

**Royal  
Geographical  
Society**

with IBG

Advancing geography  
and geographical learning

**WILEY**

---

The French Antarctic Expedition

Author(s): Jean Charcot

Source: *The Geographical Journal*, Vol. 26, No. 5 (Nov., 1905), pp. 497-516

Published by: geographicalj

Stable URL: <http://www.jstor.org/stable/1776355>

Accessed: 27-06-2016 05:03 UTC

---

Your use of the JSTOR archive indicates your acceptance of the Terms & Conditions of Use, available at

<http://about.jstor.org/terms>

JSTOR is a not-for-profit service that helps scholars, researchers, and students discover, use, and build upon a wide range of content in a trusted digital archive. We use information technology and tools to increase productivity and facilitate new forms of scholarship. For more information about JSTOR, please contact [support@jstor.org](mailto:support@jstor.org).



*The Royal Geographical Society (with the Institute of British Geographers), Wiley* are collaborating with JSTOR to digitize, preserve and extend access to *The Geographical Journal*

by the Kagera river at its mouth. This bar reduces the entrance of the harbour to a narrow width of deep water, and is an effective protection against the gales from the north-east. As the water is only from 3 feet to 4 feet deep over it, the seas rolling in from the lake break up on the bar. The southern entrance is also narrow, with deep water. Mizinda point, projecting slightly into the harbour, further improves the protection, and a pier run out at this point would enable steamers to come alongside without difficulty. The gales from east and south-east, coming from the open lake, are extremely violent on this coast. For the security of shipping on the lake, a good harbour is of the utmost importance. All the requisite conditions are amply fulfilled by Mizinda harbour.

The lake-shore north of Point Chiasimbi is very swampy, and impracticable for landing except at the mouth of the Bukora river. This river, coming from the small lakes in Ankole, is choked with papyrus and reeds throughout its length, but can be navigated in canoes through certain winding channels. Near the mouth are a landing-stage and a canoe ferry to the other bank. From just south of Chiasimbi point to the mouth of the Kagera river extends a beautiful beach of white sand resembling that of the sea, backed with parklike country, with woods and groups of fine trees. At Mizinda point a sharp projection of rocky ground occurs, forming a cliff about 150 feet in height on the eastern edge. Busungwe island, on the eastern side of the harbour, is rocky, uninhabited, and partially covered with vegetation and groups of trees. From Mizinda point southwards extends another long white sandy beach as far as the mouth of Luanyega bay, which forms another splendid harbour, but within German territory. From here southwards towards Bukoba, the lake-shore consists of steep rocky headlands with small indentations. Here and there only can sufficient shelter for canoes be found.

*(To be continued.)*

---

## THE FRENCH ANTARCTIC EXPEDITION.\*

By Dr. JEAN CHARCOT.

I AM fully sensible of the honour conferred on me by the Royal Geographical Society—an institution so universally and justly esteemed—in asking me to read before it a paper on the French Antarctic Expedition. I look on this honour, not so much as a deference paid to the expedition itself and its results, as to the efforts made to secure them. No possible comparison can be made between our little excursion and the great and brilliant English expeditions, and it is not

---

\* Read at the Royal Geographical Society, June 26, 1905. Map, p. 592.  
No. V.—NOVEMBER, 1905.]

without a certain trepidation that I venture to address you on our achievements within a few months of the return of the *Discovery* and the *Scotia*. Nevertheless, I have not hesitated to accept the opportunity offered me, knowing that you will make every allowance for our shortcomings, and take into consideration the great material difficulties that we have had to overcome.

In our country, which yields to none where there is question of explorations in Africa, in Asia, and in South America, polar expeditions had been neglected; hence even the present undertaking was favourably received only by a very small circle. It had, moreover, to be prepared somewhat hastily, and that with extremely limited means, especially at the moment of departure. I hope that in future matters will be arranged quite differently, and that henceforth France will take her part with the other great nations in the peaceful struggle against the unknown. Such co-operation cannot but tend to draw closer the ties between peoples that should be animated by feelings of mutual esteem and friendship.

Owing to the limited means at our disposal, the programme adopted by me was correspondingly modest, for I went on the principle that it would be better to employ all our resources in thoroughly exploring a narrow corner, and thus securing trustworthy documents with accurate observations, than wandering listlessly up and down the seas, exhausting our efforts in haphazard researches which might prove more satisfactory to our vanity, but would assuredly have been far less useful to science.

You will easily understand me, when I say that it is impossible to give you the exact fruits of our mission within scarcely a fortnight of our return. Our packages, with notes, documents, and collections, have not yet been opened, and the fortnight has been almost entirely occupied by me in visits and in taking the steps which were required after such a long absence, and have been almost as tiring as the preparations for the expedition, certainly more so than the expedition itself. Many long months will be needed to arrange all my scientific observations, years almost to classify and study the collections, and, even as regards the geographical studies and discoveries, I think it would be premature to give results that cannot claim finality until we have carefully gone over our notes and observations, and looked up and studied all the original charts of previous expeditions in the same regions, since it seems to us that these charts will have to be considerably enlarged and modified by our researches. Hence I hasten to assure you that the chart which you have now before you must not be considered as anything more than a mere sketch, hurriedly drawn to enable you to follow the various sections of our voyage. I think I may claim that, thanks to my associates' zeal and competency, the scientific documents brought back by us are not inconsiderable. But it will be for the savants who may have to examine them to give their opinion on their value.

I will accordingly here give you a mere summary of our labours. As for our account of the life itself of the expedition, I would ask a public accustomed to the story of the great polar epopees to excuse me for dwelling a little on that aspect of the subject. I have to state with almost a sense of shame that, owing to circumstances quite beyond my control, we had to set out without a single person experienced in the navigation of ice-fields, so that you may be interested in knowing how we managed to get through at all. Necessity is the mother of invention, and we may sometimes learn something from the shifts to which the ignorant are driven when forced to struggle through



PANORAMA OF WANDEL, WITH THE BAY WHERE THE "FRANÇAIS" WINTERED.

difficulties without the aid of precedents of which they have no knowledge.

Our general programme was to survey the north-west coast of the Palmer archipelago (Haseau, Liège, Brabant, Antwerp islands); to study the south-west entrance to the Gerlache strait; to search for a land wintering station in that region as far south as was possible with the state of the pack-ice; to make excursions in spring, and in summer to continue the exploration of Graham Land, with a view especially to elucidating the question of the Bismarck strait, and following this coast as far as Alexander I. Land. During the whole of this campaign we had to occupy ourselves with the various operations for which the expedition had been equipped. In a word, we had to continue and complete the labours of the Gerlache and Nordenskjöld expeditions.

To carry out this programme, I had built at St. Malo a small ship of 245 tons, well fitted for the work it had to do. Built entirely of oak, strength was the first consideration; the berths were well protected against cold, and special care was taken to provide proper accommodation for the laboratory, chart-room, and other installations. Thanks to its build, the ship was quite seaworthy and well suited for navigating the ice-fields. Unfortunately the engine, the best we could get for our money, was not strong enough for the work to be done, and its defects had to be made good by the skill and energy of men and officers. The navigating and scientific instruments, partly bought by me, partly lent by the Government or given by private persons, proved entirely satisfactory. I took special care with the clothing, provisions, and supplies of all sorts; and I may say that in these respects few, if any, expeditions have been better equipped than ours. The provisions were abundant, greatly varied, and of prime quality, partly prepared in France under our inspection, while certain specialities were procured in Germany, England, and the United States.

Our staff comprised six unpaid officers, and the crew fourteen men, including five sailors, three stokers, a cook, and a steward, all French except one Italian—an Alpine guide. Of the staff, M. A. Matha had charge of the hydrographic department—astronomic observations, chronometers, study of tides and currents, density and salinity of the marine waters, and terrestrial gravitation; Mr. J. Rey, of meteorology, terrestrial magnetism, and atmospheric electricity; M. P. Pléneau, of photography; Dr. J. Turquet, of zoology and botany; M. E. Gaurdon, of geology and glacial phenomena; Dr. J. B. Charcot, of bacteriology; and the captain of the *Français*, medical duties.

We sailed from Havre on August 15, 1903, and after a series of mishaps reached Buenos Ayres on November 16. For the warm reception received from the Argentine Republic, both on our arrival and return, I shall always have to speak in terms of the deepest gratitude. Nothing could exceed its generous welcome, and the accomplishment of our task is certainly in great measure due to the Argentine people. At Buenos Ayres we were lucky to meet Nordenskjöld, to whom we submitted our programme, which met with his approval. Then, a few days before our departure, we made the acquaintance of the worthy Mr. Bruce on his return from the first part of his interesting expedition. We left Buenos Ayres on December 23, and after stopping a few hours at New Year's island to pick up the five dogs lent us by the Argentine Republic, we reached Ushwaya, where an Argentine transport, driven from its route, brought our coal and our last despatches.

On January 26 we touched at Orange bay, the point where the French mission of the *Arromanche* passed a whole year (1882-83), and carried out those interesting works known to you. After taking some

observations ashore and making sundry researches, we set sail on January 27.

After a fairly smooth passage despite two days of high gales, we landed at Smith island (South Shetlands) on February 1, and here came upon our first icebergs. Then we made for Low island, passing the site of the Williams reef, which we may almost say has no existence, since on our return we again passed the same spot without seeing it, though the weather was quite clear on both occasions.

I find it impossible to give you the substance of my log-book without mentioning at least the chief names of my precursors in the regions we are now about to enter.

In 1819-21, Alexander I. Land was discovered by Bellingshausen. Foster (1828-29) was followed by the remarkable expedition of Biscoe (1832), to whom belongs by right all the west coast of Graham Land. Our countryman, Dumont d'Urville (1837-40), led the way for the German whaler Dallmann (1873-74), who reported the strait by him named Bismarck, besides various other points in the Palmer archipelago. In 1893-94, thanks to quite exceptionally favourable weather in the month of November, the whalers Evensen and Pedersen were able to approach nearer to Alexander I. Land than any other navigator. Lastly, in 1897-99, the well-conducted Belgian expedition under Gerlache marks an era in Antarctic expeditions, distinguished by the discovery of Gerlache strait and the leader's first wintering station.

On February 2, 3, 4, 5 we coasted the north-west side of Palmer archipelago, and made a rough survey of its hydrography. During those four days we were greatly impeded by snow-storms and fogs, and especially by troubles with our boiler. Numerous Balænoptera were met. On the 6th, continuing the same course, and passing many reefs and icebergs, we entered Biscoe bay, and during the night anchored off Cape Errera. On the 7th, making our way in splendid weather through numerous floes, we reached Flanders bay, but could find neither anchorage nor shelter, its shores being covered with a thick fringe of ice. We then made for Lemaire channel, but were baffled by the winds and floes, and had to return to Flanders bay, where we managed to moor the ship to the banquise (ice-fringe) by means of the ice-anchors. Here we remained eleven days, repairing the condenser and boiler, and making a few short excursions round about.

On the 19th we set sail and went in search of a good site for erecting a cairn on Wincke island. Next day we found a suitable position in the Neumayer channel, where we raised the cairn, and not far off passed the night in a little inlet with good anchorage, close to a rookery of penguins. This place, being too sheltered, would be of no use for taking observations during the winter.

On the 21st we entered the Lemaire channel, which, however, we found blocked with ice in the latitude of the southern extremity of

Wandel. We then tried to turn this island, but after passing it found ourselves again ice-bound, and had to return, anchoring in a little cove which we had noticed when passing.

On the 22nd we again essayed to advance southwards, and reached an eminence amid the floes and reefs, from the summit of which we clearly saw that no advance was then possible in that direction. So we returned to Wandel, where we remained two days patching up the boilers. Starting on the 25th in search of the Biscoe islands, we forced our way through the ice, and by nightfall reached the relatively open sea. On the 26th we again encountered a banquise near Pitt island, and tried to penetrate through the ice to the neighbouring islands.

On the 27th, our efforts to make Graham Land being thwarted by the increasing thickness of the ice, and finding no shelter under the cliffs, we had to retrace our steps, and next day again doubled Pitt island. But here, being struck by a fierce squall from the north-east, we had to remain four days at the north-east cape, enveloped in snows and fogs and beset by icebergs.

On March 3rd the fogs lifted, and, a calm setting in, we again made Wandel island, anchoring in the old inlet. The season being now advanced, and all our efforts having failed to find another shelter, we decided to pass the winter in this haven, which abounds in seals, cormorants, and penguins, and is well sheltered from all points except perhaps the north-east. Here, also, we could easily land and set up all the structure needed for our operations, and for our safety in case of any damage to the ship.

I had one of the anchor chains drawn across the inlet and made fast to the rocks on both sides in order to stop the drifting ice, and this in its turn served as a breakwater against the northern winds. The ship, which was thus thoroughly protected, had some 6 or 7 feet of water at its prow, and over 20 at the stern, so that there was nothing to fear from the large icebergs.

We at once set to work with our winter installations, fixing our portable house, and in the ice close by excavating two large stores roofed with shingles and canvas. Here we stowed the provisions, and constructed two Eskimo snow-houses, which also served to keep meat and a reserve stock of seal, which was largely consumed both by the men and exclusively by the dogs. The large whale-boat reversed afforded shelter to the petroleum casks, and the smaller boats were kept ready to be launched at a moment's notice for excursions and fishing.

Two structures, one in stone and canvas-roofed, the other in wood with copper riveting, both provided with plastered sandstone pillars and covered with marble slabs, served for magnetic observations. Another pillar, enclosed in a tent, was intended for observations with the quadrant or sextant. Corresponding arrangements were made on board, and the chain drawn across the inlet was so firmly fixed that it successfully

resisted the attacks of the ice drifting against it in the form of floes and even little icebergs piled up to an incredible size. Still the swell driving before the fierce north-easters at times caused not a little anxiety, especially for the safety of the ship. But it was soon found that, thanks to the trend of the current, the lightest southern breeze, and even a mere calm, sufficed to clear the inlet of the accumulated ice, however thick it might be, except in the month of July. We were surrounded with ice formed on the spot, and, in the spring, with floes and the *débris* of icebergs which had accumulated and become cemented together over a large area. I consider that, if a vessel were minded to winter again at Wandel, it would be in perfect safety if it took the



THE HOUSE LEFT BEHIND AT WANDEL.

same precautions as we did. It would need to be provided with a powerful wire hawser or chain cable fitted with floats, the whole kept ready to be stretched in front of the chain, at a distance of some 20 yards, and so to imprison the ice. The southerly winds, being always less violent, and being besides kept off by the shelter of the land, would never have sufficient force to break the dyke so formed, as we were able to ascertain from our experience with simple rope moorings. There is no fear of being boarded by really large icebergs, on account of the slight depth of water in our bay.

A road sufficiently wide to allow of the passage of the sledges was speedily made at the outset, affording an easy communication with the land. Under these conditions the winter was passed in complete security, apart from certain alarms on the occasion of storms from the north-east,

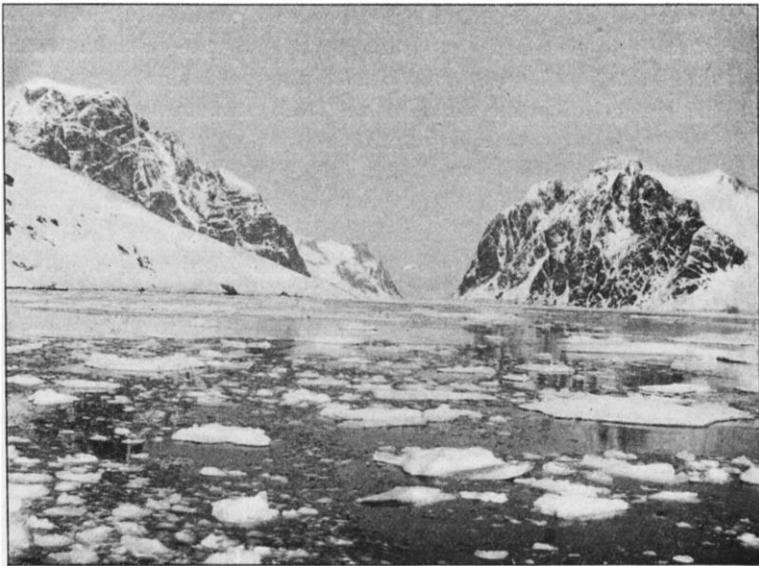
and in the most perfect comfort. Besides the plentiful stores taken with us, the seals, killed in some numbers at the beginning of winter and kept in the ice, never failed us, though it should be noted that we sometimes went several weeks without securing any. The meat is excellent, and the fat proved very useful for melting large quantities of ice. At Hovgaard island there are many more seals than at Wandel, but, except at Flanders bay, we never saw any but single individuals or small groups of from two to six. The cormorants, which were equally good eating, never left us; while the penguins, although they abandoned their rookery at the beginning of winter, frequently returned to the island in some numbers, except in August and September. During the whole winter the sheath-bills (*Chionis*) lived around the vessel like chickens or pigeons, eating the fragments thrown overboard. Lastly, we obtained a considerable number of good fish, either from the open water or from holes made in the ice, not to speak of the barnacles easily gathered from the rocks.

The scientific work was prosecuted without intermission throughout the winter, and to the satisfaction of all, thanks to the comfortable and convenient equipment of the vessel. We also took care to provide occupation and amusement for the men apart from their regular work. In the evenings we held classes for them, and I even gave them a course of instruction in English. Concerts, lectures, or readings of poetry also took place on Sunday evenings. Perfect harmony prevailed, and the best of spirits and good humour were maintained throughout the expedition. From April 27 to August 15, in order to make the most of the scanty daylight, the ship's chronometers were always set so as to mark five o'clock at the moment when twilight ceased, and as this harmless fraud was perpetrated from day to day, the crew were not even conscious of it.

The winter was relatively mild, the lowest temperature having been  $-38^{\circ}$  C. ( $-30^{\circ}\cdot4$  Fahr.); but the variations were excessively sudden, a rise from  $-30^{\circ}$  to  $-3^{\circ}$  C. ( $-22^{\circ}$  to  $+26^{\circ}\cdot6$  Fahr.) within a few hours being no uncommon occurrence, and always bringing in its train violent gales from the north-east, accompanied by snow and hoar-frost, and often lasting a long time. Winds from other quarters were never very violent, and were generally accompanied by fine weather. In summer the temperature was nearly always comparatively low, and if the north-easterly gales were of less duration, they were, on the other hand, much more frequent. During the winter, as far as we could see in Belgica strait, the water was constantly open, although often encumbered by flocs and icebergs. The open sea to the west and south-west was frozen as far as we could see, but an expanse of several miles, at one time open, at another frozen, but always impassable either on foot or in boats, separated us from this pack-ice. To the south the ice appeared more stable, from Hovgaard island onwards, but ice of the

strait which separated us from this island was constantly, within a few hours, being broken up with the north-easterly gales.

It was not till May 12 that we were first able to venture on this ice, but it was again and again broken up after this, and though we had reached Hovgaard on May 30, we could not do so again until July 4. During July we continued our preparations for a forty days' trip which we meant to undertake on August 15, but on the second of that month the ice was once more broken up, and in spite of all our efforts we did not succeed in reaching Hovgaard in a whaleboat until September 6. We arranged a comfortable shelter under a rock, and deposited a month's provisions, but just then the pack to the south



LEMAIRE CHANNEL.

became impracticable. I returned to Hovgaard on October 24, on a thin floe, and this was entirely broken up by a gale only a few hours after my return.

On October 28 we undertook a several days' excursion in a whaleboat, and formed a dépôt. We had very bad weather throughout the early part of November, but on the 10th M. Gourdon and the guide Dayné effected the difficult ascent of one of the peaks of the southern massif of Wandel island. Numerous other excursions were made, but the state of the ice and the bad weather proved great hindrances. On November 24 our usual party, consisting of two sailors, with MM. Pleneau, Gourdon, and myself, started in the whaleboat, which, with twenty days' provisions, weighed 9000 kilos. (20,000 lbs.). From the first

we had a struggle with the ice, and during almost the whole excursion we had to draw the boat along over ice which hardly bore its weight, and covered with a thick layer of melted snow, which forced us to walk with the water up to our knees. Often we had to break the ice for long distances in front of the boat, getting frequent baths as we did so. During the twelve days that this strenuous labour lasted we worked from ten to eighteen hours consecutively, economizing our food as much as possible. We reached an island south of Cape Tuxen, and, favoured by very clear weather, we were able to survey and photograph from six different points the whole coast from Wandel to the Biscoe islands. The strait which was thought by De Gerlache to possibly exist behind Cape Tuxen has really no existence. However, I can almost say for certain—as our hydrographical labours seem calculated to show—that the entrance to the Bismarck strait, reported by the German whaler Dallmann in 1873, exists in pretty much the spot where he placed it; only the general direction of the strait itself, which has been merely indicated by geographers at a venture, is not that given on our maps, especially that of Stieler.

Meanwhile work was actively prosecuted on board the ship, which remained fixed in a wide and thick field of pack-ice, but this began to loosen at the edges, and the ship commenced to open a channel. At the same time the guide, Pierre Dayné, ascended to the summit of the southern massif of Wandel. On December 10 the channel in the ice was begun by means of melinite, and by the use of saws, spades, and crowbars. On the morning of the 17th it reached the stern of the vessel, and as the ice was no longer supported, it began to float away under the impulsion of a strongish south wind, and the ship became completely free. A renewed trial of the boiler having given just enough pressure, there was nothing to delay the start for Wincke island, in order to change the record before continuing our explorations, when once we had secured a fine day for the completion of certain observations. We left behind at our winter station, a small house in sections, measuring 10 feet by 11 feet 6 inches, about 200 litres of alcohol, 375 boxes of condensed milk, 50 of sorrel, and a boat. We left also the magnetic observatory, with its pillar inside, as well as the pillar outside the stone house.\* The tide *datum* was a horizontal line with the letter F above marked on a perpendicular rock at the point M of the plan which we left.

On December 25, the men made merry around a Christmas-tree brought with us from France. Our bay had for two days been somewhat blocked, but a change of wind during the night caused the ice to move away rapidly. At 8 a.m. the fires were lighted, and we hastened to get on board the cables, ice-anchors, etc. At 5.30 p.m. we set sail,

\* The observations taken on these pillars are marked C. B. ("Cabane en bois") and P. E. ("Pilier extérieure") respectively.

and made the passage in fine weather with a breeze from the south-east, though occasionally obliged to force our way through the ice. We thus arrived without difficulty at the small bay where we had already anchored in February (Wincke island, Neumayer channel).

Here we were detained by a southerly wind, which caused the ice to accumulate at the entrance to our anchorage, and also brought with it bad weather. The guide Dayné and Jabet ascended a peak in the neighbourhood, while Gourdon and I ascertained that the cairn placed by us in Neumayer channel was in good condition. Gourdon also crossed a pass which gave him a view of Belgica strait, then free from ice. On January 3 a gale from the north-east began to free the entrances to our bay, and the following day, it being calm, although the barometer continued to fall, we started at 3 p.m. and changed the record left in the cairn on Neumayer channel as we passed. Becoming enveloped in fog, we entered Scholaert channel somewhat by guess-work, and getting a glimpse, when the fog lifted, of a wide and deep bay on the port side, we decided to seek shelter in it, as the weather was very threatening. The bay was surrounded by high ice-cliffs, and filled with floes and icebergs of all sizes. We found no anchorage or place where we could moor the ship, but, being well sheltered by the surrounding mountains, we remained under steam in the lee of a small island.

The next day, January 5, some strong gusts from the north-east compelled us to seek the excellent though dangerous shelter of the ice-cliff. We made an attempt to start at 3.30 p.m., but were driven back to our shelter until the next morning, when, in fair weather, we entered Scholaert channel and did some hydrographical work at several stations. Coasting the north side of Antwerp island, we steered west, avoiding the breakers through which we had passed unconsciously in February during a fog. There was a strong swell from the north-west, and icebergs were numerous, while in the evening we had to force a way through some 3 miles of heavy pack. On the 7th we put out our fires, and, with the help of a north-easterly breeze, steered south-east with all sails set. At 6 a.m. we saw clearly the summit of Mount William, and, skirting the ice within sight of the coast, came in sight of one of the most northerly of the Biscoe islands. On the 8th we had north-easterly squalls, with snow, and, scudding with three sails set, had a narrow escape as we passed between two huge icebergs. Two days later we took advantage of a fine interval to steer more to the south, but the weather and the ice soon became as bad as ever, and we held on to the south-west. The men had a hard time, the ropes and deck being covered with ice, the sea choppy, while snow and fog succeeded each other without a break.

On the evening of January 11 we reached the edge of very close pack-ice, which was studded with numerous icebergs, and extended as

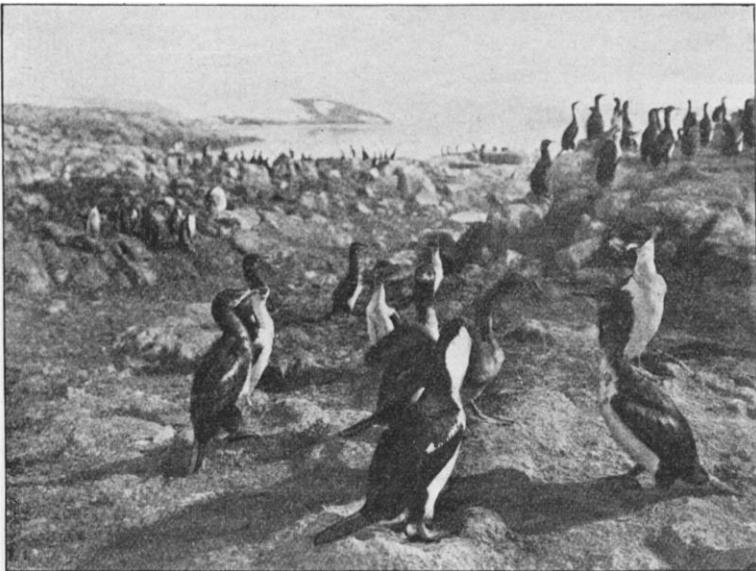
far as we could see. We sounded, and found a depth of 250 fathoms. At 8 o'clock there appeared to the south-east a very high land—Alexander I. Land. During the night we remained at anchor, and the following morning continued along the edge of the pack-ice, which we had little hope of being able to enter. However, at 1 a.m. on January 13, in spite of the great swell, the large ice-floes, and icebergs, we cut into the pack. Our advance was very slow, and before long the ice became so compact that we were unable to move. To reach the land was absolutely impossible, and it was with great difficulty that we freed ourselves. In the evening we again saw Alexander I. Land, and a high summit much nearer was observed to the south-east. Shortly afterwards a long chain of mountains was visible still further to the east. I decided to continue along the pack to the eastward in the endeavour to find a weak place which might allow us to reach the land.

At 8 o'clock on January 14, we perceived a rocky triangular summit a comparatively short distance away, in the direction in which we were steering. Early the following morning we attempted to force our way into the very compact and extended ice which separated us from the land, which now seemed to stretch away to the eastward in the form of a promontory. This is a high chain of mountains on a base of ice and snow, a continuation of that which we had seen in the previous evening. With great difficulty we managed to force our way into the ice, and scarcely a mile from the land we found a narrow channel of open water. The coast appeared to form a cliff of jagged ice, and presented no point at which it was possible to land. We steered towards the promontory to the east, with the intention of approaching the land from the south-west, if the channel did not close up.

We proceeded some 10 miles, and were about a mile from land when, in passing a large tabular iceberg of more than 150 feet high, the ship received a terrible shock, striking four or five times with great violence and freeing herself before the engines, which had been reversed, could produce any effect. The bows were taking water, and the pumps were immediately got to work. Our situation was a bad one, as no landing could be made on this coast, and other submerged rocks might be encountered; besides, there was the possibility of the ice closing up, and if it was necessary to continue pumping, it would be impossible to risk wintering on board, so it became urgent that we released ourselves from the ice quickly. We could not count on our engines, as they had been damaged, but, favoured by a north-east wind, and profiting by the small channels, we proceeded with infinite caution to retrace the pack-ice. Several hours of clear weather fortunately permitted us to accurately fix our position, and survey and draw carefully this new but inhospitable coast. While thus engaged the pumps were kept working, each taking his turn willingly, following the good example set by MM. Pléneau and Gourdon, who worked with the men.

In spite of our damage, we decided to try and regain one of our known anchorages, and continue as much as possible the hydrography of the coast. The state of the ice and our damaged condition would not allow us to proceed further south, at least for the moment, so it remained for us to continue the work in the region where we were, and even a little to the north.

On January 19 we steered towards the land, which we were soon able to distinguish, and at 10 a.m. entered a large bay enclosed by large islands, separated from us by thick pack-ice, which we endeavoured to pierce, but its thickness increased, and the icebergs came so close that we gave up the attempt. No opening could be seen anywhere,



CORMORANTS.

and neither the coast nor islands appeared to offer a landing-place. The weather became stormy, and the wind blew strongly from the north-east; but although we were surrounded with icebergs, we were comparatively sheltered by the pack and the islands, which were evidently Biscoe islands, and we decided to remain here during the gale. In the morning the weather cleared, and we left our anchorage and steered towards the north, following the edge of the pack, only to encounter heavy seas and thick fog, which lasted three days.

On January 24, during a short clearance we saw to starboard some breakers, then a reef, and further away a cap-shaped island surrounded by reefs, probably the most northerly of the Biscoe group. On January 26 we saw Mount William to the south-east, about 75 miles distant.

We continued along the land in the direction of Scholaert channel, of which we wished to complete the hydrography. Whilst the weather permitted, we continued the survey we had already begun of this channel, and fixed the position of the group of islands.

On January 29 we entered Belgica strait, but a strong wind from the south-west retarded our progress, already none too rapid, but shortly after midday we anchored in a small harbour, which we had provisionally named Port Penguin.

The men were weakened by the excessive fatigues of the hard voyage we had made, and the results of the winter had made itself felt upon their health. Nearly all were enfeebled and ate little; but none complained, and kept in good spirits. From February 8 to 11 the weather was magnificent, but up till then it had not ceased to be bad. The men were able to rest and nurse themselves, these last days of sunshine especially benefiting everybody.

The repairs to the engines were finished, and, profiting by the transparency of the water, we were able to estimate the damage to the bows of the ship, which was serious enough, perhaps more serious than we had thought.

While in this excellent harbour everything was put in order on board the ship, and the water-tanks filled. Every day we fished and caught a score of large and excellent fish. The guide Dayné and the storekeeper Jabet accomplished in twenty-two hours a very laborious and dangerous ascent of the highest summit of Wincke, about 5000 feet. I decided to give to this peak the name of Louis de Savoie, the first man to climb it being an Italian.

On February 11 we tried our engines, which worked almost satisfactorily, and enabled us to weigh anchor and proceed to Biscoe bay. Favoured by magnificent weather, we reached the end of the bay before a rocky peninsula, which is almost certain to be the place where Biscoe landed. We took several photographs in the historic bay, which Biscoe would certainly have done had he had a camera. In the evening we regained our anchorage.

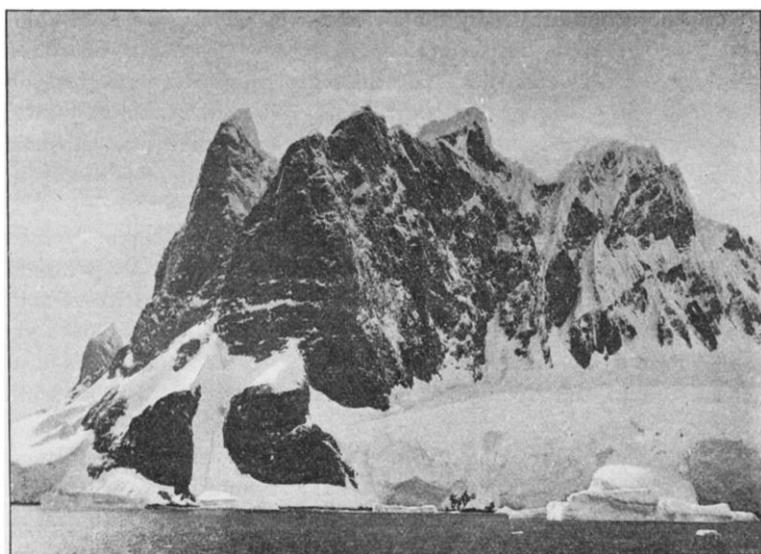
We afterwards returned through Belgica strait, where we again had to struggle against fog and bad weather from the north-east, and after remaining to make a survey of the narrow channel which separates Liege island from Brabant island, we followed the coast of Hoseason island, discovered by Foster in 1829. We landed near Cape Possession, where various work was executed, and after a rapid survey of the neighbouring islands, which agrees with that of the commander of the *Uruguay*, Captain Galindez, we said *Au revoir* to the Antarctic, leaving the last iceberg at Low island.

We anchored on March 4 at Puerto Madryn, where we learned with surprise of the anxiety which prevailed on our account, and I take advantage of this occasion to thank all those who have sought to

reassure us, and in particular Mr. Bernacchi, from whom I have contracted a large debt of gratitude.

It was my intention to tell you, at the beginning of this meeting, that it is impossible to give you for some time the scientific results of our expedition; however, I shall be pleased to send the Society a list of the work done, together with some of the results which are already known.

*Hydrography.*—A regular triangulation, departing from a measured base, has been effected from our winter quarters, the island Booth-Wandal, in a radius from 2 to 5 miles. From the extreme stations of this set of triangles we were able to take bearings of different peaks



CAPE RENARD.

from 30 to 40 miles distant, which will permit the placing of these points with considerable accuracy. On these positions rest the compass surveys executed afterwards, either in the changes of the ship's position, or on the spring journey to the south. A region of 30 to 50 miles around Wandel island was thus determined by triangulation.

The other positions of the coasts surveyed were determined by means of positions at sea resting on astronomical observations. These are—to the north, the exterior contour of the Palmer archipelago and Scholaert channel; to the south, Biscoe islands and two still unknown portions of Graham Land, of about 30 miles each. It is interesting, in regard to the islands bearing his name, to remark that Biscoe only fixed Pitt and Adelaide islands, and was content to indicate between these two islands a chain of smaller islands covered with an ice-cap. Pitt

island is given in three different positions in English and German publications and in the Admiralty charts. These positions differ between them, either  $1^{\circ}$  in latitude or longitude. The result is a great uncertainty about the position of Biscoe islands, which Gerlache passed without seeing in that which is assigned to them on the British Admiralty charts. We have not obviously been able to survey these islands completely, the straits which separate them being completely blocked with ice, but we have been able to fix their exterior contour, giving their breadth, which is the most important point for navigation. They lie close to Graham Land. The survey of the exterior coasts of the Palmer archipelago completes entirely the geography of that region, in conjunction in the north, centre, and south with the map of Gerlache strait drawn by the *Belgica* expedition. We were able to identify to the north Hoseason island and Cape Possession, determined by Foster and Kendall in 1829; to the south, Bismarck estuary, sighted in 1873 by the whaler Dallmann, and undoubtedly before him by J. Biscoe, who landed there in 1832, in the bay which bears his name, probably on the same rocks where we had a hydrographic station.

Finally, we were able to set, on good astronomical observations, the bearings of Alexander I. Land, to which the ice prevented our approach.

The rate of the chronometers was determined during the winter by means of the sextant observations of M. Claude. Our chronometers were kept in an almost constant temperature, and maintained a very regular rate. One may hope in deducing, by the comparison of the time of arrival and of departure, an exact longitude for our winter quarters.

*Tides.*—The *régime* of tides was studied by means of a registering tide-gauge, which was working for about six months. The tides are feeble (about 5 feet being the maximum), but very regular, contrary to the nautical instruction in vogue. The cause of this irregularity is, that they have a *régime* of diurnal preponderance, while the tides in the neighbourhood of Cape Horn and South Georgia are semi-diurnal. Treated by the method of harmonic analysis of Prof. Darwin, the observations of the fifteen first days served to predict with considerable exactness the tide of a day determined five months later. The observations collected will allow us to calculate, by the above method, the principal waves composing the tides at the point studied. We took also some tidal observations at two other points—Wincke island and Flanders bay.

*Colour and Density of Sea-water and Sea-ice.*—During our winter, samples of sea-water and sea-ice, at different periods of formation, were collected and tested during the voyage. The density was measured by means of a Buchanan areometer; the proportion of chlorine by the Mohr-Bouquet de la Grye method.

*Gravity Observations.*—We possessed one of M. Bouquet de la Grye's

comparison pendulums, by means of which seven series of measurements were made in Wandel island. Similar measurements were made in Paris by means of the same instrument placed under the same conditions. The comparison of duration of oscillation, with all corrections made, should give the force of gravity at Wandel island to correspond with the figures observed at Paris.

Of the meteorological studies, which were carefully conducted, the chief results are—low summer temperatures, great and sudden thermometric changes, frequent north-east and east-north-east squalls, with thermometer high and barometer low; fair weather with gentle south-south-west breezes, with low thermometer and high barometer (mean about 30 inches). Lastly, in fine weather, very great regularity in the diurnal variation of the hygrometric conditions, a variation identical with that observed at Cape Horn.

Polar auroras very rare and faint.

It is interesting to compare the simultaneous character of our meteorological records with those of Año Nuevo, and of the observatory established at the South Orkneys.

*Terrestrial Magnetism.*—This study consisted of absolute observations of D., I., and H., and in hourly observations of D. and H. The monthly diurnal variation of these two elements was determined by at least two series of twenty-four hours. A few disturbances were also studied.

The curves obtained are merely an amplification of those of Cape Horn. They will enable the isolated observations previously made in the Antarctic to be approximately systematized.

In atmospheric electricity the two main results are—about 70 volts per metre for the difference of potential between two points of the atmosphere, and very strong electric tensions during most of the north-east squalls. Besides the measurements of tension, we studied the loss, in the atmosphere, of the electricity with which objects were charged. The apparatus employed were those of Elster and Geitel. We carried out the same studies as those made by the Danish Mission to Cape Thorsden.

*Zoology and Botany.*—In these branches our observations and researches have been most fruitful. Both the zoological and botanical specimens collected come from the various stations visited—Flanders bay; Wincke island; Wandel island (winter station); Biscoe bay (Antwerp island), and another bay in that island; lastly, Hoseason island. Fishing with line, trawl, bag, and net yielded numerous specimens of the inshore fauna and flora, and this class of collections was completed by many excursions along the coast.

The cetaceans, several species of which were met, formed the subject of a few observations.

The seals, very numerous in these regions, and represented by four known species, gave occasion to some interesting notes. Of these, a  
No. V.—NOVEMBER, 1905.]

number of specimens have been brought back in the form of skins, skeletons, and skulls.

In our collections, birds are represented by one hundred specimens, consisting of skins, fledgelings, embryos, eggs, etc. Other members of the animal kingdom were captured by means of the above-mentioned fishing-gear.

The fishes, taken in considerable numbers down to depths of 200 feet, represent some fifteen species. On the collection of invertebrates, Prof. Joubey states, "As far as one can judge after a few hours' inspection, and after a rapid arrangement of the materials in large sections, a rough estimate may already be formed of the interest presented by the very numerous objects brought back by Dr. Charcot.

"An attractive feature of this collection is the fact that it comes mainly from shallow inshore regions in the Antarctic. From this point of view, it fortunately completes the work of previous expeditions, such as that of the *Belgica*, nearly all the captures of which were fished up from depths of from 200 to 300 fathoms. Thus, so far as regards the marine invertebrates, these two expeditions, far from going over the same ground, complement each other in a very happy and useful way. I should not like to make even a superficial estimate of the objects received in my department. Still, I may point out a very fine series of echinoderms, including some sea-urchins, star-fish, and crinoides, all not only new, but most interesting from the morphological standpoint. There is also a fine series of annelides, of worms, of nemertes and planaria, besides a considerable quantity of all kinds of parasites—intestinal worms from seals, birds, and fishes. These materials promise to yield highly interesting discoveries.

"The molluscs are remarkable for some magnificent nudibranches, and new or extremely rare shell-fish. The sea-anemones, the octopuses, squids, and medusæ form a remarkable group, if not in number, at least for their novelty.

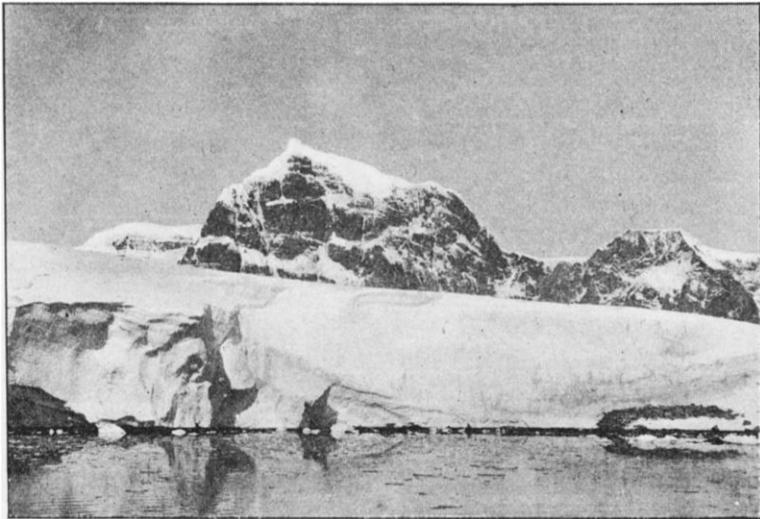
"A vast number of ascidians, including some most curious forms, have been obtained from the surface down to a depth of 60 fathoms. These ascidians are likely to yield important discoveries.

"I find it impossible to say anything about the brachiopods, the cephalopods, the innumerable polyzoa, and a superb collection of sponges. Of all this we can for the present form no more than a general impression—an impression that the Antarctic littoral fauna is being unveiled.

"In the class of insects are comprised specimens of Diptera and Hemiptera. The crustaceans are represented by numerous individuals belonging to the groups of copepods, amphipods, schizopods, and isopods. Several species of acarides have been found in the mosses, while others are parasites of the birds. From the pantopods were also produced some good specimens."

In botany a great mass of materials was gathered amongst the algæ, representing the groups of floridææ, theophyceæ, chlorophyceæ, and oscillariaceæ, besides numerous species of diatoms. Special attention was given to those of the pack and fringing ice. During our land and climbing trips we secured specimens of mosses, lichens, and freshwater algæ. Lastly, two species of phanerograms were discovered in the Antarctic islands. The first was a grass, the *Deschampsia (Aira) antarctica*, found in Wandel island (65° 5' S.) and in Biscoe bay; the second a caryophyllacea, the *Colobanthus crassifolius*, var. *B. brevifolius*, Engler, found only in Biscoe bay (Antwerp island, 64° 50' S.).

*Geology.*—Notes and observations on the geological constitution of



DUKE OF ABRUZZI PEAK, WINCKE ISLAND.

the explored regions. Physical geography of the lands traversed. Specimens of the rocks, of the glacial muds, of the sands and gravels of the seaboard. Photographs of the surface relief. Glacial action, erosion, weathering.

The region traversed consists essentially of crystalline rocks, and especially of granites. There are no sedimentary formations, nor any fossils. Hence the chief interest is petrographic, and we have brought back somewhat numerous specimens of the rocks. Iron pyrites abounds in these rocks, and the relief of the mountains is continually modified by their sub-aërial oxidation and transformation into limonite, and by the disintegration of the rocks which have already been greatly weathered by the action of frost. The relief takes the general form of steep ridges sharply outlined with a main north-east to south-west trend, broken by fissures at right angles with their direction, and forming

2 M 2

fjords on very low hills. The microscopic examination and chemical analysis upset the relation that might be established between these ranges and the Cordillera which bends round from Chile into Tierra del Fuego, and is apparently continued by the South Orkney islands.

Notes on the movement of ice, especially in the bays near the winter station; formation of the marine ice in those bays.

Notes on the movements, dimensions, and transformations of the icebergs; table icebergs.

Thickness of the fringing ice; its formation and destruction.

Constitution of the glacial headlands in the islets of the archipelagos west of Graham Land.

General direction of these islets.

Notes on the glaciers of Danco Land and of the Palmer archipelago; their progress and discharge.

Ascent of a summit in Wandel island, and exploration of the mountain crest in that island.

*Bacteriology.*—Bacteriological analysis of the sea-water, of the air, ice, and snow.

Numerous cultures (in good condition till the present time) derived from the analysis of the sea-water and of the intestinal fauna of the seals, birds (penguins, gulls, cormorants, petrels), and fishes.

Rubbings and preparations; numerous objects preserved.

*Collection of photographs*, forming geographical, hydrographical, meteorological, zoological, and other documents.

Photographs of the installations of apparatus during the winter.

*Medical Observations.*—A serious case of myocarditis which occurred at the winter station. On some circulation troubles which may possibly be attributed to Bright's disease. General survey of the sanitary condition of the expedition.

---

Before the paper, the PRESIDENT said: I now have the honour to introduce to you Dr. Jean Charcot, who has been good enough to come over from Paris to read to us a paper on his Antarctic work, from which he has only just returned. The general outlines of his voyage are well known to all of you who study attentively the *Journal* of the Society. But I expect that you do not know the full extent—in fact, you cannot know the full extent and value of his work until you hear Dr. Charcot's account that he is going to give us to-night. I have no doubt that many of you must have felt with us keen anxiety at the beginning of this year about the safety of the expedition. You will remember the reports that were brought back to South America and telegraphed home by an Argentine gunboat as to the probable loss of all concerned; and I remember vividly a day in last March—I was living in France at that time—when I took up the *Matin*, which, as you remember, was the newspaper which contributed so largely to the expense of the expedition, and found in it a telegram announcing the safe return of Dr. Charcot and all on board. I need not tell this audience that the name of Charcot has been long a household word in this country, where the reputation of the late

Ske  
to illustra  
DR C  
C

# FRENCH ANTAR

Scale  
Nat. scale 1:2,500,000

L  
(Ba

C. Cockb

BRABANT

ANTWERP

Mt William  
8950'

Wandel I.  
Hovgaard I.

C. Terra

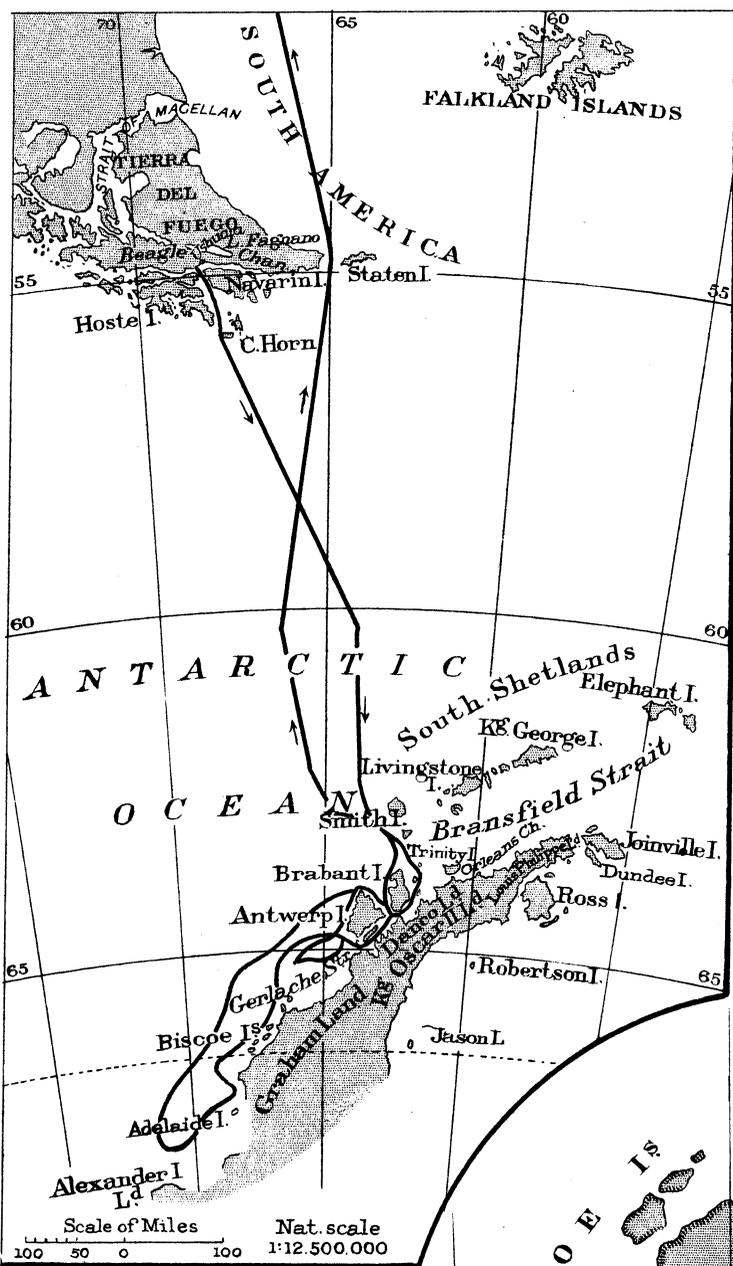
Flanders Bay

GERFLAC

LADANG

FOYN  
LAND

HAM



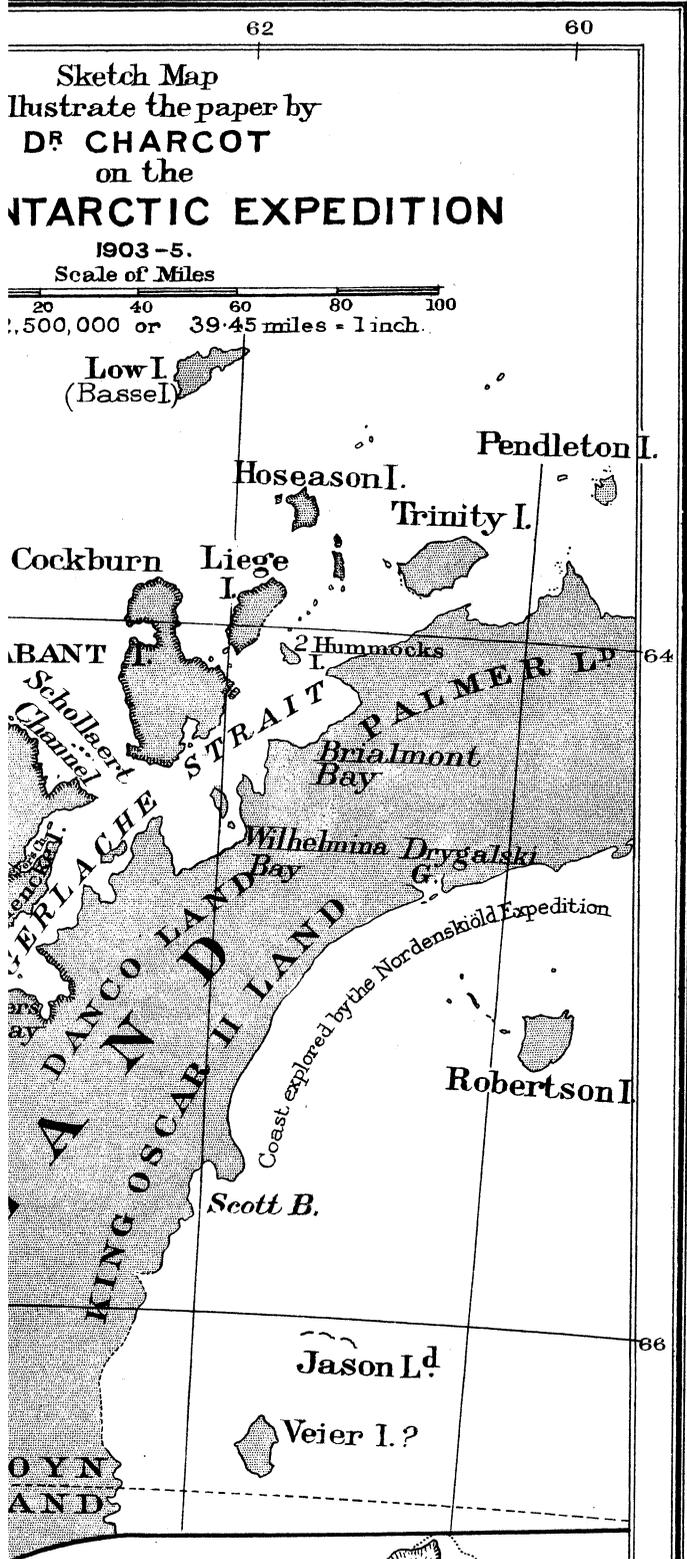
Scale of Miles  
0 50 100  
Nat. scale  
1:12,500,000

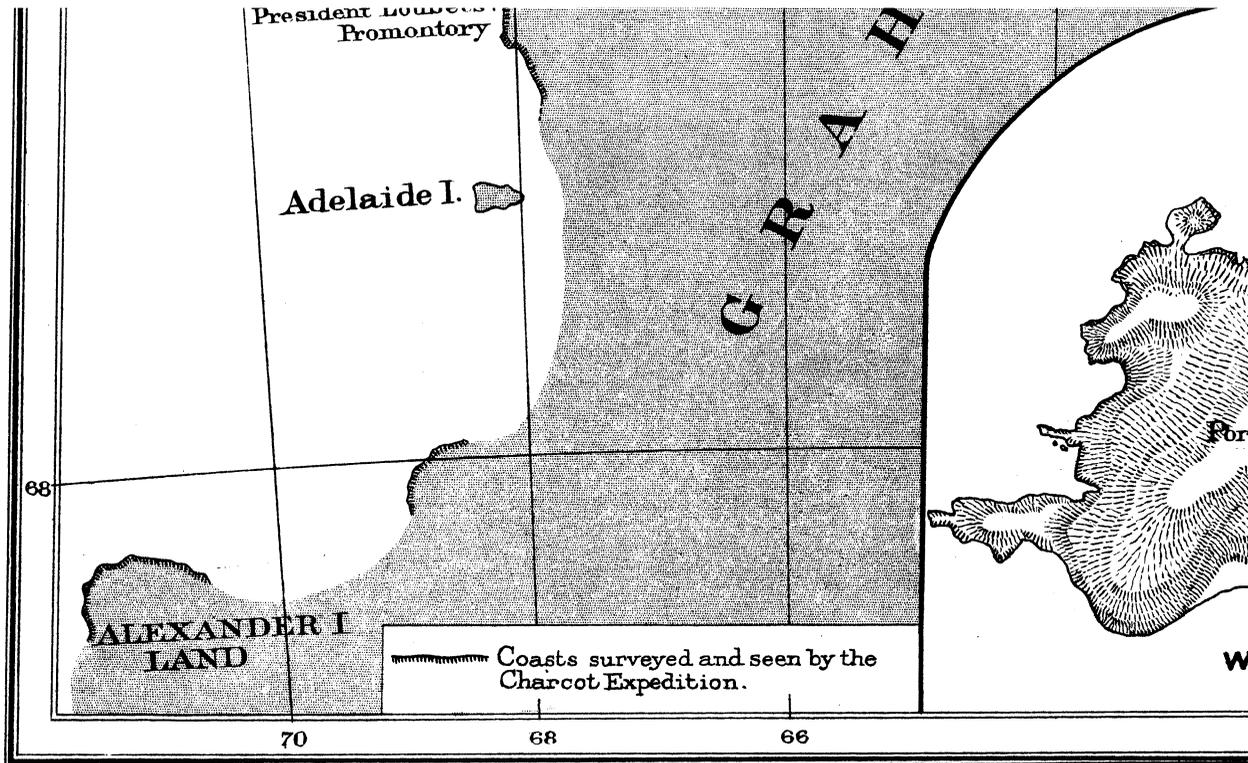
Antarctic Circle

President Loubet's +  
Promontory

FRENCH ANTARCTIC EXPEDITION  
CHARCOT.

THE GEOGRAPHICAL JOURNAL 1905.





*Published by the Royal Geographical Society.*

