
,,	,,	22 49 54.45	3 19.84	57 04 45.9	$\ominus$	. .	P.	19 17 12	. . . . .	53 15 21		
,,	,,	22 56 27.14	3 19.85	58 13 49	$\ominus$	. .	H.	19 23 43.55	. . . . .	53 15 40.2	53 12 55.7	On Boat Island, at the Whale-fish Islands.
July	1	22 35 33.7	3 29.15	54 06 09	$\ominus$	. .	F.	19 02 24.88	. . . . .	53 15 32.5		
,,	,,	22 53 15.3	3 29.21	57 14 26	$\ominus$	. .	H.	19 20 07.33	. . . . .	53 15 07.7		
,,	,,	22 59 58.97	3 29.23	58 25 04.2	$\ominus$	. .	P.	19 26 50.2	. . . . .	53 15 30		
,,	4	23 43 47.5	3 38.85	32 22 36	L	3 49	P.	. . . . .	. . . . .	. . . . .		
,,	8	23 47 19.6	3 51.68	30 49 42	L	3 37	P.	19 57 27.2	69 31 28	57 14 10.2	57 10 11.7	
,,	,,	23 50 47.8	3 51.68	31 07 42	L	3 54	F.	20 01 03	. . . . .	57 12 19.2		
Sept.	11	7 31 31.5	7 17.9	34 29 23.5	$\ominus$	. .	P.	2 14 46	74 28 15	81 55 36		
,,	,,	7 34 59.4	7 17.9	34 44 19	$\overline{\odot}$	. .	H.	2 18 18.2	. . . . .	81 54 31.5		
,,	,,	7 37 29.6	7 17.9	33 28 47	$\underline{\odot}$	. .	H.	2 20 48.9	. . . . .	81 54 24	81 51 12.9	On the Beach at Cape Warrender.
,,	,,	7 42 08.9	7 17.9	33 07 27	$\underline{\odot}$	. .	F.	2 25 13	. . . . .	81 58 12		
,,	,,	7 44 09.4	7 17.9	34 00 55	$\overline{\odot}$	. .	F.	2 27 14.4	. . . . .	81 57 58.5		
,,	27	25 51 18.36	8 11.4	14 49 29	$\overline{\odot}$	. .	P.	20 12 50.17	73 13 37.3	89 01 23.4		
,,	,,	26 02 42.7	8 11.4	15 37 44	$\ominus$	. .	F.	20 24 12.42	. . . . .	89 01 59.7	88 56 26.8	Place of Observation, S. 84° 45′ West of Observatory at P. Bowen, distant 2310 ft.
,,	,,	26 11 43.1	8 11.4	16 08 12	$\underline{\odot}$	. .	H.	20 33 16.52	. . . . .	89 01 02		

OBSERVATIONS for LONGITUDE by CHRONOMETERS used in DETERMINING the POSITION of LANDS, &c., during the Season of 1825.

DATE.	Time by 816.	816's Correction to Mean Greenwich Time.	Observed Altitude.		Dip of the horizon.	Observer.	Apparent Time.	Latitude North.	Longitude West By 816.	Longitude West By Mean of 9 Chronometers.	BEARINGS OF LAND, &c.
1825.	H. M. S.	H. M. S.	° ′ ″		′ ″		H. M. S.	° ′ ″	° ′ ″	° ′ ″	
June 2	20 00 21.6	+5 39 07.94	57 48 16	$\ominus$	. .	S.	19 45 40	73 09 03	89 01 47.1	89 01 20.85	Place of Observatⁿ. Neill's Harbour.
July 6	2 08 04.6	7 54 20.44	60 10 48	$\ominus$	. .	R.	4 02 04.4	73 09 13	89 00 54.6		
„ 24	20 31 14.4	7 54 54.43	68 08 24	$\underline{\odot}$	. .	F.	22 16 30.2	73 27 33	90 52 52.9		
„ „	20 32 15.9	7 54 54.44	68 13 24	$\underline{\odot}$	. .	P.	22 17 31.23	73 27 14	90 52 58	90 50 34.6	On shore, E. Coast of N. Somerset.
„ „	20 34 22.3	7 54 54.43	68 21 45	$\underline{\odot}$	. .	F.	22 19 40.7	73 27 33	90 52 13.9		
„ 25	3 35 47	7 54 54.92	43 11 09	$\underline{\underline{\odot}}$	. .	F.	5 20 35.75	73 24 30	90 49 09.3	90 52 45.1	On the ice.
„ „	3 40 50.8	7 54 54.6	42 26 20	$\underline{\underline{\odot}}$	. .	P.	5 25 52.7	73 24 30	90 56 21		
„ 26	15 52 23.9	7 54 58.9	33 57 09	$\overline{\odot}$	. .	F.	17 35 50	73 06 17	91 21 21		
„ „	15 57 45.36	7 54 58.9	33 39 38	$\underline{\odot}$	. .	F.	17 41 09	73 06 17	91 21 57.9	91 19 52.3	On shore, E. Coast of N. Somerset.
„ „	17 54 04.9	7 54 58.4	50 47 37	$\underline{\underline{\odot}}$	. .	P.	19 37 22.25	73 06 15	91 23 25.5		
„ 28	18 45 42.2	7 55 02.4	56 16 05	$\underline{\odot}$	. .	P.	20 27 48.2	72 51 51	91 42 49.5	91 40 19.5	
Aug. 11	17 10 23.48	7 55 29.72	36 06 45.5	$\underline{\odot}$	. .	F.	18 53 39.5	72 46 32	91 52 22.5		
„ „	17 13 54.3	7 55 29.72	37 40 20.5	$\overline{\odot}$	. .	F.	18 57 08.25	72 46 32	91 52 53.5		
„ „	17 16 38.0	7 55 29.72	38 04 13	$\overline{\odot}$	. .	F.	18 59 54.25	72 46 32	91 52 19	91 50 05.5	East Coast of North Somerset, being the place where the Fury was driven on shore.
„ „	17 19 51.6	7 55 29.72	37 29 38	$\underline{\odot}$	. .	F.	19 03 08.5	72 46 32	91 52 9.3		
„ 12	3 53 00	7 55 30.1	31 58 23	$\underline{\underline{\odot}}$	. .	P.	5 36 23.31	72 46 29	91 51 45		
„ „	3 59 24.08	7 55 30.5	31 01 51.5	$\underline{\underline{\odot}}$	. .	H.	5 42 45.59	72 46 29	91 52 18.6		
„ 22	18 19 32.2	7 55 51.59	19 44 38	L.	3 41	F.	20 03 42.4	72 33 00	92 19 16.6	92 18 22.8	
„ 28	1 19 59.4	7 56 02.09	40 54 27	$\overline{\odot}$	. .	F.	3 18 59.12	73 09 08	89 01 25.95	89 01 20.85	Place of Observatⁿ. Neill's Harbour.
„ „	1 24 30.36	7 56 02.09	39 19 27	$\underline{\odot}$	. .	F.	3 23 30.76	73 09 08	89 01 15.75		
Sept. 1	1 11 18.8	7 56 09.09	17 39 13.3	L	3 41	F.	3 26 20	74 03 00	85 20 58.3	85 19 44.9	Cape Craufurd S. 55° E. 7 or 8 leagˢ.
„ „	1 19 37.8	7 56 10	17 10 14	L	4 00	P.	3 34 54.5	74 03 00	85 17 22.5		
„ 2	0 31 04.8	7 56 12.07	18 46 00	L	3 41	F.	2 59 31.6	74 00 00	82 04 55	82 03 40.5	
„ „	0 42 55.4	7 56 11.9	18 09 17	L	3 55	P.	3 11 25.3	74 00 00	82 04 06		
„ 3	0 27 49.6	7 56 14.03	17 57 40	L.	4 01	F.	3 08 38.1	73 58 20	79 04 46.6	79 04 06	
„ „	0 31 33.7	7 56 13.9	17 45 57	L	4 00	P.	3 12 18.7	73 58 20	79 05 37.5		

N°.

OBSERVATIONS for DETERMINING the LONGITUDE of the OBSERVATORY at PORT

The Occultations of the Fixed Stars, and the eclipses of Jupiter's Satellites, were observed with an achromatic telescope, by Dollond,
The times of observation were deduced from the transits of stars passing the meridian as near the occultation as possible. To
to exclude the whole of the Moon's disk, except that near which the occultation took place. Some of the Stars, whose occultations
Le Caille, Zach, and Mayer, besides a selection of Stars lying near the Moon's path, extracted from the observations of Mr. Pond,
the Stars observed (x Aquarii) being found in most of the above catalogues with a different place in each, that furnished by Dr. Bradley
Wollaston's Fasciculus, or from the tables in the Journal above referred to. In the computation of the Moon's parallaxes at the time
the Ellipticities $\frac{1}{306}$ and $\frac{1}{312.5}$, as well as the Moon's Equatorial parallax, and a mean of the two employed in the computation. A
favourable for that determination than those which occur near the north and south extremities.

DATE.	Star's Transit, from whence Mean Time is deduced.		Rate of Chronometer on Mean Time.	Star Observed.			Time shewn by Chronometer.	Mean Time at Port Bowen.	Assumed App. Time at Greenwich.	STAR'S	
	Stars.	Time shewn by Chronometer.		Name.	Magnitude.	Im. or Em.				Right Ascension.	North Polar Distance.
		H. M. S.	S.				H. M. S.	H. M. S.	H. M. S.	H. M. S.	° ′ ″
1824. Dec. 25	α Andromedæ	12 06 40.75	0	x ♒	5	Im.	13 01 51	6 36 52.41	12 32 21	22 28 41.89	95 07 33.65
	α Arietis . .	14 04 20.26									
1825. Jan. 3	α Arietis . .	13 29 41	−2.9			Im.	12 40 06	6 14 23.26	12 05 00	6 04 21.62	67 27 03.91
				z ♊	4						
	Rigel . .	16 37 58.57				Em.	13 36 54.8	7 11 12.17	13 01 43		
	α Orionis .	17 17 26.35		μ ♊	3	Im.	16 07 38.2	9 41 55.82	15 32 10	6 12 24.08	67 24 20.99
Feb. 1	Pollux . .	17 14 24.33	+7	Unknown. ✱ in ♋	5.6	Im.	18 13 03.5	11 44 58.26	. . . .	. . . . .	. . . . .
	Regulus .	19 38 27.84									
Mar. 23	β Leonis . .	18 07 07.20	+2.25	Unknown. ✱ in ♈	5	Im.	17 07 11	10 34 39.74	. . . .	. . . . .	. . . . .
	Spica Virg.	19 42 42.45									
„ 24	α Hydræ . .	15 42 28	+2.25	1 x ♉	5	Im.	18 28 12	11 55 38.34	17 44 48	4 14 57.51	68 06 42.03
	β Leonis . .	18 03 13.34									
	Spica Virg.	19 38 48.88		2 x ♉	5	Im.	18 43 10	12 10 36.32	17 59 54	4 15 01.52	68 12 22.47

N°. IV.

…TORY at Port Bowen, by Occultations of Fixed Stars by the Moon, 1824–25.——By Lieut. Henry Foster.

…elescope, by Dollond, of 46 inches focal distance, and 3¼ inches aperture; a power of 68 was always used.
…tion as possible. To obviate any error arising from the glare of light, a diaphragm cut out of card-paper was placed in the focus of the object-glass, so as
…s, whose occultations were observed, are not inserted in any of the catalogues with which we were furnished; the latter consisting of those of Bradley,
…rvations of Mr. Pond, and published in the nineteenth Number of the *Journal of the Royal Institution*. It may be proper to remark, however, that one of
…nished by Dr. Bradley has been employed in the computation. The apparent places of the Stars have been deduced by general tables for that purpose in
… parallaxes at the time of occultation, the method of the Nonagesimal has been used, and the latitude of the Observatory reduced to the Earth's centre for
… the computation. A preference may be given to the longitude resulting from the occultations which took place near the Moon's centre, as being more

STAR'S PLACE.				MOON'S							
…ight …ension.	North Polar Distance.	Latitude.	Longitude.	True Latitude.	True Semi-diameter.	Horizontal Par. reduced.	Parallax in Latitude.	Parallax in Longitude.	Correction in long. from limb to centre.	Mean Time at Greenwich by Observation.	Longitude in Time.
s.	° ′ ″	° ′ ″	s. ° ′ ″	° ′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	H. M. S.	H. M. S.
41.89	95 07 33 65	4 07 18.3 N	11 06 58 56.5	4 51 45.88 N	14 46	54 01.28	45 28.96	28 08.02	14 47.09	12 33 10.24	5 56 17.83
				0 00 41.11 S	16 04.03	58 46.66	50 02.36	16 47.31	15 35.82	12 10 11.18	5 55 47.92
21.62	67 27 03.91	0 54 35 S	3 01 00 24.7								
				0 03 45.43 S	16 04.43	58 48.25	48 34.7	15 08.53	15 54.95	13 06 47.11	5 55 34.94
24.08	67 24 20.99	0 50 14.4 S	3 02 51 44.7	0 11 54.38 S	16 05.47	58 52.40	45 51.75	7 59.1	14 13.27	15 37 19.37	5 55 23.55
. . .	. . . . .	. . . . .	. . . . . .	. . . .	. . . .	. . .	. . . .	. . . . .	. . . .	. . . . .	. . . . .
. . .	. . . . .	. . . . .	. . . . . .	. . . .	. . . .	. . . .	. . . .	. . . . .	. . . .	. . . . .	. . . . .
57.51	68 06 42.03	0 36 38.9 N	2 05 45 31.5	1 35 43.07 N	15 11.4	55 32.2	48 46.56	23 15.57	11 10.44	17 51 01.87	5 55 23.53
01.52	68 12 22.47	0 30 54 N	2 05 45 26.6	1 35 03.73 N	15 11.5	55 33.6	49 13.88	22 48.65	2 48.23	18 08 05.51	5 55 29.19
MEAN LONGITUDE by Six Occultations of Fixed Stars . . . . 88° 54′ 52.4″ W. =											5 55 39.49

OBSERVATIONS for DETERMINING the LONGITUDE of the OBSERVATORY at

These Longitudes were obtained by observing the Transit of the Moon, and that of certain well known fixed Stars, having Meridian. The accordance of the results thus furnished, in an observation requiring very

DATE.	Time shewn by Chronometer at Transit of				Daily Rate of Chronometer employed.	Interval.	
	Moon.		Star.			Mean Solar.	Sidereal.
1824.		H. M. S.		H. M. S.	S.	H. M. S.	H. M. S.
November 7	2d Limb.	7 03 40.83	Aldebaran.	7 24 11.85	g. 0 41	0 20 31.02	0 20 34.38
„ 13	2d Limb.	24 33 02.6	Pollux . . α Hydræ . .	20 09 07.65 23 53 13.38	„ 2.9	2 23 54.70 0 39 49.19	2 24 18.33 0 39 55.73
December 1	1st Limb.	14 23 58.12	α Arietis . .	15 22 52.54	„ 1.72	0 58 54.35	0 59 04.02
„ 2	1st Limb.	14 09 38.87	α Arietis . .	15 18 58.34	„ 2.83	0 09 19.45	0 09 20.48
„ 4	1st Limb.	16 51 45.14	α Arietis . .	15 11 15.53	„ 4.0	1 40 29.33	1 40 45.84
„ 5	1st Limb.	17 47 59.18	α Arietis . .	15 07 23.54	„ 3.92	2 40 35.20	2 41 01.57
„ 6	2d Limb.	18 48 45.53	Pollux . .	20 39 51.55	„ 3.90	1 51 05.72	1 51 23.97
„ 10	2d Limb.	22 13 02.47	Regulus .	22 29 42	l. 6.0	0 16 39.60	0 16 42.34
„ 28	1st Limb.	12 33 07.55	α Andromedæ α Arietis . .	11 55 07.36 13 52 46.91	0	0 38 00.19 1 19 39.36	0 38 06.43 1 19 52.44
„ 29	1st Limb.	13 16 48.20	α Andromedæ α Arietis . .	11 51 15.45 13 48 55.13	g. 4.1	1 25 32.51 0 32 06.84	1 25 46.56 0 32 12.12
1825. January 1	1st Limb.	15 48 20.56	α Ceti . . . Aldebaran.	14 33 03.82 16 05 33.70	„ 5.2	1 15 16.47 0 17 13.08	1 15 28.83 0 17 15.91
„ 2	1st Limb.	16 45 58.88	β Tauri . . .	16 50 25.5	„ 4.6	0 04 55.66	0 04 56.48
„ 3	1st Limb.	17 45 28.41	α Orionis . .	17 17 26.35	l. 2.9	0 28 02.11	0 28 06.71
„ 4	2d Limb.	18 47 20.98	Pollux . .	19 02 11.65	g. 3.8	0 14 50.63	0 14 53.07
„ 24	1st Limb.	10 31 09.1	α Andromedæ	10 11 09.56	„ 3.87	0 19 59.49	0 20 02.77
„ 25	1st Limb.	11 13 22.35	α Pegasi . . α Arietis . .	9 04 11.47 12 05 00.32	„ 5.5	2 09 10.30 0 51 37.77	2 09 31.61 0 51 48.24
„ 26	1st Limb.	11 57 48.05	α Pegasi . .	9 00 19.82	„ 4.5	2 57 27.68	2 57 58.82
„ 27	1st Limb.	12 45 20.17	α Arietis . . Aldebaran.	11 57 19.53 14 25 30.12	„ 6.2	0 48 00.44 1 40 09.52	0 48 08.32 1 40 25.97
February 1	1st Limb.	17 26 37.67	Pollux . . Regulus. .	17 14 24.33 19 38 27.84	„ 7	0 12 13.28 2 11 49.52	0 12 15.29 2 12 11.19
„ 2	1st Limb.	18 24 09.72	Regulus. .	19 34 35.77	„ 3.84	1 10 25.86	1 10 37.43
March 4	2d Limb.	18 55 20.75	Regulus. .	17 39 13.40	„ 6.74	1 16 07	1 16 19.51
„ 31	1st Limb.	16 37 57.02	Regulus. .	15 55 11.45	0	0 42 45.57	0 42 52.60
April 1	1st Limb.	17 31 37.33	Regulus. .	15 51 15.95	0	1 40 21.38	1 40 37.87

No.

ATORY at

Stars, having
requiring very

AL. Sidereal.
H. M. S.
0 20 34.38
2 24 18.33 0 39 55.73
0 59 04.02
0 09 20.48
1 40 45.84
2 41 01.57
1 51 23.97
0 16 42.34
0 38 06.43 1 19 52.44
1 25 46.56 0 32 12.12
1 15 28.83 0 17 15.91
0 04 56.48
0 28 06.71
0 14 53.07
0 20 02.77
2 09 31.61 0 51 46.24
2 57 56.82
0 48 08.32 1 40 25.97
0 12 15.29 2 12 11.19
1 10 37.43
1 16 19.51
0 42 52.60
1 40 37.87

V.

PORT BOWEN, by TRANSITS of the MOON, 1824-25.——By LIEUTENANT FOSTER.

nearly the same declination with the Moon, for the purpose of thence deducing her right Ascension at the time of passing the minute accuracy, may serve to shew the degree of dependence to be placed in them.

Correction of AR. for Moon's Apparent Semidiameter.	Moon's observed AR. at Transit.	Mean Time of Moon's Transit at Port Bowen.	Mean Greenwich Time by observed AR. of Moon.	Longitude in Time.	REMARKS.	
° ′ ″	° ′ ″	H. M. S.	H. M. S.	H. M. S.		
0 16 53.7	61 03 20.70	12 55 43.95	18 51 51.40	5 56 07.45	"	"
0 16 22.2	149 27 34.42	18 24 45.36	24 20 32.06	5 55 46.70	"	"
0 15 25.36	14 49 50.41	8 14 49.71	14 10 58.99	5 56 09.28	"	"
0 15 53.08	27 16 03.73	9 00 28.46	14 56 35.47	5 56 07.01	"	"
0 16 52.65	54 48 45.45	10 42 25.42	16 38 22.58	5 55 57.16	"	"
0 17 18.0	69 53 06.60	11 38 35.34	17 33 55.06	5 55 19.72	"	"
0 17 28.27	85 31 04.28	12 39 19.65	18 35 10.75	5 55 51.10	"	"
0 16 28.38	145 18 59.97	16 22 04.55	22 17 44.72	5 55 40.17	"	"
0 15 10.6	9 37 26.87	6 07 54.71	12 04 02.56	5 56 07.85	"	"
0 15 34.52	21 32 54.02	6 51 31.02	12 47 25.98	5 55 54.96	"	"
0 17 09.2	62 27 02.52	9 22 46.86	15 18 27.55	5 55 40.69	"	"
0 17 29.5	77 52 38.65	10 20 21.88	16 16 18.90	5 55 57.02	"	"
0 17 36	93 45 25.8	11 19 46.23	17 15 35.57	5 55 49.34	"	"
0 17 28.1	109 38 57.85	12 21 35.66	18 17 18.33	5 55 42.67	"	"
0 14 58.30	5 06 14.65	4 03 43.97	9 58 55.94	5 55 11.97	"	"
0 15 17.55	16 39 02.55	4 45 50.33	10 42 15.29	5 56 24.96	"	"
0 15 43.00	28 45 43	5 30 11.11	11 26 13.42	5 56 02.31	"	"
0 16 13.33	41 38 36.88	6 17 36.65	12 13 18.3	5 55 41.65	"	"
0 17 26.37	117 01 01.24	10 58 32.64	16 54 22.64	5 55 50	"	"
0 17 08.64	132 24 10.14	11 55 58.39	17 51 34.46	5 55 36.07	"	"
0 16 48.69	168 34 30.21	12 24 36.25	18 20 03.32	5 55 27.07	"	"
0 16 43.46	160 46 16.76	10 05 05.25	16 00 52.56	5 55 47.31	"	"
0 16 48.08	175 12 40.26	10 58 45.12	16 54 44.18	5 55 59.06	"	"
MEAN LONGITUDE by 23 OBSERVATIONS of MOON'S TRANSIT				5 55 50.066	= 88° 57′ 30.99″ W.	

VI.

OBSERVATIONS FOR DETERMINING THE LONGITUDE OF THE OBSERVATORY AT PORT BOWEN, BY THE ECLIPSES OF JUPITER'S SATELLITES, 1824—25.

BY LIEUTENANT FOSTER.

THIS method of determining the longitude, which, at the best, is perhaps more convenient than accurate, was in the present instance rendered more than usually uncertain, on account of Jupiter being very near his opposition. This, was, however, in some degree compensated by observing Immersions and Emersions of the same Satellite, and taking an Arithmetical Mean of each.

The observations were made with Dollond's telescope already described, a power of 68 being employed; and recourse was also had to a diaphragm, to prevent the light of the planet from distracting the eye.

An asterisk, in the column of Longitude, is prefixed to the Eclipses observable at Greenwich.

OBSERVATIONS of the ECLIPSES of JUPITER'S SATELLITES, for determining the LONGITUDE of the OBSERVATORY, PORT BOWEN, 1824—25.

DATE.	Satellite observed.	Im. or Em.	Time shewn by Chron. at Im. or Em.	Star's Transit, from whence Mean Time is deduced. Star.	Star's Transit: Time shewn by Chron.	Rate of Chron. on M. Time.	Chronometer Fast of Mean Time, at Observation.	Longitude in Time.	Mean Longitude by each Satellite's Im. and Em.	REMARKS.
1824.			H. M. S.		H. M. S.	S.	H. M. S.	H. M. S.		
Oct. 27	I.	Im.	20 59 31	α Andromedæ. α Orionis . .	15 41 12.23 21 26 35.85	g.2	6 07 30.94	5 56 52.94		♃ partially obscured by haze.
Nov. 19	„	„	21 08 49.6	Capella . . Rigel . . .	19 15 24.20 19 17 41.25	„ 2.18	6 08 32.31	5 56 46.71		
Dec. 5	„	„	19 25 33.5	Rigel . . .	18 15 39.7	„ 3.92	6 09 22.34	5 55 39.84		
„ 21	„	„	17 55 50	α Arietis. . .	14 19 48.27	„ 4.4	6 24 43.53	5 55 42.53		
1825. Jan. 4	„	„	21 43 15	Pollux . . .	19 02 11.65	„ 4.0	6 25 45.82	5 56 12.82	H. M. S.	
„ 6	„	„	16 12 11	α Arietis. . .	13 18 05.36	„ 4.0	6 25 55.24	5 55 49.24	5 56 10.68	
Feb. 7	„	Em.	15 02 55.2	α Arietis. . . α Ceti	11 14 47.94 12 10 28.17	„ 4.33	6 28 27.7	5 54 54.5		
„ 14	„	„	16 57 03	α Andromedæ. Procyon . .	9 05 32.53 16 08 13.24	„ 5.0	6 29 01.18	5 55 31.18		The transit of α Andromedæ is that observed on the 10th of February, and that of Procyon on the 17th. Overcast weather prevented intermediate ones.
April 1	„	„	17 25 28	Regulus . .	15 51 15.95	„ 0.4	6 32 52.21	5 55 41.21		
„ 8	„	„	19 21 37.5	Spica Virg.	18 40 28.32	„ 4.4	6 33 11.65	5 54 41.15	5 55 12.76	
1824. Nov. 17	II.	Im.	18 49 56.5	α Arietis. . . Capella . .	16 17 13.76 19 23 11.87	„ 3 0	6 08 27.73	5 55 20.23		
Dec. 1	„	„	24 01 34	α Arietis. . .	15 22 52.54	„ 1.72	6 09 09.16	5 55 09.16		
1825. Jan. 2	„	„	23 59 35.5	β Tauri . . . α Arietis. . .	16 50 54.55 13 29 41	„ 4.6	6 25 39.15	5 55 38.68		The transit of α Arietis was observed on the 3d.
„ 20	„	„	18 31 01.5	α Arietis. . . Rigel . . .	12 24 12.47 15 32 31.02	„ 5.0	6 27 05.56	5 56 25.06	5 55 38.23	
Feb. 14	„	Em.	18 36 53	See 14th Feb.	above.	„ 5.0	6 29 01 53	5 55 33.53	5 55 33.53	
1824. Dec. 6	III.	Im.	20 58 15	Castor . . . Pollux . . .	20 28 42.75 20 39 51.55	„ 3.9	6 09 26.15	5 51 33.15		
1825. Jan. 25	„	„	25 01 30	α Arietis. . .	12 01 08.96	„ 4.6	6 27 34.65	5 56 52.65		
April 7	„	„	17 00 11	Spica Virg.	18 41 19.88	„ 2.6	6 33 07	5 54 58	5 55 27.93	
Feb. 9	„	Em.	12 33 56	α Arietis. . . α Ceti	11 07 04.25 12 10 28.17	„ 4.4	6 28 35.79	5 55 19.79		
Mar. 31	„	„	16 33 42	Regulus . .	15 55 11.45	0	6 32 51.87	5 54 30.87		
April 7	„	„	20 33 57	Spica Virg.	18 44 19.88	„ 2.6	6 33 07.37	5 54 34.37	5 54 48.34	
MEAN LONGITUDE by 21 ECLIPSES of JUPITER'S SALELLITES									5 55 28.59	= 88° 52′ 08″.85 W.

VII.

ABSTRACT of LUNAR OBSERVATIONS for DETERMINING the LONGITUDE of the OBSERVATORY at PORT BOWEN, 1824-5.

DATE.	Star.	Observer.	No. of Observations	West Longitude.	REMARKS.	DATE.	Star.	Observer.	No. of Observations	West Longitude.	REMARKS.
1824.				° ′ ″		1825.				° ′ ″	
Dec. 5	Pollux	P.	10	89 03 25.5	* E. of ☾'s remote limb.	Dec. 5	Arietis	P.	10	88 54 01.5	* W. of ☾'s near limb.
,, ,,	,, ,,	P.	10	89 02 31.5		,, ,,	,, ,,	P.	10	89 01 27	
,, ,,	,, ,,	P.	10	89 06 31.5		,, ,,	,, ,,	P.	10	88 46 51	
,, ,,	,, ,,	P.	10	89 07 45		,, ,,	,, ,,	P.	10	89 02 37.5	
,, ,,	,, ,,	P.	10	88 42 43.5		,, ,,	,, ,,	P.	10	88 42 27	
,, ,,	,, ,,	P.	10	89 04 49.5		,, ,,	,, ,,	P.	10	88 54 12	
,, ,,	,, ,,	P.	10	89 05 16.5		,, 6	,, ,,	C.	10	88 51 18	Do. Do.
,, ,,	,, ,,	C.	10	88 23 42		,, ,,	,, ,,	C.	10	88 43 34	
,, ,,	,, ,,	C.	10	88 24 48		,, ,,	,, ,,	C.	10	89 05 09	
,, ,,	,, ,,	C.	10	88 40 10		,, ,,	,, ,,	C.	10	89 02 00	
,, ,,	,, ,,	C.	10	88 23 45		,, ,,	,, ,,	C.	10	89 03 01	
,, 8	Regulus	P.	10	89 07 18	* E. of ☾'s near limb.	,, ,,	,, ,,	C.	10	88 46 06	
,, ,,	,, ,,	P.	10	88 59 00		,, ,,	,, ,,	R.	10	89 06 19.5	
,, ,,	,, ,,	P.	10	88 45 33		,, ,,	,, ,,	R.	10	89 08 49.5	
,, ,,	,, ,,	P.	10	89 07 52.5		,, ,,	,, ,,	R.	10	89 04 21	
,, ,,	,, ,,	P.	10	89 03 04.5		,, ,,	,, ,,	R.	10	89 16 31.5	
,, ,,	,, ,,	P.	10	89 04 57		,, ,,	,, ,,	R.	10	89 12 30	
,, 29	Aldebaran	C.	10	88 52 34	* E. of ☾	,, ,,	,, ,,	R.	10	89 07 10.5	
,, ,,	,, ,,	C.	10	88 54 07		,, ,,	,, ,,	R.	10	89 07 19.5	
,, ,,	,, ,,	C.	10	88 52 25		,, ,,	,, ,,	R.	10	89 07 10.5	
,, ,,	,, ,,	C.	10	88 52 24		,, ,,	,, ,,	R.	10	88 56 39	
,, ,,	,, ,,	C.	10	88 45 40		,, ,,	,, ,,	R.	10	89 03 18	
,, ,,	,, ,,	C.	10	88 22 30		,, ,,	,, ,,	R.	10	88 59 24	
,, ,,	,, ,,	C.	10	88 30 00		,, ,,	,, ,,	P.	10	89 13 57	
,, ,,	,, ,,	C.	10	88 44 49		,, ,,	,, ,,	P.	10	89 15 58.5	
,, ,,	,, ,,	C.	10	88 43 51		,, ,,	,, ,,	P.	10	89 19 54	
,, ,,	,, ,,	C.	10	88 44 57		,, ,,	,, ,,	P.	10	89 13 09	
,, ,,	,, ,,	S.	10	88 54 00		,, 8	Aldebaran	C.	10	88 33 21	* W. of ☾
,, ,,	,, ,,	S.	10	88 43 25		,, ,,	,, ,,	C.	10	88 37 16	
,, ,,	,, ,,	S.	10	88 44 45		,, ,,	,, ,,	C.	10	88 34 56	
,, ,,	,, ,,	S.	10	88 43 15		,, ,,	,, ,,	C.	10	88 38 26	

Longitude by 310 Lunar Distances, Star East of Moon . . . . 88° 49′ 44″.355
,, by 310 ,, ,, Star West of Moon 88 59 00.488

Mean Longitude by 620 Lunar Distances, Star East and West . . . 88 54 22.421 West.

ABSTRACT OF OBSERVATIONS FOR DETERMINING THE LONGITUDE OF THE OBSERVATORY AT PORT BOWEN.

		°	′	″
MEAN LONGITUDE	By 6 Occultations of Fixed Stars	88	54	52.4
	By 23 Observations of Moon's Transit	88	57	30.99
	By 21 Eclipses of Jupiter's Satellites	88	52	08.85
	By 620 Lunar Distances, Star East and West of ☾	88	54	22.42
	By 9 Chronometers	88	55	08.1
	Received Longitude, being the Mean of all the above . .	88	54	48.55 W.

VIII.

OBSERVATIONS FOR DETERMINING THE LATITUDE OF THE OBSERVATORY AT PORT BOWEN, A.D. 1824—25.

THE following observations of Polaris were obtained by Troughton's Repeating-Circle employed on the former voyages, such improvements having been made in that instrument as the climate rendered necessary. Polaris was selected for determining the latitude, as well on account of its slow motion giving time for the settling of the level, as to avoid, by its high altitude, any effect of unequal refraction. The observations in Table I. are computed by the formula and tables published in the *Philosophical Magazine* for June, 1822, by Francis Baily, Esq., to whom we are much indebted for his kindness in furnishing Lieutenant Foster with a copy of them. The correctness and facility with which this method may be adopted at any hour of the four-and-twenty, when the star is visible, rendered it an invaluable acquisition to us, under the unfavourable circumstances of climate in which we were placed. The observations in Table II. are computed by the method of Versed Sines.

The refractions employed in the computation, as well as their correction for the temperature and pressure of the atmosphere, are taken from the tables published at the end of the *Nautical Almanac* for 1824—25.

An asterisk, in the column marked "Index," denotes the instrument not having been re-set to 360° at the commencement of that observation. In such cases, the mean reading of the preceding observation is taken as the Index-Error.

TABLE I.——OBSERVATIONS of POLARIS, for DETERMINING the LATITUDE of the OBSERVATORY at Port Bowen, 1824-25.

DATE. 1824.	Time by Chronometer.	Polaris on Meridian by Chron.	Rate of Chron.	Chron. on Apparent Time.	Horary Angle in Sidereal Time.	Mean Reading of the four Verniers.	Correction for Index.	Correction for Level.	No. of Observations.	Observer.	Corrected Barometer.	Thermometer.	Refraction applied.	Final Correction from Mr. Baily's Tables.	North Latitude.
	H. M. S.	H. M. S.		H. M. S.	H. M. S.	° ′ ″	″	′ ″			Inches.	°	″	° ′ ″	° ′ ″
Oct. 16	15 46 54.08	16 44 28	. .	. . .	0 57 43.32	91 12 05	0	−0 1.85	6	F.	30.33	+ 1.5	17.34	+1 33 59.94	73 13 42.19
„ „	17 19 43.83	. . . .	. .	. . .	0 35 21.58	91 00 40	*	−0 7	6	F.	. . .	+ 1	17.31	1 36 01.39	73 13 35.80
„ „	18 02 37.87	. . . .	. .	. . .	1 18 22.64	61 00 15	0	−0 31.5	4	F.	30.33	0	17.39	1 31 06.14	73 13 40.60
„ „	18 35 29.01	. . . .	. .	. . .	1 51 19.12	153 30 25	*	−0 52	10	F.	. . .	0	17.54	1 24 59.04	73 13 46.12
„ 27	9 01 31.4	. . . .	. .	Slow. 0 17 22.4	1 30 31.94	61 08 13.8	0	−0 1	4	P.	30.45	− 1	17.67	1 29 03.61	73 13 35.51
Nov. 16	9 05 30.1	. . . .	. .	0 18 31.9	0 05 11.25	90 53 30	0	+0 4.5	6	P.	29.65	−20	17.51	1 37 06.44	73 13 40.30
„ „	9 51 49.7	. . . .	. .	0 18 31.9	0 41 15.95	91 04 48.75	0	−0 23	6	P.	29 65	−20	17.61	1 35 26.75	73 13 31.85
„ 18	16 15 59.91	15 15 02.1	3	. . .	0 01 07.71	90 16 10	0	−0 15.5	6	F.	29.50	−21	16.62	1 33 23.07	73 13 39.13
„ „	17 24 16.58	. . . .	. .	. . .	2 09 30.42	92 32 26.25	0	+0 12	6	F.	. . .	. .	18.27	1 20 38.64	73 13 36.76
„ 19	8 58 05.4	. . . .	. .	0 17 53.8	0 00 47.03	121 12 27.5	0	−1 98.5	8	P.	29.63	−25	17.82	1 37 00.86	73 13 37.44
„ „	9 55 07.4	. . . .	. .	0 17 56	0 56 26.55	121 37 21.7	*	−0 6	8	P.	. . .	. .	17.77	1 33 56.25	73 13 36.52
„ „	10 43 32	. . . .	. .	0 17 58.5	1 35 10	122 23 39.55	*	+0 12 5	8	P.	. . .	. .	17.92	1 28 05.73	73 13 37.34
„ „	11 49 08.25	. . . .	. .	0 18 01	2 50 51.8	124 54 06.25	*	+1 11.5	8	P.	. . .	. .	18.32	1 09 08.61	73 13 36.32
„ 20	15 54 55.46	15 07 16	+2	. . .	0 47 47.23	121 30 01.25	0	+0 22	8	F.	29.87	−11	17.56	1 31 45.04	73 13 39.49
„ „	16 50 06.75	. . . .	. .	. . .	1 43 07.52	122 34 23.75	0	+1 02	8	F.	. . .	. .	17.84	1 26 32.50	73 13 39.94
„ 22	8 09 22.3	. . . .	. .	0 16 52.4	0 38 01.33	121 23 10	0	+0 27.5	8	P.	29.61	−17	17.40	1 35 36.47	73 13 38.94
„ „	9 51 46.12	. . . .	. .	0 16 53	1 04 39.92	121 45 03	*	+0 1.5	8	P.	. . .	. .	17.41	1 32 55.52	73 13 39.25
„ „	10 29 17.5	. . . .	. .	0 16 56	1 42 20.47	123 33 57.5	*	+0 20	8	P.	. . .	. .	17.56	1 26 41.93	73 13 43.31
„ „	12 01 25.9	. . . .	. .	0 16 59.9	3 14 48.31	125 56 57.5	*	+0 29	8	P.	. . .	. .	18.16	1 01 22.84	73 13 38.20
„ „	12 50 09.6	. . . .	. .	0 17 00.2	4 03 39.92	128 20 02	*	+0 20	8	P.	. . .	. .	18.41	0 43 35.31	73 13 38.53
„ 24	15 13 09.37	14 51 47 5	+3.2	. . .	0 21 25.33	61 37 51.25	+5	−0 28	4	F.	29.91	−15.5	17.59	3 36 39.99	73 13 40.39
„ 25	14 17 13.81	. . . .	. .	Fast 5 34 25.5	0 08 39.20	121 12 17.5	+5	+0 5.5	8	P.	30.05	−23	17.99	1 37 02.65	73 13 35.86
„ „	15 39 11.5	. . . .	. .	5 34 26.5	1 13 30.95	121 56 18.75	*	−1 24	8	P.	. . .	. .	18.06	1 31 40.58	73 13 39.70
„ „	16 29 10	. . . .	. .	5 34 27.3	2 03 36.84	123 11 52.50	*	−0 29	8	P.	. . .	. .	18.16	1 22 01.26	73 13 41.11
„ „	18 28 17	. . . .	. .	5 34 28.9	4 03 01.82	128 17 48.75	+5	−0 18	8	P.	. . .	−21	19.07	0 43 49.67	73 13 39.29
„ „	19 09 44.75	. . . .	. .	5 34 20.5	4 41 35.78	130 29 33.75	*	+0 17.5	8	P.	. . .	. .	19.58	0 27 11.89	73 13 37.87

OBSERVATIONS of POLARIS, for DETERMINING the LATITUDE of the OBSERVATORY at PORT BOWEN—*continued.*

DATE. 1824.	Time by Chronometer.	Polaris on Meridian by Chron.	Rate of Chron.	Chron. on Apparent Time.	Horary Angle in Sidereal Time.	Mean Reading of the four Verniers.	Correction for Index.	Correction for Level.	No. of Observations.	Observer.	Corrected Barometer.	Thermometer.	Refraction applied.	Final Correction from Mr. Baily's Tables.	North Latitude.
	H. M. S.	H. M. S.	s.	H. M. S.	H. M. S.	° ′ ″	″	′ ″			Inches.	°	″	° ′ ″	° ′ ″
Nov. 25	19 52 00.63	. . . .	. .	f.5 34 30.1	5 26 58.99	132 52 07.5	*	+0 7.5	8	P.	. . .	−25	20.05	+0 09 26.338	73 13 41.23
» »	21 17 09.25	. . . .	. .	5 34 31.2	5 52 19.49	137 37 07.5	0	−0 6.5	8	P.	. . .	−20	20.84	0 26 11.39	73 13 42.92
» 28	14 59 09.05	. . . .	. .	5 35 25.3	0 45 14.81	121 27 40.5	+5	+0 36	8	P.	29.85	− 5	17.80	1 35 02.49	73 13 36.01
» »	16 06 58.3	. . . .	. .	5 35 26.3	1 53 13.75	92 09 14.5	*	−1 12	6	P.	. . .	. .	17.62	1 24 23.62	73 13 34.34
» »	16 41 08.1	. . . .	. .	5 35 26.3	2 27 29.15	124 00 33.75	*	+0 50.5	8	P.	. . .	. .	17.67	1 15 55.37	73 13 36.42
Dec. 2	17 38 27.31	14 20 21.3	+2.8	. . .	3 18 28.13	126 07 43.75	+5	−0 48	8	F.	29.87	−16.2	18.38	1 06 26	73 13 42.77
» »	18 08 43.12	. . . .	. .	. . .	3 48 48.86	127 34 55	*	−1 5.5	8	F	. . .	. .	18.62	0 49 13.01	73 13 44.68
» 7	13 28 33.25	. . . .	. .	5 37 35.02	0 18 38.04	121 14 00	+5	+0 35.5	8	P.	29.43	−11	17.26	1 36 45.55	73 13 35.21
» »	14 09 06.12	. . . .	. .	5 47 35.82	0 22 00.69	121 16 50	*	−0 15.5	8	P.	. . .	. .	17.26	1 36 37.52	73 13 30.91
» 9	13 20 01.56	. . . .	. .	5 48 26.3	0 19 14.84	121 12 55	+5	+1 39.5	8	P.	29.63	−18.5	17.34	1 36 43.96	73 13 37.91
1825. Jan. 7	11 58 40.08	. . . .	. .	6 01 20.8	0 14 48.13	121 14 08.8	5	+0 18	8	P.	29.54	−35	18.11	1 36 46.28	73 13 36.63
» »	12 37 25.03	. . . .	. .	6 01 21.4	0 53 38.39	121 34 27.4	*	+1 31	8	P.	29.54	−35	18.08	1 34 05.61	73 13 36.51
» »	14 28 47.4	. . . .	. .	6 01 23.2	2 45 16.88	124 40 55	+5	+1 59	8	P.	. . .	. .	16.60	1 10 44.07	73 13 34.93
» »	15 11 21.2	. . . .	. .	6 01 23.9	3 27 57.06	126 33 16.2	*	+1 28.5	8	P.	. . .	. .	18.91	0 56 45.34	73 13 35.15
» »	15 45 17.3	. . . .	. .	6 01 24.4	4 02 08.24	128 14 00	*	+0 59	8	P.	. . .	. .	19.09	0 44 07.44	73 13 41.07
» »	16 29 11.8	. . . .	. .	6 01 25.2	4 46 09.15	130 34 31.3	*	+1 11	8	P.	. . .	. .	19.45	0 26 31.72	73 13 41.03
» 10	12 28 35.56	12 03 51.30	+5.6	. . .	0 24 48.23	121 17 40	+5	−0 3	8	F.	30.05	−35	18.51	1 36 22.89	73 13 35.85
» »	14 17 08.71	. . . .	. .	. . .	2 13 38.79	123 32 40.75	*	−0 43	8	F.	30.06	−35.5	18.16	1 19 28.93	73 13 42.75
» »	14 51 28.5	. . . .	. .	. . .	2 48 04.08	93 36 15.50	*	+0 5.5	6	F.	30.07	. .	19.03	1 09 53.12	73 13 44.35
» »	15 46 57.15	. . . .	. .	. . .	3 43 41.62	63 40 16.25	*	−0 18	4	F.	. . .	−36	19.31	0 51 05.09	73 13 46.04
» »	16 17 12.21	. . . .	. .	. . .	4 14 01.54	128 50 53.75	+5	+0 39	8	F.	30.08	−37	19.55	0 39 29.48	73 13 43.75
» 11	10 20 10.5	. . . .	. .	6 02 48.7	1 08 00.14	121 50 55	+5	−0 54.5	8	P.	30.04	−39	18.58	1 32 20.54	73 13 35.18
» »	10 54 00.5	. . . .	. .	6 02 49.2	0 34 05.08	121 22 12.5	*	−0 9.5	8	P.	. . .	. .	18.40	1 35 49.63	73 13 36.57
» »	11 23 49.8	. . . .	. .	6 02 49.6	0 04 11.29	121 12 40	*	+0 12.5	8	P.	. . .	. .	18.38	1 36 59.40	73 13 35.66
» »	12 05 06.1	. . . .	. .	6 02 50.2	0 37 11.19	121 24 12.5	*	−0 12	8	P.	. . .	. .	18.04	1 35 36.25	73 13 34.74
» »	12 43 27.1	. . . .	. .	6 02 50.7	1 15 37.99	121 58 29.2	*	+0 37.5	8	P.	. . .	. .	18.52	1 31 14.07	73 13 34.11
» »	13 37 44.3	. . . .	. .	6 02 51.5	2 10 03.31	123 25 34.6	*	−0 11	8	P.	. . .	. .	18.78	1 20 22.85	73 13 37.86
» »	14 51 37.4	. . . .	. .	6 02 52.6	2 27 07.93	126 33 11.2	*	−0 42.5	8	P.	. . .	. .	19.26	0 57 02.75	73 13 31.40

„	„	15 37 21.6	. . . .	. .	6 02 53.3	4 09 57.96	128 38 48.2	*	+1 24.5	8	P.	. . .	. .	19.54	0 41 01.93	73 13 33.93
„	„	16 23 59.9	. . . .	. .	6 02 54	4 56 43.71	131 10 38	*	+0 46.5	8	P.	. . .	. .	19.80	0 22 08.62	73 13 35.98
„	„	23 39 41.84	23 58 02.56	+4.9	. . .	0 18 23.89	183 45 42.5	+5	−0 29	10	F.	30.04	−39	22.56	−1 36 43.53	73 13 43.32
„	12	0 25 16.79	. . . .	. .	. . .	0 27 18.51	183 43 48.75	*	−0 49	10	F.	. . .	−39.3	22.56	1 36 29.95	73 13 42.42
„	„	1 18 04.34	. . . .	. .	. . .	1 18 14.24	146 22 48.75	5	−0 10	8	F.	30.03	−39	22.44	1 31 52.76	73 13 38.85
„	„	14 07 13.41	11 56 06.82	+4.9	. . .	2 11 27.69	92 35 18.75	0	+0 58	6	F.	29.94	−38.3	18.61	+1 20 01.75	73 13 36.85
„	„	14 46 33.45	. . . .	. .	. . .	2 50 54.04	93 43 01.25	*	−0 43.50	6	F.	. . .	−38	19.00	1 09 01.22	73 13 36.82
„	„	15 53 07.02	. . . .	. .	. . .	3 57 58.32	128 02 11.25	+5	−0 16	8	F.	29.97	−37.5	19.41	0 45 50.64	73 13 34.92
„	14	23 49 41	22 46 26.70	+4.5	. . .	0 03 14.62	73 31 35	+5	+0 26	4	F.	29.58	−28	21.66	1 37 00.25	73 13 36.89
„	„	24 20 36.62	. . . .	. .	. . .	0 34 15.42	73 27 16.25	*	+0 20	4	F.	. . .	−28.2	21.85	1 36 01.37	73 13 45.66
„	„	24 54 53.37	. . . .	. .	. . .	1 08 37.70	73 15 48.75	*	+0 19	4	F.	. . .	−28.5	21.70	1 33 03.36	73 13 39.72
„	„	25 19 11.7	. . . .	. .	. . .	1 32 59.95	73 01 45.75	*	+1 25	4	F.	. . .	−28.2	21.73	1 29 47.03	73 13 38.61
„	„	25 48 38.25	. . . .	. .	. . .	2 02 31.24	72 41 41.25	*	+0 24	4	F.	29.59	−27	21.59	1 24 33.80	73 13 40.90
„	15	21 20 19.2	. . . .	. .	6 04 16.7	10 09 47.49	182 07 22.5	5	+0 47	10	P.	29.75	−29	21.65	1 26 54.024	73 13 42.92
„	„	22 22 42.94	. . . .	. .	6 04 17.5	11 12 20.68	146 46 44.25	*	+1 36.5	8	P.	. . .	. .	21.77	1 35 06.11	73 13 41.75
„	„	23 02 07.6	. . . .	. .	6 04 18	11 51 51.32	147 00 15.75	*	+2 56	8	P.	. . .	. .	21.81	1 36 57.35	73 13 41.57
„	„	23 40 48.3	. . . .	. .	6 04 18.5	12 30 37.86	146 57 31.3	*	−0 27	8	P.	. . .	. .	21.78	1 36 13.25	73 13 43.37
„	16	23 01 28	23 38 44.5	+5.1	. . .	0 37 24.49	110 47 47.5	+5	−0 12	6	F.	29.73	−33.5	21.90	1 35 50.09	73 13 41.44
„	„	24 21 14.78	. . . .	. .	. . .	0 42 37.11	110 08 25	*	−0 4	6	F.	29.69	. .	22.12	1 35 28.90	73 13 43.28
„	17	11 26 36.4	. . . .	. .	6 04 43.3	0 22 34.89	121 16 07.5	+5	+0 28.5	8	P.	29.64	−27	17.83	+1 36 29.46	73 13 37.60
„	19	22 44 18.8	23 27 09.6	+5.4	. . .	0 42 58	110 07 45	+5	+0 13	6	F	29.60	−21.6	21.71	−1 35 27.44	73 13 45.23
„	„	24 20 30.8	. . . .	. .	. . .	0 53 29.03	110 03 15	*	−0 10	6	F.	29.57	−25	21.69	1 31 35.35	73 13 43.83
„	20	19 55 35.8	. . . .	. .	5 22 12.8	9 48 23.1	108 50 33.3	0	+1 04.5	6	P.	29.32	−29	21.37	1 22 41.71	73 13 41.04
„	„	20 37 12.8	. . . .	. .	5 22 13.4	10 30 06.31	109 36 13.7	*	+0 21	6	P.	. . .	. .	21.51	1 30 14.06	73 13 46.75
„	„	21 00 18.7	. . . .	. .	5 22 13.8	10 53 15.06	109 54 30	*	+1 08	6	P.	. . .	. .	21.57	1 33 16.53	73 13 38.63
„	„	21 39 55.3	. . . .	. .	5 24 14.3	11 32 58.22	110 14 16.3	*	+0 1	6	P.	. . .	. .	21.63	1 36 23.80	73 13 39.29
„	„	22 00 45.3	. . . .	. .	5 22 14.7	11 53 51.24	110 17 11.7	*	+0 24	6	P.	. . .	. .	21.65	1 36 58.89	73 13 40.79
„	„	22 22 48.3	. . . .	. .	5 22 14.9	12 15 57.68	110 16 17	*	−0 3	6	P.	. . .	. .	21.64	1 36 47.91	73 13 43.94
„	21	23 35 19.12	23 19 27	+5.5	. . .	0 15 54.67	73 31 12.5	+10	+0 6	4	F.	29.28	−31.8	21.81	1 36 48.13	73 13 37.20
„	24	20 56 56.5	. . . .	. .	5 22 49.5	11 06 08.33	146 43 52.5	*	+0 18.7	8	P.	29.80	−38	22.32	1 34 31.65	73 13 40.93
„	„	21 31 34.3	. . . .	.	5 22 49.6	11 40 51.72	147 02 35	*	1 07	8	P.	. . .	. .	22.38	1 36 42.12	73 13 39.01
„	26	23 00 53.6	23 04 02.60	+5	. . .	0 03 10.04	147 03 50	+10	+0 50	8	F.	29.73	−12.2	22.49	1 37 00.77	73 13 44.53

TABLE II.

OBSERVATIONS for DETERMINING the LATITUDE of the OBSERVATORY at PORT BOWEN, by CIRCUM-MERIDIONAL ALTITUDES of STARS, 1824—25.

DATE.	Star observed.	No. of Observations.	Observer.	Mean of the sum of N.V. Sines of Hor. Angle.	Mean Reading.	Index.	Level.	Barometer.	Thermometer.	Refraction applied.	Correction to observed Zenith Distance: Due to N.V. Sines of Hor. Angle.	Correction to observed Zenith Distance: For Rate of Chron. on Sid. Time.	Latitude, North.
1824.					° ′ ″	″	′ ″	IN.	°	′ ″	′ ″	S.	° ′ ″
Oct. 28	α Andromedæ.	4	F.	594	180 21 55	0	+ 3.5	30.23	−15.5	+1 9.15	− 44.26	− 0.26	73 13 38.77
Nov. 20	Polaris. . .	6	F.	618.5	90 52 02.5	0	+1 37	29.87	14	16.96	− 4.0	− 0.02	73 13 40.86
Nov. 20	Procyon . .	8	F.	1107.5	540 16 11.25	0	+0 19	29.88	14	2 37.25	−1 11.36	− 0.42	73 13 31.75
1825. Jan. 12	Polaris. . .	12	F.	1646.22	181 50 06.25	+5	− 2	29.99	38.7	18.34	− 10.63	− 0.06	73 13 40.96
„ 17	Polaris. . .	8	F.	513.44	147 3 8.75	0	− 3	29.74	33.2	22.13	+ 2.75	0.00	73 13 42.57
„ 19	Polaris. . .	14	F.	1955.69	25 18 57.5	0	+ 43	29.57	25	21.57	+ 10.47	+ 0.06	73 13 38.57
„ 20	Polaris. . .	8	F.	531.82	121 11 10	5	+ 1.7	29.39	26.5	17.65	− 3.43	0.00	73 13 42.33

MEAN LATITUDE of the OBSERVATORY at PORT BOWEN, by 93 SETS of OBSERVATIONS (contained in Tables I. and II.) . . 73 13 39.388

IX.

MAGNETIC OBSERVATIONS.

DIP OF THE MAGNETIC NEEDLE OBSERVED AT WOOLWICH, AND AT DIFFERENT STATIONS WITHIN THE ARCTIC CIRCLE.

In the following Table is given a general abstract of the dip and intensity of the magnetic needle, as observed at different stations in the years 1824—25, and those at Woolwich prior and subsequent to the voyage.

The needles employed in the annexed observations on the dip, or in those on magnetic intensity, are numbered as follows:—

No. 1. A rectangular needle by Jones, $7\frac{1}{4}$ inches in length, on Meyer's construction, having a light cylindrical arm at right-angles to its axis, for screwing on a small brass sphere.

No. 2. The same needle, with a sphere somewhat larger.

No. 3. Do. with a sphere larger still.

No. 4. A plain rectangular needle, by Jones, of the same length, and used with the same instrument as the above.

No. 5. Another similar needle, belonging to the same instrument, but employed for the intensity.

No. 6. A conical needle by Dollond, $11\frac{1}{2}$ inches in length, with a moveable axis, for shifting into four different positions.

No. 7. A rectangular needle, by Dollond, of the same length as No. 6, and used in the same instrument, but employed exclusively for the intensity.

It may not be unnecessary to state, that every precaution which suggested itself was taken to ensure accuracy, and that the needles were vibrated after each observation by means of a small piece of magnetized wire, that their axes might not be injured by raising them in the Y's off the agate planes.

Each of the registered observations on the dip were deduced from five readings of the needle in each of its different positions.

The observations for intensity, by means of the *time* in which the needles performed one hundred vibrations in the meridian, are deduced from the mean of four hundred vibrations obtained with the face of the instrument on each side of the vertical, and the needles reversed on their axes in the two positions.

DATE.	Time.	Latitude.	Longitude.	Observer.	Needle.	Temperature. Air.	Temperature. Instrument.	Dip.
1824.	H. M. H. M.	° ′ ″	° ′ ″					° ′ ″
May 5	5 A.M.	Woolwich	Common.	F.	2	+48.7	+60	70 55.94
„ 6	Noon.	„	„	F.	4	+59	+68	70 06.46
„ 8	5 37 P.M.	„	„	F.	1	+62½	+65	69 25.2
June 26	10 A.M. to 4 P.M.	68 59 18	53 12 55.7	F.	4	+41.5	+41.5	83 02.6
	6 to 10 „	. . . . .	. . . . .	P.	4	+42	+42	82 59.85
„ 27	8 P.M. to Midnight.	. . . . .	. . . . .	F.	1	+44	+45	82 55.9
„ 28	1 to 4 A.M.	. . . . .	. . . . .	F.	2	+44	+44	82 36.3
July 25	Noon.	70 56	60 52	F.	4	+38	+38	84 10.8
	1 to 3 P.M.	. . . . .	. . . . .	P.	4	+42	+42.5	84 06.57
Nov. 1	10 A.M. to 2 „	73 13 39.39	88 54 48	F.	4	− 6	− 6	87 42.46
„ 2	10 „ 3 „	. . . . .	. . . . .	F.	2	+ 3.2	+ 3.2	87 51.7
„ 3	10 „ 2 30 „	. . . . .	. . . . .	F.	1	+ 2	+ 2	87 57.7
„ 5	10 „ 6 „	. . . . .	. . . . .	F.	6	+10	+10	88 16.91
„ 6	10 „ 6 „	. . . . .	. . . . .	F.	6	− 4.5	− 4	88 13.75
„ 9–10	10 „ 4 „	. . . . .	. . . . .	P.	6	+ 7	+ 8	87 43.79
„ 11	9 „ 2 „	. . . . .	. . . . .	P.	4	+ 1	+ 8	87 51.62
„ 12	10 „ Noon.	. . . . .	. . . .	P.	1	−14	− 8.5	87 54.94
	0 30 to 2 30 P.M.	. . . . .	. . . . .	P.	2	− 9	− 7	87 52.75
	3 „ 5 „	. . . . .	. . . . .	P.	3	−10	− 6	87 47.3
1825.								
Jan. 4	0 30 „ 4 „	. . . . .	. . . . .	P.	4	−27	−25	88 00.17
„ 5	1 „ 4 „	. . . . .	. . . . .	P.	4	−36.5	−31	87 55.99
„ 6	11 A.M. to 2 30 „	. . . . .	. . . . .	F.	4	−30	−22	88 10.96
„ 7	10 „ 2 „	. . . . .	. . . . .	F.	1	−35	−33	88 11.02
	2 to 6 „	. . . . .	. . . . .	F.	2	−36	−25	87 40.05
„ 8	11 „ to 3 „	. . . . .	. . . . .	F.	6	−33	−29	88 29.49
April 26	11 30 „ 3 „	. . . . .	. . . . .	F.	4	+ 2	− 1	88 16.99
	4 to 7 30 „	. . . . .	. . . . .	F.	2	+ 2	+ 1	88 12.76
„ 27	6 15 „ 8 30 A.M.	. . . . .	. . . . .	F.	1	− 3	0	88 09.32
	9 20 „ 11 30 „	. . . . .	. . . . .	P.	4	+25	+26	88 06.86
June 2	11 40 A.M. to 1 30 P.M.	. . . . .	. . . . .	P.	1	+26	+28	88 03.07
	1 50 to 4 00 „	. . . . .	. . . . .	P.	2	+29	+29	88 13.8
„ 27	9 30 A.M. to 3 „	. . . . .	. . .	F.	6	+47	+48	87 36.77
„ 28	Noon 2 „	. . . . .	. . . . .	F.	4	+43	+42	87 31.17
	4 to 6 „	. . . . .	. . . . .	F.	1	+43	+42	87 52.5
	6 30 „ 9 „	. . . . .	. . . . .	F.	2	+40	+41	87 54.2
July 27	10 A.M. to 1 30 „	73 06 17	91 19 52.3	P.	2	+50	+50	88 02.1
Aug. 13	8 45 „ Noon.	72 46 32	91 50 05.5	F.	4	+42	+47	88 25.44
	0 20 to 3 30 P.M.	. . . . .	. . . . .	F.	2	+46	+48	88 12.68
	6 30 „ 7 35 „	. . . . .	. . . . .	F.	1	+42½	+42	88 19.55
„ 30	8 „ 11 A.M.	73 09 08	89 01 20.8	F.	4	+33	+33	88 08.25
Dec. 4	11 10 A.M. to 2 0 P.M.	Woolwich	Common.	F.	4	+47	+47	70 10.1
	2 50 to 4 37 „	„	„	F.	2	+46	+46	69 54.7
„ 5	1 30 „ 4 10 „	„	„	F.	1	+45	+45	69 56.5

Mean Dip.	REMARKS.	DATE. Day.	DATE. Time.	INTENSITY. M. Time in performing 100 Vibrs.	INTENSITY. Temp.	INTENSITY. Needle used.	INTENSITY. Ratio deduced.
° '		1824.		s.	°		
70 09.2 N.		May 7	Noon.	364.67	+57	5	1.00
82 53.66	On Boat Island—Whale-fish Islands.		h.				
		June 27	2 P.M.	340.35	+44	5	1.148
84 08.68	On the Ice, Davis' Strait.	. . . .	. . . .	. . .	. .	. .	. . .
° ' "							
87 55 29	Partly by lamp-light.	Nov. 8	10½ A.M.	404.94	−13½	7	1.296
88 05 31	By candle-light.						
		1825. Jan. 10	11¼ „	404.69	−22	7	1.298
88 13 02	By day-light.						
88 08 12							
87 44 41		June 27	9½ „	406.50	+47	7	1.286
Mean Dip at Port Bowen 88° 01' 23							
88 02 1							
88 19 22	Eastern Coast of North Somerset.						
88 08 25	Neill's Harbour.						
70 00 4		Dec. 3	11½ „	461.02	+47½	7	1.00

X.

OBSERVATIONS ON THE MAGNETIC NEEDLE, FOR PLACING MR. BARLOW'S CORRECTING-PLATE.

THE Ships having dropped down the river to North Fleet, Mr. Barlow came on board, on the 10th of May, 1824, to fix his Correcting-plate to the Compass of His Majesty's Ship Hecla, for which purpose the ship's head was directed to each point, to obtain the necessary observations.

The following table contains the details:—

NORTH FLEET, MAY 10, 1824.

Ship's Head by Compass.	Bearing of Ship from Station.	Bearing of Station from Ship.	Local Attraction.	Ship's Head by Compass.	Bearing of Ship from Station.	Bearing of Station from Ship.	Local Attraction.
North.	S.40° 50′W.	N.41° 00′E.	+0° 10′	South .	S.36° 58′W.	N.37° 00′E.	+0° 02′
N,byW.	41 36	43 10	+1 34	S.byE.	31 30	30 00	−1 30
N.N.W.	42 44	45 30	+2 46	S.S.E.	32 00	29 40	−2 20
N.W.byN.	43 22	47 00	+3 38	S.E.byS.	31 01	27 50	−3 11
N.W.	43 52	49 00	+5 08	S.E.	30 24	25 40	−4 44
N.W.byW.	43 58	49 40	+5 42	S.E.byE.	33 39	28 00	−5 39
W.N.W.	42 49	49 50	+6 51	E.S.E.	37 23	30 20	−7 03
W.byN.	41 10	49 00	+7 50	F.byS.	40 59	34 00	−6 59
West.	41 29	47 00	+6 11	East.	43 28	36 50	−6 38
W.byS.	40 48	47 20	+6 32	E.byN.	47 29	40 50	−6 39
W.S.W.	39 46	46 10	+6 24	E.N.E.	49 33	43 10	−6 23
S.W.byW.	38 30	44 00	+5 30	N.E.byE.	50 36	44 10	−6 26
S.W.	36 30	42 20	+5 50	N.E.	50 36	46 00	−4 36
S.W.byS.	. .	. . .	. . .	N.E.byN.	. . .	. . .	. . .
S.S.W.	34 58	38 30	+3 32	N.N.E.	45 51	42 00	−3 51
S.byW.	. . .	. . .	. . .	N.byE.	43 54	42 20	−1 34

From these results Mr. Barlow furnished (from his table of local attractions) the situation for the plate to be fixed abaft the compass, in the line of no attraction; it was with its centre 14 inches from the vertical line of support of the card, and 12 inches below its horizontal plane. As we proceeded to the north, however, it was soon found from observations on the variation of the compass with the ship's head at different points, that the plate, as fixed in England, did not wholly correct the local attraction of the Hecla in very high latitudes.

The following are the variations of the compass obtained on the 18th of June, 1824, in latitude 61° 13′ N.; longitude 55° 30′ W.; with the ship's head at

		°	′	
N.E.byE.	Variation	59	12	Westerly.
South	"	49	17	"
East	"	60	00	"
W.byS.	"	41	12	"

From these results, it appears that the plate was fixed too near the compass.

The Expedition having anchored at the Whale-fish Islands, for the purpose of unloading the Transport, the following observations were made, with a view of fixing the plate more accurately to the compass, July 3d, 1824:

Cor. Magnetic Bearing of Ship's Head.	Compass Bearing of Theodolite from Ship.	Cor. Magnetic Bearing of Comp. from Theodolite.	Local Attraction + N. end to the W. − to E.	Cor. Magnetic Bearing of Ship's Head.	Compass Bearing of Theodolite from Ship.	Cor. Magnetic Bearing of Comp. from Theodolite.	Local Att. + when North end drew to W. − to E.
	° ′	° ′	° ′		° ′	° ′	° ′
North.	N.34 47E.	S.34 01W.	+00 46	South.	N.41 12E.	S.41 57W.	−00 45
N.E.	28 47	39 34	−10 47	S.W.	50 35	33 39	+16 56
East.	26 12	44 08	−17 56	West.	46 20	27 55	+18 25
S.E.	29 10	45 40	−16 30	N.W.	51 40	39 36	+12 04

The plate and compass were now taken on shore, and after a few trials, the following corresponding deviations of the needle were produced by the plate, when its centre was 17 inches below the horizontal plane of the needle, and 13.3 inches from the vertical line passing through its point of support.

Correct Mag. Position of Plate.	Correct Mag. Bearing of object.	Bearing of object with Plate fixed.	Deviation produced by Pl. + N. end to the W. − to the E.	Correct Mag. Position of Plate.	Correct Bearing of object.	Bearing of object with Plate fixed.	Deviation produced by Pl. + N. end to the W. − to the E.
	° ′	° ′	° ′		° ′	° ′	° ′
North.	S.74 40W.	S.74 46W.	+ 0 06	South.	S.74 10W.	S.74 40W.	00 00
N.E.	. . . .	63 20	− 11 20	S.W.	. . . .	N.86 50W.	+18 30
East.	. . . .	56 50	− 17 50	West.	. . . .	N.86 20W.	+19 00
S.E.	. . . .	60 00	− 14 40	N.W.	. . .	S.86 42W.	+12 02

The centre of the plate being placed in the above position, abaft the compass on board, the ship's head was again directed to the different points specified in the following Table; the fourth and eighth columns of which shew the amount of attraction of the iron in the ship, uncorrected by the plate:—

Correct Mag. Bearing of Ship's Head.	Bearing of Theodolite from Ship with Plate fixed.	Bearing of Compass on board from Theodolite.	Difference of Bearings.	Correct Mag. Bearing of Ship's Head.	Bearing of Theodolite from Ship with Plate fixed.	Bearing of Compass on board from Theodolite.	Difference of Bearings.
	° ′	° ′	° ′		° ′	° ′	° ′
North.	N.42 40E.	S.39 43W.	+ 2 57	South.	N.56 50E.	S.58 12W.	− 1 22
N.E.	50 50	49 33	+ 1 17	S.W.	Object on shore not seen.		
East.	52 10	51 27	+ 0 43	West.	N.42 10E.	S.41 33W.	+ 0 37
S.E.	58 55	57 42	+ 1 13	N.W.	N.34 30E.	S.31 52W.	+ 2 28

In the course of the experiments on shore at the Whale-fish Islands, for finding the required position of the plate, a considerable difference in the deviations it produced was observed to take place, when that part of the plate which had been kept uppermost was turned downwards.

The following Table may serve to point out the necessity of always keeping that part upwards, which was so at the time when its attraction on the compass represented the local attraction of the ship: to ensure which, it would be proper for the plate to be fixed on a square or triangular pin, instead of a circular one.

The SITUATION of the PLATE with respect to the COMPASS in this instance was 17 inches below the pivot, and 12 inches from the plumb-line passing the same.

Magnetic Position of the Plate.	Correct Mag. Bearing of the object.	Bearing of object with Plate fixed, X uppermost.	Bearing of object with Plate fixed, X downwards.	Attraction due to Plate when X was uppermost.	Attraction due to Plate when X was downwards.	Difference of Attractions — when X downward is the least.
	° ′	° ′	° ′	° ′	° ′	° ′
North.	S.83 40W.	S.83 40W.	S. 83 40W.	00 00	00 00	0 00
N.E.	. . . .	70 40	73 26	− 13 00	− 10 14	− 2 46
East.	. . . .	64 10	67 45	− 19 30	− 15 55	− 3 35
S.E.	. . . .	67 47	70 25	− 15 53	− 13 15	− 2 38
South.	. . . .	83, 10	81 30	− 00 30	− 2 10	+ 1 40
S.W.	. . . .	N.76 35W.	N.81 25W.	+ 19 45	+ 14 55	− 4 50
West.	. . . .	75 40	79 00	+ 20 40	+ 17 20	− 3 20
N.W.	. . . .	83 40	84 30	+ 12 40	+ 11 50	− 0 50

During the time that we were detained in the *pack*, in Davis' Strait (1824), favourable opportunities were afforded, of proving the accuracy of the plate's present position, by comparing the variation of the compass which it furnished, with those obtained on the ice at some distance from the ships: the following Table contains the observations made between the Whale-fish Islands and Port Bowen.

DATE. 1824.		Latitude, North.	Longitude, West.	Ship's Head by Compass.	Variations observed on Board.	Variations observed on Ice or shore.	REMARKS.
July	10	70° 00′	59° 00′	E.S.E.	72° 55′W.		
"	"	. . .	. . .	N.N.W.	72 10		
"	14	71 16	59 25	N.16½°E.	78 21	78° 48′W.	Observed on ice, 330 yards from the ship.
"	21	71 02	60 40	. . . .	. . .	77 37	On the ice, 400 yards from ditto.
"	22	70 58	60 45	N.½E.	78 01		
"	24	70 57	60 56	. . . .	. . .	78 24	On the ice, ¼ of a mile from the ships.—Dip, 84° 15′.2.
Aug.	15	72 27	61 22	N.N.E.	83 58		
"	"	. . .	. . .	N.50°E.	82 12		
"	"	. . .	. . .	E.S.E.	84 41		
"	16	72 28	61 30	. . . .	. . .	82 58	On ice, about 300 yards to the N.N.W. of ships.
"	20	72 34	62 15	South.	84 37	83 22½	On the ice, 400 yards from ship, with Kater's Compass, 1 and 2.
"	"	. . .	. . .	East.	83 32		
"	21	. . .	. . .	N.N.W.	81 00		
Sept.	10	74 10	80 25	N.W.	108 57		
"	11	74 20	81 26	N.b.W.½W.	110 43		
"	"	74 28	. . .	. . . .	. . .	104 57½	At Cape Warrender, with Kater's Compass, 1.
"	14	74 00	85 15	N.N.W.	108 08		
"	"	73 56	85 12	S.E.	109 57		
"	15	74 00	85 16	W.N.W.	114 53	. . .	No observations for comparison at these places.
"	"	. . .	. . .	E.N.E.	114 26		
"	26	73 52	86 53	South.	115 06		
"	"	73 49	. . .	W.S.W.	128 29		
"	"	. . .	. . .	W.b.N.½N.	128 29		
"	"	. . .	. . .	N.W.b.W.	127 59		
"	28	. . . .	. . . .	S.14°W.	122 35	. . .	Port Bowen.
					133 44E.	. . .	Do. without the plate.

The following tabulated experiments were made in Barrow's Strait between the parallels of 73° 56′, and 74° North, longitude 84° 30′ and 85° 16′ W. They were obtained by taking the bearing of a distant object with the compass, having the plate fixed to it, and also taking the bearing when the plate was removed from the compass: the difference between these bearings (the ship's head being kept at the same point in both cases) shews the amount of attraction corrected by the plate, since it will be seen, on looking over the preceding table, that the variations observed on the ice or on shore at some distance from the vessels, accords very nearly with that observed on board with the ship's head in various directions:—

DATE. 1824.		Magnetic Direc. of Ship's Head.	Bearing of Object, Plate fixed.	Bearing of Object, Plate off.	Diff. of Bearing, or Amt. of Att. cor. by Pl.	REMARKS.
Sept.	13	E.byS.	North.	N. 59° 00′W.	59° 00′	Mean of several observations by Capt. Parry and Lieut. Foster.
„	„	E.S.E.	North.	. . . . .	. . .	
„	„	N.N.W.	North.	. . . .	no diff.	This observation was made, to see if the object bore the same on opposite tacks.
„	14	West.	West.	N. 54 00W.	36 00	Several observations.
„	„	E.S.E.	S. 4° 20′ E.	S. 57 00 E.	52 40	
„	„	E.S.E.	4 20	. . . . .	no diff.	
„	„	N.N.W.	4 20	. . . . .		
„	„	N.N.W.½W.	N. 85 30 E.	N. 71 00 E.	14 30	
„	15	E.byS.	S. 02 20 E.	S. 60 20 E.	58 00	Several observations.
„	16	N. 47° W.	N. 25 00 E.	. . . . .	. . . .	
„	„	E.byS.	22 00	. . . . .	3 00	Discrepancy.

Soon after our arrival in Port Bowen, it was ascertained that the variations observed on shore and on board (ship's head S. 14° W.) agreed within a few minutes; nevertheless, we were anxious to see how near the plate would, in other directions of the ship's head, continue to correct such enormous deviations as at present influenced our compasses. For this purpose, the ship's head was warped round to east, and afterwards to west; since, at these points, the forces* opposed to each other would then act at right angles to the needle, and consequently in the best mechanical position for detecting any inequality of action that might exist between them. With the ship's head at east, the difference between the correct magnetic bearing of an object, and that shewn by the compass on board having the plate attached, was 8° 27′, and at west, 6° 58′, the north end of the needle in both instances being drawn forward by the ship's iron, thus indicating a want of power in the

* That of the iron in the ship and in the plate.

plate. It was not, however, deemed necessary to alter the position of the plate in consequence of these trifling discrepancies, when compared with the amount of local attraction that it did correct, when placed in the situation assigned for it at the Whale-fish Islands.

The plate and compass being taken on shore, and their centres placed relatively to each other as on board, the fourth and eighth columns of the following Table shew the effect it produced. It may be proper to remark, that when the plate was in a direction having a southerly expression, the needle traversed with great sluggishness and uncertainty.

Correct Magnetic position of Plate.	Correct bearing of object.	Bearing of object with Plate.	Deviation produced by Plate.	Deviated position of the Plate.	Correct Magnetic position of Plate.	Correct bearing of object.	Bearing of object with Plate.	Deviation produced by Plate.	Deviated position of the Plate.
North.	West.	West.	° ′ 00 00	North.	South.	West.	° ′ N. 70 0 E. S. 67 0 E.	. . .	. . .
N.W.	,,	° ′ N. 62 40 W.	+27 20	° ′ N. 17 40 W.	S.E.	,,	South.	° ′ −90 00	° ′ N. 45 00 E.
West.	,,	37 20	52 40	37 20	East.	,,	S. 40 50 W.	−49 10	N. 40 50 E.
S.W.	,,	00 40	89 20	45 50	N.E.	,,	S. 64 50 W.	−26 10	N. 18 50 E.

Now, on the supposition that the plate, fixed as at the Whale-fish Islands, represents the power of the iron in the ship on the compass at this place (which it will do nearly), the fifth and tenth columns in the above table shew the manner in which the needle on board would indicate the direction of the ship's head when on the correct magnetic bearings shewn in the first and sixth columns; which direction, in every case, will be the resultant due to two unequal forces, one of which (the earth) remains constant, while the ship's attraction (which at present is stronger than the earth's) is subjected to every change of position, from coincidence with the former to direct opposition. Therefore, when the iron in the vessel and the magnetic pole coincide, that is, when the ship's head is north, the power by which the needle takes up its direction, is that due to the sum of the two forces (earth and ship); but, with the ship's head south (which places the needle between the two forces), the opposite and stronger action of the iron in the ship, to that of the earth, overcomes the latter; and, in this case, the power by which the needle takes up its direction, is that due to the difference only of their relative forces, which, in the present instance, was not sufficient to overcome the friction on the pivot, and the needle thereby became indifferent to any direction.

Thus we see, as we advance towards the magnetic pole, that the iron in ships renders the compass on board useless long before its directive energy is destroyed by the increase of dip; and that the plate, when fixed in its proper situation, not only corrects the deviations in this extreme case, but restores to the needle, throughout the entire circle of azimuth, the natural intensity by which its horizontal motion is governed.

In order that this mode of correcting the local attraction of vessels might be put to the severest test in our power, the Hecla, on her return to England in 1825, was swung round the compass in the usual manner, at North Fleet, on the 27th of October; the plate being attached to the support of the compass in that position which was assigned to it at the Whale-fish Islands, July, 1824.

The fourth column in the following Table shews the amount of local attraction uncorrected by the plate:

Magnetic Position of Ship's Head.	Compass Bearing of Theodolite from Ship.	Correct Magnetic Bearing of Compass from Theodolite.	Error.
	° ′	° ′	° ′
North.	S. 33 7 W.	N. 33 16 E.	− 0 9
N.E.	35 50	35 48	− 0 18
East.	38 30	37 31	+ 0 59
S.E.	34 30	33 17	+ 1 13
South.	30 04	29 28	+ 0 36
*S.W.	26 30	27 33	− 1 3
West.	35 35	36 07	− 0 32
N.W.	36 37	36 08	+ 0 29

* The difficulty of retaining the ship's head at S.W. rendered the observation at that point somewhat uncertain.

The nature of these errors, although but small, are of such a kind as to indicate too strong a power in the plate; and the same (as will appear by the preceding experiments) shewed itself in a stronger manner in Barrow's Strait, which is probably attributable to the partial induction of the plate from the needle itself. This conclusion appears to be borne out in some experiments on the attractions between a cast-iron shell and the needle, which were greater when the needle was strongly than when weakly magnetised, a circumstance which can only be explained by supposing an induced action of the kind alluded to. This might be partially remedied by employing a larger plate at a greater distance from the compass.

XI.

OBSERVATIONS on the VARIATION of the MAGNETIC NEEDLE, made on BOARD His Majesty's Ship HECLA, at Sea, with Gilbert's AZIMUTH COMPASS, having Mr. Barlow's CORRECTING-PLATE attached to it.

DATE.	Latitude, North.	Longitude, West.	Direction of the Ship's Head.	Observer.	Westerly Variation. Observed.	Westerly Variation. Mean.
1824.	° ′ ″	° ′ ″	°		° ′	° ′ ″
			N. 56 E.	P.	59 28	59 20 00
			N. 56 E.	F.	59 12	
			N. 73 E.	P.	61 14	61 14 00
			N. 82 E.	P.	59 19	59 19 00
June 18	61 11 00	56 02 40	East.	F.	60 00	60 00 00
			South.	P.	49 13	49 15 00
			South.	F.	49 17	
			S. 79 W.	P.	41 01	41 06 30
			S. 79 W.	F.	41 12	
			N. 45 E.	P.	58 12	
			N. 45 E.	F.	58 36	58 41 20
„ 19	61 56 00	55 48 30	N. 45 E.	H.	59 16	
			East.	P.	56 48	56 31 00
			East.	F.	56 14	
			N. 22 W.	P.	72 39	72 24 30
			N. 22 W.	F.	72 10	
July 10	70 00 00	58 40 00	S. 67 E.	P.	72 21	72 38 00
			S. 67 E.	F.	72 55	
			N. 16 E.	P.	78 28	
„ 14	71 16 00	59 22 00	N. 16 E.	F.	78 21	78 22 00
			N. 16 E.	H.	78 17	
„ 22	70 58 00	60 43 00	N. 5 E.	P.	77 56	77 58 30
			N. 5 E.	F.	78 01	
			N. 22 E.	F.	83 58	83 58 00
Aug. 15	72 27 00	61 17 00	N. 50 E.	F.	82 12	82 12 00
			S. 56 E.	P.	84 40	84 40 00
			S. 67 E.	F.	84 41	84 41 00
			East.	P.	83 21	
„ 20	72 34 00	62 08 00	East.	F.	83 32	83 24 40
			East.	H.	83 21	

DATE.	Latitude, North.	Longitude, West.	Direction of the Ship's Head.	Observer.	Westerly Variation. Observed.	Westerly Variation. Mean.
1824.	° ′	° ′ ″	°		° ′ ″	° ′ ″
Aug. 20	72 34	62 08 00	South.	P.	85 58 00	85 17 30
			South.	F.	84 37 00	
„ 21	72 30	62 12 00	N. 22 W.	F.	81 00 00	81 00 00
Sept. 10	74 10	80 25 30	N. 45 W.	P.	108 23 00	108 40 00
			N. 45 W.	F.	108 57 00	
„ 11	74 20	81 29 45	N. 11 W.	P.	113 06 00	113 06 00
			N. 16 W.	F.	110 43 00	110 43 00
„ 12	74 12	84 01 45	N. 11 W.	P.	117 38 00	117 38 00
„ 26	73 52	87 02 00	S. 11 W.	P.	124 23 00	124 23 00
1825.						
Aug. 25	72 55	92 19 00	S. 39 W.	F.	133 00 00	133 00 00*
Sept. 2	74 04	82 08 00	S.E.byS.	F.	136 57 00	136 21 07†
			S.E byS.	P.	135 45 15	
„ 3	73 58	78 21 00	S.S.W.	F.	112 09 00	. . . .
„ 9	71 37	60 13 00	W.½N.	F.	79 08 00	79 08 00
„ 14	71 07	58 37 00	W. byS.	F.	81 32 00	80 45 59
			W. byS.	P.	79 59 58	
			W. byS.	F.	77 09 00	
„ 15	70 42	58 31 00	W. byS.	F.	76 31 00	76 47 22
			W. byS.	P.	76 51 25	
			W. byS.	P.	76 38 04	
„ 16	67 53	57 53 00	S.S.W.½W.	F.	68 49 00	. . . .
Oct. 2	58 41	26 42 00	East.	P.	42 38 18	42 38 18
„ 3	59 01	23 46 00	S.E.½E.	F.	43 14 30	43 42 25
			S.E.½E.	P.	44 10 20	
„ 4	59 12	20 56 00	South.	F.	39 01 00	38 46 38
			South.	P.	38 32 17	

* True variation observed on shore near this place, 129° 25′.
† True variation observed at Cape Warrender, 105°¼.

XII.

OBSERVATIONS on the VARIATION of the MAGNETIC NEEDLE, made on Shore, or on the Ice.——1824—25.

DATE.	Latitude, North.	Longitude, West.	Observer.	Compass.	Westerly Variation. Observed.	Westerly Variation. Mean.	REMARKS.
1824.	° ′ ″	° ′ ″			° ′ ″	° ′ ″	
June 28			P.	G.*	70 46 00		
			F.	G.	70 00 10		
„ 29	68 59 13	53 12 56	F.	G.	70 03 30	70 23 57	On Boat Island, Whale-fish Islands.
			H.	G.	70 36 20		
			P.	G.	70 34 40		
			H.	G.	70 23 00		
			P.	G.	78 48 00		
July 14	71 16 30	59 22 00	F.	G.	78 48 00	78 49 30	On ice, 330 yards from the ship.
			H.	G.	78 52 30		
„ 21	71 02 00	60 36 00	P.	G.	77 46 20	77 41 40	On ice, 400 yards from the ship.
			F.	G.	77 37 00		
„ 24	70 57 00	60 55 30	F.	G.	78 24 00	78 24 00	On ice, ¼ of a mile from the ship.
Aug. 16	72 28 00	61 26 30	F.	G.	82 58 00	82 58 00	On ice, 300 yards from the ship.
			P.	K. 1	84 10 55		
			P.	K. 2	82 37 16		
„ 20	72 34 18	62 08 00	F.	K. 1	84 34 00	83 25 44	On ice, 400 yards from the ship.
			F.	K. 2	82 11 00		
			H.	K. 1	84 23 00		
			H.	K. 2	82 38 14		
			P.	K. 1	104 36 30		
Sept. 11	74 28 16	81 51 13	F.	K. 1	104 57 30	104 48 30	Cape Warrender, Barrow's Strait.
			H.	K. 1	104 52 00		
1825.							
June 4	73 09 08	89 01 20	S.	K. 3	118 48 00	. . . .	In Neill's Harbour.
„ 10	72 17 00	82 56 00	S.	K. 3	100 04 00	. . . .	On shore, E. Coast of P. Regent's Inlet.
„ 14	72 44 00	82 27 33	S.	K. 3	125 07 00	. . . .	
„ „	72 45 15	89 26 33	S.	K. 3	122 27 00	. . . .	
„ 15	73 02 30	89 19 00	S.	K. 3	135 03 00	. . . .	Compass very sluggish.
July 25	73 23 00	90 53 00	F.	G.	126 07 15	125 34 42	Upon ice.
			P.	G.	125 02 09		
„ 27	73 06 00	91 20 00	F.	K. 3	135 26 00	128 23 17	On shore, E. Coast of North Somerset.
			P.	K. 1	121 20 35		
Aug. 15	72 46 00	91 50 00	F.	K. 2	129 25 00	129 25 00	Do. where Fury was left.

* G. Gilbert's Compass. K. Kater's Compass.

XIII.

OBSERVATIONS for DETERMINING the VARIATION of the MAGNETIC NEEDLE, at PORT BOWEN, 1824—25.

DATE.		Time.	Thermometer.	No of Observations	Observer.	Wind.	Weather.	Westerly Variation.	REMARKS.
1824.		H. M.	°					° ′ ″	
Nov.	1	1 50 P.M.	− 6	10	P.	E.S.E.	Mod. overc^t. and dusky.	121 52 00	
„	2	9 30 A.M.	+ 3.5	10	F.	E.byS.	Mod. small snow falling.	122 15 06	
„	„	11 20 „	+ 3	10	P.	„	Overcast.	121 41 36	Compass not tapped, wind sufficient.
„	„	1 30 P.M.	+ 2	12	P.	„	„	120 49 55	
„	„	2 30 „	+ 1	10	P.	„	„	121 13 30	
„	4	9 40 A.M.	+ 2	10	P.	East.	Fresh, overcast.	121 01 54	
„	„	10 20 „	+ 2	10	P.	„	„ „	121 36 06	
„	„	Noon. „	+ 2	10	P.	„	„ „	120 47 48	
„	„	1 00 P.M.	+ 2	7	F.	„	„ „	121 24 06	
„	5	10 00 A.M.	+10	4	F.	„	„ „	121 48 15	
„	6	10 00 „	+ 4	10	P.	N.W.	Overcast and dusky.	122 15 48	The Compass tapped.
„	„	10 30 „	+ 4	10	P.	„	Overcast.	122 18 36	
„	„	10 50 „	+ 4	10	P.	„	„	122 18 42	
„	„	0 30 P.M.	+ 4	10	P.	„	Fresh, clear, and light.	122 53 54	
„	„	1 00 „	+ 4	10	P.	„	Still more clear & light.	122 36 54	
„	„	1 30 „	+ 4	10	P.	„	Very little wind, quite cl^r.	122 28 54	
„	20	0 40 „	. . .	14	P.	North.	Fine and clear.	121 20 00	
„	„	10 20 „	. . .	10	P.	„	„ „	121 25 00	These observations made by lamp-light; compass tapped.
„	„	10 40 „	. . .	10	P.	„	„ „	121 15 00	
„	„	11 00 „	. . .	10	P.	„	„ „	121 29 18	
„	„	11 20 „	. . .	10	P.	„	„ „	121 45 30	
Dec.	31	11 00 A.M.	−15	10	C.*	N.E.	Thick and hazy; twilight at noon, not good.	125 03 30	Compass not tapped.
„	„	11 40 „	−15	10	C.	„	„ „	124 36 00	
„	„	0 15 P.M.	−15	10	C.	„	„ „	123 24 00	
„	„	1 00 „	−15	10	C.	„	„ „	122 52 00	
1825.									
Jan.	11	10 30 A.M.	−36	10	C.	Calm.	Fine and clear.	123 04 00	Compass very sluggish; tapped.
„	„	11 00 „	−36	10	C.	„	Good twilight.	123 08 00	
„	„	Noon. „	−36	10	C.	„	„	123 30 00	
							MEAN	122 14 44	

* Mr. Crozier.

MEAN VARIATION OF THE MAGNETIC NEEDLE.

Mean Variation by the foregoing Observations	122	14	44	W.
„ „ by line of Zero of Needle, No. 1, used for Diurnal Variation . .	124	47	00	„
„ „ by „ No. 2, „ . .	123	04	00	„
MEAN VARIATION at Port Bowen	123	21	55	„

NOTE.—Our observations carried on during a great part of the winter passed at Port Bowen, in 1824—5, on the Diurnal Variation and Intensity of the Magnetic Needle, together with those for determining the Amount of Atmospheric Refraction at low Altitudes and Temperatures, were presented to, and read before the Royal Society, soon after the return of the Expedition to England. It being understood to be the intention of that learned body to honour these observations by publishing them in their Transactions, and the numerical details being very extensive, it has only been thought expedient so far to avail ourselves of the kind permission granted by the President and Council, as to give in this volume the general results already alluded to in the course of the Winter Narrative. (See pp. 52, 53, 56, 57.)

On the same account, it has been deemed necessary to publish, in this Appendix, only a brief abstract of the results of Lieut. Foster's Experiments with an Invariable Pendulum, at Port Bowen, in the Spring and Summer of 1825. (See Appendix, No. VI.)

XIV.

OBSERVATIONS FOR THE DIP OF THE HORIZON AT SEA, MADE WITH Dr. WOLLASTON'S DIP-SECTOR.

OBSERVATIONS for the DIP of the HORIZON at SEA;

These Observations are few in number, in consequence of the almost constant presence of the
A few Observations of a similar kind, made by Lieutenant Foster in His Majesty's

DATE.		Time.	Latitude.	Longitude.	Observer.	No. of Observations.	Height of the eye in feet.		DIP.		Difference, Tabular being	TEMPERATURE.		Barometer.
									Tabular.	Observed.		Air.	Sea.	
1823.		H. M.	° ′	° ′			Feet.	In.	′ ″	′ ″	′ ″	°	°	Inches.
July	25	3 30 P.M.	79 22 N.	8 40 E.	F.	6	14	3	3 42	2 52.9	+ 0 49.1	+43	+40	29.64
„	27	7 00 A.M.	77 58 „	2 28 „	F.	6	14	7	3 45	4 00	− 0 15	37	39	29.80
„	„	Noon.	77 40 „	1 50 „	F.	6	14	8	3 46	3 46	0 0	38	38.5	30.00
„	28	Noon.	77 30 „	1 40 W.	F.	6	12	8	3 30	3 31.7	− 0 1.7	35.5	35.8	30.20
„	„	P.M.	77 27 „	2 00 „	F.	6	12	6	3 29	3 07.5	+ 0 21.5	34.8	33.5	30.20
„	31	. . . . .	76 00 „	4 12 „	F.	6	12	10	3 32	3 12.5	+ 0 19.5	38.8	37	30.09
Aug.	1	4 00 P.M.	75 45 „	6 45 „	F.	6	14	5	3 45	3 54.6	− 0 9.6	39.5	36.5	30.04
„	2	5 00 A.M.	75 37 „	7 02 „	F.	6	14	2	3 42	3 53.8	− 0 11.3	36	36	30.02
„	3	Midnight.	74 30 „	14 38 „	F.	6	13	0	3 33	1 52	+ 0 1.4	32	31.5	30.10
„	„	. . . . .	. . . .	. . . .	F.	6	13	0	3 33	0 00	+ 0 3.3	32	31.5	30.10
Sept.	21	5 00 P.M.	66 05 „	4 30 E.	F.	6	13	7	3 37	3 92.2	+ 0 7.8	43	50	29.40
„	22	7 30 A.M.	64 46 „	5 44 „	F.	6	13	8	3 38	3 19.1	+ 0 18.9	45.5	51	29.51
„	25	4 30 „	64 11 „	7 02 „	F.	6	13	0	3 33	3 30.8	+ 0 2.2	48.5	50.5	29.50
„	„	. . . . .	. . . .	. . . .	. .	. .	15	0	3 49	3 49.1	− 0 0.1	48.5	50.5	29.50
1824.														
June	6	10 00 A.M.	60 22 „	20 21 W.	P.	8	13	6	3 37	2 45.6	+ 0 51.4	52.5	49.5	30.24
„	10	1 30 P.M.	58 50 „	28 30 „	P.	10	15	0	3 49	3 17.5	+ 0 31.5	52	48	30.16
„	„	. . . . .	. . . .	. . . .	F	6	15	0	3 49	4 09.1	− 0 20.1	52	48	30.16
„	„	. . . . .	. . . .	. . . .	F.	6	15	0	3 49	3 42.5	+ 0 6.5	52	48	30.16
July	9	8 00 A.M.	69 30 „	57 15 „	P.	20	19	0	4 10	3 42.2	− 0 27.8	36	34	29.88
„	„	. . . . .	. . . .	. . . .	F.	6	22	0	4 37	4 37.5	− 0 0.5	36	34	29.88
„	„	Noon.	69 45 „	56 45 „	F.	10	22	0	4 37	3 50	+ 0 47	39.5	36	29.82
„	„	0 30 P.M.	. . . .	. . . .	P.	20	18	6	4 14	3 29.4	+ 0 44.6	39.5	36	29.82
„	„	4 00 „	. . . .	. . . .	F.	10	23	0	4 43	3 57.9	+ 0 45.1	38	38	29.78
„	„	4 15 „	. . . .	. . . .	P.	10	19	6	4 20.5	3 19.7	+ 1 00.8	39	35.5	29.78
„	10	11 40 A.M.	69 55 „	58 37 „	P.	12	19	0	4 19	3 48.4	+ 0 30.6	34	29	29.83
„	„	Noon.	. . . .	. . . .	F.	10	19	0	4 19	3 47	+ 0 32	34	29	29.83
„	11	7 40 A.M.	70 11 „	58 53 „	P.	20	18	6	4 14	3 10.2	+ 1 03.8	33	30	29.70
„	„	9 00 „	. . . .	. . . .	F.	6	22	0	4 37	3 49.1	+ 0 47.9	33	30	29.70
„	„	. . . . .	. . . .	. . . .	F.	6	22	0	4 37	4 05.8	+ 0 31.2	33	30	29.70

made with Dr. Wollaston's DIP-SECTOR.——1823—24.

ice, and its extreme ruggedness, preventing the possibility of obtaining a well-defined Horizon.
Ship, Griper, in the year 1823, are prefixed to those obtained on the present voyage.

POINTS of the HORIZON observed.				WIND.		WEATHER AND REMARKS.
S.E.	and	N.W.		E.byN.	Light.	Sea smooth; land distant in S.E.
East.	,,	West.	well defined.	W.N.W.	Fresh.	Much motion.
W.S.W.	,,	E.N.E.	,, ,,	W.byN.	,,	Sea rough.
E.byN.	,,	W.byS.	,, ,,	S.W.	Moderate.	Ice seen, N.W.
S.W.	,,	N.E.	,, ,,	S.S.W.	Light.	Ice blink, N.E.
N.E.byN.	,,	S.W.byS.	,, ,,	S.W.	,,	Sea smooth.
W.byN.	,,	E.byS.	,, ,,	Westerly.	,,	Ice seen from North to W.byS.
S.S.W.	,,	N.N.E.	,, ,,	N.W.	,,	Fog bank in the N.W.
N.E.byN.	,,	S.W.byS.		N.E.byN.	,,	Ice-horizons. This observation gives the height of the ice, 2ft. 9in.
N.W.	,,	S.E.		,,	,,	Ice-horizon. This observation makes the height of the ice, 18 feet.
E.N.E.	,,	W.S.W.	,, ,,	N.N.W.	Moderate.	Showers of rain.
N.E.byE.	,,	S.W.byW.	,, ,,	W.N.W.	,,	Sea smooth; land South.
W.byS.	,,	E.byN.	,, ,,	E.S.E.	,,	Land; S.E.byE. to S.S.W.; cloudy.
. . .	. . .	. . .	. . .	,,	,,	
N.byW.	,,	S.byE.		S.S.E.	,,	Cloudy.
N.E.	,,	S.W.	,, ,,	East.	,,	Sea smooth; horizon variable; weather moist; horizon clear at the last observation.
Do.	,,	Do.		,,	,,	
Do.	,,	Do.		,,	,,	
S.E.byS.	,,	N.W.byN.	,, ,,	N.W.byN.	,,	Very fine; several ice-bergs in sight, the "pack" 8 or 9 miles West.
S.E.	,,	N.W.	,, ,,	,,	,,	
N.W.byW.	,,	S.E.byE.	,, ,,	,,	,,	,, ,, ,,
N.W.byN.	,,	S.E.byS.	,, ,,	,,	,,	,, ,, ,,
East.	,,	West.		N.byW.	Fresh.	Sky clear above; hazy near horizon; some ice-bergs near.
North.	,,	South.		,,	,,	
Do.	,,	Do.	,, ,,	N.W.	Moderate.	Clear in zenith; clouded in horizon; ice in south horizon.
Do.	,,	Do.	,, ,,	,,	,,	
S.E.byE.	,,	N.W.byW.	,, ,,	N.W.byN.	,,	Clear and cloudless; ice seen in N.W.byW.
N.N E.	,,	S.S.W.	,, ,,	,,	,,	
N.N.W.	,,	S.S.E.	,, ,,	,,	,,	

XV.

TIDE TABLE at PORT BOWEN, 1825.

DATE. 1825.	High Water. Time.	Rise from the last low Water.		Low Water. Time.	Fall from the last high Water.		☽'s PHASES.
	H. M.	Ft.	IN.	H. M.	Ft.	IN.	
April 16	11 30 P.M.	.	.	. . .	.	.	
„ 17	. . .	.	.	5 30 A.M.	3	2	
„ „	11 30 A.M.	3	4½	5 20 P.M.	4	0	● New, 17^{d}. 21^{h}. 20^{m}.
„ „	Midnight.	4	3½	. . .	.	.	
„ 18	„	.	.	6 00 A.M.	3	8	
„ „	11 30 A.M.	3	4½	6 00 P.M.	4	0½	
„ 19	0 15 „	4	7	6 30 A.M.	3	9	
„ „	Noon.	3	2	7 30 P.M.	3	9	
„ 20	1 00 A.M.	4	9	7 30 A.M.	3	9	
„ „	1 00 P.M.	4	1	7 10 P.M.	4	1	
„ 21	1 30 A.M.	5	1	7 40 A.M.	3	11½	
„ „	1 15 P.M.	2	10½	8 00 P.M.	4	1	
„ 22	2 00 A.M.	4	11	8 00 A.M.	3	7	
„ „	1 20 P.M.	2	5	8 00 P.M.	3	9	
„ 23	3 00 A.M.	3	10	9 00 A.M.	2	2	
„ „	2 30 P.M.	3	4	8 45 P.M.	3	4	
„ 24	3 45 A.M.	3	9	10 00 A.M.	3	1	
„ „	4 10 P.M.	2	6	9 00 P.M.	3	5	
„ 25	4 30 A.M.	4	6½	11 00 A.M.	2	7½	☽ First Qr. 25^{d}. 12^{h}. 38^{m}.
„ „	4 00 P.M.	1	4	10 20 P.M.	2	5	
„ 26	6 30 A.M.	3	4½	11 50 A.M.	3	5	
„ „	5 45 P.M.	1	1½	. . .	.	.	
„ 27	. . .	.	.	1 00 A.M.	2	8	
„ „	6 15 A.M.	4	0	1 30 P.M.	2	9	
„ „	7 30 P.M.	1	7	. . .	.	.	
„ 28	. . .	.	.	1 00 A.M.	1	11	
„ „	8 00 A.M.	3	3	2 15 P.M.	3	3	
„ „	8 45 P.M.	2	5	. . .	.	.	
„ 29	. . .	.	.	2 30 A.M.	2	6	
„ „	8 50 A.M.	3	1½	3 00 P.M.	3	7½	
„ „	11 00 P.M.	3	7	. . .	.	.	
„ 30	. . .	.	.	4 00 A.M.	3	3	
„ „	10 00 A.M.	3	6½	4 10 P.M.	4	7	
„ „	10 30 P.M.	4	6	. . .	.	.	
May 1	. . .	.	.	4 30 A.M.	3	10½	
„ „	10 45 A.M.	4	10	5 00 P.M.	4	10½	
„ „	11 00 P.M.	5	4½	. . .	.	.	

DATE.	High Water. Time.	Rise from the last low Water.		Low Water. Time.	Fall from the last high Water.		☽'s PHASES.
	H. M.	Ft.	IN.	H. M.	Ft.	IN.	
May 2	. . .	.	.	5 45 A.M.	4	4	
„ „	11 10 A.M.	4	2	5 45 P.M.	5	2	○ Full, 2^{d}. 2^{h}. 59^{m}.
„ „	Midnight.	4	8	. . .	.	.	
„ 3	„	.	.	6 10 A.M.	4	8	
„ „	Noon.	3	11	6 30 P.M.	5	2	
„ 4	0 35 A.M.	6	4	7 45 A.M.	5	2	
„ „	0 15 P.M.	3	3	7 15 P.M.	5	2	
„ 5	1 30 A.M.	6	1	8 00 A.M.	4	5½	
„ „	1 30 P.M.	3	1½	7 30 P.M.	4	7	
„ 6	2 45 A.M.	5	10	9 30 A.M.	4	1	
„ „	1 45 P.M.	3	8	8 15 P.M.	4	10	
„ 7	3 00 A.M.	5	2	10 00 A.M.	3	8	
„ „	2 15 P.M.	2	2	8 40 P.M.	3	3	
„ 8	4 00 A.M.	4	6	10 00 A.M.	3	1	
„ „	3 30 P.M.	1	8	10 00 P.M.	2	6	
„ 9	4 30 A.M.	3	11	11 15 A.M.	2	9	☽ Last Qr. 9^{d}. 9^{h}. 21^{m}.
„ „	4 30 P.M.	1	3	11 30 P.M.	1	11	
„ 10	6 00 A.M.	3	2	11 15 A.M.	2	4	
„ „	6 00 P.M.	1	4	11 25 P.M.	1	10	
„ 11	6 45 A.M.	2	0½	1 30 „	2	9½	
„ „	7 15 P.M.	1	6	. . .	.	.	
„ 12	. . .	.	.	2 15 A.M.	1	5	
„ „	7 15 A.M.	3	2½	3 10 P.M.	3	4	
„ „	8 15 P.M.	1	11	. . .	.	.	
„ 13	. . .	.	.	2 10 A.M.	1	9	
„ „	8 45 A.M.	2	3	2 40 P.M.	3	3	
„ „	9 30 P.M.	3	2½	. . .	.	.	
„ 14	. . .	.	.	3 30 A.M.	2	2	
„ „	9 00 A.M.	2	3½	4 15 P.M.	2	3½	
„ „	10 00 P.M.	2	3½	. . .	.	.	
„ 15	. . .	.	.	3 45 A.M.	2	5	
„ „	10 00 A.M.	2	7	4 10 P.M.	3	0	
„ „	10 40 P.M.	3	5	. . .	.	.	
„ 16	. . .	.	.	5 00 A.M.	2	11	
„ „	10 30 A.M.	3	6½	5 00 P.M.	3	8½	
„ „	11 15 P.M.	4	8½	. . .	.	.	
„ 17	. . .	.	.	5 45 A.M.	3	3	

TIDE TABLE at PORT BOWEN, 1825—*continued.*

DATE.		HIGH WATER. Time.	Rise from the last low Water.	LOW WATER. Time.	Fall from the last high Water.	☽'s PHASES.
		H. M.	Ft. IN.	H. M.	Ft. IN.	
May	17	11 00 A.M.	2 10	5 30 P.M.	4 1	● New, 17d. 12h. 6m.
„	„	Midnight.	3 3	. . .	. .	
„	18	„	. .	6 00 A.M.	3 9	
„	„	Noon.	2 9	. . .	. .	
„	19	0 30 A.M.	. .	7 15 A.M.	3 9	
„	„	0 10 P.M.	2 5	6 45 P.M.	4 3	
„	20	1 15 A.M.	5 2	7 45 A.M.	3 11	
„	„	0 45 P.M.	2 4½	6 15 P.M.	4 1½	
„	21	2 00 A.M.	5 3½	9 30 A.M.	3 7	
„	„	1 40 P.M.	2 6½	7 30 P.M.	3 6	
„	22	2 20 A.M.	5 1	9 15 A.M.	3 8	
„	„	2 00 P.M.	2 2	8 30 P.M.	3 6	
„	23	3 15 A.M.	4 11	10 00 A.M.	3 5	
„	„	3 00 P.M.	2 2	9 30 P.M.	3 2	
„	24	3 45 A.M.	4 2½	10 30 A.M.	3 4½	☽ First Qr. 24d. 18h. 51m.
„	„	4 30 P.M.	2 10	10 45 P.M.	3 8	
„	25	5 00 A.M.	4 0	11 30 A.M.	4 0	
„	„	5 30 P.M.	2 11½	11 00 P.M.	2 2½	
„	26	6 40 A.M.	3 5	0 40 „	3 5	
„	„	6 20 P.M.	2 3	. . .	. .	
„	27	. . .	. .	0 45 A.M.	2 6	
„	„	7 00 A.M.	2 11	1 30 P.M.	3 7	
„	„	9 30 P.M.	3 1	. . .	. .	
„	28	. . .	. .	2 10 A.M.	2 11½	
„	„	8 00 A.M.	3 1½	2 20 P.M.	4 0	
„	„	9 20 P.M.	4 0	. . .	. .	
„	29	. . .	. .	3 00 A.M.	3 0	
„	„	8 50 A.M.	3 0	3 30 P.M.	3 5	
„	„	9 50 P.M.	4 8	. . .	. .	
„	30	. . .	. .	4 00 A.M.	3 8	
„	„	10 00 A.M.	2 11	4 00 P.M.	4 6	
„	„	11 15 P.M.	5 5	. . .	. .	
„	31	. . .	. .	6 00 A.M.	3 10	○ Full, 31d. 11h. 58m.
„	„	11 00 A.M.	2 1	5 30 P.M.	4 6	
„	„	11 50 P.M.	5 7	. . .	. .	
June	1	. . .	. .	5 30 A.M.	4 2	
„	„	11 30 A.M.	3 1	5 30 P.M.	4 8	
„	2	0 15 P.M.	4 5	7 10 A.M.	4 4	

DATE.		HIGH WATER. Time.	Rise from the last low Water.	LOW WATER. Time.	Fall from the last high Water.	☽'s PHASES.
		H. M.	Ft. IN.	H. M.	Ft. IN.	
June	2	Noon.	2 10	6 30 P.M.	4 8	
„	3	1 20 A.M.	6 0	8 30 A.M.	4 5	
„	„	1 30 P.M.	2 10	7 15 P.M.	4 6	
„	4	2 00 A.M.	6 0	8 15 A.M.	4 2	
„	„	1 30 P.M.	2 7	7 50 P.M.	3 11	
„	5	3 00 A.M.	5 5	9 00 A.M.	3 9	
„	„	2 20 P.M.	2 3	9 00 P.M.	3 6	
„	6	3 25 A.M.	4 5½	9 45 A.M.	3 6½	
„	„	3 00 P.M.	2 2	9 15 P.M.	2 8	
„	7	4 00 A.M.	4 1	10 50 A.M.	3 1	
„	„	3 30 P.M.	1 9	10 30 P.M.	2 2	
„	8	5 00 A.M.	3 4	11 00 A.M.	2 8	☽ Last Qr. 8d. 2h. 17m.
„	„	5 10 P.M.	1 5½	10 35 P.M.	1 8½	
„	9	5 45 A.M.	2 9	Noon.	2 7	
„	„	6 35 P.M.	1 5½	. . .	. .	
„	10	. . .	. .	0 35 A.M.	1 6	
„	„	6 5 A.M.	2 2½	1 15 P.M.	2 5	
„	„	7 50 P.M.	1 11½	. . .	. .	
„	11	. . .	. .	1 10 A.M.	1 8½	
„	„	7 40 A.M.	2 2½	2 00 P.M.	2 6½	
„	„	8 55 P.M.	2 6	. . .	. .	
„	12	. . .	. .	2 00 A.M.	1 7½	
„	„	9 00 A.M.	1 5½	2 50 P.M.	2 9	
„	„	9 45 P.M.	3 1	. . .	. .	
„	13	. . .	. .	3 50 A.M.	2 0	
„	„	10 00 A.M.	1 7	3 45 P.M.	3 0	
„	„	10 15 P.M.	3 8½	. . .	. .	
„	14	. . .	. .	3 57 A.M.	2 6	
„	„	10 20 A.M.	3 10	4 30 P.M.	3 3½	
„	„	11 00 P.M.	4 4½	. . .	. .	
„	15	. . .	. .	5 00 A.M.	2 0½	
„	„	11 00 A.M.	2 0½	5 15 P.M.	2 3	
„	„	11 40 P.M.	3 7½	. . .	. .	
„	16	. . .	. .	5 45 A.M.	3 5½	
„	„	11 20 A.M.	2 2½	5 45 P.M.	3 11	● New, 16d. 0h. 22m.
„	17	0 30 „	5 2	6 25 A.M.	3 7	
„	„	11 40 „	2 3	6 00 P.M.	4 3	

Mean Time of High-Water at Full and Change . . 11h. 10m.

Greatest Rise and Fall of Tide . . . 6ft. 4in.
Least do. do. . . . 1 1½

XVI.

EXPERIMENTS TO DETERMINE THE RATE AT WHICH SOUND TRAVELS AT VARIOUS TEMPERATURES AND PRESSURES OF THE ATMOSPHERE.——Port Bowen, 1824—25.

The following experiments were made with a six-pounder brass gun placed on the beach at the head of Port Bowen, and fired by signal from the Hecla, the interval elapsed between the flash and report being carefully noted by the beats of a pocket-chronometer held to the ear of each observer. The initials in the columns of interval are those of Capt. Parry and Lieut. Foster, and the result in the last column of the table is deduced from the mean of both.

The distance of the muzzle of the gun from the place of observation, as measured trigonometrically by Lieut. Foster, was 12892.82ft., and by Capt. Parry (by a different series of triangles) 12892.96. The mean distance, employed in the calculation, is 12892.89ft.—The bearing of the gun was S. 71° 48′ E.

DATE.	Barometer.	Thermometer.	WIND.		Weather.	No. of Guns fired.	Interval in Seconds, between Flash and Report.			Rate of travelling per second, in feet.
			Direction.	Force.			P.	F.	Mean.	
1824.	Inches.	°					s.	s.	s.	
Nov. 24	29.841	− 7	E.S.E.	Light.	Overcast.	5	12.3525	12.430	12.3912	1040.49
Dec. 8	29.561	− 9	N.N.E.	Squally.	Very clear.	6	12.331	12.5266	12.4288	1037.34
1825.										
Jan. 10	30.268	−37	E.S.E.	Light.	Clear.	4	12.5889	12.4700	12.5290	1029.04
Feb. 7	29.647	−21.5	N.E.	Light.	Very clear.	6	12.639	12.6167	12 6278	1020.99
„ 17	29.598	−18	Calm.		Overcast.	6	12.372	12.440	12.406	1039.25
„ 21	29.735	−37.5	Calm.		Overcast.	6	12.8167	12.7067	12.7617	1010.28
Mar. 2	30.398	−38.5	East^{y}.	Light.	A little overcast.	6	12.640	12.780	12.710	1014.39
„ 22	30.258	−21.5	West^{y}.	Light.	Very clear & fine.	6	12.400	12.7167	12.5583	1026.64
June 3	30.118	+33.5	East^{y}.	Light.	Very clear.	6	11.7333	11.744	11.7387	1098.32
„ 4	30.102	+35	S.E.	Str. & Sq.	Clear.	6	11.5889	11.4733	11.5311	1118.10

These observations appear to indicate a decided decrease of velocity, with an increased density of the atmosphere; the rate of travelling decreasing from 1098 feet per second, at a pressure of $30^{in.}.118$ and temperature $+33°.5$, to 1014 feet per second, at a pressure of $30^{in.}.398$ and temperature $-38°.5$; all other circumstances being alike. The last experiment in the Table shews a still greater velocity, at a high atmospheric temperature; which, however, might have been influenced by a stronger breeze blowing from the direction of the gun at that time.

XVII.

ABSTRACT OF EXPERIMENTS MADE WITH AN INVARIABLE PENDULUM, FOR DETERMINING THE FIGURE OF THE EARTH.

By Lieut. HENRY FOSTER, R.N. F.R.S.

The determination of the figure of the earth, by means of the vibrations of a pendulum in different latitudes, is a subject which has long engaged the attention of the scientific world. Of late years this interesting problem has received, from the ingenuity of Captain Henry Kater, certain improvements and simplifications which have rendered it much easier in practice, and given to its results more accuracy than had before been obtained. The Board of Longitude, therefore, suggested that it should become one of the objects of scientific inquiry in the present voyage, and accordingly the apparatus of Captain Kater's construction was supplied to the Expedition.

It is to be regretted, that the only place affording opportunities for swinging the pendulum was Port Bowen, in latitude 73° 13′ 39″.4 N., where the ships passed the winter of 1824—25.

As the nature of this problem requires the number of vibrations of the same pendulum to be known at different places, in order to their being compared together, it became necessary to swing it at some fixed point in England; and Mr. Pond, the Astronomer Royal, kindly permitted the apparatus to be set up at the Royal Observatory at Greenwich, furnishing me with the exact rate of the clock, and otherwise assisting my operations previous to the Expedition leaving England in 1824, and also after its return in 1825, in order to ascertain whether the pendulum had sustained any damage in the course of the voyage.

The details of all these Experiments being given in the *Philosophical Transactions* for 1826, it will be sufficient here to extract the results of the observations at each station, permission having been obtained to that effect from the President and Council of the Royal Society. The number of vibrations made by the invariable pendulum at Greenwich in 24 hours mean time, reduced to the level of the sea, and in vacuo at the temperature of 50° of Fahrenheit in April, 1824, was 86159.315. In November, 1825, after the return of the Expedition, the number of vibrations made at Greenwich by the same pendulum, similarly reduced, was 86159.554, being 0.24 of a vibration more than the number obtained before leaving England in 1824. As this difference no doubt arose from the effects of wear in the knife-edge of the pendulum in the course of the experiments, I have assumed an equable wear throughout, and have taken the mean of the first and last series of observations, viz.: 86159.434 for the actual number of vibrations made at Greenwich, to compare with those obtained at Port Bowen by two series of observations, the mean of which gave 86230.242.

From the above data, viz., the number of vibrations of the pendulum at Greenwich = 86159.434, and those at Port Bowen = 86230.242, together with the length of the Seconds' Pendulum in the latitude of Greenwich, *assumed* at 39.13911 inches, the length of the Seconds' Pendulum at Port Bowen, *relatively* to that of Greenwich, is found to be 39.203468 inches; whence we find (according to Clairault) the fraction expressing the diminution of gravity from the pole to the equator .0054155, the ellipticity of the earth $\frac{1}{309.16}$, and the length of the Equatorial Pendulum 39.009797 inches of Sir George Shuckburgh's scale.

It must be remembered, however, that the above lengths of the Seconds' Pendulum are merely used for the sake of comparison, and for the purpose of deducing the ellipticity of the earth from the actual observation of the increased action of gravity. But as soon as the *real* length of the Seconds' Pendulum at Greenwich shall be determined, that at Port Bowen will likewise be known by means of these experiments, while their results, as far as the figure of the earth is concerned, will remain unchanged.

H. F.

NATURAL HISTORY.

ZOOLOGY.

BY LIEUT. JAMES CLARK ROSS, R.N., F.L.S.

THE Natural History of the Arctic Regions has lately received so much attention, and has been so ably and copiously illustrated, that little is now left to be said on the subject. The present notice is, therefore, confined to an enumeration of the several species which fell under our observation during the late voyage. Their number will appear small, when compared with the collections made on former occasions; but the extreme sterility of the country in the neighbourhood of Port Bowen, where the Expedition wintered, together with the short period of our stay in those regions, will sufficiently account for this circumstance.

It would perhaps have been desirable, on this occasion, to collect into one view the observations of those who have recently written on the subject, and, together with the additional information which this voyage has afforded, to have formed a complete Fauna of that portion of the Arctic Regions which has been visited by the late Expeditions for the discovery of a North-west Passage. This would, however, have necessarily far exceeded the prescribed limits of this notice, and probably have required much more time to execute it, than the early publication of the Narrative would admit.

The arrangement and generic names used by Cuvier, in the *Règne Animal*, have been adopted in the account of the Mammalia.

MAMMALIA.

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1. Ursus Maritimus. *Polar Bear.*

These animals were frequently met with on floating fragments of ice, both in Davis' Strait and Baffin's Bay, but none were killed until after the arrival of the Expedition at Port Bowen. There they visited the ships in considerable numbers, and in the course of the winter and ensuing spring eleven were killed. Of these the males averaged 8½ cwt., the females about 7½ cwt., and the largest which was obtained did not exceed 9 cwt. The very wonderful accounts of the magnitude of these animals, which some authors have given, appear extravagant and exaggerated, when we observe that the largest of those which have been met with in the course of the late voyages weighed less than 12 cwt., and did not exceed 8 feet 9 inches in length.

That the gravid females alone hibernate, and that the males and unimpregnated females wander about in the neighbourhood of the clear water throughout the winter, has been so fully confirmed by the testimony of the Esquimaux on the former, and our cwn experience on the present voyage, that no doubt can now remain on this interesting subject.

2. Canis Lagopus. *Arctic Fox.*

Some of these beautiful little animals were caught in traps, during the winter, at Port Bowen, and one of them lived in confinement for nearly five months; but, notwithstanding the kindest treatment and attention, it continued wild and untractable to the last. It began to cast its winter-coat early in May, the fur about the head and sides first falling off, and exposing a short dark brown hair. approaching to a blueish black at the base. It died at the end of May, before its summer dress was perfected.

In some few specimens the tail was perfectly white, agreeing with that part of the Linnæan specific character, *cauda apice concolore*, but in by far the greatest number the hairs at the end of the tail were terminated with black.

A single individual of the sooty variety was taken in November, a female, agreeing with that described by Dr. Richardson *, except that it approached more nearly the size of the other variety. Pennant, in his *Arctic Zoology*, considers this a distinct species; and it has been described, in Shaw's *Zoology* and M'Kenzie's *Travels*, under the name of *Canis Fuliginosus:* its identity with the Arctic Fox is, however, now tolerably well established.

In confirmation of what O. Fabricius says on the subject, I was informed by Lieutenant C. Holboll (an officer of the Danish navy, who had resided in Greenland between two and three years, for the purpose of collecting subjects of Natural History), that he had taken from the same litter four whelps of the sooty, and four of the white kind.

The only three specimens of the sooty variety which have fallen under my observation were, as described by Dr. Richardson, "of an uniform blackish brown colour;" we may add that a slight purple lustre is observable in recent specimens only, and by a peculiar shade of light. The mixture of short dark and white hairs in the face gives it a ferocity of expression very different from that of the white variety.

3. Arvicola Hudsonia. *Hudson's Bay Lemming.*

The peculiar formation of the fore-claws of this animal, which distinguishes it from its congeners, has been ably pointed out by Captain Sabine, in his Appendix to Parry's first voyage. They were but rarely met with during the present voyage, and only two were caught. Their tracks were sometimes seen during the winter, shewing that they occasionally venture from their burrows, even in the coldest season of the year.

4. Lepus glacialis. *Polar Hare.*

Abundant on the south shore of Barrow's Strait; and at Port Bowen they were occasionally seen during the winter, where three were shot. They differed from

* Appendix to Parry's Second Voyage, p. 302.

those described by Captain Sabine in the Appendix to Parry's first voyage, in having the ears exactly the same length as the head, and the whiskers perfectly white.

5. CERVUS TARANDUS, *Rein Deer*,

WAS rarely met with during the present voyage. Two were shot on the north shore of Barrow's Strait, near Cape Warrender, and a few others were seen on the coast of North Somerset.

6. PHOCA FŒTIDA. *Rough Seal.*

A YOUNG animal of this species, agreeing with the descriptions of authors as having attained one year old, was shot at Port Bowen in June, 1825.

Besides this species, which was very numerous in the bays along the eastern shore of Regent's Inlet, the *P. barbata* and *P. Grœnlandica* were seen in considerable numbers on the packed ice of Davis' Strait and Baffin's Bay; but none were shot.

7. BALÆNA MYSTICETUS, *Black Whale*,

WAS rarely seen in the course of our progress through the ice in Baffin's Bay; but in Prince Regent's Inlet they were found in considerable numbers. A young whale was killed in June, 1825, for the purpose of supplying the ships with oil. By means of powerful purchases, it was drawn up on the fixed ice, and stripped of its blubber. This process had scarcely been completed, when the ice broke adrift and floated off with the carcass; thus preventing any further examination, which might have afforded some very interesting information.

8. MONODON MONOCEROS. *Narwhal.*

VERY numerous in Baffin's Bay and Prince Regent's Inlet, but none were killed. The head and horn of one was found above high-water mark at the head of Port Neill. The horn measured 8 feet, and at the base was 8 inches in circumference, gradually tapering to a fine point, completing eight spiral turns from the base to the tip. It was very solid, except about five or six inches from the base, and weighed 15½ lbs.

In the head the rudiments of the second horn, mentioned by Fabricius and Cuvier, were not discernible.

Besides the eight species of Mammalia above enumerated, the *delphinapterus beluga*, or white whale, was seen in great numbers along the shores of North Somerset and the neighbourhood of Jackson's Inlet. The *trichecus rosmarus*, or walrus, was also occasionally met with; but as none of either species were taken, no additional information has been obtained.

BIRDS.

The second edition of M. Temminck's *Manuel d'Ornithologie* has been followed, both in the arrangement and generic names used by him, with a single exception; and the following authors are occasionally referred to:—

Gmelin, *Systema Naturæ Linnæi.*
Fabricii, *Fauna Grœnlandica.*
Latham's *Index Ornithologicus.*
Latham's *General Synopsis of Birds.*
Pennant's *Arctic Zoology.*
Pennant's *British Zoology*, 2nd edition.
Sabine's *Memoir on the Birds of Greenland.*
Sabine, in *Supplement to Parry's First Voyage.*
Sabine's *Appendix to Franklin's Journey.*
Richardson's *Appendix to Parry's Second Voyage.*

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1. Falco Islandicus. *Jerfalcon.*

Falco Islandicus. *Gmel.* i. p. 275. *Lath. Ind. Orn.* i. p. 32. *Temm.* p. 17. *Greenl. Birds*, No. 1.
White Jerfalcon. *Lath. Syn.* i. p. 83, and *Supp.* p. 21.

This bird, of which but a solitary individual had been met with during the three former voyages, was seen frequently during the present. A pair, in mature summer plumage, flew past the ship in September, 1824, in Lancaster Sound, corresponding with the descriptions of authors above quoted. Another, which was seen in September, 1825, in lat. 74°. N., on the return of the expedition to Baffin's Bay, accorded nearly with the description of the young bird in Temminck's *Manuel*, p. 18, and commonly known as the *falco gyrfalco* of Gmel. i. p. 275, and Lath. *Ind Orn.* i. p. 32.

2. Strix nyctea. *Snowy Owl.*

Strix nyctea. *Gmel.* i. p. 291. *Lath. Ind. Orn.* i. p. 57. *Temm.* p. 82. *Fabr.* p. 60. *Supp. to Parry's First Voyage*, p. cxciii. *App. to Parry's Second Voyage*, p. 342.
Snowy Owl, and White Owl. *Arct. Zool.* ii. p. 233. *Lath. Syn.* i. p. 132.

Was rarely seen, and none were shot. The half of one was found near Port Bowen, the remaining part having, as we supposed, been devoured by a fox, who left us nothing but the head and right side of his victim. This individual, as well as the few others which have been seen, were all in the state of plumage described by Fabricius; but none of the mature birds, described by Temminck and others as being of a pure white, have ever been observed on either of the voyages. Fabricius mentions that they are frequently found dead.

3. Corvus corax. *Raven.*

Corvus corax. *Gmel.* i. p. 364. *Lath. Ind. Orn.* i. p. 150. *Temm.* p. 107. *Fabr.* p. 62. *App. to Parry's Second Voyage*, p. 343.
Raven. *Lath. Syn.* i. p. 367. *Arct. Zool.* ii. p. 245.

Has been found in the most northern parts of the Arctic regions visited by the expeditions. A pair took up their winter residence in the high cliffs of Port Bowen, and occasionally approached the ships in search of food.

During the winter they were frequently observed to have a white ring round the neck, caused by the accumulated encrustments of the vapour of their own breath, and giving them a very singular appearance.

Winter produced no effect on their plumage, nor did they differ in any respect from the European bird.

4. Plectrophanes Lapponica. (Meyer.) *Lapland Finch.*

Emberiza calcarata. *Temm.* p. 322. *App. to Parry's Second Voyage*, p. 345.
Fringilla Lapponica. *Gmel.* i. p. 900. *Lath. Ind. Orn.* i. p. 440. *Fabr.* p. 119.
Lapland finch. *Arct. Zool.* ii. p. 377.

In the midst of the confusion which prevails to this day in respect to the arrangement of this bird, the experience which the late voyages have afforded induces me to adopt that of M. Meyer.

I am unable, in this instance, to accede to the opinion of M. Temminck in arranging it with the snow-bunting, because in its habits it differs essentially from it, while its external characters separate it most decidedly from *emberiza.* Both in its characters as well as habits, it unquestionably agrees more nearly with the lark than with any other known genus. It has the long hind nail of the latter; like it, it soars in the air, sings most sweetly on the wing, and invariably rests or runs upon the ground, never alighting upon prominences like the snow-bunting, which will fly from stone to stone, chirping like many others of its congeners.

The form of its bill, however, and the acuminate shape of its wings, exclude it from the genus *alauda;* and as it cannot with propriety be placed in any other, the necessity of forming a new genus, intermediate between the lark and bunting, seems sufficiently imperative.

They are more rarely met with than the snow-bunting, arriving later and returning to the southward sooner, as has been observed by O. Fabricius.

The very accurate and minute description of this bird by Dr. Richardson and M. Temminck, as above quoted, render any further remark unnecessary.

5. Emberiza nivalis. *Snow-bunting.*

Emberiza nivalis. *Gmel.* i. p. 866. *Lath. Ind. Orn.* i. p. 397. *Temm.* p. 319. *Fabr.* p. 117. *Greenl. Birds,* No. 5. *App. to Parry's Second Voyage,* p. 343.
Snow-bunting. *Brit. Zool.* i. p. 444. *Arct. Zool.* ii. p. 355. *Lath. Syn.* iii. p. 161.

Although it has become necessary to form a new genus for the proper arrangement of the Lapland finch, I can by no means agree with M. Meyer in placing the snow-bunting in it. Its external characters referring it, without doubt, to the genus *emberiza,* a slight dissimilarity of habits is certainly not sufficient to remove it from a place it has so long undisputedly held in the system. M. Temminck has formed of these two birds a second section, differing from the buntings, properly so called, in having "l'ongle derrière long, foiblement arqué." In this there must be some mistake; the hind nail of the snow-bunting is neither longer nor straighter than many of its congeners, for instance, the *E. citrinella.*

They were always amongst the first birds that returned in the spring; their earliest arrival was about the middle of April, thus preceding all others, except the grouse, by nearly a month.

We found them breeding at the Whale-fish Islands early in July, and a nest with six eggs was brought on board by one of the officers: it was formed of dried grass, and lined with feathers, which were covered with a fine white down. The eggs were of a cream colour, thickly covered with small reddish-brown marks and spots.

6. Tetrao ruesptris. *Rock Grouse.*

Tetrao rupestris. *Gmel.* i. p. 751. *Lath. Ind. Orn.* ii. p. 640. *Supp. to Parry's First Voyage*, p. cxcv. *App. to Parry's Second Voyage*, p. 348.
Rock Grouse. *Arct. Zool.* ii. No. 184. *Lath. Syn. Supp.* p. 217.

Several birds of this species were shot at Port Bowen in October, 1824, in perfect winter plumage. In these individuals the female birds were marked with the black line from the beak, through the eye, as strongly as the males; a mark which, I believe, has hitherto been considered peculiar to the male bird.

On their return in March they were still in perfect winter plumage, and the black line through the eye of both the male and female birds was as conspicuous as in those shot in the autumn. It was, however, afterwards found on the females in every stage of obliteration as the season advanced; and in the last few which were shot, near the end of May, it had wholly disappeared, agreeing then with Captain Sabine's description of birds killed at Melville Island about the same period of the year. In some of these last few the summer plumage was beautifully and distinctly seen, by removing the winter covering, which only partially concealed it, and had not yet moulted.

Captain Sabine, in the work above referred to, has already pointed out characters by which this and the two following species can be distinguished from each other in their various plumages.

7. Tetrao lagopus. *Ptarmigan.*

Tetrao lagopus. *Gmel.* i. p. 749. *Lath. Ind. Orn.* ii. p. 639. *Fabr.* p. 114. *Supp. to Parry's First Voyage*, p. cxcvii. *App. to Parry's Second Voyage*, p. 350.
Ptarmigan. *Arct. Zool.* ii. p. 315. *Lath. Syn.* iv. p. 741.

Was shot at Port Bowen as late in the year as the 16th of November, 1824, in company with the *T. albus*, and returned from the south about the middle of March, continuing to arrive in considerable numbers until nearly the end of April.

During the last week in March about sixty birds of this species were shot, in which, as in the preceding species, no difference could be discerned in the plumage of the male and female, the black band through the eye being equally distinct in both. I had the opportunity of examining between twenty and thirty female birds in a more advanced period of the season, shewing it in different degrees of distinctness, and subsequently many from which it had totally disappeared.

After the very marked succession of appearances which I have been enabled to follow through above two hundred individuals, I can entertain no doubt of every female of both this and the preceding species being marked with the black band through the eye as strongly as the male in the winter season and in high northern latitudes. Fabricius mentions that in the winter time, in Greenland, the rudiments of this mark were observable on the female bird.

Nearly all the birds of this species had fourteen black and two superincumbent white feathers on the tail; but occasional individuals were found with sixteen black and the two superincumbent white feathers, which evidently shews that the number of tail feathers can never be used as a specific distinction, and in some measure accounts for the difference of opinion amongst authors on this subject.

There is also a remarkable peculiarity in the anatomy of this bird, which merits a passing notice. In all the gallinaceous tribe, the intestina cæca are very large, but in this bird they are much more extensive than, I believe, in any of the others. Originating about five inches from the vent, they follow all the convolutions of the direct canal to rather more than two-thirds of its length, and terminate in a white blunt point, perfectly unconnected with any part of the intestines for about two inches from the end. The whole of the rest of the cæca are joined to the direct gut by a strong and very vascular mesenteric membrane. I am not aware whether either the preceding or following species are the same, not having had an opportunity of examining them after I observed it in this species. In the common partridge of England, the cæca are only about one-third the length of the main gut. Their use, in the economy of the bird, has yet to be determined by the physiologist.

8. Tetrao albus. *Willow Partridge.*

Tetrao albus. *Gmel.* i. p. 750. *Lath. Ind. Orn.* ii. p. 639.
Tetrao saliceti. *Temm.* p. 471. *App. to Franklin's Journey*, p. 681. *App. to Parry's Second Voyage*, p. 347.
Willow Partridge. *Hearne's Travels*, p. 338.
White Grouse. *Lath. Syn.* iv. p. 743. *Arct. Zool.* ii. p. 308.

Was rarely met with during the present voyage, and but few were shot. The two preceding species retire late in the autumn to the southward, to winter; but this bird has been found in very high north latitudes throughout the year. On this occasion they were shot in every winter month except January; and at Igloolik, where they were more numerous, they were occasionally seen throughout the winter; which shews that, although probably the greatest number of them migrate further south, yet many remain. The colour of the birds corresponding so perfectly with the snow, in which they bury themselves to a level with its surface, renders it very difficult to distinguish them, and accounts in some measure for so few having been shot.

Those which were killed during the winter were found to be in excellent condition; their crops contained principally the seed-vessels of the *saxifraga oppositifolia.*

M. Temminck has thought proper to change the name of this bird to *T. saliceti*, for reasons which do not appear to me sufficiently obvious; I have therefore ventured to employ that which it received from Linnæus, and by which it has been sufficiently well distinguished by almost every other modern author.

9. Tringa maritima.

Tringa maritima. *Gmel.* i. p. 678. *Lath. Ind. Orn.* ii. p. 731. *Temm.* p. 619. *Greenl. Birds*, No. 7. *Supp. to Parry's First Voyage*, p. cci.
Striated Sandpiper. *Arct. Zool.* ii. p. 472. *Lath. Syn.* v. p. 176.

Did not arrive in the neighbourhood of Port Bowen until early in June; at that time the birds of one year old were found in the same flocks with the mature birds.

They differ in no respect from the English bird.

10. Charadrius pluvialis. *Golden Plover.*

Charadrius pluvialis. *Gmel.* i. p. 688. *Lath. Ind. Orn.* ii. p. 740. *Temm.* p. 535.
Golden Plover. *Arct. Zool.* ii. p. 483, No. 399.

Arrived in their winter plumage at Port Bowen about the middle of May. In the course of the season they were shot in every state of change, to their perfect summer plumage; in which state they are the *C. apricarius* of authors.

11. Phalaropus hyperboreus. *Red Phalarope.*

Phalaropus hyperboreus. *Lath. Ind. Orn.* ii. p. 775. *Temm.* p. 709. *Greenl. Birds,* No. 11.
Red Phalarope. *Brit. Zool.* ii. p. 125. *Arct. Zool.* ii. p. 494.

A small flock of these birds alighted under the lee of the ship, during a strong breeze of wind, and were so fearless of danger as to approach within a few yards of her, feeding on small shrimps, which were seen in great numbers. At this time we were sixty miles from the nearest land, (Disco.)

We found them breeding at Whale-fish Islands, but saw no more of them after leaving the coast of Greenland.

12. Phalaropus platyrhinchus. *Flat-billed Phalarope.*

Phalaropus platyrhinchus. *Temm.* p. 712. *Greenl. Birds,* No. 12. *Supp. to Parry's First Voyage,* p. cci. *App. to Parry's Second Voyage,* p. 355.

This bird, which has been so ably extricated by M. Temminck and Captain Sabine from the confusion into which it had fallen, was but rarely met with during the present voyage; a circumstance rather remarkable, from their having been found both at Igloolik to the southward, and at Melville Island to the northward, breeding in great numbers.

The peculiar plumage of the female bird, which has been so accurately pointed out by Captain Sabine, makes her remarkable as being one of the very few instances in which the female bird is known to excel the male in beauty of appearance.

13. Sterna arctica. *Arctic Tern.*

Sterna Arctica. *Temm.* p. 742. *Supp. to Parry's First Voyage*, p. ccii. *App. to Parry's Second Voyage*, p. 356.
Sterna hirundo. *Greenl. Birds*, No. 17.

Abundant in Baffin's Bay and Davis' Strait; but were only seen, during the present voyage, in the mature plumage of summer.

14. Larus glaucus. *Glaucous Gull.*

Larus glaucus. *Gmel.* i. p. 600. *Lath. Ind. Orn.* ii. p. 814. *Fabr.* p. 100. *Temm.* p. 757. *Greenl. Birds*, No. 19. *Supp. to Parry's First Voyage*, p. cciii.
Glaucous Gull. *Arct. Zool.* ii. p. 532. *Lath. Syn.* vi. p. 374.

Some remarkably fine specimens of this very magnificent bird were shot early in June, 1825, in the neighbourhood of Port Bowen. The astonishing size which these birds, under certain circumstances, attain, fully justifies the assertion of M. Temminck, that they are the largest of the known gulls, although Captain Sabine has shewn, in the *Supplement* above referred to, that the average size of the *L. marinus* rather exceeds that of the *glaucus*.

The dimensions of a pair which were killed on the 11th of June, being the largest which were shot, and surpassing any which have yet been recorded, are selected for insertion here:—

	Length. IN.	Extent. IN.	Tarsus. IN.	Beak. IN.	Weight. lb.	oz.
Male . . .	33	68	3.4	4.1	4	11
Female . .	31.5	65	3.4	3.9	4	7

The wings of the male bird extended more than an inch beyond the tail, which is not usually the case in this species.

They were rarely met with in our progress up Davis' Strait and Baffin's Bay; but were found in considerable numbers towards the end of July, breeding on the ledges of the high and precipitous cliffs of the shores of North Somerset. At this time the young birds were seen covered with a down of a deep lead colour.

15. Larus argentatus. *(Black-winged) Silvery Gull.*

Larus argentatus. *Gmel.* i. p. 600. *Temm.* p. 764. *App. to Parry's Second Voyage*, p. 358.
Silvery Gull. *Arct. Zool.* ii. p. 533. *Lath. Syn.* vi. p. 375.

All the birds of this species which were shot during the present voyage, had the usual dark markings on the flag-feathers of the wings. An immature bird, killed in July, was marked by a broad band across the tail, of a dark brown colour, mixed with small white spots near the extremity. Spurious wing, and primary covertures, marked longitudinally with the same colour; in every other respect it agreed perfectly with M. Temminck's description of the mature bird in summer.

None of the variety described by Captain Sabine, in the *Memoir on the Birds of Greenland*, were shot; and if any were seen, they were mistaken for the preceding species, which they so nearly resemble.

16. Larus eburneus. *Ivory Gull.*

Larus eburneus. *Gmel.* i. p. 596. *Lath. Ind. Orn.* ii. p. 816. *Temm.* p. 769. *Greenl. Birds*, No. 21. *Supp. to Parry's First Voyage*, p. cciv.
Ivory Gull. *Arct. Zool.* ii. p. 529. *Lath. Syn.* vi. p. 377.

Very numerous in Davis' Strait and Baffin's Bay. They were obtained in every variety of plumage, from the young to the mature bird. The plumage of the bird of the first year is described by M. Temminck, as above referred to, with minute precision, and that of the second year by Captain Sabine, in the *Memoir on the Birds of Greenland* above quoted.

The naked circle round the eye is, in the young bird, of a dark brown colour, in which a very slight tinge of red is observable; as the bird advances towards maturity, the red is found to prevail, and in the old bird is of a dull red colour. This, I imagine, is not the case until the fourth year; for many birds, in mature plumage, were found with this very much obscured. Of about seventy examined by me, only six were found to have the red circle unmixed with brown.

Average length of the male, 19 inches, female 18, and young bird 17 inches; tarsus 1.5.

17. Larus tridactylus. *Kittiwake.*

Larus tridactylus. *Lath. Ind. Orn.* ii. p. 817. *Temm.* p. 774. *Fabr.* p. 98. *Greenl. Birds*, No. 22.
Kittiwake. *Arct. Zool.* ii. p. 529. *Brit. Zool.* ii. p. 186. *Lath. Syn.* vi. p. 393.

By far the most numerous of the gull tribe inhabiting that portion of the Arctic Regions which has been visited by the late Expeditions. They were found breeding on the shores of North Somerset in great numbers. Large flocks of immature birds were seen on the return of the Expedition to the south in September 1825, attended by the *lestris pomarinus* in considerable numbers.

18. Lestris parasiticus. *Arctic Lestris.*

Lestris parasiticus. *Temm.* p. 796. *Greenl. Birds*, No. 24. *Supp. to Parry's First Voyage*, p. ccvi. *App. to Parry's Second Voyage*, p. 361.
Larus parasiticus. *Gmel.* i. p. 601. *Lath. Ind. Orn.* ii. p. 819.
Arctic Gull. *Arct. Zool.* ii. p. 530. *Brit. Zool.* ii. p. 179. *Lath. Syn.* vi. p. 389.

19. Lestris pomarinus. *Pomarine Lestris.*

Lestris pomarinus. *Temm.* p. 793. *Supp. to Parry's First Voyage*, p. ccvi. *App. to Parry's Second Voyage*, p. 361.

Many of these birds were seen at the Whale-fish Islands early in July; where it is probable they breed.

It is somewhat remarkable that it should have escaped the notice of Fabricius; yet it is hardly possible that he could have confounded it with the preceding species, although some authors have been led into this mistake by not having seen specimens of both. I am not aware of its ever having yet been enumerated amongst the birds of Greenland, although they were seen by us in considerable numbers whilst off that coast.

Their mode of living is similar to that of the *parasiticus*, which accounts for their being found constant attendants on the flocks of young kittiwakes, as already mentioned. They are more numerous than the *parasiticus*, and undergo similar changes of plumage, from the nest to maturity.

20. Procellaria glacialis. *Fulmar Petrel.*

Procellaria glacialis. *Gmel.* i. p. 562. *Lath. Ind. Orn.* ii. p. 823. *Temm.* p. 802. *Fabr.* p. 86.
Fulmar Petrel. *Lath. Syn.* iv. p. 403. *Arct. Zool.* ii. p. 534. *Brit. Zool.* ii. p. 203.

21. Anas spectabilis. *King Duck.*

Anas spectabilis. *Gmel.* i. p. 507. *Lath. Ind. Orn.* ii. p. 845. *Temm.* p. 851. *Fabr.* p. 63.
King Duck. *Brit. Zool.* ii. p. 246. *Arct. Zool.* ii. p. 554. *Lath. Syn.* vi. p. 473.

This and the two following species of ducks arrived in great numbers early in June, in the neighbourhood of Port Bowen. Few were shot, for as the season advanced they proceeded northward, to the islands, to breed.

22. Anas mollissima. *Eider Duck.*

Anas mollissima. *Gmel.* i. p. 514. *Lath. Ind. Orn.* ii. p. 845. *Fabr.* p. 68. *Temm.* p. 848.
Eider Duck. *Brit. Zool.* ii. p. 243. *Arct. Zool.* ii. p. 553. *Lath. Syn.* vi. p 470.

23. Anas glacialis. *Long-tailed Duck.*

Anas glacialis. *Gmel.* i. p. 529. *Lath. Ind. Orn.* ii. p. 864. *Temm.* p. 860.
Long-tailed Duck. *Brit. Zool.* ii. p. 268. *Arct. Zool.* ii. p. 566. *Lath. Syn.* vi. p. 528.

24. Colymbus septentrionalis. *Red-throated Diver.*

Colymbus septentrionalis. *Gmel.* i. p. 586. *Lath. Ind. Orn.* ii. p. 801. *Fabr.* p. 94. *Temm.* p. 916. *Greenl. Birds*, No. 16.
Red-throated Diver. *Brit. Zool.* ii. p. 169. *Arct. Zool.* ii. p. 520. *Lath. Syn.* vi. p. 344.

A single individual, which was shot at the Whale-fish Islands, agreed perfectly with the description of authors. It was rarely seen afterwards.

25. Uria Brunnichii. *Brunnich's Guillemot.*

Uria Brunnichii. *Greenl. Birds*, No. 14. *Temm.* p. 924. *Supp. to Parry's First Voyage*, p. ccix. *App. to Parry's Second Voyage*, p. 377.

Were found breeding at the Whale-fish Islands, in considerable numbers, early in July. They agreed in every particular with the description given in the *Memoir on the Birds of Greenland* above quoted, except that the mark on the upper mandible was, in all the individuals I have seen, of a greenish yellow.

They arrived in the neighbourhood of Port Bowen early in June, and were found in company with the three preceding species of ducks. At this time several were shot with the throat and neck perfectly white, in others the feathers on these parts were black tipped with white, giving them a mottled appearance; but in the greatest number they were in perfect summer plumage. This is sufficient to shew that they undergo similar changes from season as the *U. troile*, as had been anticipated.

26. Uria grylle. *Black Guillemot.*

Uria grylle. *Lath. Ind. Orn.* ii. p. 797. *Fabr.* p. 92. *Temm.* p. 925. *Greenl. Birds*, No. 15. *Supp. to Parry's First Voyage*, p. ccix. *App. to Parry's Second Voyage*, p. 377.

Black Guillemot. *Brit. Zool.* ii. p. 163. *Arct. Zool.* ii. p. 516. *Lath. Syn.* vi. p. 332.

Abundant in all parts of the Arctic Regions visited by the Expeditions.

27. Uria alle. *Little Auk.*

Uria alle. *Temm.* p. 928.

Alca alle. *Gmel.* i. p. 554. *Lath. Ind. Orn.* ii. p. 795. *Fabr.* p. 84. *Greenl. Birds*, No. 13.

Little Auk. *Brit. Zool.* ii. No. 233. *Arct. Zool.* ii. p. 512. *Lath. Syn.* v. p. 327.

Large flocks of these birds were met with in the northern parts of Baffin's Bay, whither they resort in vast numbers to breed.

They agreed with Temminck's description, except that the small white dot above the eye has escaped his notice. An individual, shot in September, had the cheeks, chin, and upper part of the throat perfectly white, breast and lower part of the throat mottled with black and white, the feathers on these parts being black tipped with white; in other respects agreeing with the description of birds in their mature summer plumage. There is no difference in the plumage of the young and mature bird, as has been asserted.

28. Mormon fratercula. *Puffin Auk.*

Mormon fratercula. *Temm.* p. 933.
Alca Arctica. *Gmel.* i. p. 549. *Lath. Ind. Orn.* ii. p. 792. *Fabr.* p. 83.
Puffin Auk. *Arct. Zool.* ii. p. 511. *Lath. Syn.* v. p. 314.

Abundant at the Whale-fish Islands, where they were found early in July, breeding in holes in the most precipitous and inaccessible situations near the sea. The few which were shot agreed sufficiently with the description of authors. They were not seen by us after leaving the coast of Greenland.

29. Alca torda. *Razor-bill Auk.*

Alca torda. *Gmel.* i. p. 551. *Lath. Ind. Orn.* ii. p. 793. *Temm.* p. 936. *Fabr.* p. 78.
Razor-bill Auk. *Arct. Zool.* ii. p. 509. *Lath Syn.* v. p. 319.

Abundant on the coast of Greenland. They were found in considerable numbers at the Whale-fish Islands, breeding in similar situations with the preceding species. All that were shot were in mature plumage, and agreed perfectly with M. Temminck's description.

The *alca pica* of Fabricius and other authors is the young of this bird.

FISHES.

1. Ophidium Parrii.

Several individuals of a new species of *ophidium* were found in Baffin's Bay and Prince Regent's Inlet, swimming about pieces of ice which had been much worn by the action of the sea; the holes and fissures thus made affording them a secure retreat from their numerous enemies, to which a disposition to swim near the surface exposes them.

In its general appearance, it approaches more nearly the *ophidium viride* of Fabricius * than any other of its congeners, but differs materially from it in the size of the pectoral fin, which in this species is very much larger, and contains between three and four times the number of rays of that of the *O. viride*. There are also other more minute differences, as will be seen by the following description:—

Head.—Very obtuse, being, in its length, depth, and transverse diameter, equal; broader than the body, flattened and grooved between the eyes, which are lateral, and rather large. Irides pearl white. Mouth rather large, placed at the extremity of the head, and armed with numerous minute teeth on the palate and either jaw; lower jaw rather the longer, and without cirri.

Body.—Three times the length of the head, ensiform, much compressed, and gradually tapering towards the tail, which is pointed. Neck much arched, giving a greater depth to the body there than in any other part. Back of a dark greenish-brown colour, which is lighter on the sides; belly before the vent white; vent nearer the head; fins partake of the colour of that part of the body on which they are inserted.

Fins.—Dorsal fin, which rises just behind the head, and anal fin, which commences immediately behind the vent, unite with the caudal, and together consist of ninety-five rays; of which the dorsal and superior half of the caudal

* *Fauna Grœnlandica*, p. 141, No. 99. La Cepède, *O. Unernak*, ii. p. 280.

contain fifty, and the anal and inferior half of the caudal forty-five rays. Pectoral fins, which are very large, contain thirty-seven rays, and, when stretched backward along the body, extend rather beyond the vent, and completely cover the whole of the belly and throat.

They were found to vary in size from 4 to 8 inches: the following dimensions are of an ordinary-sized fish, from which the above description was principally taken.

	Inches.	Tenths.		Inches.	Tenths.
Length to the caudal fin . . .	4	8	whole length	5	5
„ of the caudal fin . . .	0	7			
„ of the head	1	2	⅓rd the length of the body.		
„ to the vent	1	7			
„ of dorsal and ventral fins	0	8	each.		
Greatest depth of the body . .	1	5			

This species is named in honour of Captain Parry, the distinguished commander of the Expedition.

2. Ophidium viride.

Ophidium viride. *Fabr. Fauna Grœnlandica*, p. 141.
Ophidium unernak. *La Cepède, Histoire Naturelle des Poissons*, ii. p. 280.

An individual of this species was taken from the stomach of a kittiwake, in a sufficiently perfect state to secure its identity with tolerable certainty. It was 3½ inches in length, and accorded with Fabricius's description above referred to.

3. Merlangus Polaris. (*Leach.*)

Merlangus Polaris. *Supp. to Parry's First Voyage*, p. ccxi.

Was found in considerable numbers under similar circumstances with the *Ophidium Parrii.* They constitute the principal food of the numerous sea-fowl which migrate to the Arctic Regions in the summer, to breed; but their most destructive enemy is the *delphinapterus beluga*, or white whale: from its persecutions they have been known to leap on to the ice by hundreds; and on one of these occasions, which occurred near Port Bowen, and was witnessed by one of the officers, sufficient were collected to afford several delicious meals to the officers and crew of the Expedition.

It is this fish which Captain Parry mentions in the narrative of his second voyage, as having been collected in great numbers from the pools left by the falling tide, on the rocks at the entrance of the Duke of York's Bay*. They are very numerous in all parts of the Arctic Regions visited by the late Expeditions.

There is considerable variation in the number of rays in the fins, which seems not to depend on the size of the fish. The following, which is the average of a great many, differs slightly from those given by Captain Sabine as above referred to:—

P. 18. V. 6. D. 13, 15, 20. A. 17, 21. C. 42 to 48.

4. Cottus Polaris?

Cottus Polaris? *Supp. to Parry's First Voyage*, p. ccxiii.

Two individuals of a very small species of *cottus* were found on the ice near Port Bowen, but in so mutilated a state as to preclude the possibility of determining their identity with perfect certainty. They were each nearly 2 inches long.

5. Cottus quadricornis.

Cottus quadricornis. *Bloch, Ichthyology*, iii. p. 216, plate 108. *La Cepède, Histoire Naturelle des Poissons*, iii. p. 241. *Supp. to Parry's First Voyage*, p. ccxiii.
Cottus scorpioides. *Fabr. Fauna Grœnl.* p. 157.

Found at the Whale-fish Islands in considerable numbers, but none were seen after leaving the coast of Greenland.

Besides the five fish above enumerated, a species of *pleuronectes* was seen, and an imperfect skeleton of one was found on the ice in Port Bowen, from which it was impossible to determine the species. It was probably either the *P. glacialis* or *P. stellatus*, both of which are mentioned by Dr. Richardson † as inhabitants of the Polar Sea.

* See page 39. † Appendix to Franklin's Journey, p. 724.

INSECTS.

In the following list of Insects, the generic names of P. A. Latreille (*Genera Crustaceorum et Insectorum*) have been generally used, and the arrangement of M. le Chevalier de Lamark (*Histoire Naturelle des Animaux sans Vertèbres*) has been followed in most cases.

1. Simulium reptans.

Simulium Reptans. *Lam.* iii. p. 432.
Culex Reptans. *Fabr. Fauna Grœnl.* p. 210, No. 172.

Found at the Whale-fish Islands in considerable numbers. All the specimens examined by me had two white rings on the legs; in this respect agreeing with those found by Fabricius in Greenland, and differing from Linnæus's description of those found in Sweden.

2. Ctenophora Parrii.

Ctenophora Parrii. *Kirby, in Supp. to Parry's First Voyage*, p. ccxviii.

A single individual was found amongst some plants sent home from the Whale-fish Islands, and was the only one taken during the voyage, although I have no doubt that they were very abundant at that place. It was a female, and agreed exactly with the excellent description above referred to. The male has not yet been described.

3. Perdicia rivosa.

Tipula rivosa. *Lam.* iii. p. 437, sp. 3. *Fabr. Fauna Grœnl.* p. 200.

Found abundantly in all parts of the Arctic Regions which have been visited by the late Expeditions. They are most abundant by the sides of lakes and in marshy places.

4. Culex caspius.

Culex caspius. *Pallas Russesch Reisen*, App. i. p. 23, No. 78.
Culex pipiens. *Fabr. Fauna Grœnl.* p. 209.

This beautiful insect is well described in the works above referred to: it is nearly allied to the *C. pipiens*, but is (besides the differences noticed by Fabricius) smaller. Its bite is very painful and venomous.

5. Melitæa tullia.

Papilio tullia. *Fabr. Fauna Grœnl.* p. 192.

Taken very abundantly at Port Bowen, and found in all parts visited by the late Expeditions. Individuals vary considerably in the disposition of the black markings of the wings; but the excellent description by Fabricius has been taken from the most beautiful and most common of the varieties, and enables me, without doubt, to identify the species.

6. Bombyx Sabini?

Bombyx Sabini? *Kirby, in Supp. to Parry's First Voyage*, p. ccxv.

A solitary individual was brought on board, in a very mutilated state, by one of the Esquimaux from the Whale-fish Islands. It agreed, as far as I was able to make out, with the description above referred to; but its identity is doubtful.

7. Bombus Arcticus.

Bombus Arcticus. *Kirby, in Supp. to Parry's First Voyage*, p. ccxvi.
Apis Alpina. *Fabr. Fauna Grœnl.* p. 199, No. 155.

All the specimens brought home from Port Bowen are females, and correspond exactly with Fabricius's minute and very accurate description, except that they are smaller—the length of the body being only ten lines; in which they agree, as well as in all other points, with those described by Mr. Kirby.

It is the earliest insect on the wing, and has been found in all parts of the Arctic Regions visited by the late Expeditions, but is by no means numerous.

8. Formica Rubra.

Formica rubra. *Lam.* iv. p. 98.

Abundant at the Whale-fish Islands; it was also found, on the preceding voyage, on several parts of the Melville Peninsula.

9. Dysdera erythrina.

Aranea erythrina. *Lam.* v. p. 97, sp. 3.
Aranea rufipes. *Fabr. Fauna Grœnl.* p. 226.

Abundant at the Whale-fish Islands; it was also found, on a former voyage, on the shores of Repulse Bay.

10. Oxyopes variegatus.

Aranea variegata. *Lam.* v. p. 102, sp. 24.
Aranea crucigera? *Fabr. Fauna Grœnl.* p. 228.

Found abundantly at the Whale-fish Islands. This is probably the same species which Fabricius heard of from the inhabitants of Greenland; but not having seen any himself, he has made a mistake in calling it the largest, though it certainly is the most beautiful of the genus inhabiting Greenland. The *A. saccata* is considerably larger than this.

11. Lycosa saccata.

Aranea saccata. *Lam.* v. p. 103, sp. 27. *Fabr. Fauna Grœnl.* p. 228.

The largest and most numerous of the tribe which I have met with in the Arctic Regions. It was found at the Whale-fish Islands, and, on the preceding voyage, on several parts of the Melville Peninsula.

12. Salticus scenicus.

Aranea scenica. *Lam.* v. p. 103, sp. 29. *Fabr. Fauna Grœnl.* p. 227.

Found commonly in all parts of the Arctic Regions, frequently amongst the ruins of the Esquimaux huts and graves. It is very active, and leaps horizontally in a surprising manner.

Besides the twelve insects above enumerated, a species of *sphex* and a *coleopterous* insect were seen; but as none have been brought home, I am unable to give them a place here with any certainty. There are doubtless many others which have not been observed, for in this branch of natural history there were not many amongst the officers who collected, and the few opportunities of landing which occurred during the summer were generally occupied in some more favourite pursuit.

MARINE INVERTEBRATE ANIMALS.

In the following brief notice of the Marine Invertebrate Animals brought home by the late Expedition, the generic arrangement of M. Le Chevalier de Lamarck (*Histoire Naturelle des Animaux sans Vertèbres*) has been followed in every instance.

1. Beroe pileus.

Beroe pileus. *Fabr. Fauna Grœnl.* p. 361, No. 354. *Supp. to Parry's First Voyage*, p. ccxxi.

Extremely numerous in Baffin's Bay and Davis' Strait. It was observed to emit a beautifully brilliant phosphoric light when agitated, rendering the path of the ship through the water, on a dark night, surprisingly resplendent.

2. Dianæa glacialis.

Dianæa glacialis. *Supp. to Parry's First Voyage*, p. ccxxi. Plate i. fig. 1.

Abundant in Davis' Strait and Baffin's Bay, but rarely met with in Regent's Inlet.

3. Cyanea Arctica.

Cyanea Arctica. *Lam.* ii. p. 519. *Supp. to Parry's First Voyage*, p. ccxxi.
Medusa capillata. *Fabr. Fauna Grœnl.* p. 364, No. 358.

4. Ophiura fragilis.

Ophiura fragilis. *Lam.* ii. p. 546. *Supp. to Parry's First Voyage*, p. ccxxii.
Asterias fragilis. *Zool. Dan.* iii. p. 28, Plate 98.

Some imperfect specimens of this species were found on the ice in Port Bowen.

5. Ophiura filiformis.

Ophiura filiformis. *Lam.* ii. p. 546.
Asterias filiformis. *Zool. Dan.* ii. p. 24, Plate 59.

6. Nymphum grossipes.

Nymphum grossipes. *Lam.* v. p. 79. *Supp. to Parry's First Voyage*, p. ccxxv.
Picnogonum grossipes. *Fauna Grœnl.* p. 229, No. 310.

Fine specimens of a female and nine young ones were found on the ice at Port Bowen. They agreed admirably with the description of Fabricius, but differed from the plate in the *Zool. Dan.*, in the points mentioned by Captain Sabine. and which could not have been taken from the animal under consideration.

7. Nymphum hirsutus.

Nymphum hirsutus. *Supp. to Parry's First Voyage*, p. ccxxvi.

Two individuals of this species, which were taken in a dredge in Port Bowen, differed in no respect from the description above quoted, except that the two fingers of the mandibules are armed with numerous minute teeth along the whole of their inner edges, and form a most destructive weapon.

8. Idotea entomon.

Idotea entomon. *Lam.* v. p. 159. *Supp. to Parry's First Voyage*, p. ccxxvii.

Abundant at the Whale-fish Islands, and has been found in all parts of the Arctic Regions visited by the late Expeditions.

9. Idotea Baffini.

Idotea Baffini. *Supp. to Parry's First Voyage*, p. ccxxviii. Plate i. fig. 4-6.

A few specimens, which were found on the ice at Port Bowen, differ from Captain Sabine's otherwise accurate description, in having the spines on the second and third segments of the body, the longest and strongest; and all of them being much larger than is represented by the very beautiful engraving. There are also two small spines on the upper plate, in which the branchiæ are included.

10. Caprella scolopendroides.

Caprella scolopendroides. *Lam.* v. p. 174.
Gammarus quadrilobatus. *Zool. Dan.* iii. p. 58, Plate 114, fig. 11, 12, Female (young ?)
Squilla quadrilobata. *Zool. Dan.* ii. p. 21, Plate 56, fig. 4, 5, 6, Male (young ?)
Squilla lobata. *Fabr. Fauna Grœnl.* p. 248, No. 225.

Was found abundantly at Port Bowen, but considerably larger than those from which Müller's drawings were taken, and nearly as large as the magnified figures. They also differ in having a great number of small spines along the back, which, however, were not observable on the young ones found attached to the antennæ of the females. They agreed in all other respects. I have therefore considered them to be of the same species, as it is probable that Müller's drawings were taken from the young.

11. Cyamus ceti.

Cyamus ceti. *Lam.* v. p. 176.
Oniscus ceti. *Fabr. Fauna Grœnl.* p. 253, No. 230. *Zool. Dan.* iii. p. 69, Plate 119. fig. 13-17.

Found on a young whale which was killed in June 1825, near Port Bowen.

12. Gammarus Sabini.

Gammarus Sabini. *Leach, in Ross's Voyage*, 8vo. ii. p. 178. *Supp. to Parry's First Voyage*, p. ccxxxii. Plate i. fig. 8-11.

Found on the ice at Port Bowen, but not very abundantly.

13. Gammarus loricatus.

Gammarus loricatus. *Supp. to Parry's First Voyage*, p. ccxxxi. Plate i. fig. 7.

In the figure above referred to, each pair of antennæ appear to be placed on a peduncle, which is not the case.

They were found in considerable numbers on the ice in Port Bowen.

14. Gammarus boreus.

Gammarus boreus. *Supp. to Parry's First Voyage*, p. ccxxix.

The specimens which I possess differ from Captain Sabine's description in having the superior antennæ as long as the head and six first segments of the body, and the antennæ, legs, and tail being fringed with most beautifully fine ciliæ, particularly the plates of the tail. The fifth, sixth, and seventh pair of legs increase successively in length, the fifth pair being the smallest. In all other respects my specimens correspond exactly with his description.

15. Talitrus nugax.

Gammarus nugax. *Supp. to Parry's First Voyage*, p. ccxxix.
Cancer nugax. *Phipps's Voyage*, Plate xii. fig. 3.

By far the most numerous of the *crustacea* inhabiting the Arctic Seas. The superior antennæ are shorter than the inferior, which, according to the arrangement followed in this notice, separates it from the genus *gammarus*, where it has been inadvertently placed.

16. Talitrus Edvardsii.

Talitrus Edvardsii. *Supp. to Parry's First Voyage*, p. ccxxxiii. Plate ii. fig. 1-4.

Was found on the ice at Port Bowen in great numbers. The plate and description above referred to are very exact.

17. Nebalia glabra?

Nebalia glabra. *Lam.* p. 198.
Cancer bipes. *Fabr. Fauna Grœnl.* p. 246, Plate i. fig. 1.

A single imperfect specimen was taken out of a block of ice, in too mutilated a state to determine its species with certainty.

18. Mysis flexuosus.

Mysis flexuosus. *Lam.* v. p. 200.
Cancer flexuosus. *Mull. Zool. Dan.* ii. p. 34, Plate lxvi.

The long and very delicate antennæ of this animal were broken, in the only individuals which I have seen. I have no doubt, however, of their identity, as they agree in all other points with the descriptions and plate referred to.

19. Crangon boreas.

Crangon boreas. *Lam.* v. p. 201. *Supp. to Parry's First Voyage*, p. ccxxxv.
Cancer boreas. *Phipps's Voyage*, p. 194, Plate xi. fig. 1. *Zool. Dan.* iv. p. 14, Plate cxxxii. fig. 1.

Vary in size from 2 to 6 inches in length, including the antennæ. The plates referred to are tolerably good, and of different sized animals. All that were taken had the spines on the thorax mentioned by Captain Sabine. A few were found on the ice at Port Bowen, but on the preceding voyage they were taken with nets, in considerable numbers, off the island of Igloolik.

20. Alpheus aculeatus.

Alpheus aculeatus. *Supp. to Parry's First Voyage*, p. ccxxxvii. Plate ii. fig. 9, 10.
Cancer aculeatus. *Fabr. Fauna Grœnl.* p. 239, No. 217.

A single individual was found dead on the ice at Port Bowen. They were taken very abundantly, on the preceding voyage, in the neighbourhood of Igloolik.

The difficulty of preserving the numerous species of mollusca which are to be found so very abundantly in the Arctic Seas, may account in some measure for so few having been brought home. To those which are enumerated above, the *Limacina Arctica* and *Clio Borealis* may be added; they were extremely numerous in Davis' Strait and Baffin's Bay.

BOTANICAL APPENDIX,

BY

PROFESSOR HOOKER, LL.D. F.R.A. & L.S.

Regius Professor of Botany in the University of Glasgow.

It has been considered proper here, as in the former Arctic Voyages, to add a list of the Plants discovered during the Expedition.

In the present instance, this list has been reduced to as small a compass as possible, there being but few plants which had not been found during the previous voyages; and of the others, a very limited number having seemed to require particular notice, it has been deemed sufficient to confine their references almost wholly to the Botanical Appendices of the two preceding Narratives of Captain Parry, where the accounts are given in detail.

The small number of species here enumerated is owing to the few opportunities that were afforded for the officers to go on shore, as well as to the extreme poverty of the soil in those places that were visited.

W. J. Hooker.

Glasgow, April 8, 1826.

DICOTYLEDONES.

I. RANUNCULACEÆ.

1. Ranunculus.

1. Ranunculus nivalis. Linn. Brown in Parry's 1st Voyage, App. p. cclxiv. Hooker in Parry's 2d Voy. App. p. 3.

R. sulphureus. Solander and De Cand.

Hab. Cape Warrender. North Somerset, very abundant. Regent's Inlet.

2. Ranunculus hyperboreus. Rottb. Brown in Parry's 1st Voy. App. p. cclxiii. Hooker in Parry's 2d Voy. p. 4.

Hab. Regent's Inlet.

3. Ranunculus lapponicus. Linn. De Cand. Syst. Veg. v. 1. p. 271. ejusd. Prodr. v. 1. p. 35.

Hab. Whale Islands, scarce. Lieut. Ross.

This plant has been long known as an inhabitant of Lapland; and Dr. Richardson gathered it in the wooded country of North America, from lat. 54° to 64° north. It had not been found by the officers during any preceding voyage. Discovered by Lieutenant Ross.

II. PAPAVERACEÆ.

2. Papaver.

4. Papaver nudicaule. Linn. Brown in Parry's 1st Voy. App. cclxx. Hooker in Parry's 2d Voy. App. p. 4.

Hab. North Somerset.

III. CRUCIFERÆ.

3. Cardamine.

5. Cardamine bellidifolia. Linn. Brown in Parry's 1st Voy. App. p. cclxx. Hooker in Parry's 2d Voy. App. p. 9.

Hab. North Somerset; gathered by Mr. M'Laren.

4. Draba.

6. Draba alpina. Linn. Brown in Parry's 1st Voy. App. p. cclxv. Hooker in Parry's 2d Voy. App. p. 5.

Hab. Port Bowen. Regent's Inlet.

7. Draba hirta. Linn.

Var. 4. 1-3-pollicaris, foliis integerrimis, scapo gracili aphyllo. Hooker in Parry's 2d Voy. App. p. 6.

D. hirta. Fl. Dan. t. 142.

Hab. Port Bowen. Regent's Inlet.

5. Cochlearia.

8. Cochlearia fenestrata. Brown in Parry's 1st Voy. App. p. cclxvi. Hooker in Parry's 2d Voy. App. p. 7.

Hab. North Somerset. Whale Fish Islands. Regent's Inlet.

The specimen gathered in Whale Fish Islands, consisting of a single stem, without root-leaves, is twice the size of the common appearance of Mr. Brown's *Cochlearia fenestrata*, and has its stem-leaves ovato-deltoid, upon a broad distinct footstalk.

6. Platypetalum.

9. Platypetalum purpurascens. Brown in Parry's 1st Voy. App. p. cclxvii.

Braya arctica. Hooker in Parry's 2d Voy. App. p. 7.

Hab. Port Bowen.

I am indebted to the kindness of Lieutenant Ross for fine specimens of the *Platypetalum purpurascens* of Mr. Brown, gathered in a former voyage, which have enabled me to detect an important error into which I have fallen in the Botanical Appendix to Capt. Parry's 2d Voyage, where I have considered this plant as a species of *Braya*, and described it as *B. arctica*. The habit indeed of *Platypetalum*, *Braya*, and *Parrya* is very similar; and without the perfect fruit, it becomes very difficult to distinguish them. Of my supposed *Braya arctica*, there were only specimens in flower in the collection, and these flowers were scarcely fully developed. In that state, the germen being oblongo-cylindraceous, I rather referred the genus to *Braya* than to *Platypetalum*. I mentioned, however, that the form of its germen was the only point of difference which existed between it and Mr. Brown's character of the latter genus. The fully formed seed-vessel in *Platypetalum* is ovate or oblong, and the seeds form two rows.

7. Eutrema.

10. Eutrema Edwardsii. Brown in Parry's 1st Voy. App. p. cclxx. Hooker in Parry's 2d Voy. App. p. 9.

Hab. Port Bowen. Regent's Inlet.

8. Parrya.

11. Parrya arctica. Brown in Parry's 1st Voy. p. cclxviii. Tab. B. Hooker in Parry's 2d Voy. App. p. 8.

Hab. North Somerset; gathered in considerable abundance by Lieut. Ross

IV. CARYOPHYLLEÆ.

9. Lychnis.

12. Lychnis apetala. Linn. Brown in Parry's 1st Voy. App. cclxx. Hooker in Parry's 2d Voy. App. p. 9.

Hab. Port Bowen. Regent's Inlet.

10. Cerastium.

13. Cerastium alpinum. Linn. Brown in Parry's 1st Voy. App. p. cclxx. Hooker in Parry's 2d Voy. App. p. 9.

Hab. Port Bowen. Whale-Fish Islands. Regent's Inlet.

11. Arenaria.

14. Arenaria rubella, Wahl. Hooker in Parry's 2d Voy. App. p. 11.

A. quadrivalvis, Brown in Parry's 1st. Voy. App. p. cclxxi.

Hab. North Somerset. Port Bowen. Regent's Inlet.

15. Arenaria Rossii. Brown in Parry's 1st Voy. App. p. cclxxii. Hooker in Parry's 2d Voy. App. p. 11.

Hab. Port Bowen; scarce, and not in flower. Lieut. Ross.

16. Arenaria Pumilio, Br. MSS. Hooker in Parry's 2d Voy. App. p. 11.

Hab. Whale-Fish Islands, and Port Bowen, not in flower. Lieut. Ross.

17. Arenaria Peploides. Linn. Sp. Pl. p. 605. De Cand. Prodr. v. 1. p. 418. Hooker in Acc. of Capt. Sabine's Plants of E. coast of W. Greenland.

Hab. Whale Islands. Port Bowen.

Found by Lieut. Ross; it had not been seen in any of the preceding voyages, but is a native of the coast of Labrador and Hudson's Bay, and of Greenland.

12. Stellaria.

18. Stellaria Edwardsii. Brown in Parry's 1st Voy. App. p. cclxxi. Hooker in Parry's 2d Voy. App. p. 10.

S. nitida. Hooker in Scoresby's E. coast of W. Greenland, App. p. 441.

Hab. North Somerset.

19. Stellaria humifusa. Rottb. in Act. Hafn. v. 10. p. 447. t. 4. f. 14. Fl. Dan. t. 978. Hooker in Parry's 2d Voy. App. p. 11.

Hab. Whale Islands, very abundant. Lieut. Ross.

V. SAXIFRAGEÆ.

13. Saxifraga.

20. Saxifraga oppositifolia. Linn. Brown in Parry's 1st Voy. App. p. cclxxiii. Hooker in Parry's 2d Voy. App. p. 12.

Hab. Port Bowen.

21. Saxifraga Hirculus. Linn. Brown in Parry's 1st Voy. App. p. cclxxiii. Hooker in Parry's 2d Voy. App. p. 12.

Hab. Port Bowen. North Somerset. Regent's Inlet.

22. Saxifraga flagellaris. Sternb. Brown in Parry's 1st Voy. App. p. cclxxiii.

Hab. North Somerset. Regent's Inlet.

This plant, although found plentifully at Melville Island, does not appear to have been seen by any of the officers during the second voyage.

23. Saxifraga stellaris. Linn.

Hab. Whale-Fish Islands.

The flowers of this plant are very small and imperfect, and it approaches very nearly to the following species, *S. foliolosa* of Brown in Parry's 1st Voyage.

24. Saxifraga foliolosa. Brown in Parry's 1st Voy. App. p. cclxxv. Hooker in Parry's 2d Voy. App. p. 13.

Hab. North Somerset; Lieut. Ross.

25. Saxifraga tricuspidata. Rottb. in Act. Hafn. v. 10. p. 446. t. 6. n. 21. Fl. Dan. t. 976. Brown in Parry's 1st Voy. App. p cclxxiv. Hooker in Parry's 2d Voy. App. p. 13.

Hab. Cape Warrender; also the Whale Island; but not in flower there. Lieut. Ross.

26. Saxifraga nivalis. Linn. Brown in Parry's 2d Voy. App. p. cclxv. Hooker in Parry's 2d Voy. App. p. 13.

Hab. Port Bowen. Regent's Inlet.

27. Saxifraga cæspitosa. Linn.

Var. surculis nullis, foliis plerumque trifidis subciliatis, caule uni-trifloro, calyce nigro-pubescente glanduloso. Hooker in Parry's 2d Voy. App. p. 13.

S. uniflora, Brown in Parry's 2d Voy. App. p. cclxv.

Hab. Port Bowen. Regent's Inlet.

This is that variety which Mr. Brown, in his Appendix to the 2d Voyage, has called *S. uniflora*. But the number of flowers on its scape is very variable.

28. Saxifraga rivularis, Linn. Hooker in Parry's 2d Voy. App. p. 13.

S. hyperborea. Brown in Parry's 1st Voy. App. p. cclxv.

HAB. Whale-Fish Islands.

29. Saxifraga cernua. Linn. Brown in Parry's 1st Voy. App. p. cclxxv. Hooker in Parry's 2d Voy. App. p. 14.

HAB. Port Bowen. Regent's Inlet.

14. CHRYSOSPLENIUM.

30. Chrysosplenium alternifolium. Linn. Brown in Parry's 1st Voy. App. p. cclxxv. Hooker in Parry's 2d Voy. App. p. 14.

HAB. North Somerset, scarce Lieut. Ross.

VI. ROSACEÆ.

15. DRYAS.

31. Dryas integrifolia. Vahl. Brown in Parry's 1st Voy. App. p. cclxxv. Hooker in Parry's 2d Voy. App. p. 15.

D. tenella. Pursh.

HAB. Whale-Fish Islands. Regent's Inlet.

Plants of this species, brought by Mr. Goldie from Anticosti, have been cultivated for two years in the Botanic Garden at Glasgow, where they still retain all their characters.

16. POTENTILLA.

32. Potentilla anserina. Linn.

δ. *Grœnlandica.* (De Cand. Prodr. v. 2. p. 582) glabriuscula, nana, foliis multo minoribus paucijugis, foliolis obovatis rubro-virentibus subtus niveis.

P. anserina, Grœnlandica. Tratt. Syn. Bot. P. iv. p. 13.

HAB. Whale Fish Islands.

So different in general appearance is this from our common *P. anserina*, that from the single specimen I had at first the opportunity of seeing, and of which the blossom was also unopened, I was induced not only to consider it different from that plant, but also to believe, that it rather belonged to the genus *Sieversia* than *Potentilla*, so much did it resemble specimens of *S. Rossii*. Lieut. Ross, however, was good enough afterwards to communicate to me other specimens, together with his observations made upon the living individuals, by which he clearly proved it to be not only a *Potentilla*, but *P. anserina*, in that state wherein Professor Giesecke found it in Greenland, and which both Trattinick and De Candolle have described as their *var. Grœnlandica*.

The leaves of the smaller specimens are not above an inch and a half in length; those of the largest three inches, above quite glabrous, the under-side white, with a pubescence so short, so minute and so dense, as to appear to arise from a pulverulent substance. The scape is generally quite glabrous, but sometimes there are a few appressed hairs at the upper extremity. Calyx altogether glabrous, its alternate smaller leaflets lanceolato-elliptical obtuse; all of them, as are the margins of the leaves, purple.

When in full flower, the segments of the calyx are recurved; as they are also in a specimen, given me by Dr. Richardson, which he had gathered in Arctic America.

33. Potentilla pulchella. Brown in Parry's 1st Voy. App. p. cclxxvii. Hooker in Parry's 2d Voy. App. p. 15.

HAB. North Somerset and Regent's Inlet.

VII. ONAGRARIÆ.

17. Epilobium.

34. Epilobium latifolium, Linn. Hooker in Scoresby's Pl. of E. coast of W. Greenland, App. p. 410, and in Parry's 2d Voy. App. p. 16.

Hab. Whale Islands. Port Bowen, and coast of North Somerset, but not in flower at either place. Lieut. Ross.

VIII. COMPOSITÆ.

18. Leontodon.

35. Leontodon palustre. Smith. Brown in Parry's 1st Voy. App. p. cclxxviii. Hooker in Parry's 2d Voy. App. p. 17.

Hab. North Somerset.

19. Cineraria.

36. Cineraria congesta. Brown in Parry's 1st Voy. App. p. cclxxix. Hooker in Parry's 2d Voy. App. p. 17.

Hab. Port Bowen. Regent's Inlet.

20. Antennaria.

37. Antennaria alpina. Brown in Parry's 1st Voy. App. p. cclxxix. Hooker in Parry's 2d Voy. App. p. 17.

Gnaphalium alpinum. Linn.

Hab. Whale-Fish Islands.

21. Chrysanthemum.

38. Chrysanthemum integrifolium. Richardson in Franklin's Journal, App. p. 749. Hooker in Parry's 2d Voy. App. p. 18.

Hab. North Somerset. Regent's Inlet.

IX. MONOTROPEÆ.

22. Pyrola.

39. Pyrola rotundifolia. Linn. Brown in Ross's Voy. ed. 2. p. 192. Hooker in Parry's 2d Voy. App. p. 19.

Hab. Whale Islands, not in perfect flower. Lieut. Ross.

X. VACCINIEÆ.

23. Vaccinium.

40. Vaccinium uliginosum. Linn. Hooker in Parry's 2d Voy. App. p. 19.

Hab. Whale-Fish Islands.

XI. ERICINEÆ.

24. Ledum.

41. Ledum palustre. Linn. Hooker in Parry's 2d Voy. App. p. 19.
Hab. Whale-Fish Islands.

25. Azalea.

42. Azalea procumbens. Linn. Hooker in Parry's 2d Voy. App. p. 19.
Hab. Whale-Fish Islands.

26. Andromeda.

43. Andromeda tetragona. Linn. Hooker in Scoresby's E. coast of W. Greenland, App. p. 410. Brown in Parry's 1st Voy. App. p. cclxxxi. Hooker in Parry's 2d Voy. App. p. 20.
Hab. Whale Islands, but not in flower. Lieut. Ross.

27. Diapensia.

44. Diapensia lapponica.
Hab. Whale Island, very abundant.

28. Empetrum.

45. Empetrum nigrum. Linn. Hooker in Parry's 2d Voy. App. p. 20.
Hab. Whale-Fish Islands.

XII. SCROPHULARINÆ.

29. Pedicularis.

46. Pedicularis hirsuta. Linn. Hooker in Parry's 2d Voy. App. p. 22.
Hab. Port Bowen, Regent's Inlet.

XIII. POLYGONEÆ.

30. Oxyria.

47. Oxyria reniformis. Hooker. Brown in Parry's 1st Voy. App. p. cclxxxii.
Rumex digynus, Linn.
Hab. North Somerset. Regent's Inlet.

31. Polygonum.

48. Polygonum viviparum. Linn. Brown in Parry's 1st Voy. App p. cclxxxi. Hooker in Parry's 2d Voy. p. 23.
Hab. Port Bowen. Regent's Inlet.

XIV. AMENTACEÆ.

32. Salix.

49. Salix reticulata. Linn. Hooker in Parry's 2d Voy. App p. 24.

HAB. Whale Islands and Port Bowen; scarce. Lieut. Ross.

The specimens of this plant are very small, not larger than *Salix herbacea;* is often to be seen on the Scottish mountains.

50. Salix arctica. Brown in Parry's 1st Voy. App. p. cclxxxii. Hooker in Parry's 2d Voy. App. p. 24.

HAB. Whale-Fish Islands, Port Bowen, and Regent's Inlet.

51. Salix herbacea. Linn. Hooker in Parry's 2d Voy. App. p. 24.

HAB. Whale-Fish Islands.

52. Salix polaris. Wahl. Fl. Lapp. Hooker, in account of Capt. Sabine's Plants from E. coast of W. Greenland. Linn. Trans. v. 14. p. 387.

HAB. Whale Islands, abundant. Lieut. Ross.

This plant was first discovered by Martins in Spitzbergen, where Captain Sabine has since gathered it. It does not seem to have been found elsewhere, except in Lapland, and in the habitat above mentioned.

MONOCOTYLEDONES.

XV. JUNCEÆ.

33. JUNCUS.

53. Juncus biglumis. Linn. Brown in Parry's 1st Voy. App. p. cclxxxii. Hooker in Parry's 2d Voy. App. p. 24.

HAB. Regent's Inlet.

34. LUZULA.

54. Luzula hyperborea. Brown in Parry's 1st Voy. App. p. cclxxxiii.

β. minor; foliis latioribus, bracteis partialibus vix fimbriatis. Hooker in Parry's 2d Voy. App. p. 25.

HAB. Regent's Inlet.

XVI. CYPERACEÆ.

35. CAREX.

55. Carex fuliginosa. Sternb. and Hopp. Hooker in Parry's 2d Voy. App. p. 26.

HAB. Whale Islands, Port Bowen, and North Somerset. Lieut. Ross.

56. Carex membranacea. Hooker in Parry's 2d Voy. App. p. 26.

HAB. North Somerset. Lieut. Ross.

Lieut. Ross has marked the specimens he has been so good as to send me "*Carex compacta ?*" of Brown in Ross's Voyage. I have no means of determining this point, since I have never seen an authentic specimen, and no description has yet been given of it. It is certainly the same as my *C. membranacea.*

XVII. GRAMINEÆ.

36. ALOPECURUS.

57. Alopecurus alpinus. Smith. Brown in Parry's 1st Voy. App. p. cclxxxiv. Hooker in Parry's 2d Voy. App. p. 27.

HAB. Whale-Fish Island. Port Bowen. Regent's Inlet.

37. Colpodium.

58. Colpodium latifolium. Brown in Parry's 1st Voy. App. p. cclxxxvi. et cccix. Hooker in Parry's 2d Voy. App. p. 28. cum Ic.

Hab. Port Bowen. Regent's Inlet.

38. Phippsia.

59. Phippsia algida. Soland. in Phipps's Voy. p. 200. Wahl. Fl. Lapp. p. 25. t. 1. Brown in Parry's 1st Voy. App. p. clxxxv.

Hab. North Somerset. Lieut. Ross.

39. Poa.

60. Poa abbreviata. Brown in Parry's 1st Voy. App. p. clxxxvii.

Hab. Port Bowen, very abundant. Lieut. Ross.

61. Poa arctica. Brown in Parry's 1st Voy. App. p. cclxxxvii. Hooker in Parry's 2d Voy. App. p. 28.

Hab. North Somerset. Regent's Inlet.

Var. Vivipara.

Hab. North Somerset. Lieut. Ross.

40. Pleuropogon.

62. Pleuropogon Sabini. Brown in Parry's 1st Voy. App. p. cclxxxix. t. D. Hooker in Parry's Voy. App. p. 29.

Hab. North Somerset, scarce. Lieut. Ross.

41. Deschampsia.

63. Deschampsia brevifolia. Brown in Parry's 1st Voy. App. p. ccxci. Hooker in Parry's 2d Voy. App. p. 29.

Hab. Port Bowen.

42. Trisetum.

64. Trisetum subspicatum. Palisot. Brown in Parry's 1st Voy. App. p. ccxcii. Hooker in Parry's 2d Voy. App. p. 29.

Hab. North Somerset, very abundant Lieut. Ross.

43. Hierochloe.

65. Hierochloe alpina. Rœm. et Schult. Brown in Parry's 1st Voy. App. p. ccxciii. Hooker in Parry's 2d Voy. App. p. 30.

Hab. Cape Warrender, and North Somerset. Lieut. Ross.

66. Hierochloe pauciflora. Brown in Parry's 1st Voy. App. p. ccxcii. Hooker in Parry's 2d Voy. App. p. 30.

Hab. North Somerset.

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ACOTYLEDONES.

XVIII. FILICES.

44. Aspidium.

67. Aspidium fragile? Swartz. Hooker in Parry's 2d Voy. App. p. 30.
Hab. Port Bowen, very scarce. Lieut. Ross.
I have put a mark of doubt against this plant, because the only frond I have seen is young, and destitute of fructification, and because the pinnæ appear to be more divided than in our European plant of the same name.

XIX. LYCOPODINEÆ.

45. Lycopodium.

68. Lycopodium Selago. Linn. Hooker in Parry's 2d Voy. App. p. 30.
Hab. Whale-Fish Islands.

XX. MUSCI.

46. Bryum.

69. Bryum cæspitittium. Linn. Hooker in Parry's 2d Voy. App. p. 31.
Hab. Whale Islands. Lieut. Ross.

47. Encalypta.

70. Encalypta affinis. Hedw. Hooker in Parry's 2d Voy. p. 37.
Hab. Whale Islands and North Somerset. Lieut. Ross.

48. Polytrichum.

71. Polytrichum juniperinum. Hedw. Hooker in Parry's 2d Voy. App. p. 38.
Hab. Whale Islands. Lieut. Ross.

XXI. LICHENES.

49. Gyrophora.

72. Gyrophora tesselata. Ach. Hooker in Parry's 2d Voy. App. p.
Hab. Port Bowen, collected off the rocks during the winter. Lieut. Ross.
73. Gyrophora erosa. Ach. Brown in Scoresby's Arctic Regions. Hooker in Parry's 2d Voy. App. p. 41.
Hab. Whale Islands. Lieut. Ross.

50. Lecanora.

74. Lecanora elegans. Ach. Brown in Parry's 1st Voy. p. cccv. Hooker in Parry's 2d Voy. App. p. 42.
Hab. Whale Islands. Lieut. Ross.

51. Cetraria.

75. Cetraria islandica. Ach. Brown in Parry's 1st Voy. App. p. cccvi. Hooker in Parry's 2d Voy. App. p. 43.

Hab. Whale Islands. Lieut. Ross.

76. Cetraria juniperina. Ach. Brown in Parry's 1st Voy. App. p. cccv. Hooker in Parry's 2d Voy. App. p. 43.

Hab. Whale Islands and Port Bowen. Lieut. Ross.

77. Cetraria nivalis. Ach. Brown in Parry's 1st Voy. App. p. cccvi. Hooker in Parry's 2d Voy. App. p. 43.

Hab. Whale-Fish Islands.

52. Cenomyce.

78. Cenomyce vermicularis. Ach. Hooker in Parry's 2d Voy. App. p. 45.

Cerania vermicularis. Brown in Parry's 1st Voy. App. p. cccvii.

Hab. Whale Islands; Port Bowen, and North Somerset. Lieut. Ross

79. Cenomyce rangiferina. Ach. Hooker in Parry's 2d Voy. App. p. 44.

Hab. Whale Islands. Lieut. Ross.

80. Cenomyce pyxidata. Ach. Brown in Parry's 1st Voy. App. p. cccvii. Hooker in Parry's 2d Voy. App. p. 44.

Hab. Whale Islands. Lieut. Ross.

81. Cenomyce gracilis. Hooker. Hooker in Parry's 2d Voy. App. p. 44.

Hab. Whale Islands. Lieut. Ross.

82. Cenomyce deformis Ach. Syn. Lich. p. 268. Engl. Bot. t. 2051. Hooker, Fl. Scot. P. II. p. 63.

Hab. Whale Islands. Lieut. Ross.

83. Cenomyce coccifera. Ach. Syn. Lich. p. 269. Engl. Bot. t. 2051. Hooker, Fl. Scot. P. II. p. 63.

Hab. Whale Islands. Lieut. Ross.

84. Cenomyce bellidiflora. Ach. Syn. Lich. p. 270. Engl. Bot. t. 1894. Hooker, Fl. Scot. P. II. p. 64.

Hab. Whale Islands. Lieut. Ross.

NOTES
ON THE GEOLOGY
OF THE
COUNTRIES DISCOVERED DURING CAPTAIN PARRY'S SECOND EXPEDITION. A. D. 1821-22-23.

BY PROFESSOR JAMESON.

THE length of the Arctic winter, the frequent covering of snow, even during the summer season, the extreme difficulty of land travelling, the necessary operations of the ships,—all militated against extensive and minute geological researches in the regions visited by the Expedition. Notwithstanding these almost insuperable barriers to the geologist, the activity and enterprise of the officers of the *Hecla* and *Fury* have made us acquainted in a general way with the geological nature of those rude, dreary, and desolate, although very interesting countries.

The following few additional remarks, suggested by an examination of the specimens of rocks collected by the officers of the Expedition, and by the details in the Narrative, were written at the request of Captain Parry.

Form of the Land.—The lands discovered by the Expedition during this voyage, with the exception of Melville Peninsula, are insular; and of these latter Southampton and Cockburn Islands are the largest, while Winter Island and Igloolik, for may reasons, may be considered as the most interesting.

The land, whether continental or insular, appears in general to be hilly, with comparatively little low and flat country *. The hills are usually disposed in ranges, single hills seldom appearing to rise from surrounding low and flat tracts. The general direction of the ranges of hills is not mentioned in the Narrative; but Captain Parry informs me that the most considerable range met with was

* In the map of Melville Peninsula, a great tract appears without hills, which is only thus laid down, because it was not explored.

in Melville Peninsula, which extended from the river Crozier, in lat. 69½, towards Cape Germain, in lat. 67⅔, ranging S. by E. and N. by W. The lands are not lofty; the average height may be stated at 800 feet, and the highest summits measured did not exceed 1500 feet above the level of the sea. The valleys are narrow and rugged, and the cliffs and precipices, in their various fantastic bearings, sometimes exhibit fronts of more than an hundred feet of perpendicular height. The shores are either low, with a shallow sea, or they are rocky and cliffy, with a comparatively deep sea. The submarine land varies in form, and also in mineralogical nature, as is shewn by the soundings recorded in the Narrative; and the geognostical relations of the bottom of the sea with the rocks of the dry land, are in some measure pointed out by the facts stated by Captain Parry. The hills and valleys, during the greater part of the year, are deeply covered with water (the most abundant of all known mineral substances) in the state of snow and ice. The various beautiful colours, and striking and often highly picturesque forms, exhibited by the ices and snows of the Arctic Regions, are admirably depicted in the Narrative; and we doubt not that the geologist would, in the lonely, snowy, and icy wastes of the North, meet with splendid displays of those beautiful illustrations of the formation of strata and veins, and of caves and caverns, which occur, although on a small scale, during the winter of Great Britain.

No *springs* were met with. Captain Parry informs me that "no springs whatever were observed in the Arctic Regions visited by him, the ground at a short distance from the surface being perpetually frozen." During the short Arctic summer, temporary superficial springs will flow, but these in a few weeks will be again frozen up. Hot springs are reported, in some narratives, to have been seen in old Greenland; but nothing of this kind occurred during the course of the Expedition.

Lakes.—Several single lakes, and also chains of lakes, are mentioned in the Narrative. In general they appear to be of inconsiderable size and depth, the largest being only two or three miles in length. In Melville Peninsula lakes were met with about 15 fathoms deep in the places which were sounded; and Captain Parry thinks it probable that, in other parts, some of them might be twice that depth. The colour of the lake water was, in general, brownish-green, and its transparency was in no instance very great.

Rivers.—From the limited extent of the land, the rivers are neither numerous nor remarkable for size. Those most particularly mentioned in the Narrative are the Barrow and the Crozier, in Melville Peninsula, and Gifford River, in Cockburn Island. Barrow River, in some parts of the few miles of its course surveyed, was about 200 yards broad; and, near to its mouth, varied in breadth from half a mile to 400 or 500 yards. Its banks are frequently steep and lofty, in some places being nearly 200 feet high, and ornamented by a vegetation unusually luxuriant for so severe a climate. But the most striking feature of this fine river is its cascades, one of which is represented in a beautiful drawing of Captain Lyon's, admirably engraved by Finden. This cascade, with a breadth of forty yards, is precipitated in one vast continuous sheet of water, almost perpendicular, for 90 feet. Of the Crozier little is recorded. "Opposite to their tents it was about 200 yards broad, but this was only a branch of the main river." Gifford River appears of very considerable size, for we are told in the Narrative that it was about a mile and a half broad, and continued of the same breadth for fifteen miles.

Soil.—The solid strata are sometimes covered with alluvial matter formed by the action of the weather on the subjacent rocks; but I do not find the thickness of this cover or sub-soil noticed in the Narrative. Captain Parry, however, informs me, that "loose mineral matter of any kind seldom exceeds a foot in thickness; and beneath this the ground is literally frozen as hard as a rock, a pick-axe only bringing off dust and mere fragments, as from a mass of granite." Over this *sub-soil* lies a layer, more or less thick, of vegetable soil. The depth of the vegetable soil, Captain Parry informs me, "seldom exceeds a very few, perhaps from four to five, inches, and that only in a few insulated spots, sheltered and otherwise favourable for vegetation." More frequently, however, the bare surfaces of the strata are exposed to the weather, and on these, and in the chinks of the rocks, a few plants, frequently cryptogamous, are seen struggling for existence.

Rocks.—The general aspect of these Arctic lands, already noticed, announce the nature of the prevailing rock formations. These appear to belong to the primitive, and occasionally to the transition classes. Of the interesting secondary formations little was met with. The alluvial strata are not particularly noticed in the Narrative; and no modern volcanic rocks were seen by the officers of the Expedition.

General direction of the Strata.—We do not find, in the Narrative, any observations which could lead us to state with certainty this feature in the arrangement of the strata.

I. PRIMITIVE ROCKS.

The following rocks of this great class were met with, *viz.*: Granite, Gneis. Mica-slate, Eurite-Porphyry, Hornblende-rock, Hornblende-slate, Primitive Greenstone, and Primitive Limestone. All these rocks occur more or less distinctly stratified, and numberless transitions of the one into the other were observed. Comparatively few interesting veins occur, and of these none remarkable either for breadth or extent were met with.

GRANITE.

This rock, which in general is composed of felspar, quartz, and mica, exhibits the following characters. Some varieties are grey or white, others red, and these tints are owing to the colour of the felspar or quartz. The red varieties appear to be the most abundant, and of these the most beautiful owe their fine colours to flesh-red felspar. The quartz in general is grey-coloured, and simply translucent. In some varieties, however, it was in the state of grey and brown rock-crystal, which, when in cavities, is regularly crystallized. The mica, which varies in colour, from grey to deep-brown inclining to black, was, in some specimens, crystallized in tables; but we have not learned that it had been met with in large plates in the granite, or in any other of the primitive rocks. Some of the granites are without mica, and therefore composed of quartz and felspar. Others consist principally of felspar and mica; and on the coast to the north of Cape Wilson the granites were frequently almost entirely composed of felspar. Of all the varieties of the granular structure, the coarse granular is the most frequent, the collection containing but few specimens of the small and fine granular. Some varieties are beautifully porphyritic, as those from Duke of York's Bay and the island of Neerlo-Nakto, Igloolik, and the south shore of the Strait of the Fury and Hecla; while others exhibit the graphic structure, forming the *graphic granite* of authors. The columnar, tabular, and globular structures were not observed in any of the granites, nor do we find that granite distinctly stratified was met with in Melville Peninsula, or in any of the islands. The following imbedded minerals occur in the granite:—

1. *Rose Quartz*, in veins, in Lyon's Inlet, also in Winter Island, on the coast north of Cape Wilson, at Neerlo-Nakto, and Liddon Island.

2. *Actynolite*, Lyon's Inlet.

3. *Pistacite*, or *Epidote*. This mineral, generally of a yellowish-green colour, occurs either disseminated in minute patches in the felspar or quartz, or in beautiful small crystals in drusy cavities, in Winter Island, Lyon's Inlet, near Moyle Bay, and on the coast to the north of Cape Wilson.

4. *Precious Garnet*, transparent, and of a fine columbine-red colour, in Lyon's Inlet and Winter Island.

5. *Chlorite*. In this variety the chlorite takes the place of the mica, forming the rock named *protogine* by authors, and of which the summit of Mont Blanc in Switzerland is composed. It was met with in Winter Island and Lyon's Inlet.

6. *Schorl*. In Winter Island a granite was picked up containing schorl, and very minute crystals of *beryl*. Schorlaceous granite was also found on the coast north of Cape Wilson.

7. *Coccolite*. In a small piece of granite found on the coast north of Cape Wilson.

8. *Zircon*. In a small fragment from Barrow River, minute crystals, apparently of zircon.

9. *Graphite*, or *Black-lead*, in disseminated grains and crystals, in Winter Island, and on the banks of Barrow River.

10. *Specular Iron Ore*, in granite in Winter Island.

11. *Iron Pyrites*. This mineral, which is one of the most generally distributed of the metalliferous compounds in different countries, was observed in the granite of Winter Island, that of Safety Cove, and the coast north of Cape Wilson.

Geognostical Position of the Granite.—Neither the details before us, nor the specimens, allow us to infer with anything like certainty the place or places, in the primitive series, occupied by the granite here described. Some of the varieties very much resemble those that form part of the granite-gneiss formation; others may belong to the varieties that occur in vast masses underlying gneiss.

Geographical Distribution of the Granite.—Specimens were brought from the shore of the Duke of York's Bay, Lyon's Inlet, Five-hawser Bay, Upper Savage Island, west shore of York Inlet, head of Gore Bay, Ducket Cove, Winter

Island, near Moyle Bay, Safety Cove, coast north of Cape Wilson, Owlitteeweek Island, Barrow River, Igloolik, Neerlo-Nakto island westward of Igloolik, south shore of the Strait of the Fury and Hecla, Coxe's Islands, Richards Bay, Amherst Island, and Liddon Island.

II. GNEISS.

The colours of this rock are red and grey, and its fracture is sometimes coarse, sometimes fine slaty. The concretions vary in size from coarse to fine granular, and the coarse granular varieties sometimes pass into granite. Judging from the collection, and the details in the Narrative, gneiss appears to be the most abundant of all the primitive rocks in the countries explored by the Expedition. The following imbedded minerals were found in it:—

1. *Precious Garnet.* This beautiful gem occurs abundantly in grey gneiss in Five-hawser Bay, also in Winter Island, where hyacinth red garnets are associated with rock-crystal, in Lyon's Inlet, and in the rocks of Safety Cove.

2. *Rose Quartz.* In the Narrative, it is remarked of Rendezvous Island, that it is composed of gneiss traversed by rich veins of rose quartz, and that large masses of the same were lying around.

3. *Actynolite*, in the gneiss on the banks of Barrow River.

4. *Graphite*, or *Black Lead.* In Winter Island, Five-hawser Bay, coast to the north of Cape Wilson.

5. *Magnetic Iron Pyrites*, in the gneiss on the coast to the north of Cape Wilson.

6. *Common Iron Pyrites*, on the coast to the north of Cape Wilson.

Geographical Distribution.—Shore of Duke of York's Bay, Vansittart Island, Upper Savage Island, York Inlet, head of Gore Bay, near Cape Welsford, Winter Island, near Moyle Bay, Safety Cove, coast north of Cape Wilson, Owlitteeweek Island, Barrow River, Richards Bay, and Igloolik. Other localities are given in the Narrative.

III. MICA-SLATE.

This slaty compound of mica and quartz occurs in comparatively small quantity, and, judging from the details and specimens, seems in general to form beds subordinate to the gneiss, which, as already mentioned, is the prevailing formation in the Arctic countries discovered by the Expedition. Some varieties appear passing into clay-slate, and these may be more connected with the clay-slate than with the gneiss. The following minerals occur imbedded:—

1. *Hornblende*, in the rocks of Five-hawser Bay, and in those of Neerlo-Nakto.

2. *Actynolite.* Five-hawser Bay.

3. *Tremolite.* Five-hawser Bay.

4. *Precious Garnet* and *Grenatite.* These were detected in a small specimen from Igloolik.

5. *Rock Crystal*, in small clove-brown and brownish-black crystals, at Five-hawser Bay.

6. *Common Iron Pyrites*, and *Magnetic Iron Pyrites*, in specimens gathered in Igloolik.

Geographical Distribution.—Lyon's Inlet, Winter Island in considerable quantity, coast north of Cape Wilson, Igloolik, south shore of the Strait of the Fury and Hecla, Quilliam Creek, and Bouverie Island.

IV. CLAY-SLATE.

This rock appears to have been met with even less frequently than the mica-slate. It is noted as occurring in Winter Island, Richards Bay, where it contains imbedded iron-pyrites, the coast to the northward of Cape Wilson, and in Bouverie Island.

V. CHLORITE-SLATE.

This rock occurs more abundantly than either mica-slate or clay-slate, but not in such quantity as the quartz-rock of the transition class. The following imbedded minerals were met with in it:—

1. *Actynolite.*

2. *Hornblende.*

3. *Felspar* of a red colour.

4. *Indurated Talc*, or *Talc-slate*, in Winter Island, and with apple-green talc Igloolik.

5. *Massive Common Chlorite*, on the coast north of Cape Wilson.

6. *Calcareous Spar* and *Rhomb Spar.* South shore of the Strait of the Fury and Hecla, also in Igloolik.

7. *Precious Garnet*, in Igloolik.

8. Octahedral crystals of *Magnetic Iron Ore.* Barrow River.

9. *Red Iron Ore.*
10. *Iron Pyrites.*

Geographical Distribution.—Lyon's Inlet, Winter Island, coast to the northward of Cape Wilson, Barrow River, Igloolik, south shore of the Strait of the Fury and Hecla, Neerlo-Nakto, Quilliam Creek, Bouverie Island, Amherst Island, Liddon Island, and Richards Bay.

VI. HORNBLENDE.

This mineral occurs in the form of beds, and also disseminated, in the other primitive formations. Sometimes the mass is almost entirely of hornblende, when it is named *hornblende-rock*, of which beds occur at the head of Gore Bay, in Lyon's Inlet, Safety Cove, Winter Island, coast north of Cape Wilson, Five-hawser Bay, and Tern Island. When the hornblende is arranged so as to form a slaty rock, it is named *hornblende-slate*, of which beds were met with in Winter Island. When the hornblende is associated with felspar, the compound is named *greenstone*, of which examples were found in Igloolik, and in the island of Neerlo-Nackto.

The imbedded minerals in these rocks are felspar, mica, chlorite, actynolite, quartz, diallage, common iron pyrites, and magnetic pyrites. It may be remarked that the variety of hornblende named actynolite appears also to occur in beds associated with the hornblende and other primitive rocks.

VII. SERPENTINE.

This rock, considered by some as a compound of diallage and felspar, by others as a simple mountain rock, was met with in different quarters. Its colours are dark leek-green and greenish black; the lustre glimmering; the fracture splintery, or splintery conjoined with conchoidal; more or less translucent. The following imbedded minerals were observed:—

1. *Brown Diallage.*
2. *Glassy Actynolite.*
3. *Fibrous Greenish-gray Talc.*
4. *Flexible Asbestus.*
5. *Rhomb-spar* and *Calcareous-spar.*
6. *Chrome Ore* or *Chromate of Iron.*
7. *Magnetic Iron Ore.*
8. *Iron Pyrites.*

Geographical Distribution.—Lyon's Inlet, near Moyle Bay, in Winter Island, Liddon Island, Neerlo-Nakto, and Bouverie Island.

VIII. LIMESTONE.

All the varieties of this rock in the collection are composed of coarse and small granular concretions, loosely aggregated, and the only colours observed were snow-white and greyish-white. The following imbedded minerals occur in it:—

1. Small but beautiful crystals of *Mica*, at Five-hawser Bay, and in Winter Island and Barrow River.
2. *Augite*, at Lyon's Inlet, Barrow River, and Winter Island.
3. With *Serpentine*, forming *Verde-antico*. Winter Island.
4. *Precious Serpentine*. Winter Island.
5. *Sphene*, and *Titanitic Iron*. Winter Island.
6. *Graphite* or *Black Lead*. Coast northward of Cape Wilson, Barrow River, and Igloolik.

Geographical Distribution.—Five-hawser Bay, Lyon's Inlet, Winter Island, coast northward of Cape Wilson, Barrow River, and Igloolik.

IX. PORPHYRY.

In the collection of rocks I found but one specimen of porphyry, which is eurite porphyry, a rock which may be considered as a variety of granite. It was found in Five-hawser Bay. The total absence of porphyry in the primitive districts visited by Captain Parry is worthy of notice.

II. TRANSITION ROCKS.

The following rocks, apparently belonging to this class, were met with in different places: *viz.*, Red Sandstone and Quartz-rock, Greywacke-slate, Drawing-slate, Flinty-slate, and Limestone.

I. QUARTZ-ROCK AND RED SANDSTONE.

Red and variegated Sandstone of the Narrative. Old Red Sandstone and Transition Quartz-rock, Transition Red Sandstone, and Recent or New Greywacke of authors.

This interesting rock is composed of granular quartz, sometimes nearly in the state of rock crystal. The granular is sometimes combined with the slaty structure in those varieties in which mica prevails. Grains and crystals of felspar are occasionally distributed through it. The felspar is either fresh, or more or less disintegrated. Some varieties have a structure apparently conglomerated, and others bear a striking resemblance to the gritstone which lies under the coal formation. Some varieties, met with in Neerlo-Nakto, are vesicular, the walls of the vesicular cavities being lined with small crystals of quartz, and bear a distant resemblance to *Buhr-stone*. The colours are white, grey, purple, and red; and sometimes the colours are arranged in stripes. The white, or grey and hard varieties may be considered as transition quartz-rock; the red and variegated as transition red sandstone or recent greywacke. The following imbedded minerals occur in it:—

1. *Felspar.*
2. *Mica.*
3. *Chlorite.* This variety is either slaty or massive.
4. *Pale Rose Quartz,* at Lyon's Inl
5. *Epidote,* or *Pistacite.* This mineral, minutely disseminated, gives, we presume, the yellowish-green colour to some rare varieties of this rock.
6. *Rock Crystal,* in small crystals, in cavities of quartz-rock in Liddon Island.
7. *Schorl,* in the quartz-rock of Winter Island.
8. *Red Iron Ore.* Neerlo-Nakto.
9. Crystals of *Common Iron Glance* and *Red Iron Ore,* in Liddon Island, and Neerlo-Nakto. Scaly foliated iron glance in Liddon Island, and at Cape Matthew Smith. Here also small-foliated iron glance alternates in layers with small-granular white quartz-rock.
10. *Scaly Foliated Iron Glance,* Richards Bay; and the same associated with red iron froth in specimens from Igloolik.
11. *Compact Red Iron Ore,* at Cape Matthew Smith, and Richards Bay; also in Bouverie Island, along with quartz inclining to rock-crystal, and also in Amherst Island.
12. *Copper Pyrites* with *Copper Green;* also copper pyrites with compact iron glance, in Richard's Bay.
13. Quartz-rock, in which the grains or concretions appear to be connected together by copper pyrites, and the surface stained with *green Malachite.*
14. *Quartz Rock,* with *Magnetic Iron Ore.*

Geognostic Situation.—This rock appears to belong to the transition class. It very much resembles, in its associations, the transition quartz-rock and red sand-

stone of Scotland, as that of Sutherland and Caithness. It may be remarked, that probably some of the specimens of quartz-rock enumerated above, as those with schorl, may belong to the primitive class.

Geographical Distribution.—Upper Savage Islands, west shore of Duke of York's Bay, Five-hawser Bay, Lyon's Inlet, Winter Island, Safety Cove, island of Owlitteeweek, island off Cape Wilson, coast north of Cape Wilson, Igloolik, Cape North-east, south shore of the Strait of the Fury and Hecla, Neerlo-Nakto, Quilliam Creek, Richards Bay, Bouverie Island, Amherst Island, Liddon Island, along the south shore of Cockburn Island onward to Whyte Inlet.

II. GREYWACKE, GREYWACKE-SLATE, AND TRANSITION CLAY-SLATE.

Greywacke and greywacke-slate, with disseminated iron pyrites, occur in Winter Island, at Neerlo-Nakto, and in Amherst Island. The transition clay-slate was met with in Bouverie Island.

III. FLINTY-SLATE AND DRAWING-SLATE.

The only specimen of flinty-slate is one from Lyon's Inlet. The drawing-slate was seen in Winter Island, and specimens of it with disseminated iron pyrites were picked up in Igloolik.

IV. TRANSITION LIMESTONE.

From the Narrative, it appears that Amherst Island is principally composed of greywacke and greywacke-slate; and along with these is a limestone, probably belonging to the transition class.

III. SECONDARY ROCKS.

The only secondary rocks of which specimens were brought home, are limestone, bituminous shale, and secondary trap.

I. LIMESTONE.

Mountain Limestone, or *First Secondary Limestone:* the *Transition Limestone* of some geologists.

The colours of this limestone are yellowish-grey, yellowish-white, and ochre-yellow. In some varieties the fracture is coarse splintery, combined with minute-foliated; in others the general fracture is foliated, and throughout the mass are cavities, the walls of which are lined with rhomboidal crystals. Other varieties again have a slaty fracture; lustre glimmering or shining, and translucent on the edges, or opaque. Flint and conchoidal hornstone occur imbedded in it. It contains various organic remains. The following occur in the limestone of the island of Igloolik. Corals, two genera, *viz.*, *Caryophyllea* and *Astræa*. A species of a new genus of coral was found in a piece of limestone by that excellent observer Mr. Stokes, who communicated the following account of it:—" The new fossil coral is a flat lobe, covered on both sides with pores. which are obscurely laminated, and each pore or cell is continued through the substance of the coral. The cells are arranged in curved radii from a centre, like the lines upon an engine-turned watch-case, and (which is unusual in corals) increase in size as they are more distant from the centre. On one surface the cells appear to be all four-sided, in which respect also they differ from all other corals." Casts of two species of *trilobites*, one species of *productus*, a species of *terebratula*, a species of *trochus*, a *turritella*, a *maclurite*, and also a *nautilus* and *orthoceras* were detected in the limestone.

Of all the fossil organic remains, the most abundant in the collection is a species of orthocera, similar to one sent me some years ago from an island in Lake Huron, by the Hon. Mr. Maule, and of which a figure is given in the first volume of the new series of the Transactions of the Geological Society.

Geographical Distribution.—Shoal in York Bay, west shore of York Bay, Ducket Cove, Amitioke, Pingitkalik, Arlagnuk, Mogg Bay, and Quilliam Creek, in Melville Peninsula; Winter Island, Lyon Inlet, Safety Cove, Igloolik, Tern Island, island of Owlitteeweek, Bouverie Island, and Amherst Island. The island of Igloolik, which is very low and rather level, is almost entirely composed of this limestone. The specimens of primitive rocks from that island in the collection, Captain Parry informs me, were broken from detached masses, lying on the surface of the limestone, there being no fixed primitive rock in the island. The next island to the north-west, called Neerlo-Nakto, is also principally composed of limestone, but abounding much more than Igloolik in fragments of primitive rock.

II. BITUMINOUS SHALE.

Specimens of this rock from Lyon's Inlet and Winter Island are in the collection.

It is a common rock in the coal formation; but of that formation no other trace was met with.

III. SECONDARY GREENSTONE.

This rock, which is a compound of augite and felspar, was met with in different places; but its particular geognostic relations are not given, and cannot be inferred with any certainty from the data before us. Specimens were collected in Lyon's Inlet; at Safety Cove, where it is porphyritic; in Winter Island, where it has titanitic iron ore disseminated through it, and sometimes is iron-shot and porphyritic. On the coast to the north of Cape Wilson it contains veins of calcareous spar. It was met with in Tern Island, also in Amherst Island, and in Whyte's Inlet, in Cockburn Island.

IV. ALLUVIAL ROCKS.

No extensive deposites of alluvial rocks were met with. The most striking objects under this head are the outliers or boulders or fragments of rocks found spread over the surface of some of the islands. The surface of Igloolik, a limestone island, is strewed with blocks of primitive rocks; the island of Neerlo-Nakto, which is principally composed of limestone, is also strewed over with primitive blocks or boulders; and in Amherst Island, in which greywacke and greywacke-slate are almost the only rocks, rolled masses or boulders of granite, gneiss and quartz-rock, are not uncommon.

NOTES ON THE GEOLOGY

OF THE

COUNTRIES VISITED DURING CAPTAIN PARRY'S THIRD VOYAGE.

The first landing was made on the Whale-fish Islands, on the east coast of Baffin's Bay, which my friend and pupil, Dr. Neill, as mentioned in the Narrative, found to be composed of gneiss. On crossing Davis' Straits, the next land visited was Cape Warrender, where all the fixed rocks, according to Dr. Neill, proved to be primitive, and the principal or only formation gneiss, which, as is very generally the case with that rock in these Arctic countries, abounded with imbedded grains and crystals of precious garnet. Nodules of clay iron ore were found on the beach, but want of time prevented their original position from being determined. The ice having forced the vessels close to the land a little to the eastward of Admiralty Inlet, on the south coast of Barrow's Strait, a landing was effected. The country, as far as Dr. Neill penetrated, was of compact secondary limestone. On the beach were fragments of bituminous slate and of ironstone. Mr. Ross found pieces of coal about two-thirds up a small peak of limestone. The coal, Dr. Neill informs me, was not black, but brown coal, and therefore belongs to a new formation of that mineral. The vessels now forced their way to Port Bowen in Prince Regent's Inlet, where they remained during the winter. Expeditions were made from Port Bowen toward the north and toward the south, also to the west side of the Inlet upon the coast called North Somerset. The whole country travelled over on both sides of the inlet appeared to consist of secondary limestone, with subsidiary beds of gypsum. No high land was met with; but on the coast, as at Cape York, perpendicular and high limestone cliffs made their appearance. The specimens of limestone in the collection sent for my inspection exhibited the following characters:—

I. *Secondary Limestone of Port Bowen, Neill's Harbour, &c.*

Its colours are ash-grey and yellowish-grey, more or less inclining to ochre-yellow and yellowish-brown. In some varieties the brown colours are disposed in horizontal stripes. The lustre is glimmering; the fracture is splintery, or splintery combined with minute foliated, or simply granular foliated, and some varieties are slaty. It is more or less translucent on the edges, and generally yields readily to the knife. Some varieties, however, are so hard as to give a few sparks with steel. All the varieties, by friction, give out that disagreeable smell which is so well known in stinkstone, and to which mineral they may be referred. The external characters intimate its magnesian character, which is confirmed by the experiments of Dr. Neill, who found it to contain from 20 to 30 per cent. of carbonate of magnesia.

It is everywhere very distinctly stratified, and the strata are uniformly horizontal. Imbedded in them masses of chert occur, but not frequently. The organic remains observed in the limestone are entrochites, catinulariæ, spiropore, turbinoliæ, favosites, several species of terebratulæ, a trochus, a turritella, and an orthoceratite.

On the upper parts of the hills around Port Bowen, generally on the surface of a brick-red limestone, mentioned by Dr. Neill in the Narrative, were found masses of fibrous brown iron ore, or brown hematite. These, in all probability, were derived from veins or imbedded masses in the limestone. In the cliffs, caves are of frequent occurrence, and these often of very considerable magnitude.

This, which may be called Port Bowen limestone, extends onwards to Cape York, and, according to the observations made during the second voyage, even to Admiralty Inlet and Possession Bay, and was met with as far south in Prince Regent's Inlet as the Expedition explored.

II. *Secondary Limestone of North Somerset.*

The country on the west side of Prince Regent's Inlet, named North Somerset, was examined in part, and there, as on the east side, at Port Bowen and elsewhere, the solid stratified rocks were everywhere of secondary formation, and the principal rock limestone. The specimens from that quarter exhibit the following characters:—

1. *Limestone of North Somerset.*

Its colours are ash, greyish-black, and yellowish-grey; lustre glimmering; fracture splintery, or splintery combined with minute foliated, and some varieties slaty; opaque, or more or less translucent on the edges; by friction yields the urinous smell of stinkstone, but not so strongly as most of the limestones of Port

Bowen. It is distinctly stratified, and the strata are everywhere horizontal. It affords the same organic remains as the limestone of Port Bowen, with addition of a species of modiola. Of all the fossils the terebratulæ and encrini appear to be the most abundant. Caves occur in it, as at Port Bowen; and frequently it exhibits cliffs of considerable height.

2. *Gypsum of North Somerset.*

This mineral was found in beds several feet thick, extending for at least thirty miles through the country, and associated with a limestone, which, when near the gypsum, abounded in terebratulæ, also contained entrochi, and a species apparently of modiola. All the varieties of this gypsum are of a snow-white colour, and of these the *granular foliated*, the *fibrous*, and *selenite*, were met with, but not the compact. The selenite was very abundant, and its broad plates at a distance reflected the sun's rays like mirrors. It occurs more than a hundred feet above the level of the sea, and, with its slaty limestone, rests on the more common and compact kinds, which agree in every character with those of Port Bowen.

Geognostical Situations of the Limestone of Port Bowen, North Somerset, &c.

From the data before us, it is not easy to refer all the limestones of Prince Regent's Inlet to their places in the geognostical series. The limestone associated with gypsum in North Somerset may safely be referred to the second secondary limestone formation, the first or oldest flœtz limestone of Werner. The lower limestones of North Somerset, and those of Port Bowen, Neill's Harbour, and of most of the country on the east side of Prince Regent's Inlet, may either form part of the second secondary limestone,—a supposition countenanced by the universal horizontality of its strata, its magnesian character, its brown hematite, and certain organic remains it contains; or it may belong to the first secondary limestone,—a conjecture not destitute of plausibility, when we recollect its imbedded chert, and the characters of some of its fossil organic remains. As gypsum and limestone occur near to Possession Bay, we must refer these to the second secondary limestone. The horizontality of the limestone strata on the north side of Barrow's Strait seems to point it out as probably belonging to the second secondary formation.

III. *Alluvial Rocks.*

Alluvial marly deposites, from the snow waters passing through and along the surface of the limestone strata in the summer season, occur in the valleys, and on the shore; also fragments of the limestone from the same source. The limestone hills around Port Bowen and Neill's harbour, and the whole limestone country extending as far north as Cape York, and to the southward as far as Cape Fitzgerald, were, as Dr. Neill informs me, more or less covered with boulders of primitive rocks, which were either rounded or angular. Similar boulders were observed strewed over the limestone on the west side of Prince Regent's Inlet in North Somerset. The specimens from the boulders around Port Bowen, in the collection, are of granite, sienite, gneiss, indurated talc, hornblende-rock, actynolite-rock, a beautiful quartzy iron-glance, and brown hematite. The boulders of granite, gneiss, and sienite, were the most numerous and largest; those of talc, actynolite, and ores, less numerous and smaller. Some of the boulders near to Port Bowen, Dr. Neill informs me, were upwards of 50 tons in weight, and lay fully 400 feet above the level of the sea; and he saw a boulder of granite, two or three tons weight, resting on the summit of the highest limestone hill in the vicinity of Port Bowen. On inquiring as to the mode of distribution of these boulders, Dr. Neill informed me that they were numerous along the acclivities of the hills on both sides of Prince Regent's Inlet, everywhere resting upon the secondary limestone; but on leaving the coast, they gradually diminished in number and also in size, and, at a distance of from fourteen to sixteen miles from the sea, they were comparatively rare, and in general not larger than a closed fist. These remarkable masses, Dr. Neill further mentioned, more nearly resembled the primitive rocks of the Whale-fish Islands than of any other quarter visited by the Expedition; and even the nearest known fixed primitive rocks were those at Cape Warrender, upwards of one hundred miles distant.

CONCLUDING REMARKS.

THE observations made during the four Arctic Expeditions, *viz.*, that under Captain Ross, and the three under Captain Parry, afford the following general facts and inferences:—

1. That the regions explored abound in primitive and transition rocks, and that, although the secondary rocks occupy considerable tracts, still their extent is more limited than that of the older formations; that the alluvial deposites are not extensive; that true or modern volcanic rocks were nowhere met with; and that the only traces of the tertiary strata were found in the sandstones and clays connected with the secondary traps of Baffin's Bay.

2. That the primitive and transition islands were, in all probability, at one time connected together, and formed a continuous mass with the continental parts of America; and that, in the plains and hollows of this land, were deposited the secondary limestones, sandstones, gypsum, and coal, and upon these again the tertiary rocks.

3. That, after the deposition of these secondary and tertiary rocks, the land appears to have been broken up, and reduced either suddenly or by degrees, or partly by sudden and violent action and partly by the long-continued agency of the atmosphere and the ocean, into its present insular and peninsular form; and that, consequently, the secondary and tertiary formations were formerly, in those regions, more extensively distributed than they are at present.

4. That, previously to the deposition of the coal formation, as that of Melville Island, the transition and primitive hills and plains supported a rich and luxuriant vegetation, principally of cryptogamous plants, especially tree ferns, the prototypes of which are now met with only in the tropical regions of the earth. The fossil corals of the secondary limestones also intimate that, before, during, and after the deposition of the coal formation, the waters of the ocean were so constituted as to support polyparia closely resembling those of the present equatorial seas.

5. That, previously to and during the deposition of the tertiary strata, these now frozen regions supported forests of dicotyledonous trees, as is shewn by the

fossil dicotyledonous woods met with in connexion with these strata in Baffin's Bay, and by the fossil wood of Melville Island, Cape York, and Byam Martin Island.

6. That the boulders or rolled blocks met with in different quarters, and in tracts distant from their original localities, afford evidence of the passage of water across them, and at a period subsequent to the deposition of the newest solid strata, namely, those of the tertiary class.

7. That nowhere are there any discoverable traces of the agency of modern volcanoes, and we may add that in the Arctic Regions the only known appearances of this kind are those in Jan Mayen's Island, described by Scoresby.

8. That the only intimations of older volcanic action are those afforded by the presence of secondary trap rocks, such as basalt, greenstone, trap-tufa, and amygdaloid.

9. That the black bituminous coal, the coal of the oldest coal formation, which some speculators maintain to be confined to the more temperate and warmer regions of the earth, is now proved, by its discovery in Melville Island, far to the west, and in Jameson's land, far to the east, in Old Greenland, to form an interesting and important feature in the geognostical constitution of Arctic countries.

10. That the red sandstone of Possession Bay, &c., renders it probable that rock-salt may occur in that quarter.

11. That, although no new metalliferous compounds have occurred to gratify the curiosity of the mineralogist, yet the regions explored by Captain Parry have afforded various interesting and highly useful ores, such as octahedral or magnetic iron ore, rhomboidal or red iron ore, prismatic or brown iron ore, and prismatic chrome ore or chromate of iron; also the common ore of copper, or copper pyrites, molybdæna glance, or sulphuret of molybdæna; ore of titanium, and that interesting and valuable mineral, graphite or black lead.

12. That the gems, the most valued and most beautiful of mineral substances, are not wanting in the Arctic Regions visited by the Expeditions, is proved by the great abundance of the precious garnet, which we doubt not will be found, on more particular examination of the primitive rocks, to present all the beautiful colours and elegant forms for which it is so much admired. Rock-crystal, another of the gems, was met with, and also beryl and zircon.

13. That these newly-discovered lands exhibit the same general geognostical arrangements as occur in all other extensive tracts of country hitherto examined

by the naturalist; a fact which strengthens that opinion which maintains that the grand features of nature, in the mineral kingdom, are everywhere similar, and, consequently, that the same general agencies must have prevailed generally during the formation of the solid mass of the earth.

14. Lastly, that the apparent irregularities which at first sight present themselves to our attention, in the grand arrangements in the mineral kingdom, are the offspring of our own feeble powers of observation, and disappear when the phenomena are examined in all their relations. It is then indeed that the mind obtains those enduring and sublime views of the power of the Deity, which, in geology, reward the patient observer, raise one of the most beautiful and interesting departments of natural science to its true rank, and prove that its relations connect, as it were, in the scale of magnitude, the phenomena of the earth with those more extensive arrangements presented to our intelligence in the planetary system, and in the grand framework of the universe itself.

ROBERT JAMESON.

Royal Museum, College, Edinburgh,
April 24, 1826.

THE END.

LONDON:
PRINTED BY WILLIAM CLOWES,
Northumberland-court.

DIRECTIONS TO THE BINDER FOR PLACING THE PLATES.

ERRATA.

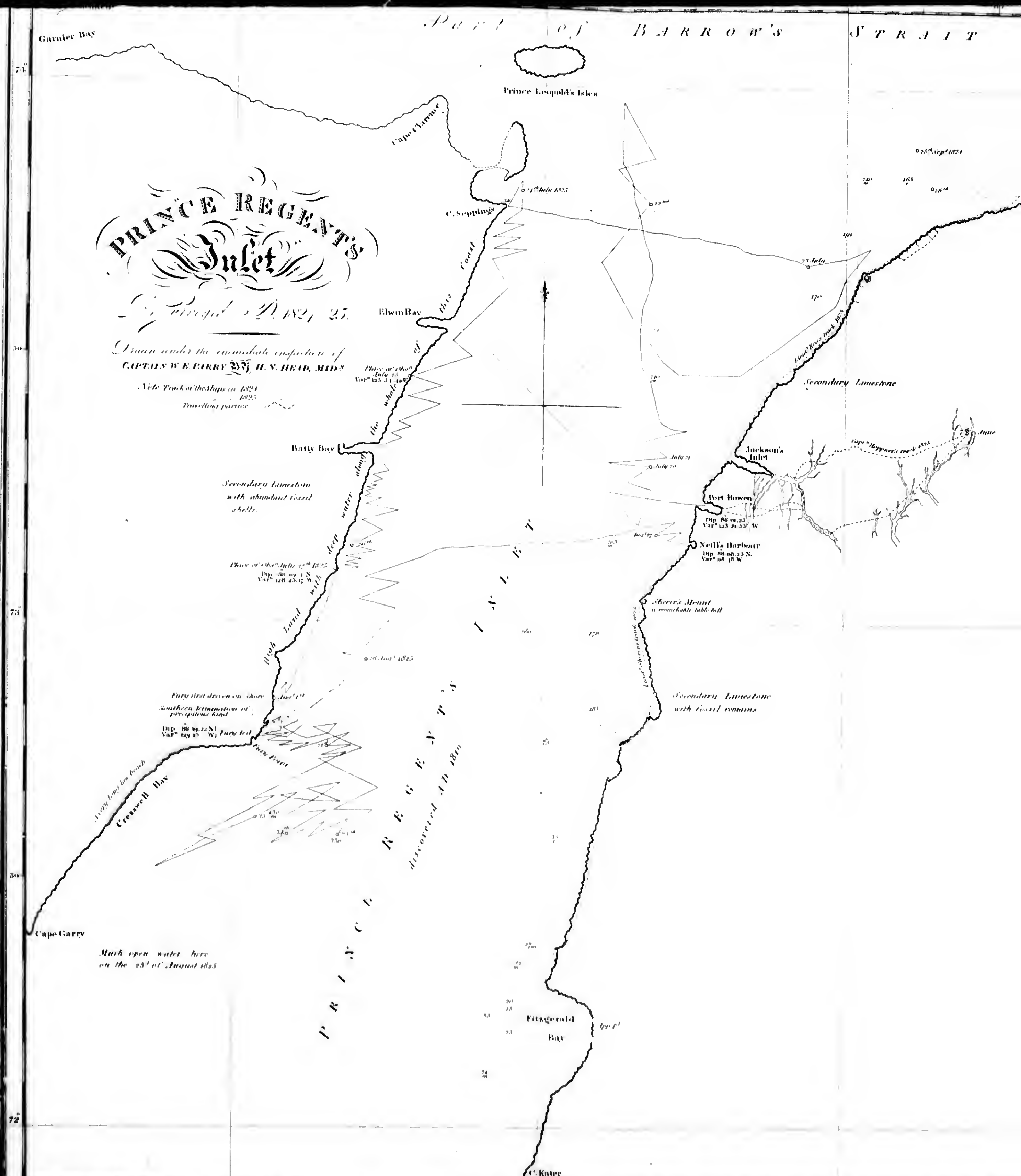
Page xi, line 9, *for* them eat, *read* the meat.
—— 11, line 11, *for* na, *read* an.
—— 60, line 8, *for* a semicolon, *put* a comma.
—— 68, last line, *for* abligation, *read* obligation.
—— 109, line 11, *for* lay, *read* lie.
—— 120, line 22, *for* warm, *read* warn.
—— 183, line 21, *after* beyond, *add* all.
Appendix, page 80, last line, *for* VI. *read* XVII.

74°

North Hill, Port Bowen, S. 38°E.

R. S. Head, del.

J. C. Walker.



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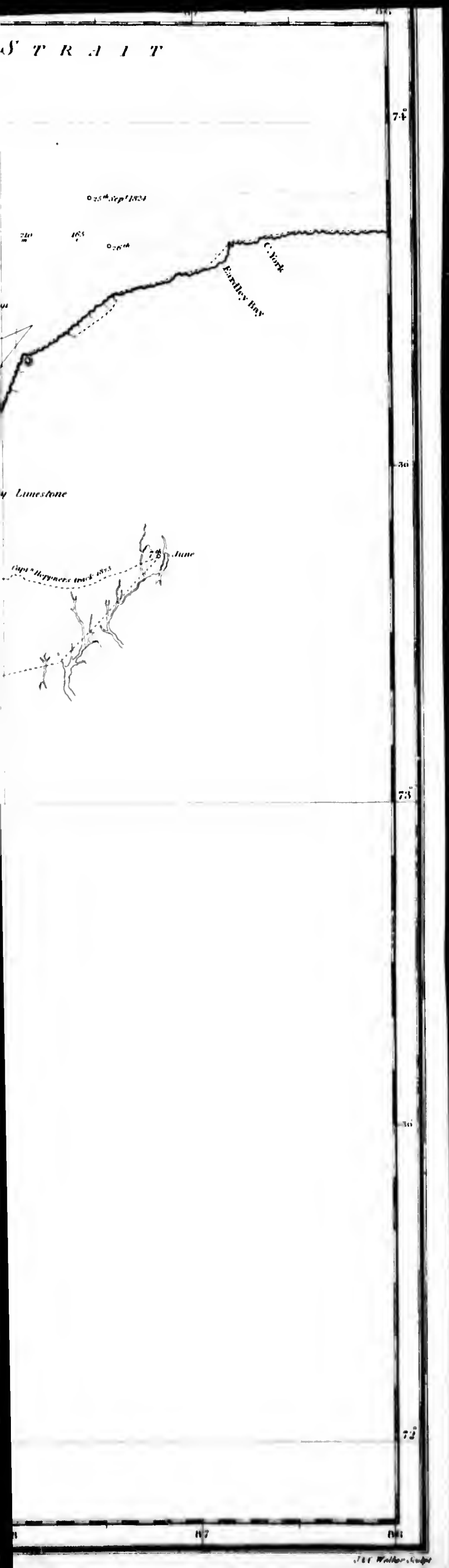

STRAIT
74°
C. York
Eardley Bay
Limestone
June
73°
72°
87
88
J. & C. Walker Sculpt

alley above Lievely (Id. of Disko) taken from the Southward.

N. 53° W. Cape Rosamond North

Ice berg ...

N. 51° W.

North Hill, Port Bowen S. 38° E.

G. S. Head, del.

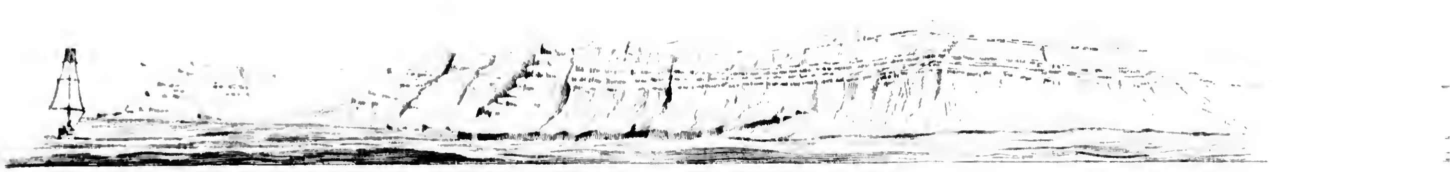
Riskol (vulgo Reef-koll) Hill N.N.W. distant 3 or 4 leagues.

N. 58° W.

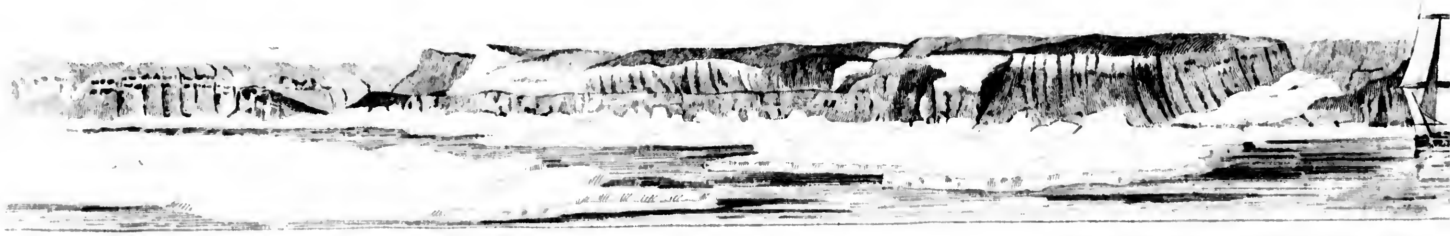
Land to the Westward of Croker's Bay.

Ice berg aground

Situation of the Hecla & Fury on the South Shore of Lancaster



Cape Crawfurd S.E.b.E. dist! 8 or 9 miles.



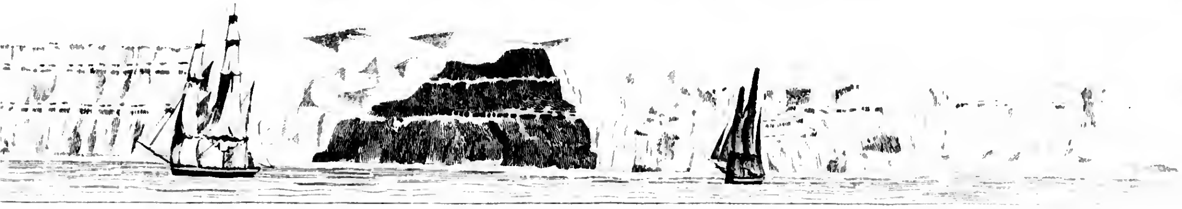
Jackson's Inlet

View of the Eastern Coast of Prince Regent's Inlet

n. S. Head, del!

Published as the Act directs [illegible] by John Murr

Valley above Lievely (P.d of Disko) taken from the Southward.



Cape Home

Cape Rosamond

North

…ay on the South Shore of Lancaster's Sound September 21.st 1824.

Fury Point S. 18° W.

S. 51° W.

…Coast of Prince Regent's Inlet.

North Hill, Port Bowen S. 38° E.

…blished as the act directs June 1826 by John Murray Albemarle Street London