

1896 the rate from New Orleans to Liverpool fell from fourteen and one-half cents a bushel to eight and one-half cents. During the period mentioned the saving to shippers of grain alone amounted to the enormous sum of \$207,000,000. The total saving on all exports since the construction of the South Pass jetties has never been computed.

The vast area of the Middle West is vitally interested in deep Mississippi River channels. The difference of but one cent per bushel on transportation of grain means millions of dollars annually to the farmers of the West. There are at present a large number of ocean-going vessels trading at New Orleans that are forced to leave that port and look for employment elsewhere when light freights such as cotton are unobtainable. Of course, all such loss of capacity is sooner or later borne by the producer, and not the shipowner. The problem in brief is this: Large steamers carry freight cheaply; small steamers, dearly.

Liverpool to-day is carrying on harbor improvements at an expenditure of \$17,000,000, in order to accommodate vessels of 900 feet length, 90 feet beam, and 40 feet draft. It is estimated that such vessels would have an economy probably three times as great as the majority of those now trading at the port of New Orleans. When it is remembered that ocean freights exert a tremendous influence in the regulation of railroad freights, the total saving to Western and Southern farmers to be secured by the admission of such steamers to the Mississippi assumes really imposing proportions.

There is another phase of the situation usually less dwelt upon, but none the less important. At present there are few harbors where the larger vessels of the United States navy could seek refuge in case of overpowering necessity, particularly in the Gulf. With the completion of the Southwest Pass improvements, New Orleans might easily be made one of the great bases of naval operations, since the river itself affords a harbor that can accommodate in single file something like 1,500 vessels. At low water there is ample depth for 200 miles above the Passes, and being landlocked this immense harbor could easily be rendered impassable to any foe. Moreover, it is a fresh-water harbor, and vessels may lie there for years without being subjected to the destroying influence of barnacles and other marine growth.

The effect of the development of the new pass upon the city of New Orleans will be of tremendous importance. Experts in commercial affairs are wont to allude to the tremendous possibilities to be opened up to that port through the contemplated Isthmian canal. Predictions are freely made that, with really deep water to the Gulf, the city will yet occupy the proud position of first exporting port in the United States. These seers of commercial visions find their inspiration in these facts: That the city's railroad facilities are already matchless, with even greater under contemplation; that the port is every year being more and more regarded as the natural outlet of the great West; that deeper water at the mouth of the river will cause such a reduction in ocean freights as to place New Orleans in a class by itself in the shipment of all food stuffs and other Middle West products to countries across the sea.

The first step in the realization of this dream of commercial greatness is the notable engineering feat now under way at the Southwest Pass. In order that the forty-five millions of people in this country directly affected may enjoy a greater degree of prosperity, and that, incidentally, Europe may have cheaper food, one of the greatest rivers in the world has been commanded to mend its vagrant ways, and to occupy in larger measure than heretofore its true position in the nation's marvelous development.

THE SWEDISH ANTARCTIC EXPEDITION, 1902-3.

By DR. OTTO NORDENSKJÖLD, Commander.

It was on the 21st of February, 1902, that the "Antarctic" left our winter party for the last time—six men, absolutely cut off from the world, standing on the shore to see the mast tops sink below the horizon. We had already had some experience to show that, though our station lay far to the north, we should not have to meet smaller difficulties than in the inner Antarctic regions, and it is easy to understand what our feelings were at that moment. But well it was that none of us could then anticipate that two long winters would pass before we should again see a human being, and that our faithful steamer would never again be seen by any of us.

During the first weeks all the members of our little party were busily occupied in constructing our houses and observatories, and in arranging everything so that we should be prepared for the winter. Already in February we had experienced a number of severe gales and storms with temperatures as low as -12 deg. C. (10 deg. F.), a "summer" temperature scarcely to be expected in a latitude of only $64\frac{1}{2}$ deg. S. We had, however, occasional fine days, and it was during such a period, about the middle of March, after we had finished all the most important arrangements and had started the scientific observations, that I decided before the new ice was formed to go out on a boat trip southward intending to reconnoiter the southern parts of Admiralty Inlet and to lay down a depot for use in the future.

We started on March 11, but soon found that it was already too late in the season for expeditions of this kind. The ice-pack, moving in the narrow straits with the strong tide-currents with irresistible force, kept

our boat in imminent danger, and as soon as the water calmed new ice was formed between the ice-floes. However, we ascertained that Admiralty Inlet is really a strait, dividing Seymour Island and that on which the winter station was situated from the mainland; and also that Cape Lockyer is situated on a separate island. After two days we had to leave the boat at the edge of the fixed land ice and use our sledge in order to push on as far as possible with the supplies for establishing a depot. We were only just back to the boat when a storm started blowing, reaching during the first hour a velocity of more than 60 miles an hour, the thermometer being as low as -16 deg. C. (3 deg. F.). Still we could sleep in our bags until in the morning we were awakened by the water running into the tent. The ice had broken up, and the sea was washing over our tent—five minutes more and we should have been swallowed by the sea. As it was, in a second we were out of the bags, and soon had our boat and other things brought further in on the ice. But the gale was blowing terribly, and we could not see 100 yards around us; so the whole day we had to walk about, keeping watch until we could the next day proceed on our way homeward, though the wind was still rather too strong.

For further excursions outside our own island we had now to wait until the sea was solidly frozen over. For this several weeks were required, and even in May violent gales could break it all up in a few hours. So we settled our winter routine. The meteorological observations were divided between Dr. Bodman and Lieutenant Sobral, though during the night watches the work was shared by the whole scientific staff. Dr. Ekelof was busily occupied with bacteriological investigations, and I myself used every opportunity to collect fossils and prepare the map of our surroundings.

In this way the time passed tolerably well. We were all very glad to have as much to do as possible, as we were very closely confined to our winter quarters, and the space was rather small. As a matter of fact, no one had anticipated that we should be compelled to remain so much within doors. It is true that from the reports of the "Belgica" and "Southern Cross" expeditions it was well known that the winter in the Antarctic is both severe and stormy; but who could imagine that we in our station, situated six or seven degrees farther from the pole, should meet with a considerably lower temperature than the first of the above mentioned expeditions, and almost as low as the second, and at the same time should experience gales that, in persistence, if not in strength, far surpassed those encountered by the expeditions referred to. But so it was. April was the best month during the winter, but with the beginning of May there commenced a period of storms which, with short intermissions never exceeding three days, lasted five months, until the end of September. During the whole of this time the average velocity of the wind was 23 miles an hour, and once, during a whole fortnight in May and June, it averaged 45 miles.

It is difficult to give an idea of these terrible gales. Our house was continually shaking like the cars in an express train, and in fact there is a certain likeness between the two; if our house had been moving with the same speed as the wind rushed past when at its height, in less than 24 hours we would have reached the pole. Everything not solidly fixed was carried away, and after every storm we had to look for lost things. A large whaleboat lying on the shore was carried off hundreds of yards and crushed against the rocks. But what made the wind specially objectionable was that these strong gales from the southwest brought with them the lowest temperatures that we experienced—a feature in a measure peculiar to the region. Thus during the period mentioned in June the thermometer varied between -25 deg. and -32 deg. C. (-13 deg. and -26 deg. F.), and our stormiest day (mean velocity 63 miles an hour) was also one of the coldest (mean -31 deg. C., or -24 deg. F.). At such temperatures it was absolutely impossible to stand up against a wind of that force, and even in the daytime it became quite a difficulty to go as far as the observatories.

So it came about that we had to pass a very long time indoors, more even perhaps than many expeditions wintering in the darkness of the night far nearer to the pole. Our house was small but pretty comfortable, with one large room 8 feet by 14 feet in the middle and four smaller on the sides, one for the kitchen and three sleeping rooms for two men each. Over the whole house was a roomy loft, used as a store room. It was generally not difficult to keep the house warm, though we had hoped to get some snow to pile up round the walls, which, however, was never possible. Seals' blubber as fuel proved far superior to coal.

I made during the winter several short sledge trips, though I was never absent for a long time. From the beginning of August, however, a good part of the time was occupied in preparations for a longer sledge trip southward, which I had already contemplated before landing. We carried for the purpose a pretty good equipment of necessaries, and it was only in one point that we were seriously handicapped—viz., the number of dogs at our disposal. In this respect we had always met with bad luck. Of the dogs I brought from Greenland, all except four died on the way out, those four, however, being exceedingly fine animals. A number of pups born on the ship were frozen to death in a gale a few days after our landing before we had been able to arrange for them. The dogs I brought from the Falkland Islands proved not altogether unsuited to our

needs, but most of them, and first of all the strongest and most courageous, had soon been killed by their ferocious Greenland companions. So for the expedition I could only use in all five dogs, a quite insufficient number remembering that it was impossible, by reason of the smallness of our company, for me to arrange so that an auxiliary party should follow us with fresh supplies.

My companions on the trip were Lieutenant Sobral and the sailor Jonasen. I took two sledges, the one to be pulled by the dogs, the other by two of the men. Though it was possible to load the latter sledge much more lightly than if we had had to pull the whole outfit ourselves, still the pace of our march was that of the men pulling, and a few dogs more would have allowed us to move much more quickly. We carried provisions for 45 days, but calculating that we should go on the sea-ice, and that our load was already rather heavy, I took only about 20 days' food for the dogs. At this time of the year I considered it almost certain that we should find seals and penguins on our way.

After a long delay, caused by the storms, we started from the station on September 30. During the first ten days we were favored by exceptionally fine weather, but after October 10 the storms commenced again, violent as before, and combined with a cold that was felt all the more after the preceding mild period. Before that date, however, we had passed out of Admiralty Sound and discovered a great inlet extending northward from Cape Foster; I believed it to be a large channel opening into the Erebus and Terror Gulf and separating an archipelago of islands from the mainland. This mainland, the hitherto unknown connection between Louis Philippe Land and King Oscar Land, is formed by a high range of mountain peaks separated by large glaciers and further inland passing into a level ice-covered plateau. Passing along this coast, though at a distance, we arrived at Christensen Island, which may be considered as an extinct volcano. My plan was in the further trip to travel southward as near the main coast-line as possible, and, as already mentioned, I had reckoned to make this journey on the sea-ice. I was therefore very much surprised to meet at Christensen Island a high ice wall extending inward in a westerly direction as far as I could see. If we did not care to go outside of the whole archipelago, where we had already once passed with the "Antarctic," and where nothing could be seen of the inner land, we had to pass over this ice. We decided to attempt the task, and during the whole time until we turned back we passed over level ice, rather low and almost without crevasses when we were at a distance from land, but rising rapidly and at the same time full of large, deep, impassable crevasses as soon as we approached the land. These extensive ice-plains, unlike anything I know of in aspect and formation, except, perhaps, the region inside Ross's great ice barrier, where the "Discovery" has had its winter quarters, were a great obstacle to our advance, in so far that with them every hope of finding seals for dog food vanished, and when I turned back on October 21 it was much earlier than I had expected. But then we were encircled by deep crevasses that could only be passed on narrow snow-bridges, and we had every reason to fear that if a thaw should set in we could not pass them at all. The last week had been a continual series of gales, the wind blowing straight against us. Our tent was in a deplorable condition, having been severely damaged by the wind, and already we had to feed the dogs out of the pemmican brought for ourselves. Of killing the dogs there could be no question, as this would have spoilt every hope for future sledge trips.

At this time we had arrived at lat. 66 deg. S., long. 62 deg. W., somewhat more than 200 miles from the station. On the southernmost point I climbed a high summit affording a good view of the surrounding mountains and ice plains. My intention was to find a way back much nearer to the coast. But here we met with crevasses which were almost impassable unless we were prepared to lose far more time than we could spare during this period of alternate storms and snow fog. So we had to go further off, and thus had very little opportunity for mapping the details of the coast line. On November 7 we were back at the station, having been absent 34 days, of which, however, only 22 or 23 were such as could be used for traveling.

Though there was still no change to be seen in the ice we already began to look for the returning of the "Antarctic." During the whole month I was busily occupied with work in the neighborhood that I wished to finish before going on board. About December 1 I made a sledge trip to Seymour Island, principally for geological studies, but also for collecting eggs for our table during the summer. It was during an excursion to the northern point of that island that I made in one day two important discoveries. On a ridge of hills I collected numerous fossil bones of vertebrate animals, some of them of great size, and a little further south I found a layer rich in plant remains belonging to numerous species. And so there seems to be no doubt that in those remote regions, where now the vegetation is as much inferior to that of Greenland or Spitzbergen as that is compared with an English forest, the climate was once mild, and that there existed then large forests of leaf-bearing trees where birds sang and strange large animals fed on the herbage. That this has been the case in the north has long been known, but it is the first time it has been proved in the south.

The ice on our east coast was at this time covered by deep melting water and very difficult to pass, and we

had every reason to believe that it would soon break up. Unfortunately, during the summer the strong gales of which we had formerly had such an abundance were almost completely wanting, and the year came to an end without any perceptible change in the ice. Then for the first time we began to be uneasy about our relief, and we started preparations to collect birds and seals for meat, as well as blubber, in case we should have to stay for another winter. The temperature was unexpectedly low and easterly winds with fog and snow very common. Though there were many open lanes in the ice, and a blue water sky was almost constantly to be seen far into the north, we were never really anxious about the fate of the "Antarctic" just because the sea was never open enough for us to expect her arrival.

For our principal food during the winter we intended to kill a number of penguins, but in hope of relief, and also because we did not want to do their young more harm than necessary, we delayed this as long as possible. The ice had now opened so much on the east coast of the land that when, on February 6, we were ready to start for the rookery on Seymour Island, we could make the trip by boat. We killed about 400 birds, which proved fully sufficient for our winter. However, to our taste, seal meat is much better than penguins, and it is specially to be remarked that it is impossible to get, even from a great number of penguins, grease enough to serve as fuel during winter.

It was during those days that the ice-conditions were the best that summer. Much open water was seen in all directions on our east coast, and several times we imagined we saw the ship among the ice. But the winter was already setting in; strong gales, alternating with snow and snow fog, were blowing from all directions, sometimes with temperatures as low as -10 deg. C. (14 deg. F.); and a few days later, again nothing but ice was seen all round the horizon, and everybody was forced to acknowledge that we were going to pass another long winter in our old quarters. None of us knew that during those stormy days the "Antarctic" had fought her last fight with the ice.

From this time commenced for us the second winter. We had good stores of provisions brought from home, except meat, which, as already mentioned, was got from the game of the region. Of course, we had to change our menu in respect of several more or less important items of food. But the only real difficulty was the isolation, which seemed the greater now that we had once considered the relief to be so near. With some letters and newspapers, some new books, or, far better, some new fellow-workers, if that could have been, I think we should all have been comparatively satisfied. And we were anxious also about the future; if there was ice one year there could just as well be ice for two or three, and would a relief expedition come if anything had happened to the "Antarctic"? And the worst of all was that we all knew that by ourselves we could do nothing for our safety.

But I never heard a complaint from any of my companions, and, in fact, our great consolation was that this second winter would give us far more ample opportunity to work for science than we could ever have expected. Especially it was clear that as our meteorological observations had given so many new and unexpected results, a second year would be of great importance, particularly if the others taking part in the international undertaking continued their work, as was the case with the British expedition and the Argentine station. All the members did their best to find new ways to complete their researches.

Fortunately this winter was far better than the former, not so much with regard to the temperature as to the gales, which were neither so strong nor so persistent as before. A few short sledge trips were made during the winter, but as my intention was to make several long expeditions in the spring I spared our efforts for that time. But before describing the only trip executed, it may here be appropriate to give a short summary of the scientific results obtained during the two years of wintering.

The principal object was the magnetic and meteorological observations. About the former nothing can here be recorded, the observations not yet having been worked out. An interesting though negative result was that in those two years we did not observe a single aurora australis. Of the meteorological results the most interesting is the unexpectedly cold climate of the region visited. The mean temperature for the first year was about -12 deg. C. (10.2 deg. F.), the same as in Hudson Strait or in Yakutsk, the two coldest places in the north, situated in more or less the same latitude as our station; at the same time it is several degrees lower than the temperature experienced by the Belgian expedition six degrees further south (14.7 deg. F.). It is possible that this year was colder than usual, but as already stated the second winter was not very much warmer. What seems to be certain is that the summer was exceptionally cold; with a mean temperature of -2.2 deg. C. (28.2 deg. F.) it is the coldest known until now on the earth. In connection with this are to be considered the exceedingly bad ice conditions, that were so disastrous for us.

Interesting, too, are the great average velocity of the winds (the first year 20 miles an hour), their generally southwesterly direction, and the strength of the gales in the winter as compared with the summer.

As of geological interest, I have already mentioned the discovery of fossil plants and vertebrates, but besides this the island where the station was situated, as well as neighboring islands, are very rich in fossils,

all belonging to Mesozoic or Tertiary formations. Also our researches on the ice have yielded several results as to the causes of stratification, the temperature and the movement of the ice, etc. It was a surprise to find that, while in the winter all snow was carried away by the gales, the surface of the ice keeping constant, there was in the summer time on the glacier at the level of the sea a great accumulation of snow. The bacteriological work has also given several new results, observations on the tides have been taken, and several other studies executed. To the results of our cartographical work I will return later.

For the sledge trips of the second year I could dispose of six Greenland dogs, two of them born on the station. This time it was my intention to study the region north and northwest from the station up to Bransfield Strait, and as I knew how much easier it is to travel and how much faster the speed when the whole load is pulled by dogs, I decided to take only one companion and to divide the work into two expeditions of moderate length.

Taking provisions for us and the dogs for 30 days I started with the sailor Jonassen on September 29. This time the weather was quite the reverse of that of last year. On the second day we encountered a severe gale, so that our tent was broken, and we had to go back for a day to get it repaired. At first we followed the same route as last year; but, arriving at the western end of Admiralty Sound, we turned to the north into that great inlet discovered during the previous expedition. Though for several days we were confined to the tent, because of wind and dense fogs that made the mapping work impossible, the weather was comparatively favorable and was growing better and better. Soon we found that we were in a large channel presenting the grandest scenery. On one side was the magnificent range of King Oscar Land; on the other a large archipelago forming a remarkable contrast to the former and made up of tuffaceous volcanic rocks, with sounds, glaciers, and promontories, all dominated by the shining blue-white prominent peak of Mount Haddington, probably formed by a mighty crater.

Through this channel we passed until October 12. At that time we had advanced near to Cape Gordon and we had before us Erebus Gulf, a blue streak in the sky showing that there was open water near at hand. We were surrounded by islands, which I believe had never been seen by man, and our last camping-place had been at the foot of one of those islands, a high precipitous volcanic cliff. We were traveling rapidly toward a dark promontory, perhaps the Cape Corry of the charts. For a moment I fixed my attention on some dark objects near to shore, but only to consider them as probably large boulders. Then suddenly Jonassen shouted to me, asking if I could see what it was. Stopping and examining them a little more closely, I said: "Yes, they look like people, but of course that cannot be; perhaps it is some large penguins." But we were both seized by a peculiar emotion, and a few seconds later I had the glasses again to my eyes and saw that it was really two men coming to us. Who could they be? Numerous conjectures floated before my mind, but were all rejected. It was not probable that they were either some of my companions from the winter station, or that the "Antarctic" had returned and had already sent out a relief party.

Meanwhile we had turned, and both parties were rapidly approaching one another. Every second my astonishment was greater. I saw two men, their faces coal-black, the eyes protected by rude wooden pieces; their black hair was hanging to the shoulders; their clothes were blackened and of an unknown shape. Even at the moment we met I had no idea who they were, and their first question, "Have you heard anything from the 'Antarctic'?" could not explain the situation.

But it did not take long for me to hear their story. It was Dr. Andersson, the leader of the expedition during my absence, and Lieut. Duse, who had, together with a sailor who was now preparing their dinner a little nearer the land, left the "Antarctic" at the end of December, the previous summer, when it became exceedingly dubious whether the ship could reach the station during that season. Their intention was to reach our station with a sledge, pulled by themselves over the ice. Their starting place was a bay near to Mount Bransfield, and they were to induce us to retire there in case the ice conditions were not better. For this eventuality there had been put on shore a small depot, but, as the ship was to return under any conditions, this contained only the things necessary for the summer. However, they soon found that it was impossible at that time to reach the station owing to the state of the ice, this being in many places broken up at the shores and covered by deep water. So they turned back to the starting point and here they passed the time agreed waiting for the ship.

But as the months passed without any notice, they began to grow anxious and prepare for winter, and in the beginning of March they moved into a small, low, stone hut. Here they passed seven long winter months. The construction of the hut was a difficult task, as the ground was frozen and they had no tools. They killed about 500 penguins for winter food, depending for fuel exclusively on the seals, which they had all the winter through in sufficient numbers, though not greater than necessary. They had no books, and even if they had had they could not have read them by the feeble light of their blubber lamp. The temperature inside was generally below freezing point, and by reason of the gales they were for long periods con-

fining to their berths composed of the bags and the few articles of clothing carried for the summer.

Notwithstanding this, their sojourn had not been without results. Mr. Duse had made a map of the surroundings so that there is now, including the work of the "Antarctic" in the Orleans Channel, and my own work and that of Mr. Duse on our sledge-trips, a complete map of the whole coast from the southern end of the Gerlache Channel, on the west coast, to the turning point of our first sledge expedition in latitude 66 deg., on the east. Dr. Andersson had found interesting proofs of the former greater extension of the glaciers, and what was more important, he had found a rich fossil flora of a very different type from that of Seymour Island and belonging to an older geological epoch.

Now they were on their way to the winter station, having started from their hut the same date as we had left our place. Without dogs and with a heavy load they had to move rather slowly, and their speed was not increased by the fact that two of the three had recently had their feet rather badly frost-bitten.

It is difficult to say which of the two parties rejoiced the most. For us they were bearers of news from that outer world we had almost forgotten, but for which we were nevertheless always longing—news that was just as interesting even if it were a year old. For them we represented a kind of civilization, and we had good reason both of us to be grateful that the members of both parties were all well and in full working capacity.

This meeting changed all my plans, though for the moment I would have turned back even had it not happened. As, according to their observations, the open water came rather near to Cape Gordon, we turned and went on through an inner strait connecting the channel with Sidney Herbert Bay; this strait had been discovered by Andersson and Duse during their first trip. We here met with much snow, and owing to the heavy load—all the most important things having been transferred to our sledge, after which the other was left on the shore—our advance was not very fast. Still, on October 16, exactly two years after the expedition left Sweden, we were again at the station. As it proved afterward this was not too early, the ice opening so much during the next few days that we should have found it rather difficult to pass the last cape.

Naturally for the time our principal interest centered about the "Antarctic" and about the chances for our relief. So much was soon evident that there would not be any hindrances this year of the same kind as in the last year. Before the end of October the ice was more open than it had at any time been during the last summer, and as a proof of the difference between the two years it need only be mentioned that while in 1902 the mean temperature for the latter half of October was at 0 deg. F., it was in 1903 $+30$ deg.

By reason of the ice conditions, we could not think of any long sledge expeditions, but we made a number of short trips and interesting studies among the islands round the station.

During this time it was seldom that we were all assembled at the station, and thus it happened that on that memorable day of the expedition, November 8, two of us were out on a visit to Seymour Island to bring home the first penguin eggs of the season. They were expected home that day, and when we saw at a distance some moving objects on the ice, we believed it to be they. But a few minutes later a second look showed us four persons, and, without even taking time to arrange our clothing, we were in a moment all out on the ice to meet the party. After waiting so long, at last the relief had come, and so early in the year we could not expect any other ship but our own "Antarctic." We were prepared to greet the newcomers with a cheer, but, coming nearer, a doubt took hold of us and our pace rather slackened. Soon we could greet our visitors—Commander Irizar, from the Argentine steamer "Uruguay," and another officer, accompanied by our own two companions. Even now our first inquiry was for the "Antarctic," and everybody will understand our feelings when we heard that there was no news from the ship. Alas! the probability that all the men on board were lost, together with the ship, was all too great.

However, we could not but be glad to accept the invitation from the Argentine commander to embark on his steamer, which was next to go out on a search for the lost members of the expedition. While we were following our guests to the house, hundreds of questions were put, and we also now heard that a Swedish relief expedition had been fitted out, though lately no news had been heard of its progress.

At night the officers returned to the ship, driving on the dog-sledge and accompanied by some of our men. It was late, but none of us was thinking about going to bed. We had all to work at the preparations for the start, and I was busily occupied in writing a report to be left in the house. Suddenly the dogs started howling, and somebody told me that there were several men outside. Naturally we thought the commander had sent some men from the ship's crew to assist us in the preparation, and we were all too busy to go out and meet them.

When nothing further was heard, Dr. Bodman went out to look who it was. A moment later we heard him crying and screaming, the only words to be caught being cheers and "It is Larsen!" And again in a second we all huddled out. It seemed too marvelous, too impossible even to believe in our eyes, but there they were, Capt. Larsen, Mr. Andersson, and four men

from the "Antarctic," coming just at the right moment, the same day that we had for the first time despaired of their fate.

And here I will give a short report of the voyage of the "Antarctic" from November 6, 1902, when she left Ushuaia for the last time, and of the fate of the members of the expedition after the steamer had sunk. When far west of the South Shetlands, they had met with dense pack ice, amid which they had to struggle for several days. After having passed this ice they found Bransfield Strait and its surroundings comparatively free from ice, and here they worked for some time, obtaining a very interesting series of soundings as well as collections of animals and plants unexpectedly rich even compared with what we had seen the first summer. At the same time, as already mentioned, a chart was made of the Orleans Channel as far as where this passes into the Gerlache Channel.

This work having been finished, the intention was to proceed to the winter station, but now the difficulties really began. They soon found that the whole of Erebus Gulf was filled with ice, and when they tried to pass eastward of Joinville Island they were caught by the ice and drifted with this as far north as Elephant Island. Eventually, however, by dint of hard work, they got free of the ice and, trying again to find a way through the strait west of Joinville Island, they there passed Christmas, with the nearest land in sight, though at a distance of about 60 miles. It was now that Dr. Andersson and Mr. Duse decided to make the sledge trip, the result of which has above been related. During this time the "Antarctic" had to try her luck another time eastward of the land.

It was now late in the summer, and, though the ice conditions were clearly hopeless, there was nothing else to be done except to press on. Struggling hard, they passed round Joinville Island, during the first days of the new year, and through a narrow opening in the ice they could advance several miles to the south. But here they were again caught by the ice, and drifted north until, on January 10, a strong gale from the south commenced, filling the bay and setting the ice rapidly against the northern shore. The steamer was at that time fast in the ice about 20 miles south from Dundee Island. The storm keeping on, the ice began to press very heavily, lifting the ship about four feet. The situation was most perilous, and the disaster came with a big ice-floe, with strong pressure-ridges, rising high out of the water. From this ice emerged a large ice-foot which, catching the steamer from underneath, broke the rudder and the keel, bent the axle of the screw, and tore up the bottom of the ship, fixing the vessel at the same time solidly in its embrace.

Only after three weeks' hard work was it possible to release the steamer from the grasp of this ice-foot. The pumps were working all the time, and when the ship got free the leak proved too great to be managed with the resources on board. For another week the vessel drifted in the ice without finding a way out. Had it only been possible to bring the ship to the beach while still afloat, the stores and provisions, as well as all our valuable collections, could have been saved. But even this proved impossible, and the same head gales in the beginning of February that raised our hopes in the station were disastrous for the ship. On February 12 the "Antarctic" was abandoned, and an hour later she was buried in the sea.

The question was now to bring the men and as many as possible of the most important things over the drifting pack-ice to the land selected for winter quarters, the small, volcanic island of Paulet, known to be rich in seals and penguins. This, under the admirable direction of Captain Larsen, was executed during the following sixteen days. Three boats were carried, used as sledges and pulled by the party, to take the outfit. The advance was very difficult, and many times in the morning the whole party found themselves carried

away by the strong currents much farther from their goal than before the whole work of the foregoing day. Gradually more and more of the things were lost, and at last, when they arrived at the open land at the foot of the island and had to put out the boats, only a small part could be saved. The travelers were barely on the shore when a storm broke out, carrying off the ice and making it impossible to think of returning to bring on shore the part of the outfit left on the ice.

It was a great pity, and, to the scientific staff on board, I believe the greatest sorrow was to lose so

itants with the steam whistle of our ship. The effect was instantaneous—in a second the beach was alive with men, still unable to understand their luck. The change was too great, after all their privations, with the dark prospect of the future, to be suddenly awakened out of their sleep, placed in the midst of civilization, and at the same time know that all their companions from the two other winter stations were well, and all this to happen so early in the year, when no relief could have been expected.

It was undoubtedly a great proof of the awakened



PANEL FROM THE CUBICULUM.

many valuable collections, including almost all the photographs taken during the summer. Happily all older collections had been lodged safely before the steamer started, and even now they managed to bring on shore several of the most valuable specimens. This is so much the more creditable as the provisions and other outfit were very scarce and the prospects of the future were nowise bright, especially as it was impossible to know at what time assistance might come. Here also a stone hut was built, and in this the twenty men passed the winter, using for food the meat of seals and penguins that could be obtained, and also catching a good number of fish, which proved a very welcome change. What was most scarce was fuel, as the seals were by no means numerous during the winter. It was a hard life, but happily all were in good health, except the young Norwegian seaman Wenersgaard, who died of heart affection in the middle of the darkness and the gales of the winter on June 7. It had long been arranged that a small party should start for the winter station to bring us news of the fate of the "Antarctic" as soon as the ice would allow. On October 31 they started, and, passing the site of the winter hut at Mount Bransfield, where they learned the news of how that party had spent the winter, they arrived at our station just at the last moment when we were going to leave definitely the place and the region.

And now came the last great event in the story of the expedition. After having embarked on the "Uruguay," the 10th, we passed very early the next morning Paulet Island, awakening its involuntary inhab-

interest of the Argentine nation and of the capacity of its navy to send this expedition, and to us the stay on board has only bright remembrances, for we were received as, I believe, has rarely been the lot of a shipwrecked expedition. Passing the winter station of Mount Bransfield to pick up the collection left there, we arrived at the port of Santa Cruz on November 22, and during the following hours the telegraph announced to the world the news of our return.—London Times.

THE BOSCOREALE FRESCOS.*

THE recent acquisition of the Boscoreale Frescos and a magnificent *biga* or double-yoke chariot said to have been found at Norchia, a village on the site of an Etruscan town, by the Metropolitan Museum of Art of New York city, is the most noteworthy event in the recent history of the museum and enables it to take rank among the great museums of the world.

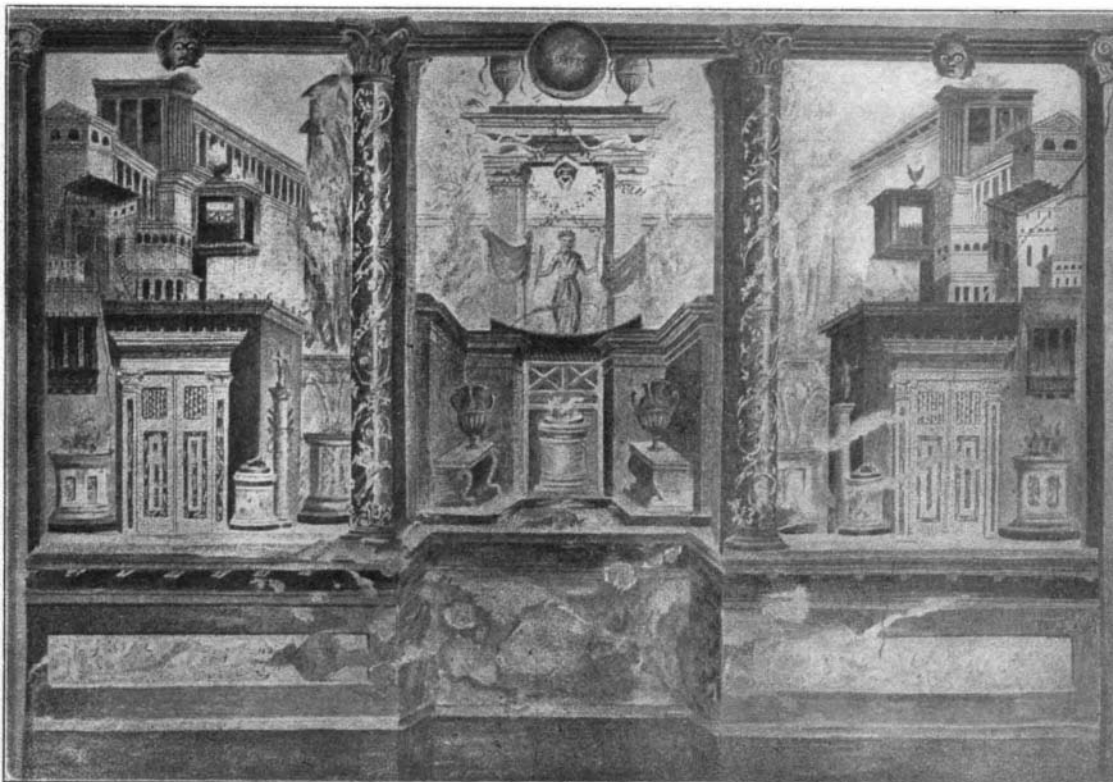
The frescos are from a Pompeian villa, near the little city of Boscoreale, which was buried in the year 79 A. D. beneath the ashes of Vesuvius. They were unearthed in 1901. The modern city of Boscoreale, situated in the province of Naples and at the foot of Vesuvius, has for several years been celebrated in archaeological annals. The beautiful collection of silverware executed by Greek artists of Alexandria, at present at the Louvre thanks to the munificence of Baron Edmond de Rothschild, the important find of gold coinage of the reigns of Galba, Otho, and Vitellius, and the rich set of household furniture acquired by the Museum of Berlin had already brought the city into prominence, when a find still more important came and added a new *éclat*.

The Deputy Vincenzo de Prisco, to whom the success of former excavations was due, continued in 1900 explorations in the vicinity of the villa Pisanella, and after arduous efforts was rewarded by discovering at several meters below the surface of the ground the wonderful wall-paintings which we have to-day.

The villa Pisanella was one of the most luxurious and most artistic of that ancient epoch. It stood on the beautiful slope of Vesuvius and commanded one of the most delightful nooks of the incline near the peaceful little city of Pompeii. It was very natural that the rich patricians of the time seeking in the quiet of the country a relaxation from the busy life of the city should be seduced by the happy situation of this hill at the base of Vesuvius—a verdant hill which opened up a wonderful panorama to their eyes.

By a refinement of luxury due to the conquests of the Romans in Asia, the paintings which ornamented the walls of this sumptuous villa represented the best examples of the art of that time. We do not know the name of the patrician who built this house of allurements, but the paintings found there readily suggest that he was a lover of music and also of games such as wrestling. Many of the paintings represent musicians and athletes and upon one fresco can be seen a table loaded with prizes for the games, among them being crowns of gold.

* This article, taken from Current Literature, is based largely upon a French monograph entitled *Les Fresques de Boscoreale*, published recently in Paris and written by M. Arthur Sabbon, docteur ès lettres de l'université de Naples. The illustrations were furnished through the kindness of the Director of the Metropolitan Museum of Art in New York.



PANEL FROM THE CUBICULUM.