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To the North Magnetic Pole and Through the North-West Passage

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# The Geographical Journal.

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## TO THE NORTH MAGNETIC POLE AND THROUGH THE NORTH-WEST PASSAGE.\*

By Captain ROALD AMUNDSEN.

To Sir John Franklin must be given the honour of having discovered the North-West Passage, and to Admiral Sir Robert McClure that of being the first to pass through it, partly in his vessel the *Investigator* and partly on foot. On the foundations laid by the splendid work done and the rich fund of experience gained by English navigators in these regions, I succeeded—in the track of Sir James Ross, Dr. John Rae, Admiral Sir Leopold M'Clintock, Sir Allen Young, and many others—in making my way in the *Gjøa* to the region around the Earth's north magnetic pole, and, furthermore, in sailing through the North-West Passage in its entirety. If I have thus been the first to sail through the North-West Passage, it is with pleasure that I share the honour with those brave English seamen—the seamen who here, as in most of the other parts of the world, have taken the lead and shown us the way.

It was the Norwegian minister to England, Dr. Fridtjof Nansen, who, by his great experience and his many good counsels, made the *Gjøa* Expedition what it was: one in all respects well planned and excellently equipped. In order not to tire my hearers, I will give in as few words as possible the earlier history of the expedition.

The scheme of the *Gjøa* Expedition I had a welcome opportunity of laying before the Norwegian Geographical Society on November 25, 1901. It was briefly as follows: With a small vessel and a few companions, to penetrate into the regions around the Earth's north magnetic pole,

\* Read at the Royal Geographical Society, February 11, 1907. Map, p. 596.  
No. V.—MAY, 1907.]

and by a series of accurate observations, extending over a period of two years, to relocate the pole observed by Sir James Ross in 1831, and also to make investigations in its immediate vicinity. This was the chief object of the expedition.

The condition of the ice still farther west allowing of it, it was furthermore my intention to attempt to sail through the North-West Passage in its entire extent, this being a problem which for centuries had defied the most persistent efforts. I chose a small vessel, with the view to be better able to pass through the sounds of these regions, which are narrow, shallow, and generally packed with ice. In preferring a small number of members to a larger one, it was—apart from want of space—because, in the event of such a misfortune occurring to us as the loss of our vessel, it would be easier to find means of subsistence for a small than for a greater number of men.

My undertaking, as soon as it became known, awakened great interest in very wide circles, and several wealthy men came forward and supported the enterprise with donations. It would take too long to name all the persons who gave the expedition pecuniary support, but I must in respectful gratitude mention the names of their Majesties King Haakon and King Oscar II.

The vessel of the *Gjøa* Expedition was built in Hardanger in 1872, and was my only contemporary on the trip. She had originally been used in the herring fisheries along the Norwegian coast; later she was sold to Tromsø, whence she sailed for many years in the Arctic sealing trade. She had weathered many a storm, though not always scathless. After my purchase of her, I had a small petroleum motor, of 39 indicated horse-power, put into her, to help us along in calm weather. The ice-sheathing, which before only reached a couple of planks under the water-line, I had lengthened right down to the keel; stout cross-beams were put into the hold and connected with massive joints to the deck and keelson, and the old hempen rigging was replaced by wire rigging.

I had chosen my companions by degrees. First in order I must mention the man who sacrificed his life in the service of the expedition, Gustav Juel Wiik. He was born in 1878, at Horten, and thus lived to be somewhat over twenty-seven years of age. From six weeks' study shortly before the departure of the expedition, at the Magnetic Observatory at Potsdam, where he particularly studied the use of self-registering magnetic instruments, he returned with the most excellent testimonials for industry and thoroughness. I had a good opportunity of seeing, during our three years of work together, that these testimonials were not exaggerated, and the magnetic data we brought back with us I owe, in the first instance, to this young man's painstaking and accurate labour. In addition to his position as assistant in the meteorological observations, he was also the second engineer.

The second in command of the expedition was Lieut. Godfred Hansen, of the Danish navy, born in Copenhagen in 1875. His light-hearted disposition was of absolute benefit to us, and during the three years—more than three years—that he and I spent together in the little cabin of the *Gjøa*, 6 × 9 feet, I became more and more attached to him. It was prophesied before our departure from Norway, that



CAPTAIN ROALD AMUNDSEN.

within a year we should not be able to bear the sight of one another; this prophecy, however, we thoroughly gave the lie to, and I almost think we could have managed three years more. He was the navigator of the expedition, the astronomer, geologist, surgeon, photographer, electrician, and an expert in dealing with our explosives. He also played star-parts as meteorologist and magnetician. Sergeant Peder Ristvedt was born in Sandsvär in 1873. Besides being first engineer,

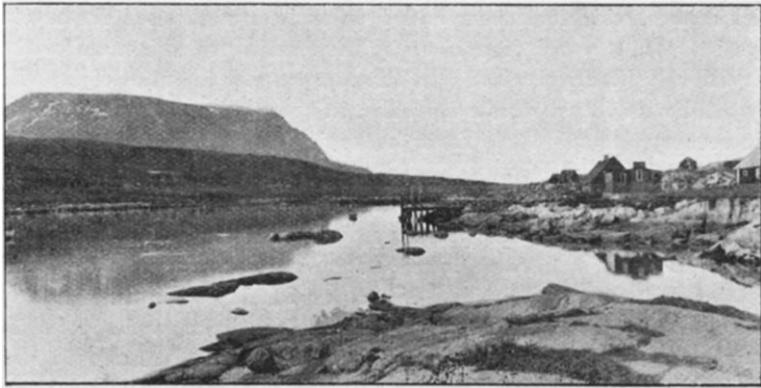
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he was also our meteorologist, smith, clockmaker, copper and tinsmith, gunsmith, etc. I knew Ristvedt before I engaged him, as he had taken part as assistant in my first expedition in the *Gjøa* in 1901. I was thus aware of what I was doing when I secured the service of this capable man and pleasant companion. Anton Lund was the first mate of the expedition. He was born at Tromsø in 1864, and was thus the oldest member of the expedition. He had sailed from his earliest youth on our Norwegian sloops to the Arctic ocean, and was consequently an unusually experienced man in all matters connected with the condition of the ice and navigation through it. Helmer Hansen was born in the Vesteraal islands in 1870. He had previously been a peasant, fisherman, and Arctic navigator. His position was that of second mate, and he was careful and conscientious in all that he did. Last of all, then, comes the cook, Adolf Henrik Lindström, born at Hammerfest in 1865. He took part in Sverdrup's expedition in the *Fram*, and had thus extensive experience as an Arctic cook. I will confine myself to informing you that, besides providing us for three years with excellently prepared food, served to the minute, he voluntarily filled the vacant posts of botanist and zoologist. His kitchen work ended, he was pretty sure to be seen abroad on arctic summer evenings with his botanical collecting-box, his shotgun, and his butterfly-net, and woe to the flower, bird, or insect which came his way! After this description of my comrades, I feel sure that none of my hearers will be surprised that we succeeded in accomplishing what we did.

At twelve o'clock on the night between June 16 and 17, 1903, we cast off, and the *Gjøa* was towed down the Christiania fjord. It poured with rain, and was as dark as in a sack. Some of my friends tried to console me by saying that the weather was much the same when Nansen started in 1893, and that it was a good omen. However, I had never been a believer in omens, and I therefore felt myself, in spite of these auspicious torrents, very uncomfortable in my soaking clothes. At six in the morning we entered the harbour at Horten, where we took our explosives aboard. At eleven in the forenoon the last tie which bound us to home was broken, for the tow-rope snapped, and left the *Gjøa* to her own fate. We were then just outside Färder lighthouse. After the tug had given us the proper farewell civilities, it stood up the fjord again, and the *Gjøa*, by her own exertions, worked her way slowly forwards against a southerly breeze. The voyage across the Atlantic has been made countless times, and does not offer any particular interest. A great number of people had, indeed, designed this ocean as the *Gjøa's* last resting-place; but, in spite of many prophecies and many warnings, our good little *Gjøa* quietly and calmly worked her way onwards, giving not a moment's thought to all the wiseacres. How glorious it was to have exchanged the narrow hot streets for the open sea! and not only we human beings enjoyed the change, but our dogs likewise. We had,

I should explain, six dogs with us which had taken part in Sverdrup's expedition, and they seemed to enjoy the voyage exceedingly, running about and getting into as much mischief as was to be attained. Their spirits were particularly high on rough days, as then they had an agreeable change in their otherwise somewhat monotonous diet (consisting of a stockfish and a quart of water), in the shape of the delicious viands sacrificed to them by my seasick companions.

On July 9 we sighted the first ice, in the vicinity of Cape Farewell, the southern extremity of Greenland, and on the 11th the land round the cape itself appeared in sight. The wind, which had not been particularly favourable to us up to this, did not improve now, and our



GODHAVN.

voyage up the whole of the west coast of Greenland was thus one single struggle against the ever-prevailing north wind. We had to console ourselves with the proverb that "it is an ill wind which blows nobody any good." Though the contrary wind from the north hindered our progress, it at any rate set the ice in motion southwards, and made a way for us.

The voyage, which had hitherto been somewhat monotonous, became more lively on the appearance of the ice. Icebergs of varying shape glided past us and took captive our attention. Now and then we made an excursion into the drift-ice, and shot some of the beautiful large bladder-nose seal that were lying about on the higher parts of the ice. Both men and dogs were longing for fresh meat, and this sealflesh provided us with an agreeable change in our menu.

On July 24 we sighted Disco island, and the day afterwards anchored at Godhavn, whither the Royal Danish Greenland Trading Company had been kind enough to bring some of our equipment in their ships. Here we spent five days, enjoying the great hospitality of the inspector and the governor of the colony. After having taken a series of

magnetic and astronomical observations, and shipped all our things, we left the place on July 31.

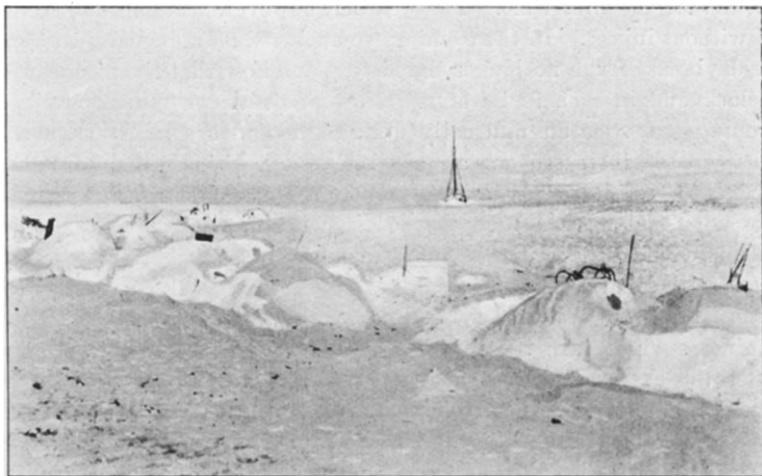
On August 8 we reached Holm island, which marks the beginning of the redoubtable Melville bay. The ice was packed close, but, however, proved to be broken. We kept cruising backwards and forwards alongside the edge, watching for an opportunity to enter it, and at last, on the evening of the 10th, it so far slackened that we were able to slip in. In thick fog, we wound our way about through fairly practicable ice, a few icebergs now and then breaking up the dense masses of the fog with the strength of their flashes, calling to us their own warning. On August 13, at half-past two in the morning, we saw the last of this fog, the *Gjøa* quietly and calmly gliding out of the thick masses, which had surrounded us as in a nightmare for several days, into a new world, lighted up by the loveliest sunshine, and with a marvellously beautiful view. In the east we saw the head of Melville bay filled with impenetrable icefields; in the north lay the fine mountain scenery around Cape York, beckoning and calling to us in the sunshine—the feeling was overwhelming; before us, shining in blue and white, lay the huge masses of drift-ice. There was not much open water to be seen from the masthead, but then we did not want very much. On August 15 we reached Dalrymple rock, where two Scotch captains, Milne and Adams, had left a largish depôt for us. Here we fell in with the Danish Literary Greenland Expedition, and spent a few lively and pleasant hours with the members of it. On August 17 we continued our voyage, and bore across Baffin bay, in sight of the Carey islands. It was lucky for us that we met with calm weather here, for with our deeply laden vessel a storm might have had serious consequences. Besides our sky-scraping deck cargo, there were on the top of it all our eighteen dogs, the greater number of which had been shipped at Godhavn. By way of making the time go quicker, they had divided themselves into two about equally strong sides, and from time to time made inroads on each other's territory. This game, needless to say, was hardly to the liking of the man who happened to have the watch, and many a round oath found its way out into the world. On August 20 we stood into Lancaster sound; a few icebergs, which had collected round Cape Horsburgh, and some slack ice stretched straight across the sound. We kept in under the northern shore. The land made an exceedingly barren impression; there was no vegetation to be seen, and the mountains were high and table-topped. It was, however, not often that we were able to see land, the fog for the most part being thick and heavy.

On August 22 we reached Beechey island, where I had arranged to stop and take a series of magnetic observations, which were to decide our future course. Before the departure of the expedition, several persons more interested than learned in terrestrial magnetism had

written to me, pretending by a subtle method, which, however, they did not disclose, to have discovered that the magnetic pole had moved, with a speed of I don't know how many miles in the year, in a north-westerly direction, and was now on Prince Patrick's Land. They might as well have said in the moon for all they knew.

Beechey island gives a barren and dismal impression; and particularly sad are the ruins of the house erected by the British Government for the succour of the Franklin Expedition. Five graves did not make it any more cheerful. The memorial stone to Sir John Franklin was the only thing which in the least brightened all this sadness—a handsome marble tablet, put up to his memory by his faithful wife.

The magnetic observations indicated the pole as being in a southerly



ESKIMO CAMP NEAR GJÖA HARBOUR.

direction, and Prince Patrick Land was this time left in peace. We left Beechey island on the 24th, and shaped the course for Peel sound, entering those waters in dense fog. The ice was the whole time fairly practicable, and we met only loose streams which presented no hindrance. At Prescott island the compass, which for some time had been somewhat sluggish, entirely refused to act, and we could as well have used a stick to steer by. Navigation, as we now practised it, was at first a somewhat unfamiliar proceeding, and when one watch released the other, and the fog lay close and compact, as it always did, strange remarks might have been heard. "What are you steering?" would ask the relieving watch, in a cross and sleepy tone. "Supposed to be steering south, but ain't sure we're not going north;" and as he handed the tiller to the other, one would hear, "Steady—so." So there one would be

at two o'clock in the morning, just up from a comfortable warm berth, the fog pouring down over everything, and absolutely nothing to be seen in any direction, and one was to steer steady! This was certainly great fun; but custom is a remarkable thing. Within a short time we became quite at home even with this sort of navigation, and we made way. On August 28 we passed the spot where Sir Allen Young was stopped in his vessel the *Pandora* by impenetrable ice. Later in the forenoon the western entrance to Bellot strait, where Sir Leopold M'Clintock in vain tried to get through, was passed. Now began our voyage along the west coast of Boothia Felix—a voyage that more than once looked dark for us. We were not hindered by ice to any great extent; the land lead was, as a rule, so wide that we could get along without difficulty; but that which was worse for us was the shoal water, the constant fog, and the pitch-dark nights. On August 31 we struck ground for the first time. The weather, however, was fine, and we got off without injury. In the evening we anchored off a low island to wait for daybreak, for I no longer dared to go on now that the nights were so dark, and in such foul waters. How peaceful everything was that evening! It was an unusually dark night and absolutely calm, and what greatly increased our already romantic position was the fact that we—I confess it openly and without shame—had no idea where we were! The land had been mapped in winter, and many of the small islands which we came across were not marked at all, the snow covering them at the time having rendered them invisible. All was so peaceful, quiet, and calm. We had all retired, and left the watch to one of the engineers whose turn it happened to be. I had just got out my log to enter the events of the day, when I was suddenly interrupted by the cry of fire. I knew what this meant on board a small vessel carrying 7000 gallons of petroleum, great quantities of gunpowder and explosives, and whose whole hull was, besides, saturated with tar. We were all up on deck in less time than it takes to tell it. The first thing that met our eyes was an enormous pillar of fire rising up through the engine-room skylight. Things didn't look peaceful any longer. We all ran like mad for vessel and life! The engineer on watch had not left his post; he was holding out bravely down below in the suffocating smoke, trying to the best of his abilities to subdue the fire, which had arisen in some cotton permeated with petroleum. This was Wiik. We succeeded by united exertions in becoming master of the fire, and got off without much damage.

The evening of this same day we beat up under an islet and anchored there. We took this to be one of the small islands lying north of Malty island. It was then blowing hard and night coming on. At four the next morning we weighed, and continued our course. It was a fine morning, partially clear, and with a westerly breeze. I was at the tiller, and my two comrades were hoisting the sails. Suddenly there was

a shock, and we struck three times. All expedients to get off were in vain, and there we were for thirty hours. A strong breeze blew up from the north, and came to our assistance, and under crowded sail we succeeded in forcing the *Gjøa* across a 200-yard-long bank, and out into comparatively deep water. We only lost our false keel; but from that day to this it has been a matter of wonder to me that human handiwork could have withstood the treatment which the *Gjøa* underwent on that occasion. During this enforced delay we got a determination for position, and thus knew where we were. About midday we cast anchor off Cape Christian Frederik, on Boothia Felix, so as to get things a little in order after grounding. The wind was then slack and off shore. At eleven in the evening, it suddenly went over to the



VEGETATION AT KING POINT.

south-east, and blew hard. There was no question, in the darkness and the shoal and foul sea outside, of getting under way. There was only one thing to be done, and that was to pay out our cables to the bitter end and await results. The wind soon increased to a gale, the seas were high and short, shaking our chain cables violently. The land did not look as well now as when we came in and anchored into it to leeward. All hands were on deck, and getting ready for the stranding which seemed inevitable. Each man had had his work allotted to him, and at the moment when the cables gave would be in readiness at his post. The petroleum motor was going at full speed, and the vessel was kept well up to the wind and sea, by which means I hoped to ease a little the violent strain on the cables. We had anchored at midday on the 3rd, and it was not till four o'clock on the 8th that the wind dropped sufficiently for us to get out again. Then another drifting night in pitch

darkness among shoals and rocks, and then at last release. It is impossible to describe the well-being, the feeling of calm and safety, which came over us after these ten days of ceaseless fighting, when we dropped anchor on September 9, at half-past three in the afternoon, at the head of Petersen bay, in King William Land. There, approached by a narrow inlet, lay the harbour which was to be our place of sojourn for two years—"Gjøahavn," or Gjøa harbour. A fresh land breeze prevented us from standing in, and it was not till the evening of the 12th that it fell sufficiently for us to beat up against it and drop anchor. Now we could breathe. We had done a good bit of work.

"Gjøahavn" was all that the heart could desire, small and landlocked. Low sandy land, covered with moss, rose gently upwards from all sides, until it reached a height of 150 feet, and thus formed a sheltered little basin where we could lie safe and snug. The day after our arrival here I rowed ashore with my instruments to ascertain the state of the magnetism in this area, and, strange as it may sound, we had found the very spot which, according to my scheme, was the most suitable for a magnetic station—about a hundred nautical miles from the magnetic polar area. There was no longer any doubt; this would be our home for the next two years. The time after this was very busy. The vessel was hauled close up to the shore, which fell abruptly away, a conveying rope rigged to the masthead, and all our provisions passed ashore by means of it. Everything was put in order, and the house which we built covered over with a sail.

Then came the observatories, and of them a mushroom growth sprang up. First the magnetic variation house, then a dwelling-house for the meteorologist and magnetician, the two latter being built of empty provision cases filled with sand. After that came the house for the absolute magnetic observations: the walls were built of blocks of snow, and the roof made out of thin transparent sailcloth. Finally, we built the astronomical observatory, which was known as "Uranienborg," this also being of snow, with a sailcloth roof. Besides all this building, we had done another good stroke of work in the shape of killing a hundred reindeer, and we had thus abundant provisions for ourselves and our dogs throughout the winter. The ice formed on October 1 and 2. The vessel was then covered with a winter awning, and everything got ready to receive the approaching winter.

On October 29 the first Eskimo made their appearance. Expectation on this point had always run high, and we had talked daily about meeting with them. Sir John Ross, in his description of his voyage, gives the word "Teima" as the usual salutation between white man and Eskimo; and we had therefore carefully laid this word to heart in order at once to check any warlike desires, should they be apparent. This first meeting was exceedingly ridiculous, and is one of our liveliest reminiscences. With two companions, armed to the teeth—namely,

Anton Lund and Helmer Hansen—I started off to meet the Eskimo, walking first myself, with two comrades following me at about three paces' distance. They had shouldered their guns, and had such a fierce expression on their faces that it alone would have been enough to put a warlike detachment to flight, to say nothing of the five unfortunate Eskimo who were approaching us. The step and set-up of my detachment were unexceptionable. Arrived at about a hundred paces from us, the Eskimo stopped, and we, not wishing to show less strategic ability, did likewise. Now, I thought, is the moment to set this matter at rest, and shouted "Teima" at the top of my voice. It did not seem to affect them in the least, and, after a short parley among themselves, they recommenced their march on us. They were five in number, had formed in a sort of fighting line, and now advanced towards us smiling and humming. Two of them had their bows firmly secured to their backs, and the three others were apparently unarmed. We on our side, of course, reassumed our advance, repeatedly shouting, "Teima, teima," and the Eskimo answered, but with quite another word, namely, "Manik-tu-mi." We now approached one another quickly, and finally ended by meeting. It was a remarkable encounter. The Eskimo stroked and patted us both in front and behind, all shouting "Manik-tu-mi" as hard as they could. We, true to our original plan of campaign, copied our adversaries, and shouted and howled, patted and slapped, to the best of our ability.

They were fine men, these Eskimo, tall and strongly built, and in their appearance reminded me more of Indians than of Eskimo, having the redskin type of complexion; they were, moreover, slim, and, as I said before, tall. The ordinary broad and fleshy Eskimo nose was exchanged for one better in shape, somewhat hooked; their hair was cut short, with the exception of a small crest of long hair which stretched from one temple round the nape of the neck to the other temple. We now proceeded, laughing the whole time, to the vessel. These Eskimo called themselves "Ogluli Eskimo," and looked upon the North American coast from Back river westwards to Adelaide peninsula as their hunting-fields. We made many good friends among this race, but it was not till later, when we met with the "Nechjilli Eskimo," that we made inseparable allies.

On November 2 the permanent station began its work. I will try, in as few words as possible, to explain terrestrial magnetism and the use of our magnetic instruments.

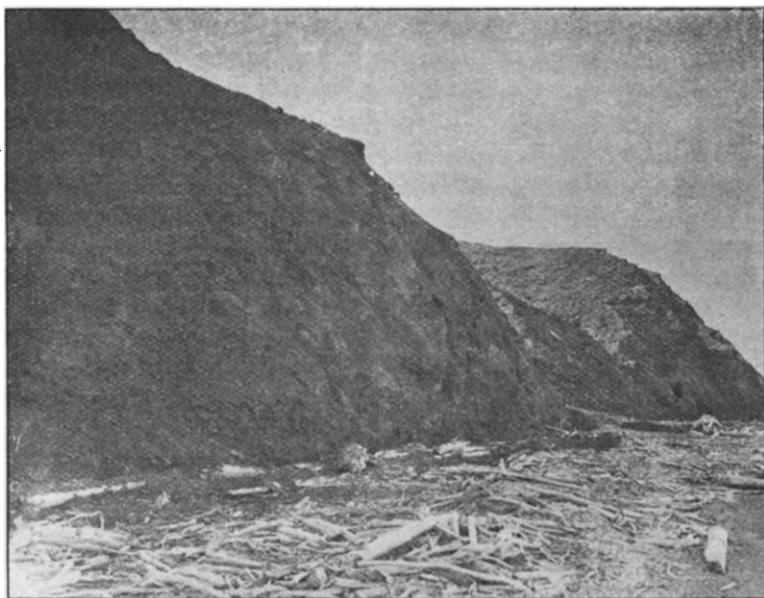
Terrestrial magnetic power is, with regard to direction and force, different on every point of the surface of the Earth, nor is it always the same in one and the same place. It is subject to regular daily and yearly changes, and, similarly, there often occur irregular more or less violent disturbances. Finally, small displacements show themselves from year to year, which continue in the same manner for a long series

of years. All this has been discovered through observations undertaken during the course of time at various parts of the surface of the globe, partly during travels, and partly by permanent stations. A careful study of all the available material which had been acquired by observation caused the great German mathematician and physicist, Gauss, in the thirties of last century, to form a theory as to the sequence and varied appearance of the phenomena of terrestrial magnetism at a certain moment of time according to the geographical latitude and longitude. It thus became possible to construct three different maps, of which two show the direction of the force, and the third its strength. The reason why two maps are necessary for direction is because the direction must be given both in relation to the north and to the south geographical line, and in proportion to the horizontal plane of a place. The direction of the terrestrial magnetic force in relation to the north-to-south line can be observed by the help of the compass, which, as we know, generally points somewhat east or west of this same north. This divergence is called the variation or the declination. On a magnetic map lines are drawn which show the direction of the magnetic needle at every point of the Earth's surface. These lines, which are called magnetic meridians, converge at two points—the north magnetic pole, on the Arctic coast of North America, and the south magnetic pole, in the interior of the Antarctic continent. Each of the lines indicates, as will be understood, the direction one would go if he followed exactly the direction indicated by the north or south end of the magnetic needle. In the first case, one would at length arrive at the north magnetic pole; in the other, at the south magnetic pole.

If a magnetic needle be placed so that it can turn on an axis through its centre of gravity—exactly like a grindstone—the needle will of itself adopt a diagonal position when the plane of revolution is identical with the direction which the needle of a compass indicates. An instrument of the kind is called an “inclinatorium,” and the angle which the dipping-needle forms with the horizontal plane is called the magnetic inclination of a place. Here, in our parts, the north end of the needle points down towards the earth; in Australia, on the contrary, it is the southern end which dips. At the north magnetic pole the dipping-needle assumes a vertical position with its north end down; at the south magnetic pole it assumes a vertical position with its south end down. The inclination, then, at both their points is  $90^\circ$ , and decreases according as the distance becomes greater from them. On a series of points within the tropical zone the inclination is  $0^\circ$ ; that is to say, the dipping-needle places itself exactly horizontally, and that line which we may imagine as drawn through all these points is called the “magnetic equator.” It is situated partly above, partly beneath, the Earth's geographical equator.

The force of terrestrial magnetism works, as will be understood,

with its whole strength in the direction given by the dipping-needle, and it may be asked, How great is this force in the different places? In order to discover this we must imagine the force dissolved into two parts, one part working horizontally, and one part working vertically. It is evident that it is the horizontal part of the force which causes the needle to take a set position, and if we know all about this force—"horizontal intensity," as it is called—and at the same time know the inclination, it is easy, by a simple calculation, to find the collective strength, the total intensity. For the determination of horizontal intensity two methods are adopted, either each one alone or preferably, for the sake of comparison, simultaneously. One method consists in



DRIFTWOOD AT KING POINT.

placing a magnetic bar by the side of a needle at a given distance from it, and observing how many degrees the needle moves away from its original position. It is clear that the weaker the horizontal intensity the greater the oscillation of the needle, and when the strength of the magnetic bar is known, it is possible, by the aid of the angle of oscillation and the distance, to calculate the horizontal intensity.

The other method is to note the time of oscillation of a magnetic bar suspended by a thread in such a manner that it can revolve in the horizontal plane. When the magnet is allowed to be at rest, it sets, under the influence of horizontal intensity, in the direction of the needle. Brought out of equilibrium by a little push, it will swing backwards and

forwards, and the stronger the horizontal intensity, the sooner it will come to rest again, or, in other words, the shorter will be the time of each individual oscillation. When the strength of the oscillatory magnet is known, and observation is made of how many seconds are necessary for an oscillation, the horizontal intensity can be calculated.

Maps are constructed to give an idea of the value of horizontal intensity, expressed in so-called electric units, on the different parts of the Earth. A line passes through all the places where the horizontal intensity is the same. The horizontal intensity decreases towards the magnetic poles. It is, therefore, matter of consequence that terrestrial magnetism here, where the inclination is  $90^\circ$ , acts with its whole strength vertically downwards, and thus cannot have any effect in a horizontal direction.

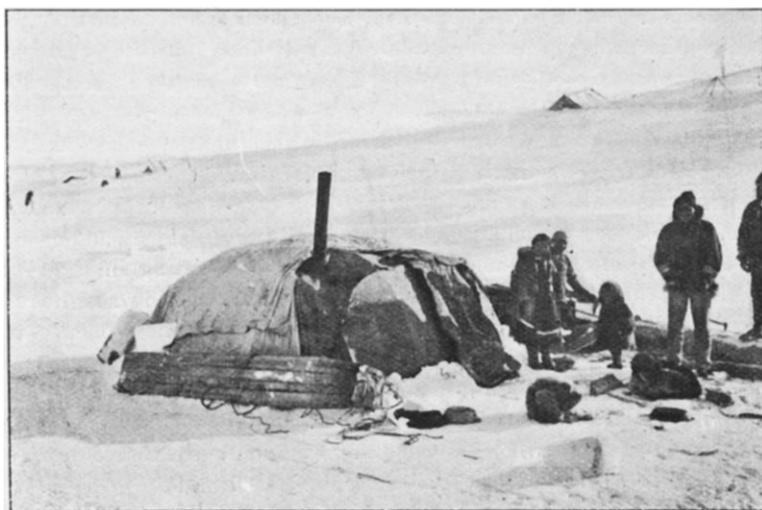
Although the magnetic maps are very dissimilar, they are alike in one respect, namely, that the magnetic poles are the points of mark on the surface of the Earth, and it is obvious that magnetic investigations just at these points, or in their immediate vicinity, must be of the greatest interest to the science of terrestrial magnetism. The Gauss theory by no means solves all the riddles presented by the phenomena of terrestrial magnetism, but continual efforts are being made to complete these riddles by the collection of as reliable and comprehensive observations as it is possible to procure.

The magnetic work of the *Gjøa* expedition is intended to be a contribution to this object. But the difficulties were not small. The very fact that horizontal intensity, as we have heard, becomes, in the vicinity of the magnetic poles, so infinitesimally small, renders necessary extraordinary precautions for the determination of this itself, as well as of the variation. The *Gjøa* expedition's equipment of instruments was calculated for this purpose. The magnets, fourteen in number, were chosen with great care in Potsdam just before our departure. The inclination we were able to determine by the help of three inclinoria of varying construction, and for the determination of the declination we had two different instruments.

Added to these were a set of self-registering variation apparatus; that is to say, three instruments permanently erected in a dark room, each instrument containing a small magnetic needle, two of the latter being suspended by a fine quartz thread, the third oscillating on a fine bearing in such a manner that the needle with its movements followed the declination, the second the horizontal intensity, and the third the inclination, even its minutest changes. Each needle was provided with a looking-glass, which reflected the light from a lamp on to a drum covered with photographic paper, which, by means of clockwork, made one revolution during the course of the twenty-four hours. It was arranged so that the reflection from each of the three needles struck the drum at different heights, and caused a little dark spot; but when

the drum with its paper revolved, each of these spots was continued, forming a consecutive dark line. There were thus three dark lines across each other on the paper, when after the lapse of twenty-four hours it was taken off.

After what we have already heard, it will easily be understood that it would not have done to select the pole itself for a permanent observation station, even had we known beforehand its exact situation, and could have foreseen that it would keep immovable on one of the same spot. Advised by Prof. Adolf Schmidt, I therefore decided to make the base station, where the instruments for variation were to be erected, at such a distance from the pole that the inclination would be about  $89^{\circ}$ . This



ESKIMO CAMP AT KING POINT.

requirement was fulfilled by Gjøahavn, which accordingly became our headquarters. We constantly made excursions hence to adjacent parts of the country, and right in to Boothia Felix, where I succeeded by the help of declination in absolutely proving what of late has been assumed on theoretic grounds, namely, that the magnetic pole has not an immovable and stationary situation, but, in all probability, is in continual movement. In what manner this movement takes place our considerable amount of matériel acquired by observation will, when it has been worked out, give instructive information.

The magnetic observations were kept going day and night, without interruption, for nineteen months. Meteorological observations were also taken the whole of the time. Prof. Mohn had equipped the expedition with a complete set of meteorological instruments, and made it his business that the meteorologist of the expedition should receive the best

instruction. The meteorologist, Dr. Aksel Steen, was my magnetic counsellor at home in Norway, before the departure of the expedition, and many a good bit of advice did he give me. The astronomical equipment was for the greater part due to Prof. Geelmuyden.

The Eskimo came and went now as often as they liked, and in a short time became quite at home with us. Towards Christmas they all disappeared, with the exception of an old man, Teraiu, with his wife, Kaijoggolo, and little son, Nutara. They came and lived with us during the whole of the coldest part of the winter, the rest of the tribe having gone westward to capture seal.

Christmas was now approaching with rapid steps, and countless preparations were made. The days had begun to be shorter and the cold sharper. Then came Christmas Eve, the first on board the *Gjøa*. The weather was splendid, absolutely still, and sparkingly bright. The thermometer  $-40^{\circ}$  Fahr. ( $-40^{\circ}$  C.). And what a Christmas Eve it was out here! Was not heaven itself sending us a greeting? The most glorious aurora we had yet seen lighted up the entire sky, in chasing rays from the horizon towards the zenith. The rays seemed to be racing one another, racing to see which would be the first in the wild chase. Then they all suddenly unite, as if at a given signal, and change into the shape of a soft, delicately-formed ribbon, twisting in light and graceful movements. It is as if the unquiet beams had now sought rest. Are they, perhaps, thinking of something new? Then suddenly the beautiful ribbon is, as it were, torn in many pieces. Again begins the chase, again the wild flight. It is difficult to imagine what the next step will be. It seems as if the zenith would now be chosen as the central point for the whole movement. And so it is. Suddenly, as if by magic, the most glorious corona streams forth from it.

Christmas goes, the New Year comes. The many holidays have already begun to tire us, and we take up our work again with pleasure. The first item on our programme is the equipment for my approaching sledge journey to the immediate area of the magnetic pole. The original plan was that I should make this expedition with one companion and provisions for three months, supported by a relieving expedition under Lieut. Hansen with one man. There were consequently four of us who were obliged to have their things in order by a certain date. In one thing there was a general consensus of opinion, namely, that Eskimo fur garments were the most suitable for this climate. We had, therefore, taken time by the forelock and bartered with the Eskimo for the lightest and finest reindeer-skin clothing we could get. After many small trials, too, we all agreed that snow-huts were far superior to tents when the temperature was below  $-22^{\circ}$  Fahr. ( $-30^{\circ}$  C.). I therefore started a class, with old Teraiu—the Eskimo who stayed with us, with his family—as teacher. We all four joined, and now built a snow-hut regularly every forenoon. Sometimes one of us was master

builder and the others masons, sometimes the other. Old Teraiu, who could not understand what we were building all these huts for, shook his head pensively, evidently in the conviction that we had taken leave of our senses. Sometimes he would throw out his arms to indicate the overwhelming number of houses, and exclaim, "Iglu amichjui—amichjui—amichjui!" Which means, "This is a dreadful lot of houses." But in this, too, we arrived at what we wanted: we became at last good snow builders.



INTERIOR OF SNOW-HUT.

On February 29 we took our sledges up on to the heights in order to be ready for a start the next morning. The day for the beginning of our sledge-journey broke clear and still. The temperature was not exactly summery, the thermometer reading nearly  $-64^{\circ}$  Fahr. ( $-53^{\circ}$  C.).

One sledge had a team of seven, mostly young dogs, for we had lost all the others during the course of the winter from one or other mysterious disease: the other sledge was hauled by three men. We found it difficult to make any way; the sledges ran badly. The snow

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in this severe cold was like sand, and advance very heavy. After terrible labour we made 4 miles the first day. Before we could go to rest we had to build our house. Thanks to the many huts we had built before that winter, we did this fairly quickly—in about an hour and a half. The temperature, which had sunk to about  $-70^{\circ}$  Fahr. ( $-57^{\circ}$  C.), did not tempt us to be out longer than was absolutely necessary. As soon, therefore, as we had finished the hut, we went in and walled up the entrance with a large block of snow. The cooking apparatus was set going, and it was soon warm and cosy in our little snow-house. In spite of the low temperature—about  $-77^{\circ}$  Fahr. ( $-62^{\circ}$  C.)—the lowest we observed, we spent in all respects a comfortable night. The next day, after ceaseless toil from morning to evening, we managed to cover  $3\frac{1}{2}$  miles. I realized now that this sort of thing was not good enough, and decided to make the depôt where we were, return to the vessel, and wait for warmer weather.

On March 16 I again made another attempt to move this depôt somewhat farther out. It was on this trip that we first met with the Neeljilli Eskimo, and accompanied them home to their snow-huts, which lay among the pressure ridges in Rae strait. Our first meeting with this tribe was thoroughly friendly and hearty. Their camps consisted of sixteen snow-huts, inhabited by about a hundred people. In appearance and dress, they were exactly like our former friends the Ogluli Eskimo.

When my companion and I were about to begin to build our house of snow, they all came and gave us to understand that they wished to help us. We gladly left the work to them, and after the lapse of half an hour our hut was completely finished. The following morning occurred a scene which very clearly shows in what respect the whites are held among these savages. From our earlier Eskimo friends, the Ogluli Eskimo, we had learned that the word "miki" meant a dog. As all our dogs were young and not up to much work, I asked one of our new friends—a man named Attikleura, who appeared to be the chief of the tribe—to lend me his dogs the next day. He thought a good deal when I asked him to do this, looked at me, and smiled faintly, but made no answer. I, however, did not give in, but repeated my request. He nodded his head, and we did not mention the matter again, as I now considered it settled. When I came out of the hut in the morning, Attikleura's little son was standing near the door. I did not take much notice of him, but went on to his father's hut to ask what had become of the dogs. I naturally used the word "miki" which I had learned. He looked at me in astonishment, and made me understand that I had got his "miki." As I persistently denied this, he made signs to me that we should go out. He went straight over to his little boy, pointed to him, and said, "Ona mikaga," which is to say, "Here is my boy." Now everything was clear to me. "Miki" did not mean with this

tribe "dog," but "child." So great was then their fear of us that he had without demur given his son away. I let him understand that I had made a mistake; the whole thing ended by hearty laughter on both sides.

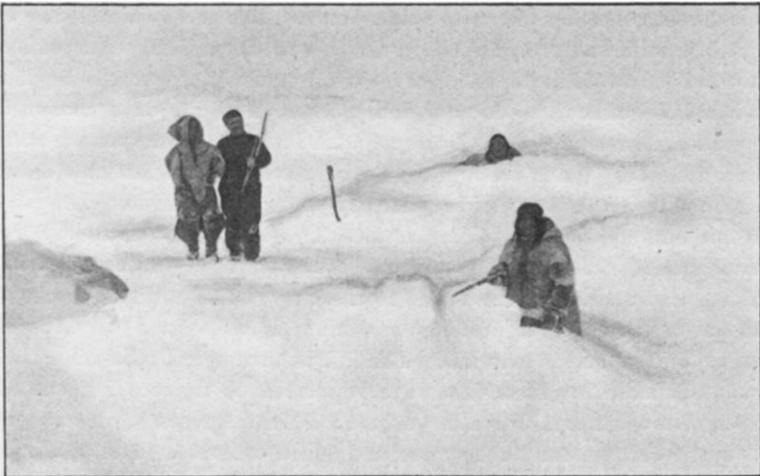
After two days' march we came across, at Matty island, a small camp, consisting of six huts. These belonged to some Ichjuachtorvik Eskimo, as they called themselves, who were from the east coast of Boothia Felix, near the place where Ross wintered in the *Victory*. These people made a very bad impression on me, and I said to my companion in the evening that we had better lash everything securely on the sledges, and let the dogs sleep near them. In the morning when it was time to start we missed a saw, an axe, and a knife. I made the Eskimo understand that they must return the stolen articles, but they pretended that they had no knowledge of the matter. After addressing myself to them two or three times in vain, I grew tired of it, and got out one of our carbines. I then explained to them as well as I could that I knew who the thieves were, and that I would shoot them if the articles were not given back. This worked. The things were returned in a hurry. I did not dare to make any depôt in the neighbourhood of these thieves, but retraced my steps, and confided everything to the care of our new friends, the Nechjilli Eskimo. I was never disappointed in the confidence I placed in these people; they were what they appeared to be from the very first moment—thoroughly honest. Quite a crowd of them joined company with us, and returned to the *Gjöa*, staying with us for a few days.

On April 6 I started off with Sergeant Peder Ristvedt to make magnetic investigations in the vicinity of the pole. We were equipped for three months, but our nine dogs were not equal to drawing the heavily loaded sledges. We had a couple of Eskimo with us who were going out to capture seal. It was a lovely day, and curious as it may sound, felt quite summer-like with a temperature of  $-22^{\circ}$  Fahr. ( $-30^{\circ}$  C.). We had, of course, been used to a much lower temperature during the two preceding months, February giving an average of about  $-45^{\circ}$  Fahr. ( $-43^{\circ}$  C.). This was the reason why we perspired as if we were in the tropics that day with its  $-22^{\circ}$ . We had to throw off garment after garment, and only stopped when modesty demanded it of us. This sledge trip was not very successful. An injury to my leg, which I incurred, kept me lying in my bag for a week. I had, however, the satisfaction of getting as close to the pole as was necessary. We had been obliged on our way to cache one of our sledges, and provisions for a month, in order to hasten our advance. This was, unluckily, in the neighbourhood of the Ichjuachtorvik Eskimo hunting grounds. When we came back to fetch our things, everything, with the exception of 10 lbs. of pemmican, had been stolen. We were thus obliged to return home after only two months' absence.

In the beginning of June, large numbers of Eskimo appeared at the ship with blubber and skins of seals for sale which they had caught during the course of the winter months. We paid them in wood and iron. In the middle of July most of them left us again, to hunt reindeer and catch salmon in different directions. In the summer of 1904, Lieut. Hausen went a rowing expedition with one man to Cape Crozier, about 100 miles distant, to put down a large depôt. The latter was for use on his sledge-journey to the east coast of Victoria land, planned for the spring of 1905. Gustav Wiik had all this time had sole charge of the magnetic observations of the station, and had done excellent work. The summer was short and cheerless. The vessel slipped the ice on July 22. Of birds of passage we saw swans, geese, loons, ducks, eiders, and many small birds. The ptarmigan came in March and went in November, the only stationary animals were the Arctic fox, the stoat, and the lemming. The vegetation was rich, and large tracts were to be seen quite covered with flowers. There were butterflies, flies, and some other insects, not to omit several milliards of gnats. The winter set in somewhat earlier this year than the preceding one, and the ice formed a week sooner. The reindeer, of which there had been great numbers the previous autumn, were this year very seldom to be seen. The whole of our winter provision thus consisted in 1904 of only twenty deer, and these we had shot far inland, whereas, in 1903, we could have killed as many as we liked quite close to the vessel. However, the Eskimo, who had spent the summer reindeer-hunting in Northern America, brought us a quantity of venison, and from other quarters we procured salmon, cod, and trout, so that we were well provided for the next winter too. In the middle of October the Eskimo returned from their summer excursions, and then visited us in great numbers, but went off again to fish before the darkest part of the winter set in. Towards Christmas they returned to the vessel, and we then had the pleasure of their company for nearly two months. On November 20 we had a visit from an Eskimo family of a quite strange tribe. They proved to be Kinepatu Eskimo from Chesterfield inlet, near Hudson bay. The man's name was Atagala. He knew English sufficiently to explain that near where he lived two large vessels were lying. For an old Mauser rifle and four hundred cartridges he undertook to take a mail down to them and return with an answer, about 1500 miles. On May 20, the next year, a sledge-team of ten dogs swung into our harbour. It was Atagala. He brought us a mail from the *Arctic*, a ship belonging to the Canadian government, which was wintering at Cape Fullerton, in Hudson bay. She had originally been the *Gauss*, and was built by the German South Polar Expedition, but was now out to inspect and choose suitable spots for small garrisons. Major Moodie was in chief command, and Captain Bernier in command of the ship. An American whaler, the *Era*, was also wintering at the same place. Captain Comer, of the *Era*, and

Major Moodie sent me ten sledge-dogs, as I had written to the former, telling them that the greater number of our dogs had died in the course of the first winter.

During our seventeen months' intercourse with the Nechjilli Eskimo we became by degrees so intimate with some of them that they little by little lost the mistrust they usually have for strangers, and showed us complete confidence. We, however, never really acquired their language, and, consequently, could not thoroughly understand their life. What I have to tell about them, however, is based partly on careful observation, and partly on information from the Eskimo themselves, and this being the case, I venture to think that my information regarding one of the most interesting and least-known races of the world is correct.



ESKIMO BUILDING SNOW-HUTS.

What adds greatly to the value of these searches is the series of splendid photographs taken by Lieut. Hansen during our sojourn in those parts.

Nechjilli, which the Nechjilli Eskimo look upon as their home, are the banks of the great Willersted lake on Boothia isthmus, and of the little bit of river which flows from the lake into the sea. Unfortunately, we never had time to pay them a visit, but from the Eskimo's often repeated descriptions I know what the country looks like, and what their life is there. From the time the ice breaks up in June or July to January or February the next year, it is here that they live—in summer in their tents, and, when the snow falls, in their snow-houses. Often in transition periods, from winter to summer and summer to winter, when the snow—as it is in the month of June—is too waterlogged to be used for the building of entire snow-huts, they are obliged to use a construction the walls of which consist of snow and the roof of skins, a

combination of snowhut and tent; or, as often happens in September, when the cold strikes in and the lakes freeze before the snow comes, they are obliged to construct a building of ice with a skin roof.

When an Eskimo is about to build a snow house, he is always careful first to consult his "hervond." This is simply a stick of straightened horn taken from the antlers of the reindeer. At the lower end it has a ferrule of musk-ox bone, and at the upper a handle of reindeer bone. It is about a yard long. With his keen glance he now scans the country, and at the place which pleases him best thrusts his "hervond" into the snow. He does this in order to find out its quality, for it is as important for an Eskimo to find good snow for his building as it is for a bricklayer to have lime for his stone. A very long experience is required in order to test the snow in this manner, and, when several Eskimo are together, it is a task generally left to the oldest ones. The most suitable snow is that of a solid and compact kind, with a superincumbent layer of loose snow, about a foot in depth. Nor must the underlying snow be too hard, or it will be difficult to cut out the blocks. The site once chosen, the upper loose snow is shovelled away, and is laid round the spot where the house is to be. When the underlying hard layer is laid bare, the builder begins with his knife—which is usually long-bladed and long-handled—to cut out and build up the blocks. The house is constructed from inside, and the blocks are cut exclusively from the building site: it is seldom that an Eskimo has resort to the snow outside. The blocks are cut out of snow with a high edge, and that is the reason why the site can contain sufficient material. The hut is built spirally, in such a way that the succeeding block is always supported on a preceding one, and in shape much resembled a large beehive. Our greatest difficulty was always when we had to decrease and build the roof. The blocks are then placed in a very inclined position, one may say almost rocking. But the Eskimo are born to this way of building. Where one of them puts the block there it stays, even if it forms an angle of  $45^\circ$  with the horizontal plane. The structure is completed by a little, dexterously placed, plug of snow in the apex of the roof. After the house is up, there will be a mass of refuse snow lying inside it. With this the sleeping-bench and fireplace are made. Meanwhile, the lady of the house has not been without occupation outside. The loose snow, which was shovelled away at the beginning, she uses to caulk all the holes and cracks with, and if she has any to spare she throws it over the entire house, which helps a very great deal in making it warm and draughtless. When all is finished inside, an aperture is cut in the wall of the same height as the bench. The man comes out and the woman takes his place. First of all, the large watertight kayak-skin is handed in and is spread over the entire bench; then comes the turn of all the reindeer-skins—soft, large, and warm; then the rest of the effects, such as cooking-utensils, a drying-grill, blubber for the lamp, and a number

of other things which the Eskimo find indispensable. When all this is done, the housewife is walled in. It will be asked, What was this immured lady doing inside the hut? Perhaps it will not be indiscreet of me to poke a little hole in the wall and peep in. In the name of knowledge everything is permissible, so with a "ski" staff, which I happened to have with me, I made a hole in the wall and opened a way into the sight of this mysterious interior.

The first thing she does is to put the lamp in place and make a fire. After that she fills the cooking-pot with snow, and hangs it over the flames to melt into water for her thirsty husband. As soon as she is satisfied that the lamp-flame is burning to its greatest extent, she turns her attention to arranging other things, the sleeping-bench is levelled and flattened, reindeer-skins placed in order on it, and everything made as comfortable and cosy as possible. All being arranged, she seats herself before the fireplace and seems to be particularly anxious to make the fire burn as brightly and give out as much heat as possible. Now I understand why it is she is walled up in this house—in order to warm it and make the blocks of snow sink, so that the whole will form a close and compact wall. But she will certainly not succeed in this if I continued at my peeping, so I fill it up again and take myself off. Meanwhile, the man has built the passage, 9 to 12 feet in length, which leads into the house. But he will certainly not dare to make a hole in the wall and put it in communication with the interior of the house before he receives higher orders from his better half. He amuses himself meanwhile with his friends, who are in a similar situation, and whiles away the time in joking and conversation. They are a fine group of men who are standing there, ranging tall, from 5 feet 9 inches to 6 feet, though there are some short ones among them. They are powerfully built, the life they lead inducing all-round development. The ladies' pellucid voices are now heard, and the expectant husbands can complete their structures by knocking a hole through the wall from the passage to the hut.

Let us now pay a visit to one of these camps, and see what Eskimo life is here in these burrows of snow immediately after their construction. The huts are of different sizes. Some people like them high, some low. The circumference is from 30 to 45 feet, according to the size of the family. It is the month of January, and the cold is severe. They, therefore, live two families together, so as to be warmer. The members of the family have just assembled after the building operations and a long day's sledging. The housewife sits in her accustomed place and croons her monotonous chant, consisting of four words and as many notes, which are repeated in varying forms. These sounds, when they are repeated often enough, we found unendurably monotonous. Politely to request them to be quiet was of no use; but we found another most effective means, namely, to give a vocal performance of our own at the

same time. Then we had peace, for our many tones, no doubt, sounded as awful to Eskimo ears as their four did to ours. Well, this was not very polite on a first call, but, anyhow, they were not offended.

The first thing an Eskimo does when he enters his hut is to take off his outer coat and beat all his clothes quite free from snow. This he does so that the latter shall not have time to melt and wet his clothes. If he intends to be in the whole evening, he takes off his other outer garments. If any of them have become wet during the course of the day, they are thrown to the lady of the establishment, who puts them up on the grill to dry. His hunger has now to be appeased, and the most tempting pieces of meat and fish are brought out—of course, frozen stiff. But this does not affect the Eskimo in the least; once down it melts soon enough, and enormous quantities disappear. Their knives are their only eating implement, but these they handle with dexterity. They hold the piece of meat fast with their teeth and the left hand, and with lightning rapidity pass the knife right under their noses, and cut off a piece of meat so close in to their lips that one is astonished that the latter do not go too. One large bit of blubber after the other goes the same way.

The family having thus finished this important business, a nap will possibly be to their taste, and the entrance is carefully bricked in from the inside. They now proceed to undress till they are quite naked, and then sleep the sleep of the just under large coverings of reindeer-skin shared in common, possibly till late the next day. This, however, depends upon whether they have enough food. If the man intends to live here for any length of time, he chops himself a window the following day out of the ice on the nearest fresh-water pool, and inserts it in the wall immediately above the entrance. His dame can then see to do her work by daylight. She has plenty to look after. She sits by the fire, which is her accustomed place, with her legs tucked up under her, and watches the flames and her offspring, who are running in and out playing. She smiles and looks absolutely happy. Probably it is the two small physiognomies, encrusted with soot and train-oil, which call these pleasant thoughts. It is not so long since the youngest left her hood, where children are carried till they are about two years old. Their play grows less by degrees, and the youngest one goes up to his mother and looks inquiringly in her face. She knows her boy, she does. The children here are not weaned so quickly, and mother's milk is to their taste long after they begin to walk. I have even seen boys ten years of age lay their arrows aside and take part in the repast.

But see, here comes a friend, of the same sex, of course. She has come to pass the time of day; is bored, perhaps, in her own hut. It is Alo-Alo, a young and attractive woman. The sharp cold has given her a fresh colour, and the pretty brown eyes with the blue whites look very much as if they could hide something behind them. Out of her

hood sticks up a little wondering face ; it is her year-old son "Akla," or the brown bear. Conversation is soon in full swing, and the two women seem to have a great deal that is amusing to tell one another. Suddenly the baby in the hood begins to move, and with incredible rapidity and quite unparalleled adroitness changes place from the hood to his mother's lap. He has his wishes complied with, and is going to be put back in his warm, cosy place, when his mother discovers that he is more than usually dirty to-day. The washing process which then takes place must



ESKIMO IN SNOW-HUT.

be very practical when water is scarce. She licks the child clean, and then puts him back. If it has been a fine day, the men have been out on the ice to capture seal, and are now coming back in the dusk. They seldom return home empty-handed, but have a seal or two with them, which are then handed over to the housewife, who has to see to their partition. The entrails, which are the greatest delicacy they know, go to the one who has caught the seal ; the rest is divided among all. After supper they often require a little diversion in the long winter evenings.

They then assemble in the largest hut, and spend a few hours together, singing and dancing. These huts are often quite handsome structures, and I have seen them 14 feet high and 25 feet in diameter. On these occasions the women all sit round in a circle and begin their monotonous chanting, the men entering the circle one by one to perform a kind of solo dance, beat a frame covered with thin tanned reindeer-hide, and scream something perfectly dreadful. What astonished me most at these festivities was the singing of the women. I had always thought that all their tunes—or rather variations on the five notes—were impromptu, but here I had certain proof that they really were songs, for I heard as many as twenty women singing together at these gatherings for a whole hour at a time, without any of them falling out of the melody. In my opinion this almost points to musical gifts.

The next evening the magician of the tribe will perhaps give a representation in the same hut. This is a very serious affair—the only performance we never had an official invitation to. We tricked them all the same, and found out what went on. The hut is made almost dark, only quite a little flame being allowed to burn, which, of course, made things the more mysterious—complete darkness would be too dull. The magician and his assistant (usually his wife) take their places on the bench, and the company sit at the other end of the hut. Absolute darkness broods over the performers. The two now begin to utter loud howls, and, on the whole, lead one to suppose they are killing one another. After this farce has been going on for half an hour the noise grows less, and by degrees everything becomes quiet. The light is made stronger, and, to the apparent surprise of everybody, the magician now exhibits two holes in his coat, which, before the light had been subdued, was quite whole—one hole in his chest and the other in his back, and they go to prove, of course, that during this turbulent scene he has run himself through with his spear. Judging by appearances, the Eskimo all take this very seriously; but when later I joked with them about it they laughed and said that the whole thing was nonsense.

Any real sign of astonishment these people seldom show. One of the few times that I can remember seeing any trace of this was when I sent a messenger to the ship—I was then in camp about 10 miles away taking magnetic observations—with a letter in which I asked for a certain quantity of ammunition. When he returned the next day and I told him before he gave me the consignments that I knew how many cartridges he had with him of each kind, and that he might count them himself, he was astonished to see that I was right, and much impressed by the use we put our writing to. They often amused themselves later by scribbling some strokes on a bit of paper and giving it to us. We always pretended to be highly astonished, and read it out loud; this greatly amused them. Family life gave us the impression, as a rule, of being happy, though I know of cases where the husband ill-treated his

wife. The male sex being so much more numerous than the female, it was not unusual to find marriages where the wife had two husbands. The reverse relationship I never met with. In general, the husband was spokesman and the wife obeyed blindly, but elderly widows were sometimes personages of great influence.

The religious opinions of the Eskimo were like our own in that they had an understanding of a good and an evil being, of punishment and reward. If a man had behaved as he should in this life, then he would go to the hunting-fields in the moon; and had he been a bad man he must go under the earth. During the whole of our stay among them there only occurred, as far as I know, four births and two deaths. The latter, in both cases, being suicide. It is not considered to be wrong; but is, however, only resorted to when the pain in an illness is too great to be borne. The way in which they do it is, I think, peculiar to them alone. A sealskin thong is stretched across the hut 2 feet above the floor. The sick person is left alone in the hut and the others go outside; they, however, have peepholes in the wall, through which they follow events. The sick person now kneels down and endeavours to suffocate himself by pressing his throat against the strained thong. If the unfortunate person is unable to do the business for himself, or it seems to be taking too long, one of those outside comes in and expedites matters by pressing his head down on the thong. Fighting with closed fists occurs now and then, and murder is not unknown. It thus happened in the summer of 1904, at the station, that a boy twelve years of age accidentally shot another boy of seven in a tent. The father of the boy who was killed immediately seized the other, who, for that matter, was his adopted son, and dragged him out of the tent and stabbed him to death. Their dead they sew up in a reindeer-skin, and lay them on the ground. A few articles, such as a bow, spear, arrows, and other things, are placed beside them. We found many an interesting object in this manner.

On April 2, Lieut. Hansen and Sergeant Ristvedt started on their sledge-journey to chart the east coast of Victoria Land. They had two sledges, twelve dogs, and equipment for seventy days. The provisions were measured as shortly as possible so as to reduce weight. All the same, it is very necessary on a long journey of the kind that everything should be carefully planned so as really to hold out the requisite time. The depôt, which had been made the year before, had been entirely spoiled by bears, but Lieut. Hansen and his companion shot bears, seals, and reindeer, and thus spun the journey out for eighty-four days. Excellent work was done. The east coast of Victoria Land was charted right up to the 72nd parallel. The land, formerly seen by Dr. Rae, at the south end of Victoria Strait, proved to be a group of over a hundred small low islands. These were charted on the way back. An interesting event from this journey was the meeting with another unknown

Eskimo tribe, the "Külnermium Eskimo," whose hunting-fields extend from the Coppermine river eastwards. These Eskimo, like the others mentioned, have no connection with civilization. We, of course, received our bold companions with flags waving on their return, and a feast to commemorate it.

On June 1 we dismantled the observatory containing the magnetic self-registering instruments. For nineteen full months Wiik had kept this going, and had done work which will, without doubt, be rich in results.

On August 13, at three o'clock in the morning, we continued our way westwards, and I am not sure that the little brown-eyed people in there on the beach were quite cheerful that morning. Hardly, for they were losing several rich and great friends. They waved long to us—probably a farewell for life; and if some traveller, many years later, pays this place a visit, the numerous tent-rings will remind him of the many happy days the *Gjøa* expedition spent here with their friends the Nechjilli Eskimo. The day afterwards we stopped at a place called by the Eskimo, Kamiglu. Here we took an Eskimo boy named Manni on board. He won us one and all by his openness and honesty; and even the cook, who hated Eskimo, had I think a warm feeling somewhere at the bottom of his heart for him. It was my intention to bring him home and show him a little of the world he could never have imagined, and to send him back again, in the event of his wishing it; but he was accidentally drowned at Herschel island. After passing through narrow and shallow waters we came out, on August 21, in Dolphin and Union straits. Now we could breathe! On the forenoon of August 28, we sighted a sailing-ship. It was a proud moment for us all when we hoisted our flag and bore down on the American.

On September 3 we were stopped by ice at King Point, and soon after that were beset for a third winter. However, we were in high feather all the same; on the shore lay the finest driftwood that could be desired, the sea was full of fish, and not far off there were hares in thousands. On the shore, some fathoms in past us, lay the nipped whaler *Bonanza*. The first thing we did was to build ourselves a house of drift timber, and after that the observatories were put up. From October 20 to March 12 I was out travelling with the *Gjøa's* mails, Lieut. Hansen having command on board meanwhile. This winter was exceedingly severe and disagreeable. On my return everything was in the best order; but on March 26 Wilk became ill and had to take to his berth. He died on the 26th. It was a hard blow to lose a comrade so near home. It was not until May 9 that we were able to bury him, the ground up to then being too hard frozen. In the mean time his coffin stood in our dwelling house on shore, which we gave up to it, nailing up the door. Later on we put up a large cross with an inscription on it at the north end of his grave, and when the flowers came, decorated it

with them. It is situated on a very prominent point, and will be a landmark for the numerous ships which pass by it.

The spring was a cheerful time. The continual passage of Eskimo and whites made the time pass quickly. On July 2 we got out of the ice, and brought up under the *Bonanza*, so as to avoid the ice which was drifting backwards and forwards in the land lead.

On July 11 two of the American whalers came to our place to collect driftwood, and the same evening we stood out. We took a last farewell of our comrade whom we were leaving behind us out there, and dipped our flag as a last mark of honour to him as we passed under his grave. Already at Herschel island we were stopped by the ice, and were kept there a whole month. After many narrow passages and abrupt turns, we stood down Behring strait on August 30. The day afterwards we went into Nome, a gold-digging town in Alaska. The reception we received and the enthusiasm our enterprise had aroused there we shall never forget.

On September 5 the *Gjöa* set sail southward under Lieut. Hansen's command for San Francisco, and on the 7th I left with the magnetic instruments for Sitka, in order to conclude our work. On October 19 we met again in San Francisco, where we confided the vessel to the hands of the American navy. There rests the old *Gjöa*, and greatly does she need it.

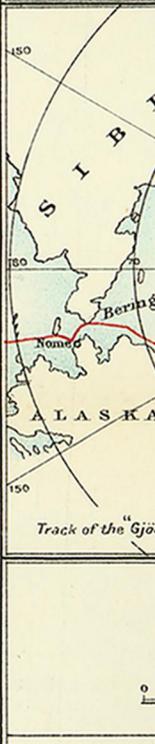
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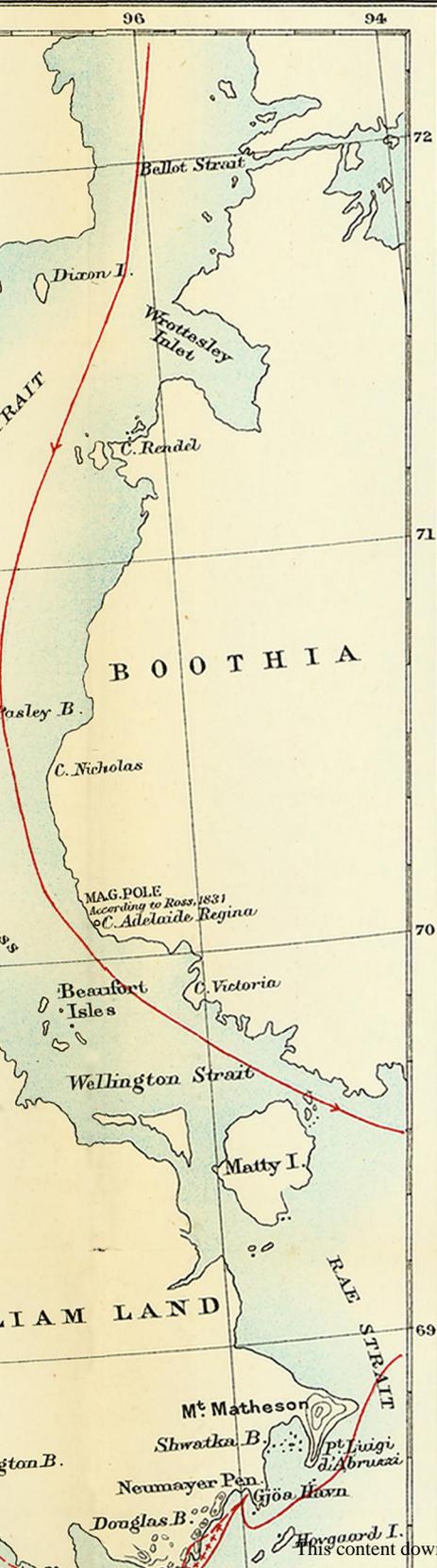
Before the paper, the PRESIDENT: I shall say little on the subject of Captain Amundsen's very remarkable explorations, as the paper will speak for itself, and you will hear what highly competent experts think of these explorations when we come to the discussion, which, I am glad to say, will be joined in by his Excellency Dr. Nansen, by Admiral Sir Vesey Hamilton, by Sir Allen Young, and a number of other well-known Arctic authorities. But it strikes me as extraordinary that only seven men should start away in a very small vessel and live a number of years in the Arctic Regions, and do the remarkable work they have done. I must say a few words about Captain Amundsen's preparation for this work, and the foresight he displayed. Many years ago he went on a sealing expedition into the Arctic Regions for no other purpose than to prepare himself for his recent work. Later on, as he advanced in his ideas and felt that examination into the conditions around the magnetic pole was to be the main object of his explorations, he went to Hamburg, where he put himself under the tuition of Dr. von Neumayer, one of the greatest living authorities on magnetism, and he devoted a long period to studying the subject, and it is typical of Captain Amundsen's character that his first step in the present expedition was to purchase and select his magnetic instruments. As another means of preparation for Polar work, he went as first officer in the *Belgica* to the Antarctic Regions, and remained there for two years. In conclusion I must point out that, as an incident in his recent explorations, Captain Amundsen passed through the North-West Passage in the first vessel that has ever sailed through it. I wonder what would have been the effect a century ago if it had been announced that some one was going to address a meeting describing his voyage through the North-West Passage? I do not think the Albert Hall would have sufficed if it had existed in those days. I now call upon Captain Amundsen to read his paper.





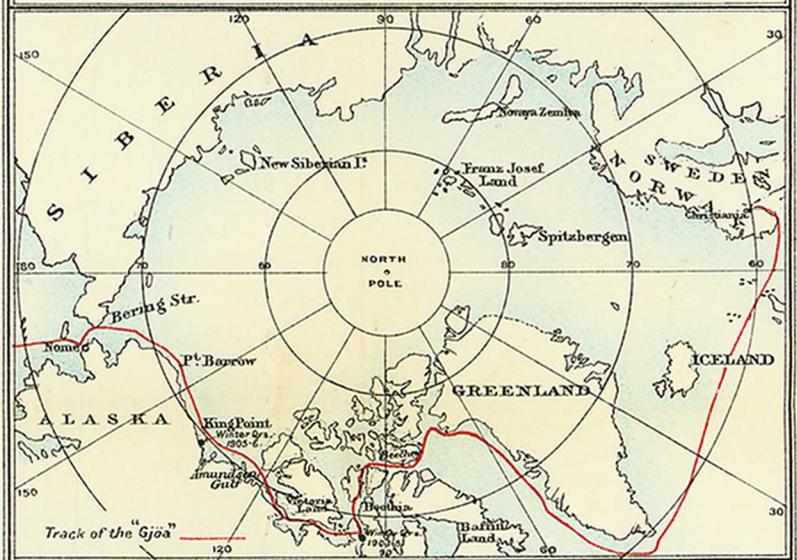
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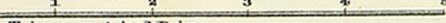
MAP  
to illustrate the  
**VOYAGE**  
AND  
**ARCTIC EXPLORATIONS**  
OF  
**CAPT. ROALD AMUNDSEN.**

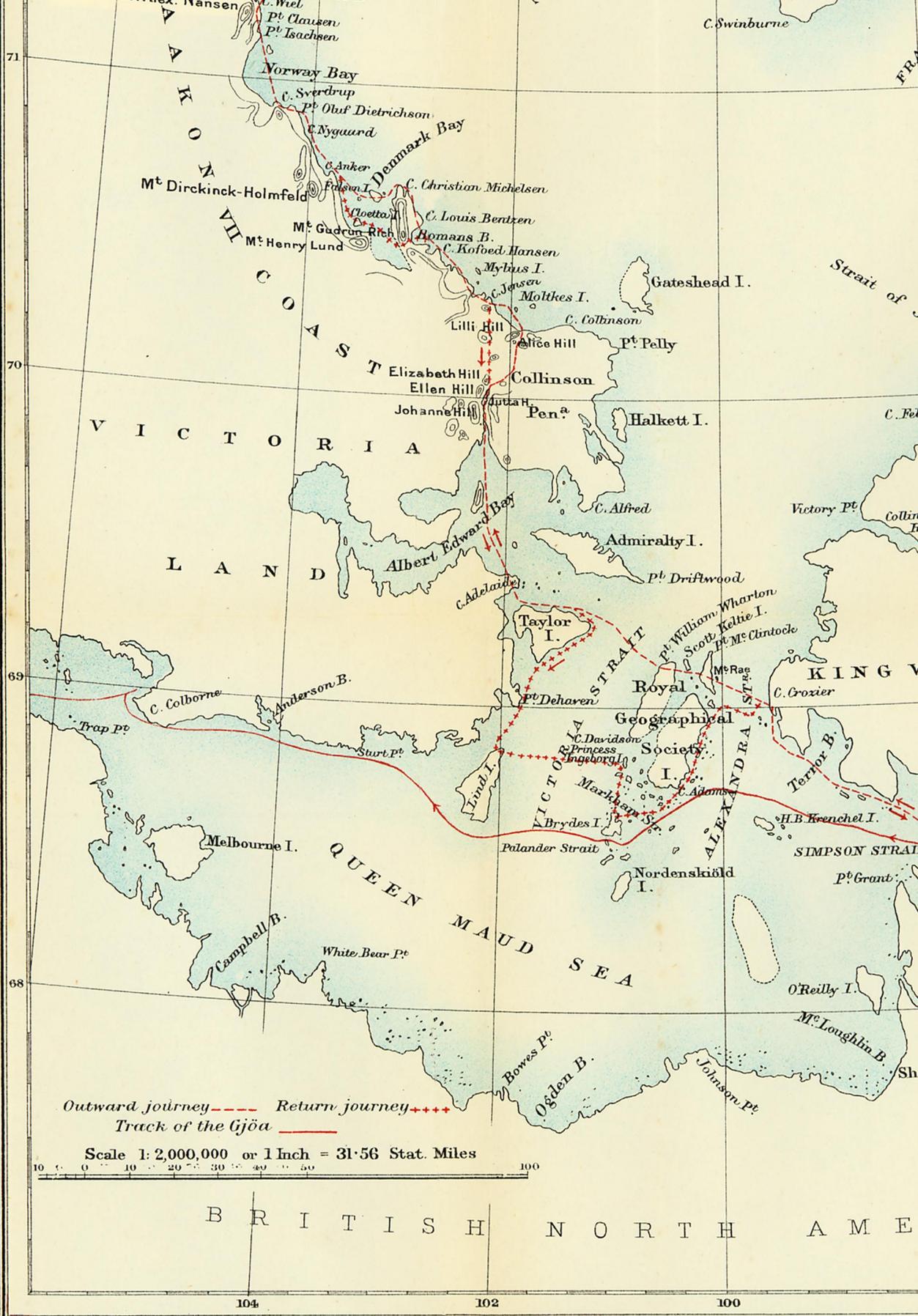
From Surveys by  
**LIEUT. G. HANSEN.**  
(Royal Danish Navy)  
1903 to 1906.



**KING WILLIAM LAND**  
**NEUMAYER PENINSULA.**

Scale 1:125,000 or 1 inch = 1.97 miles.





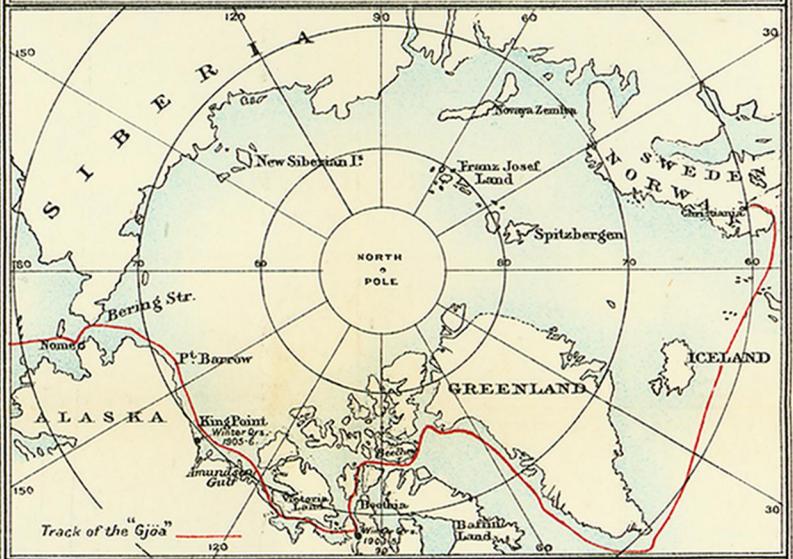
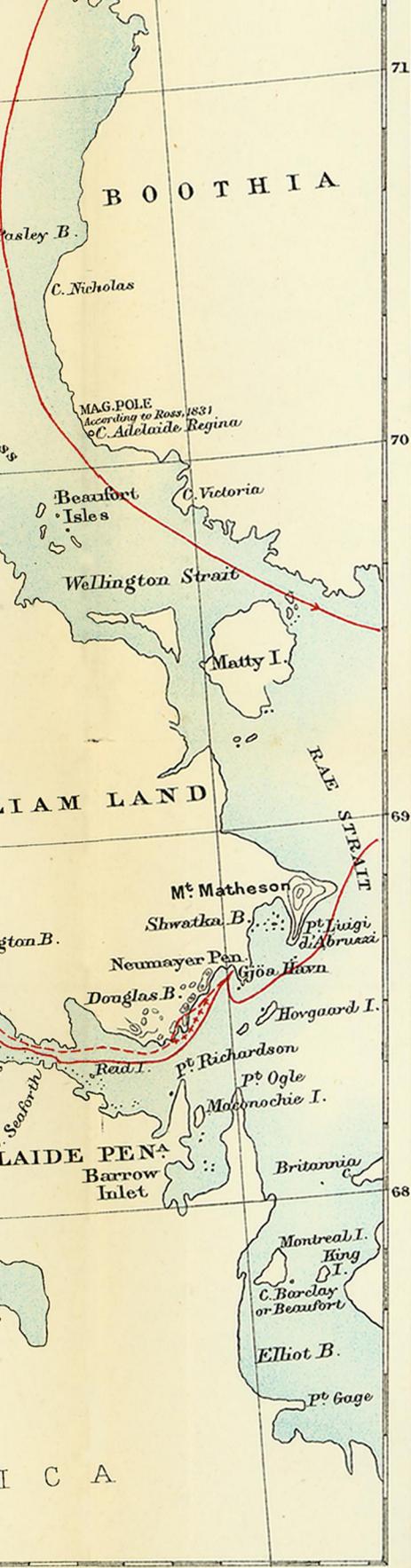
Conical Projection with Standard Parallels 68° 10' and 71° 20'

Published by the Royal Geographical Society



# CAPT. ROALD AMUNDSEN.

From Surveys by  
**LIEUT. G. HANSEN.**  
 (Royal Danish Navy)  
 1903 TO 1906.



## KING WILLIAM LAND NEUMAYER PENINSULA.

Scale 1:125,000 or 1 inch = 1.97 miles.

Trigonometrical Point & Observation Station

