

stretches back from the bay as a dreary waste to another small curved beach at the head of another inlet of the sea. Behind this inlet is an irregular rocky mountain mass forming the end of the island, on which are two large glaciers very steeply inclined, and one of them terminating in a sheer ice-fall. At its back this mountain mass is bounded by precipices with their bases washed by the sea. The plain is traversed by several streams of glacier water coming from the southern glaciers, and these streams are constantly changing their course, as the beach and plain are washed about by the surf in heavy weather. At the time of our visit, the main stream stretched across the entire width of the plain and entered the sea at the extreme western verge of the beach, so we had to ford it. This stream was about twenty yards across, and knee-deep, and so intensely cold that it pained my legs worse than any glacier water I have ever waded in. The water was brown, opaque, and muddy, being charged with the grindings of the glaciers. Running into the sea, it formed a conspicuous brown tract, sharply defined from the blue-green water of the sea, and extending almost to the mouth of the bay. The sandy plain seemed entirely of glacial origin; it was in places covered with glacial mud, and was yielding, and heavy to walk upon. Mr Buchanan observed that the isolated rocks which had been rolled down upon this plain from the heights above were cut by the natural sand-blast into forms resembling trees on a coast exposed to trade-winds. The effect of every prevalent wind was shown by the facets cut by the blown sand upon the surfaces of the rocks, the largest facet in each case being that turned towards the west.

“The plain was strewed with bones of the sea-elephant and sea-leopard, those of the former being most abundant. There were remains of thousands of skeletons, and I gathered a good many tusks of old males. These bones lay in curved lines, looking like tide lines, on either side of the plain, above the beaches, marking the rookeries of old times and tracks of slaughter of the sealers. Some bones occurred far up on the plain, the elephants having in times of security made their lairs far from the water's edge. A few whales' *vertebræ* were also seen lying about. On the opposite side of the plain from that bounded by the glacier is a stretch of low bare rock, with a peculiar smooth and rounded but irregular surface, which appears from a distance as if glaciated; but on closer examination it is seen to show very distant ripple marks and lines of flow, and the rock-mass is evidently a comparatively recent lava-flow from a small broken-down crater which stands on the shore close by. The remains of the crater are now in the form of three fantastic, irregularly conical masses, composed of very numerous thin layers of scorixæ, conspicuous because of their varying and strongly contrasted colours and very irregular bedding. A section of the lava-flow is seen in the low cliffs forming the line of the harbour. The present condition of Heard Island is evidently that which obtained in Kerguelen Island formerly, when glaciers covered the land almost entirely and dipped down into the sea. It is, however, an extraordinary fact that Heard Island, only 300 miles south of Kerguelen Island, should thus still be in a glacial epoch, whilst in Kerguelen Island, a very much larger tract, the glaciers should have shrunk back into the interior, and have left so much of the land surface entirely free of ice, the ice epoch being there already a thing of the past.

“The great height of Big Ben, and consequent largeness of the area where snow constantly accumulates, and cannot be melted, no doubt accounts to a considerable extent for the peculiar conditions in Heard Island. A similar rapid descent of the snow-line within a few degrees of latitude occurs in the Chilian Andes,<sup>1</sup> so great is the chilling influence of the vast southern sea. As already mentioned, Heard Island is in a corresponding latitude to Lincoln. No doubt when England was in its last glacial epoch, Heard Island enjoyed a much milder climate, and it was possibly then that the

<sup>1</sup> Grisebach, *Die Vegetation der Erde*, Leipzig, 1872.