On 16 December 1913, as local inhabitants told De Agostini, a huge flood of water, earth and rocks washed down the Rio Blanco valley. An accumulation of rocks, still visible although invaded by vegetation, proves that it was caused by the destruction of a great dam in front of the Rio Blanco Glacier. We can assume that the glacier has been retreating since then, and has not yet reached its new equilibrium.

The next corrie glacier to the north, Piedras Blancas Glacier, so named for its white granodioritic frontal moraine, and Marconi Glacier, have the same extension as in 1936. The same can be said of the Gorra Blanca Glacier, which is not a corrie glacier but an outflow of the "*Hielo Continental*" through a broad pass between Cerro Gorra Blanca and Cordón Marconi.

Conclusion

There is then no proof of a general recession of south Patagonian glaciers during the last twenty years as in Europe. The known examples can be explained by local orographic factors. I think that hitherto authors have been influenced by the important and undeniable recession of glaciers in the Andes near Santiago and Mendoza, and the consequent production of many important "stone rivers," but the climatic conditions of Pantagonia are quite different, and no extrapolation through 2000 km. can supply the missing records.

A pilot who has flown over Patagonia for the last twenty years has assured the writer that the climate has become less cold but wetter and cloudier during that time. With the invasion of settlers and sheep there were many huge fires which destroyed an important part of the primeval woods. This may make for dryness, but the influence of the relatively near and almost unknown Antarctic Continent should prevail.

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MARINE AND LACUSTRINE ICE-PUSHED RIDGES

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Marine ice-pushed mounds and ridges * formed by sea ice, growlers and bergs are common on the Arctic beaches. Crescentic ice-pushed ridges are found on both modern and elevated beaches at Slidre Fiord, Ellesmere Island, N. W. T. The material in the ridges is derived from the scars which are associated with them. The slope which faces the scar is flat, due in part to the fact that it may have been overridden by the ice, whereas the other slope of the ridge is steep. The ridges are a few feet in height and several feet long. One ridge was found which is more than 20 ft. (6 m.) above sea level and many scores of feet from the strand line. It may have been formed when the sea level was higher, or during the present sea level by ice thrust above and beyond the highest tide line. Ice-pushed ridges and crescents were not seen on the elevated beaches at Resolute Bay,

* These features have been variously described as "ice ramparts", "ice-shove ridges" and "ice-push ridges"; the name used here is, in our view, more descriptive and euphonious.—*Ed.*

Fig. 1 (p. 169). The Viedma Glacier

Fig. 3 (p. 170). Laguna Sucia and the Rio Blanco Glacier

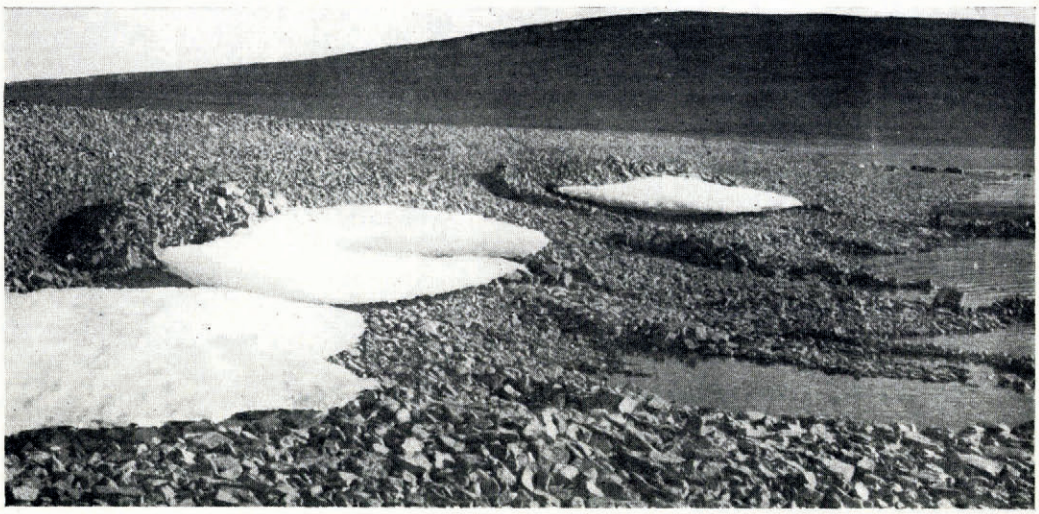

Fig. 1 (p. 175). Ice-pushed ridges and the floes which formed them. Allen Bay, Cornwallis Island, N. W. T. 22 August, 1949 *Photograph by George Jacobsen*

Fig. 2 (p. 175). An ice-pushed ridge on the margin of a lake at Resolute Bay, Cornwallis Island N. W. T. Knapsacks in the background give the scale *Photograph by Robert L. Nichols*

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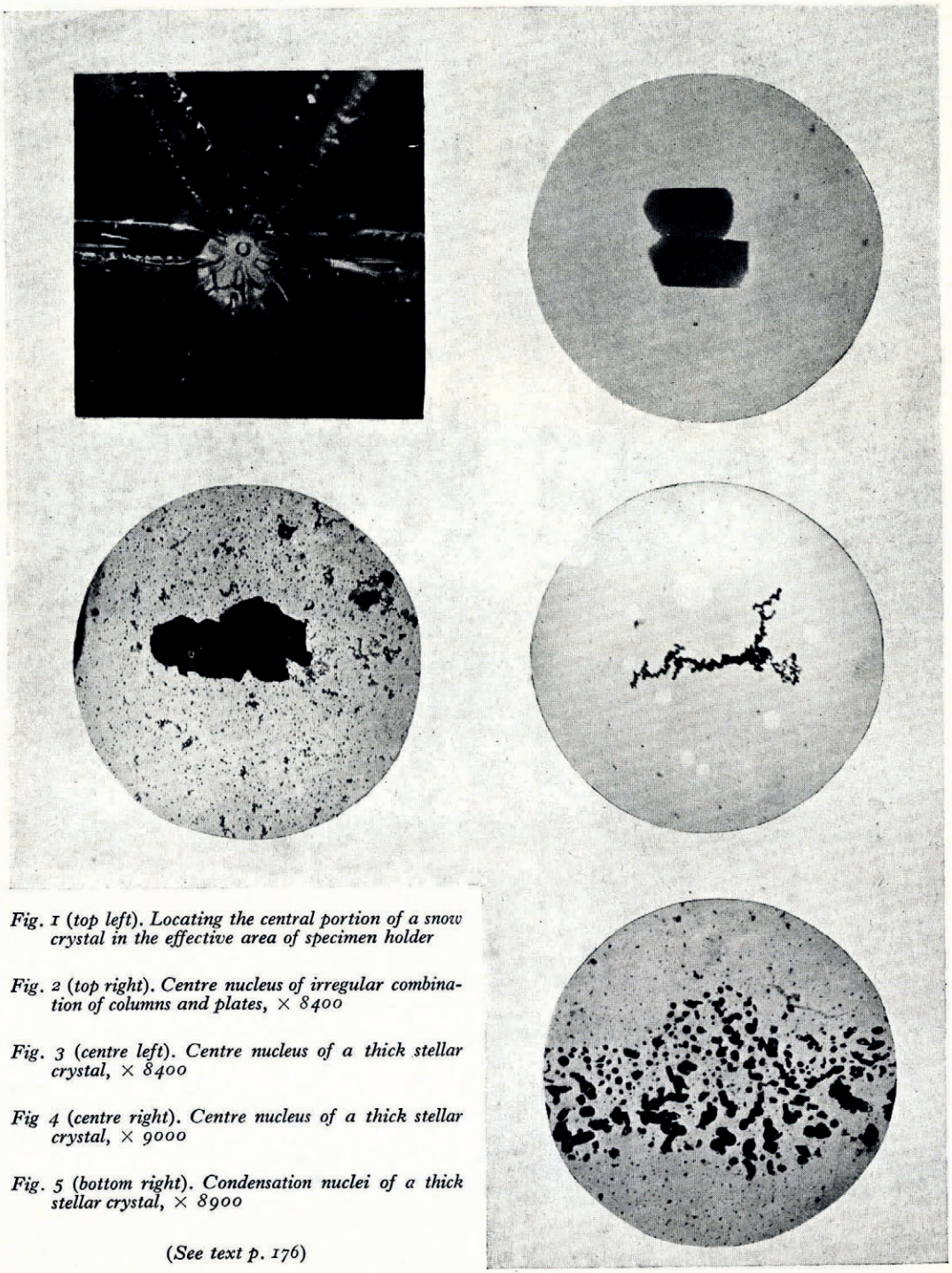

Fig. 1 (top left). Locating the central portion of a snow crystal in the effective area of specimen holder

Fig. 2 (top right). Centre nucleus of irregular combination of columns and plates, × 8400

Fig. 3 (centre left). Centre nucleus of a thick stellar crystal, × 8400

Fig 4 (centre right). Centre nucleus of a thick stellar crystal, × 9000

Fig. 5 (bottom right). Condensation nuclei of a thick stellar crystal, × 8900

(*See text p. 176*)

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Cornwallis Island, N. W. T., but are common on the modern beach. They are as much as 2 ft. high, but are not usually permanent, as the waves destroy them soon after they are formed (Fig. 1, p. 173).

Shingle heaps up to 60 ft. in height at Hillock Point, Melville Island, N. W. T., have been reported by M'Clintock.[1] Armstrong described mounds on the north-west coast of Banks Island, N. W. T., which he said were upwards of 100 ft. in height. He wrote concerning them, "The appalling evidence we were afforded of the effects of pressure, caused by stormy winds acting on a trackless icy sea, . . . we had not witnessed in any other part of our eventful voyage, and baffles all attempts at describing—mounds being piled together to the height of upwards of 100 feet." [2, 3] The great height reported for these mounds, much greater than those published by later observers of these mounds and ridges, makes one wonder whether they are due to: (1) Ice-push. (2) Morainal material dropped from drifting bergs. (3) Pre-glacial or glacial topography. (4) Beach shingle which owes its height in part to the elevation of the shoreline. (5) A combination of processes. A study of Armstrong's and M'Clintock's texts makes it seem unlikely that these heights were obtained by precise measurement.

Lacustrine ice-pushed ridges are usually small features a few feet or more in height. A more or less continuous lacustrine ridge 6 ft. (1·8 m.) high on the landward side and between 8 and 9 ft. on the lakeward side is located on a delta on the east side of the lake, west of the meteorological station at Resolute Bay, Cornwallis Island, N. W. T. (Fig. 2, p. 173). This must be a particularly favorable place for the formation of lacustrine ice-pushed ridges, for it is considerably higher than those which are usually described.[4, 5]

An ice-pushed ridge is also located on the east side of the lake at the foot of the bedrock ridge to the east of the settlement. It is, in places, about 12 ft. wide and between 3 and 4 ft. high on its landward side. It is asymmetric in transverse cross-section; its landward side is nearly at the angle of repose, while its lakeward side is much flatter. The ridge is made of many pushed units and on its lakeward side a thin layer of silt, sand and pebbles had recently been added. This layer is also similarly asymmetric in transverse cross-section and its surface is grooved and striated. The grooves and striations were formed by round stones and fragments which were pushed across the surface of the silt layer by the ice. Fine material plowed forward by the round stones and fragments is piled up on their landward sides.

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