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THE NATIONAL ANTARCTIC EXPEDITION.*

By Commander ROBERT F. SCOTT, R.N.

SUMMARY OF PROCEEDINGS.

THE following report of the work of the National Antarctic Expedition from March, 1903, dated "*Discovery*, Auckland island, March 23, 1904," has been forwarded by Commander Robert F. Scott, R.N., to the Presidents of the Royal and Royal Geographical Societies, and is published here with their sanction :—

"My report of proceedings forwarded by the *Morning* in 1903 was intended to amplify the telegram despatched at the same time. I understand the latter was altered out of all recognition by Reuter's Agency, and therefore fear the report must have been somewhat obscure in places. I trust it is understood that these reports purport merely to outline the movements and work of the various members of the expedition. I purposely refrain from such matters as the results of scientific observation and investigation, preferring to leave these to the reports of the various officers specially concerned in them.

"The winter closed in very rapidly after the departure of the *Morning* on March 2, 1903, temperatures fell, and the weather became gloomy, but there was little snow. Some ice broke away, but the open water never came nearer than within 4 or 5 miles of the ship. The month of March was occupied principally in laying in a store of seal-meat and flesh of skua gulls for winter consumption. Fish-traps were also set, but though at first these were very successful, they soon ceased to provide any substantial addition to our fare. The articles supplied to us by the *Morning* consisted principally of tinned vegetables, soups, sauces, herbs, pickles, and bottled fruits. They were not absolutely essential, but they greatly added to our comfort. Of such necessaries as biscuits, flour, oatmeal, and sugar we had an ample supply, and from this time we ceased altogether to use tinned meats.

"When April came without change in the ice-conditions, we were forced to abandon all hope that the ship would be free. The *Discovery* had been prepared for sea, but she was now again dismantled. The winter awning was spread, and snow was placed on the decks. We soon came to understand that our second winter was likely to be far pleasanter than the first. Experience suggested numerous ways in which the material comfort of the living-quarters could be improved. The men were in excellent spirits, much exercise was taken, and games of hockey continued until the light failed. But the greatest advances were made in respect to the food and light. It was only after his

* An adequate map, showing the exploring work of the expedition during the two years, will be published in the August *Journal*.

departure that I fully appreciated how far our wretched cook had gone in spoiling the food. Under new arrangements, the food was always appetizing, and though seal-meat was the principal fare, all hands partook of it, and continued to enjoy it thoroughly.

"The light provided throughout the second winter was acetylene gas. A stock of calcium carbide had been obtained for the hut, and this was now brought into use with a single burner in each compartment of the living space. The light was brilliant, and had a most happy effect on the comfort of the community. This beautiful illuminant is in every respect excellently adapted for use in a polar winter. Generally speaking, we had less wind in the early winter of 1903 than in the corresponding season of 1902, but in the latter months of 1903 the wind increased considerably, so that the averages for the two seasons differ but little. The temperatures during the latter season have been far lower. I have already remarked that the *Discovery* lay in a most sheltered spot. The difference in temperature between a thermometer in the screen and one placed $1\frac{1}{2}$ mile to the south was rarely less than 10° . It was in this outer position, in the month of May, that we read the low temperature of $-67^{\circ}7$. From this time the temperature rose until it again fell in the spring. We had no heavy gale or snowfall until the second week in June, when a heavy southerly blizzard again buried the ship in drift. We had not sufficient photographic paper to get a complete record with the Eschenhagen instruments throughout the second season, but Mr. Bernacchi used such paper as remained to obtain records of the most interesting periods. In all other respects, the routine of observations was maintained as during the first season.

"Ample employment for the men was found in preparing for the spring sledging. This involved much repairing and renewing and some change in design of the equipment. In drawing out plans for the coming sledging season, I thought it wise to fix its conclusion at a comparatively early date, in order that all hands might be available to assist in releasing the ship should the opportunity occur. The date fixed was December 15, as at this time, in 1902, the open water was within 9 or 10 miles of the ship. In arranging the extended journey, I was confident that without dogs it would be useless to attempt to penetrate further to the south. My experience of the barrier surface and some arithmetic convinced me that a party of men could not hope to reach beyond the farthest point of the previous year, however amply supported. The actual performance of the southern parties completely justified this view. Our course of the previous year had taken us well clear of the land to the south-west; but there remained many points of interest in connection with the junction between the barrier and the land, and especially in connection with some apparent straits which intersected the coastal mountains, and which we had only viewed at a great distance. In the second place, we did not know what lay to the

south-eastward. We imagined the barrier to extend almost indefinitely in that direction, but we had no proof. Finally, I thought it possible, with the help of experience, to penetrate considerably further to the westward over the ice-cap of Victoria Land. Our small complement only admitted of two properly supported journeys and one unsupported journey. I decided that the supported journeys should be to the south-west and west, the unsupported to the south-east. The latter was entrusted to Lieut. Royds, the south-west journey to Lieut. Barne, and I arranged to lead the western party myself.

"The winter passed away with extraordinary rapidity, and without a single case of sickness. With the spring, the whole ship became very busy with immediate preparations for the sledging. The first spring journey was started on September 7, the party consisting of Lieut. Royds, Dr. Wilson, Cross, Whitfield, Williamson, and Blissitt. The object of the party was to visit the emperor penguin rookery, near Cape Crozier, and it was timed to hit off the period of incubation. In this the expedition failed, for these extraordinary birds appear to breed in the coldest and darkest months of the year; but, by a fortunate circumstance, they succeeded in procuring a number of deserted eggs. Dr. Wilson was able to take a number of notes, and the party brought back two live chicks, to which Cross sacrificed his sleeping-jacket, though the temperature was continually below -50° , and at lowest -62° . The party reached the ship on September 17.

"Lieut. Barne left the ship on September 12, placed a depôt to the south, and returned on September 20. His party included Lieut. Mulock, Quartly, Smythe, Crean, and Joyce. They experienced the lowest temperature for a sledging party on record, the thermometer remaining almost continuously below -60° , and registering as low as -68° . Under these very severe conditions there was only one very severe frost-bite. This was one of Joyce's feet, which on two occasions had to be nursed back to life for more than an hour.

"The western party of last year spent considerable time in crossing a range of foothills 4000 feet in height. I thought it possible to avoid this, and started on September 9 to find a new route and establish a depôt. The party included Mr. Skelton, Mr. Dailey, Evans, Lashly, and Handsley. We found an easy road up a glacier, and placed the depôt at a height of 2000 feet, 60 miles from the ship. Returning from this point in three and a half days, we regained the ship on September 20. We were to some extent sheltered from the extreme cold encountered by the other parties, but the temperature was frequently below -50° , and at lowest $-59^{\circ}5$. I have mentioned these temperatures, because I believe they are almost, if not quite, without precedent in polar travel, and they therefore afford the best possible proof of the excellent state of health of the ship's company.

"The extended south-western journey was started on October 6; the

main party consisted of those persons who had laid the depôt, and the supporting party was in charge of Mr. Dellbridge, and included Wild, Heald, Allen, Pilbeam, and Croucher. Mr. Barne had also the depôt laid by himself, and some food remaining at depôt (A) from the previous season. The party was most unfortunate in experiencing an almost continuous south-westerly wind, with drift and snow, against which they could only march with difficulty over a wretched surface. The supporting party turned on October 28, and the main party, after a continuous struggle, reached the mouth of the strait in lat. 80° S. on November 14. They advanced a short way inside the strait, but were continuously headed off by ice-disturbances. On November 22 they turned, and, keeping as close as possible to the coast-line, they made their way homeward, arriving at the ship on December 13. The whole party showed evidence of their hard work. Mr. Barne and Quartly were somewhat overstrained, and the latter was placed on the sick list for a short time. The party was unfortunate in failing to penetrate further into the straits, as I had hoped they would; but their observations on the ice-disturbances, the finding of a lateral moraine of huge granite boulders, and other evidences, prove that the strait contains an immense glacier, one of the most important feeders of the barrier, and it shows indirectly the great extent of the land ice-cap to the westward of this position. One of the most important facts discovered on this journey was the movement of depôt A. The fact admits of no doubt, as the depôt was established on the line of transit of two well-defined peaks. It was found to have moved a distance of 608 yards across the line. This is the only definite measurement of a barrier movement we have obtained. It may be difficult to understand how vast all these ice-problems are to a sledge party endeavouring to solve them. Once amongst the disturbed ice, it may take days to reach a point but a few miles distant. Meanwhile, the party is repeatedly plunged into hollows, where they can see nothing, and the greatest care has to be exercised to avoid dangerous crevasses. On October 12, Dr. Wilson made another journey to Cape Crozier for zoological purposes. He was accompanied by Cross and Whitfield. The party had wretched weather, and on one occasion were practically confined to their tent for a week. Determined to continue his work, Dr. Wilson eked out his small supply of provisions by killing seals and penguins, and cooking with a blubber fire. They reached the ship on November 5. From lack of equipment, Mr. Royds was not able to start to the south-eastward till November 10. His party consisted of Mr. Bernacchi, Cross, Clarke, Plumley, and Scott. They were unsupported, and the direction taken admitted of no depôt. In spite of more or less constant south-westerly winds, thick weather, snowfall, continual drift, and a heavy surface, the party made steady progress, and turned on November 28 at a distance of 155 geographical miles from the ship. The whole journey lay over a

monotonous plain, in which no undulation could be detected. The marching hours averaged over nine a day, and food was cut to a minimum. Knowing as I do the barrier surface, and considering the want of support, the impossibility of making depôts, and the monotony of the work, I think this journey cannot but be described as a splendid effort. It was by no means barren of result. Mr. Bernacchi obtained a most interesting and uniform series of magnetic observations with the Barrow circle; careful observations were made of the barrier surface, including several temperatures taken in the snow surface by digging and in crevasses. The latter are especially interesting, because we have often looked for evidence to show that the barrier is afloat far south of its northern edge, and I think these temperatures go far to prove it. The series shows a steady fall to a certain depth, after which there is an equally steady rise to the lowest point reached (19 fathoms). Such an effect can only be produced by the presence of water. The party reached the ship on December 10, all being in good health, though exceedingly hungry.

“The western party left the ship on October 12. The main party consisted of myself, Mr. Skelton, Mr. Feather, Evans, Lashly and Handsley; the supporting party of Mr. Ferrar, Kennar, Weller, Mr. Dailey, Williamson, and Plumley. The ascent, which led over the icy surface of a glacier, was in places extremely rough, and we soon had considerable trouble in keeping the sledges in repair. By October 18 we had arrived at a point about 5000 feet above sea-level, and 80 miles from the ship; but here, discovering that the runners of three out of four sledges were practically disabled, we had no choice but to return to the ship. With a final march of 31 miles, the ship was reached on the night of October 21. I decided to make a fresh start to the west with the main party only, and arranged for Mr. Ferrar to proceed independently with two men, Kennar and Weller. He elected to accompany my party to the summit, and to make his geological examination when returning, at his leisure. Accordingly, I again left the ship on October 26, with repaired sledges and a party of nine. We had further difficulty with the sledges, and were delayed by thick weather and heavy winds, but on November 4 reached a height of 7200 feet. Here we were forced to remain in camp for six and a half days, during the whole of which time the wind blew furiously from the summit, the air was thick with driving snow, and the temperature was continuously low. Two attempts were made to start, but frost-bites came so rapidly that we were quickly driven back to our sleeping-bags. Towards the end the very close confinement began to tell on the party, and I had decided to get away at all hazards, when the wind fortunately lulled. We managed to get away, and over the summit, whilst Mr. Ferrar started to descend. We were now at a height of 8900 feet, at which altitude we continued as we advanced to the west. The travelling

conditions were exceedingly severe; our gear was badly "iced up" after the long stay in camp; the cold was intense, especially at night. The surface, though hard, was sprinkled with rime, which greatly increases the friction; but the most obnoxious element was a constant westerly wind, which cut like a knife. In spite of every effort, our progress became slower, and there were evident signs of fatigue in some of the party, though all endeavoured to hide it. On November 21 Handsley's chest gave him some trouble, and we were reduced to relay work. On November 22 I was reluctantly forced to divide the party. I selected Evans and Lashly as fittest to proceed, and the remaining three, much to their disappointment, were directed to return. By easy marches the returning party reached the ship on December 16, Mr. Skelton taking a number of observations and photographs on the way. The advance party was now able to make much better progress, and no further signs of fatigue appeared, though we increased the marching hours. Observations made at the most westerly camp show it to have been in lat. $77^{\circ} 59' S.$, long. $146^{\circ} 33' E.$ We made this camp on the night of November 30, and started to return on the following day. The summit of Victoria Land is a vast plain, in this latitude of a height of nearly 9000 feet. I am inclined to think that it is lower towards the north and higher to the south, but that the difference in level is slight. The wind is almost continuously westward. There was evidence that during the winter it blows with great violence from the west-south-west; during the summer it gradually shifts to the south-west and south, or even more southerly, when what I believe to be the only snowfall of the year takes place. Everything points to an extremely small snowfall. There are slight undulations or saucer-shaped depressions, the exact shape and extent of which it is impossible to determine. They are detected by differences of shade on the snow-plain, or with a levelled theodolite. The greatest difference in level seemed to be about 50 or 60 feet, and as the inclination is spread over a distance of 2 or 3 miles, it is imperceptible underfoot. Journeying east or west, we each day appeared to cross two or three long, low, irregular waves, the eastern faces and hollows of which were clothed with sastrugi of enormous height, whereas the summits and western faces were quite smooth, and afforded a good travelling surface. After a somewhat adventurous return, we reached the glacier, and made a *détour* down a northward arm, which we found to end far from the sea, and to be succeeded by a chain of frozen lakes. We returned to the ship on Christmas Eve.

"Mr. Ferrar left me on November 11 to return down the glacier valley. The valley cuts deep into the mountain ranges, with sides that are always steep and often precipitous, where the bare rock is exposed. The rocks are generally not difficult to reach, and the moraines give an excellent indication of the nature of the rock to be looked for. Mr. Ferrar's discovery of plant-remains alone indicates the importance of

this journey; but in addition to this, he was able to make a fairly complete geological survey of an extensive district, and to secure evidences of the extent of former glaciations, and of the retrogression of the present one, which I feel sure will be of the greatest interest. The details of his work will appear in his own reports, and I would add that he deserves great credit for the practical manner in which he managed his small sledge party. He had only one sledge, and that had suffered greatly from the hard rough ice of the glacier, so that he was obliged to exercise great judgment in selecting his camps, and to travel extensively from each camp, in order, as far as possible, to save his sledge from breaking down. He returned to the ship on December 11. Lieut. Armitage, Dr. Wilson, and Heald were absent from November 23 to December 12, making a survey and examination of a glacier which flows into the strait to the northward of Mount Discovery; and on November 16, Dr. Wilson, Mr. Hodgson, and Croucher commenced a small trip of eight days, spent in examining the junction between the barrier and Erebus island.

“Dr. Koettlitz spent the greater part of the summer in bacteriological work. Mr. Hodgson took advantage of the fine weather to augment his collections. Mr. Ford remained on board as cook and steward; and Dell, who, on account of a wound in his arm, was prevented from sledging, was employed in training the dog-team. The team, which consisted of six young dogs, born in 1902, soon became highly efficient; at first, in supplying the sawing camp, and later, in communicating with the relief ships, they proved of the greatest use. Before leaving the ship, I had seen a large tent made in preparation for the summer work. I directed that this tent, together with the necessary stores and a boat, should be taken to the northward before December 15, that the tent should be erected in a safe spot to leeward of some islets, about 9 miles from the ship, and that sawing should be commenced near this camp as soon as the officers and men returned from sledging. I have already mentioned that in December, 1902, the open water was close to the islets. My intention to be back by December 15, 1903, was frustrated, and Lieut. Armitage took charge of the operations, but under considerable difficulties, for the open water was not now within 17 miles of the ship or 8 of the camp. Under these circumstances, he decided to start sawing near the camp, thinking that the saw-cuts might remain open, though the floes could not be detached till the outer ice had broken away.

“The sawing was commenced on December 18, and shortly after officers and men were divided into three watches of nine, which, by relieving one another, kept one saw continuously at work. The ice was from 7 feet to 8 feet thick, and the greatest length of cut accomplished in a four hours' watch was 40 feet, whereas to clear a channel it is necessary to saw approximately four times its length.

It was soon discovered, moreover, that the saw-cuts, being filled with slush, were rapidly refreezing. The prospect was not inspiring, yet the work was cheerfully continued.

"I reached the camp on New Year's Eve, and, seeing the futility of the work which had now been in full swing for more than ten days, arranged to break up the camp and return to the ship. With the exception of Dr. Koettlitz, Mr. Ford, and my own sledge party, all hands were employed on the saw. The work was hard, and its hopeless nature must have been obvious to every one, yet it was carried on vigorously, in the evident determination that no effort should be spared in the cause of freeing the ship.

"It was most gratifying to see the splendid state of the health of the party. Sledging and sawing had combined to bring all into the fittest condition—appetites were enormous, spirits never flagged, and it would have been difficult to find a more contented community.

"The men returned to the ship on January 2. On the following day Dr. Wilson and I proceeded to the ice-edge, and camped on the westernmost headland of Erebus island, which I have called Cape Royds. We found here a new rookery of Adelie penguins, and a number of erratic granite boulders, and decided to remain some days. At this time the ice showed no sign of breaking up; a loose patch lay off its edge, coming and going with wind and tide, but effectually damping the swell.

"On January 5, we were looking to seaward from our tent, when the *Morning* hove in sight, shortly followed by another ship, for which we were wholly unable to account. After signalling through to the *Discovery*, and arranging for the transmission of mails, we went aboard the *Morning*, and soon learnt all the news. I need not say how concerned I was to learn the extensive preparations that had been made for our relief; the letters made it quite clear how this had come about, but it was impossible not to feel the keenest regret that our position should not have been better known and such a large outlay avoided.

"The instructions to abandon the *Discovery* cast a gloom over the whole ship; the spirit in which they had been issued was understood, but on the spot, face to face with the situation, the ultimate release of the ship appeared a certainty to every one. There was not one who would not have been prepared to back his opinion by remaining by her, or who did not shrink from the thought of leaving her. Up to this time, we had all held optimistic views of our chances of release in the present season. Captain Colbeck's report of a clear sea to the north was also cheering, but towards the last week in January, when there was little change in the ice-conditions, all began to grow despondent; it seemed as though the ice were determined to exact its tribute.

"The *Terra Nova* attempted to butt the ice with a full head of steam, but the result was insignificant; some explosions were tried, but more with the idea of ascertaining the best method of using them than from

hope of an effective result. The distance was altogether too great for such attempts.

“To be prepared for all contingencies, I thought it wise to commence the transport of our most valuable effects to the relief ships on January 15. It was arranged that one large tent should be placed and kept halfway between them and the *Discovery*. The loads were taken to this tent by our own people, and from thence carried on by the sledge teams to the relief ships. The surface became so extremely heavy that the parties were obliged to spend each alternate night in the tent, and it was, therefore, only on alternate days that loads were despatched from the ship. By the end of the month, all collections, registers, instruments, and valuable books had been transported.

“The first general break-up of the ice commenced towards the end of January. A heavy swell entered the strait, and was felt very distinctly on board the *Discovery*. The ice went out very rapidly, and in large floes, which streamed away to the north-west. The result of our ten days' labour on the saws went out in one large floe. By the end of the month both ships were inside the glacier, 8 miles to the north. On February 3, the open water was within 6 or 7 miles of the *Discovery*, but by this time the swell had almost vanished, and the ice was quiescent. If the explosives were to be used, I now thought the distance warranted their trial, and went myself to the relief ships for that purpose. The ice-edge now extended in a straight line, approximately east and west, for a distance of 6 or 7 miles, and this broad front was more or less equidistant from the *Discovery* at every point. The slight swell that remained formed long cracks from 100 yards to 200 yards apart, parallel to the ice-edge, and extending its whole length. In course of time a lateral crack would suddenly spread from the edge to the outer crack, then in a very short time all the ice beyond the outer crack would strip away along the whole edge. These lateral cracks formed the lines of weakness, and it was in making them artificially that I hoped for good results from the explosives. A few trials proved so effective, that on February 6 an explosive party was sent from the *Discovery*, and all available hands from the *Morning* and *Terra Nova* were employed in digging holes for the explosion. The holes were made from the eastern extremity of the ice on a line towards the *Discovery*, and at intervals varied according to circumstances. The thickness, and in places the sodden condition of the ice, made this work most laborious, and I cannot speak too highly of the manner in which the crews of both relief ships stuck to their work. On more than one occasion, when the results warranted, they volunteered to continue throughout the night. Although at times the effects of the explosions were most inspiring and great advance was made, there were several days when little or no good results appeared to be achieved, and as the season advanced each day became of greater importance. On

February 10 our prospects did not look bright; but on February 11 another big break-up of the ice occurred, and on February 12 the relief ships were within 3 miles of the *Discovery*. Explosions were resumed, and on the morning of February 14, this distance had been reduced to $1\frac{1}{2}$ mile. At 5 p.m. on the same day another break-up commenced, and the men working on the ice could barely be picked up fast enough. The news quickly spread on board the *Discovery*, and all hands were soon assembled on Hut Point. The floes appeared to break away about as fast as the relief ships could steam through them. As usual, the broken ice streamed away to the north-west. A large pool of broken water had been gradually forming throughout the season off Hut Point, and at 11 p.m. the last strip of fast ice between this pool and the sea broke away, and amid much enthusiasm, the relief ships steamed round the point and secured abreast of the *Discovery*. Although the ice continued to break away to the south, it held fast in the small bay in which the *Discovery* lay, and here it was from 12 feet to 17 feet thick. On February 15 we were busily engaged in filling the boilers. In the night I exploded a charge which cracked the floe in all directions.

“Early on February 16, a final explosion practically cleared our small bay of ice, and the *Discovery* swung slowly round to her anchors, one of which was immediately weighed. In the evening the *Terra Nova* came alongside to give us coal, but later it blew hard from the south-west, and she again put to sea. A strong wind from this quarter was a most rare occurrence, and I expected that, as usual, the wind would quickly shift to the east; but, though it lulled in the night, in the morning it increased to a full gale without change of direction and with a rising sea. The *Discovery* had heavy anchor gear, but I knew the holding-ground to be bad, and that we were too close to the ice-foot to allow of cable being veered. Steam was raised with all despatch, but before the engines were ready the ship began to drag, until her stern was bumping against the ice-foot, and the moment that the engines were reported ready, I had no option but to weigh anchor. It was an unfortunate moment for a first trial of the engines, but all would have been well had we been able to hold our own till clear of the small shoal off Hut Point, barely a quarter of a mile from the ship. At first we did so, but later the strong current running to the northward round this point caught our bows and swept us on to the shoal, and she took the ground at 11 a.m., with wind, sea, and current all tending to place her farther ashore. In the afternoon it blew very hard, the ship bumped very heavily, and the seas broke over her. Knowing the shoals to be small, and finding a deeper sounding at the bow-sprit end, I tried with steam and sail to force her over the bank, but this only seemed to make matters worse. There was nothing to be done till the weather moderated. It was a very trying time, but every one behaved admirably, and arrangements for lightening the ship were discussed. At 6 p.m.

the wind commenced to lull, and shortly after 7 the ship was reported to be forging astern; in a few minutes there was no doubt of the fact. The engines were put full steam astern, and the ship rolled, until at 7.30 she slid off into deep water; whilst ashore, a good deal of the false keel was ripped off. Beyond this, I do not think the ship sustained any damage whatever. There was no increase in the leaks.

“On February 18, at the northern glacier tongue, we were joined by the *Terra Nova* and *Morning*, and we spent the latter part of that day and the night in dodging from side to side of the glacier, and getting in the small quantity of coal which the relief ships could spare. We received fifty tons of coal from the *Terra Nova*, and twenty-five from the *Morning*. To supply us with the latter amount, Captain Colbeck reduced his own stock to a minimum; but the total quantity was most disappointing, as, together with what remained of our own supply, we had now only 115 tons, and I knew this would be insufficient to carry out our programme of proceeding round Cape North should we meet with pack-ice. I was able to communicate my plans and wishes to the captains of the relief ships at that time. I wished, also, to water ship, and to pick up a boat which we had left on the glacier, but another gale sprang from the south-west on the afternoon of February 19, and we were forced to put to sea. We steered for the northward, the relief ships in company, and ran close along the coast-line, which was almost free of pack, as far as Cape Washington. Off this cape, on February 21, the *Morning* parted company and proceeded to the northward. As she is much better under sail and much worse under steam than the other ships, it was not desirable that she should remain with them. On February 22 we entered Wood bay, which was heavily packed, and watered ship; in the evening the ship was swung, and we proceeded to sea. The coast from Cape Sibbald to Coulman island was also heavily packed; keeping outside the pack, we met a heavy easterly swell, and during the night had much trouble with our pumps, having to put the fires out in the main boilers until the stoke-holes were cleared of water. In the morning we proceeded under steam, and passed close to Coulman island about noon.

“On February 24 we passed through the Possession islands, and shortly afterwards a bad strain in the rudder-head was noticed for the first time. We sought shelter and anchored that night in Robertson bay. The spare rudder was shipped and the ship ready for sea by 9.30 a.m. on the following day (February 25). To the northward of Robertson bay we found a vast number of birds and many streams of pack. The weather was moderately clear, and we had a good view of the coast-line, but during the evening and night were forced to keep well to the north. On the morning of the 26th it was very thick, and the pack-ice was all about us; before noon it cleared, and we proceeded along an open lead towards the land. Shortly after noon we arrived

at the end of this lead; we were nearly abreast of Smith's inlet, and the coast-line could be very distinctly seen as far as Cape North, but the pack-ice extended on all sides of us. From the crow's-nest, however, the pack did not appear close, and I could see several promising leads along the coast-line. With another hundred tons of coal, I should not have hesitated to enter the pack; but we had now only eighty tons left, and I felt, under the circumstances, that it was an unjustifiable risk, more especially as the barometer was falling, and there were all the signs of an approaching gale. We spent the afternoon in sounding and dredging, and at 5 p.m. ran to the eastward to escape from the pack. With a strong ice-blink on our port hand, we turned north on February 27, keeping approximately on the meridian of 172° E. On the 28th we got a strong south-east gale, with frequent snowstorms. The engines were stopped at 3.30 a.m., and we proceeded under sail; two hours later we lost sight of the *Terra Nova*. Hoping she would pick us up, I stood steadily on under sail on the same course throughout the day and the following night, and we saw nothing more of her until she arrived at this place. At 4 a.m. on February 29 we wore ship and stood to the westward in about lat. $67\frac{1}{2}^{\circ}$ S., continuing on the same course throughout March 1. During the whole of this time, and since February 26, we had constantly a strong ice-blink, and every evidence of pack on the port hand.

“Early on March 2 land was reported on the port bow; we made out a long island, which we took to be Russell island, but the upper parts were entirely hidden by cloud. We passed within 2 miles of the northern end of this island, the weather rapidly clearing, and the clouds lifting, until in the afternoon we could see the whole island and other islands to the north. We were much puzzled in placing the islands. Only one thing was clear: that the island to the south, if Russell island, was one island and not three. The solution of the problem flashed on me when I again looked at the sketch of the islands given with Balleny's log in the ‘Antarctic Manual.’ Accepting the southern island as Balleny's Sturge island, which it exactly resembles when viewed from the north, we saw that the number and outlines of the other islands agreed with the sketch, except that Peak Freeman was hidden in cloud, and we did not see Row island, which is described as low. Since that, Mr. Mulock has plotted the angles taken during the day, and we can now say with certainty that the Russell islands are in error, and that the island so-called is Balleny's Sturge island. Considering the meagre nature of Balleny's log, that this was the only information that Ross possessed of Balleny's discoveries, and that the latter only saw land at a great distance, I think the mistake may be easily understood.

“Our movements on March 3, 4, and 5 are best gathered from the table of positions.

Date.	Latitude.	Longitude.
March 3	67° 34' S. ...	159° 54' E., D.R.
„ 4	67° 24' S. ...	165° 38' E., Obs.
„ 5	66° 23' S. ...	154° 7' E., Obs.

“Throughout the day and night of March 4 we stood to the north-west, taking a north-east course on the morning of March 5, so that our track lay much closer to the assigned position of Cape Hudson than the positions would indicate. After passing Balleny islands, we saw no signs of pack-ice, but bergs were fairly numerous. We had continuously a long swell from the north-west-west, but little wind. It was thick on March 3, but quite clear on March 4 and 5, when we could have seen land at a great distance. Soundings taken on the three days gave an almost uniform and remarkable depth of 250 fathoms. On March 4, a fairly good haul was made with the trawl. On this day I was much tempted to continue in a south-westerly direction, but had again to deplore the insufficiency of our coal-supply. We had now little more than fifty tons left, and this, I knew, would be barely enough to carry us to the rendezvous. The *Discovery* is a wretched sailer, and in her present trim, with the small spare rudder, is almost unmanageable under sail alone, however the yards may be trimmed. When close hauled she carries almost full weather helm, and makes from three to four points of leeway. To economize coal, we had to remain under sail alone on more than one occasion when amongst bergs, and the situation was rendered more unpleasant by the fact that there were only four hands in the deck watch. Under steam and sail she behaves exceptionally well for a ship of her class; she is very stiff and weatherly, and we have never yet found it necessary to heave to.

“On March 5 we re-crossed the Antarctic Circle, after an interval of two years and two months. From this time we had almost continuous north-westerly and westerly gales until we arrived at Auckland island. The three days were spent under sail alone, but we made so much leeway that we were obliged to get up steam again. We sighted these islands on March 14, having been close hauled throughout. Early on March 15 we anchored in Laurie Cove, with ten tons of coal remaining in the bunker. The *Terra Nova* arrived on March 19, and the *Morning* on March 23. Both ships had experienced very severe weather; they had been driven far to the eastward, and had been repeatedly hove-to. We have here refilled our boilers, and received thirty-three tons of coal from the *Terra Nova*. The *Morning* is taking in ballast, after which we shall leave for Lyttelton in company.

“I would only at present notice in general terms the conduct of the officers and men of this ship throughout the expedition. I have given my reason for touching lightly on the scientific work accomplished, believing that each officer will receive full credit for his departmental labours, especially under the arrangements which have been made with

regard to the scientific publications. But in polar expeditions there must always be times when all must work for the common good regardless of department; at such times there has been no need to ask for volunteers in the *Discovery*. On the sledges or on the saws, in coaling or watering the ship, or at any task that needed to be done hurriedly, officers and men have worked alike, and grudged no labour till the work was finished. The conduct of the men has been beyond praise. By them the monotony of the second winter was met with unflinching cheerfulness. Most arduous sledge journeys and the most severe weather were encountered in the same spirit, and with an intelligence that freed the officers from all anxiety as to their welfare. But the qualities of the ship's company has never been more evident than since our release from the ice. The difficulties I have mentioned, and many others which might naturally be expected after such a long captivity in the ice, were overcome only by incessant labour. It was, in the sailor's expression, 'Watch, and stop on,' and though many were almost worn out with fatigue, there was neither complaint nor demur when a fresh task was imposed. I shall hope to make their services better known to you on the return of the expedition. Although, as was shown, our small company were so thoroughly able to take care of themselves, and naturally felt some embarrassment at the extent of the relief expedition, I would not have it appear that we undervalue the services of the relief ships. Everything that could possibly be done for us they were only too willing to do. Captain Colbeck's arrangements with regard to stores, etc., appear to have been excellent, and this year, as last, he has shown himself ever ready to sacrifice his own interests to ours. His conduct of the relief expedition deserves the thanks of his former as well as his present employers. His services were ably seconded by those of Captain M'Kay of the *Terra Nova*. Of the officers and crews of both ships, I can only add that I believe they were almost as anxious as ourselves to see the *Discovery* released, and almost as pleased when that event was happily accomplished."

THE SWEDISH ANTARCTIC EXPEDITION.*

By Dr. OTTO NORDENSKIÖLD.

It is with a full consciousness of the great honour accorded me, that I have accepted the invitation of the Royal Geographical Society to submit to you this evening the first account given outside Scandinavia of the Swedish Antarctic Expedition, of which I was head.

* Read at the Royal Geographical Society, March 21, 1904. Map, p. 128. The map is only a provisional sketch-map, as it has not yet been possible to draw up a map embodying the exact measurements of the expedition.