REPORT ON THE GIPPS CREEK DISTRICT

Location and Access

The Gipps Creek district is situated on the south flanks of Ben Lomond in north-eastern Tasmania. Access is gained by means of a branch road from the Avoca to Storeys Creek road. Avoca is a township and s station on the St. Marys railway. The road from Avoca is 12 miles in length and is passable for motor vehicles though the surface is poor at many places and the grades are sometimes heavy.

Geology

The district is occupied chiefly by granitic rocks of Devonian age. To the north of the sections described below, slates and quartzites of the Cambro-Ordovician system outcrop, and represent a remnant of these rocks into which the granite was intruded. In Dillon Bottom and at a few localities along Cradle Creek, Permo-Carboniferous pebbly shales and mudstone occur. Those in Cradle Creek are lying horizontally, and those in Dillon Bottom are standing vertically. The latter junction with the granite to the east and at first sight the contact would appear to be an intrusive one. This, however, is not in accordance with evidence in adjacent parts of the district and the real explanation is that the junction is a faulted one and represents a point on the fault mapped by Mr. A.M. Reid in the examination of the Avoca Coalfield.

Economic Geology

The lodes occur entirely in the granitic rocks and occupy a zone about 60 chains long and 25 chains wide. The general strike is 10 degrees to 20 degrees west of north and the prevailing (and characteristic) dip is to the east at angles of 20 degrees to 30 degrees. The lodes are generally of the quartz type with cassiterite, wolfram, chalcopyrite, tourmaline, mica, and fluorite as associated minerals. The cassiterite and wolfram are the minerals of economic importance. Cassiterite predominates in the northern, and wolfram in the southern part of the zone. A few typical greisen veins composed of quartz mica also occur and carry metallic minerals similar to the above. The lodes owe their origin to the passage of vapours and solutions through the granitic rock during the closing phases of its consolidation, and possibly while the lower parts of the magma was still in a molten state. A feature of the southern part of the zone are vertical walls which cut off the lodes and represent fault planes. At other parts the lodes are stated to terminate against veins of fine grained white quartz ("Crockery stone") which may represent later fillings of fault planes similar to those referred to above.

The Mining Properties

Section 8811/M, 20 acres, G.H. Hodgman.

This section is situated in the high ridge between Gipps Creek and Cradle Creek and is occupied wholly by granite. Several adits, shafts etc. occur on the property but are now largely fallen in and destroyed. The greater part of these workings were probably carried out in the eighties by the Clunes T.M. Co. (formed in 1882). The mine became known as the Long Tunnel, and though held subsequently by the Long Tunnel T.M. Co. (1891), and the St. Aubyn M. Co. (1901), little, if any, work appears to have been performed. On the surface, shallow underhand stoping has been carried out along a length of several chains on a lode which has a

course of 350 degrees with a dip to the east ranging from 50 to 70 degrees. At one place where the lode was not stoped it has two good walls of granite with at least two veins of quartz between the walls. The width between the walls ranges from 2 to 4 feet and the veins are 12 inches wide. A short adit of 10 feet in length connects with these stopes and on the dump numerous pieces of ore are found. The lode would appear from these to consist of white reef quartz with the following minerals; cassiterite, wolfram, chalcopyrite and white mica. Cassiterite appears to have been the most important mineral, wolfram being subordinate. The chalcopyrite is reported by Montgomery to have occurred as a two inch vein with rich tin ore in close vicinity to it. The underground workings cannot now be inspected and the following information is taken from previous reports by Montgomery (1892) and Waller (1901).

Montgomery reports on two underlay shafts and two adits. The northern of the two shafts was sunk 20 to 30 feet on the underlay on the above lode which was 2'3" thick. This shaft was then continued vertically to connect with an adit driven in a north-easterly direction to cut the above lode. The adit has a length of about 100 feet at which distance it cuts a barren quartz lode with a bearing of 350 degrees and a dip to the east of 45 degrees, this lode underlying the tin lode and being 50 feet to the west thereof. Another shaft was sunk on the lode to the south of the above one. From his observations, Montgomery recommended extending the adit to give the lode a practical trial which he regarded as worthy of such. Waller also refers to the above adit and three underlay shafts. He states that the adit cut the barren lode at 93 feet and a drive followed this lode for 180 feet at least. Two of the underlay shafts are said to have been sunk of the quartz-tourmaline (or tin) lode and one on the barren lode although this seems to be the one described by Montgomery on the tin lode. In addition to the above, two other adits have been driven. One is situated several chains to the south of the above, but beyond being mentioned by Waller, no description is given. No ore can be found on the dump and it does not appear as though a lode was intersected. The other adit is the long one which gave the mine its name. This was driven from near the west central portion of the south boundary of the present lease at a slight altitude above Gipps Creek. It was driven for 560 feet, but even at the time of Montgomery's visit, it had fallen in beyond 300 feet. The first 200 feet had a bearing of 350 degrees, when a change of course to 12 degrees was made for 80 feet. At 280 feet a small lode bearing 350 degrees and dipping easterly at 50 degrees or 60 degrees was intersected and followed northwards. This lode appears to be to the west of the lode found further north and parallel thereto. As remarked by the previous investigators this adit should have been driven across the strike of the lode system in a generally easterly direction instead of a northerly one which is parallel to the lodes. The most important lode so far discovered is that which has been described as the tin lode and on which the small amount of stoping was carried out. Waller appeared to believe that the upper adit had cut the lode on account of pieces of ore at the entrance. Some of this may have come from the upper part of the underlay shaft which was sunk on the tin lode. If, however, this adit was not extended as recommended by Montgomery this is the first work that should be attempted on this section.

Section 9270/M, 10 acres

This section is situated immediately to the west of Gipps Creek and was, until recently, leased by J.J. Goodall. It is occupied by the usual granite of the district. Near the north-western corner, a greenish lode material containing quartz and mica occurs strewn over the surface. Near by in a water race a formation 15 inches in width and bearing 345 degrees has been exposed. It consists of a medium grained greisen of quartz and mica and good prospects of tin were obtained from the rubble. A few chains to the south, loose pieces of a fine-grained honeycombed greisen are found. Some of these contain fine grained tin distributed throughout the greisen. Further south and between the water race and the cart track a small excavation has been made from which one bag of tin was sluiced. At the western end, soft mica greisen occurs and was followed to a depth of 7 feet. It is said to lie against a granite wall bearing east and west and dipping southerly. This greisen does not appear to extend eastwards. Two shafts have been sunk to the south to cut this mica greisen on its assumed underlay. In the western one a 4 inch vein of quartz mica and greisen is stated to have been cut. The eastern one intersected a formation but without any mica. It would appear that either the mica greisen has no downward extension (which would be in accordance with its erratic nature) or the shafts are not sunk deep enough. The latter point could be settled by deepening the shafts. Several chains to the west a low knoll of tourmaline granite occurs. On the western side, about 2 cwts. of slugs of cassiterite were obtained from the soil etc. resting on the granite. Pieces of dark green tourmaline rock are also plentiful. In the shallow excavations a narrow vein of the tourmaline rock dips to the east at a very low angle. Above this vein, mica greisen occurs in places and is stated to give good prospects of cassiterite. The slugs of cassiterite were undoubtedly shed from these formation. Though possibly other ore would be found in them, the small size at the surface is not encouraging.

Section 4709/M, 5 acres, Park & Bailey

This section is situated to the east and north of Gipps Creek near the sharp bend it takes to the east a short distance below its junction with Cradle Creek. Though charted as above, the whole of the interest in it is held by Mr. E. Hayes. The section is occupied wholly by granite. Several lodes carrying wolfram have been located and worked on a small scale on this lease. One lode occurs near the south-east corner of the section. The oldest workings consist of a lower adit driven on the lode to the north west. It is stated that £160 worth of wolfram was won by these means in 1908 or 1909. Later Mr. Hayes sluiced the dump from this adit and won £91 worth of wolfram. Later another adit was driven at a bearing of 350° into the hill and at an altitude of approximately 50 feet above the other. The lode is a quartz-wolfram one and has a dip of 20° to the east. At the face, it is 20 inches wide. A small amount of underhand stoping has been carried out beneath the approach to the adit and gave 1½ tons of wolfram. The first seven feet of the adit yielded 7 bags, the next 14 feet more, and a small overhead stope at the face 6 bags of ore. On the surface the north-western end of the sluicing shows the lode terminating against a vertical wall with a bearing of 340° which probably represents a fault plane. Future work should therefore be restricted to the eastern side of this fault. The lode is persistent in the faces

development work and the market value of the wolfram. It is difficult to determine the direction of the downthrow of the fault and so no indication can be given as to the position of the western part of the lode. Two other parallel lodes occur near the central part of the south boundary of the section. An adit was driven at 330 degrees for 20 feet and cut the eastern one which was then followed to the north and south. At the face of the south drive the lode is 20 inches wide and is composed almost wholly of tourmaline. At the face of the north drive, six inches of quartz and wolfram are showing. The lode has been stoped to the surface between these points and yielded 39 bags of wolfram. The western one has been worked at the surface and also opened up by an adit now fallen in. The lode is a quartz one and contains wolfram and tourmaline. It is stated that one ton of wolfram was obtained from the lode and half a ton of mixed cassiterite and wolfram from the detrital material to the west thereof. Both lodes have a northerly bearing and a low dip to the east. Their future exploration depends upon further development work exposing other shoots of ore. Near the north west corner of the lease another lode has been exposed in shallow surface and underground workings. A vertical wall representing a fault plane crosses the lode at an acute angle, its bearing being 330 degrees. The lode to the west of the fault has a general bearing of 340 degrees and little work has been done on it. At shallow depth this portion would terminate against the fault plane. At the southern end of the workings the eastern portion has been downthrown about 12 feet, but north along the fault this throw decreases to zero. The largest amount of workings are situated on the northern part of the lode east of the fault. The lode is here reported to be one foot wide and to be a quartz-wolfram lode with a little tourmaline, and to be still going underfoot in the workings. Eight tons of wolfram were obtained by Mr. Hayes in recent years. As in the above cases future successful exploitation depends upon the finding of shoots of ore in the lode. To the north this lode continues into the 1 acre lease (4762/M) of J. Egan.

Section 6061/M, 5 acres, E. Hayes

At the south-west corner a lode passes into this section from section 4762/M. This lode has a northerly bearing and has been opened up along practically the whole of its length adjacent to the western boundary of the section. It is stated that the lode had a width ranging up to 18 inches, and while poor at the outcrop, it was richer at shallow depths. The lode was a quartz-wolfram lode and contained a small amount of cassiterite. To the north this lode should either intersect or continue as the lode (Tunnel) on section 9170. In view of the different bearings and difference in metallic contents the former explanation may be the more likely. This lode has been exposed over a greater length than any other, except perhaps that on section 3927/M and so seems to be worthy of further prospecting. The successful exploration depends upon locating payable shoots of ore along this length. On the northern half of this section extensive sluicing operations have been carried out along the course of an unnamed creek and a considerable distance up the southern bank thereof. Besides the detrital material several narrow gutters ran westerly through this ground. In the western portion of this sluiced area, the material on the bottom contained mixed cassiterite and wolfram while the upper layers are stated to have contained only cassiterite. The wolfram and probably some of the tin

ore has been shed from any northerly continuation of the lodes on sections 4709/M (western part) and 4762/M. Tin ore is being won from the material as far up stream as the workings have progressed. This ore has undoubtedly been shed from lodes (not necessarily large) occurring in the hills to the east of the workings. An irregular system of quartz-wolfram veins occur in the eastern part of the sluiced ground. They have no definite strike except such as to indicate a general northerly bearing and dip to the east or south. The widths are also irregular and as so far exposed the veins have no commercial importance. The tunnel lode at the re-entrant angle on 9170/M will extend at shallow depth into section 6061/M. It should be easily located near the north-western corner of this latter section and opened up to shallow depths by an adit from the northern bank of the unnamed creek in that vicinity.

Section 4762/M, 1 acre, J.F. Egan

This section is situated between 6061/M on the north and 4709/M on the south side. The lode in the north-western corner of 4709/M continues into this section and has been opened up at numerous places along its outcrop until eventually it decreases to 2 inches in width. Another parallel lode occurs 20 to 30 feet to the east of the above. It has been opened up by shallow workings along its outcrop. It is stated that the width was 4 inches at the surface, but increased at depth. The lode is of the quartz-wolfram type and enclosed in soft granite walls. The southern continuation of the lode in the western part of 6061/M extends a short distance into this section. The southern end is marked by a fault crossing the lode at an acute angle. This fault may be the northern continuation of that present in the north-western corner of 4709/M.

Section 4547/M, 5 acres.

This section embraces practically all the workings known as the Tungsten Mine. It is situated on the south side of Gipps Creek along the easterly flowing stretch south of the junction of this creek with Cradle Creek. The section is occupied by granite. Between 1899 and 1902 this mine was operated by the Ben Lomond Tungsten Mining Co. N.L., but the amount of work carried out was not great. Waller in 1901 reported on the property as follows "No. 1 vein, on which most of the work has been done, is from 18 inches to two feet in thickness, and consists of quartz, tourmaline, tungsten, and very small quantities of tin and galena. It is very flat dipping not more than 20 degrees to the south, while the strike is about east and west. No. 2 vein is parallel to No. 1 and perhaps 20 feet below it vertically. It is apparently of exactly the same nature and about the same size. No. 1 vein has been opened up along its outcrop for a distance of a couple of hundred feet, and the stone taken out until the overburden increased to 8 or 10 feet. In the eastern end of the workings a tunnel has been driven along the vein for a distance of 30 feet, and a portion of the vein has been stoped out. Some of the above lying at grass is very rich in wolfram, and all of it contains a little. The vein will probably prove to be patchy, but judging by the work done, the patches are fairly close together. Mr. T. Briggs, the late mine manager, tells me that 16 tons of wolfram ore were obtained, assaying 68 to 70% of tungstic acid"

After the above company ceased to exist, the leases were taken up by Mr. Briggs, the former manager, and a considerable amount of work was carried out. At least three other adits were driven in the lode from the slope to

Gipps Creek and the greater part of the ore stoped to between them. These are probably on the No. 1 vein referred to by Waller. The methods of removing the wolfram from the quartz are not known, but were probably somewhat crude. Judging by the immense amount of quartz about and the manner in which it occurs it would appear that the old dumps and tailings were gone over and perhaps sluiced at least once. The lode appears to have a general northerly strike and a flat dip to the east which directions are different to those reported by Waller. The average width would appear to be 18 inches. Wolfram and tourmaline are practically the only minerals associated with the quartz. It is stated that at the south end of the workings that a "slide" was met with and that the lode could not be traced further south. A shaft was sunk from a point several chains to the south-west of the most western part of the workings to a depth of 30 or 40 feet but did not cut the lode. The location of the shaft suggests that the downthrow of the fault was to the south, but it is difficult to see why the shaft should have been sunk so far from the last known outcrop of the lode. The northern end of the lode was also intersected by a fault. This fault is located just outside the entrance to the adits and the lode was downthrown to the north about 20 or 30 feet. The faulted portion of the lode however had only a slight extent due to its location on the steep fall of the hill. In the present state of the workings and the numerous dumps on the property it is difficult to locate the No. 2 vein referred to by Waller, and it seems probable that this faulted portion of No. 1 vein may represent such vein, the fault not being known to exist at that time. It was stated that the lode was still going underfoot, but this could not be verified. Judging by the amount of quartz on the dumps, a considerable amount of ore must have been stoped and a corresponding quantity of wolfram obtained. No records are available as to the total production. Any extensive mining operations would have to be conducted by means of a shaft and it is probable that more consistent and greater values would have to be found in this portion of the lode to make such operations probable.

Section 9436/M. J.F. Reynolds

This section is situated in the flat bed of Cradle Creek and immediately to the west thereof. The alluvial material occupying the bed has been almost entirely removed, exposing the soft granite bottom beneath. Several greisen veins or lodes have been thus exposed. The most important one crosses the north-western part of the lease. It has a bearing of 40 degrees and dips to the south-east. The outcrop at the north eastern end is not on the above lease but on 3927/M to the north. The outcrop has been trenched along for several yards and a shaft sunk to 6 feet at the north-eastern end. The lode is said to be 15 inches wide at the bottom. To the south east a shaft has been sunk to a depth of 20 feet to cut the lode at depth. It is stated that 6 to 7 feet of lode was struck and not entirely passed through. Both the shafts were full of water and could not be inspected. The ore consists of quartz, mica and tourmaline with dark brown cassiterite and, in one spot only, a small amount of wolfram. The lode is last exposed as a result of sluicing near the south west corner of the lease. Though the faces of ore could not be inspected, it would appear that, if it is as stated, further work should be carried out at depth and also along the strike of the lode. Though the mica portion of the ore is soft and might be sluiced near the surface the proposition must be regarded as a lode mining one and

other ore would have to be crushed and treated. The enclosing granite is soft and this would persist to at least shallow depth and so would favour the prospecting and development work in the shallow parts of the lode. Another lode occurs to the north west of the above and just off the section. It has a bearing east of north and though vertical at the surface, it is stated that it dips to the east at depth. The lode is a greisen one composed of quartz and mica and containing cassiterite. The width is stated to be 12 inches. If this continues to the south, it should junction with the above lode. Another lode occurs to the south of the first described lode. It has a northerly strike and a flat dip to the east. The lode is rather irregular, but the crushed ore gives good prospects of cassiterite. To the north, this lode should junction with the one first described.

Section 3927/M, 20 acres, J.F. Reynolds.

This section is situated along Cradle Creek immediately above its junction with Gipps Creek. The country included in it consists mainly of granite generally in a soft, weathered condition. Small outcrops of shale probably of the Permo-Carboniferous System occur in the valley of Cradle Creek. This section embraces a portion of the alluvial ground along Cradle Creek which at different times was worked by the Clunes Co. and later the Gipps Creek Co. and others. In addition to the alluvial, the detrital material on the eastern side of the creek has been sluiced for distances of several chains from the creek. Generally it was found that the payable material extended as far as a lode which has a direction parallel to the creek. This lode has been traced to the north almost as far as the northern boundary of the section. Where it appears to terminate against a 6 inch vein of fine grained quartz (the local "crockery stone") bearing 325 degrees. The lode has a general bearing of 340 degrees and becomes more prominent near the south-east corner of the section. At this point it strikes at 340 degrees and has a low dip to the east. The width is irregular and ranges up to 6 feet, the enclosing country being soft weathered granite. The lode consists of quartz and mica greisen with tourmaline and cassiterite. The cassiterite shed from it has been the most important contributing factor to the alluvial ground along Cradle Creek. A small amount of the lode material has also been broken for its cassiterite content. This lode is approximately on the northern extension of the Tunnel lode to be described below. Though the two may be situated along the same lode channel they are different in nature, one being a greisen and the other a quartz lode.

Section 9170/M, 5 acres, J.F. Reynolds

This section is situated on the east bank of Gipps Creek south of its junction with Cradle Creek. It is occupied by soft granite. Near the re-entrant angle on the southern boundary a tunnel has been recently driven at a bearing of 40 degrees. At 40 feet from the entrance a lode with a low easterly dip was intersected. The lode is 4 to 5 feet wide and generally contains three independent veins of quartz separated by granite. The upper vein is 20 to 24 inches wide, the middle vein 6 to 12 inches and the lower vein 9 to 12 inches wide. The veins consist of white reef quartz containing cassiterite, wolfram and chalcopyrite, cassiterite being predominant over the wolfram and forming the commercially important mineral in the lode. A short drive has been driven to the south east, another 20 feet in length to the north and a winze sunk 20

feet on the underlay at points between 40 to 50 feet from the entrance to the adit. The lode is visible at the face of the northern drive. It is stated that the lode was still persisting in the bottom of the winze, but as the latter was full of water, this statement could not be verified. The metallic values are distributed through the quartz in a most irregular manner so that ordinary sampling loses much of its value. The alternatives are to take a very large number of samples or better still to take out a large consignment of ore and have the metallic contents extracted. In the following assays Sample 2 represents 2 feet of the top vein, 6 inches of granite and 10 inches of the middle vein, while Sample 3 represents the bottom vein.

	Tin %	Copper %	Tungstic Acid %
Sample 2	0.18	0.13	Nil
Sample 3	0.55	0.05	Trace

As stated above these do not represent the true value of the lode, but serve to indicate rather that the tin content is considerable and of the order of magnitude of payable ore. From the appearance of the lode in the adit and the appreciable tin contents of it, further prospecting to determine its extent and value is warranted. The adit was continued some distance further on a more easterly bearing and another lode was cut in the face. This lode is not fully exposed as ore appears to extend into the back of the adit. The part exposed consists of a lower vein of 9 to 12 inches separated by several inches of granite from a 6 to 9 inch vein of quartz. This lode is parallel and overlying the first lode intersected. It is that it was worked at the outcrop and the ore was carted to the Ben Lomond Battery for crushing. A sample at the face yielded on assay at the Mines Department Laboratory, Launceston, the following results: Tin 0.07%, copper 0.05% and tungstic acid nil. Judging by this sample the ore has no commercial value, but as stated above the metallic content is erratically distributed throughout these quartz lodes.

Section 9024/M 20 acres J. F. Reynolds.

This section is situated along and to the west of Gipps Creek to the south of 9170/M. It is occupied by granite except in the south-western corner where pebbly shales of the Permo-Carboniferous System have been exposed by sluicing. These shales strike West of North and dip vertically. The junction with the granite is a vertical one and represents a fault with a considerable downthrow to the west. On the western fall of the ridge between Gipps Creek and Dillon Bottom, several trenches have been cut. In the most northern a three-foot formation with veins of reef quartz containing cassiterite has been exposed. The formation is rather irregular, but appears to dip to the east, and is cut off by a vein of white fine grained quartz "Crockery stone". Half a chain to the south another trench has exposed a small amount of quartz-mica greisen. The alluvial material along Dillon Bottom has been sluiced upstream for a distance of 5 or 6 chain from the south boundary of the section and a width ranging from 30 to 50 feet. This material consists of 2 to 4 feet of material with the following general section - Sandy soil - Angular quartz wash - Clay - Wash with worn pebbles.

The clay does not persist throughout the deposit being absent in some places. The bottom is granite at the southern end and shales at the northern end of the workings.

It is stated that 3 tons of tin ore has been obtained as a result of the above sluicing. It is evident from the occurrence that the tin ore must have been shed from the granite area to the north and east of Dillon Bottom. This does not necessary imply that important tin lodes will be found as the cassiterite could be derived from a number of lodes similar to those already located on the ridge.

CONCLUSIONS.

It has been seen that there exists in this district a zone containing numerous quartz lodes with cassiterite and wolfram as economically important minerals. The lodes range up to several feet in width and up to 7 or 8 chains in length. The metallic values are erratically distributed throughout the lodes. In the past the lodes have been worked on the surface and to shallow depths by adits. In this way the easily accessible shoots of ore have been mined, treated, and disposed of, and working then abandoned. At present the price of wolfram is low and there is little encouragement to develop the lodes containing this mineral. The price of tin however is high and those lodes containing cassiterite are beginning to receive attention. In both cases, future workings mean that the lodes will have to be followed in length and depth in order to locate the payable shoots of ore.

P.B. Nye

GOVERNMENT GEOLOGIST

Hobart,
5/8/26.