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MONAZITE IN TASMANIA

The following report covers the first section of a reconnaissance of the Monazite deposits of the State of Tasmania. The mineral has been recorded from a number of localities associated chiefly with tin ore as a troublesome impurity.

Records relating to monazite are incomplete. The price offered has always been too low to encourage its recovery and where it is plentiful the difficulty of separating it from cassiterite has often caused the abandonment of what would otherwise be a profitable tin-bearing deposit.

This investigation occupied the period, 13th February to 17th March, and occurrences at Scottsdale, Pioneer and Endurance Mines, The Yellowband and King Island were visited.

The report summarises the results of the examination and suggests possible development in the areas visited.

Samples taken during the reconnaissance are, at present, with the Chief Chemist at Launceston. The results of analyses will be tabulated in the final report.

Locality plans for all except the King Island deposit are included in this report.

The Mount Stronach Area.

Monazite was recorded from the Mt. Stronach district by W.H. Pettard in his 'Minerals of Tasmania' published in 1910. It has been met with in all the alluvial tin workings and has, at times, been so abundant as to make treatment of the tin concentrates too difficult to be profitable. Information relative to monazite is, therefore, indefinite, for areas high grade in monazite have been purposely avoided even though alluvial tin ore was present.

At the time of this examination only two areas were being worked. These, held by Messrs. G. and A.J. Gowland were separated by about three miles and were situated on either side of the Great Forester River about six miles north of Mt. Stronach. Other leases in the area are still in force though mining operations are not in progress.

The mine workings are situated at a comparatively high level above the river. The tin ore is occurring in remnants of Tertiary wash situated on the flanks of granitic hills. Geological boundaries are indefinite due to the fact that the Tertiary sediments are themselves granitic in appearance and except where granite is outcropping can easily be confused with the granitic gravels recently formed by denudation of the granites.

The river flat through which the Great Forester River flows is composed of recent sediments and varies in width to approximately a mile. These river flats were not tested for monazite during this examination but prospects taken at each of the Gowlands' holdings showed that monazite is widely distributed and, in parts, would be equivalent to from $\frac{1}{2}$ to $\frac{3}{4}$ oz. per dish, approximately 4 lb. per cubic yard.

There has not been any systematic testing of the area either for its tin or monazite content. The mine workings.

show that tin has been widely distributed throughout the Tertiary sediments but the (recent) river flats are too low-lying for successful testing by pits.

The area which is considered a potential source of monazite is the comparatively flat to saucer-shaped area extending from Mr. A.J. Gowland's lease on the eastern side across the Great Forester River in a westerly direction past the lease of Mr. Geo. Gowland to the Scottsdale-Forester Road. The area would extend for at least a mile north of this line, and in a southerly direction would extend along the flats on either side of the high ground occurring as ridges forming the northerly extension of Mt. Stronach. There is not sufficient evidence on which to base estimates of quantities available but the mine workings reveal depths ranging to approximately 25 feet and local reports state that at times it was considered advisable to abandon areas which would otherwise have been profitable tin producers because of abundance of monazite occurring with the concentrates. The area is readily accessible by well formed roads from Scottsdale and in the dry season at least no difficulty would be encountered with cross-country transport.

To estimate the reserves of monazite available in the Stronach area would necessitate a campaign of boring during which additional reserves of tin ore may also be proven.

The Pioneer District.

The only recorded sales of monazite in Tasmania are sales of concentrates by the Endurance Mine in the years 1943 and 1944 when 32.5 tons and 0.1 ton of monazite were sold for £486 and £2 respectively. The larger parcel was recovered from an accumulation of material discarded after the streaming of the tin concentrates. It is reported that the original concentrates before streaming for tin contain not more than one per cent of monazite and the present accumulation of discards would not greatly exceed 1,000 tons.

Monazite is widely distributed throughout the area, for both the Pioneer and Endurance Mines have shown its presence. More recently, monazite has been recorded in the concentrates of the Dorset Tin Dredge where again it amounts to approximately one per cent of the whole of the original concentrates recovered.

There are no records showing the distribution or quantity of monazite available. It is certain that operators on a smaller scale than the established mines have also discarded monazite concentrates as being unprofitable.

The Yellowband Area.

The Yellowband area is situated about 12 miles from the main Waratah-Corinna road along the Parsons Hood track. The track has been cut in a general southerly direction from a point on the road 6½ miles from the town of Waratah and was originally designed to assist prospectors who were mining for the tin ore which originally brought the Yellowband area into prominence.

Tin ore was first discovered about 50 years ago and most of the creeks in the vicinity of Pine Creek and Yellowband Creek have been worked for the recovery of that

ore. In no instance was the depth of wash great but prospects tried during this examination suggest that high grade ore was won.

It was during the operations for the recovery of tin ore that the occurrence of monazite was recorded at Yellowband plain but being of the nature of an impurity in the tin ore there is no recorded information relative to the grade or quantity of ore available. This examination was undertaken to determine its distribution within the area.

A report by J.B. Scott written in the year 1929 gives some useful information on the construction of the track and the results of prospecting by Keygan and the Pryde Brothers in the vicinity of Pine Creek. Though the occurrence of monazite is not recorded there, it was placed on record that the tin concentrates, valued at £6 per cwt. contained osmiridium to the value of £4 per cwt. with one grain of gold.

The Parsons Hood track has not been in use since the year 1934 or 1935 and it is at present in a very much overgrown condition with fallen timber and second growth scrub making progress both slow and difficult. With one exception, the huts built by the early prospectors have collapsed, the one remaining being situated near the intersection of the track with Pine Creek.

The creeks and button grass plains were tried by prospect dish for the occurrence of monazite. It was found to occur generally over the area with the grade increasing in a southerly direction towards the Yellowband Creek. In Pine Creek and Keygan's Creek a proportion of cassiterite occurred with the monazite but in Yellowband Creek where the wash was in situ as deep sediments, there was apparently no tin occurring. Material accumulating in potholes in the outcropping granite where the track crosses the Yellowband Creek contained a proportion of cassiterite as distinct from the almost clean monazite concentrate in the alluvial button grass flat further upstream.

The button grass plain, considered to be worthy of testing for monazite, extends from a point immediately south of Pine Creek in a southerly direction across Yellowband Creek and onwards past the head waters of the Little Wilson River, a total distance of approximately 3 miles. The plain varies in width from about a quarter to three quarters of a mile. Where tests were made in Yellowband Creek the depth of wash recorded was ten feet but there is no certainty that bottom was reached. The occurrence of granite ridges within the area of the plain suggests that no great depth of wash can be expected but prospects taken suggest that at least ¼ oz. monazite per dish will be the grade of ore available.

To enable the Yellowband area to be tested, the first necessity would be to recondition that section of the Parsons Hood track extending from the Waratah-Corinna road to the Yellowband Creek crossing. It would be necessary to clear scrub and fallen timber from perhaps 12 miles of track. Corduroy and culverts placed there in 1928 have deteriorated and would, to a great extent, need to be renewed and the bridge over Pine Creek would need to be replaced and strengthened. At present this bridge is out of alignment. Preliminary testing of the ground could then be carried out by pit sinking but the final testing would necessitate boring. In either case there is the possibility of proving additional tin resources.

The Fraser River Area.

The Black Sand deposits of Fraser River on King Island have been known for a considerable time to contain a relatively high proportion of monazite. This fact was recorded by Pettard in his 'Minerals of Tasmania' published in the year 1910. The beach sands are also high grade in tin ore and it has been primarily for its recovery that they have received attention. The sands have been the subject of previous reports by Departmental officers and in the year 1929, under the supervision of Mr. F. Blake, a series of 24 bores were completed to test the deposit. These bores revealed that the sands ranged in grade for tin oxide to more than 8 lb. per cubic yard and that their main constituent was ilmenite.

Further investigations have indicated that rutile is present as also is monazite and zircon.

The Fraser River sands occur as a raised beach situated to the north of the Fraser River where it enters the sea at Naracoopa on the east coast of King Island. The deposit extends for a considerable distance northerly along the foreshore but is confined to an area approximately three chains in width between the sand dunes and the shore. The sands have developed their greatest thickness on the inshore side, where they reach a thickness of at least 10 feet, and taper off in thickness as the shore is approached. The grade of ore varies considerably. Several attempts have been made to recover the tin ore from the Fraser River Beach sands but in general they have been unsuccessful. The present operators are using a Wilfley concentrating table with some success but they are handicapped by shortage of equipment. I have been informed that their present equipment is capable of handling only 4 cubic yards of the heavy sand per shift and the recovery is only profitable when carefully selected high grade sands are treated. With a reported average grade of at least 4 lbs. cassiterite per cubic yard the deposit is a desirable one and with added equipment should yield a profitable return with the recovery of the monazite as a further incentive.

In treating the sand a reasonable separation of tin ore and monazite is made. The tin is extremely fine grained and will all pass through 125 mesh. The monazite, though fine grained, is comparatively coarse, but is recovered with an admixture of ilmenite and zircon which must be removed magnetically.

With improved and more equipment this deposit should be an economic unit.

Signed: H.G.W. Keid
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