REPORT ON MINERAL PROSPECTS

OF

FLINDERS ISLAND, BASS STRAIT

by

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Geology

Flinders Island consists of a Palaeozoic basement of quartzites and slates (Mathinna Beds) intruded by granitic rocks with minor basic dykes. (late Devonian ?). This is overlain by a veneer of Cainozoic non-marine beds, basaltic lavas, marine beds and dune and lagoonal deposits. The marine beds include Tertiary and Quaternary horizons. The geology of the island is summarised in the accompanying maps and in recent unpublished manuscripts by F.L. Sutherland and R.C. Kershaw.

Economic Possibilities

The limestone resources have been discussed by Everard (1950) and Hughes (1957), and the soil resources by Dimmock (1957). The main mineral exploitation has been minor quantities of tin ore from scattered alluvial grounds, and this is discussed in various Tasmanian Mines Department reports, mostly unpublished (see reference list). From examination of these reports it would seem that the only tin deposit worth more detailed prospecting is the Tanners Bay field, following the recommendations of Hughes. Sub-basaltic tin leads are known under basalt at Canns hill, but this is a relatively restricted deposit. The largest basalt flow on the island is the Chew Tobacco Creek - Petrifaction Bay flow, and a sub-basaltic lead here must be considered as a possibility, although it would require drilling the Bootjack Plain through basalt to prove it.

The source of the alluvial tin is not concisely proven, but is presumably the granite, although the tin-bearing host granite may now be completely stripped. Mapping and sampling of the granite is necessary to determine any relationships between granite type, structure and location of the alluvial tin deposits. As far as I am aware this has not been done and is an essential first step to understanding the distribution and extent of the tin deposits. Such mapping may also reveal presence of other granitic minerals such as molybdenite, etc. More detailed examination of granite petrology would also assist in evaluating possibilities of other derivative heavy minerals, such as ilmenite, rutile, magnetite, etc. Topaz, zircon

and other related minerals, as recorded from the island's alluvial deposits, represent a possible semi-gem prospect, but are probably not a commercial proposition. Minor records of gold, silver and possibly uranium on the island suggest that these metals are not worth further consideration.

The main prospects on the island would appear to be exploitation of heavy mineral alluvial deposits. In many regards, such as presence of Palaeozoic basement and extensive dune deposits, Flinders Island resembles King Island, where heavy mineral sands are an economic proposition. One important, and possibly critical factor, is the presence of strips of basic volcanic lavas (Cambrian) on King Island, which would provide a broad source of ferro-titanium ore. Basic dykes (Devonian ?) and basic lavas (Tertiary) are known on Flinders Island, but these are small in extent and unlikely to prove abundant source rocks, and the granite is an unexamined source.

Possible hosts for heavy minerals on the island include the extensive dune series, marine beds and drainage and lagoonal deposits. Apart from the tin prospecting, the heavy mineral contents of these deposits are an unknown quantity. Dark sands (grey) have been reported from aerial reconnaissance of the island, but as the sands on the island may contain dark organic horizons, this is not significant in itself. Flinders Island dunes form one of the most extensive Tasmanian series (as seen on looking at the 1962 Geological Map of Tasmania) and this presents some problems for adequate sampling and testing. Examinations of the dunes indicate several series ranging in age from at least the Lower Pleistocene to present day, with different characteristics, including a strong dichotomy into calcareous western dunes and siliceous eastern dunes. These factors will require careful sampling and assessment. However, the main distributions of the dune series have been recently mapped, which will enable representative sampling programs to be established. Below and interspersed with the dunes are the Tertiary-Quaternary marine horizons, which include coarser near-shore deposits of possible heavy placer content. These beds are mostly buried, but are accessible for sampling in the many drains and waterhole excavations on the Furneaux Estate. Some dune series on the island are observed to extend below present sea level, so that this province includes off-shore as well as on-shore deposits. A knowledge of the on-shore heavy mineral contents would assist in considering likely off-shore prospects.

Alluvial fan deposits aproning the granite highlands would appear to be potential heavy mineral traps. These are not prevalent on the island, but the most extensive one at Leventhorpe Creek may be worth testing (alluvial tin is known on the headwater region of Leventhorpe Creek). Thus, possible heavy mineral hosts are widespread on Flinders Island, but until they and the source basement are sampled their economic potential is an unknown quantity. The Flinders Island environment of repeated winnowing of coastal deposits by marine incursions on paper is certainly conducive to concentration of heavy mineral placers. At present, however, no definitely significant mineral deposits can be indicated, without embarking on prospecting, mapping and sampling.

Recommendations

If further prospecting on Flinders Island is desired, the following appear necessary for complete evaluation of the economic possibilities.

1. Mapping and examining the granite basement for its tin and other heavy mineral potential.

2. Representative sampling across the different dune series of the island to pick up any possible available horizons.

3. Check sampling of the marine, littoral and alluvial fan deposits of the island.

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