TIN MINING IN TASMANIA

Preliminary Statement

During the past 50 years tin has figured as one of the chief exports of Tasmania. Although the output today is much below the peak reached some years ago this branch of the mining industry is second only to copper in importance. Owing to the relatively low market rates of other metals it is a matter of self-interest to the State that tin mining be carried forward effectively and expedeously. The one Government agency through which the essential support for the development and extension of the industry must ordinarily come is the Department of Mines. Thoroughly aware of that fact the officers of the Geological Survey branch have exhaustively studied certain sections of the tin-fields, and have prepared many reports and bulletins dealing with their works; but large areas remain to be examined in detail.

The Department is greatly handicapped by small appropriations which have kept down the personell to meagre proportions. Yet, an endeavour is being make to complete the survey of the north-eastern field before 1930. Despite their many difficulties the bibliography is rather extensive and includes the following:-

The Blue Tier Mining District and its Tin Deposits
by G. Thureau, 1886.

Reports on the Blue Tier Tin Field by
A. Montgomery, 1889 and 1893.

The Tin-bearing Gravels of the Gladstone District,
A. Montgomery, 1891.

The Alluvial Tin Mines at Derby,
by J. Harcourt Smith, 1899.

Preliminary Report on the Deep Lead or Infrabasaltic Stanniferous Gravels of the Ringarooma Valley.
by W.H. Twelvetrees, 1900

Report on the Tin Mines of Blue Tier,
by W.H. Twelvetrees, 1901.

Report on the Tin Ore Deposits of Mt. Heemskirk,
by G.A. Waller, 1902.

The Tinfield of North Dundas,
by L.K. Ward, 1909

The Stanley River Tin Field,
by L.L. Waterhouse. 1913.

Recconnaissance of North Heemskirk Tin Field,
by L.L. Waterhouse. 1914.

The South Heemskirk Tinfield,
by L.L. Waterhouse.1915.

The Gladstone Mineral District,
by W.H. Twelvetrees, 1916.

The Mining Fields of Moina, Mt. Claude and Lorinna,
by A, McIntosh Reid, 1919.

The Mt. Pelion Mineral District,
by A. McIntosh Reid, 1919.

The Mt. Bischoff Tin Field,
by A. McIntosh Reid, 1923.

The Sub-Basaltic Tin Deposits of the Ringarooma Valley,
by P.B. Nye, 1925.

Report on Brookstead Tin Mines,
by A. McIntosh Reid,

Report on St. Pauls Tin Mines,
by A. McIntosh Reid.

Report on Mr. Lindsay Tin Mine,
by A. McIntosh Reid.

Bulletins dealing with Blue Tier Tin Field and Cox Bight Tinfield are now in course of preparation.

General Statement

In this report a brief account is given of the nature of the several kinds of deposit, with particular reference to those typical of the more important bodies. Appended are more detailed reports of some vein, lode, and alluvial deposits, which are now either in process of investigation or about to be investigated. These descriptions will convey an idea of the location of the deposits in relation to line of transport and port of shipment, their nature, and their variety. Moreover, an attempt is made in some cases to form estimates or ore reserve, value of ore, and cost of mining and concentration.

The Plane of Tasmania in the Tin Industry

Of late years Tasmania has fallen from its high estate as one of the foremost producers of tin. This is due largely to the great reduction in the output of the Mt. Bischoff mine. Some years ago the output of that mine was greater than the aggregate output of all other mines in Australia. Still, in the classification of our resources tin must be placed among the metals of greatest, if not quite the first, economic importance.

It is necessary for purposes of comparison to examine the statistics of all producing countries. The following analysis is illuminative and indicates the present position of Tasmania in the scale.

Almost all of the world's tin is fabricated and consumed in the United States of America and Europe. It has been estimated that during the next few years the annual tin consumption of the United States will amount to 70,000 tons of new metal out of an estimated world production of 125,000 tons. The balance of 55,000 tons will practically be consumed in Europe. The United States therefore will consume 60% of the world's tin, and Europe will use the rest.

The estimated total tons (125,000) of tin to be used, may be apportioned among the various industries approximately as follows:-

Tin and terne plate	48,600 tons
Solder, tabbitt and bearing metals.	41,600 "
Brass and bronze	8,300 "
Foil	6,800 "
Collapsible Tubes	4,200 "
White Metal	2,700 "
Miscellaneous	12,800 "

The bulk of the tin is used by the highly industrialised countries of Europe and America, but the bulk of the tin ore is produced in countries in which manufacture is comparatively low in the industrial scale. Assuming a world's production of 125,000 tons it is likely to be derived as follows:-

Malaya	35,000 tons
Bolivia	32,000 "
Dutch East Indies	24,000 "
China	9,000 "
Siam	7,000 "
Nigeria	6,000 "
Australia	4,000 "
Cornwall	2,000 "
India	1,500 "
South Africa	1,500 "

The output estimated for Australia may be regarded in some quarters as high, but a considerable increase is anticipated especially from Tasmanian sources. The production of Australia in 1925 was 2072 tons of which the State of Tasmania contributed 1130 tons or 54.5 per cent. Calculated in terms of world production Tasmania now produces about one per cent, a not insignificant proportion.

<u>The Development of Our Resources.</u>

The obvious result of the geographical distribution of tin ore is that the tin of the world today is being moved from the non-industrial (comparative) to the industrial countries.

The United Kingdom secures its requirements of tin within the Empire, very little foreign capital being invested in the tin industry of the Dominions and Colonies. In many cases capital for tin ore production is provided wholly or in part by local investors, but the larger schemes requiring a greater amount of capital are financed in England.

As regards Tasmania the works of exploration and development in some cases are provided for by local investors; but, in the operation of the large low grade deposits of tin-bearing stone English investors are invited to provide the necessary capital. That is a natural consequence of the fact that the products of all our tin mines are marketed and fabricated in England. In a small State, such as Tasmania, where there are so many avenues for investment a small proportion only of the available money can be diverted to this branch of the mining industry. That amount is used in part for exploration and development and in part for the operations of mining and concentrating the ores of the smaller deposits. It is recognised that the preliminary investigation of the deposits is one of the responsibilities of the Mines Department, and that the subsequent works of exploration and development should be the responsibility of local companies. Such practice is almost general here. If the results of the exploratory and developmental works are regarded as satisfactory English firms are invited to check the results obtained, and, if they consider it desirable, acquire the lease rights of areas direct from the Crown or through the leasees as the case may be.

Tasmania needs English capital in the tin business to assist in placing the undeveloped resources on a producing basis.

Details of Production

The output for the year 1926 was 1096 tons, valued at £322,526, being a reduction of 33.5 tons as compared with the previous year, but an increase in value of £25,011.

The records show that Tasmania has produced tin ore to the value of £15,375,908.

Tin ore is obtained from two principal sources namely

1. Primary deposits,
veins, lodes, replacements, aplite dykes, etc.

and 2. Secondary Deposits,
alluvial and detrital beds.

Those of the first type are represented in the world famous Mt. Bischoff Mine, from which to 1925 over 4,728,000 tons of crude ore had been mined and treated for 78,234 tons of tin oxide, valued at £5,462,748. The sum of £2,539,500 has been distributed in dividends.

The principal alluvial mines are those of the Arba, Briseis and Pioneer.

The Arba Company, during the period 1903 to 1920 treated 3,260,851 cubic yards of drift and got 1362 tons of tin oxide, the content being 0.93 lb. per cubic yard.

The Briseis group operating on the cascade lead removed 5,732,700 cubic yards of overburden and treated 9,304,800 cubic yards of drift for 12,881 tons of tin oxide valued at £1,644,900 and paid £502,500 in dividends. In addition 9,600 tons was produced by the early operators.

Pioneer Mining Company operating on Wyniford River lead has sluiced 13,000,000 cubic yards of drift for a yield of 8607 tons of tin oxide and has paid £526,000 in dividends.

Many other but smaller companies are operating in the NE district.

Of the two classes of deposit, using the general terms lode and alluvial, the latter is the more attractive because a deposit of that kind can be opened at many points and can be valued fairly accurately before the outlay of large capital thereby minimising the risk of loss. Lode deposits, on the contrary, require the expenditure of large sums in their development, and the tin ore in them is not so regular in distribution. In consequence, the alluvial are the first resources to be tapped, and from such the greater part of the tin ore raised in Tasmania has been obtained. Many of the easily worked alluvial beds have been depleted of their ore reserve, others are nearing depletion, while some - the very deep beds - have not been explored. Although alluvial mining companies may be expected for some time to contribute largely to the output, the time is fast approaching when closer attention will be directed to the large supplies locked in the lodes. The development of the lode resources is immediately and continuously necessary in order to prepare for the replenishment of the reserves depleted by production.

Cost of Production

The cost of production varies within a very wide range in the several fields according to the conditions peculiar to each. It is difficult to get precise information regarding costs the accounts of which as a rule are not inclusive of;

exploration and development

overhead charges and interest

amortization on mine investment and realisation.

Taking some of the most favourably situated mines as examples the mining, milling, concentrating, and transport costs may be given with a fair degree of accuracy, such being based upon actual results during long periods of operation.

Avoca Field -

St. Pauls Mine -
open-cutting and milling - 8/- per ton of crude ore
mining and milling - 10/- per ton of crude ore

Lottah Field -

Blue Tier (late Anchor) Mine -
open-cutting and milling -2/10 per ton of crude ore

Renison Bell Field -

Renison Bell Mine -
open cutting and milling -5/8 to 9/2 per ton of crude ore.

Mt. Bischoff Field -

Mt. Bischoff Mine -
open cutting and milling-5/2 to 6/9 per ton of crude ore.
→ vein mining and milling -15/- to 20/- per ton of crude ore.

As regards alluvial tin mining the cost varies according to conditions between 6 pence and eighteen pence per cubic yard of material.

Extent of Investigations

During the past 55 years the tinfields of Tasmania have been carefully investigated by experienced prospectors, miners, and mining engineers. In addition, the Geological Survey has been extended to every district. Where detailed examinations have not been made reconnaissance surveys have provided enough informations to serve as a guide to the prospective value of those areas. All the tinfields are known. The cream, as represented by surficial alluvial and detrital deposits, has been skimmed offfthe primary deposits, and the lodes and deep leads of alluvial remain. It is to these that attention is now directed.

Suitable Areas for Development

Those deposits - alluvial and lode - only that are of great extent and have a prospective commercial value will be mentioned in the following statement. The selection of such deposits for particular mention is a natural consequence of the fact that the shallow easily accessible deposits have already been or are being worked. The exploration and development of the large low grade deposits is possible only to highly capitalised companies.

The following is a list of some of the tin ore deposits worthy of attention.

1. Alluvial.

(a) Ringarooma System

(b) Mussell Roe System

(c) Thureau's Deep Lead

(d) Cox Bight

(e) Bells Plains

(f) St. Pauls River.

2. Lode and dyke

(a) St. Pauls Mine (late Royal George), Avoca

(b) Blue Tier Mine (late Anchor).

(c) Mt. Maria Group, Blue Tier.

(d) Mt. Lindsay Mine, near Renison Bell.

Appended are brief reports dealing with some of these.

(a) Ringarooma System

Numerous tributary leads have been and are being worked between Branxholm and Pioneer. The main lead has not been toughed in these districts due chiefly to the thick overburden of basalt. Further the lead extends to the north of Herrick and eventually loses its basaltic overburden, but has not been prospected to determine its extent and value.

(b) The Mussell Roe System

This system exists in the vicinity of Gladstone but has been worked to only a limited extent. From this deep lead the Scotia, Lochaber, and Aberfoyle Companies obtained approximately 800 tons of tin ore. Three small companies have recently been formed to prove the extent, depth, and value of this lead and its tributaries. In the past hydraulic sluicing methods were employed, the water supply being obtained by way of the Mt. Cameron Water-race from the Mines Department. The lead is too deep (over 100) to be worked economically in that manner.

(c) Thureau's Deep Lead

This lead exists near St. Helens, but likewise has only been worked to a slight extent, and the extent and value of the deposit is unknown.

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