MEMORANDUM

Possibilities of Increasing Gold Production in Tasmania

The question of increasing the output of gold calls for investigations into technical, economic and financial matters.

It must be admitted that the greater proportion of readily discovered surface deposits have already been located and to reveal new deposits of economic importance will need different methods and heavier expense. It will require scientific and systematic prospecting and a close investigation of the possibilities of further development of the deposits which are not yet explored or remain unworked for economic reasons. The latter consist of mines and deposits which present a variety of conditions for the cessation of mining operations. One of the most common appears to be the penetration of the oxidation zone, with its free gold, into the primary sulphide zone containing a lower gold content combined with increased difficulty in metallurgical treatment. Recent advances in metallurgical treatment warrant the prospecting of the many veins, which have been worked to shallow depths of 50 to 200 feet and abandoned upon reaching the primary sulphide zone, in order to prove the grade and tonnage available.

The most serious problem is not in finding where the former results justify a fair expectation that the vein or lode is worth re-opening but in securing sufficient capital to conduct mining operations on the scale necessary to ensure a profit. In order to stimulate production State assistance might be granted to small parties to obtain light machinery to enable the working of such mines to be conducted below water level and developed sufficiently to demonstrate if worthy of being worked on a larger scale, with heavier machinery and company organisation.

The difficulty in determining that any mine is definitely worked out beyond hope of finding further ore occurrences justifies the revival of active prospecting of known lodes on existing fields, even if surface prospecting has failed to give encouraging results.

A critical study of the literature will indicate the relative importance of the various prospects and they can then be classified accordingly. Taking the prospects in order of promise, studies of the mine plans and sections (utilising the contour method of revealing structures, maxima and minima considerations and assay value distributions) will indicate the most favourable locations for the extension of gold shoots by extrapolation and the projection of possible new locations by repetition.

A study of the available literature clearly demonstrates the almost complete lack of detail relative to structural control, in most cases the reports are purely descriptive of workings as they existed at the time of examination. It is now recognised that accurate and painstaking mapping techniques are necessary for adequate detail of structure, so that extreme care will

be necessary in the formulation of a prospecting campaign based on such inadequate data.

In the case of veins where sulphides predominate a minerographic study of the paragenesis of the minerals will reveal valuable information regarding the nature of the gold occurrence which is essential in obtaining maximum efficiency in gold recovery. When the mechanical polishing lap is completed and installed the Geological Survey will be equipped to undertake such work.

Efforts to increase the gold output of the State may be summarised as follows:-

(1) Track cutting in less explored localities (western districts) followed by Geological Survey, and prospecting under strict supervision.

(2) Investigation by drilling of known deep leads.

(3) Exploration of reefs in known gold belts (north eastern district) by diamond drilling etc.

(4) Investigation of metallurgical problems.

SHALLOW ALLUVIAL DEPOSITS

There are several areas adjacent to the recognised mineral belts in which little investigation has been undertaken principally owing to remoteness from existing lines of transport, and roughness of the terrain. One such area is that south from Arthur River to head-waters of Savage and Donaldson Rivers. A large tract of country exists consisting predominantly (probably) of Lower Palaeozoic rocks. Alluvial gold deposits and quartz reefs have been reported in northern portion of the area, otherwise little is known of the locality. To test such an area preliminary track cutting is essential followed by Geological Survey and prospecting under strict supervision.

Possibilities of small alluvial gold deposits between Jane River field and Gordon River cannot be overlooked and here again track cutting must precede exploration. The deeper alluvial deposits along the lower course of Algonkian Rivulet offer possibilities for testing by hand boring or shaft sinking.

DEEP ALLUVIAL DEPOSITS

Deep leads occur at Lefroy, Back Creek and Corinna. At Back Creek the leads have been tested to a small extent only and possibilities for further development lie in complete and systematic boring of the deposits.

Near Corinna gold bearing gravels 30 to 150 feet deep extend over a large area. The gold is generally fine and the content low, but parts of the ground might be worked successfully under large scale conditions with sufficient water and head pressure. Systematic boring is the only feasible method of testing these deposits.

QUARTZ REEFS

All the old fields have been explored at surface with such thoroughness that further expenditure in that class of work is not regarded with favour. The only

practicable scheme for exploration is search by diamond drilling &c. for hidden bodies along well defined gold belts; gold bearing zones below worked portions of known reefs and along possible continuations of same.

In any contemplated drilling campaign it is urged that due consideration be given to the desirability for a constant check on the progress of the drill by recognised survey methods.

MATHINNA

This field probably offers the most encouraging prospects for further development and consideration has already been given to a proposed drilling campaign. Details of two tentative bore sites in the vicinity of Golden Gate Mine are contained in a memorandum to the Secretary for Mines, dated January 14th 1938. Details of tentatively selected bore sites in the vicinity of Star of Mathinna and Jubilee Mines are contained in another memorandum to the Secretary dated May 20th 1938. It is suggested, however, that the location of these bores be reconsidered in the light of the new technique to which reference has already been made.

LYNDHURST OR WATERHOUSE

This field was operated about 1870 and several mines opened on gold bearing quartz reefs. As soon as the sulphide zone was entered at about 100 feet mining ceased apparently owing to inability of the operators to recover the gold contained in the sulphide ore. The reefs appear to warrant testing by drilling in the sulphide zone. Metallurgical investigations of the ore is desirable as owing to improvements in metallurgical practice of recent years a high recovery of gold from sulphides at a much lower cost can often be obtained.

SOUTH MOUNT VICTORIA

In parts of this area highly pyritic reefs carrying gold occur and those known as Hinemoa, Una and O'Brien have been exposed by workings. The Hinemoa lode appears to consist of a series of lenses of variable value with indications that a considerable tonnage of sulphide ore could be proven. An adit has opened the lode at 200 feet below outcrop over a length of 210 feet. A large block of undeveloped ground existing between the surface and adit level should be explored. The best method to test this is by locating the outcrop and driving on the reef at 100 feet vertically above the existing adit.

Una and O'Brien reefs should be tested below present workings, preferably by diamond drilling.

The metallurgical treatment of ores from these mines requires consideration in order to determine the proportion of gold obtainable from battery treatment and the possible recoveries from other processes. Some such work has already been undertaken on ore from O'Briens reef.

ALBERTON

This field contains numerous short and comparatively narrow reefs outcropping on a steep ridge. The topographical conditions have enabled exploration by adits resulting in the discovery of gold bearing quartz of reasonable profitable grade in many cases so far as the comparatively

shallow depths are concerned.

Indications point to secondary enrichments in upper portions of the reefs but certainty on this point cannot be gained until the reefs are tested at greater depths. The latter is desirable and can be undertaken by diamond drilling at inaccessible mines and by shaft sinking from lowest workings in others.

BEACONSFIELD

The Tasmania Mine was the most productive gold mine in the State, and this is now being tested below the bottom level (1500 feet) by drilling.

North Tasmania Mine was worked from shaft to a depth of 400 feet. Where cut at that level the reef was 4' 6" wide and several crushings averaged one to six ounces of gold per ton. A cross-cut from 500 feet level was started but discontinued at 180 feet from the reef. At 200 ft. level the lode contained a high proportion of copper ore from which 1 to 2 oz. of gold were obtained per ton. If this mine is now accessible it would be advisable to sample the remaining ground above 400 ft. level and to extend the 500 ft. cross-cut to cut the reef. Diamond drilling below the latter level is advisable.

MANGANA

This was the first gold field to be discovered. Numerous reefs were found along two principal zones and mines started but with no great success as little gold was found below 200 feet from surface. The best method for further exploration is by drilling along possible extensions of the zones. In this regard an attempt might be made to locate any southern continuation of Sovereign Reef below the surface.

LEFROY

Numerous reefs were worked on this field but the best values were not found to extend below approximately 400 feet. Beyond this depth the reefs were unpayable. With the object of determining whether richer shoots occurred in the untested primary parts of the reefs a considerable amount of drilling has been carried out in recent years but with negative results. It is doubtful if there are any possibilities for further development.

GLADSTONE

Apparently the most favourable prospects in this area are located within the old Victory leases which included a number of short and narrow, parallel quartz veins; but whether any prospects exist depends upon the results in the developmental work undertaken by Victory Gold Mine Company subsequent to 1932, when the Government Geologist reported upon the mine. Unitl results of this work are available no assessment of the prospects can be made.

Two other factors may have had considerable incluence on the operation of this Company:-

(1) Failure, in view of the narrow and short veins, to maintain a proper balance of development to ensure a continuity of supply for treatment.

(2) Difficulty in making a highly efficient extraction of gold from the sulphide concentrate which is predominantly arsenopyrite.

PORPHYRY DYKES

At Beulah narrow dykes of porphyry contain gold varying from ½ dwt. to 7 Dwt. of gold per ton and it is reported that an average of 1 dwt. may be safely anticipated. This field has possibilities for future development and is worthy of careful investigation and survey.

ACTING GOVERNMENT GEOLOGIST

ACTING FIELD GEOLOGIST

The Director of Mines,
HOBART.