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Author(s): Sherard Osborn

Source: *Proceedings of the Royal Geographical Society of London*, Vol. 17, No. 3 (1872 - 1873), pp. 172-183

Published by: [Wiley](#) on behalf of [The Royal Geographical Society \(with the Institute of British Geographers\)](#)

Stable URL: <http://www.jstor.org/stable/1798887>

Accessed: 12/06/2014 12:48

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know that these German Geographers were coming over to confer with the Royal Geographical Society of London. He would now call upon Capt. Sherard Osborn to communicate his paper on Arctic Exploration.

On the Probable Existence of Unknown Lands within the Arctic Circle.

By Captain SHERARD OSBORN, R.N.

It is a well-accepted axiom in the exploration of the Arctic Seas, that if lands can be found, whether continuous or adjacent to one another, in any given direction, that the possibility of tracing them either by ship, boat, or on foot with sledges, becomes a certainty; and that the risk of being caught in the drifting ice, and so being swept out of the Arctic Circle, is proportionately diminished.

If the student of Polar geography will take a globe and turn the North Pole towards himself, he will be struck by this remarkable fact: that, of the three continents of Europe, Asia, and America, which environ the North Pole, they none of them approach it within the 70th parallel of latitude, except that promontory of Asia in about 105° E. long. between the Obi and Lena rivers. With that exception, those continents all stop abruptly short about the 70th parallel, forming as it were the edges of a vast crater in the earth's surface,—that crater being the Arctic Ocean, approximately 2400 miles in diameter, or about the distance from England to Halifax. Of all this wide expanse we know but little, and it is only at two points that seamen and explorers have been able to penetrate it to or beyond the 80th degree of north latitude—viz. at Spitzbergen and up Baffin Bay, two routes some 90 degrees of longitude apart.

Of the Spitzbergen route towards the Pole, it may be said that no one by ship or boat had ever yet gone beyond 82° 43' N.; that at that point an interminable sea of ice* was seen extending north; that there were no indications of land beyond Spitzbergen, and that the southward motion of the ice-fields on which Parry travelled in 1828 carried him back faster than he was able to proceed northward.

Of the Baffin Bay route I will now enter into greater detail. This great bay, as it has been called, but strait as it should be really named, has been traced already from lat. 60° to lat. 82° N.,

* Parry, July 13th, 1827—obs. lat. 82° 17' N.—says, "Mounting one of the highest hummocks, we could discover nothing to the northward but the same broken and irregular surface, and we now began to doubt whether we should meet at all with the solid fields of unbroken ice, which every account had led us to expect in a much lower latitude. The weather was remarkably clear. Our height from the level of the sea, 40 feet.

"A very strong ice blink overspread the whole northern horizon."

a distance of 1320 miles between the continent of Greenland on the east and a vast archipelago of islands extending from the north side of Hudson Bay to Grinnell Land ; but in neither case, either on the one hand or the other, has the land been seen to terminate.

This archipelago of islands projects itself northward from the American continent, preserving a mean width of nearly 700 miles, and, together with Greenland, bars as it were the Polar waters flowing into the Atlantic from those whose natural outlet is the Pacific Ocean. It will be seen, furthermore, that this Arctic archipelago is nearly on the opposite meridian to the Pole of that promontory of Asia which I have before said penetrates within the 70th degree, so that the two known points of Cape Timoor in Asia and Cape Parry in Grinnell Land are within 1200 miles of each other, or halfway across the entire Arctic Ocean, thus reducing the width of the unknown area by one-half. Two American travellers, Dr. Kane and Dr. Hayes, have each at different times reached the northern part of this Sea of Baffin, the one on the east coast, and the other on the west. Both bear testimony to the two following facts.

They saw the land of this archipelago still stretching northward, and both saw open water. The contrast, therefore, between the Spitzbergen and Baffin routes into the Arctic Sea may be simply summed up again as follows :—

Spitzbergen route, in lat. $82\frac{3}{4}^{\circ}$ N. A sea of ice, and no land in sight.

Baffin Strait route, in 82° N. Land extending northward, and plenty of open water.

Let us next consider the two following points :—

Are there grounds for believing that this Arctic archipelago extends much further north than it has been already traced ?

Would such lands, if they do exist, be of service in a further exploration of the Polar area, and conduce to the safety or support of explorers ?

My reasons for believing that land extends far to the north of any point yet reached in this Arctic archipelago are based on the following evidence. While employed in compiling from the journals of Captain Sir Robert McClure, the discoverer of a north-west passage in H.M.S. *Investigator*, I was struck with his description of the extraordinary ice met with by him in the sea west of the archipelago under consideration, and which he traced from Behring Straits up to the north-west of Banks Land, round a great curve of more than 1000 miles. I compared it subsequently with the reports of Lieutenants Mecham and McClintock, who visited in 1853 the west

shores of Prince Patrick Land; and again with the remarks of Captain (now Admiral) Collinson, who, like McClure, passed between this great ice and the American continent in his remarkable voyage in H.M.S. *Enterprise*.

All their descriptions agreed, and it was evident to me that no one who had travelled elsewhere in the Arctic regions had ever met with similar oceanic ice; and it certainly was nothing like the ice-fields found about Spitzbergen or the east coast of Greenland, as I will presently show.

Its character I often discussed with the able navigator of Sir Robert McClure's ship, the late lamented Stephen Court, who was subsequently my navigating officer for two years in H.M.S. *Furious*. From his statement I can safely describe this western ice as a vast floating glacier-like mass, surging to and fro in an enclosed area of the Arctic Sea, bounded on the south by the shores of North America, on the west by Kellett and Wrangel Land, on the east by the Arctic archipelago under consideration, and on the north—and there is the query. But if there was space for it to move north, there is no question but that the furious south storms which sweep over the North American continent would blow it far in that direction, and bring its masses down into the Atlantic by way of Spitzbergen, whereas, as a matter of fact, it never went more than a few miles off the American coast, leaving a narrow belt of water; and directly the gale ceased it surged back again, with its edge grounding in 100 feet of water. The same phenomenon occurred along its eastern edge, where this great ice-field impinged on the archipelago in Banks Land. There, under the most favourable circumstances, the ice never moved off more than a mile or two, and in most places came home against the cliffs, leaving hardly the width of the *Investigator* to go past the edge of it, aground sometimes in 12 or 15 fathoms water, showing a thickness of 70 or 80 feet. Meham and McClintock found it on the west coast of Prince Patrick Island, pressed up with tremendous energy on those low shores, and forming in places such a barrier, especially on the south-west extreme, as to oblige Meham to take his sledges landward, to avoid the insurmountable barrier the broken floe edge had there formed.

This ice, as described to me, consisted of vast continuous fields, whose thickness below water was more than 60 feet, whilst the surface resembled hills and dales of rounded outline, studded close together; the major portion of these hillocks, 30 or 40 feet in height above water, and some of them as much as 100 feet, packed so close together from the effects of alternate snow, thaw, and frost,

that there was scarcely sufficient footing to be found amongst them. And in proof of the extraordinary age of the ice-fields, these hillocks were found to be pure, fresh-water ice, indicating the long period that the snows had fallen on the surface of that frozen sea.* This ice must not be confounded in any way with what is called "packed ice." It was far too heavy and massive to be broken up in that manner, and it was only along its edge that fragments were found broken off by contact with the cliffs or shore. These fragments, as far as is known, form great ice-streams, which pour through Behring Straits and Barrow Straits, though much broken up and reduced in thickness long before they had been met with by our navigators. We saw very little of this ice in Jones' Sound, the entrance being there barred by Prince Patrick Island and the lands which lie north of it.

In one place, just north of the Mackenzie River, the *Investigator* stood in a thick fog up a sort of cleft 90 miles long in this great ice-field. McClure found the sea gradually deepening as he advanced, but the sharp ice edge was higher than the gunwales of his ship, and he escaped by a miracle before it closed on him, and gladly retraced his steps to its outer edge.

I have said that this ice is not met with on East Greenland and North Spitzbergen, and my authority is, first, that of the late dis-

* Commander McClure, off Point Warren. Between Point Barrow and the Mackenzie:—

Investigator, 24th Aug. 1850.

"I took the height above the water in seven places, which gave an average of 11 feet 11 inches; a pack chiefly composed of such would be too powerful a foe for any ship long to contend against."

"Cape Prince Alfred. North-west coast of Banks Land:—

"To prevent being carried away with the pack which was filling up its space, we secured to the in-shore side of a small but heavy piece of ice, 72 feet thick, grounded in 12 fathoms, 74 yards from the beach."

"We were now setting fast upon another large piece of a broken floe, 54 feet thick, grounded in 9 fathoms upon the *débris* formed at the mouth of a large river."

"Surrounded with masses of ice, 16 and 18 feet thick, while the grounded floes are from 40 to 67 in depth."

"Our day's work did not exceed 15 miles, when we were compelled to make fast to the land ice, which along the whole of this coast is of the most massive and terrific dimensions I have ever witnessed. There was little selection of berth on a coast-line nearly straight; but a slight indentation, protected east and west by two large pieces of a broken floe, 30 feet above the water, gave hopes of some shelter."

"Indeed, since rounding Cape Austin it had lost much of its terrible aspect, which led to the inference that we were fairly in Barrow Strait, and that the main Polar pack takes a direct line from the last-mentioned cape to the E.N.E.; and that which fills these bays, and is carried down Barrow Strait, is the comparatively small ice which drifts from its southern edge, as we have invariably remarked that there is a decidedly eastern current, which impels the enormous Polar floes on that course, while the lighter, influenced by wind, is oftentimes setting in an opposite direction."—*Official Report to Admiralty.*

tinguished President of the Royal Society, General Sir Edward Sabine, who in his work on the voyage he made in 1825 with Clavering to East Greenland says, speaking of the ice between Spitzbergen and it in 75° and 76° N. :—"The character of the field ice was heavier than that which occupies the middle of Davis's Straits and Baffin's Sea in the early part of the navigation, but was not so heavy as the field ice in the neighbourhood of the Georgian Isles (Melville Island)." *

Parry says, in his boat journey of 1827, "Lat. $82^{\circ} 26'$ N. The floe not more than 4 feet thick;" and in lat. $82^{\circ} 32'$ N., he remarks, "the floes were larger to-day, and the ice of heavier dimensions than we had yet met with; but the general thickness of the floes did not exceed 9 or 10 feet, which is not more than the usual thickness of those in Baffin's Bay and Hudson's Strait, while it is a great deal less than the ordinary dimensions of the ice about Melville Peninsula, and not half the thickness of that towards the western extremity of Melville Island." Near his extreme point he remarks that the largest floe was then from $2\frac{1}{2}$ to 3 miles square, and from 15 to 20 feet thick, and that that ice was the heaviest he met with, before he had to turn back in consequence of finding that the southerly drift of the ice gave him no hope of being able to attain 83° N., much less the Pole.

With this data before us, and the certainty that none of those who have been up Barrow and Jones Straits have ever seen anything but small fragments of this ice; with the certainty that nothing like it ever comes down into the Atlantic by way of Spitzbergen—for a twenty-feet-thick ice-field there is considered very heavy ice; with the certainty, too, that it was not met with at the head of Baffin Straits by either Kane or Hayes—surely I shall not be considered a mere theorist if I assert that this true "mer de glace" west of the archipelago is land-bound on its northern edge, and if so that the archipelago must sweep up very near the Pole of our earth, if not across and beyond it.

Apart from the ponderous character of this "mer de glace" leading me to the conclusion that it is formed in a land-locked sea, there is additional data, namely, that of the direction and the amount of tide on its shores. For of course, as in the Mediterranean and Black Seas, an enclosed area of salt-water, with only a narrow outlet to a great ocean, has generally but slight rise and fall of tide.

We find at Kotzebue Sound and Point Barrow, in Behring

* See page 421.

Straits, where Moore and Maguire wintered in H.M.S. *Plover*, that the flood tide came from the Pacific, and the rise and fall was only 2 feet at the former, and only 7 inches at Point Barrow.

McClure, in the Princess of Wales Strait, found the flood-tide coming from the south, with only 3 feet rise and fall on spring-tides. At the Bay of Mercy, Banks Land, the flood, such as it was, came from the east up Barrow Strait, with only 2 feet rise, agreeing much with all other observations taken up Barrow Strait, viz. at Beechey Island, Cornwallis Island, Leopold Island, and Melville Island, at which places the flood evidently came from the Atlantic, *via* Baffin Bay, diminishing as it approached the sea, west of the archipelago.*

In Jones Strait the flood-tide likewise comes from the east, as Admiral Richards and I had good proof of in a boat expedition during the autumn of 1852; and we both found, as we went westward along the north shore of the Georgian or Parry group, that the tides, as indicated by the ice-action upon the shore, diminished likewise as we went west.

Now, if the area of sea west of this archipelago was not land-locked, but opened into the general space called the Arctic Ocean, I think seamen and geographers would agree with me that the tidal wave of that vast area, as compared with the limited one of Baffin Strait, would cause the flood-tide to come from it into, at any rate, the west entrance of Barrow Strait and Jones Sound, whereas the evidence I adduce shows that the flood travels towards this sea, which I say is enclosed by land, instead of from it, as would otherwise be the case. The best parallel I can give to the tidal observation of Barrow Strait, is that of the Strait of Gibraltar and the Cattegat, where the flood-tide flows into two enclosed seas from the Atlantic Ocean.

Apart from the tideless character of the sea west of the archipelago leading me to the belief that it is land-locked to the north, and has no communication with that portion of the Polar waters which flow into the Atlantic, there is another corroborative fact. The two great Polar currents by which that enormous amount of ice discharges itself into more southern latitudes comes from two

* In Barrow Strait the flood comes from the east with a rise and fall at Port Leopold and Beechey Island of about 7 feet on the spring-tides. This tide by the time it has reached Melville Island diminishes much in velocity, and at Winter Harbour shows only a mean rise of 3 feet.

With reference to the Pacific tide, Admiral Collinson's observations in H.M.S. *Enterprise* show that it reaches to about the same meridian, viz. 120° w. long., along the shores of North America; agreeing remarkably with the tidal observations of McClure, Parry, and others, making that meridian the point at which the Pacific and Atlantic tides meet.

opposite directions. The ice formed north of Spitzbergen and Nova Zembla discharges itself by a south-westerly current, of which there is ample evidence, and the rate, according to the seasons, varies from 8 to 13 miles a day.* On the other hand, the ice from what I believe to be an enclosed sea, west of the archipelago, discharges itself for the major part in a south-easterly direction, of which we have had practical proof since 1850 in the drifting out to sea in Davis Straits of the four expeditions when beset, of James Ross, De Haven, Kellett, and M'Clintock; the only exception to this south-easterly current being a small amount of much disintegrated ice, which escapes southward into the Pacific through the shallow strait of Behring. The only way I can account for two diametrically opposite currents flowing from that Polar area before us is by assuming that they flow from two spaces of water separated from each other.

I have, therefore, not the slightest doubt that, whether this Arctic archipelago be followed to the north, or the recently discovered lands north of Siberia near Behring Strait be traced; we shall find that they are nearly connected one with the other; and in doing so, the exploration of the Polar area will be thoroughly and successfully accomplished.

Let me now point out in what way these lands, if they exist, give good promise for future exploration.

In the first place this archipelago abounds in harbours and creeks where a ship can find shelter, having pushed during the summer season as far as navigation can carry her. She then secures a base safe from the ever-southerly drift of winter ice. From such a position in early spring, sledge parties, on the system introduced by my distinguished friend Sir Leopold M'Clintock, can be pushed forward to the utmost limits of men's physical powers. Secure in a harbour, those on board the ship can pursue those scientific researches on shore which have hitherto been so much lost sight of in Arctic exploration, and also avoid the horrors of wintering in the pack, which have been testified to so vividly even in our

* "Ships, which have been beset in ice between Spitzbergen and Greenland, have been found to drift to the s.w. and s.w. by s., at the rates of 182 miles in 13 days; 120 miles in 9 days; 420 miles in 50 days; and 1300 miles in 108 days; or at an average rate of about 13 miles a day, with the exception of a third instance, which gives 8 miles a day, but still in a south-west direction.

"This south-westerly current, however, does not appear to reach below the parallel of Cherie Island in the east, nor to extend as far as Cape Farewell in the west, and certainly not beyond it; for a south-easterly current has been found to prevail there, from the fact of bottles, which were thrown into the sea in those parts, having been picked up on the shores of Great Britain and Tenerife."—Extract (p. 341) from the 'Voyage of the *Dorothea* and *Trent* in 1818.'

time by Sir George Back, Sir James Ross, Captain De Haven, and Sir Leopold M'Clintock, not to speak of the still more disastrous experiences of our German brethren in the *Hansa*.

Furthermore, if any untoward accident should befall a ship in any part of this archipelago, I have no hesitation in saying that, with our present knowledge and appliances, any naval leader would be utterly unworthy of his post who could not so arrange his communications with the Danish settlements in Baffin Bay as to carry his party back there in safety; and I unhesitatingly assert that none of these elements of success and safety for a Polar exploration exist on the route favoured by German geographers in pushing northward through a mere sea of ice from Spitzbergen.

There is another point, too, in connection with the advisability of an Arctic exploring expedition keeping hold of the land wherever it is possible; and that is, the proofs which have gradually accumulated that in every land of this Arctic archipelago there are resources in the way of animal life which, if properly sought for, will do much to preserve the health and strength, if not save the lives, of future explorers.

Both shores of Baffin Strait, as far as they have been explored, prove to abound in animal life.

Within a few miles of where Kane tells us his harrowing tale of the craving for fresh food amongst his people which induced them to feed upon vermin, Hayes found abundance of reindeer, seal, and walrus. To use his own words:—

“The whole region round Port Fulke, at the entrance of Smith's Sound, is teeming with animal life, and one good hunter would feed twenty mouths; the sea abounds in walrus, seal, narwhale and white whale; the land in reindeer and foxes; the islands and cliffs in summer swarm with birds, and the ice is the roaming ground of bears.”—P. 420.

Morton, who reached the extreme north visited in this direction of Greenland, found open water in June alive with birds. On the west shore, whalers, as well as Hayes, have seen both deer and musk oxen; and I could fill a chapter with facts to show that our recent explorers over the whole of the Parry group have had slowly revealed to them the fact that there is hardly one of those islands in which, had we known it, and had a better system of hunting parties been organised, we could not have added largely to our comfort and resources. One illustration may suffice.

From that very Melville Island that Parry visited in 1820, and did not obtain a day's rations for his crew, Captain Kellett, in his last winter there, drew 10,000 lbs. weight of fresh venison and beef from a very limited area; and whilst we in Northumberland Sound

never procured one fresh meal, Captain Richards and I, as we landed in the grey light of a March afternoon on Bathurst Island, saw, to our astonishment, large herds of deer feeding on its snow-covered terraces, and I subsequently saw plenty more of them.

There is one more argument in favour of the Baffin Strait route, which is, that along its shores, on both sides, human beings, in the shape of Esquimaux, are able to exist, and have been seen, or very recent traces of them, as high as the land has been visited.

They are everywhere found well disposed, and will be useful as hunters and fishermen, and there is no reason, from their own account, to doubt their existence still further north than Europeans have yet been.

In the words of Kalutenah, an old chief of a tribe near Cape Alexander:—"There are good hunting grounds at the north, plenty of musk ox; and wherever there are good hunting grounds, there the Esquimaux will be found."

I hold that, amongst the many interesting questions which the exploration of the Polar area will, in the interest of science, yield a solution, there is nothing more curious, from an ethnological point of view, than tracing human life up to the Pole itself, not to speak of the assurance their existence gives of the possibility, worst come to the worst, of our explorers being able to live where their fellow-creatures are to be found; in illustration of which I would point to the case of the American, Mr. Hall, who lived amongst Esquimaux, as an Esquimaux, for nearly six years, and has again recently returned undaunted to share the lot of this northern race.

I have now laid before you my final reasons for adhering to the opinions of the Arctic Council of the Royal Geographical Society for preferring the route *viâ* Baffin Bay towards the unknown area which lies around the northern pole of our earth, and for urging on our Government this route as the right one for a public expedition next year; at the same time I beg you will not consider me, though an advocate for this route, to be the opponent of any other which individuals may be ready to venture upon, whether by Spitzbergen or from Behring Strait. I only desire to see a naval expedition go where such thought and reasoning as I am able to bring to bear on the subject tell me the greatest amount of scientific and geographical knowledge will be acquired, with the minimum amount of risk for those who are employed in it.

No one can honour more deeply than I do the enterprise and love of exploration which induces men like Mr. Leigh Smith to attempt with their own resources to penetrate the mysteries of that frozen sea north of Spitzbergen; and if he fails, or comes back empty-handed,

I feel sure that no Fellow of this Society will sneer at his enthusiasm, cavil at his reasoning, or blame him for want of results.

But with a Government expedition, despatched, as I trust it will be, under the advice not only of this Society, but that of every learned and scientific body in Great Britain, it is all important that it should not prove a failure, return empty-handed, or end in a catastrophe.

It is to guard against these eventualities that the Arctic Committee of our Council did so wisely, I think, in recommending the Baffin Bay route as the right one for Polar exploration; and I rejoice that the President and Council have so unanimously adopted it.

Admiral Sir G. BACK said it was quite possible that the ice to the north of Behring Strait was land-bound, for from the extreme north of Parry's furthest latitude there was ample room and space enough for hundreds of islands, against which the ice might accumulate. When Sir John Franklin and himself went from the Mackenzie River toward Behring Strait, they saw a considerable quantity of old ice, which drew too much water to approach the shore, that was more or less encumbered by drift ice of formidable dimensions. Some idea of the pressure of that old ice was afforded by the fact that two small icebergs had been forced high on the beach, on the inner ledges of which, some 20 ft. above the base, portions of gravel and shingle were deposited. They had great difficulty in deciding as to the direction of the flow of the tide, not only there, but also between the mouth of the Coppermine River and Point Turnagain, and ultimately they came to the conclusion that it was from the east, with a rise and fall of eighteen inches or two feet. He had not the slightest doubt that Smith Sound would be the best route for further exploration, and would afford the best results to science. He was with Franklin in the Spitzbergen seas in 1818, and the deepest ice seen on that occasion, on a floe of four miles in diameter, was 42 ft., but that was an extraordinary thickness. He trusted that the Government would be more liberal-minded in 1874 than in 1873, and would be induced to fit out a polar expedition in full accordance with the recommendations of the Arctic Committee.

Admiral R. COLLINSON, referring to the remarkable packing of the ice from Behring Straits, said by the force of the wind and the current one layer of ice became piled up upon another, until their united height was as much as 25 or 30 feet. This pressure was exerted in the winter as well as in the summer, for when Capt. Maguire wintered at Point Barrow, in the month of February, by a very violent gale the ice was blown off the land, and for two or three days the sea was clear. In the summer time, when the ice was grounded, one piece could be seen to ride over another in the most extraordinary manner. When the *Plover* anchored out in Kotzebue Bay, the ice came in and actually rode over the vessel so that they could not get at the windlass to slip their cable, but by the greatest good fortune the cable parted. He did not think, with Capt. Osborn, that the ice was land-bound, but was rather of opinion that from Behring Straits to the pole there was no land whatever. If there had been land a southerly gale would blow the ice further off the coast, but he frequently had scarcely working distance between the shore and the ice. He passed a winter in Victoria Land, and the highest tide was 3 ft., but that was an unusual height and was caused by the wind. The average rise and fall would be 18 inches. There was not a doubt that the tidal wave was seriously affected by the fixed ice which covered it. In Victoria Straits there was only 7 inches on an average, though on one occasion there was a rise of as much as

2 ft. 4 in. He also experienced great difficulty in ascertaining where the flood came from; but at the mouth of the Coppermine River, he was convinced it was from the east. He agreed with Captain Osborn that the right way to explore the northern seas was to follow the land. He believed by proceeding up Smith Sound an expedition would be able to get further north than by any other route, and with a greater probability of obtaining valuable scientific results.

Captain WELLS, R.N., said, so far from regarding the heavy ice on that part of the Arctic Sea north of North America as a proof of the existence of land still further north, he considered it as a proof of the non-existence of land. He had seen a floe north of Spitzbergen which was ten miles in diameter. The ice there was generally very flat, and might be of two years' formation. Alexander Parker, who sailed 800 miles north of the mouth of the Lena, found the ice impassable. It was perfectly natural that the ice on meeting an abrupt shore should careen over one piece upon another so as to form a barrier. It had been said that the water from the rivers thawed the ice, but he had attempted to wade through a small stream and found it icy cold, and to say that the river water thawed the ice, was an absurdity. Ice was thawed from below, while fresh water flowed on the surface of salt water. How then could the fresh water from the rivers thaw the ice from below? After what had been stated about the pressure of the ice north of America, it was impossible to suppose that any vessel could force her way through. The year before last, thirty American whaling vessels were deserted and wrecked, in consequence of the pressure of the ice. The thickest fixed ice he had seen, however, in the neighbourhood of Spitzbergen, was only twelve feet thick. He was on one occasion beset in an enormous floe with a heavy gale of wind blowing, but they were as comfortable and happy as possible, and if they had had a steamer they could have gone up to the north pole, which was clear before them, for they saw the blue cloud which always indicated water to the northward. If a vessel were beset on the other side, however, she would be lost, and the crew would have to make their way to the Danish settlements. From all the 234 books that had been written on the Arctic regions, it was well known that no party of Esquimaux had ever been seen in one place numbering as many as 100, and although game abounded in some parts, only a very small number of men could live together. The 150 men in Franklin's party were lost because their number was so great. He should be very sorry to have to leave a ship and depend for support on the game that could be obtained on the journey to the Danish settlements.

Mr. E. WHYMPER expressed himself as being strongly in favour of the scheme proposed by the Arctic Committee for the exploration of the polar regions by way of Smith Sound. He had spent a considerable time last year with Peter Jensen, who was with Hayes on his memorable journey up Smith Sound. Although he was left by Hayes upon the western shores half starved and totally disabled, and felt the effects of that journey long afterwards, he was now most ardent to join another expedition to the north pole, and he would be a most valuable assistant to any English expedition which might be despatched. Captain Osborn had pointed out that the existence of large bodies of reindeer was a strong argument in favour of the Smith Sound route, but it should be remembered that reindeer were migratory animals, and that the tameness of those which had been met with was a proof that they had not been there long. Those which Jensen saw were so tame that he shot them down like cows one after another. A ship going up Smith Sound with the expectation of finding reindeer might possibly be very much disappointed. In the parts of Greenland which he had visited there were now no reindeer at all, but perhaps in two or three years' time there might be vast numbers of them.

Captain SHERARD OSBORN said his information with regard to the floes near

Spitzbergen was obtained from Parry, who stated that the largest he met with was $2\frac{1}{2}$ miles square. Hummocks were produced by the crushing together of thin ice. Those hummocks might be 40 or 50 ft. high, but it would not follow that the ice would be so thick below them. Captain Wells had misunderstood his allusion to animal life, as he had done the entire tenour of the paper read. He should be very sorry to send out a ship unprovisioned to depend upon the food obtainable in the Arctic regions, but it was a great thing to give men fresh meat even only twice in a month. 10,000 lbs. of meat were obtained from a limited area of Melville Island in one season. It might have been an accidental circumstance that Hayes found so many reindeer, while Kane, only 20 miles off, found none; but it showed, at all events, that immense numbers exist somewhere in the neighbourhood.

The PRESIDENT said it was to the advantage of geographical knowledge that such questions should be thoroughly investigated. Since the Government had declined to undertake to furnish ships for a renewed polar expedition this year, the Geographical Society had applied to the Royal Society for their co-operation; and the Royal Society had nominated a committee to confer with the Arctic Committee with a view of ascertaining and tabulating all the scientific reasons which existed for polar exploration. As soon as the joint committee had sent in its report, they would be prepared to go to the Government again; and they had great hope of success.

Eleventh Meeting, May 12th, 1873.

MAJOR-GENERAL SIR HENRY C. RAWLINSON, K.C.B., PRESIDENT,
in the Chair.

ELECTIONS.—*Colonel W. W. Anderson* (Political Agent in Kattywar); *W. A. Baines, Esq.*; *Commander W. Milton Bridger, R.N.*; *Edward H. Cardwell, Esq.*; *Jesse Chadwick, Esq.*; *John Coles, Esq.*; *Captain Frederick Elton*; *John Fair, Esq.* (Consul for the Argentine Republic); *R. Bishop Farrar, Esq.*; *Major-General John Forbes, C.B.*; *W. Freeland, Esq.* (Barrister); *Captain Grey* (Bengal Staff Corps); *Theodore Jervis, Esq.* (Barrister); *Rev. H. W. Kemp*; *Maurice Kingsley, Esq.*; *Joseph Christopher Leaver, Esq.*; *William Barry Lord, Esq.*; *Captain Marcus Lowther, R.N.*; *Robert Lydgate, Esq.*; *William Lydgate, Esq.*; *P. H. McKerlie* (F.S.A. Scotland, &c.); *Alfred P. Newton, Esq.*; *Rev. Robert Nimmo, B.A.* (Chaplain R.N.); *Captain Francis Lamb Philp* (Royal Scots Greys); *Edward Prentice, Esq.*; *James Price, Esq.*; *W. H. Ravenscroft, Esq.*; *D. Scott, Esq.*; *John Henry Skilbeck, Esq.*; *John Berger Spence, Esq.*, F.G.S.; *Sir Edward Sullivan, Bart.*; *Thomas P. Tindale, Esq.*; *Francis William White, Esq.*

PRESENTATIONS.—*R. A. Cottrill, Esq.*; *W. H. Ravenscroft, Esq.*

ACCESSIONS TO THE LIBRARY FROM APRIL 28TH TO MAY 12TH, 1873.—‘Die Preussische Expedition nach Ost Asien.’ Vol. III.