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The Discoveries of the 'Polaris,' and Voyage of the 'Arctic'

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Besides the subjects already mentioned, I am glad to say that many other papers are in hand, on various countries, and will be brought before you in the course of the Session. Among them are one on the late Captain Rokeby's Surveys in Nubia, between Suakin and Berber; one by Dr. Kirk, on his Examination, in company with Captain Wharton, R.N., of the Mouth of the Lufiji River—the interesting stream on the East Coast of Africa, of which we still know so little; a third by Professor Leone Levi, on the Geography and Resources of Paraguay; besides others on Australia, Persia, and Beluchistan.

In conclusion, I cannot refrain from alluding to the great losses which Geographical Science, and our Society in particular, have sustained during the vacation, in the death of so many distinguished travellers:—Count de Strzelecki, Admiral Sir Robert McClure, Mr. Emil von Sydow, Sir Henry Holland, Mr. J. B. Pentland, the explorer of Southern Peru and Bolivia. This is a heavy list in so short a period. I do not record the names here with the intention of drawing attention to the great services which each has rendered to Geography and the kindred sciences; this, indeed, would be to anticipate the obituary notices which form part of the Annual Address in May of each year, and the drawing up of which will be part of my duty. But, as veteran travellers and geographers disappear from the scene, I would ask the younger members of the Society to remember that the Royal Geographical Society cannot afford to rest its character merely on the laurels of a bygone day; and that, if the Society would keep its position before the world, young and able geographers must not rest whilst there remain regions on the earth's surface with the physical features or inhabitants of which our countrymen are still imperfectly acquainted.

The following paper was read:—

The Discoveries of the 'Polaris,' and Voyage of the 'Arctic.'

By C. R. MARKHAM, Esq., C.B., Secretary R.G.S.

COMMANDER MARKHAM was appointed to the *Sultan* before he had been three weeks in England (after returning from the Arctic regions), and is now on his way to Lisbon; so that the results of his observations must be presented to the Society without the advantage of his presence, and in a paper, the contents of which are culled from his journal, and from his Report to Admiral S. Osborn, but not by himself. His own experience of ice navigation, and the details he gathered from the crew of the *Polaris*, are, however, so

important that it has been thought desirable to bring them before a meeting of the Society thus early in the Session, in order that the Fellows may be in possession of the new data relating to the problem of Arctic exploration. In the present very brief communication the chief points of interest connected with the discoveries of the *Polaris* will be enumerated, and the experience acquired from a modern voyage in a powerful steam-whaler, as regards ice navigation, will be pointed out.

It must be remembered, in the first place, when we consider the remarkable character of Captain Hall's voyage, that his vessel was ill adapted for the purpose, and had insufficient steam-power; that the commander was a man without education, and that he was in no sense a seaman, but rather an enthusiastic and most gallant leader, depending on others to navigate his vessel and to render his discoveries useful; and that the officers and crew were for the most part advanced in years, of various nationalities, without any zeal for discovery, without discipline or control, and in a position in which every man considered himself as good as his neighbour. Mr. Hall himself, and Dr. Bessels, were the only two among the ill-assorted company who were really interested in the work. It is necessary to dwell upon this aspect of the question, to show how much, how very much might be done, under the same circumstances, by a really well-equipped naval expedition.

The most striking fact connected with the voyage of the *Polaris*, in August 1871, is that she went from Cape Shackleton to her extreme northern point up Smith Sound, in $82^{\circ} 16' \text{ N.}$, in five days, without obstruction of any kind; and that even then she was stopped merely by loose floes, through which a powerful vessel, like any one of the Dundee whalers, could easily have forced a passage. Indeed, Captain Markham was informed that the *Polaris* was stopped by a very insignificant stream of ice, with a magnificent water sky as far as could be seen to the northward. Hall himself was most reluctant to turn back; but, being no sailor, and having no experience in ice navigation, he thought he had no alternative but to follow the advice of old Captain Buddington, who had no interest in the matter, and feared that if they persevered it might be difficult to retrace their steps.

The floes up Smith Sound were not of a heavy description, and seldom exceeded five feet in thickness, so that we may infer that they were formed in one winter. No icebergs of any size were seen to the north of 80° . But there is one very remarkable point connected with the ice-drift. At Newman Bay, about 18 miles to the northward of the winter quarters of the *Polaris*, in $81^{\circ} 38' \text{ N.}$,

the floes appeared to be heavier and more extensive than they were to the southward, although they were all drifting to the south and west. Two or three of the fields off Newman Bay were estimated to be a mile long and of considerable thickness; but all the ice seen from their winter quarters appeared to be only of one year's growth. Dr. Bessels believes the opening called Lady Franklin's Bay to be a strait, and he accounts for the disappearance of the heavy ice to the south of about $81^{\circ} 30'$ by its drifting into that opening.

The coast of Greenland, at the furthest point reached, is steep and precipitous, and is free from land-ice; while the shores of Grinnell Land, on the opposite side, appear to be low and shelving, and have fast ice attached to them. The extreme northern points of Greenland and Grinnell Land appeared to reach to about the same latitude, $82^{\circ} 20' N.$; and beyond them, with a channel about 50 miles in width intervening, a distant polar land was made out, in about $84^{\circ} N.$ This will probably be that "paradise of birds" where the knots go to breed, and all the other vast congregation whose place of nidification has not yet been discovered. But there is reason to think that, at some time or other, human beings have been there also, for at the furthest point reached by the *Polaris* the vestiges of man were found. They consisted of a couple of walrus ribs, which had been used as sledge-runners; a small piece of wood that had formed part of the back of a sledge; an old bone-knife handle; and the remains of a summer encampment—three circles of stones for keeping tents in position, with spaces left for the entrances. Traces of the presence of man on the verge of the unknown region are proofs of its being habitable, and consequently of the presence of open water and much animal life.

A regular current was flowing down the strait from the north, and the prevailing winds were from the north-east. In $82^{\circ} N.$ much drift-wood was seen; and Mr. Chester, the mate, picked up a piece, 4 feet long, which most probably was borne on the waves of a Polar sea, from the coast of Siberia. The most interesting discovery connected with oceanic movements was that the tidal waves from north and south meet at Cape Fraser, on the west coast of Grinnell Land. This was fully demonstrated by the drift of the *Polaris*, and by tidal observations. To the south of Cape Fraser the flood-tide makes to the north, whilst to the north of that point it flows south. The rise and fall during spring-tides was about $5\frac{1}{2}$ feet, and during the neaps about 2 feet. No agitation of the water was noticed off Cape Fraser, caused by the meeting of the two waves, for the ice would effectually prevent anything of the sort. To the south of Cape Fraser the tide

rose to a greater height during the night, as is the case along the coast of Greenland; whereas to the north of Cape Fraser there was no perceptible difference between the day and night tides.

Turning from the experience of the *Polaris* during the navigable season to what is to be learned from the story of winter quarters in Polaris Bay, the details are equally instructive. This expedition passed the winter in $81^{\circ} 38' \text{ N.}$, a point considerably further north than any human being has been known to have wintered before. The prevailing winds were from the north-east, and the lowest temperature registered was $-48^{\circ} \text{ Fahr.}$ Now Kane's minimum, in a position 180 miles further south, was -69° , and the minimums registered by expeditions wintering among the Parry Islands ranged from -48° to -59° ; so that the cold certainly does not increase on approaching the Pole. Indeed observations tend to the conclusion that the pole of cold is much nearer to the Arctic circle than to the Pole of the earth. In the comparatively mild climate, between the 81st and 82nd parallels, fifteen species of plants were found, and the herbage was sufficient to sustain herds of musk oxen, twenty-six of which were shot. Seals of three kinds were seen as far north as $82^{\circ} 16' \text{ N.}$, besides foxes and lemming, ptarmigan, seventeen other kinds of birds, including the rare Sabine gull and the Iceland snipe, and several insects. With the exception of poor Hall himself, not a man of the expedition died, although many were far advanced in years and had led hard lives, and all returned in perfect health.

We learn from the voyage of the *Polaris* that a vessel may steam up Smith Sound to 82° or 83° , and probably much further, without any difficulty; that land exists in 84° , or at a distance of only 350 miles from the North Pole; that currents and tides, ebbing and flowing between Baffin's Bay and the Polar ocean, keep the ice within the strait in constant motion, and indicate its navigability at intervals during the working season; that the climate far to the north is milder than in the more southern portions of the Arctic regions; that there is great abundance of animal life; and that the subjects for scientific investigation, which have been indicated by the labours of Dr. Bessels, are even more numerous and interesting than had been anticipated.

Let us now turn to the voyage of the *Arctic*, and contemplate the remarkable change which the use of powerful steamers has caused in ice-navigation. The *Arctic* is a steamer of 439 tons and 70 horsepower, with angle-irons on each side of the stem, and strongly fortified inboard. Her first encounter with ice was in Davis Straits, when Captain Markham was a witness to the way in which she forced a passage through 50 miles of formidable pack, in which a

sailing vessel would have been perfectly helpless. Then came the passage through Melville Bay, between the land-ice and the moving pack, which had been the terror of the whalers for the last half century. There are several persons in this meeting who have been in Melville Bay for thirty and forty days, in a sailing vessel, or still worse, in a steam-tender, obliged to wait upon a sailing vessel, tracking and blasting, sawing and cutting, and wearing their lives out with bitter annoyance at the delay. Now, this year was not exceptionally clear; there was a good deal of ice, and much care was necessary, as well as some little charging of the ice, and judicious audacity. Yet the *Arctic* succeeded in passing through the ice of Melville Bay and reaching the North Water in sixty hours. Again, when beset several times in the middle ice, and in Prince Regent's Inlet, the *Arctic* was able to force her way through pack in which a sailing vessel would have been utterly helpless. To one who, like Captain Markham, had studied the records of Arctic voyages with care, these performances of the steamer in which he was taking a passage were most suggestive. There was nothing to have prevented her from proceeding up Smith Sound in the track of the *Polaris*, if the Captain could but have been persuaded that there were whales in that direction. The whale fishers are very slow to go off the old beaten track without some strong inducement, and a Government expedition must lead the way and bring to light the capabilities of the unknown region as regards the yield of oil-producing animals before its productions are sought after by traders. But even in the ordinary course of the fishery and during a short summer cruise the *Arctic* went further than the expedition of Sir Edward Parry in 1824, or of Sir James Ross in 1848; than that of Mr. Saunders in 1850, of Captain Forsyth in 1850, of Mr. Kennedy in 1851, and nearly as far as that of McClintock in 1858. These facts show the great change that steam and other modern appliances have effected in ice-navigation, for the voyage of the *Arctic* this year was not exceptional. The same voyage, with the exception of the run down Prince Regent's Inlet to Cape Garry, has been made year after year since she was built.

Captain Markham was thus enabled to visit the scenes of winter quarters of former Arctic expeditions, which have become classic ground in the glorious annals of northern discovery.

At Port Leopold he examined the traces left by the expedition of 1848, under Sir James Ross, with whom the late Sir Robert M'Clure, Sir Leopold McClintock, and Captain Cheyne, were serving. Here were the framework of the house on Whaler Point, the steam launch, and the great dépôt of provisions, and Captain Markham picked up

a cylinder red with rust, containing the numerous records left by Sir James Ross and others, all soaked with wet. As they must have perished if they had continued there, he carefully dried them and brought them home, delivering them into the hands of Sir Alexander Milne. A notice of what he had done was written out, and secured in the cylinder to one of the posts of Sir James Ross's house. The provisions at Port Leopold, which had been lying there for twenty-five years, were in a wonderful state of preservation: the biscuits being as good as when baked, and the tobacco and chocolate quite fresh. About 230 casks, of different sizes, were lying about in all directions.

After cruising about for some time in Lancaster Sound and Barrow's Straits, the *Arctic* made a run down Prince Regent's Inlet into Creswell Bay, and beyond Cape Garry, where a great number of whales were found; and this inlet thus bids fair to become an important fishing station, as Sir Edward Parry prophesied many years ago. This gave Captain Markham another opportunity of visiting a spot which has become classic ground in the annals of Arctic adventure, namely, Fury Beach. Here, it will be remembered, H.M.S. *Fury* was forced on shore in 1824, and, notwithstanding the strenuous exertions of Sir Edward Parry and every soul in the expedition to heave her down and repair damages, she became totally unseaworthy, and was obliged to be abandoned. Anchors were laid out on the beach with cables passed round masses of grounded ice, to form a safe wet dock; all the stores and provisions were landed to lighten her, and there was a display of splendid seamanship. But all was of no avail, and an immense pile of stores and provisions was left on Fury Beach. Sir John Ross, in 1829, took tons away, and, when he and his crew wintered there in 1832-33, they lived on these provisions. The place was last visited by Mr. Allen Young in March, 1859, and no living soul had landed on Fury Beach since that date. Casks, spars, rigging, and a perfect assortment of ship's stores, were strewn about in all directions, with the remains of "Somerset House," in which the Rosses and their men had passed several dreary months. Three bower-anchors were on the beach, two boats, the topsail-yards, and the running riggings of the *Fury* unrove, and jagged up in five-fathom lengths. Hundreds of tins of preserved meat and vegetables were lying about, all in an admirable state of preservation after a lapse of nearly fifty years. And even the rope was quite fresh. There is also a perfect set of whaling implements, including lances and harpoons. Captain Markham brought two home, and one of them, although it has been exposed to the frosts and thaws of forty-eight

years, only required a little rubbing up to be as bright as when it was first made. He also picked up two seamen's knives and a pair of binoculars, which must have belonged to some Arctic worthy of the last generation. Another relic is the small piece of wood, of oval form, from the stern of the cutter, on which the boat's recall had once been painted. Although all the paint has disappeared, the outline of the Union Jack with a pennant under it, can still be made out. The visits to Port Leopold and Fury Beach have been particularly alluded to, because they bring home to us the revolution that has taken place in ice-navigation. Points which were reached with extreme toil and difficulty by Sir Edward Parry and Sir James Ross, and which were the farthest limits of their respective voyages in sailing-vessels, were visited this summer by a steamer without any check worth speaking of, and in the ordinary course of a whaling voyage. It is true that, even in former days, occasional fortunate voyages were made; but what was then the exception is now the general rule. The difficulties of ice-navigation must not be under-stated, but there can be no doubt that those difficulties have been materially reduced by the skilful and seaman-like application of steam-power and other modern appliances. A very great insight may be obtained into the present system of ice-navigation by a voyage in a whaler undertaken by a naval officer; and the idea of despatching Captain Markham on this duty is one which was most happy in itself, and for which geographers are certainly very much indebted to Admiral Sherard Osborn.

The Meeting will, I think, be of opinion that the results of the Arctic investigations in 1873, though humble in themselves, have added something to our knowledge, and will not be wholly unprofitable in furthering the great cause of Arctic discovery.

Admiral R. COLLINSON said his experience in the Arctic regions was limited to the regions east of Behring Straits, but he had advocated from the first the prosecution of Polar research by way of Smith Sound, and he was glad to find that the United States Expedition had been so successful. The voyage of the *Polaris* afforded evidence that further exploration in the same direction would be attended with satisfactory results. Undoubtedly, in the upper part of Smith Sound there appeared to be a rise of temperature, which at present could not be accounted for, and the investigation of this subject was of the greatest possible importance.

Captain CHEYNE (who accompanied Sir James Ross's expedition) said it was his deliberate opinion that it would be a comparatively easy thing for an expedition to reach the North Pole, either in a vessel or by a sledge party; and if England did not now do her duty in this respect, she would find other nations soon surpassing her. The Royal Society and the Geographical Society had always "backed up" Arctic research, and he trusted that they would continue to do so until the North Pole was finally reached.

Admiral SHERARD OSBORN said, after the disappointment of last spring, he was glad to find a naval officer on half-pay who was ready to devote

himself to the best method of obtaining information from the Arctic regions, so as to strengthen the hands of those who intended again to apply to her Majesty's Government for the despatch of an expedition. It was of the utmost importance to know what progress had been made during the past ten years in ice-navigation. He himself, and one or two others present at that meeting, went out in 1850 in the first steam-ship that ever penetrated the ice. Before their departure they had the consolation of being told that they would only live 48 hours in the ice; but they were very soon convinced that a great change was about to take place in Arctic navigation. Captain Penny, a distinguished whaler, said a great revolution would take place, and such had been the case, for at the present day all the vessels that had attempted to penetrate the ice were steamers. Some years ago it was considered lucky if in one season one ship out of three could cross the middle ice, but the captain of the *Arctic* told him that for nine consecutive years he had never failed to pass through it. Captain Markham had seen how this was accomplished. The change was most remarkable; for here was a whaler, not sent out to run unnecessary risk, but merely in the ordinary way of business, passing the extreme point reached by some half-dozen Arctic expeditions, and returning, a full ship, two months earlier than the period at which whalers formerly came home. She was back early in September, whereas, twenty years ago, whalers thought themselves fortunate if they reached home by the 14th of November. The Arctic whale-fishery was the best school in the world for mercantile seamen. Arctic whalers were the pick of the mercantile marine. Their labours were continuous, and the risks they ran were extreme. They had to hunt a fish which would assuredly destroy them if they did not kill him. They ventured among the ice in the boldest way, and thought nothing of leaping from their beds into their boats and working in them 13 or 14 hours before they returned to the ship. Yet this great school for our seamen would have been closed years ago, if it had not been for the labours of Arctic explorers. The old Spitzbergen field was discovered in the course of Arctic exploration. Davis discovered Davis Straits, where the fishery continued for years, and the whalers never passed through that ice until Sir John Ross fought his way through and discovered whales further north. From that time the whalers forced their way through the middle ice. Parry discovered the fishery in Prince Regent's Inlet, and declared that it would be the great fishery of the future, and whenever the captain of the *Arctic* reached that ground he invariably filled his ship. No doubt there were other parts in which the whales congregated after being driven from their old grounds, and undoubtedly, if future Arctic explorers discovered fresh fisheries, the Dundee and Aberdeen fishermen would follow in their wake. It was a remarkable commercial fact, that the whale-oil of the Arctic Seas was largely used in the preparation of a fibre produced in British India—jute. The quantity of this material that was worked up in Dundee was enormous. During the last eight years he had been concerned in the manufacture of submarine cables, for which tens of thousands of tons of jute had been required, and every ton of it had to be manipulated with whale-oil brought from the Greenland Seas. This was a curious fact, showing how wonderfully one branch of commerce was connected with another. He attached great importance to the fortunate meeting of Captain Markham with the crew of the *Polaris* before they had been dealt with by the reporters of the New York press, and also before any attempt was made in New York to make the tales of the two parties coincide. One-half the crew of the *Polaris* drifted during a snow-storm on an ice-field down to the coast of Labrador, and reached the United States some months ago. The remainder of the crew were met with by Captain Markham in the *Arctic*, and by another whaler, the *Ravenscraig*, during the past whaling season in Baffin's Bay. They had abandoned the *Polaris*, and were going south in their boats to the Danish

settlements. The story given by the men was a very clear one. There could be no doubt that they had run 720 miles, from Cape Shackleton, in the month of August, up Smith Sound, without meeting with any important impediment, up to the furthest point yet reached by any vessel, in fact, within a few miles of Parry's farthest north latitude from Spitzbergen. The man who was the heart and soul of the expedition then died, and from that time no further effort was made to proceed northwards, though there was plenty of water and sailing ice, and though one of the men, who went up on a hill near where they wintered, saw far to the north high Polar land. The *Polaris* found the west coast of Smith Sound to be a very indented coast, evidently a part of that great Arctic archipelago known to English navigators. The crew of the *Polaris* were so aged that Captain Markham said he could hardly call one of them an efficient, able-bodied seaman, and not one was fit to be put into a sledge. There were, too, more captains than seamen. Yet that wretched crew did not lose one man throughout the whole winter. The only person who perished was Captain Hall, and his death was so unexpected that it aroused suspicions of his having been poisoned. Much could not be said of the mild temperatures existing, as the Pole was approached, until the publication of the data, but in a general way it might be stated that it was milder in the upper part of Smith Sound than further south. Every seaman of the crew assured Captain Markham that the tide came from the north, and there could therefore be little doubt in an ordinary man's mind that it must come from some great sea north of Spitzbergen and Greenland. There was no force of water from the west, so it must come from the Atlantic through the Polar current.

Mr. R. H. PRANCE suggested that, if the Government did not think it worth while to fit out another expedition, the Royal Geographical Society should undertake to do so. He was quite sure that sufficient funds could easily be obtained by public subscription.

Admiral SHERARD OSBORN said he had weighed the same suggestion for the last ten or twelve years, and he would be the last man to go to Government for help if he thought it right that a private expedition should winter in the Polar Sea. Experience had taught him that the readiest way to commit her Majesty's Government to successive Arctic expeditions for several years to come, would be to fit out a private expedition under a bold leader and get him to push into the Polar Sea. The probabilities were that the whole country would then be roused, and search expeditions sent out for the next quarter of a century, but such a proceeding he would never be a party to. In order to have a perfect Arctic expedition it was necessary that it should be under Government auspices, with naval discipline, naval order, and naval *esprit de corps*, to carry them through the labours of an Arctic winter and spring. He could not in public state what he knew of the sufferings of some of the American expeditions, and the causes of those sufferings; but the starvation of Kane's people arose from want of organisation and open mutiny, and Captain Hall had to take the life of almost his only companion in the Gulf of Boothia. He therefore thought it would be a great mistake for private enterprise to do more than supplement a Government expedition, by taking care after a public expedition had sailed, to keep open communication annually between the dépôt ship and England.

Mr. PARKER SNOW said he knew Captain Hall intimately. For a considerable time he had his private journals in his possession, and was therefore acquainted with the inner heart of the man, and was convinced that he was about the last person whom the American Government should have placed in command of so important an expedition. A more gallant, brave, and enduring explorer did not exist, amongst his own loved Esquimaux; but it required a naval man, and strict discipline, for such an undertaking as that in which the

Polaris was lost. He himself considered it a national duty on the part of England to accomplish that which she had been striving after for over 300 years. In 1850, when, as second in command under the late Captain Forsyth, they ran through Baffin Bay, Lancaster Sound, and down Prince Regent Inlet, to the very position reached this year by the *Arctic*, they found open water, until they reached a barrier of ice below Fury Beach. They then turned back, and arrived home in safety, never having dropped anchor during the four months they were out. He thought a small topsail schooner, of course with auxiliary power, would accomplish as much as a large steamer. Any expedition sent out should remember that Franklin's journals were as yet undiscovered, and numerous bodies of our unfortunate countrymen unburied, also that round by Behring Straits the coast is navigable right up to King William Land.

Second Meeting, 24th November, 1873.

SIR H. BARTLE E. FRERE, K.C.B., K.C.S.I., &c., PRESIDENT, in the Chair.

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PRESENTATIONS.—*Dr. Don Manuel Gonzalez de la Rosa*; *W. L. Lawrence, Esq.*; *James Price, Esq.*; *Neville Hart, Esq.*