

PRELIMINARY REPORT ON FURNEAUX GROUP OF ISLANDSGeography & Physiography:

The Furneaux Group of islands is situated at the eastern entrance of Bass Strait to the north-east of Tasmania, from which it is 13 miles distant, between nearest points. The group comprises Flinders Island (802 square miles), Cape Barren Island (172 square miles), Clarke Island (44 square miles) and numerous smaller islands distributed about the coast lines of the larger units. Access is gained from Tasmania by means of a small steamer trading to the ports at the settlements of White Mark, Emita and Lady Barren on Flinders Island fortnightly. Passenger aeroplanes flying from Tasmania to Victoria land at Flinders Island every second day, and on the return journey from Victoria to Tasmania on the alternate days.

The west, south and north ports of Flinders Island are well served by motor roads from which by-roads extend to selections.

Flinders Island is represented by disconnected and rugged mountain ranges, from north to south, through the central portion with an extreme height of 2285 ft. at Strezlecki Peaks in the south. Low lying plains fringe the east and parts of the west coast line.

Cape Barren Island is distinguished generally by high and broken country. Mt. Munro in the north east is the highest point and attains a height of 2348 feet, while Mt. Kerford (1644 feet) to the south east is another conspicuous eminence. Low lying plains also extend along the east coast of this island.

The main topographical feature of Clarke Island is a flat central plateau of an average height of 350 feet above sea level. It is bordered along the south, west and north coasts by lines of hills rising about 200 feet above the plateau.

The drainage of these islands is effected by means of short streams, with limited catchment areas, flowing directly towards the sea from the inland highlands.

Climate conditions are very mild, there being no extremes of heat or cold and the rainfall is moderate.

Geology:

The oldest rocks occurring in the Furneaux Group are quartzites and slates (Mathinna Series) referred to the Cambro-Ordovician period. They are intruded on a large scale by granite of Devonian age which represents a northern outlier of the granite batholith of North-Eastern Tasmania. Narrow basic dykes also of Devonian age occur intrusive into the above rocks. Small isolated areas of Tertiary basalt overlie the Cambro-Ordovician sedimentary rocks and Devonian granite. To the east of White Mark the basalt is underlain by gravels and clays of Tertiary age. In other places small areas of similar gravels appear at surface overlying Devonian granite. Upper Tertiary limestones, calcareous sandstones, clays, grits, sands and gravels overlie the older rocks, chiefly along the coastal belts. Recent alluvian has been deposited in the beds of the present streams and sands are accumulating in places along the low-lying coastal areas.

Alluvial Tin Deposits:

Alluvial tin was discovered on Flinders Island

at Killicrankie Bay and near Tanner's Bay in 1882. In the same year the mineral was identified on Cape Barren Island at Rooks River. From that period onward small tonnages of tin have been recovered intermittently up to the present date from several small alluvial fields on both islands.

With two exceptions the tin deposits occur in comparatively low lying basins or open valleys adjoining coastal bays. The tin is in sporadic distribution through Upper Tertiary sediments consisting of granite grits, sands, clays and fine gravels which in the lower portions are often in various stages of consolidation. These were formed from the wastage of adjacent land areas, on a gradually sinking floor, in protected bays and inlets of the sea at a time when the land was much lower in relation to the sea than at present. The bed-rock upon which the tin bearing sediments were deposited is Devonian Granite in almost every instance.

Two ancient stream, deposits have been located on Flinders Island, one of which is of the sub-basaltic type.

Pats River Tinfield:

This field is situated on Flinders Island, three miles north-north-west of White Mark, and is reached by means of a formed and partly metalled road connecting with the main west-coast road.

The area is represented by a narrow arm of the coastal plain extending north-westerly up the valley of Pats River and its two main branches.

The deposit consists of granite grits, sand and fine gravels with a little clay which were originally laid down on the granite floor of an inlet of the sea. In depth these sediments vary from 3 feet to 20 feet. The tin which is fine in grain, is erratically distributed in the deposit and no rich concentrations, extending over large areas, have been located. Portion of the lower drifts are found to be cemented to form a consolidated mass, and few attempts have been made to exploit the tin content in these parts. Small areas in the valley of North Pats River and its upper tributaries have been sluiced during the past 40 years and a little work has also been accomplished at South Pats River. Insufficient water and lack of head pressure have obstructed the successful working of larger areas.

Tanners Bay Tinfield

This is situated one mile and three quarters north of Tanners Bay in the north-west of Flinders Island. The motor road from White Mark to Palana passes through the area. A northerly extension of the west coastal plain stretches inland from Tanners Bay in a narrow belt through to Killicrankie Bay. From Tanners Bay the plain rises gradually in a northerly direction to an approximate height of 300 feet in a distance of 2½ miles, and from this point the land falls regularly to Killicrankie Bay. Small creeks flowing to both inlets have slightly dissected the plain. The plain is limited to the east and west respectively by the highlands of Mt. Boys and Mt. Tanner.

The bedrock of the district is Devonian granite, which in the plain area is overlain by Tertiary grits, sands

clays and gravels to a maximum exposed depth of 15 feet. The latter are tin bearing and were deposited over inlets of the sea by streams draining the adjacent land areas in Tertiary times. The area covered by the drifts appears to be extensive but owing to a partial cementation, and in places a complete consolidation of large portions of the deposit, coupled with a scarcity of water for hydraulic sluicing, only spasmodic attempts have been made to exploit the contained tin over a period of 53 years. Along the creek flowing to Tanners Bay, workings extend for an approximate length of 25 chains over a maximum width of 2 chains and have exposed drifts varying in depth from 3 feet in the south to 15 feet in the northern parts. The tin is a fine grained variety and is found in close association with topaz, locally called "Killiecrankie diamonds". Although a little tin is present throughout the deposit, in the proximity of the workings, it is chiefly concentrated in the lower layers in conjunction with lignitic wood and pyrite.

One mile to the west of the main workings prospecting by pits, and a small amount of sluicing has been attempted in a creek running towards Killiecrankie Bay.

#### Cann's Hill:

An attempt was made some years ago to test tin gravels in a sub-basaltic lead of Lower Tertiary age at Cann's Hill,  $1\frac{1}{2}$  miles to the east of White Mark. A short adit was driven northerly from the hill slope falling to O'Doherty Creek. The granite wall of the old gutter was penetrated for a short distance before passing below 7 ft. of Tertiary basalt into large quartz boulders and clay constituting the lead. The latter was found to contain coarse tin but at the point of operations the gutter proved to be both shallow and narrow.

A little tin was mined in a primitive manner but the prospect proved uneconomical to work since no adequate supply of water was available for sluicing and the handling of the large boulders in the deposit was found to be too costly.

#### Redding Creek:

This area is one mile and three quarters west-south-west of Badger Corner and is reached by means of a cart track from Whitemark-Badger Corner road. Redding Creek flows southerly to the coast, opposite Tin Kettle Island after taking its rise in the foothills of Stryelecki Range.

The bedrock of the area is Devonian granite and this rock is in contact with quartzites and slates of Cambro-Ordovician age along a north-easterly line slightly to the east of the area.

Between the upper branches of Redding Creek

the granite is overlain by a narrow longitudinal belt of Lower Tertiary stream grits and gravels, approximately 30 chains in length. Tin oxide together with small quantities of gold are contained in the grits and gravels.

The deposit has been treated to a limited extent by means of ground sluicing for the recovery of these minerals. The sediments as exposed in the workings attain a maximum depth of 9 feet, but as the bedrock is only showing in a few places it is possible that a greater thickness is present along the main gutter. In the deeper exposed portions towards the south of the workings the bottom appears to be dipping to the east and suggests that the gutter is several feet to the east at that point. The lower layers of the deposit are in a cemented condition and have only been worked to a small extent.

Here again lack of adequate water supplies appears to have been a deciding factor in the decision to suspend mining operations.

#### Rooks River Tinfield:

Rooks River is a small stream flowing north-easterly from Mt. Munro to Deep Bay on the north coast of Cape Barren Island. The origin of the alluvial deposit in this area agrees in all essentials with the ancient bay deposits of Flinders Island. The field is the most developed and important alluvial tin area in the Furneaux Group.

Tin was first discovered here in 1882 and mining in a moderate manner has continued with broken periods up to date. Three comparatively large workings in close proximity to each other have been opened by means of hydraulic sluicing, and one of these is being operated at present. Several minor workings are distributed over other parts of the area. The deposit consists of the usual grits, sands and gravels with occasional clay bands, and varies in thickness from 5 feet to 30 feet. The granite bedrock upon which the deposit was laid down is uneven and large holes occur in which the tin is often concentrated to a greater degree. As on Flinders Island much of the lower sediments are in various stages of consolidation and in parts of the older workings have not been mined. The tin is usually found to be richer towards the bottom where it is associated with lignite and much pyrite. Bands of grits rich in tin have in places been cemented into a hard mass by sulphide of iron solutions forming pyrite, and in treating these portions it has been found necessary to roast the material and wash in caustic soda to separate and clean the tin oxide.

Tin oxide concentrates being produced from this area assay between 72% and 74% tin.

More water is available at Rooks River for sluicing than at the other tin fields in the Furneaux Group, but under present conditions the supply is insufficient during dry months for continuous work. A scheme for the conservation of water by the construction of dams in the upper part of Rooks River is now under consideration, and if completed would maintain supplies throughout the year.

#### Modder River Tinfield:

This area is situated in the south-west of Cape

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Barren Island. Modder River takes its rise on the southern slopes of Mt. Munro and Double Peak and runs south-westerly to Thunder and Lightning Bay.

The stream flows over open plain or valley dissected to a moderate degree by the watercourses.

The tin field occurs in the upper region of the valley and is covered to a maximum depth of 50 feet by tin bearing grits, sands, clays and gravels of Upper Tertiary age which were deposited in a previous inlet of the sea. Granite of Devonian age underlies these sediments and outcrops to the north, east and west of the area. Although no extensive mining has been undertaken two small working faces were opened up of recent years along the stream slopes, and about 10 tons of tin oxide produced. The deposit as exposed in the faces varies from 3 feet to 20 feet in thickness and is consolidated in parts. The tin is generally in a fine state of division but is occasionally coarse in grain. A little tin occurs throughout the deposit in association with ilmenite, but is more concentrated in the gravels near the bottom.

A boring campaign, with the object of proving the tin distribution and depth of the deposit in this area, is now proceeding. If these tests prove successful it is likely that large scale tin-winning operations will commence in the near future.

Water for sluicing is not plentiful, but the supply could be much improved by damming the larger branch streams.

#### Battery Bay:

This area is situate north and adjoining Battery Bay on the south coast of Cape Barren Island. Battery Creek, rising in highlands to the north, flows to the bay over a low lying plain extending inland for nearly one mile. Granite outcrops over parts of the plain, but to the east of Battery Creek and in the vicinity of another small creek further west this rock is overlain by ancient bay sediments of Upper Tertiary age. As in other local deposits of this type the latter consist of grits, sands, clays and gravels containing tin oxide in fine distribution. They are exposed in a partly cemented condition along a low cliff face, up to 15 feet in height above high water mark, on the shore of Battery Bay, and a small area has been worked for tin immediately east of Battery Creek mouth. The full thickness is indeterminate at this point owing to the deposit extending below sea level. At 5 chains up the stream a small face has been opened along the east bank and tin is now being worked to a limited extent by ground sluicing methods. Water is scarce, but no attempts have been made to conserve existing supplies.

#### Other Alluvial Areas on Cape Barren Island:

Several areas occur on Cape Barren Island in which similar conditions exist to those already described viz., low lying plains or valleys adjoining bays or inlets over which are distributed deposits of sands, grits and gravel etc., which in most instances carry varying

proportions of tin oxide. Very little prospecting or mining has taken place in these localities which include:-

- i. Lee River, a stream heading to the south and flowing to the east end of Deep Bay, on the north coast. A large potential tin area exists in this region and prospecting has recently revealed the presence of alluvial tin in Ransom Creek, a western tributary of Lee River, and near the shore at the mouth of the river.
- ii. Dover River is a north flowing stream emptying into a small bay east of Dover Point, on the north coast. Tin exists in the alluvial deposits of this valley and has been worked to a slight extent at the mouth of the river, and 2 miles inland in the south-east part of the area. Traces of alluvial gold are also present in the sea sands along the beach fringing the bay. A drilling campaign to test this area by means of a hand boring plant is about to be undertaken by the Mines Department.
- iii. Rhodes Creek takes its rise on the northern slopes of Mt. Kerford range and Hogan Hill, and flows north easterly to the east coast in the vicinity of Harley Point. Alluvial tin, in close association with quantities of zircon, was recently located in the gravels of this area and is now being prospected.
- iv. Prospecting has disclosed traces of tin with much ilmenite in the valleys of Rice River and West Creek flowing to Kent Bay on the south coast. No concentrations of economic importance have as yet been located.

#### Primary Tin Deposits:

No primary deposits of economic value have yet been proved to exist in the Furneaux Group.

At the north-east end of Babel Island a tin-bearing pegmatite vein was traced for a short distance on the shore line. Rich patches of tin oxide were located in association with fluorite, but as the lode was not proved to extend inland, access was difficult and both fuel and water supplies lacking, the lode was not exploited.

A pegmatite vein carrying tin oxide occurs on the plateau about the centre of Clarke Island. Prospecting by shafts and trenches has established the length over a distance of 12 chains, and a bulk crushing of 10 tons of ore taken from a surface stope, 20 years ago, contained  $\frac{1}{2}\%$  tin.

Aplitic granite containing blebs and small irregular patches of tin oxide are located on Cape Barren Island at Mt. Munro and Mt. Kerford. On the northern slopes of Mt. Munro, at Lode Hill in Rocks River, watershed, tin bearing aplite is exposed in several small open cuts excavated for prospecting purposes. The tin is here associated in the rock with small quantities of chalcopyrite and molybdenite. None of these minerals appear to be sufficiently concentrated to make economic working possible. It seems certain that the alluvial

tin deposits of Cape Barren Island have been formed to a large extent from the wastage of the tin bearing aplites.

Gold Deposits:

No gold deposits of any extent have been located in the district and those that have been traced appear to be only of minor importance.

Several small quartz and quartz-sulphide reefs occur both on Flinders Island and Cape Barren Island.

A little fine alluvial gold is found in beach sands and gravels near the mouth of Dover River on Cape Barren Island. At Redding Creek, towards the south of Flinders Island, small amounts of alluvial gold have been obtained in sluicing gravels for tin.

Conclusion:

Alluvial tin deposits constitute the principal mineral wealth of the Furneaux Group. Numerous alluvial areas occur on Flinders Island and Cape Barren Island, some of which have been worked to a slight extent. Several areas exist at Cape Barren Island which have not yet passed the prospecting stage. In all of these areas drilling by means of hand-boring plant is most suitable for testing the value of the deposits.

In a few places boring has been executed by private enterprise but neither records nor plans of these are available. Two separate deposits are now being tested by hand bores, one at Modder River by private individuals, and the other Dover River by the Mines Department. To obtain the best results all efforts along these lines should be co-ordinated and copies of plans and records of all private boring be deposited with the Mines Department for future reference.

Owing to the small catchment areas of streams on the islands water supplies have generally proved inadequate for hydraulic sluicing. Even grades over low lying areas in the alluvial fields have also proved a deterrent to mining by interfering with the disposal of tailings down drainage channels. No attempts have been made to elevate the material into sluice boxes and remove tailings by stacking.

In the future, after areas have been thoroughly bored to ascertain the economic value of the deposits the possibilities of working them by means of dredges will have to be considered.

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