

In November, 1907, I had part of a day at Port Pegasus along with the Subantarctic Expedition of the Philosophical Institute of Canterbury. Finally, by direction of the Hon. the Minister of Lands, I was engaged by that Department to prepare this report, and in consequence spent several weeks during September and October, 1908, in order to extend my knowledge of the vegetation, and especially examine the neighbourhood of Port Pegasus, the plant-covering of the scenic reserves, and the distribution of the yellow-pine (*Dacrydium intermedium*). I also made considerable collections of the plants, including the mosses and liverworts, and took a large number of photographs. In all this work I was assisted most zealously by Mr. J. W. Murdoch, who is an admirable botanical collector and an excellent observer.

D. PHYSIOGRAPHY.

Stewart Island lies about fifteen miles from the nearest point of the mainland, from which it is separated by the shallow waters of Foveaux Strait. Its area is estimated at 425,390 acres. In shape the island is irregularly triangular. The western side, the longest, runs in a north and south direction for thirty-nine miles, the north-east and south-east being thirty-three and thirty miles respectively (81A); almost everywhere the surface is hilly, and not infrequently mountainous. In the north is a high ridge with many spurs, culminating in a peak, Mount Anglem, or Hananui, 3,200 ft. in height, to the south of which the land continues much broken and hilly to the shores of Paterson Inlet; while the wall-like mass of the Thomson Range forms its south-western boundary, beyond which is the flat valley of the Freshwater or Ohekia River, the principal stream from Mount Anglem. On the south side of the above valley, and west of Paterson Inlet, is Mount Rakiahua, 2,217 ft. high, to the south of which, but separated by the Rakiahua Valley, is a mountain-chain, which attains in places a height of more than 2,000 ft., and whose chief summits are Table Hill, 2,347 ft., and Mount Allen, 2,459 ft. This chain extends down the centre of the island to Port Pegasus, and divides the waters of the south-east from those of the west. The narrow southern extremity of the island is lower, but still mountainous, several curious smooth granite cones rising to a height of more than 1,000 ft. (Photo No. 39), while at the extreme southern extremity is Smith's Lookout, 1,758 ft. in height.

Perhaps the most striking features of Stewart Island are Paterson Inlet and Port Pegasus. The former, a fine broad expanse of lakelike water, irregular in shape, and dotted with islets, pierces right to the centre of the island, running westward for ten miles, and putting forth three extensive arms, known as South-west Bay, North Arm, and Caerhowel Arm (see map).

Port Pegasus, in the south, is smaller and narrower. It runs parallel with the coast for about seven miles, its entrance blocked by three islands, between which are narrow passages. It is divided into a North and South Arm, connected by a narrow strait, the Acheron Anchorage.

There is little really flat ground on Stewart Island. East of the Table Hill dividing-range the country is comparatively low, but it is much broken. At the head of Paterson Inlet is the mouth of the Freshwater River, a sluggish tidal stream of dark water, navigable for small boats for a few miles. Its course lies through a narrow valley, bordered by sandhills, extending northward to the jagged Ruggedy Mountains, and continuing still at a low level north of that range, whence there is quite low country to the sea.* Also, there is an opening to the west following a branch of the Freshwater River, which debouches into a wide, flat area filled with an ancient dune-complex,† and separated from the sea at Mason Bay by a wall of dunes about 400 ft. high.

The coast-line is usually rocky, but here and there are sandy beaches, especially that of Mason Bay.

A number of islands dot the adjacent sea, particularly on the east and south-west, while on the north-west is the fairly large Codfish Island. Nineteen miles eastward is the low island of Ruapuke, four miles and a half long and two miles wide, and in Foveaux Strait lie Dog and Centre Islands, the former two miles and a half, and the latter four miles from the South Island mainland. Thirty-five miles to the westward are the Solanders, islands of volcanic origin (Speight, 77A), the main island 1,100 ft. high, a well-known landmark to sailors. Finally, sixty-two miles south-south-west of the south-west end of Stewart Island lie the Snares, whose vegetation has an equal affinity with that of the subantarctic islands, with which it has been usually classed (Cockayne, 18).

Stewart Island and its outlying islands are composed for the most part of granite and diorite gneiss,‡ but the central dividing-range is partly, at any rate, made up of a schist very similar to that of Central Otago. The Solanders are volcanic, being composed of hornblende-andesite (Speight, 77A).

The Stewart Island granite§ is frequently quite soft, and rapidly disintegrates into clay. In the south it crops out to the surface, and is much weathered (see Photo No. 3), the conical mountains being probably the outcome of this rather than of ice-action, though in appearance many rocks, as Petrie pointed out (69), have certainly the character of *roches moutonnées* (see Photo No. 39). There has been undoubtedly more or less glaciation in Stewart Island. A typical moraine (see Photo No. 1), damming up a small lake, occupies the flattish ground beneath the final precipices of Mount Anglem, and it is more easy to believe that glaciation has been much more extensive than that there was merely at one period a small ice-field on the highest mountain. Mr. R. Speight's recent important discovery of moraines

* From information supplied by Mr. J. W. Murdoch.

† For explanation of this term, see my recent report to the Lands Department on sand-dunes.

‡ Marshall (67B, p. 498) gives certain details as to the rocks at Half-moon Bay, Golden Bay, and Ruggedy Point, at which latter is "a large intrusive mass of granophyre, whose resistant nature causes it to form outstanding pinnacles and cliffs."

§ Mr. Speight kindly supplied the following note *re* certain rocks I collected: "All the specimens are yellowish-coloured granite, containing a considerable amount of quartz, that from the Frazer Peaks being a mica variety with a fair proportion of plagioclase. The specimen from Wilson's Bay is very similar in character, except that it contains numerous small patches showing graphic intergrowths of quartz and feldspar on a small scale (granophyric structure). The third specimen, from Thomson Range, contains a large amount of microcline—in fact, it is the dominant feldspar in the rock."