

might sail, stands out more than a mile from the coast to the westward.

On the evening of the 6th January, we observed Bligh's Cap on the starboard bow, but as it was too late to get into Christmas Harbour, we hauled to the wind and stood off for the night. In the morning Bligh's Cap was again seen, and soon after the Francis, steam was got up, and we proceeded for Christmas Harbour. On entering the harbour there are high rocky cliffs on the right hand or northern side, the barren appearance of which is most agreeably relieved by patches of bright green. The point to the left is lower. The arch in a detached piece of rock described by Cook does not open until you are well within the outer bay, in which the coal is found. Further up the harbour the shore on the north side is less precipitous, but on the south side a most remarkable boulder, some 600 ft. high, almost overhangs the water; at the head of the harbour the ground rises gradually some 300 ft.; but in the background, on every side, a high range of mountains completely encircles the anchorage. It was blowing very hard right out of the harbour, with squalls coming down from the hills. We had to go ahead full speed and could well imagine the difficulty a sailing vessel would have in getting to the inner anchorage. Ross was a couple of days doing it, and had eventually to warp up.

Since this expedition was fitted out, a visit to Kerguelen's Land was looked forward to with perhaps more pleasure than any other of the numerous places on our route, on account of its being so rarely visited and little known. It well merits the name of the Island of Desolation, as nothing can be more barren than the appearance of the high rocky mountains, covered with snow even at this season of the year, which corresponds with July in the northern hemisphere; and although the bright green renders the shore rather pretty, yet our previous experience told us that it was only moss and a kind of grass growing on a soft boggy soil, and gave no promise of useful vegetation. It was a matter of great interest to the sportsmen on board to know if there were wild ducks on the island. The old voyagers Cook and Ross mention their existence, and say that they were good eating, and a sealer we met at Tristan d'Acunha who had passed a season at Kerguelen told us that they were in great numbers. But not having seen any at Marion, we were doubtful on the point, afraid that they had been confounded with slag. It was, therefore, with considerable satisfaction that whilst pulling towards the beach at the head of the harbour an unmistakable wild duck flew over the boat. I carefully marked it down in some grass about a hundred yards from the beach. The landing was very good on a smooth beach of black sand, with a number of penguins, slough-bills, and tern-petrels on it. The ducks are smaller than mallard, but larger than widgeon. The plumage is dark-brown, prettily speckled on the breast, neck, and part of the back with grey feathers. The drake is a larger bird than the duck, more grey in the breast plumage, and very handsome wings with dark-blue, brown, and black feathers. They live principally on the seed of the cabbage, their crops being full of it, and the stalks of the plant were seen to be bitten. The weight of the drake was 16 ounces, and of the duck 14 ounces. These birds do not appear to have been named or described by naturalists; probably the variety is only to be found on the islands in this part of the world.

Seeing that most of the ducks took to the hills, we then struck up towards the snow, expecting to find a lake on one of the ridges which ran along the side of the mountain, but there were very few. Even where the ground is quite bare of grass it is very soft in places, particularly at the small streamlets which run down in almost every direction. We picked up some crystals, and kept our eyes open for diamonds.

On the 8th January, the weather appearing settled it was determined to go south at once and have a look at the different places, with a view to selecting the most suitable for the transit observers, so we weighed anchor and steamed out of Christmas Harbour and made sail. Passing between Swain's Island and Home's Foreland, in the afternoon we sighted Mount Campbell ahead, so called by Cook. It is a remarkable object, the surrounding country being low; it is about 600 ft. high and round-topped. We went outside the Rocks of Despair and Kent Island, and ran in for Accessible Bay. Got up steam, and proceeded into Betsy Cove, opposite King's End Point, where we anchored. It is a little bit of a place, scarcely room for the ship to swing, and a great quantity of kelp grow-

ing close to the shore, but a very snug harbour well sheltered from the prevailing winds.

On January 14 a party was organised to dig for petrels and their eggs in the moss. It was good fun digging; the petrels, tern, and slag all burrow in the soft moss, a great number of eggs and young were obtained, sometimes three or four feet in the ground. A dog would have been very useful to tell the burrows that were inhabited. We were greatly amused watching some king-penguins on the march, the leader would advance a few yards and halt, then the main body moved up, leaving a rearguard; the rearguard would then close, and they appeared to have a grand consultation, when the manoeuvres would be repeated. The same bird always led; when they came to the stream, which was only ankle-deep in parts, running very rapidly over a rough stony bed, the marches became shorter. Occasionally one would fall, but he generally recovered himself and got into his place like a good soldier.

We remained at Kerguelen until the 31st of January, on which day the ship's company built a large cairn on the hill on the N. E. side of the harbour, which in all probability will remain for ages as a memorial of the visit of the *Challenger*, into which the report, with charts, &c., of our proceedings whilst at the island, soldered up in a tin case, were deposited, for the information of the expedition for observing the transit of Venus on the 9th of December, 1874. Not the least sign of a tree was seen on the island; the largest plant is the cabbage, and that rarely exceeds two feet high.

At noon on the 6th of February we sighted Heard Island, and shortly afterwards anchored in Corinthian Bay. The bay, which opens to the eastward, is completely surrounded by hills, except at its head, where there is a low beach of black sand extending across the island to the western shore, a distance at this point of about seven miles. The hills on the northern shore are topped with snow, but it does not come down to the water's edge. A point of land runs out into the bay, but it appears to be quite free of vegetation. There was a little green on one of the hills in the background, but the moss does not grow in anything like the luxuriance of Kerguelen, and cabbage does not exist. On the south-western and southern shores there are magnificent glaciers, extending to the water's edge. The mountain was clear to a height of about 800 ft., but above that clouds and mist completely obscured it. The total height is variously estimated by sealers and others at from 6,000 to 12,000 ft., but that is mere guesswork, as it does not appear that any one has made the calculation by angles. Of one thing we were quite certain—there must be immense fields of ice on the high ground to feed the glaciers, which we were told extended the whole length of the island to the southward on both sides.

Leaving the neighbourhood of Heard Island, we proceeded to the southward. The icebergs met with by us were usually from  $\frac{1}{2}$  to 1 mile in diameter and about 300 ft. high; the highest measured was 350 ft. high, but it was evidently an old berg, floating on a large base; the largest was seen farther south, in lat.  $66^{\circ} 43' S$ ; it was certainly three miles in length, and was accompanied by several others nearly as large. They were all remarkably clear of rocks or stones, although each time we have dredged sufficient evidence has been brought up that the bottom of the sea is fairly paved with the debris brought by them from the Antarctic lands. In shape they are nearly all tabular, the original top surface of the glacier remaining uppermost, or inclined at a slight angle to the horizon. In this cold climate they could not be otherwise, unless they broke up in consequence of some local weakness.

To the eastward of  $92^{\circ} E.$  long. icebergs were very numerous, and continued so as we ran to the eastward, even when we were at a distance from the pack. Their absence further to the westward, between  $70^{\circ}$  and  $80^{\circ} E.$  long., except when close to the pack edge, was so marked that, coupled with their absence on the same meridian in lower latitude, as shown by the ice charts, it is thought that there can be no land for a considerable distance south in that neighbourhood, and that a very high latitude could be gained there if desired.

The pack ice consisted chiefly of small saltwater ice-pieces from 30 to 50 feet in diameter; 100 miles inside the pack edge Ross found them to be 200 yards in diameter. The summer season's ice was about 3 feet in thickness, the hummocky ice, formed by several layers of this heaped one upon another and frozen compactly together, was 7 to 8 feet thick, the upper portion of each piece being covered by a layer of snow about a foot in thickness. Scattered about in the pack were a few