REPORT ON THE MINERAL DISTRICT BETWEEN CORINNA AND WARATAH.

Mines Office, Launceston, July 25th, 1897.

SIR,

I HAVE the honour to present the following preliminary Report of an examination of the mineral district between Corinna and Waratah. The time at my disposal was much too short to allow of anything but a very hurried examination of such an extensive belt of country, and, as in a great many cases no work was going on, and most of the shafts were full of water, it was quite impossible to form a correct estimate of the prospective values of the different properties; this Report will therefore only deal with the district in a cursory way, and I hope to be able to make a more extended examination at some future date.

All the hydraulic sluicing companies formed to work the extensive deposits of auriferous gravel in the neighbourhood of Corinna have ceased sluicing operations, and I did not examine any of these properties. A good deal of money has been spent in constructing water-races, &c., and as far I could judge in passing, a fair trial of the wash appears to have been made, but the results were very disappointing. At several of these claims one or two men are utilising the water brought in by the companies, but I could not hear of any of them getting much gold.

Arriving at Corinna on the evening of the 19th of May, I went next morning to see the Savage River mine, which is best reached by going down the Pieman by boat for about two miles and thence by track some two miles inland. The Savage River Company was originally formed as a hydraulic sluicing company to work some of the alluvial terraces of the Savage River, but their operations were not successful, and attention is now being directed to underground prospecting. Two tunnels have been driven in a W.N.W direction. The lower one, at an elevation of about 150 feet above sea level, is over 300 feet long; it passes through some feet of gravel into soft decomposed slates. Two small veins carrying oxides of iron and manganese were cut, which might contain silver and copper, but I do not know if they have been tried. On the hill above the tunnel there are some large boulders of gossan, but nothing corresponding to these was met with in the tunnel, and it seems probable that they have come from some formation higher up the hill. No. 2 tunnel, 85 feet above No. 1, is 45 feet long, the country being similar to No. 1, with bands of quartzite. Native copper is said to have been found in the joints of the country in this tunnel, but I could not see any. Several small shafts have been sunk through the gravel up to 20 feet in depth, but I have no information as to the quality of the "wash." The prospects of this mine, as far as I could see, are not very encouraging, though it is quite possible that there may be other surface indications which I did not see.

Lucy Spur.—From the Nancy Landing, some four miles above Corinna, a track leads to the Lucy Spur, passing by the old Frenchman's Peak Hydraulic Company's workings.

The Lucy Spur Company spent a large sum in bringing in a water-race fifteen miles long from the Rocky River, and a good deal of sluicing was done. Some rich patches of gravel were found, but were of very limited extent, and the bulk of the wash did not prove payable. The company has a couple of men working in the southern portion of the property, about S.S.E. from the old workings, and they are at present driving a small prospecting tunnel through soft sandstone striking north and south, and underlaying to the east. Eighty feet above this another tunnel has been driven 115 ft., in which several veins of rubbly quartz, containing copper pyrites and red and brown oxides of iron, were cut, which give very fair prospects of fine gold. These quartz veins occur in what is probably the capping of a quartz porphyry dyke, containing gold more or less through its entire width of about 38 ft., but not in payable quantities. These workings are on the eastern side of the ridge which runs through the property a little to the west of north. Good gold has been obtained from the creek on the eastern side, and from another creek running to the west good gold is said to have been obtained up to where it cuts through the spur, to the north of the present workings. The lower tunnel is about 220 ft. below the Lucy Spur water-race, which is said to contain from 35 to 40 sluice-heads, so that ample power for crushing purposes would be available if payable gold were struck.

From the Lucy Spur it is about six miles to the Rocky River, which is crossed a short distance above its junction with the Whyte River. The largest gold nuggets yet found in Tasmania—one weighing 243 ounces—were obtained in the bed of the Rocky River a short distance above the junction, and good gold has also been obtained from the Whyte River. A little above the junction the latter makes two sharp bends, forming a loop, and a scheme was mooted some years ago to drive a tunnel through the narrow ridge known as the "razor-back," and thus lay bare the bed of the river for about three-quarters of a mile, but nothing came of it.

The Rocky River Gold Mining Company.—Hold Sections 34-94, 35-94, 36-94, of 10 acres and Section 61-95 of 9 acres, situated between the Whyte and Rocky Rivers. The principal workings are about a quarter of a mile above the suspension bridge over the Whyte River, which here runs nearly west. No. 1 tunnel, between 140 and 150 feet above the river, was driven 340 feet, bearing south 35° east, and at 108 feet a cross-cut was put in over a hundred feet to the west without cutting anything of any value. From the end of the tunnel a cross-cut was driven to the east, and at 45 feet No. 1 lode was cut, striking a little west of north; this was driven on 30 feet south and 8 feet north, the lode in the south end being about 3 feet wide, consisting chiefly of magnetite and iron pyrites; in the north end the lode is broken and poor. At 90 feet from the flat sheet No. 2 lode was cut and driven on 4 feet north and 86 feet south, the ore in the north end being about 18 inches, and in the south end 3 feet wide, very similar to No. 1 lode. The cross-cut was continued to 360 feet without cutting any further ore bodies. The main country rock consists of hornblende, talcose, and other crystalline schists striking nearly north and south and dipping at high angles to the east, but in the cross-cut to the east of the lodes a hard belt of hornblende gneiss was cut.

No. 2 tunnel, about 120 feet below No. 1, is 228 feet long, with several bends. At 105 feet a small formation was cut, which on driving south opened out considerably, and is probably identical with No. 1 lode cut in the upper tunnel. As is usual with deposits of this kind, the ore appears to occur in lenticular masses. At 210 feet it had widened to about 8 feet, and at the time of my visit a winze was being sunk, but was only a few feet below the floor of the tunnel. The ore is very similar to what is seen in the upper tunnel, but contains more copper pyrites, and black oxide of copper is also said to have been found. In places there is a great deal of calcite disseminated through the ore, and veins of calcite carrying bunches of clean copper pyrites are occasionally met with. In the face, as I saw it 264 feet from the flat sheet, there was about 6 inches of calcite and pyrites on the footwall and on the hanging-wall, the dark green schist was strongly impregnated with iron pyrites in elongated particles with polished surfaces, pointing to great pressure and shearing action since they were deposited. One sample from this tunnel is said to have yielded 1 oz. 15 dwts. gold per ton, 7 ozs. silver, and 5 per cent. copper, and a sample of 56 lbs. to have yielded at the rate of 18 dwts. gold per ton, but, to arrive at any estimate of the value of the property, systematic sampling and assaying is absolutely necessary. It is probable that rich secondary bunches of ore may be met with, but the success of the mine must depend on the value of the bulk of the ore.

On the top of the ridge, 370 feet above the river, is a strong outcrop of magnetic iron. On the southern slope, 100 feet below the outcrop, a tunnel has been driven 102 feet in an easterly direction, the last 18 feet being through a gossan formation containing brown hematite, magnetite, and a little oxide of copper. This has a promising appearance, and could be easily prospected by a tunnel at a deeper level towards the Rocky River.

At present it costs five pounds (£5) per ton to pack ore from the mine to Corinna, but it should be done for very much less, although the first part of the track is certainly very steep, and in a terrible state. I hear that steps are about to be taken to construct a tramway down the Whyte River to some convenient point on the Pieman. This is the natural outlet for the district, and it is a great pity that the entrance to the river is such a dangerous one. It is a splendid river, and once over the bar there is deep water for some miles beyond Corinna. Before constructing the tramway it would be advisable to send away a parcel of ten to twenty tons, to find out what the ore already exposed is likely to realise in bulk.

To the north east of the Rocky River Company's workings on Section 47-95, known as Hacket's Section, a formation has been cut carrying iron pyrites and a little copper pyrites associated with magnetite, hematite, quartz asbestos in hornblende schist. A shaft about 10 feet deep has been sunk on the formation, which is about 4 feet wide at the top and about 2 feet in the bottom. A prospecting tunnel is being driven to intersect it at a depth of about 40 feet, and at the time of my visit the schist in the end was impregnated with pyrites, and a few feet more driving should prove what the lode is like at this level. From the mouth of the tunnel the ground falls rapidly to the Whyte River, offering splendid facilities for testing at a lower level should the prospects revealed by the present tunnel warrant it.

From the suspension bridge over the Whyte River the track is very rough and steep to the junction with the Corinna Road on Brown's Plains, the rise being about 750 feet in a mile and a half. Between the eight and the nine mile pegs from Corinna the ironstone formation is seen outcropping on the road, and on Section 886-93M some work was done several years ago by the South Savage River Company. Several trenches have been cut, exposing a strong formation consisting chiefly of magnetic and other oxides of iron, the country being metamorphic crystalline schists similar to those at the Rocky River. A shaft, now full of water, was sunk 60 feet, the ore at surface consisting of magnetite with a good deal of pyrites, talc, and asbestos, but I have no information as to assay values. The country is here covered with bauera and horizontal scrub, and a good deal of time was lost in unsuccessfully looking for another large pyrites formation said to have been cut lower down the creek.

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To the east of the South Savage are situated two sections, 1077-93M and 1078-93M, in the names of Heaps and Simson. What is known as the Nine Mile Creek runs through the sections, and in working up the bed of this for gold a formation carrying copper pyrites was cut. A shaft was started close by the bed of the creek, but after sinking 30 feet the water became too strong. This shaft had been baled to a depth of about 16 feet from the surface at the time of my visit, and an examination of it showed a quartz formation about 3 feet wide carrying a little copper pyrites and carbonate of iron at the top, while just above the level of the water there is about 18 inches of fairly solid copper pyrites, samples from which are said to have given 28 per cent. copper, 8 dwts. gold, and 10 ozs. silver per ton. The course of the lode is apparently N. 20° W., the underlay at the top being to the west, but in the bottom it is said to be to the east towards the creek. Lower down the creek another shaft was sunk and a crosscut started for the lode, but work was suspended before the lode was cut. No work was being done on this property, but the prospects are such as to deserve further attention. An effort should be made to trace the course of the lode by trenching: if, as seems probable, it is running parallel to the creek, water will prove very troublesome, and as the hills on either side are very steep it will be difficult to divert the course of the creek. The rise from the shaft to the Corinna Road is 660 feet in about a mile. From this point the road was followed to the 16 mile-peg on Long Plains, and in about a mile from the turn-off Weetman and Crockford's was reached. The two sections formerly held by this company, 2–85 and 3–85, of 15 acres each, held in the name of H. H. Gill, were originally granted as reward claims for gold. The spur on which the workings are situated runs about N. 10° E., and is covered with quartz gravel of varying depths, from which altogether about 500 ozs. of coarse crystalline gold have been obtained. On the west side of the ridge three tunnels were driven and connected by winzes on a very flat quartz vein 6 to 12 inches wide crossing the country and running approximately east and west. In the rise from No. 2 to No. 1 tunnel some very rich patches are said to have been obtained, and a little underhand stoping was done below No. 2 level, but I could not ascertain how much gold had been obtained. In No. 3 tunnel the rich shoot was also cut, and a winze sunk on it, (now full of water). The country rocks are metamorphic schists and slates, striking about north and south, and in No. 2 tunnel several small quartz veins have been cut running parallel with the country, and a good deal of driving has been done, but so far as I could learn very little gold had been found. It is very unlikely that the rich shoot referred to above on the cross vein is the only one it contains, and it is hard to understand why more prospecting has not been done on this.

On the east side of the hill Messrs. Batty and M'Grath have cut a deep trench about 90 feet long, and from the end a small drive has been put in north and south. The country is much broken, and traversed by small quartz stringers carrying a little gold.

All the creeks in the vicinity of Long Plains carry more or less gold. It is very difficult to obtain accurate information as to the amount that has been actually obtained, but I have been informed on good authority that between twenty and thirty thousand ounces have been obtained from Main Creek and its affluents,—Grey's, Riley's, Big and Little Duffer. Big and Little Smith's and Townsend's Creeks, and there are still a few men fossicking. In Big Duffer Creek, about 200 yards above its junction with Little Duffer Creek, on Section 113-95, in the name of Shore & Sykes, a formation has been cut showing copper pyrites, zinc blende, and quartz, but no work has been done on it beyond putting in a shot in the capping. Its apparent strike is a little east of north, underlaying to the east. To the north of Weetman and Crockford's, in Riley's Creek, a quartz formation about 10 feet wide, carrying a good deal of iron pyrites, has been cut, which seems well worth further prospecting. A good many sections have been pegged for gold in this locality, but the only mining work that I saw was on what was formerly, I believe, known as the Stanley Company's property, Sections 56-94 and 104-95. A prospecting tunnel has been driven about 300 feet, and several small veins of quartz, with oxides of iron and manganese, have been cut, which look rather promising, but no driving has been done on them, and I do not know if they contain anything of value.

After crossing Main Creek the track rises to what is known as O'Brien's Terrace, where deep gold-bearing wash has been found at an elevation of about 1150 feet above sea level. Several shafts have been sunk, one of which is said to be 80 feet deep, and the bottom was not reached. Good prospects were, I believe, obtained from the wash, but the difficulty of obtaining a supply of water for sluicing prevented much work being done.

From here the Badger Plains track was followed to the Clarendon, Section 792-93M, 80 acres. On this section a tunnel was driven 400 feet in an easterly direction, but at the time of my visit this was blocked about 200 feet from the entrance, the ground having come away from the back. The first 50 feet are through soft decomposed whitish schist, succeeded by dark green actinolite schist impregnated with pyrites, with occasional bunches of magnetite, and showing in places stains of carbonate of copper. A belt of serpentine rock with veins of asbestos was also passed through, but I was unable to determine its relation to the crystalline schists. The ore at the mouth of the tunnel is principally magnetite and pyrites. Some high assays for gold are said to have been obtained from here, and the property deserves further attention.

The Rio Tinto Mining Company's property lies to the north-east of the Clarendon. and comprises in all 330 acres, included in sections 177, 178, 179, 180, 268 and 274-93M. No work was being done at the time of my visit, but Mr. Thorne, the mine manager, kindly showed me over the old workings. Two formations have been discovered on the property, the westerly one, known as No. 1 lode, being probably a continuation of that cut in the Clarendon, the outcrop of magnetic iron being traceable nearly all the way, and for some miles further to the north-east.

The Savage River cuts through the formations, and on No. 1 lode two tunnels have been driven on the north side of the river, and one on the south. Nos. 1 and 2 tunnels are situated close together, about quarter of a mile below the bridge on the old Specimen Reef track across the Savage River. By the bridge there is a belt of magnesian limestone or dolomite, which is succeeded by a fine-grained greenstone with minute granules of pyrites and magnetite disseminated through it, which is doubtfully classed as diorite. This continues as far as No. 2 tunnel, which has been driven 114 ft. about N.E., and from the end a crosscut put in 40 ft. to the N.W. The main mass appears to be magnetite and cupriferous pyrites with occasional veins of asbestos, but there is no defined boundary between the ore and the country rock. In places where water is oozing out, the walls of the drive are stained with incrustations of sulphate and carbonate of copper. No. 1 tunnel, a little to the west of No. 2, has a total length of 184 ft. through similar matter to No. 2. These tunnels were driven by the old Huzza Company, and were probably considered to be on the walls of the lode, as the greenstone again appears to the west of No. 1. A cut has, however, been taken along the hill and two more ore bodies cut, separated by a narrow belt of greenstone. The more westerly one shows about 50 ft. of magnetite and pyrites, the latter occurring mixed with the magnetite and also in veins. To the north the hill rises abruptly, and should the ore prove payable in bulk an immense quantity would be available, but systematic assaying is absolutely necessary to form any adequate idea of its value. On the south side of the river, a little to the west of Nos. 1 and 2 tunnels, is No. 3, which was driven 178 ft. bearing about S.W., the ore being similar to that on the other side, but its width is unknown. No. 4 tunnel was driven by the present company from a point on Hall's Creek about half a mile above its junction with the Savage River. It is driven across the country, bearing a little S. of E., and is in 172 ft. Ore was first met with at 147 ft., and a few feet further ahead is a small vein of copper pyrites. From here to the face the country, consisting chiefly of actinolite schist, is much disturbed with magnetite and pyrites disseminated through it. The main mass of the deposit is probably not far ahead, and it would be advisable to continue this cross-cut right across the formation, taking samples for assay every few feet. In this way a fair idea could be formed of the average value of the ore. The means of access to this property are very poor, but there are exceptionally good natural facilities for cheap working, and if it could be proved that the ore would yield a small profit per ton by being treated on the spot, there would be a great future before the district. Immense deposits of magnetite are of frequent occurrence in the crystalline schists in other parts of the world, especially in Norway and Sweden and the United States, but their origin, and indeed the origin of the crystalline schists themselves, is a much disputed point.

No. 2 lode lies some distance to the east of No. 1, and has a strong outcrop of red and brown oxides of iron. A tunnel has been driven 386 feet in a S.W. direction along its course. At 177 feet a winze was sunk about 17 feet through gossan, and a cross-cut to the west at this point shows the lode to be about 17 feet wide containing promising looking gossan with a little native copper and black and red oxides of copper showing in some of the vughs. A rise was also put up 80 feet, and at 50 feet up a cross-cut was driven through oxidised lode-matter similar to that seen in the level. At 266 feet there is apparently a fault in the lode, and the slide has been followed for some distance, but only small veins of carbonate of iron were met with. This lode seems worth further prospecting.

North of the Rio Tinto blocks are two sections in the name of W. W. Stewart, on which no work has been done so far as I know. The outcrop here forms the crest of the ridge, the highest point of which, close to the boundary between Stewart's and Thorne's section, is about 750 feet above the bridge over the Savage River. The ground here falls very rapidly to the west towards Hall's Creek, and offers splendid facilities for cross-cutting at low levels. Further north on Section 650-93M, in the name of J. H. Thorne, a tunnel has been driven from the west side of the ridge in a direction a little S. of E. for a distance of 220 feet. Two large gossan formations were cut, separted by a belt of soft decomposed schists. Twenty-three feet from the end native copper was met with through the country and eight feet further is a vugh showing native copper and specular iron. The last ten feet consist chiefly of magnetite specular iron and pyrites, and the indications warrant further prospecting being done.

Some distance further north the outcrop is overlain by basalt. The general strike of the formation is apparently a little east of north. All along the line the local attraction is so great that the magnetic compass is not of much use, and in connection with this I would strongly urge that in every mining district the true meridian be ascertained and laid down with permanent marks. At present all the mining surveys start with a magnetic bearing, and this often leads to considerable errors.

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Specimen Reef, Hall's Creek.—A good deal of work was done here some years ago, including the bringing in of a water race about four miles long, and the erection of a six-head battery driven by a water-wheel. Three tunnels have been put in, and altogether over 2000 feet of driving has been done. No. 1 tunnel, bearing N. 30 E., was driven along the reef for about 300 feet and connected with the surface by several rises. At about 80 feet from the entrance a winze was sunk on the reef which underlays rather flat to the S.E., to connect with the No. 2 level 100 feet below, and at 60 feet down an opening was made in either end and short drives put in north and south. The north end shows about a foot of dark carbonate of iron, which is said to be the matrix in which the best gold occurs here. The drive south shows only traces of the lode, with blue pug on the footwall. Above the tunnel for some distance beyond the winze the ground has been stoped to the surface, which is here only 25 to 30 feet above, and some rich patches of gold were obtained. No. 2 tunnel has a total length of about 1000 feet, including 300 feet from the entrance to the lode. Just beyond where the lode was struck the ground had come away from the back and blocked the drive.

In No. 3 tunnel, which is about 100 feet below No. 2, the lode was cut at about 500 feet, and has been followed 200 feet to the north. When I saw it the lode was about 3 feet wide, rather broken with bunches of quartz and a little carbonate of iron. The intention is to drive under what is known as White's winze from No. 2 level, some 400 feet ahead of the present face, where a very rich shoot of stone is said to have gone down under foot, but could not be followed on account of water. Another good shoot may be cut at any time, and the present proprietors certainly deserve success for their pluck in doing so much dead work in face of great difficulties. Another formation carrying quartz and carbonate of iron was cut in the main tunnel about 60 feet beyond the present drive, but no work has been done on it. The gold found in this mine is said to be generally covered with oxides of iron and manganese occurring in black lumps locally termed "clinkers." Simple battery treatment would probably result in a big loss, and grinding and pan-amalgamation would be necessary. In places there is a good deal of pyrites which is also said to assay well for gold, and to save this considerable additions and repairs will have to be made to the battery, but very little can be done in this way until better means of access are provided.

HEAZLEWOOD AND WHYTE RIVER DISTRICTS.

The greater portion of the rocks of these fields consists of igneous rocks of very varying composition and structure, ranging from acidic through basic to ultra-basic. In the western portion of the field they are generally coarsely crystalline, but to the east are fine-grained to compact, and throughout the field have been more or less chemically altered to serpentine.

Messrs. Twelvetrees and Petterd have recently made an extended microscopical examination of some of the rocks from this neighbourhood, and have identified the following varieties:—Hornblende-granitite, Porphyritic diabase, Augite syenite, Gabbro of several types, and several varieties of the Pyoxenite and Peridotite families. These rocks are probably of several different ages, but prolonged examination in the field and careful microscopical and chemical examination would be necessary to determine their relations to one another and the sedimentary rocks, through which they have intruded in numerous dykes and bosses. The sedimentary strata, consisting of limestones, sandstones, and slates of silurian age, are best seen to the west of the Godkin line of lode, narrowing going north and cutting out altogether on the other side of the Heazlewood River, but widening to the south. Narrow belts are also seen further east separated by igneous dykes, the slates near the contact being frequently porcellanised and altered to hornstone.

The main line of contact on the west crosses the Waratah-Corinna track, near the 18-mile peg from Waratah, and the slate country to the west of this should be well prospected, being very favourable for the occurrence of lodes.

The only work that was going on in the Heazlewood District at the time of my visit was on Section 1758–91M, 80 acres, owned by the Lord Brassey Nickel Company, situated on a high hill to the north of the Heazlewood Bridge. Several small veins containing nickel ores have been found on this and the adjoining section to the south.

A shaft, now full of water, was sunk at the top of the hill on an E. and W. vein, and some good ore was obtained. The nickel is chiefly in the form of sulphide of nickel and iron, and I have been unable to detect any trace of arsenic in it with the blowpipe. It is of a light bronze colour, and in powdered form is attracted by the magnet, resembling pyrrhotite, but clean samples are said to have assayed as high as 40 % nickel. Mr. Petterd informs me that he has submitted samples to the well known mineralogist, Professor Dana, of the United States, who has pronounced it to be a new mineral, and the name "Heazlewoodite" has been proposed for it. So far as could be seen, it is always associated with the green hydrous carbonate of nickel zaratite.

The serpentine in which the veins occur is traversed in all directions by slickensided planes, probably due to differential movements within the mass. These are sometimes coated with a thin film of zaratite, and have led to a lot of useless work being done. A tunnel started presumably to

cut the vein on which the shaft was sunk has a very tortuous course of 265 ft., having followed these "greasy heads," and has gone right away from the supposed course of ore. A deviation has, however, been made, and the tunnel is being taken in straight, but had not reached the vein when I was there.

On the adjoining section to the south, 102-93M, 52 acres, known as Roy's Luck, a shaft was sunk 20 feet on a vein running about N.W., and there is said to be 6 to 9 inches of solid sulphide ore in the bottom, but as the shaft was full of water I could not examine it. A tunnel has been driven in an easterly direction along the northern boundary of the section to intersect this vein, and is in 120 feet, but has not yet reached it. This work is temporarily suspended, but should be pushed ahead in view of the prospects obtained at the bottom of the shaft. The veins cut on the surface vary in strike from W. to N.W., and it is probable that at the points of intersection good bunches of ore may be met.

Several other sections have been taken up in this vicinity, but no work has been done on them.

The weathering of the Serpentine forms very little soil, and the hill is bare of trees, so that timber for mining purposes is difficult to obtain.

On an uncharted section about a mile and a half S.W. from the Heazlewood Bridge several trenches have been cut across a quartz formation, carrying in places a little copper pyrites. In one of these trenches there is about six feet of broken quartz, but I could see no ore in it, though some of the stones at the side of the trench show a little copper pyrites. Further to the south a shaft, now full of water, was sunk about 20 feet, and I was informed that three tons of ore, assaying 23 per cent. copper, had been sent away; but I could get no information as to the size of the lode at the bottom, or the silver and gold contents of the ore sent away, and can therefore form no opinion of its value.

Heazlewood Mine.—This property consists of two 80-acre sections, 1309-87M and 1310-87M. I was only able to make a hurried examination of the workings, which have been abandoned for some time. On section 1309 a main shaft was sunk 160 feet, and equipped with a small winding-plant. An adit level, about 390 feet long, driven along the lode from the eastern side of the hill, connects with the shaft 60 feet below the surface. The lode here stands almost vertical, striking about N.N.W. Above this level it has been stoped to the surface, and was I believe in places up to 14 feet wide, mostly filled with fragments of the enclosing serpentine country rock, calcite, with small veins and bunches of galena and zinc blende; and I am informed that 230 tons of ore, averaging 56 per cent. lead and 88 oz. silver per ton, were sent away from here. In one place, near the shaft, I noticed a nice vein of galena about six inches wide going down underfoot; but below this level the shaft is full of water, and I could not learn what the lode was like at the bottom.

On the western side of the hill a tunnel has been driven about 400 feet towards the main shaft, and at 220 feet connected with the surface by an air shaft 70 feet deep. Two short cross-cuts were also driven from the main tunnel, but I could see no sign of any lode formation.

On the southern block, Section 1310-87M, several parallel lodes have been cut and three tunnels were driven, aggregating, including cross-cuts, about 1400 feet. The lowest tunnel is about 330 feet below the brace of the main shaft, and is said to be 475 feet long with a cross-cut of 136 feet, but the entrance was blocked. 50 feet above this, higher up the creek, is another tunnel 375 feet long connected with the surface by a cross tunnel. The bulk of the lode-filling appears to have been shattered country rock containing small veins of galena associated with blende, pyrites, quartz, and calcite.

Further up the creek is a third tunnel, 387 feet long, from which better prospects are said to have been obtained, but this I unfortunately missed.

From the main shaft a fair cart road about three quarters of a mile long connects with the Waratah road between the 14 and 15 mile pegs, so that the property is easily accessible, and the amount of ore already won should encourage another trial being given to the mine.

The Heazlewood Main Lode has been traced through Sections 825-87M and 4-87M, formerly known as the Heazlewood Extended, and a good deal of prospecting by means of tunnels and shafts was done some years ago. I had no time to examine these, but I understand that several small veins of galena were cut and some ten tons of ore sent away, but nothing was discovered which could be considered payable.

From the Heazlewood shaft a good pack-track about 3¼ miles long has been made to the Mt. Stewart Prospecting Association's property, consisting of two 80-acre blocks, Section 763-93M and an adjoining block to the north not numbered.

Crossing the Whyte and Castray Rivers sandstones and limestones are seen, but further south serpentine rocks again occur, and the boundary between the igneous and sedimentary rocks has not been determined. The track passes by the old Castray River Company's workings, where a little alluvial gold is still being obtained.

The Mt. Stewart workings are situated on a rather flat hill at an elevation of about 1400 feet above sea-level. A lode running approximately north and south has been traced through the property, and two shafts were sunk on it, but both of these were full of water. The top shaft is 43 feet deep,—the lode at the top being about 2 feet 6 inches wide of galena blende and quartz, showing a crustiform structure. In the bottom there is said to be about 10 inches of clean high-grade galena in three veins. The lower shaft is 19 feet deep,—the lode being about 2 feet wide, mostly quartz and blende, with a little galena. Two tunnels have also been driven to cut the lode, but on account of the flat nature of the country it has not been possible to get any great amount of "backs." In No. 1 tunnel, known as Harvey's tunnel, the lode was cut at 120 feet, and some high-grade galena is said to have been obtained, but I was unable to see the lode, as the end was blocked. This tunnel is too shallow to be of much use, and another tunnel has been driven by the present proprietors, which, at the top shaft, should give about 70 feet of "backs." The lode was struck at 100 feet, and a drive put in along its course 520 feet in a northerly direction. The lode has varied from a trace up to the full width of the drive, carrying in places small seams of zinc blende and siliceous galena, said to assay up to nearly 200 ozs. silver per ton. At 560 feet from the entrance a rise has been put up 40 feet, and this should be continued to the surface, a further distance of 15 to 20 feet, as the air in the end is rather light, and only one shift has been able to work. The present face is about 400 feet from the top shaft, but the last 60 feet have apparently been off the course of the lode. At 580 feet a small prospecting cross-cut has been driven 33 feet to the east without cutting it, and it seems probable that the lode lies to the west of the drive. Where seen the lode shows a favourable banded structure characteristic of true fissure lodes; and the ore is of a high grade,—a bulk sample from several tons raised having, I am informed, shown it to be worth about £15 per ton.

To the west of the main lode is a vein of talc 12 to 18 inches wide running about E.N.E., and showing in places stains of carbonate of copper. Though of not much importance in itself, it should be traced to where it intersects the main lode.

Another interesting occurrence on this property is what is called the "opal lode," a vein filled with chalcedony and common opal of various shades. Messrs. Twelvetrees and Petterd have made a microscopical examination of this stone and pronounced it to be "opalised serpentine."

Whyte River Mine, Section 109-93M, formerly 1083-87M, 34 acres.—On this section two tunnels have been driven on the north side of a hill running through the section, and one on the south side. No. 1 tunnel, which is only about 30 feet below the crown of the hill, was driven about 200 feet through soft decomposed igneous rock, and at 100 feet a lode formation about 5 feet wide was cut, consisting chiefly of shattered country rock stained with oxides of iron and manganese, impregnated with chromate and carbonate of lead. A winze on this connects with No. 2 level 60 feet below No. 1. In No. 2 tunnel the lode was cut at 160 feet from the entrance, and a drive put in about 200 feet in a general south-easterly direction. The lode is here very similar to No. 1 level, having no defined walls, and showing in places crystals of chromate of lead. A little beyond the rise to No. 1 level a winze was sunk 30 feet and a little stoping was done, but these workings were full of water. Good ore is said to be going down under foot, and on the tip at the mouth of the tunnel is some nice-looking galena mixed with a good deal of blende. No. 3 tunnel, on the south side of the hill, is about 110 feet below No. 2. It was driven almost due north for about 500 feet, where the lode was cut and driven on 170 feet, its course being north-westerly. The lode is here better defined than in the upper levels; but here, too, is chiefly filled with broken country rock with occasional bunches of pyrites and galena, quartz, and a good deal of calcite. Native silver is also said to have been found in this level, but I did not see any. This lode is supposed to be a continuation of that worked in the Bell's Reward mine, but is more probably a parallel one.

Bell's Reward.—The property formerly known as the Bell's Reward Mine comprises Sections 245-93M (40 acres) and 44-87M (20 acres) lying to the south of the Whyte River Mine. The workings are situated on the 20 acre block, and consist of several tunnels and a main shaft 156 feet deep. The main adit, which is about 500 feet long, was unfortunately blocked at the entrance, and as the shaft was full of water it was quite impossible to form any idea of the value of this property. On the surface there is a strong gossan outcrop which can be traced through the Discoverer, Godkin Extended, and Godkin Sections, the general strike being about N.W. and S.E. On the western side of the lode limestone, sandstone, quartzite, and slates occur, the country to the east being chiefly decomposed igneous rock, though occasional patches of sedimentary origin are also seen. Mr. Montgomery, late Government Geologist, after a careful examination of the Godkin Mine in December 1892, came to the conclusion that the lode is a contact one, and the sedimentary rocks seen to the east of the lode are either isolated patches or tongues projecting into the main igneous mass, and this seems most probable. The sedimentary strata have been a good deal broken

by the intrusive rocks, thus allowing passages for the circulation of mineral-bearing solutions, and the sandstones and limestones are often traversed by small threads of blende and galena. A lode is also said to have been cut in the limestone in the main adit and was followed for about 100 feet, but I have no imformation as to its size or quality. In a open cut close to the engine-house I noticed little chloride of silver in broken sandstone impregnated with oxides of iron and manganese, and all the gossan is said to carry a little silver. The main shaft is a roomy one, being 13 ft. × 4 ft. in the clear, and well timbered as far as could be seen. From the bottom I believe cross-cuts were put in S.W. 120 feet and N.E. 40 feet, when a burst of water drove the men out, and no work has since been done. It is probable that the lode was struck, and it seems a great pity that after spending so much money no effort was made to get the water out and see what the lode was like.

A good cart-road was made from the mine to the Waratah road, near the 13-mile peg, and I believe 7 tons of ore, assaying 65 ozs. silver per ton, were sent away.

On Section 916–87M, known as the "Discoverer," or Smith's section, two tunnels over 200 ft. long were driven, and one short one. No. 2 passed through clayey decomposed igneous rock for about 100 ft., when a belt of sandstone was cut, and beyond this there is a very strong manganese gossan formation, the western wall of which was not reached. No. 1 tunnel, 110 ft. above No. 2, was partially blocked, but as far as could be seen was similar to No. 2. The gossan is said to carry a little silver, but not in payable quantities, and sinking will have to be resorted to to prove the value of the lode. From what is seen in the Godkin mine, it is evident that the zone of oxidation extends to a considerable depth, but should good "pay-ore" be met with in that mine, this section should be well worth developing.

Godkin Extended, Section 62–93M, 80 acres. A good deal of work has been done on this section, with disappointing results. On the east side of the hill a tunnel was driven 105 ft. in a S.W. direction; the first 60 ft. through clayey decomposed country much stained with oxides of iron and manganese, and the remaining 45 ft. through sandstone. A shaft was also sunk 80 ft. through broken country containing bunches of gossan assaying a few ounces of silver per ton. On the west side of the hill a tunnel was driven 150 ft. through soft sandstone, and connected by a winze with the main adit 120 ft. below, which is 827 ft. long. The first part of this tunnel is in soft decomposed slate, which is succeeded by sandstone and quartzite, the latter gradually merging into limestone, which continues for the last 200 feet.

At 400 feet from the entrance a gravelly bed was cut, the pebbles of quartz being in places cemented together with blende and galena. A drive was put in to the north-west and a little stoping was done over the back of the drive, some 40 tons of ore having been sent away from here, averaging about 120 ozs. silver per ton with a low percentage of lead, and some of the clean galena is said to have bulked 350 ozs. silver per ton. Ore was found for a length of about 40 feet, but soon cut out over the back of the drive, and it appears to have been only a pocket. The end of the drive was blocked, but Mr. Thorne, the late mine manager, informed me that it was continued to 151 feet from the flat sheet through loosely cemented gravel and sand, and that at 100 feet he had put in cross-cuts and struck limestone on both sides, the width being about 25 feet; but it is very difficult to explain the occurrence of the limestone here. A winze was sunk about 10 feet south-east of the main adit to a depth of 23 feet and from the bottom sandstone was obtained, carrying strings and splashes of galena and blende, but there does not seem to be any real lode.

At 490 feet broken sandstone was met with, and a short drive put into the north-west. Above this drive is a cave of considerable extent, and in the joints in the sandstone is a brown slime which is said to carry a little silver. A little beyond this the course of the drive, which up to this point has been approximately north, has been turned to the east, and the end is within 20 or 30 feet of the eastern boundary of the section, the last 200 feet being in limestone.

Godkin Mine, Sections 1599-87M, 1615-87M, 40 acres each.—For a detailed description of the workings of this mine I must refer to Mr. Montgomery's Report of December, 1892, already mentioned, which was published with the Annual Report of the Secretary for Mines for 1892-3. All the workings on the southern section were full of water below the 45 feet level, and the only work that is being done is at the north shaft. A small pumping plant has been erected here, and the shaft sunk to 80 feet below the level of No. 5 tunnel. The bottom of the shaft is in gossan, and a cross-cut has been driven 30 feet through this to the south west, and from the end a drive put in 30 feet to the south east. The gossan, which contains a great deal of black oxide of manganese, is full of vughs, making it very bad for shooting, and progress is consequently slow. Mr. Scaddon, the mine manager, informed me that the gossan contained a little silver, but not in payable quantities. From the fact that galena was obtained from two winzes sunk between 30 and 40 feet below No. 5 tunnel, it was hoped that the oxidised zone would have been passed through, so the result is very disappointing. The first of these winzes is about 100 feet south east from the shaft, and from the open character of the lode-matter it is probable that this winze will soon be drained, and galena may be met with in the drive, but it is evident that the shaft will have to be sunk deeper to reach the main unoxidised portions of the lode.

Pike's.—On Section 2508-87M, known as Pike's Section, situated about a mile and a half south-east of the Godkin mine, a tunnel was driven, and at 100 feet from the entrance a lode was cut, running about north east. This has been followed for about 100 feet, and occasional patches of gossan with carbonate of lead and antimonial galena were met with, but the bulk of the lode-filling appears to have been broken country rock. The galena is said to be of low grade, and I do not consider that this find is of much importance, except as showing the extent of the mineral-bearing country.

On Section 1220-93M, 80 acres, formerly known as the Washington Hay, is a strong outcrop of manganese gossan striking a little east of north. A small shaft was sunk on the lode (which is almost vertical) to a depth of about 80 feet, showing in the bottom about two feet of carbonate of iron with a little galena and blende. The shaft being closely timbered, the lode could not be seen higher up, but the ore at the surface shows some nice-looking coarse and fine grained galena with carbonate of iron and quartz, and gossan with crystals of chromate and carbonate of lead. Fifty feet below the surface a short cross-cut was put in to the west and a small vein of gossan carrying blende was driven on a few feet; a little chloride of silver is also said to have been obtained from here. The country is a good deal broken and stained green, probably with oxide of chromium. Another opening higher up in the north end of the shaft shows several feet of promising looking gossan with chromate of lead disseminated through it. About 110 feet below the shaft an adit has been driven 250 feet a little west of south along the course of the lode towards the shaft, the end of the drive being about 50 feet away from the shaft. The lode is a strong one, widening in one place to about 8 feet. The bulk of the lode-matter is carbonate of iron containing small veins of galena with blende and pyrites, and I believe 30 tons of high-grade galena were sent away. The prospects of this mine warrant another trial being given to it. The Godkin Tramway passes just above the tunnel, so that the property is easily accessible.

Confidence Mine.—To the south-east of the Washington Hay, on Section 671-93M., 40 acres, formerly the Washington Extended, and now known as the Confidence, a good deal of work has been done and several small parcels of galena, about 50 tons in all, which, I am informed, assayed about 65 per cent. lead and 140 ozs. silver per ton, were sent away. No. 2 tunnel, 40 feet above the Whyte River, was driven about north-east, and the lode cut at 160 feet. This has been followed 180 feet, bearing a little east of north, being from 6 inches to 2 feet wide, carbonate of iron and fragments of country rock with occasional bunches of galena and blende.

No. 1 tunnel, 100 feet above No. 2, was driven nearly due east, and the lode cut at about 200 feet. Before cutting the lode a belt of broken country about 50 feet wide was passed through, much stained with oxide of iron, and in places approaching a true gossan. A sample across this is said to have given 56 ozs. silver per ton. The lode has been followed a little east of north for 120 feet, and at 30 feet from the flat sheet an air shaft connects with the surface about 60 feet above. At 80 feet the lode is apparently split and the western branch is being followed. Several good shoots of galena have been cut, and in the face, when I saw it, there was a vein of about two inches clean galena with about two feet of gossan, containing carbonate and phosphate of lead; a sample of this gossan is said to have given 65 ozs. silver per ton.

An intermediate tunnel about 40 feet below No. 1 was also started and driven 100 feet, but had about 40 feet further to go to reach the line of lode when work was stopped.

This mine has been recently re-started by a small syndicate, and the prospects of success seem very fair. Work is at present confined to driving No. 1 level with one shift. No. 2 tunnel would have to be extended between 300 and 400 feet to reach the shoots of ore cut in No. 1, but this would be a valuable prospecting work, and would prove the lode to a depth of about 170 feet. It seems probable that this lode is a continuation of the Washington Hay lode. The Godkin tramway passes through this section between the intermediate and No. 2 tunnels.

Washington Mine.—West of the Washington Hay and north of the Confidence is an 80-acre block section 1150-93M, known as the Washington. Two tunnels have been driven on this property. No 1 is 120 feet long through clay and decomposed slate, with bands of hornstone. At 60 feet from the entrance a drive was put in 33 feet to the north, but I could see no sign of any lode formation. No. 2 tunnel, 130 feet below No. 1, was driven 300 feet, bearing N. 70° W. The first 120 feet are through weathered igneous rock passing into a dull greyish green rock, containing a great deal of carbonate of lime. It seems probable that the intrusive rock, has here absorbed some of the sedimentary strata through which it has broken. At 73 feet from the entrance a drive was put in 100 feet to the north-east and 580 feet in a general south-west direction, the last 100 feet being nearly south. A little galena is said to have been obtained from a winze sunk 11 feet below this level (now full of water), and some stoping was done above the drive on a vein of oxidised matter, which is said to have yielded a little high grade ore, but I could see nothing of any value in the drive.

Gregory, Section 3590-87M.—The workings on this section are situated close to the road about three-quarters of a mile above the *Whyte River Hotel*. Crossing a creek a little above the road a

trench has been cut along a small lode formation striking about north-east and south-west. In one end it is about 15 inches wide, and in the other end two feet, mostly quartz with splashes of galena and pyrites. A tunnel driven in a south-east direction from the level of the road cut the lode at 241 feet, and a little driving has been done on its course to the north-east. This drive was blocked, but it is, I believe, connected to the surface by a shaft 65 feet deep. Where cut the lode is about one foot wide, similar to what is seen on the surface, and some good assays are said to have been obtained. This lode is apparently a contact one, altered slates being seen to the east of the lode, and serpentinous igneous rock to the west. As far as can be seen it is too small to be of much value.

Although a considerable amount of money has been spent in the Heazlewood and Whyte River Districts, they cannot be said to have had a fair trial. The galena is mostly of a high grade, and the prospects at several of the mines warrant the expenditure of further capital in legitimate mining. The high freights charged on the Waratah-Burnie railway, £2 per ton, have retarded the progress of the fields, but I have been informed that a substantial reduction would be made for parcels of 40 or 50 tons. Limestone and ironstone could be easily and cheaply obtained for fluxing purposes, but until much more development work has been done it would be quite premature to consider the question of erecting furnaces.

Magnet Mine.—From the Whyte River Bridge the road rises about 1000 feet in 3 miles to the top of the Magnet Hill, whence a pack track about three miles long leads to the Magnet mine. This property consists of one 20 acre block, 3705–87M, and two blocks of 40 acres each, 2074–91M and 2075–91M, lying to the north and south respectively of the smaller block on which the workings are situated. The lode has been traced by trenches through the section, and shows a strong body of very promising looking gossan with veins of galena, showing banded structure on either wall. Its strike is apparently about north-east and south-west, and at the surface it is nearly vertical, but in the upper tunnel underlays considerably to the north-west. To the east of the lode the ground falls rapidly towards a large creek running into the Arthur River, the outcrop being about 250 feet above it. No. 1 tunnel, which is only between 30 and 40 feet below the outcrop, was driven nearly due west. At 12 feet from the entrance a vein of galena was cut, and beyond this 13 or 14 feet of gossan were passed through with another vein of galena on the west wall. The cross-cut was continued to 114 feet through decomposed igneous rock, probably porphorite. North of the cross-cut the lode has been driven on 88 feet, and on the south side a drive of 50 feet was put in along the footwall, and a drive of 135 feet along the hanging wall of the lode. From the north end a rise was put up to the surface, and a little stoping has been done on either side of this as well as over the back of the south drive, and between 70 and 80 tons of high grade galena and oxidised ore have been sent away. Mr. Meredith, legal manager of the company, has kindly showed me the returns received from about 50 tons sent away between August, 1896, and April, 1897. The average net price received was between £19 and £20 per ton, the highest being £23 3*s.* 6*d.*, and the lowest £13 12*s.* 11*d.*, the latter for a parcel of oxidised ore low in lead.

There are several small veins of clean galena, but the bulk of the lode-matter at No. 1 level consists of gossan containing crystals of cerussite (carbonate of lead), crocoisite (chromate of lead), and leadhillite (sulphato-carbonate of lead.) In the north end the lode is somewhat broken, and contains a good deal of dolomite, and throughout the load bunches of carbonate of lime and iron occur, surrounded by a crust of galena, forming so-called "ring ores."

No. 2 tunnel, about 40 ft. below No. 1, and a little to the north of it, was driven about 225ft. bearing N. 55° W. In this tunnel a hard bar of dolomite was encountered, showing in places threads of galena, and a little native silver is also said to have been found. Near the end a cross drive has been put in 28 ft. S.S.W. In the face of this a little galena was showing through the dolomite, and at the time of my visit preparations were being made to continue this drive. Since my return I have heard that good galena has been cut, considerably enhancing the value of the property.

The oxidised ores from No. 1 level contain between 20 and 25 per cent. of moisture, and on account of the high freights it is found advisable to dry this before mixing with the sulphide ore. Only what is considered the best of it is sent away, and there is a large pile of stuff which is not considered good enough to ship at present, but which should pay well to smelt on the spot.

The trenches to the south of the tunnels show the lode to have the same favourable appearance. The ground here falls much more rapidly to the east, and it would be very advantageous to put in a low level cross-cut.

From the mine to the top of the hill the track is very steep, after which it has a good grade but is in many places in a terrible state, and the cost of getting the ore to Waratah is naturally heavy, viz. 27*s.* 6*d.* per ton. In a direct line the distance is only about four miles, but the intervening country is very broken and rugged. I am informed, however, that a good grade for a tramway could be obtained in 8 or 9 miles, and this will probably be eventually constructed, but in the meantime cording of track to the main road is urgently required.

This mine has undoubtedly very good prospects, and deserves more vigorous development.

From here to Waratah the old Waratah-Corinna track was followed, crossing the Arthur River, and passing through the old West Bischoff Company's property. On Section 1416-93M, formerly 2481-87M, a little work has been done on a small lode carrying sulpantimonite of lead (probably zinkenite or jamesonite), zinc blende, and a little pyrites. One sample is said to have given 52 per cent. antimony, so it is probable that stibnite also occurs. Two short tunnels have been driven along the lode through black slate. In the top tunnel there is about six inches of ore in the face, and in the lower one about ten inches. The ore is said to carry traces of gold and a little silver, but not in payable quantities, and the lode is too small to encourage much work being done on it.

On Section 1445-93M, formerly 922-91M, known as Kegan and Daly's, a tunnel bearing E.S.E. was driven 363 feet. At about 180 feet from the entrance a dyke of quartz porphyry was cut, which proved to be about 30 feet wide. This is said to carry a little tin throughout, but not in payable quantities. The country on either side of the dyke consists of altered slates and grits, in places a good deal iron-stained, and I noticed one small vein of carbonate of lime and carbonate of iron, but nothing of any value.

On the surface several trenches have been cut across an iron-stained outcrop, samples from which are said to have given from 4 to 34 ozs. silver per ton. This looks like the decomposed capping of another igneous dyke. It could be best prospected by continuing the tunnel, but I am not very sanguine as to its proving of any value.

The only other property visited in the vicinity of Mount Bischoff was the old Silver Cliff mine, Section 1209-93M, 40 acres, formerly 28-91M. After the original company ceased active operations, the mine was let on tribute, and I believe some 50 tons of high grade galena were obtained from what is known as No. 2 lode. A tunnel 90 ft. long on the course of this, about N.N.W., shows the lode to be 3 ft. to 4 ft. wide at the entrance, but it has cut out in the end. It has, however, been traced further up the hill, and some high assays are said to have been obtained from the outcrop. 42 ft. from the mouth a winze (now full of water) was sunk to a depth of 50 ft. below the level of the tunnel, and there is said to be very good ore in the bottom of this, but water became too strong, work was abandoned by the tributors, and the section was forfeited. It was then taken up by a small party of men, who are doing their best to prove the value of the lode. A short distance south of the tunnel a small shaft (now full of water) was sunk on the lode, and a little driving done at a depth of about 40 ft. by the old company, who also started a crosscut for the lode about 130 ft. below the shaft. The present owners continued this crosscut from 86 ft. to 220 ft. At 196 ft. a small vein carrying pyrites was cut, and this has been followed a little west of north for 127 ft., widening in places to 2 ft., with occasional bunches of cubical galena associated with jamesonite, zinc blende, and pyrites, with carbonate of iron and quartz, but so far nothing payable has been met with. The present intention is to drive under the winze from the tunnel (a further distance of about 130 ft.), and rise against this to work the shoot of ore in the winze, with the hope of cutting other shoots on the way. The lode has well-defined walls, and the enclosing slates are of a kindly nature, but so far the results have not been very encouraging.

From the foregoing brief account it will be seen that the extensive area of country covered by this Report is exceptionally rich in minerals, and every inducement should be given for further prospecting by constructing new tracks and improving old ones, as there is great probability of other valuable discoveries being made.

The distance from Waratah to Corinna by the present route is 40 miles. From Waratah a good road has been made as far as the Heazlewood Bridge at the 16-mile Camp, and this is now being continued round the Bald Hill, where the old track is particularly bad. At the Corinna end there is a good cart road for five or six miles, and between these points is a fair bridle track which, at no very great expense, could be made wide enough for cart traffic. The tracks branching off from this are mostly in a very bad state, and when it is considered that everything has to be packed over such tracks, I think that too much credit cannot be given to the hardy prospectors.

In conclusion, I wish gratefully to acknowledge the kindness and hospitality with which I was everywhere received, and have also to thank Mr. Hall, M.H.A., and others for the great assistance rendered me.

I have, &c.

J. HARCOURT SMITH, *B.A.*,
Government Geologist.

The Secretary for Mines, Hobart.