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NOTES ON THE OCCURRENCE OF HEAVY MINERALS ON STRADBROKE ISLAND.

by

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Zinc Corporation's Camp is established on the western side of the 18-Mile Swamp near Blue Lake, eight miles from the north-eastern end of the island and fifteen miles from Jumpinpin passage at the south end, which separates North Stradbroke Island from South Stradbroke Island. Very good permanent water is obtained from the stream running from Blue Lake, which is about 30 feet above sea level. The camp is reached by rough jeep road in approximately ¾ hour from Dunwich, to which a daily launch service runs from Cleveland, about one hour's run. There are practically no made roads on the island and most of those being used have been cleared by Zinc Corporation Ltd. Surface is sandy and loose.

Physiography.

Stradbroke Island consists largely of a series of roughly parallel high sand dunes, which trend in a north-westerly direction from the western side of 18-Mile Swamp. This swamp stretches almost the whole length of the island/in width from 1½ miles at the south end to ¼ mile at the north end. Swamp level is 5 - 6 feet above mean sea level. East of the swamp is a line of sand-dunes 100 yards or so in width and an open surf beach that stretches unbroken for the whole length of the island.

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On the western side of the swamp the fronts of the high dunes rise rather abruptly to about 200 feet in height and then continue to rise gently in a north-westerly direction. Maximum height is 714 feet approximately in the centre of the island, 3 miles east of Dunwich. Along the western side of the island is a prominent ridge averaging 200-300 feet high and running north-south, in contrast to the prevailing strike of the wind-formed dunes. This is considered to be associated with a former beach dune line, probably at a relatively higher sea-level.

The 18-Mile Swamp apparently represents an area which was submerged at the close of the Pleistocene and which has been cut off from the sea by the subsequent building northwards from the south end of the present beach dunes. This process has been aided by emergence possibly of the order of ten feet in recent times. There is evidence that this process of alternate rise and fall of sea level has occurred several times, but such extensive dune-building has taken place when the beach front was approximately along the western side of the present 18-Mile Swamp that evidences of former possible beach lines, with the exception of the one along the western side of the island, are largely obscured.

Formation of heavy mineral deposits.

Beach sand minerals being drifted northwards along the coast by wave action are exposed to strong continuous south-east winds over a long unbroken stretch of beach on Stradbroke Island. Whether the winds are stronger and more consistent here than elsewhere along the coast, there is at present no evidence available. At any rate in this area they appear to rob the beach effectively of most if not all of its heavy mineral content, as these minerals slowly migrate northwards, without anywhere being concentrated into thick stable deposits. The process of dune-building in its early stages can be seen at several places along the eastern side of the 18-Mile Swamp. Wind action has caused the development of "funnels" in the foredune, and through these funnels sand is being continually blown in a north-westerly direction, building up "tongues" of sand into the swamp, which in places have reached nearly half way

across to the western side.

During my visit, which was made in company with C.C. Morton, Queensland Chief Government Geologist, three bores were put down in one of these incipient dunes to water level (about 6 feet) at progressively farther distances from the point of origin out into the swamp. The results indicated a decrease in grade with distance - the hole farthest out into the swamp contained 0.4 per cent heavy mineral by volume, the middle one 0.5 per cent and the one nearest the point of origin of the dune 0.75 per cent. This is the natural result of the fact that the lighter quartz tends to be carried farther than the heavy minerals. A certain amount of concentration thus has taken place in the formation of the Stradbroke dune deposits, in that much of the original beach sand has been blown past the end of the dunes and over into Moreton Bay. Apart from this the heavy mineral content of the dunes can represent no more than the average heavy mineral content of the beach throughout the period of their formation, because even with the most favourable wind velocity there can be no tendency for the wind to pick up heavy minerals from the beach and leave quartz sand behind.

The effect of the continual robbing of the beach of its heavy mineral content is shown in the composition of the ~~dune~~ beach deposits. In the Southport area and on South Stradbroke the composition of the beach deposits is 42-44 per cent zircon, 27 to 28 per cent rutile and 25 to 27 per cent ilmenite, with 2 to 4 per cent other minerals. At the north end of North Stradbroke Island the composition is 26 per cent zircon, 16 per cent rutile and 56 per cent ilmenite, and from there north to Fraser Island the composition remains much the same, and this may be taken as normal for heavy mineral assemblages derived from the south-east Queensland area. The contribution that has travelled north from the comparatively rich Clarence-New England source area has been trapped on Stradbroke Island by being diverted from the beaches by wind action to the high dunes.

Geology of Stradbroke Island.

This island has always been regarded as being composed almost entirely of sand dunes, although outcrops of sandstone not dissimilar to those of the Triassic Series in the Brisbane-Ipswich area occur at Dunwich and other points on the west coast. Rhyolite is found at the north end and one or two outcrops of Brisbane schist have been reported.

During our visit gently dipping sandstones were observed in the hill near the camp, associated with what had obviously been a prominent headland on the Pleistocene beach front. A coarse bed, much too coarse to be of windblown origin, was noted in the section, which extends for a height of about 200 feet above sea level. The 1 inch military contour map of the island shows other such breaks in the continuity of the late Pleistocene shore-line and we were informed by Zinc Corporation's men that similar outcrops are associated with those "headlands". A sample from the friable sandstone in these formations gave a small yield of heavy minerals of the following composition:-

Zircon 17 per cent.
Rutile 20 " "
Ilmenite 55 per cent.
Other minerals 8 per cent.

Canberra, A.C.T.
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