

AR1913

TASMANIA



REPORT

OF THE

SECRETARY FOR MINES

FOR

YEAR ENDING DECEMBER 31

1913

Including Reports of the Inspectors of Mines, Government
Geologist, Mount Cameron Water-Race
Board. &c.



Tasmania:

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Report of the Secretary for Mines.

Mines Department,
Hobart, 9th March, 1914.

SIR,

I HAVE the honour to submit my report upon the Mines Department and the Mining Industry for the year ending 31st December, 1913.

GENERAL REMARKS.

The aggregate value of the minerals raised during the year was £1,415,700, being a decrease of £77,802 on the value of the output of the preceding year.

The value of gold won was £19,424 less than the previous year, while the output of silver-lead ores was decreased by 6834·6 tons, but the value increased by £10,899. The average price of tin was £201 11s. 8·377d., as compared with £209 17s. for the previous year. It started at £230, and reached its highest (£230 10s.) in May. The average price of fine silver for the year was 2s. 5·742d. per oz., as against 2s. 6·262d. last year. The highest monthly average was in January, when it reached 2s. 7·256d. The average price of copper was £68 5s. 8·590d. per ton, as against £73 2s. 10·525d. last year.

“THE AID TO MINING ACT, 1912.”

The expenditure for the year was as follows:—

(A)—*Mining Prospecting and Development Work, &c., undertaken by or under the Direction of the Department of Mines.*

Purpose.	Amount.
1. To provide for salaries of supervising engineers, and office charges, travelling expenses, printing and advertising, and any miscellaneous charges connected with the purposes of this Act	£ s. d. 1381 11 3
2. In prospecting or mining for gold or any other metal or mineral or developing mines at or near Zeehan	2893 8 8
3. In the equipment, salaries, wages, &c., of four Government prospecting parties	902 19 7
4. In prospecting for gold by means of diamond-drill or otherwise, at Beaconsfield	214 18 5
5. In prospecting for gold or any other metal or mineral at Lefroy, Mathinna, and in the North-Eastern mining division	697 4 3
6. In the purchase and erection or hiring of a State battery or other plant for the examination or treatment of ores in a locality on the West Coast deemed suitable by the Minister, and the cutting, construction, and formation of races, dams, and other works deemed necessary by the Minister in connection with the same, pursuant to Part IV. of “The Mining Development Act, 1912”	649 0 5

Purpose.	Amount.		
	£	s.	d.
7. In opening up old tracks	309	1	3
8. In cutting and constructing tracks in the Heemskirk District, and from Macquarie Harbour to Port Davey ...	1388	19	7
9. In obtaining reports upon sites for conservation of water	350	0	0

(B)—*Advances in Aid of Mining and Prospecting.*

Purpose.	Amount.		
	£	s.	d.
10. Advances to miners for prospecting, pursuant to "The Mining Development Act, 1912"	423	7	5
11. Assistance towards boring not exceeding one-half the total cost, pursuant to Part V. of "The Mining Development Act, 1912"	136	13	8
	<hr/>		
	£9347	4	6

CHIEF INSPECTOR OF MINES.

Ever since the appointment of the first Government Geologist, his position has been associated with that of the Chief Inspector of Mines, and the dual office has continued up to the present time. I have repeatedly represented the desirability of dissociating the duties, and of appointing a Chief Inspector, who would be able to devote the whole of his time to the inspection of mines of the State and the actual supervision of the several inspectors. The present Chief Inspector has also urged action in the same direction.

It was already decided last year to take an early opportunity of separating the two offices. It has been apparent for some time past that with the expansion of the geological branch of the Service, the Government Geolo-

gist has no time to do more in the direction of mines inspection than exercise administrative office control, leaving actual inspection to the officers under his charge.

I am pleased to record that this decision is being given effect to, and that applications are about to be considered by the Public Service Board, and I trust that the result will be the appointment of an officer with suitable qualifications and possessing the necessary practical experience, who will discharge his important duties to the satisfaction both of the Department and of the mining public.

PUBLIC BUILDINGS IN LAUNCESTON.

The inconvenient arrangements prevailing in these buildings, and their somewhat dilapidated condition, have for a long time been known to those engaged in them, and have even been the subject of comment now and then in the daily press. Their entire renovation was begun and completed during the past year, resulting in improved and more commodious arrangements for the Mines Department and Geological Survey Branch. Central corridors through the edifice have been constructed, strong-rooms and superior accommodation have been provided, and a heating system by means of hot-water pipes has been installed in lieu of the wasteful heating by coal fires.

The increased staff of the Geological Branch has been satisfactorily provided for, and a well-designed laboratory, with photographic dark-room and all other conveniences, has been laid out and equipped on the second floor. This is furnished with oil furnace, sample crushing and grinding plant driven by electricity, and all the usual equipment of a modern laboratory. This installation is attached to the Geological Survey, and it is intended to run it so as to be of the greatest benefit to the mining community and the public in general. Regulations are being framed for the conduct of the laboratory work. It is hoped with the new equipment and conveniences mentioned above, and with the modern and

expanding library stocked with literature relating to nearly all the world's mines and minerals, this branch of the Public Service will be in a position to effectively fulfil its purpose in distributing useful information in connection with the mineral resources of the island.

PUBLIC BUILDINGS, HOBART.

I have repeatedly drawn attention to the want of accommodation for this Department in the Public Buildings. The rooms are altogether too small, and unsuited for the comfort of those employed and for the accommodation of the public.

The storage-room for presses, plans, reports, &c., is totally inadequate to meet requirements, a number of the presses having to be kept in the main hall, while the strong-room is already overcrowded, and there is no room for the safe custody of the many registers and documents which have accumulated with the growth of the mining industry, and which could not possibly be replaced in case of fire.

I have given the matter a good deal of attention, and cannot see that anything can be done to remedy the matter by alteration to the present buildings; and therefore respectfully draw your attention to the urgent necessity for erecting suitable offices upon the vacant allotment adjoining the present building.

APPENDICES.

Appended will be found the following reports:—

The Annual Report of the Mt. Cameron Water-race Board.

Report of the Government Geologist.

Reports of the Assistant Government Geologists.

Report of the Chief Inspector of Mines.

Reports of the Inspectors of Mines.

Report of the State Mining Engineer.

GOLD-MINING.

The following return shows the quantity and value of fine gold won during the year:—

	Quartz.	Alluvial.	Cyanide.	Blister Copper	Silver- lead- Bullion	Totals.
	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.
Beaconsfield .	11,088·00	...	8888	...	...	19,976
Mathinna ...	710·05	...	405	...	...	1115·05
Mt. Victoria .	}	244·63	...	...	...	244·63
Warrentinna .						
Mt. Cameron .	}	...	...	...	...	8
Lefroy						
Lisle.....	}	87·45	...	...	...	125·25
Golconda. ...						
Lilydale						
West Coast...	...	34·68	...	7419	4564	12,017·68
Totals ...	11,843·85	366·76	9293	7419	4564	33,486·61

Value, £141,876, equal to 33,400·457 oz. fine gold.

Beaconsfield.—The Tasmania Gold Mine, Limited, obtained 19,976 oz., valued at £85,912 4s. 10d., from 53,233 tons of quartz; the average number of men employed being 412. The following is an account of the work done during the year:—

Very little has been done in the way of development work during the year. The crosscut going west from "Grubb's," at 1500-foot level, was completed, and a rise put up to meet the bottom of Hart's shaft, already sunk to 30 feet below the 1370-foot level. The cutting down of the shaft was not proceeded with, some prospecting was done by driving north into the footwall country from the end of Grubb's crosscut at the 1370-foot level. The work of repairing and retimbering Grubb's shaft down to 500 feet is finished. The necessity for this and for similar work, but not of such extent, in Hart's shaft, was brought about by the continuous drag, consequent on the settling northward and downward of the hanging-wall of the main lode. Insufficient filling or stowing of the stopes near the surface in the early days is said to be

the cause of this movement of the ground. Buildings and tramways at the surface are affected by it.

Work at the bottom (1500-feet) level has been mainly to the east of Grubb's crosscut.

Development results in both the 1370-foot and the 1500-foot levels, which are the two lowest, have been most disappointing. For a very considerable length the lode is split into two main branches, and this splitting seems to have resulted in lower values. At the points where the lodes have not split, values seem to have been fairly well maintained. During the past year the amount of water raised has been below the average, because development work has not been extended in the bottom levels to cut the wet beds in the western end of the mine. The total loss on mining operations has been heavy, a considerable portion of the output having been obtained from heaps of concentrates, &c., accumulated in former years.

It may be that the inducement is not sufficiently strong to warrant risking the tapping of the main body of water always met with on this side, and at a time, too, when the question of further sinking and developing the mine is in abeyance.

The total quantity of gold won by the company is 828,231 oz., from 1,035,820 tons of quartz. The total amount paid in dividends up to 1905 was £772,671 15s., since which date no dividends have been paid.

North Tasmania Mine.—Work, so far as the Tasmania Gold Mine Company is concerned, ceased on this north section early in the year. Messrs. Alfred Dally and party have now purchased the property, and prospecting work is going on to test a lode discovered a little way to the south-west of the main shaft. Some trenching has been done on the outcrop, also crosscutting to pick up the lode at the 200-foot level in the main shaft.

Coronation Gold Mine.—After being idle for the greater part of the year the work of extending the prospecting drive south from the bottom of the shaft has been resumed.

Tasmania Consolidated Gold Mining Company.—This is a new company formed to take over and prospect several leases owned by Mr. Windred, embracing the ground and mining works of the old East Tasmania Gold Mining Company. The new company was formed in England, and Mr. Malcolm K. Clarke has been appointed manager.

A steam winch winding-plant was purchased from the Tasmania Company, poppet-heads have been erected, and a commencement made to unwater the old main shaft, which is 213 feet in depth. Crosscuts (500 feet north and 550 feet south) were driven by the old company at the 100-foot level, as also a crosscut 300 feet at the bottom level. The new company purpose sinking the shaft to a total depth of 500 feet. Difficulties were experienced in bailing, owing to the old timbers having fallen down the shaft. When the water was eventually got out in September, instructions were received from the company to cease all work except keeping the water down, and at the close of the year this was all that was being done.

Lefroy.—The total quantity of gold won from this field was only 8 oz., and was won by the Golden Crest Gold Mining Company. Operations were principally confined to the Golden Heart shaft. This shaft had already been sunk to a depth of 210 feet and opened out at 190 feet, where a crosscut had been driven 120 feet north intersecting the East Clarence reef, which was then driven on east and west a total distance of 25 feet.

After erecting poppet-legs and winding machinery the company unwatered the mine and started driving east and west on the course of the reef at 190-foot level. The western drive was extended 180 feet from the crosscut following the hanging-wall of the East Clarence reef. A little gold was got for nearly all the distance, but nothing payable. At the end of this drive a crosscut was driven north 30 feet to the footwall, and this drive was afterwards connected with the old workings from the East Clarence shaft, by means of a rise 30 feet in height.

This wall also carried a lot of mineral, but only a little gold. The eastern drive was continued on the course of the reef, also proving a little gold to exist for the entire distance, until at 282 feet from the crosscut some alluvial matter in the shape of sand, silt, and fossilised wood, made its appearance in the drive. The bed-rock dipped quickly underfoot, and the main drive continued through sand, silt, &c., for a further distance of 185 feet, at about which point the bed-rock again made its appearance, forming the eastern bank of a well-defined alluvial gutter. After continuing the drive into solid bed-rock for another 20 feet or so, crosscuts were driven north and south to pick up the East Clarence reef, but without success.

To further prove the depth and value of the gutter passed over, both banks of which carried prospects of fine gold, it was decided to sink a blind shaft. This was done at a point 60 feet east of the western bank. After passing through sand and alluvial matter for 17 feet, heavy waterworn wash (principally sandstone and slate) was met with, and this was carried down 18 feet to the bed-rock. The whole of this wash carried very encouraging prospects of gold and some massive pieces of quartz were also met with; some of these showed gold freely, and were evidently broken off a reef further south.

As the bed-rock was still dipping east the blind shaft was sunk a further 14 feet, making the total depth 49 feet. A drive was then put in at 44 feet, and continued in an easterly direction for 45 feet, principally through heavy waterworn wash, all of which carried gold. The bed-rock having again disappeared another blind shaft was sunk from this level, and the bottom (bed-rock) was reached at 6 feet deep, or a total from the main drive of 50 feet, or 230 feet from the surface. The wash taken off the bottom of this shaft yielded about 13 dwt. of waterworn gold, besides showing a number of pieces of quartz showing gold. The headings from the drive gave about 20 dwt. gold of a scaly nature. As work was being carried out under great difficulties nothing further was done

to prove the width of the gutter. Work was suspended, and a start made to sink a new main shaft in a suitable position for proving and working the gutter. This shaft is 12 feet by 4 feet, and has now reached a depth of 64 feet. A powerful winding-plant has been shifted from the Pinafore main shaft; substantial poppet-legs have been erected; and all is in readiness for shaft-sinking in the new year, when good progress is anticipated.

The average number of men that have been engaged is 13. The output is nil, other than the little gold obtained from prospecting.

The coming year will prove the width and value of the gutter, and if as good as it is anticipated, there is every prospect of better times ahead for the old field.

The Lefroy Deep Lead Mining Company.—This company was formed to work the sections taken up immediately north of the New Pinafore Company. The company was floated with a capital of £10,000 in 20,000 shares of 10s. each, 5000 fully-paid-up shares to go to the vendors, and was over applied within a few hours after being placed on the market in Launceston. Work was commenced in December. A main shaft is being sunk and a winding-plant erected.

The Golden Crest Mine.—The company commenced operations early in the year, sinking to shallow depths on a small quartz vein, from which excellent prospects were obtained. This is a couple of hundred feet north of the old Reward shaft, at "Specimen Hill." The "Gift" quartz vein opened a few years ago by a syndicate is about the same distance to the south of this shaft.

To test both of these veins at a depth advantage was taken of the central position of the Reward shaft already sunk to a depth of 260 feet, with crosscuts driven both north and south at the bottom level. The shaft was put in order, a small winding-plant erected, and the water got out by June; since then prospecting has been going on below. The "Crest" lode was first tested (it had already been cut by the old company) and driven on west. The

result was not satisfactory. The "Gift" lode was then tried, the object being to extend the old drive on to the lode further west and rise to connect with the bottom of a winze sunk by the "Gift" syndicate at the west end of their lowest level, and from which it is said good payable quartz was obtained. This rise was nearly through at the close of the year, and the company should soon be in a position to know the value of their property.

Golconda.—The Lebrina Gold Mine.—The main shaft has been sunk to a depth of 100 feet from the surface, and the lode driven on, on both sides of the crosscut. The lode is improving in width, but values are not as good as at the adit levels nearer the surface, from which stone is being crushed with fairly payable results.

This is the only mine working in the Golconda district, the Golden Pyramid and New Panama companies both being idle.

North Esk River.—The Burns Creek Gold Mine is again being opened up by a Beaconsfield syndicate.

Mathinna.—The New Golden Gate syndicate has been working steadily, and obtaining good payable results from the old upper levels, 116 feet and 316 feet respectively.

The "Consols" boundary is not far off, but as the present syndicate now owns both properties it is not limited in that direction. The water has risen to within 600 feet of the surface in the main shaft.

New Jubilee Gold Mine.—This old mine, after being abandoned for many years, has been again opened up by a Hobart syndicate. The discovery of some very rich stone left in the end of one of the old stopes on what is known as the "Derby lode," caused further investigation to be made. The rich stone did not continue far. Some prospecting was then done on a flat lode nearer the surface. Eventually it was decided to try and pick up the northern continuation of the Derby lode beyond the slide, at one or both of the mine levels. These levels (Nos. 1 and 2—160 feet and 260 feet respectively) have each crosscuts going west, and drives turning to the south, where the Derby reef terminates.

Apparently the old company never made any attempt to pick up the lode north of the line of faulting; its existence in this direction is not yet proved, for the new make of stone discovered within the second half of the year, and which promises to develop into a highly payable quartz reef, is also south of the slide.

The mine manager, Mr. T. M. Brannan, in following a very small vein of quartz, by driving along the course of the slide north-easterly found indications which caused him to have a winze sunk a few feet, when a new make of stone, apparently distinct from the flat quartz the winze was going down on, came in. This was followed down. At a depth of 40 feet on the slope the thin vertical vein of stone at first met with had widened out into a lode of 5 feet, mostly solid quartz, of a payable nature. At the bottom of the winze the lode widened out to 7 feet, with 18 inches of a new splice of rich quartz on the east side.

Messrs. Reece and Lawson obtained Government aid to prospect off the main adit in the old Californian Mine. A good deal of driving has been done, and a winze sunk, but so far no payable discovery has been made.

Upper Scamander.—The New Trafalgar Company has been doing a good deal of prospecting on its lodes at the contact of the granite with the sandstone, and is now preparing to sink a main shaft.

Warrentinna.—The New Golden Mara Company has sunk the main adit to a depth of 300 feet. Plats have been cut at the 200 feet and at the bottom levels, and cross-cutting has been commenced from both these places.

ALLUVIAL AND GOLD-DREDGING COMPANIES.

Gold was obtained by the following companies in streaming their tin drifts:—

	oz.
South Mt. Cameron Tin Mining Company ...	22·80
Briseis Tin and General Mining Company ...	37·63

Total 60·45

West Coast.

A little alluvial, principally from Jackson's Creek, in the Linda Valley, has been obtained. On the same run of ground the McDowall Prospecting Association, with Government assistance, is driving a low-level adit to intersect the continuity of the gold obtained both on the surface and top workings. A depth of 100 feet separates the latter, where after a heavy flow of water a specimen of coarse gold, similar in quality to that already reported, is stated to have been found in the *debris*, which is very encouraging to the proprietors.

In the vicinity of Hall and Harvey's Creek prospecting both for reef and alluvial continues; also around Howard's Plains and Woody Hills, but up to the present nothing of importance has been discovered.

SILVER-LEAD MINING.

The quantity of silver-lead ore produced was 83,289·268 tons, valued at £319,997, being a decrease in quantity of 6834·6 tons, and an increase in value of £10,899.

The principal producers were:—

	Tons.	Value. £
<i>Zeehan Mines.</i>		
Zeehan-Montana	1425 11	26,339
Zeehan-Western	329·53	3407
Zeehan-Queen	389·75	1729
Mt. Zeehan (Tas.)	1567	6823
Oonah	2803	1777
Broken Hill Propty. Block 10...	1228	1069
Balstrup's	13·128	183
Silver Queen Extended	229·170	3342
Lease 903M	4·720	113
Austral Valley	1980	711
Queensberry	190·500	1736
<i>Dundas Mines.</i>		
Adelaide	2904·450	3571
Hercules	24,042	87,837
Zeehan-Dundas	903	9174
Ring Valley	60	1110
Comet	11,539	8850
Bon Accord	28·08	256

	Tons.	Value.
<i>Rosebery Mines.</i>		
Tasmanian Copper	10,050.30	£ 37,432
Primrose	8344.53	29,223
<i>Mt. Farrell Mines.</i>		
North Mt. Farrell	2600	28,994
Sterling Valley	28	252
<i>North Pieman Mines.</i>		
Chester Mine	7027.38	2556

Zeehan District.—Zeehan-Montana Mine Limited.—The following are the details of the mining operations carried out:—

No. 1 Shaft.—The whole of the mining operations have been from the Company's No. 1 shaft, on Nos. 2, 3, 4, and 6 lodes, at Nos. 2, 3, 4, 5, and 6 levels, simultaneously. The chief exploratory work has been confined to driving along the strike of the main north and south-east slides.

A good deal of developmental work has been carried out on the No. 2 and 6 lodes north of the shaft at Nos. 5 and 6 levels during the early part of the year, but the lodes proved small, and practically barren of galena ore.

The work along the south-east slide south of the shaft at Nos. 4, 5, and 6 levels has proven fairly productive. Two small ore-shoots have been discovered under the slide and east of No. 2 lode; these are now being stoped, and are the principal mainstay of the monthly output of ore.

Unfortunately the exploratory work north of the shaft on Nos. 2, 4, and 6 lodes has been unproductive. The lode-veins have for the most part been small, and practically barren of galena ore. In consequence of this the reserves of ore in the northern part of the mine have become exhausted.

Practically the whole of the output from the mine is now being derived from the southern portion, and in the vicinity of the south-east slide. The main exploratory drive at No. 4 level has recently intersected No. 1 lode. Where intersected the lode is 3 feet wide, com-

posed of carbonate of iron, but showing no galena ore. The company is now driving south on the lode with the hope of finding ore.

Tributers.—The several parties of tributers have been employed on small veins left in the old stopes near the surface. These workings being drained, the tributers under the company obtain advantages for treating their low-grade ore, and the sale of any ore raised. Several parties have been able to make fair wages.

The following are details of the underground work carried out:—

	Feet.
Main drives	1008
Crosscuts	256
Rises	429
Winzes	66

Total	1759

Stopes (cub. feet) 251,970

Output.—The output of ore from the mine was as follows:—Hand-picked galena ore, 596 tons; lode-stuff raised which, after concentration, produced 625 tons. Total tonnage and net value of ore, 1221 tons, value £22,626 13s. 2d.; sale of silver-bearing gossan flux, 528 tons, value £528 19s. 6d.; total value £23,155 12s. 8d.

The average number of men employed was 114.

The Zeehan-Western Limited.—No. 1 Shaft.—The No. 3 tunnel has been extended westerly for a distance of 240 feet; the principal object of this tunnel being to intersect No. 5 lode, and also to explore the ground for other lodes. Several small seams of gossan have been passed through, but found to be of no value. No. 5 lode also proved of no value, and where cut showed a division in the country-rock.

At No. 1 level, No. 1 shaft, a good deal of driving has been done, following small veins, and on the whole sufficient ore has been produced from the work to pay expenses.

South Boundary Shaft.—Mining operations have been conducted on Nos. 1, 2, and 3 lodes from Nos. 1 and 2 levels. The ore-shoots on No. 1 lode, No. 1 level, proved of good value for a length of 150 feet. The ore in this lode continued of excellent value through to the surface, but decreased in value below No. 1 level. At No. 2 level the lode proved to be practically barren of galena. The whole of the lode has been stoped out. Stopping operations are being continued on Nos. 2 and three lodes, but these are very small and patchy, and are not likely to leave much over the cost of mining.

Tributers.—A considerable number of men are employed working small veins on tribute, all of whom are making very good wages. The following is a summary of the work carried out during the year:—

	Feet.	
Drives	322	
Crosscuts	725	
Rises... ..	78	
Winzes	30	
Stopes (cub. feet) ... ..	...	129,420
	1155	129,420

The output for the year was as follows:—Hand-picked galena ore, 342 tons, value £4187 10s. 5d.; galena concentrates, 93 tons, value £1723 10s. 5d.; silver-bearing gossan flux, 834 tons, value £551 16s. 2d.; total, 1269 tons, valued at £6462 17s.

The average number of men employed was 36.

Zeehan Queen Limited.—Mining operations have been confined to tributers, a good deal of prospecting by tunnels and shallow shafts being done without disclosing payable values.

The Mt. Zeehan (Tasmania) Silver-lead Mines Limited.—A prospecting tunnel was driven into a hill north of No. 2 shaft and cut No. 10 lode. This was driven on north and

south, and stoped to the surface with moderate results. Further exploration by State assisted parties has been continued from this tunnel, and has resulted in the intersection of No. 15 lode, which, for 40 feet in length, has an average width of 6 inches of galena.

Under "The Aid to Mining Act" three other parties of tributers are operating in the vicinity of the prospecting tunnel.

At the Spray Mine three parties of tributers are working with fair results.

On the Britannia mine a new lode was found by a party of tributers, which is being worked from a tunnel level.

Unfortunately, neither by the company's prospecting work nor as a result of the tributer's operations, has anything been discovered worth following up by more extensive operations.

Silver Queen Extended Prospecting Association.—During the year 1913 considerable work has been done on this property with payable results. From the tunnel level on Section 188-87M a winze was sunk 50 feet, from the bottom of which 180 feet of driving in a northerly direction was carried out, and a fair amount of high-grade galena was won. From the tunnel level on Section 188-87M a drive north about 70 feet to reach Section 187-87M has been put in, and is still being continued, a small vein of metal showing in the drive.

Section 187-87M.—On the northern part of this section a water-wheel has been erected, and a shaft sunk on a lode carrying about 4 inches of galena. Prospecting trenches have been cut in several directions, and altogether prospects are encouraging.

Broken Hill Proprietary Block 10 Company.—Work was confined to rising and stoping on pyrites and galena lodes by tributers. A shaft was sunk about 20 feet on the western boundary of Section 3914, and a light tramway was laid to connect with the railway-siding on the Comstock Tramway.

Oonah Mine.—About 20 men were employed in extensive prospecting work, but nothing of any value was disclosed.

Austral Valley Mine.—The principal work done on this property has been quarrying ironstone flux for the Tasmanian Smelting Company, the ironstone lode being about 70 feet wide.

Kynance Syndicate.—During the latter half of the year the syndicate commenced operations on a pyritic lode, and sent 91 tons of ore to the Mt. Lyell Company's works, for which they received 11s. 6d. per ton.

Operations are at present confined to driving a cross-cut from the 80-foot adit-level to intersect the pyrites lode at a vertical depth of 50 feet.

The Queensberry Mine.—This is a section on the Henty River, held in the name of M. J. Greeves, and at present is being worked on tribute. During the first half of the year stoping was carried on, and some very good ore was obtained, but the closing down of the smelters necessitated the installation of a small dressing plant.

The mine is looking very well, and large quantities of "seconds" are ready for stoping.

Dundas District.—Zeehan-Dundas Mines Limited.—Exploration and development work on the various lodes was continued in No. 2 level with uniformly disappointing and non-payable results; consequently, with the exhaustion of all payable ore over this level work was discontinued, and the mine shut down.

The plant is dismantled for use elsewhere.

Mt. Road District.—The following is a report of the work done by the Hercules Gold and Silver Mining Company:—

Ore Mined.

Particulars.	Tonnage	Gross Value.	Net Value.	Gross Value. per ton.	Net Value. per ton.	Metal Contents.			
						Gold.	Silver.	Lead.	Zinc.
		£	£	s. d.	s. d.	oz.	oz.	tons.	tons.
Lead Sulphide Ore sold to the Tas. Smelting Works Co. (excludes any zinc values).....	22,155	70,070	16,943	63 3	15 6	3340	199,333	1767	6259
Lead Sulphide Ore mined and dumped ready for despatch	2140	6315	1231	59 0	11 6	316	18,706	168	646
Total	24,295	76,385	18,174	63 0	14 8	3656	218,039	1935	6905

Average number of men employed, 115.

Underground Works.—The operations conducted underground have been carried on in all the levels, from 3A level to No. 5 level, the vertical depth being 245 feet. In addition to production, a good deal of development and exploratory work, including diamond-drilling, has been attempted with fairly satisfactory results. The works completed are as follows:—

Development Work—	
	Feet.
Drives	796
Crosscut	437
Rises and winzes	265
	<hr/>
Total	1498
Diamond-drilling—	
No. 1 bore	66
No. 2 bore	180
No. 3 bore	50
No. 4 bore	205
No. 5 bore	188
No. 6 bore	48
No. 7 bore	178
	<hr/>
Total	915

Production Work.—Extension of area stoped, 22,241 square feet.

Ore Production.—The output has been obtained from the block of ground existing from No. 4 level upwards, the A, B, E, and F ore-bodies being utilised; as in former years

the E ore-body was the chief producer. The stopes as now opened up show the following measurements:—

Level.	Ore Body.	Stope.	Length.	Average Breadth.	Height.	Cubic Measurement.
			feet.	feet.	ft. in.	feet.
3	B	Main	77	20	7 6	11,550
3	B	1st	68	21	7 6	10,710
3	B	2nd	48	19	7 6	6840
3	E	Main	170	47	7 6	59,925
3	E	1st	99·5	58	7 6	43,282·5
3	E	2nd	73	48	7 6	26,280
3	E	3rd	41	22·5	7 6	6918·75
4	A	3rd	36	18	7 6	4860
4	A	4th	41	15·5	7 6	4766·25
4	A	5th	36	17	7 6	4590
4	B	Main	153	35	7 6	40,162·25
4	E	Main	276	56	7 6	115,920
4	E	1st	255	62	7 6	118,575
4	E	2nd	252	50	7 6	94,500
4	E	3rd	229	48	7 6	82,440
4	E	4th	218·75	40	7 6	65,525
4	E	5th	210	36	7 6	56,700
4	E	6th	153	37	7 6	42,457·5
4	F	2nd	59	28	7 6	12,390
4	F	3rd	59	26	7 6	11,505
4	F	4th	67	16·5	7 6	8291·25
4	F	5th	30	14·5	7 6	3262·5
4	F	6th	17	6	7 6	765

A great deal of attention has been given to the filling of the depleted areas, and a large expense has been directed toward the obtaining of a both quicker and cheaper means of breaking the necessary mullock. Direct rises to the surface have been laid out, and have been well advanced. Since the stoppages of deliveries to the Smelting Company, all the open stopes have been filled in, and at the present time there is little or no ground requiring attention in this direction.

Development Work.—In the top or 3A level, the main ore-body has been driven on for about 100 feet, and proved to have an average width of about 20 feet; the other works completed were all directed toward the connection of the various mullock rises, &c., with the surface. In the No. 3 level the main ore-body has been proved for a length of

540 feet, and by the extension of the main north drive connected with the surface, thereby making a new entrance to the mine. The Central Mullock Rise has now reached a height of 120 feet leaving about 60 feet to connect with the surface; the other works were principally in connection with the further opening up of the various ore-bodies. In the No. 4 level the main ore-body has been proved for a length of 305 feet, and the "C" lode has been reopened up by a drive from the surface at a lower level, which will ultimately connect with the newer portion of the mine; in addition, numerous drives and rises have been laid out and finished, accomplishing the better exploitation of the various ore-bodies. In the No. 5 level not much has been done except the necessary works in connection with the drilling plant; however, a comprehensive scheme has been laid out with the object of opening up the mine at this point, and will be commenced as soon as practicable.

Diamond-drill.—Since the arrival and installation of the plant in July last, diamond-drilling has proceeded without a stop, and the results attained can be considered very satisfactory and encouraging. The main ore-body has been proved to live down practically to No. 5 level, thereby greatly increasing the total of ore reserves, and enabling a definite, instead of an assumed, estimate to be made regarding same.

Surface.—All the various mine buildings have been maintained in good repair, and in addition, new huts have been erected for the men, a new smithy and fitting-room and carpenter's shop, also mine sanitary accommodation has been attended to, and a permanent water-supply secured. The haulage tramway has been in constant operation, and the whole plant has worked most satisfactorily, the only accident being the failure of the shaft of the main brake wheel, which delayed all work for a time. During the year the tramway has handled 24,993 tons, and the cable in use has been in operation $4\frac{1}{2}$ years, during which time very nearly 150,000 tons have been handled.

General.—For the 12 months, all the various works have been carried out without any very serious accident to any

employee happening. Several received injuries, but in each case the man was not seriously disabled for any length of time. In the underground workings no trouble in the nature of "falls of ground" or "creeps" occurred, and the mine is now in good working order and better condition than it has been for some time past.

Rosebery District.—The following work has been done by the Tasmanian Copper Company:—

Main Adit Level.—The floor stopes were advanced north from the southern boundary 51 feet. The lode is 26 feet wide, of solid sulphide: assay value—Gold, 0·148 oz.; silver, 8·2 oz.; lead, 7·4 per cent.; zinc, 31·8 per cent. The leading stope advanced to 23 feet. Lode, 30 feet wide of payable ore.

No. 7 Level.—North from the southern boundary has been extended to 71 feet; lode, 23 feet wide, assaying—gold, 0·192 oz.; silver, 13·8 oz.; lead, 18·3 per cent.; zinc, 29·5 per cent. At 32 feet from the boundary a connection was made with No. 50 rise. All ore is sent down here to the main adit level, and trucked direct to the ore-bins.

No. 6 Level.—Stopes north and south of No. 20 rise produced 1576 tons of good-grade ore. The stopes are all securely timbered and filled in with mullock.

Nos. 3, 4, and 5 Levels.—Have been thoroughly cleaned out, and small repairs effected. No work done in these levels during the year.

Output.—Nine thousand nine hundred and twenty-three tons of sulphide ore were sent to the Tasmanian Metals Extraction Company, assaying—gold, 0·151 oz.; silver, 10·3 oz.; lead, 7·3 per cent.; zinc, 26·3 per cent.; copper, 0·54 per cent.

Ore Reserves—	Tons.
Ore for immediate mining	227,308
Ore on dump heaps	5400
	<hr/>
	232,708
	<hr/>
Probable ores	775,333
	<hr/>

Average number of men employed, 22.

Everything is in readiness for a large output. The different levels are all connected, and blocks of ground are opened out in readiness for immediate stopping.

The North Tasmanian Copper Company.—No. 1 level is being extended north to come under a winze that is in No. 1A level.—In this winze there are 2 feet of good payable ore showing. The company expects to cut this ore in the present level, 70 feet below No. 1A level.

No. 1 level has been extended north 168 feet (total, 268 feet) on the footwall of the lode-channel. It has been extremely hard, making progress very slow. The lode-channel is highly mineralised, occasionally showing bunches of sulphide.

Average number of men employed, two.

The Primrose Mining Company—Main Adit Level Development Work.—South drive, along the footwall of the lode in the main adit level was extended 19 feet (total, 158 feet), in highly mineralised schist.

Hanging-wall Crosscut (133 feet south).—This was put in a distance of 62 feet to determine the hanging-wall. At 11 feet a seam of payable sulphide, 2 feet wide, was cut on the south side of the crosscut, proving the width of payable ore to be 20 feet. The seam of ore on the footwall of this make of ore (4 ft. 6 in.) is highly payable, assaying—gold, 0·202 oz.; silver, 29·4 oz.; lead, 16·2 per cent.; zinc, 26·0 per cent.

The average value for the whole 20 feet is—0·101 oz. gold; silver, 14·9 oz.; lead, 8·4 per cent.; and zinc, 17·4 per cent. The total width of the ore-channel from wall to wall is 68 feet, composed of 20 feet of sulphide and 48 feet of mineralised schist.

Hanging-wall Drive, South.—From a point 50 feet south of the main adit crosscut the company commenced a drive along the hanging-wall, and almost at once picked up a seam of sulphide 2 feet wide. This seam gradually widened

out to 20 feet, when the hanging-wall crosscut was intersected. At 137 feet from the main adit crosscut the payable ore cut out. The lode-formation from 137 feet to 100 feet (present face) is highly mineralised schist, with the exception of a small seam of sulphide 4 inches wide.

This new make of ore for the 87 feet averages by assay value—gold, 0·124 oz.; silver, 13·0 oz.; lead, 6·6 per cent.; zinc, 16·1 per cent.; and the average width, height, &c., is 10 feet wide, 87 feet long, by 177 feet high; giving 17,110 tons of probable ore.

Mining Main Adit Level.—The stopes produced 1453 tons of payable ore.

No. 3 Level.—The stopes produced 1647 tons of good payable ore. All the stopes in the mine are securely filled in with mullock.

Lyell District.—The Tasman and Crown Lyell Extended Mine was closed down during the first half of the year, and resumed work on the 1st August, with eight men.

A tramway for hauling timber has been constructed, 60 chains in length. The No. 3 level was driven a distance of 70 feet; and 389 tons of zinc and galena ore, valued at £9 10s. per ton obtained.

Mt. Farrell District.—North Mt. Farrell Mining Company.—Fourteen thousand two hundred and forty-three tons of crude ore were mined and treated, resulting in the production of 2600 tons 11 cwt. 1 qr. 26 lb. of marketable ore, containing 153,753 oz. of silver and 1470·6 tons of lead; total cash value of £29,049 19s. 11d. These returns show a substantial improvement on those of the previous year, and, being favoured with a continuance of good market prices for lead, the year just closed has been the most profitable one experienced by the company for some years past.

The total production of marketable ore amounts to 28,608 tons 5 cwt. 0 qr. 22 lb., of a cash value of £275,049 10s. 11d.

The bulk of the crude ore treated has been drawn from the two shaft levels, Nos. 5 and 6, situated 60 feet and 130 feet respectively below the lowest adit level. Owing to approaching exhaustion of the known ore-bodies at the upper adit levels the output therefrom is now very limited.

The chief developmental work of interest and importance has been that in connection with the opening up of the No. 3 lode at the bottom (No. 6) level. So far this lode has been driven upon for a total distance of 350 feet; the average width of the lode-formation taken out in driving being 14 feet. The ore-body has proved continuous throughout the whole distance driven, and substantial reserves of milling ore have been developed. From indications afforded by winzes being sunk from the No. 5 level these reserves will be considerably augmented as the No. 6 level is extended northwards.

Ore-extraction at this level is now in vigorous progress and an increasing output of milling ore is being maintained. The mill ore is of a fair average grade, but the proportion of hand-picked first-class or prill ore won is much below the averages obtained in the upper adit levels of the mine.

Prospecting operations have been carried on at the old workings on the two mining leases acquired from the late Mackintosh Mining Company, but so far have not disclosed anything of much value.

The mine is affording employment to about 120 men, and, as has been the case for some years, is almost the whole mainstay of the township of Tullah. Provided the market price of lead remains at about the same as at present, the outlook for the coming year may be considered as fairly promising.

No. 2 Level.—The work of widening and fluming a drain to carry off all the surface water is in progress.

Output.—Three thousand two hundred and eighty-six tons of sulphide ore were sent to the Tasmanian Smelting

Company; average value—gold, 0.134 oz.; silver, 11.9 oz. lead, 9.4 per cent.; zinc, 29.0 per cent.

Ore Reserves.—Twenty-seven thousand seven hundred and nine tons of ore have been blocked out ready for mining; 17,110 tons, probable ore above the main adit level; total, 44,819 tons.

Average number of men employed, 34.

The development south of the break in the lode is very satisfactory. The lode shows stronger in the bottom level than in the upper levels, it being more solid and compact.

North-Western Division.—The Magnet Silver Mining Company's operations have been confined to driving north and south at Nos. 10 and 11 levels, which have opened up payable ore. At No. 9 level the usual amount of stoping has been carried out on the southern portion of the workings, which has disclosed payable bunches of ore. The prospects of the mine are much improved to what they were in the early part of last year.

The following figures give the output and value of the ore:—

Tons treated.	Tons mineral obtained.	Silver, ozs.	Lead, tons.
27,175	5128	303,643	1220
	Value, gross.	Value, net.	
	£58,522	£42,713	

The number of men employed was 157.

Northern and Southern Division.—The Round Hill Mine produced 424.04 tons of ore, valued at £4190; an average of 14 men being employed. This mine is being worked by tributers, who are stoping above the creek level. The ore-body is about 14 feet in width, and is improving both in width and value as the rising goes on.

COPPER MINING.

The quantity of blister copper and copper ore produced was 6535.8 tons, valued at £375,664; being an increase of 8.2 tons on the previous year.

The Mt. Lyell Mining and Railway Company Limited.—
The ores and metal-bearing fluxes treated by the company
were as follow:—

	Dry Weight, tons.
Mt. Lyell Mine ore	173,368
North Lyell Mine ore	68,722
Purchased ore	94
Lyell Comstock ore	12,580
Metal-bearing flux from North Lyell Mine	71
Metal-bearing flux from Lyell-Tharsis Mine	12,229
Total	<u>267,064</u>

Quantity and value of metal produced:—	
Blister copper, 4569 tons, containing—	£
Copper, 4511 tons, valued at	324,789
Silver, fine, 349'013 oz., valued at... ..	39,944
Gold, fine, 7419 oz., valued at	31,297
	<u>396,030</u>

Since the inception of the company 125,830 tons of fine copper, 10,509,769 oz. of fine silver, and 318,886 oz. fine gold have been won, and £2,846,998 has been distributed in dividends.

Average Number of Men Employed:—

Mining Department—

At the Company's Mt. Lyell Mine ...	377
At the North Lyell Mine	377
At the Lyell Comstock Mine	98
At the Lyell Tharsis Mine... ..	9
At the Crotty Leases	31
	<u>892</u>

Reduction Works Department 715

Railway Department—

Mt. Lyell Railway	150
North Lyell Railway	17
	<u>167</u>

1774

Dividends paid during year:—£80,424 2s. 6d., equal to 1s. 3d. per share.

Mt. Lyell Mine.—The usual extraction of pyrites was made from the underground workings, with No. 8 level as the base. The removal of overburden and recovery of pyrites in the open cut was continued on a small scale. All of the stopes are yielding good supplies of smelting pyrites, and some development work at No. 8 level shows a small increase in the original estimate of ore reserves. Connection was made to the old South Lyell Mine at the No. 8 level, where a rill stope was worked by the former company for a length of over 200 feet by 50 feet wide. Preparatory work is now in hand for the conversion of the South Lyell shaft into a main mullock pass, and commencement of actual stoping operations will soon be possible.

North Mt. Lyell Mine.—The early part of the year was taken up with unwatering operations, due to the previous flooding of the mine, owing to the fire; and it was only towards the close of the period that the work of the mine had reached its normal position. Active exploration of the ore-bodies at the 850-foot, 1000-foot, and 1100-foot levels in their northward extensions has been very satisfactory. At each of these levels the ore-deposition continues beyond the original boundary of the North Lyell lease into the Lyell Comstock section adjoining. This section was purchased when the Lyell Comstock Mine proper came into the possession of the Mt. Lyell Company. The Crown Lyell Mine was also purchased during the year, and the shaft in that mine will be continued to the 800-foot level, and connection made with the North Lyell workings.

Lyell Comstock Mine.—Active exploratory work was continued at the No. 4 tunnel, and several narrow makes of ore were intersected in the main crosscut. A low-level tunnel (No. 5) has been pushed ahead to determine the downward extension of the ore-bodies exposed in the earlier workings. The boundaries of the outcrop are being deter-

mined, with the view to the establishment of open-cut workings.

Lyell Tharsis Mine.—This mine was only worked for a short time, to provide metal-bearing flux while the North Lyell Mine was non-producing, following the fire and subsequent flooding of the mine.

Reduction Works.—Smelting operations were carried on throughout the year, although the tonnages of ore coming forward for the first quarter were barely sufficient to enable smelting to be continued. Since the resumption of ore-breaking operations in the North Mt. Lyell Mine the usual complement of furnaces have been in commission.

Lake Margaret Hydro-Electric Scheme.—General progress of work was carried out in connection with the powerhouse and pipe-lines. A temporary electric plant was erected for the supply of power to operate the inclined haulage, and the electric percussive drills. Very heavy rockwork on the formation for the upper pipe-line, and at lake entrance, was put in hand.

General.—The flux and limestone quarries were conducted as usual, and the Railway Department was kept up to its usual standard of maintenance.

The Lyell Blocks Mine.—The attention of the management has been confined to sinking the main shaft. It is situated within 34 feet of the boundary of the North Lyell Mine, with which workings it is connected at the 1000-foot level, from which the depth has been advanced 226 feet, or 100 feet below the deepest workings of its neighbour. To this another 100 feet will be added, when the manager purposes opening out to commence prospecting for ore, similar to that abundant in the adjoining property.

At Mt. Jukes, Mr. James Souter, who is now lessee of that property, has driven an "intermediate" level, and recently encountered the ore-channel, upon which he is driving with satisfactory results.

Zeehan Division.—The following is an account of the work done by the Ring Valley Mine:—Driving south of

shaft at 130-foot level, 106 feet; at 50-foot level, 34 feet; at "intermediate" 27-foot level, 27 feet; rising from 130-foot level south, 79 feet; stoping at various parts of mine, 18,840 cubic feet. Employees average 16 men.

The quantity of ore obtained was 233 tons, valued at £3524.

Attention has been given to constructing a new exit from the main workings below the underground engine and machinery tunnel level, which is quite independent of any part of the main shaft from the lowest workings, to provide an easy means of escape for the employees in case of accident from any cause.

A part of the ore mined during the year comprised antimony, lead, silver, and copper, whilst occasionally fahl-ore has been obtained. The former is sent to Germany, and the latter to Port Kembla (New South Wales).

The average values contained in the antimonial class of ore equals—antimony, 20·2 per cent; lead, 9·8 per cent.; copper, 2·5 per cent.; and silver, 122 oz.

The fahl-ore averages 150·6 oz. silver, and 4·5 per cent. copper. The character of the lode varies considerably. Large bodies of pyrites predominate when the antimonial ore is encountered, alternating to small veins and pockets when fahl-ore is present.

The Dundas Cuni Mining Company Limited.—The trial shipment of ore from the North mine to Europe having been disposed of on satisfactory terms, it was decided to develop the nickel-copper lode on more comprehensive lines. Surface prospecting by trenching disclosed on Section No. 4496-m an outcrop which, on stripping, proved to have an average thickness of 6 feet payable ore for 140 feet long, and it was decided to instal plant and test the lode in depth.

The pumping engine lately used at Zeehan-Dundas Mines was removed and installed here with boiler-winding machinery and poppet heads, and a main shaft sunk 80 feet. A first level has been sent out at 70 feet, and

where the lode is now being driven on it carries 4 feet of ore of payable quality.

The production of nickel ore to date is 630 tons, but as yet no information as to its value is obtainable.

Mt. Balfour Field.—The quantity and value of copper ore produced from this field was:—Murray's Reward, 947 tons, valued at £4557.

Heazlewood.—The Jasper Copper Mine.—An average of 17 men was employed at this mine, but there has been no output during the year.

Northern and Southern Division.—A little prospecting has been done by the Mt. Mueller Prospecting Syndicate at Tyenna, but results do not appear to be very encouraging.

TIN MINING.

The quantity of tin ore raised was 4010·41 tons, valued at £531,983; an average value of £132 13s. 0·126d. per ton.

This shows an increase of 296·585 tons on the previous year.

The statistics for the year are:—

	Ore won, tons.	Value, £	Miners Employed.	
			Europeans.	Chinese.
Northern & Southern Division	57·96	6638	41	—
North-Eastern Division	1655·60	229,699	597	64
Eastern Division	480	63,604	375	26
North-Western Division	1461·74	188,995	639	—
Western Division... ..	355·11	43,047	205	—
Total	4010·41	531,983	1857	90

North-Eastern Division.—The output of tin ore was 1655·60 tons, obtained as follows:—

	Tons.
Pioneer Tin Mine	428·50
Aberroe	16·65
South Mt. Cameron	61·15

	Tons.	
Garibaldi	7 05	
Clifton Creek	159 65	
Yee Gee	49 20	
Other claims	137	
	<hr/>	
	859 2	
<i>Ringarooma District.</i>	Tons.	
Bell's Hill	8	
Other claims	16 55	
	<hr/>	24 55
<i>Derby District.</i>		
Briseis Tin Mines	514 65	
Clyde	10 65	
Waverly	7 65	
Other claims	41 90	
	<hr/>	574 85
<i>Branzholm District.</i>		
Arba Tin Mine	80 40	
New Ruby Flat	19 50	
Other claims	22 15	
	<hr/>	122 05
<i>Moorina District.</i>		
Weld Tin Mine	35 40	
New Banca	7 90	
Other claims	25 90	
	<hr/>	69 20
<i>Straits Islands</i>		5 75
		<hr/>
Total		1655 60
		<hr/>

Eastern Division.—The output of tin ore was 480 tons obtained as follows:—

Weldborough, Lottah, and Blue Tier Mines.

Anchor Mine	137 70	
Other claims	96 70	
	<hr/>	234 40

St. Helens Mines.

J. C. Macmichael	2 05	
C. Miller	3 30	
Pioneer Mine	48 30	
Other claims	19 90	
	<hr/>	73 55

<i>Avoca Mines.</i>		Tons.
Brookstead		7.55
Rex Hill		3.75
Gipp's Creek		5.15
South Esk		9.30
Royal George	122	30
Storey's Creek		9.60
Foster's		9.95
Desire		4.45
		<hr/>
		172.05
		<hr/>
Total		480.00

North-Western Division.—The output of tin ore was 1461.74 tons, obtained as follows:—

	Tons.
Mt. Bischoff	1180
Mt. Bischoff Extended	184.50
Weir's Bischoff Surprise	22.33
Wombat .....	.97
Mt. Cleveland	26.27
Ringtail	8.05
Waratah Alluvial	10.42
Mt. Balfour	29.20
	<hr/>
Total	1461.74

Western Division.—The output of tin ore was 355.11 tons, obtained as follows:—

	Tons.
Boulder Mine	63.25
Renison Bell Mine	153.55
Montana Tin Syndicate	25.98
Heemskirk	19.75
Stanley	11
Penzance	12.01
Others	69.57
	<hr/>
Total	355.11

Northern and Southern Division.—The Shepherd and Murphy Mine produced 56.41 tons of tin ore. An air-compressor plant operated by water-power has been installed. Machine-drills are now used in the stopes, effecting a great saving by their use. This mine has been

worked from adit-levels so far. There is still a big reserve of ore in sight, but the management recognising that this cannot last for ever are now considering the advisability of commencing the sinking of a main working shaft for deeper developments.

Cox's Bight.—A small party working a 5-acre section obtained 1·27 tons of tin ore.

A good deal of interest has been centred in this district during the year, and several parties have been employed by Victorian companies to prospect a large extent of country, by means of boring rods. The results in some instances are said to be very encouraging, resulting in a considerable area of ground being taken up.

North-Eastern Division.—The Briseis Tin and General Mining Company Limited.—The chief work of interest was the working of the tin drifts on the south side of the Ringarooma River to a depth of nearly 100 feet below flood-level. The ground has been raised by gravel pumps driven by water turbines. Very good values have been proved to exist in this part of the mine, the average value of the ground treated for the past 12 months being 3·81 lb. From this low ground below the river-level and below the old workings of Krushka Bros., 1152 tons of black tin have been won to date.

At the time of the flotation of the company it was quite doubtful if any tin existed in this ground at all.

On the northern side of the river poor, high-level drifts have been worked, and also a small amount of hard overburden.

A new cut through which the Ringarooma River is to be diverted to the north of its present bed has made moderate progress.

The quantities of ground dealt with during the year have been smaller than usual, the period having been a comparatively dry one.

The drifts treated at the Briseis Mines amounted to 561,000 cubic yards, from which 503 tons black tin were won; also 91,900 cubic yards of overburden were removed.

The Arba Tin Mining Company, No Liability.—The following work was carried out in connection with the opening up of the easement property:—Erection of power-station at the main Arba Mine, consisting of a Willans three-crank compound single-acting engine, directly coupled to two 50 kw. 200-220 volt, 4-pole, shunt wound Peebles direct current dynamos, which operate in series, thus giving 100 kw. at 400 to 440 volts at a normal speed of 450 revolutions per minute. Steam for this engine is supplied from one Babcock boiler, which has 938 square feet of heating surface, and is fitted with a Babcock & Wilcox superheater. Erection of transmission line 1 mile long, from the power-station to the easement lease. Building pontoon for the dredge, and installing pumping machinery and motors on same. The pumping machinery consists of a gravel and nozzle pump, the former being fitted with a telescope suction-pipe and a Von Schmidt Digger, which operates below the water-line, and keeps the pumps supplied with drift. To move the dredge when working, electric winches have been installed, and a spud, or stern pile, has been fixed to the stern of the dredge to allow the same to operate in a circle. The spud is dropped into the bottom, and holds the dredge at a fixed point, on which it will turn.

This dredge was originally intended to work afloat, but owing to excessive wear in the wheel of the worm-winch, used for raising and lowering the telescope suction-pipe, and the want of room in the paddock to turn the dredge, it was decided to take out the first paddock in the ordinary way, viz., by hydraulic sluicing with the nozzle, the pressure for same being obtained from a nozzle pump, coupled direct to the main shaft of the gravel pump.

A settling dam was constructed by throwing up an embankment 5 chains below No. 1 paddock. All tail-water is impounded in this dam, and after settling is returned to the working face through a nozzle-pump and water-race. A tail-race $3\frac{1}{2}$ chains long and 10 feet wide, into which the pump is to discharge has been constructed.

At the main Arba Mine sluicing was carried on almost continuously during the 12 months under review. The total quantity of drift and overburden removed from all faces was 265,554 cubic yards; and the total quantity of black tin produced for the period was 80 tons 11 cwt.

The average number of men employed was 52. The water-supply during the year (excepting a few weeks in the month of December) was all that could be desired.

The Pioneer Tin Mining Company Limited.—Five hundred and seventy-seven thousand six hundred cubic yards of drift have been pumped and sluiced, for a yield of 475·75 tons of stream tin.

The falling-off in the yardage sluiced was due to the uneven distribution of the rainfall, which involved the suspension of sluicing with one of the plants for six months of the year, and the intermittent running of the other.

A new method of disposing of the tailings by stacking them in the old workings by means of electrically-driven tailings conveyors has been inaugurated, and has proved satisfactory and more economical than the previous system of working.

The company has now commenced active operations at the Argonaut leases, near St. Helens, and in February, 1913, started sluicing the creek flats with a small sluicing plant which, has pumped and sluiced 121,500 cubic yards of drift for a yield of 42·125 tons of stream tin.

Sluicing was also carried on at the South Pioneer leases adjoining the parent mine (when the water-supply permitted), and 10,500 cubic yards of drift have been sluiced for a yield of 2·7 tons of stream tin, making a total for the year from this company's operations of:—

Mine.	Yardage.	Yield. Tons of S. Tin.	Approx. Value. £	Men Employed.
Pioneer ...	577,600	475·75	66,500	65
Argonaut ...	121,500	42·125	5897	15
South Pioneer ...	10,500	2·7	378	5
Total ...	<u>709,600</u>	<u>520·575</u>	<u>72,775</u>	<u>85</u>

Preparations are being made for shifting the Pioneer Mine sluicing plants ahead, which will be carried out early in the new year.

The Guiding Star Tin Mining Company.—A 10-head battery and tin-dressing machinery have been erected, and crushing commenced during the last quarter of the year. A tramway is laid up to Smith's shaft, and most of the stone is obtained from a short adit run in to cut the lode at this place. Another tramway over 30 chains in length is laid to bring stone up from a big formation, recently discovered in the alluvial workings. This promises to be a payable thing, but unfortunately it is a good way below the battery level. No work is at present being done in the main adit going in from the creek on the lode near the battery.

The Mutual Hill Company's Mine is being worked by the Briesis Company. Some fair returns are obtained from the flat.

The South Mt. Cameron Tin Mining Company, No Liability.—One hundred and fifty-three thousand two hundred and forty-six cubic yards of tin-bearing wash were treated, for a return of 61 tons 3 cwt. of tin oxide.

The amount of gold obtained from the tin oxide was 22 oz. 16 dwt.

For the first half of the year the ground treated was of a hard nature and poor value, as 66,626 cubic yards only yielded 27 tons 4 cwt. of tin oxide and 9 oz. 15 dwt. of gold, or an average of 931 lb. of tin per cubic yard.

The second half-year was no better, as 86,620 cubic yards of wash treated only returned 33 tons 19 cwt. of oxide and 13 oz. 1 dwt. of gold, making a total of 153,246 cubic yards treated for 61 tons 3 cwt. of tin and 22 oz. 16 dwt. of gold.

The amount of tin won for the year was considerably lower than the previous one.

The dryness of the season round the East Coast, and poorness of the wash treated, had a good deal to do with the reduction in output.

At the commencement of the year the dryness of the weather and consequent shortage of water proved a serious drawback, as under ordinary circumstances the second clean up should have taken place about the end of April, whereas it was not effected until the beginning of July.

The pumping plant, consisting of four Babcock and Wilcox boilers, 400 I.H.P. "Allen" engine, and Mather and Platt pump of the centrifugal type, is in good order, also the tramlines used for supply of firewood, bridges, &c.

The average number of men employed by the company was 34.

The Aberroe Tin Mining Company, No Liability.—Fifty-eight thousand cubic yards of ground were treated, for a yield of 15 tons of tin ore, the value of which would be about £18,000.

The average number of men employed was 11.

The New Banca Tin Mining Company, No Liability.—The output of tin for the year was 7 tons 13 cwt. 2 qr. 5 lb. The amount received for same was £917 3s. 8d. This tin was obtained during the last half-year, as water was not available for sluicing before July, 1913.

The number of men employed was nine.

This is significant, as indicating the small rainfall for the year.

On the lower Wyniford River, Yee Gee is still getting good results from his South Argus sluicing claim; a steam plant and gravel pump is in use.

The Garibaldi Tin Mine was let on tribute to Sheen Bros. in August. The tributors have installed a 16-horsepower portable engine to drive the gravel pump, instead of the water-power previously used. The mine was practically idle for the quarter ending 30th September.

Clifton Creek Tin Mine.—This is still maintaining a good output of tin.

Gladstone Mines.—The small mines round about this place and Mussel Roe have not been doing so well this

year. Last year they had a good supply of water for most of the year, and the price of tin was higher. This year water has been scarce from start to finish, and there has been a fall in the price of tin of from £70 to £80 per ton. Only one new mine of any consequence has been added to the list. Kerrison and Higgs have installed a 20-horse-power engine and centrifugal pump to pump water from the Mt. Cameron water-race on to their Garfield Hill Mine, east of Gladstone.

Clarence Tin Prospecting Association.—Nothing has come of the boring operations carried on by this association.

Eastern Mining Division.—The Weld Tin Mine has done fairly well considering the scarcity of water. The deep lead ground north of the township has been worked during part of the year.

Owing to the scarcity of water very little mining has been done in the Weldborough district.

The Waverly and Fancy Creek Companies keep going, but the output is not large. Some of the small claims north-eastward and at the old Cream Creek Mine are doing fairly well.

The Bell Hill Company had a very small output for the year.

In the vicinity of the Upper Cascade River, Mr. R. E. Greaves has made what appears to be an important discovery in the way of a tin lode on his Section 6568-m. The lode where cut in the tunnel 70 feet below the surface is 16 feet wide. A bulk assay is said to have given 2.3 per cent. of copper and 1.2 per cent. of tin.

Anchor Tin Mine.—There are no new developments. The drop in the tin market, scarcity of water, &c., has made things bad for this mine.

Pioneer Company's Mine, on the Golden Fleece Rivulet, known as the "Argonaut," has been working with good results since February last, when the new plant was started.

Other Claims.—McMichael, McAuliff, Millen, and others have been getting small returns from their respective claims. The Saxelby Company made an attempt with a gravel pump plant, but was not successful.

The Troy Mine (late Pyramid).—Mr. Purdue, when in London, managed to get sufficient capital to give this mine another trial. The venture is taken on by Messrs. John Taylor & Sons, who are also the London managers of the Tasmania Gold Mine. Mr. C. F. Heathcote, superintendent of the latter mine made an examination, and carefully sampled the tin-bearing quartzite in each of the adits. As a result of this, and his report to Taylor & Sons, sufficient capital has been provided to thoroughly prospect the property. The old adits, of which there are quite a number, are to be connected, and fresh adits will be driven.

If, as a result of all this, it can be shown that the great bulk of the stuff is as good as the values obtained from the first prospecting, there will, it is understood, be no difficulty in getting sufficient capital to erect works designed to treat very large quantities of low-grade stuff.

The hill—a narrow-topped ridge sloping steeply on three sides—affords great facilities for either tunnelling or open-cut working.

About 30 men are employed.

Royal George Tin Mine.—The course of the lode from where the adit cuts it at the north-west end has been driven on for over 400 feet at the deepest point; the adit level on the lode is 90 feet below the surface. The lode still maintains its width (from 11 to 14 feet) and values. A belt of pyritic ore was met with, but fortunately was soon passed. A calcining plant has been erected for roasting the seconds and dealing with more complex pyritic stuff.

About eight men are employed.

Brookstead Freehold.—An option was obtained over this by a Launceston syndicate, and an attempt was made to prove the value of the alluvial deposits by gravel-pump operations.

A plant was erected on the low sloping ground going down to the St. Paul's River. A face was opened in ground from 12 to 15 feet in depth, and sluicing ceased after a few weeks.

The Gipps Creek and other mines about Ben Lomond are going on in a small way. They have been worse off for water than the north-eastern mines.

Western Mining Division.—The Renison Bell Prospecting and Mining Company.—The number of tons of ore mined and treated was 22,730, which, on concentration, returned 153.5 tons of tin oxide, containing 96.8 tons of metallic tin, valued at £19,000. The average number of men employed was 55.

Nearly the whole of the ore treated was drawn from the open-cut workings north of the Argent River. The ore-bodies here are opening up very satisfactorily, being oxidised to a much greater depth than other parts hitherto worked. A concentration of operations makes it possible to mine ore at much less cost.

Prospecting work has been carried out continuously, and has on the whole proved highly remunerative. A good deal of attention has been given to the pyritic ore-bodies, and the development of these by drives, &c., has proved them to carry highly payable values in tin.

In addition to prospecting by adits, &c., five diamond-drill bores were put down, aggregating in all 1200 feet in depth. These were spaced at fairly equal intervals for a distance of 1000 feet on the strike of the ore-body. The results of the boring were most satisfactory as regards proving the permanency and value of the ore-bodies at that depth. In view of the contemplated early treatment of the pyritic ore, preparations are now being made for the installation of an Edwards roasting furnace capable of treating upwards of 20 tons of pyritic concentrates per 24 hours.

The duplication of the present 10-head stamp battery and milling plant is now under construction, and the neces-

sary additional concentrating machinery which the treatment of the calcined ore will involve is also under construction.

A second storage dam having a capacity of 40,000,000 gallons, is being constructed above the present dam on the Argent River. This dam when completed will ensure an unfailing supply of water for power purposes when the additional milling plant is erected.

The Boulder Tin Mine.—Ore crushed, 6458 tons; oxide recovered, 63½ tons—of an average value of £115 per ton.

The ore crushed has been densely pyritic, assaying 30 per cent. sulphur in the faces, necessitating the calcining of the whole of the concentrates before the tin can be recovered. A middle product or second concentrate is produced, carrying 40 per cent. sulphur, of which 300 tons have been sent away during the last three months.

Considerable expenditure has been incurred this year in connection with the increase of plant, buildings, and water-supply. A race 3¾ miles in length (2 feet 6 inches wide at bottom, 1 foot 6 inches deep in the solid on the low side) has been completed, together with 20 chains of fluming of the same capacity. A pipe-line 30 chains in length is under construction. This will connect between the race and the power-station. The pipes are steel rivetted, 15 inches in diameter. The pressure will be 430 feet.

The main building has been extended; a 10-head battery of 1000 lb., stamps, and rockbreaker have been erected, the crushing capacity on hard stone being estimated at 1000 tons per month. This is driven by wire rope direct from the Pelton shaft. Tables and other appliances have been added which enable a satisfactory recovery to be made from a difficult ore. The oxide recovered is very fine. Screen tests show that 80 per cent. passes through a sieve of 200 meshes to the lineal inch.

The average number of men employed was 41.

North-Western Mining Division—The Mt. Bischoff Extended Tin Mining Company, No Liability.—Stoping

was continued above the different levels, on average grade ore assaying 0.94 per cent. tin.

The mill crushed 16,956 short tons, for a yield of 182.30 tons of calcined tin ore (wet weight), valued approximately at £20,500.

The average number of men employed was 100.

The ore reserves at 30th September, 1913, were:

(3 sides)—Ore developed, 30,483 tons; value, 1.0 per cent.

(2 sides and under)—Ore developing, 8567 tons; value 0.9 per cent.

The Mt. Bischoff Tin Mining Company, Registered.—The usual surface mining was continued in the several benches of the White Face, Brown Face, Stanhope Section, Slaughteryard Face, Gossan Benches, Summit of the Mount, and Don Section.

The output of crush-dirt from all sources totalled 228,664 tons, which were delivered at the mills for crushing and concentration. From the material treated, 1180 tons of tin oxide were obtained, giving an average of 11.16 lb. per ton of crush-dirt.

The value of the ore won is estimated at £136,880; and the number of men employed during the period under review averaged 460.

Underground workings.—The extraction of ore from these workings has been much the same as during the previous year; 1200 feet of levels were driven, and a large amount of waste material has been filled in the depleted stopes.

Prospecting Drives on the Northern Slopes.—No. 2 adit east was extended 200 feet, making a total of 570 feet; 49 feet of low-grade porphyry being driven through.

No. 3 adit.—A commencement was made with a third adit, and 100 feet of driving was accomplished. This adit has yet some distance to go before the ore-body will be reached.

Surface Work on the Northern Slopes.—No. 2 aerial ropeway was successfully completed during the latter portion of the year. The installation of this plant will permit of a systematic prospecting of the surface deposits on these slopes. A bench has been started in order to test the wash in the ravine above the Loading Station, and the material won is being transported over the aerial to the main rock-crushing station, and from thence it is conveyed to the milling and concentrating plant. Some little time must elapse before reliable data can be obtained on which to base estimates of the value of these deposits.

Milling and Concentrating Plant.—This plant has worked exceptionally well, and the high-grade of concentrates produced has been maintained.

Hydro-Electric Power Plant.—All the machinery in connection with this plant has been in continuous operation. A commencement was made with the erection of the fourth turbo-generator set, and it is expected to be ready for use during the early part of next year. The working costs averaged 4s. 10.721d. per ton of crude ore.

COAL MINING.

The total quantity of coal raised amounted to 55,043 tons, valued at £25,367; being an increase of 1483 tons on the previous year.

The raisings at the different collieries were:—

Colliery.	Tons raised.	Men employed.
Cornwall	21,696	58
Mt. Nicholas	30,903	65
Spreyton	1167	7
York Plains	847	3
Illamatha	160	1
Mt. Cygnet	270	2
Total	<u>55,043</u>	<u>136</u>

The Mt. Nicholas and Cornwall collieries have maintained their outputs for the year, and could considerably increase

the supply of coal if occasion required and the trade warranted it.

The smaller collieries have contributed slightly to the output.

Catamaran Colliery.—A Broken Hill syndicate has taken up these leases with the view of first proving the ground and then opening up the mine.

Development work has been carried on under Mr. Young's supervision. A series of bore-holes has been drilled for the purpose of tracing the line of outcrop in both directions from the mine workings.

The result of boring operations has been successful, the outcrop of the seam having been traced for a total distance of 4300 feet. Considerable difficulty was experienced in tracing the seam in a north-easterly direction, owing to the presence of boulders of diabase, some of them attaining a weight of several tons. These are distributed more or less thickly all over the coalfield, and are sometimes so closely packed together that it is almost impossible to get the drill past them. Several shafts have been sunk for some distance through the boulder bed, but owing to influx of water only one shaft reached the stratified rock below the boulders. A bore from the bottom of this shaft struck the seam at 43 feet from the surface and went through 10 feet 6 inches of coal. There is every reason to expect that the seam strike continues in approximately the same direction as that already proved, right to the northern boundary of the leases.

The outcrop has also been traced from the mine workings to the south-west corner of Section 4866-m. The seam in this direction is thinner.

The old workings, being useless, a trial tunnel was started a little south-west of them, but was found unsuitable for a main entry to the mine, and a more suitable site has been selected for opening the mine up on a proper scale.

Along the north-eastern line of bores a shaft has disclosed coal of excellent quality at a depth of 27 feet.

The overlying rock is hard sandstone, which will form a first-class roof. The seam has also been proved for about 600 feet to the dip by a bore, which struck the seam at 124 feet, and was still in coal at 140 feet, when the boring rods broke off in the hole, and prevented further boring. The result of this bore is considered by the management as most satisfactory.

TASMANITE SHALE.

The Railton-Latrobe Shale Oil Company acquired the Tasmanian Shale and Oil Company's leases and plant in July, 1912. Experimental work was started immediately after in the laboratory at the Latrobe works.

A start was made in January to erect a complete experimental plant with a retort of new design. This was completed in March, and retorting and distillation carried out on a small scale for about four months.

The experiments were a complete success, both as regards quantity and quality of products.

In view of this it was decided to erect a working unit designed on the same principle as the experimental plant. Consequently, the Tasmanian Company's retorts were dismantled and scrapped.

The entire transporting and mining system has been remodelled, and an important modern process installed in the refinery for the extraction of gasoline from the retort gases. This light gravity and valuable spirit was not recovered by the Tasmanian Company.

The underground development work produced about 200 tons of shale, which is stacked at the mine awaiting haulage.

A contract has been let for an additional quantity of 300 tons. Five hundred tons of firewood have been procured and stacked at the works.

The next unit of retorts is under construction, and it is expected that the company will be producing oil in a very short time. Contracts have been made for practically the whole of the products.

OSMIRIDIUM.

The high prices offered by the several persons competing for the purchase of this metal has kept from 90 to 100 miners employed in the Savage River and its tributaries, and 1261·65 oz. were obtained, valued at £12,016, an average value of £9 10s. 5·77d. per oz.; being an increase of 482·88 oz., as compared with the previous year.

The Government Geologist visited the field during the year, and has furnished a report upon the Reward section applied for by William Caudry, the discoverer of osmiridium in lode-formation at Bald Hill, and a number of sections taken up by others in the same locality.

BISMUTH.

The Shepherd and Murphy Mine at Middlesex obtained from its tin ore 5·03 tons of bismuth, valued at £1616.

The Squib Mine obtained 0·05 ton, valued at £11.

WOLFRAM.

The output of Wolfram ore was as follows:—

	Tons.	Value, £
Avoca	31·30	3496
Shepherd and Murphy Mine at Middlesex	28·75	2692
Iris Mine	2·92	342
Squib	5·10	510
Total	68·07	7040

The following Return shows the Quantity and Value of Mineral Products for the State of Tasmania during the Year ending 31st December, 1913.

Mineral.	Quantity.	Value.
		£
Gold*..... ozs.	33,400·457	141,876
Silver-lead Ore tons	83,289·268	319,997
Blister Copper † „	4569	364,732
Copper and Copper Ore... „	1966·8	10,932
Tin Ore „	4010·41	531,983
Coal „	55,043	25,367
Wolfram „	68·07	7040
Bismuth „	5·08	1627
Osmiridium..... ozs.	1261·65	12,016
Shale.....tons	130	130
Total .....	...	£1,415,700

* Fine gold, including gold contained in blister copper and silver-lead bullion.

† Value of gold deducted.

GEOLOGICAL SURVEY.

Work in this branch has continued actively, and the demands for its services are more than can be satisfied promptly.

As is well known the functions of a Geological Survey, besides areal mapping, are to ascertain and make known the mineral resources of the State, to investigate and disseminate information concerning the ores and ore-deposits of the island generally, and add to our knowledge of any geologic features of economic importance. While the sur-

vey must of necessity embrace in its programme the consideration of many subjects belonging to pure geologic science, the Department is guided by a conviction that its principal work must always lie in the domain of economic geology.

The present staff includes specialists in economic and general geology, mining engineering, and industrial chemistry, and it is intended that the whole resources of the survey shall be at the disposal of the mining community and of all who are anxious to receive disinterested and trustworthy information.

Applications for information are being constantly received from the public, from commercial firms and educational institutions throughout the world, and frequently much time has to be spent in applying tests and collecting the information necessary for replies to very brief questions. Personal application for any information—geological, mineralogical, economic—which it is in the power of the Survey to give are earnestly invited, and will be carefully replied to.

The increasing Survey collections in the Victoria Museum will be fostered and displayed, so as to be as informative as possible to those who consult them. Due provision is being made for the necessary casing accommodation for ores and minerals from all parts of the island. Such time and effort as may be advisable and necessary will be devoted to securing the adequate arrangement and exhibition of these. In addition, educational collections of Tasmanian ores and minerals still continue to be prepared for schools and public institutions in the Commonwealth.

The Survey publications are graded into different classes. The bulletins deal as thoroughly as possible with mining districts, and are accompanied by geological maps. The reports are devoted to special inspections only. The records are restricted to the publication of the results of palæontological, mineralogical, or stratigraphical research;

i.e., to the geology of the island in its scientific aspect. It is hoped that in this way a body of useful literature will be created which will be of service not only to the present-generation, but also to those who live after us.

INSPECTORS OF MINES.

The three inspectors of mines have performed their duties satisfactorily during the year. Their reports are appended.

MINING MANAGERS' EXAMINATION.

Three candidates presented themselves for examination, but only one succeeded in obtaining sufficient marks to entitle him to receive a metal mine manager's certificate.

DIAMOND-DRILLS.

The two-diamond-drills belonging to the Department were sold towards the end of the year. They were purchased in 1882. The number of bores put down by these drills was 101, and the total distance bored was 32,901½ feet. They had not been in use since 1903, except for putting down a short bore of 218 feet by the smaller drill in 1908, and were quite out of date.

The stock of diamonds realised £2973 5s., having been disposed of to the Goldfields Diamond-drilling Company of Victoria.

DEPARTMENTAL STAFF.

The following changes in the staff of the Department have been made during the year:—

J. Wardrop, Clerk, promoted, *vice* G. Green retired, 1st January, 1913.

L. W. Fletcher appointed Clerk on probation, *vice* J. Wardrop, 1st February, 1913. Appointment confirmed 1st August, 1913.

REVENUE.

The revenue for the year amounted to £19,410 17s. 8d., being an increase of £1770 17s. 9d. on the previous year.

The sum of £3091 6s. 2d. deposited as survey fees with applications for leases is not included in the revenue.

CONCLUSION.

In conclusion, I desire to thank the officers of the Department and the officers of the Mines Drafting Branch of the Survey Department for the loyal and efficient manner in which they have performed the various duties allotted to them.

I have, &c.,

W. H. WALLACE, Secretary for Mines.

The Hon. the Minister for Mines.

Diagram showing Total Quantity Value of Gold won in Tasmania during the years 1880-1913

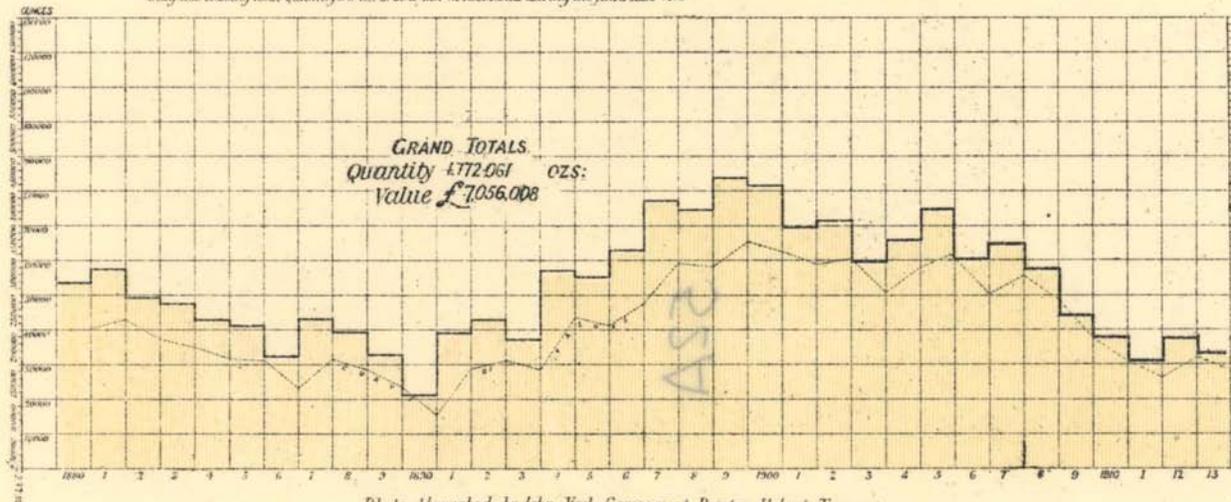


Photo Agraphed by John Vail Government Printer Hobart Tasmania.

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No. 1.

*RETURN showing the Quantity and Value of Gold won during
the Years 1880 to 1913 inclusive.*

Year.	Quantity.	Value.
	ozs.	£
1880.....	52,595	201,297
1881.....	56,693	216,901
1882.....	49,122·3	187,337
1883.....	46,577·5	176,442
1884.....	42,339·95	160,404
1885.....	41,240·95	155,309
1886.....	31,014·5	117,250
1887.....	42,609·15	158,533
1888.....	39,610·95	147,154
1889.....	32,332·65	119,703
1890.....	20,510	75,888
1891.....	38,789	145,459
1892.....	42,378	158,917
1893.....	37,687	141,326
1894.....	57,873	217,024
1895.....	54,964	206,115
1896.....	62,591	237,574
1897.....	77,131	296,660
1898.....	74,233	291,496
1899.....	83,992	327,545
1900.....	81,175	316,220
1901.....	*69,491	295,176
1902.....	*70,996	301,573
1903.....	*59,891	254,403
1904.....	*65,921	280,015
1905.....	*73,540·5	312,380
1906.....	*60,023·4	254,963
1907.....	*65,354·25	277,607
1908.....	*57,085·1	242,482
1909.....	*44,777·366	190,201
1910.....	*37,048·053	157,370
1911.....	*31,100·873	132,108
1912.....	*37,973·252	161,300
1913.....	*33,400·457	141,876
	1,772,061·201	7,056,008

* Fine Gold.

No. 2.

RETURN showing the Quantity and Value of Silver-Lead Ore produced during the Years 1888 to 1913 inclusive.

Year.	Quantity.	Value.
	Tons.	£
1888	417	5838
1889	415	7044
1890	2053	26,487
1891	4810	52,284
1892	9326	45,502
1893	14,302	198,610
1894	21,064	293,043
1895	17,980	175,957
1896	21,167	229,660
1897	18,364	200,167
1898	15,320	188,892
1899	31,519·5	250,331
1900	26,564	279,372
1901	28,774	207,228
1902	46,480	218,864
1903	42,422	192,492
1904	51,138	203,702
1905	75,270·5	246,888
1906	87,117·7	462,443
1907	89,762·5	572,560
1908	63,116·9	322,007
1909	80,378·35	298,880
1910	51,226·91	247,576
1911	61,501·195	253,361
1912	90,123·868	309,098
1913	83,289·268	319,997
	1,033,902·741	5,808,283

No. 3.

RETURN showing the Quantity and Value of Blister Copper produced during the Years 1896 to 1913 inclusive.

Year.	Quantity.	Value.
	Tons.	£
1896	41.5	1245
1897	4700	322,500
1898	4955.5	400,668
1899	8598	735,305
1900	9449	907,288
1901	9981	879,625
1902	7745	*462,151
1903	6684	*478,023
1904	8371	*582,540
1905	8610	*704,287
1906	8708	*862,444
1907	8247	*832,691
1908	8833	*603,063
1909	8638	*586,419
1910	8193	*553,822
1911	6022	*385,797
1912	5136	*430,965
1913	4569	*364,732
	127,481	10,093,565

* Value of Gold contained deducted.

No. 4.

RETURN showing Quantity and Value of Copper Matte exported during the Years 1902, 1903, and 1904 to 1913 inclusive.

Year.	Quantity.	Value.
	Tons.	£
1902	2500	50,112
1903	3727	83,624
1904-1913.....	—	—
	6227	133,736

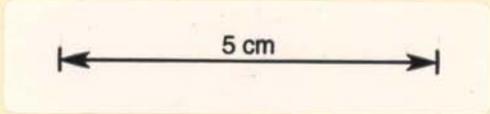
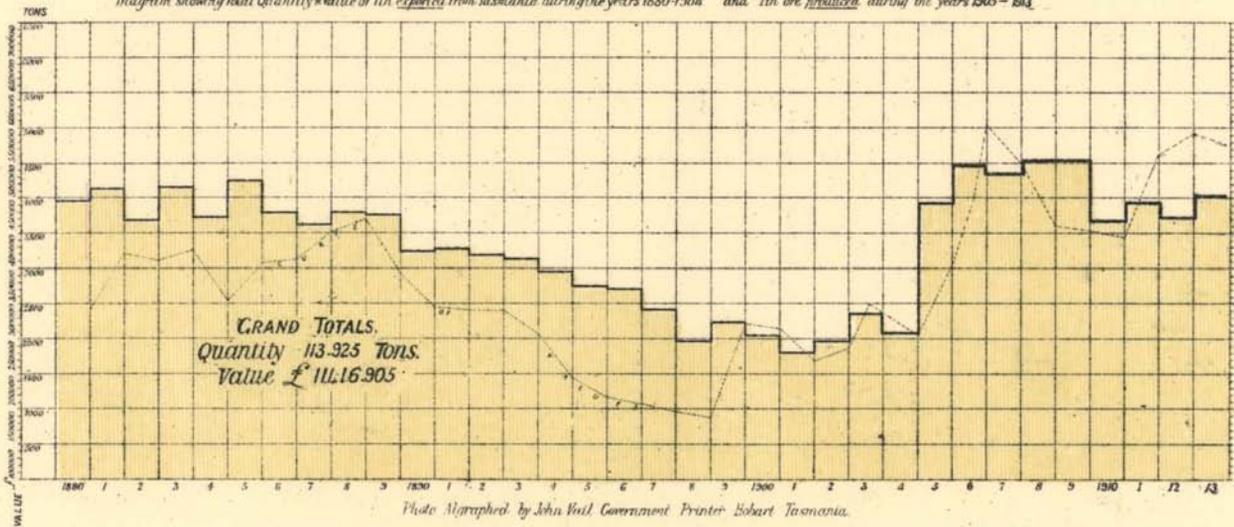
No. 5.

RETURN showing the Quantity and Value of Copper Ore produced during the Years 1896 to 1913 inclusive.

Year.	Quantity.	Value.
	Tons.	£
1896	34	1020
1897	75	2250
1898	394	8128
1899	1695	26,833
1900	4221·5	63,589
1901	11,221	130,412
1902	5994	65,270
1903	102	790
1904	104	1640
1905	1150·75	52,939
1906	2234·5	72,480
1907	788·25	36,975
1908	1185	6588
1909	1587·8	21,619
1910	671·27	13,150
1911	2286	22,852
1912	1391·6	9479
1913	1966·8	10,932
	37,102·47	546,946

Ad 2

Diagram showing Total Quantity & Value of Tin exported from Tasmania during the years 1880-1904 and Tin ore produced during the years 1905-1913



No. 6.

RETURN showing the Quantity and Value of Tin exported from Tasmania during the Years 1880 to 1904 (compiled from Customs Returns only), and Tin Ore produced during the Years 1905 to 1913 inclusive.

Year.	Quantity.	Value.
	Tons.	£
1880	3954	341,736
1881	4124	375,775
1882	3670	361,046
1883	4122	376,446
1884	3707	301,423
1885	4242	357,587
1886	3776	363,364
1887	3607·5	409,853
1888	3775·25	426,321
1889	3764	344,941
1890	3209·25	296,368
1891	3235	291,715
1892	3174	290,083
1893	3128·5	260,219
1894	2934	198,298
1895	2726·75	167,461
1896	2700	159,036
1897	2423·5	149,994
1898	1972	142,046
1899	2239·25	278,323
1900	2029	269,833
1901	1789·5	212,542
1902	1958·25	237,828
1903	2376·15	300,098
1904	2171·5	255,228
1905*	3891·5	362,670
1906*	4472·75	557,266
1907*	4342·75	501,681
1908*	4520·8	421,580
1909*	4511·2	418,165
1910*	3701·01	399,393
1911*	3953·05	513,500
1912*	3713·825	543,103
1913*	4010·41	531,983
	113,925·695	11,416,905

* Tin Ore produced : Customs having ceased to issue Returns.

No. 7.

RETURN showing the Quantity and Value of Wolfram produced during the Years 1899 to 1913 inclusive.

Year.	Quantity.	Value.
	Tons.	£
1899	3·5	99
1900	53·75	2058
1901	—	—
1902	—	—
1903	—	—
1904	15·5	1147
1905	32·25	2371
1906	19·75	1465
1907	40·75	4411
1908	4·5	338
1909	28·35	2494
1910	67·35	7280
1911	69·96	7769
1912	66·49	6601
1913	68·07	7040
	470·22	43,073

5 cm

Diagram showing Total Quantity (exclusive of Coal mined in Tasmania) during the years 1880-1913



*RETURN showing the Quantity and Value of Coal raised during
the Years 1880 to 1913 inclusive.*

Year.	Quantity.	Value.
	Tons.	£
1880	12,219	10,998
1881	11,163	10,047
1882	8803	7923
1883	8872	7985
1884	7194	6475
1885	6654	5989
1886	10,391	9352
1887	27,633	24,870
1888	41,577	37,420
1889	36,700	33,030
1890	50,519	45,467
1891	43,256	38,930
1892	36,008	32,407
1893	34,693	27,754
1894	30,499	24,399
1895	32,698	26,159
1896	41,904	33,523
1897	42,196	33,757
1898	47,678	38,256
1899	42,609	38,349
1900	50,633	44,227
1901	45,438	38,451
1902	48,863·5	41,533
1903	49,069	41,709
1904	61,109	51,942
1905	51,993	44,194
1906	52,895·75	44,962
1907	58,891	50,057
1908	61,067·75	51,907
1909	66,161·75	56,237
1910	82,445	48,609*
1911	57,067	26,214*
1912	53,560	24,568*
1913	55,043	25,367
	1,367,502·75	1,083,067

* Value at pit's mouth.

No. 9.

RETURN showing the Quantity and Value of Iron Ore produced during the Years 1897 to 1913 inclusive.

Year.	Quantity.	Value.
	Tons.	£
1897	894	812
1898	1598	1598
1899	3577	3474
1900	5375	5995
1901	612	417
1902	2386	1075
1903	5980	2905
1904	6840	2975
1905	6300	2600
1906	2600	1100
1907	3000	1150
1908	3600	1600
1909-1913.....	—	—
	42,762	25,701

No. 10.

RETURN showing the Quantity and Value of Asbestos produced during the Years 1899 to 1913 inclusive.

Year.	Quantity.	Value.
	Tons.	£
1899	200	363
1900	128	113
1901	46·5	45
1902-1913.....	—	—
	374·5	521

No. 11.

RETURN showing the Quantity and Value of Bismuth producea during the Years 1904 to 1913 inclusive.

Year.	Quantity.	Value.
	Tons.	£
1904	·3	15
1905	3·5	800
1906	·3	24
1907	·175	27
1908	3·75	462
1909	2·9	980
1910	10·70	4249
1911	14·395	5758
1912	7·59	2646
1913	5·08	1627
	48·69	16,588

No. 12.

RETURN showing the Quantity and Value of Osmiridium produced during the Years 1910 to 1913 inclusive.

Year.	Quantity.	Value.
	Ozs.	£
1910	120	530
1911	271·88	1188
1912	778·77	5742
1913	1261·65	12,016
	2432·30	20,176

No. 13.

RETURN showing the Quantity and Value of Shale produced during the Years 1910 to 1913 inclusive.

Year.	Quantity.	Value.
1910	Tons. 364	£ 214
1911	500	250
1912	—	—
1913	130	130
	994	594

No. 14.

RETURN showing the Quantity of Silver-Lead and Copper Ore smelted for period 25th June to 31st December, 1896, and 1st January, 1897, to 31st December, 1912.

Year.	Ore Smelted.	Products.			Yield.			
		Silver-Lead Bull'n.	Blister Copper.	Matte.	Copper.	Silver.	Gold.	Lead.
	Tons.	Tons.	Tons.	Tons.	Tons.	Ozs.	Ozs.	Tons.
1896	26,028 $\frac{1}{2}$ $\frac{3}{10}$	—	—	2417 $\frac{6}{10}$	1235 $\frac{1}{10}$	75,951	4707	—
1897	90,773 $\frac{1}{2}$	—	3476 $\frac{1}{2}$ $\frac{3}{10}$	257 $\frac{6}{10}$	3583 $\frac{1}{10}$	334,349	16,485	—
1898	170,933	—	4992	—	4783	606,123	24,418	—
1899	275,239	2295	8463	89 $\frac{8}{10}$	8362	1,089,657	27,615	—
1900	363,113	4817	9440	—	9341	1,215,036	26,255	—
1901	355,528	1839	9982	50	9880	800,317	21,717	—
1902	411,736	6825	7727	2882	8841	1,674,816	24,719	6654
1903	399,032	7560	6683	3413	8094	1,855,158	25,238	7529
1904	433,366	—	8371	—	8265	1,896,134	26,809	7754
1905	466,578	9422	8611	—	8596	2,075,431	26,469	9086
1906	479,775	9380	8768	—	8613	2,150,405	24,986	9300
1907	472,658	10,590	8248	—	8145	2,147,120	24,531	10,060
1908	440,145	7181	8834	—	8723	1,654,350	22,008	6850
1909	429,549	6960	8640	—	8534	1,534,780	18,812	6696
1910	386,679	—	8192	—	8093	656,793	11,851	—
1911	284,038	3328	6022	—	5951	747,748	10,565	3204
1912	331,182	5293	5136	—	5073	958,541	12,809	5123

No. 15.

RETURN showing the Average Number of Persons engaged in Mining during the Years 1880 to 1913 inclusive.

Year.	Number.	Year.	Number.
1880.....	1653	1897.....	4510
1881.....	3156	1898.....	6052
1882.....	4098	1899.....	6622
1883.....	3818	1900.....	7023
1884.....	2972	1901.....	6923
1885.....	2783	1902.....	5934
1886.....	2681	1903.....	6017
1887.....	3361	1904.....	6194
1888.....	2989	1905.....	6581
1889.....	3141	1906.....	7005
1890.....	2868	1907.....	7516
1891.....	3219	1908.....	6466
1892.....	3295	1909.....	6054
1893.....	3403	1910.....	5770
1894.....	3433	1911.....	5247
1895.....	4062	1912.....	5566
1896.....	4350	1913.....	6107

No. 16.

RETURN showing the total Number and Area of Leases issued during the Year ending 31st December, 1913.

Mineral.	No. of Applications.	No. of Sluiceways.	Area.
			Acres.
Asbestos .....	...	...	...
Clay .....	...	...	...
Coal	8	...	1480
Copper	3	...	130
Gold	35	...	529
Guano .....	...	...	...
Iron	2	...	152
Limestone	2	...	360
Machinery Sites	4	...	13
Minerals	80	...	4029
Nickel	1	...	41
Shale	2	...	1588
Silver	12	...	810
Tin	199	...	5576
Wolfram	1	...	61
Dredging Claims	10	...	217
Water-rights	72	246	352
Mining Easements	31	...	196
	462	246	15,534

No. 17.

RETURN showing the total Area of Land and Number of Sluice-heads of Water applied for during the Year ending 31st December, 1913.

Mineral.	No. of Applications.	No. of Sluiceheads.	Area.
			Acres.
Asbestos.....	7	...	350
Coal	13	...	2723
Copper	13	...	894
Chrysotile	3	...	160
Dredging Claims.....	15	...	248
Flux	1	...	2
Gold	89	...	1623
Iron	1	..	74
Limestone	1	...	100
Machinery Sites	8	..	28
Minerals.....	151	...	7415
Nickel	11	...	538
Osmiridium	48	...	820
Shale	2	...	520
Silver.....	10	...	485
Tin.....	295	...	6625
Water-rights	153	312	365
	821	312	22,970

No. 18.

RETURN showing the Number and Area of Leases held under "The Mining Act," in force on 31st December, 1906 to 1913 inclusive.

Nature of Lease.	In force on 31st December, 1906.		In force on 31st Dec., 1907.		In force on 31st Dec., 1908.		In force on 31st Dec., 1909.		In force on 31st Dec., 1910.		In force on 31st Dec., 1911.		In force on 31st Dec., 1912.		In force on 31st December, 1913.	
	No.	Area.	No	Area.	No.	Area.	No.	Area.	No.	Area.	No.	Area.	No.	Area.	No.	Area.
For Minerals, Silver, Tin, &c.	1307	Acres. 43,036	1844	Acres. 65,047	1269	44,099	1143	41,637	1141	Acres. 44,001	1025	Acres. 41,311	960	Acres. 36,157	926	Acres. 36,271
For Coal, Slate, Shale, &c.	35	6025	45	7962	45	8745	51	10,590	50	10,608	58	13,049	37	8854	23	5660
For Gold	167	1836	222	2671	111	1344	87	1265	76	1159	73	1220	73	1344	54	988
Dredging Claims	91	2027	79	1494	64	916	47	712	35	441	42	647	42	489	30	329
Mining Easements	47	298	75	436	88	453	92	464	84	484	99	606	133	606	105	603
Machinery Sites	—	—	—	—	33	133	32	129	33	121	37	145	39	149	36	153
Water-rights Mineral and Gold	391	1606 sluice-heads	490	1978 sluice-heads	511	1003 & 2000 sluice-heads	550	1022 & 2210 sluice-heads	511	1094 & 1751 sluice-heads	502	1060 & 1845 sluice-heads	550	1640 & 2043 sluice-heads	546	1909 & 2034 sluice-heads

No. 19.

*RETURN showing the Total Number of Leases in force on
31st December, 1913.*

Mineral.	Number.	Sluiceways.	Area.
			Acres.
Asbestos .....	...	...	...
Barite	1	...	80
Clay	1	...	10
Coal	16	...	3312
Copper	55	...	2642
Gold	54	...	988
Guano.....	1	...	2
Iron	3	...	222
Limestone.....	4	...	610
Lithographic Stone.....	...	...	...
Minerals	132	...	11,567
Manganese.....	...	...	...
Nickel.....	2	...	61
Ochre .....	...	...	...
Phosphate Rock	4	...	15
Silver	57	...	4157
Slate.....	1	...	240
Shale.....	1	...	1488
Tin.....	660	...	17,298
Wolfram	11	...	227
Zinc-Lead .....	...	...	...
Machinery Sites	36	...	153
Mining Easements	105	...	603
Dredging Claims	30	...	329
Water Rights	546	2084	1909
	1720	2084	45,913

No. 20.

RETURN showing the Average Number of Miners employed during the Year ending 31st December, 1913.

	Europeans.	Chinese.
Northern and Southern Division	527	...
North-Eastern Division.....	607	64
Eastern Division.....	517	26
North-Western Division	990	...
Western Division	3976	...
	6017	90

No. 21.

RETURN showing the Amounts paid in Dividends by Mining Companies during the Year ending 31st December, 1913.

Mines.	Dividends.
	£ s. d.
Copper	23,726 0 0
Gold .....	...
Tin	143,627 18 0
Silver	1083 0 0
Coal.....	1812 6 6
TOTAL	£170,249 4 6

No. 22.

RETURN showing the total Amount of Rents, Fees &c., received by the Mines Department during the Year ending 31st December, 1913.

Head of Revenue.	Amount.
	£ s. d.
Rent of Auriferous and Mineral Land.....	17,921 17 8
Fees, ditto ditto	1489 0 0
Survey Fees	3091 6 2
TOTAL	£22,502 3 10

5 cm

Diagram showing the Annual Value of Minerals & Metals raised in Tasmania from 1850-1913

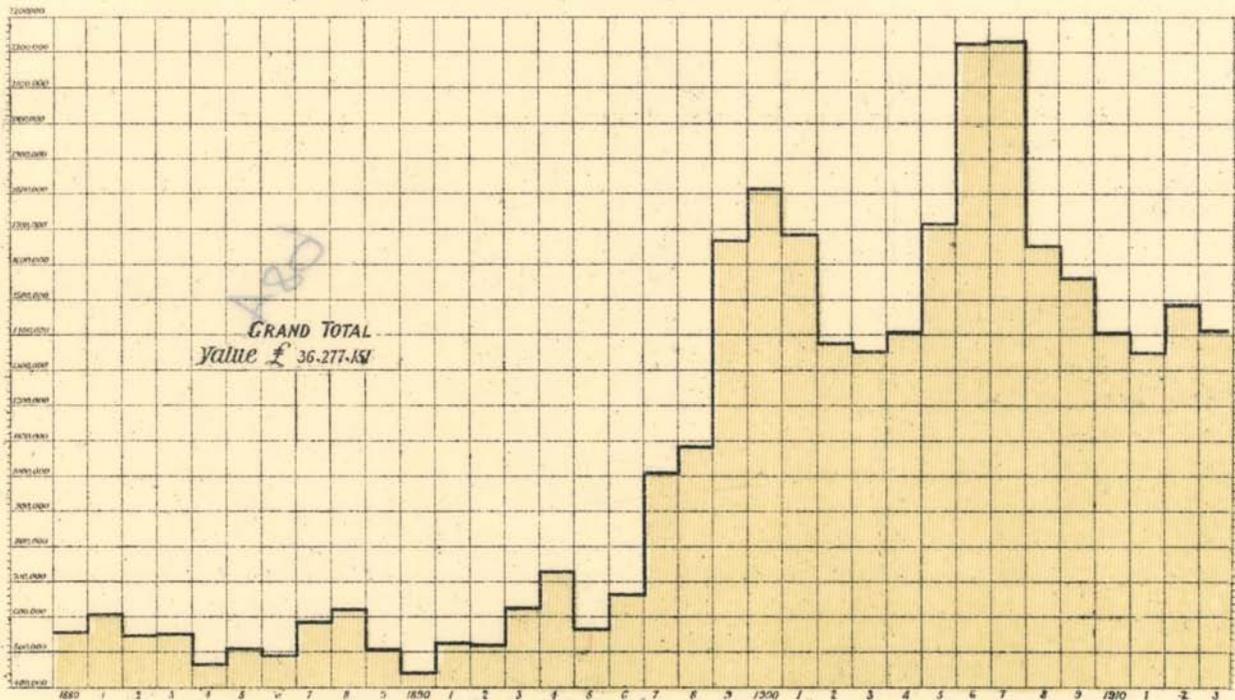


Photo Algraphed by John Veal Government Printer Hobart Tasmania.

No. 23.

RETURN showing Quantity and Value of Minerals and Metal raised in Tasmania from 1880 to 1913 inclusive.

Mineral or Metal.	Quantity.	Value.
		£
Gold ozs.	1,772,061·201	7,056,008
Silver-lead ore tons	1,033,902·741	5,808,283
Blister Copper..... "	127,481	10,093,565
Copper Matte..... "	6227	133,736
Copper and Copper Ore... "	37,102·47	546,946
Tin "	113,925·695	11,416,905
Iron Ore "	42,762	25,701
Coal "	1,367,502·75	1,083,067
Wolfram "	470·22	43,073
Bismuth "	48·69	16,588
Asbestos "	374·50	521
Shale "	994	594
Osmiridium ozs.	2432·30	20,176
Unenumerated prior to 1894...	...	31,988
Total .....	...	£36,277,151

No. 24.

RETURN showing the Mining Companies registered during the Year ending 31st December, 1913.

Number of Companies.	Capital.
11	£66,114

In addition to the above, 9 Agents for Foreign Companies, and 3 Syndicates, under 60 Vict. No. 51, were registered.

RETURN showing the Annual Value of Mineral Products for the State of Tasmania from 1880 to 1913 inclusive.

Year.	Value.	Year.	Value.
	£		£
1880.....	554,031	1899.....	1,660,622
1881.....	602,723	1900.....	1,888,695
1882.....	556,306	1901.....	1,763,896
1883.....	560,873	1902.....	1,378,406
1884.....	468,302	1903.....	1,354,044
1885.....	518,885	1904.....	1,379,204
1886.....	489,966	1905.....	1,729,129
1887.....	593,256	1906.....	2,257,147
1888.....	616,733	1907.....	2,277,159
1889.....	504,718	1908.....	1,650,027
1890.....	444,210	1909.....	1,574,995
1891.....	528,388	1910.....	1,432,193
1892.....	526,909	1911.....	1,349,497
1893.....	627,909	1912.....	1,493,502
1894.....	732,764	1913.....	1,415,700
1895.....	575,692	Unenumerated	
1896.....	662,058	prior to 1894	31,988
1897.....	1,006,140		
1898.....	1,071,084		
			£36,277,151

No. 26.

COMPARATIVE Statement of Revenue from Mines, being Rents, Fees, &c. (exclusive of Survey Fees) paid to the Treasury for the Years ending 30th June, from 1881 to 1903, and for Six months ending 31st December, 1903, and for the Years ending 31st December, 1904, to 1913 inclusive.

Year.	Amount.	Year.	Amount.
	£ s. d.		£ s. d.
1881.....	20,936 5 5	1898.....	33,661 13 9
1882.....	23,077 1 9	1899.....	24,696 10 5
1883.....	15,439 14 5	1900.....	28,380 11 10
1884.....	6981 11 10	1901.....	21,569 5 2
1885.....	11,070 5 7	1902.....	19,471 0 1
1886.....	12,523 10 4	1903.....	17,776 14 3
1887.....	14,611 11 5	1903, 1 July to 31 Dec.	14,758 17 1
1888.....	23,502 8 4	1904, Jan. to Dec.	16,631 8 2
1889.....	17,254 9 0	1905.....	20,203 17 0
1890.....	26,955 4 9	1906.....	24,136 12 5
1891.....	37,829 16 5	1907.....	24,794 7 7
1892.....	17,568 18 4	1908.....	20,311 3 0
1893.....	16,971 9 2	1909.....	22,804 1 5
1894.....	16,732 7 7	1910.....	22,221 18 0
1895.....	15,323 1 9	1911.....	20,556 15 10
1896.....	20,901 13 2	1912.....	17,639 19 11
1897.....	25,631 0 3	1913.....	19,410 17 8

The above Statement does not include Stamp Duties upon Transfer of Leases and Registration of Companies, nor the Tax payable upon Dividends, from which sources large sums are derived.

REPORT OF THE MOUNT CAMERON WATER-
RACE BOARD FOR THE YEAR ENDING
31ST DECEMBER, 1913.

Gladstone, 12th February, 1914.

SIR,

WE have the honour to submit the report of the Board for the year ending the 31st December, 1913.

Repairs.—Two small breaks occurred in the embankments after heavy rainfalls, but they were at once repaired, at very little cost.

Syphon-pipes.—These are in good order, and are working satisfactorily.

Renewal Works.—A small race from the 7-mile cutting on the main race to the Empress Saddle, a distance of about $4\frac{1}{2}$ miles, has been widened from 1 foot to 4 feet by the manager, and has proved of great benefit to the mines on the township. This race is now capable of carrying 18 sluiceheads of water. The alteration cost £150 6s. 10d., and this amount has already been paid for out of the amount received for the extra water sold, eight claims, averaging £1 per week, having been supplied during the winter months. At the present time, however, owing to unusually dry season, five claims only are being supplied.

The old Empress dam has been repaired, and will be used for storing storm-water during the winter months.

The race has been thoroughly cleaned out, and the scrub on the banks has been cut along the entire length of the race.

The total expenditure during the year, inclusive of the amount expended under 9 Edward VII. No. 51, was £1135 0s. 11d.

The revenue amounted to £1694 11s. 11d., being an increase of £49 11s. 3d. as compared with the previous year.

Statistics for the year are as follows:—

Average per week of claims supplied, 18.

Greatest number supplied in any one week, 26.

Total number of heads supplied—

Under fixed or cash scale	1766 $\frac{1}{2}$
Under royalty or credit scale... ..	1730

Total	3496 $\frac{1}{2}$
--------------	--------------------

Tin ore raised for the year:—Royalty scale, 20 tons 7 cwt. 0 qr. 4 lb.; fixed scale, 59 tons 14 cwt. 3 qr. 14 lb.

Average number of men employed per week, 37.

Total receipts for the year:—Water sold, fixed scale, £1026 11s. 11d.; royalty scale, £668 5s. Total, £1694 11s. 11d.

Expenditure.—Cost of Maintenance and Management.

	£	s.	d.
Salaries and wages	623	1	8
Insurance	6	3	0
Cleaning and repairs to race ...	12	17	6
Stores and tools	4	4	1
Stationery and printing	1	15	1
Travelling expenses	22	0	8
	<hr/>		
	£670	2	0
Renewal and repairs (9 Edw. VII. No. 51)	464	18	11
	<hr/>		
	£1135	0	11

Paid to Public Debts Sinking
Fund for the year ended 30th
June, 1913 (including moiety
of rents of mineral land served
by the race, £11 5s.) £971 1 7

We have the honour to be,

Sir,

Your obedient Servants,

W. H. WALLACE, Chairman.

JOHN SIMPSON,

CHAS. BARNES,

C. G. RYAN,

W. H. TWELVETREES,

} Members.

The Honourable the Minister for Mines.

MINE MANAGERS' EXAMINATION.

MARCH, 1913.

METALLIFEROUS.

SUBJECT—MINING.

1. Describe in detail the method of charging an ordinary hole with a high explosive for blasting in mines.
Supposing you had to continue the excavation of an adit which had been left with a perpendicular face of hard rock, upon what system would you choose the positions of your bore-holes with the object of obtaining in each case the maximum effect from the blast?
Illustrate by means of sketches
2. Describe generally what are the arrangements for pumping whilst sinking.
3. What method would you adopt for ventilating the ends of workings in mines? Sketch.
4. State the conditions which would influence you in adopting either overhand or underhand stoping, describing the advantages and disadvantages in the use of each of these methods.
5. What, in your opinion, are the appliances that should be used in connection with winding arrangements to give the maximum amount of safety without dangerous complication?
6. Describe in detail how you would timber a roadway having a bad back and sides; also a soft clay bottom that swells. Illustrate by means of sketches.
7. How would you decide on location and size of new main shaft for a mine? Assume figures for depth, output, &c.
8. What is the best distance apart for levels in a mine, and why?
9. What are the points for and against the following classes of mine pumps?—
 - (1) Gear-driven Cornish;
 - (2) Electrically-driven centrifugal;
 - (3) Electrically-driven plunger;
 - (4) Air-driven plunger.
10. Give sketches of chutes:—
 - (a) For filling trucks in a level;
 - (b) For filling skip in an inclined shaft.
11. Give specifications and sketches for underground floodgate to regulate flow of water to a shaft. Explain reason for each clause in specification.
12. A lode is about 60 feet wide, stiff-picking ground, rotten walls, value about 15s. a ton delivered to treatment works. How would you open it up and stope it?

SUBJECT—ORE DRESSING AND SAMPLING.

1. What are the characteristics in design and practice of a—
 - (a) Stamp battery used as a crushing-machine?
 - (b) Stamp battery used as a crushing and gold-saving machine?

Illustrate by means of sketches.

2. Draw a comparison between vanners and convex slime tables.
3. In making an estimate of the value of the ore in a mine, enumerate a list of the essentials you think are necessary to make that valuation sound, referring especially to sampling.
4. Give short descriptions of various stone-breakers; state which you consider the best type, and why.
5. Give description of a flotation process and of the plant used.
6. Give description of a small plant for treating silver-lead ore, and state what you would especially pay attention to if you were in charge of it.

SUBJECT—SURFACE WORK.

1. Give sketches of a set of poppet-heads about 40 feet high suitable for a mine treating 100 tons per day.
2. Design a trestle-bridge for a mine tramway with 15-foot spans to carry an 8-ton locomotive. Show how to calculate the dimensions of blue-gum girders, which are very expensive in the district.
3. A dynamo delivering current at 220 volts is located about 1 mile from the surface-works of a mine which it is desired to light with eight arc lamps (lamp-resistance absorbs 43 volts). How would you arrange lamps and calculate the size of main required, assuming 8-ampere lamps.
4. Give general design of a Pelton-wheel under a head of 100 feet to drive dynamo referred to in Question 3. How much water would be required and what size of nozzle-tip?
5. Give a design for intake of a race in a rocky gorge.
6. A crab-winch is double-g geared. The pinion on handle-shaft has 20 teeth, and the wheel it engages has 60 teeth; the pinion on the second shaft has 20 teeth, and engages a wheel with 100 teeth. The barrel is 8 inches in diameter. If two men exert a pressure of 28 lb. each at a radius of 16 inches on the handle-shaft, what weight of a cylindrical boiler could be parbuckled up an incline of 1 in 3 by a single-wire rope?
7. Explain fully the principle of the compound-wound continuous-current dynamo.
8. You desire to test a multitubular boiler. The shell-plate is $\frac{3}{8}$ -inch steel and lap-jointed, rivets steel, $\frac{3}{4}$ -inch in diameter, 3-inch pitch, two rows. The shell is the weakest part of the boiler. What should be the maximum hydraulic pressure it should be subjected to?
9. An engine piston is 12 inches in diameter, stroke 18 inches; the mean effective pressure is 25 lb. per square inch.

How many strokes per minute must it make to develop 25 indicated horse-power?

10. What proportions must the various parts of a safety-valve of the lever and ball type bear to one another so that the addition of 1 lb. weight on the end of the lever increases the pressure in the boiler by 1 lb. per square inch?

SUBJECTS—ARITHMETIC, MENSURATION, AND MINE ACCOUNTS.

1. Extract the square root of .4 to five places of decimals.
2. Reduce 8'125 shillings to its simplest form.
3. What is the cubical measurement of an ore-bin 8 feet 2 inches high, 10 feet $2\frac{1}{4}$ inches long, and 6 feet $3\frac{1}{2}$ inches wide?
4. Three men take a contract for £1250, one to have $\frac{3}{10}$ ths, the second to have $\frac{3}{15}$ ths of it. How much would the third receive?
5. If the specific gravity of a mineral is 4.4 (a cubic foot of water weighing 1000 ounces), what is the weight of a cubic yard of it? And if a cubic yard of stone weighs 5400 lb., what is its specific gravity?
6. Explain fully the difference between a working account and a balance-sheet.
7. In a metalliferous mine having a battery and tramway, winding and pumping plant, air-compressor, main shaft, and working levels, what accounts would you open, and how would you keep accounts to show amounts chargeable to capital and other expenditure respectively?

SUBJECT—MINING SURVEYING.

1. Describe the various methods of chaining in hilly country, the sources of error and precautions you would take to reduce them to a minimum.
2. Describe the vernier on a theodolite. Show how to construct a vernier to read to $\frac{1}{10}$ th part of an inch.
3. Describe the adjustments of the transit theodolite. In regard to those described for collimation and horizontality of horizontal axis, should they be done in any particular order? If so, why?
4. A fault displacing a lode has been cut at two levels 100 feet apart vertically and connected by crosscuts with a vertical shaft. Describe method of survey to locate fault.
5. Describe the plans and sections you would supply for the construction of earthworks for a substantial tramway.
6. How would you lay out a 5-chain curve for a first-class mine tramway?
7. How would you estimate the ore-reserves in a mine and conduct the sampling?

SUBJECT—MINING GEOLOGY.

1. What minerals are included under the term "black jack" as used by the miner?
2. Describe the indications which you would follow and the methods which you would adopt in prospecting new country.

3. How would you identify the following minerals:—Cassiterite, diamond, wolframite, molybdenite, cerussite, specular iron?
4. Describe the proper procedure in attempting to recover the portion of a faulted lode which has been lost in driving.
5. What is meant by the terms "primary ores" and "secondary ores"? Give some examples, and state the composition of each.
6. Explain the terms "stockwork," "saddle reef," "horse," "gash vein," "porphyry," "syncline."
7. State the mineral composition and describe the physical characters of the following rocks:—Quartzite, basalt, granite, serpentine, diorite.

SUBJECT—MINING LAW.

1. What is the penalty for damaging, misusing, or failing to use when necessary any appliance for the prevention of dust, fumes, smoke, or any other sanitary appliance provided by a mineowner?
2. When may more than 50 lb. weight of gunpowder or other explosive be stored in a mine, and under what conditions?
3. What precautions are necessary before loading a bulled chamber?
4. How may persons ascend or descend in a shaft?
5. At what angle must ladders be inclined in shafts or winzes when used for men ascending or descending?
6. What protection is required for men during shaft-sinking operations?
7. How would you proceed to mark off and apply for—
 - (a) A mineral section;
 - (b) A water-right?

MINE MANAGERS' CERTIFICATES.

The following Lists of Certificates granted since the inception of the Board of Examiners for Mining Managers' Certificates are published in accordance with a resolution passed at the Interstate Conference of Boards of Examiners held in Melbourne in March, 1906 :-

SERVICE Certificates of Competency granted by the Board of Examiners.

No. of Certificate.	Name.	Date of Certificate.
1. 92	Davies, Joseph	28 Sep. 1892
2. 92	Buffon, Geo. Donald	28 Sep. 1892
3. 92	Sinclair, George Peace	28 Sep. 1892
4. 92	Heighway, John Felton	28 Sep. 1892
5. 92	Irvine, Peter	28 Sep. 1892
6. 93	Daniel, John	29 Mar. 1893
7. 93	Marshall, John Henry	29 Mar. 1893
8. 93	Aaron, Gabriel	29 Mar. 1893
9. 93	Webb, George	29 Mar. 1893
10. 94	Payne, John Greaves	3 Apr. 1894
11. 94	Wesley, William Henry	3 Apr. 1894
12. 94	Andrews, Thomas	3 Apr. 1894
13. 95	Richards, Moses John	17 Apr. 1895
14. 95	Richards, Stephen Eddy	5 Nov. 1896
15. 98	Stubs, Joseph Thomas	20 Jan. 1898
16. 98	McCrackan, John	20 Jan. 1898
17. 98	Heery, Luke	5 Mar. 1898
18. 98	Curtain, Cornelius Henry	13 Apr. 1898
19. 98	Clerk, Frederick Malcolm	14 Apr. 1898
20. 99	Craze, John	25 Jan. 1899
21. 99	Tilley, George Reynolds	17 Apr. 1899
22. 99	Hooper, Thomas Martin	17 Apr. 1899
23. 99	Vincent, Thomas	17 Apr. 1899
24. 1900	Brown, William	9 Jan. 1900
25. 1900	Rosewarne, David Davey	4 Oct. 1900
26. 1901	Buddon, William	1 Mar. 1901
27. 1901	Yeates, Alexander	29 Apr. 1901
28. 1902	Ireland, Mark	22 Apr. 1902
29. 1902	Woolcock, John	23 Sep. 1902
30. 1903	Powell, Robert William	5 May, 1903
31. 1904	Muir, John James	27 July, 1904
32. 1904	Moyle, John	5 Dec. 1904
33. 1904	Ridley, John	12 Dec. 1904
34. 1906	Brough, Daniel	23 Apr. 1906
35. 1906	Birrell, Samuel	23 Apr. 1906
36. 1906	Barker, George	24 July, 1906
37. 1907	Wischn, John G. A.	6 Nov. 1907
38. 1910	Gullock, William	4 Mar. 1910
39. 1910	Kelly, Alcysius	24 May, 1910
40. 1913	Flight, Edward	10 Dec., 1913

CERTIFICATES of Competency granted by the Board of Examiners.

No. of Certificate.	Name.	Date of Certificate.	Class of Certificate.
1. 92	Dunstan, Alfred John	28 Sep. 1892	First class
2. 92	Ekborg, Benjamin Pher- son	28 Sep. 1892	Second class
3. 92	Hill, Charles	28 Sep. 1892	Second class
4. 92	Booth, John Robert	28 Sep. 1892	Second class
5. 92	Stapleton, Michael	28 Sep. 1892	Second class
6. 92	Lewis, Philip	28 Sep. 1892	Second class
7. 92	Hanlon, Christopher	28 Sep. 1892	Second class
8. 92	Williams, Luke	28 Sep. 1892	Second class
9. 92	Macandrew, Harold	28 Sep. 1892	First class
10. 92	Harris, William	28 Sep. 1892	First class
11. 93	Stapleton, Michael	29 Mar. 1893	First class
12. 93	Hanlon, Christopher	29 Mar. 1893	First class
13. 93	Potter, Joseph Matthew	29 Mar. 1893	First class
14. 93	Hilder, Alfred	29 Mar. 1893	Second class
15. 93	Matthews, Peter	29 Mar. 1893	Second class
16. 93	Richards, Stephen	6 Sep. 1893	First class
17. 94	Brain, Austin Lionel Bennet	3 Apr. 1894	First class
18. 94	Thorpe, Walter	3 Apr. 1894	Second class
19. 95	Williams, Luke	17 Apr. 1895	First class
20. 96	Levings, Joseph Henry	6 May, 1896	First class
21. 99	Goodall, Thomas Charles	14 Apr. 1899	Second class
22. 1900	Schloesser, Robert	19 May, 1900	First class
23. 1900	Nicholls, Charles Berres- ford	19 May, 1900	First class
24. 1900	Sale, William Robert	19 May, 1900	Second class
25. 1900	Williams, Richard	19 May, 1900	Second class
26. 1900	McPeake, John	1 Aug. 1900	First class
27. 1901	Sawyer, Basil	20 Feb. 1901	First class
28. 1902	Provis, John	22 Apr. 1902	First class
29. 1902	Bird, Robert Chisholm	22 Apr. 1902	Second class
30. 1902	Briggs, William Albert John	22 Apr. 1902	Second class
31. 1902	Bartlett, William Henry	22 Apr. 1902	Second class
32. 1902	Phoenix, William	22 Apr. 1902	Second class
33. 1902	Wright, Herbert E.	22 Apr. 1902	Second class
34. 1902	Craze, John	30 Apr. 1902	Second class
35. 1903	Waller, Richard Fitz- arthur	5 May, 1903	First class
36. 1903	Brickhill, Hector Gordon	5 May, 1903	First class
37. 1903	Barker, Reginald Fredk.	5 May, 1903	First class
38. 1903	Vincent, Thomas Henry	5 May, 1903	First class
39. 1903	Crittendon, James Henry	5 May, 1903	First class
40. 1903	Weston, Eustace Moriarty	12 Aug. 1903	First class

CERTIFICATES of Competency—continued.

No. of Certificate.	Name.	Date of Certificate.	Class of Certificate.
41. 1903	Clark, Lindesay Colin	31 Aug. 1903	First class
42. 1904	Martin, Edward Patrick	17 Feb. 1904	First class
43. 1904	Herman, Hyman	29 Apr. 1904	First class
44. 1904	Murray, Russell Mervyn	29 Apr. 1904	First class
45. 1904	More, George Allan	14 Oct. 1904	First class
46. 1905	Beamish, William Abraham	3 Jan. 1905	First class
47. 1905	Andrews, Thomas J.	1 May, 1905	Second class
48. 1905	Hitchcock, William E.	1 May, 1905	First class
49. 1905	Smith, George Oliver	18 July, 1905	First class
50. 1906	Rockett, Hildreth Peyton	23 Apr. 1906	Second class
51. 1906	Hales, Richard Chilman	23 Apr. 1906	Second class
52. 1906	Debenham Arthur John	28 June, 1906	First class
53. 1906	Coote, Charles Edward	18 Oct. 1906	First class
54. 1907	Marks, Oscar Sidney	8 Mar. 1907	First class
55. 1907	Phelan, Bernard Fredk.	23 Apr. 1907	Second class
56. 1907	Moline, Arthur Howard Pritchard	23 Apr. 1907	First class
57. 1907	Macartney, Ross Kenneth	23 Apr. 1907	First class
58. 1907	Williams, Thomas James	8 May, 1907	First class
59. 1908	Hooke, Arthur Warner	18 Mar. 1908	First class
60. 1908	Adams, Oliver Linley	25 Apr. 1908	First class
61. 1908	Seal, Leonard Presley	19 Nov. 1908	First class
62. 1909	Watt, William Shand	20 Apr. 1909	First class
63. 1909	McIntyre, William Keverall	20 Apr. 1909	First class
64. 1909	Bruschle, Conrad C.	8 May, 1909	Second class
65. 1909	Reid, William Daniel	30 June, 1909	First class
66. 1909	Brook, Reginald H. T.	5 Aug., 1909	First class
67. 1910	Martin, A. E.	17 Feb. 1910	Second class
68. 1910	McKenny, S. D.	24 Mar. 1910	Second class
69. 1910	Smith, Chas. Lonsdale	30 June, 1910	First class
70. 1910	Allen, Douglas Vernon	9 Sept. 1910	First class
71. 1910	Alabaster, Rupert Cecil	28 Sept. 1910	First class
72. 1910	Bedford, Max E.	24 Nov. 1910	First class
73. 1911	Rough, John H.	24 Apr. 1911	Second class
74. 1911	Vandean, Henry Alexander	25 May, 1911	First class
75. 1911	Garrett, James Edward	6 June, 1911	First class
76. 1912	Gudgeon, Cyril Wayth	17 Apr. 1912	Second class
77. 1912	James, Eric Lisle	17 Apr. 1912	First class
78. 1912	Jakins, George Fredk.	17 Apr. 1912	First class
79. 1912	Barkley, E.	17 Apr. 1912	First class
80. 1913	O'Brien, Arthur Ernest	1 May, 1913	Metal Mine Manager's Certificate

CERTIFICATES of Competency—continued.

No. of Certificate.	Name.	Date of Certificate.	Class of Certificate.
81. 1913	Hardman, James Thos.	1 May 1913	Metal Mine Manager's Certificate
82. 1913	De Latour, Edward Arthur	1 May, 1913	Metal Mine Manager's Certificate
83. 1913	Le Souf, Sebert Gordon	20 May, 1913	Metal Mine Manager's Certificate
84. 1913	Reid, Alexander McIntosh	20 May, 1913	Metal Mine Manager's Certificate
85. 1913	Scott, James Balfour	25 Nov., 1913	Metal Mine Manager's Certificate

COLLIERY Certificates of Competency granted by Board of Examiners.

No. of Certificate.	Name.	Date of Certificate.	Class of Certificate.
1. 1902	Brain, Austin Lionel Ben- net	28 Sep. 1902	First class
2. 1907	Wallace, Archibald Camp- bell	23 Apr. 1907	Second class
3. 1907	Williams, Thomas James	8 May, 1907	First class
4. 1910	Ledger, William	6 Sept. 1910	First class
5. 1911	Griffin, Daniel Martial Counsel	24 Apr. 1911	Second class
6. 1911	Dawson, Samuel Joseph	13 July, 1911	Second class

GEOLOGICAL SURVEY OF TASMANIA.

REPORT OF THE GOVERNMENT GEOLOGIST.

Geological Survey Office,
Launceston, 2nd April, 1914.

SIR,

I HAVE the honour to submit my report for the year 1913. Appended hereto are reports by the Assistant Geologists, Mr. L. L. Waterhouse, B.E., and Mr. Loftus Hills, M.Sc. These officers have discharged their duties with efficiency and energy, and are in every way justifying their appointment.

During the year the following bulletins were placed in the hands of the printer:—

Bulletin No. 13.—The Preoleenna Coalfield and the Geology of the Wynyard District, by Loftus Hills, M.Sc.

Bulletin No. 14.—The Middlesex and Mount Claude Mining Field, by W. H. Twelvetrees.

Bulletin No. 15.—The Stanley River Tinfield, by L. L. Waterhouse, B.E.

Bulletin No. 16.—The Jukes-Darwin Mining Field, by Loftus Hills, M.Sc.

Bulletin No. 17.—The Bald Hill Osmiridium Field, by W. H. Twelvetrees.

In October Mr. Hills visited the old Pandora Mine, near Frankford, for the purpose of seeing what had been done there since the date of Mr. Montgomery's report in 1893, and of reporting on whether there was any likelihood of renewed work at the mine contributing towards the support of a tramway into the district.

At the beginning of November Mr. Hills proceeded to the Point Hibbs country for the purpose of examining any indications of mineral in the vicinity of the Government track which is being advanced along the coast from Macquarie Harbour towards Port Davey.

In December Mr. Waterhouse commenced a field survey and examination of the Heemskirk tin mining district. Up to the end of the year he was engaged on the south end of the field.

Towards the end of the year, in accordance with instructions, I prepared for the Lands and Surveys Department three maps for the new Federal Atlas of Australia, viz. —

- (1) Small sketch geological map of the island.
- (2) Map of the mineral areas of the island.
- (3) Map showing the coalfields of the island.

Dominions' Royal Commission.

Evidence was prepared in April for the Commissioners, at their request, on the subject of "The extension of the Geological Survey, with a view to furnishing fresh supplies of

raw material for iron and other metal trades." The work and claims of the survey were set forth, and a concise account furnished at the same time of our mineral industry and production.

In May the Commission visited Launceston, and by request I appeared before it and gave evidence as follows:—

1. A map of the island was submitted, showing the areas which had been geologically examined and reported on.
2. A map was submitted showing the districts in the island for separate minerals.
3. Charts of sections were put in showing iron ore occurrences at Beaconsfield, the Blythe, and the Dial Range.
4. Tabular statements were put in summarising the annual production of gold, tin, copper, and silver-lead ores and coal to the end of 1912, and particulars of the total value of the mineral output to the same date. The total value was £34,861,451, and to the end of 1913 it is £36,277,241.
5. Sets of geological survey publications and progress reports of the mining industry were presented to the Commission.
6. An estimate of the coal resources of Tasmania was furnished.
7. Information was given with regard to the Mersey oil enterprise. I commented on the output values, and showed that the falling off since 1907 had been due to more causes than one. Among these the following were cited:—

- (a) The number of miners employed during the years in which the production receded from high-water mark was less than previously. This shortage of labour has been felt by several mines, and development work has suffered in consequence.
- (b) Owing to some companies having exhausted their shoots of ore, and being disinclined to continue much exploration work, men have been thrown out of work and have left the State. Other descriptions of work offering on the mainland at high wages rates, men here have drifted away from mining as an occupation, taken up other classes of employment, and their mining experience and skill have thus been lost. Owing to this a greater proportion of the men coming forward for work in the mines consists of unskilled labour, and this, too, has had an adverse effect on production.
- (c) Opportunities for investment of capital in other ventures have increased, and investors in mines have become more cautious than formerly, and are apt to refrain from speculative mining, and to require that propositions offered to them shall not possess other than ordinary business risks.
- (d) There is perhaps a tendency on the part of lessees to form an unduly high estimate of the selling value of their properties, and this naturally retards negotiations for the introduction of capital. In the past, too, retention of large areas by companies has impeded prospecting to some extent, though, I believe, that most companies owning unused land are now offering facilities to prospectors or tributors.

- (e) A disastrous suspension of smelting facilities at Zeehan in 1909 dislocated labour throughout the field, and the North Lyell disaster in 1912 had a temporary injurious effect on the output.
- (f) An uncertainty as to how wages are going to affect mining in the near future is being viewed by investors with uneasiness, so that new ventures require to be something very good to be able to secure money to work them.
- (g) The gradual withdrawal of men and the tendency of supporters of mining to be more exacting than formerly have diminished the number of prospectors.
- (h) It must not be forgotten that a certain amount of inflation of the statistical values was owing to rises in the market rates for minerals.

The Commissioners were informed that there are distinct directions in which increases may be anticipated. These are:—

1. Tin Ore.—The North-East Dundas tinfield comprises a large area, over which work is proceeding on a restricted scale pending the provision of a water-supply, the introduction of capital, and a satisfactory method of dealing with low-grade pyritic tin ore. As far as can be seen at present, there is a large extent of tin-bearing ground in the neighbourhood of 1 per cent., and the returns from this field may be expected to increase.

Reference was also made to the Heemskirk and Stanley River districts. The Blue Tier tinfield was mentioned as one in which probably runs of stone exist, which would pay to work at the high prices ruling for tin, provided power water could be conserved.

2. Silver-lead and Zinc.—The Hercules-Rosebery belt of mixed sulphides has been imperfectly turned to account hitherto, but it is considered that the near future holds developments which will result in the profitable treatment of these refractory ores. Reference was made to the present condition of the silver-lead field of Zeehan. I stated that, in my opinion, the few points at which work has proved remunerative on an extended scale cannot rationally be regarded as the only centres of ore-deposition. It is not too much to say that, with the exception of a few mines, the entire lode-complex of the Zeehan field below water-level is still virgin ground.

3. Gold.—The attention of the Commission was drawn to the buried alluvial leads of Lefroy, and also to the certainty that some of the reefs in that district will be found to be auriferous at a greater depth than the critical horizon of about 400 feet, below which reefs there have not been profitably worked. The Mangana-Mathinna-Mt. Victoria auriferous belt was submitted as one that is still unexhausted.

4. Coal.—It was explained that the output is practically regulated according to internal demand, but that as the population of the island increases, this may be expected to augment.

5. Shale Oil Industry.—Full information was supplied to the Commission with respect to the tasmanite seams near Latrobe and Railton and the attempt which is being made to initiate a new industry.

6. Copper.—The work being done by the Mt. Lyell Company was well known to the Commissioners. The possibilities of discoveries outside the Lyell mines were referred to.

7. Iron Ore.—The existence of large deposits of iron ore was brought before the Commission, in particular at the Blythe, Dial Range, and Anderson's Creek. Outcrops in other localities were also mentioned, viz., those at Temma, Comstock, Meredith Range, Savage River, Florentine Valley, Gordon Track, &c. One of the Commissioners, accompanied by the State Mining Engineer, visited the Blythe property.

Coal Resources.

The report which I prepared in 1911 for the International Geological Congress held at Ottawa in 1913 has been published in the large work compiled by the Congress, entitled "The Coal Resources of the World" (three vols. and atlas).

Osmiridium.

The high market rates ruling for this mineral has continued to stimulate the output. Its discovery in undisturbed serpentine rock on the Bald Hill in the Heazlewood district led to increased prospecting and to a good many applications for leases. An examination which I made of the area in July last showed that the Bald Hill, which forms the divide between the 19-mile Creek and the Heazlewood River, must have shed the mineral which has been recovered from the creeks heading from its western flanks and from the streams into which they flow (the 19-mile Creek and the Savage River). It was expected that profitable belts of osmiridium-bearing stone would be found in the hill. It seemed to me, however, that far too great reliance was placed in the chalcedonic veins at the summit of the hill as a source of the mineral. I formed the opinion that these veins were unrelated to the occurrence of osmiridium, and that the country-rock would be found to be the host of this mineral; also, that to prospect systematically the serpentine rock itself would be a perfectly legitimate undertaking. The mineral has been found in the serpentine below the western brow of the hill, quite independent of vein-formations, and apparently distributed either sporadically or in "schlieren" (magmatic differential bands) in the peripheral parts of the igneous mass. A good many ounces have been, as I understand, extracted from this spot by Mr. Caudry. The variety of rock which appears to be most favourable is a light-coloured softened serpentine, rather greasy and more or less ferruginous. The mineral frequently cannot be recognised until it has been cleaned with acid, owing to a coating of iron oxide. Besides this, some of it is enclosed in grains of chromic iron ore, with which it is possibly sometimes intergrown.

Mining in the matrix, however, can hardly be said to have started. The output of the district is practically derived from the detrital and alluvial deposits. The serpentine country exists still further north than the Bald Hill, and that area will doubtless now receive the attention of prospectors.

The other producing district is that north of the Pieman, in the vicinity of the Wilson and Huskisson Rivers. The

mineral in this field is also shed from the same ultra-basic girdle which skirts the great granite range of the Meredith.

Wherever serpentine exists in Tasmania, osmiridium may be looked for; but as there are no large areas of this rock outside those which are now being exploited, it is not likely that additional discoveries of much importance will be made. Discoveries, however, may be made within the present areas.

In 1911 the total Tasmanian output was returned as 272½ oz.; in 1912, 778½ oz.; and in 1913, 1261½ oz. The selling-price, which has been as much as £11 per oz., has greatly stimulated production, but this extraordinary price seems to be dependent on causes which are not too well known. It is certain, however, that besides a steady and increasing use for making fountain-pens, there is at present a great demand for iridium and osmiridium in connection with the hard platinum jewellery now so fashionable.

Programme of Work for this Year.

The proposed work is as follows:—

Government Geologist:

- (a) Visit to the New Jubilee Mine at Mathinna.
- (b) Visit to the Catamaran and Port Esperance Coal-fields and to limestone deposits near Ida Bay.
- (c) Visit to limestone deposits in the vicinity of Beauty Point and Yorktown.
- (d) Preparation of chapter on the geology of Tasmania for the British Association.
- (e) Completion of new geological map of Tasmania.
- (f) Valuation of iron ore resources for the International Geological Congress.
- (g) Visit to the Gladstone district when time permits.

Mr. L. L. Waterhouse:

- (a) Preparation of bulletin on the Heemskirk district
- (b) Examination of North-East Dundas tinfield.
- (c) Preparation of bulletin on North-East Dundas tinfield.

Mr. Loftus Hills:

- (a) Preparation of bulletin on the country south of Macquarie Harbour.
- (b) Examination of the Mt. Read country and preparation of bulletin.
- (c) Examination of the Rosebery district.

Mr. W. D. Reid:

- (a) Initiation and conduct of the new laboratory.
- (b) Preparation of Government Geologist's maps for the printer.
- (c) Work on new geological map of Tasmania.
- (d) Assistance in the Inspection of Mines Branch.

The districts examined by the geologists have been such as to contribute to a certain amount of specialisation by each officer, which is a decided advantage, and will become increasingly valuable as further progress is made. Thus, the work done by Mr. Waterhouse has inevitably led him to the special consideration of facts bearing on tin-ore deposits; while Mr. Hills' work has involved studies in copper, zinc, and lead.

It is easy to foresee the usefulness of this division of work, and it has been borne in mind in arranging the present year's programme.

Mr. Waterhouse's next journey will be to the North-East Dundas tinfield, where a good deal of work has been done on properties since Mr. Ward's examination. Mr. Ward's bulletin, which has been out of print for a long time and is in great demand, will be reissued. Its admirable account of the geology of the district will thus be once more generally available, and Mr. Waterhouse will investigate the mining properties from their economic aspects, and bring our knowledge of these up to date.

Mr. Hills, who is now examining the Mt. Read country, will continue his work on the mixed sulphide belt of the West Coast Range by inspecting the Rosebery district. It is intended to proceed with the examination of this mountain chain until the work is completed, leaving Lyell till the last, when the important problems of that field can be attacked with the advantage of full knowledge of the features of the rest of the range.

Time has not allowed me to begin work in the north-eastern quadrangle as proposed, and already, as may be seen above, other items of work, interrupting the programme, have made their appearance.

Assay Laboratory.

The work of equipping this has proceeded during the year, but delays in delivery of plant and chemicals have had the effect of postponing the commencement of operations. An oil furnace and an electrically-driven crushing and grinding plant have been installed; the balances will now be put in position, and as soon as office arrangements are completed, it will be possible to begin work. Since the beginning of the new year Mr. W. D. Reid has been appointed Government Assayer, and will take charge of the laboratory.

Renovation and Reconstruction of Offices.

This work was begun and completed during the year. Alterations were effected of the whole of the public buildings under a vote granted by Parliament. The improvements have benefited all the departments of the Public Service occupying the buildings. In particular, the Geological Survey has received improved accommodation with a convenience and economy unknown before. The laboratory accommodation is entirely new, and will, it cannot be doubted, be of great service to the public. The furniture and equipment of the drafting-rooms, stores, workroom, and offices generally have been designed with a view to increased efficiency in carrying out current work.

While the builders were in possession, suitable rooms for the Survey were found elsewhere in the city, but as can be readily understood, the moving to and fro, the temporary storage of a good deal of material, the designing for our new necessities, and the preparations for the equipment of the laboratory involved considerable interruption of current work, as well as a great amount of extra work by the members of the staff. Notwithstanding this, thanks to their energetic and

persistent efforts, the ordinary work during the year has not unduly suffered.

State Mining Engineer.

During the year the Geological Survey has received from time to time information of value from the State Mining Engineer. The latter has, in the course of the track-cutting work and the Government prospecting under his control, communicated facts bearing on economic geology which have been of use to the Survey. Mr. Conder, at my request and with your sanction, accompanied Mr. E. F. Pittman, Government Geologist and Secretary for Mines for New South Wales, in his examination of the West Coast mining fields in connection with an Australian handbook to be brought out for the use of the British Association for the Advancement of Science, which is to hold its congress in Australia in September next. Mr. Pittman expressed himself to me in very appreciative terms with respect to Mr. Conder's assistance.

I believe that it would be highly advantageous if this office were made a permanent one. Some amount of Government prospecting ought to be continually in progress, and there are always State problems in engineering work which would warrant the continuation of the office in question.

Mr. Conder also accompanied Mr. Lorimer, of the Dominions Commission, on his visit to the Blythe Iron Mines and some of the mines on the West Coast.

Museum.

Work has continued here in the direction of fresh additions to the collections. The demands on the geological staff do not admit of much time being spent on this branch of work, but this year it will be necessary to devote some attention to rearranging and labelling. Some collections of ores were displayed at the A.N.A. exhibition in Launceston in the beginning of the year. Some very fine specimens of chromate of lead from the Adelaide Mine, Dundas, were acquired by purchase by the Hon. Edward Mulcahy, Minister for Mines, and apportioned between the museums in Hobart and Launceston. Thanks are due to Mr. August Simson for presenting collections of Tasmanian ores and minerals gathered by him for many years past.

Sundry requests were received from public institutions and others for collections of Tasmanian ores, &c., and these have for the most part been complied with. Some, however, are still outstanding.

Office.

The departmental correspondence has comprised 2881 letters, reports, bulletins, &c., in and out. The usual acknowledgments are due to proprietors of the "Examiner," "Daily Telegraph," "Daily Post," "Zeehan Herald," "Australian Mining Standard," "Australian Mining and Engineering Review," Queensland Government "Mining Journal," "The Mining Journal" and "Mining and Engineering of New York" for supplying office-copies of their publications.

I have, &c.,

W. H. TWELVETREES, Government Geologist.

W. H. WALLACE, Esq., Secretary for Mines, Hobart.

REPORTS OF ASSISTANT GOVERNMENT
GEOLOGISTS.

Geological Survey Office,
Launceston, 2nd April, 1914.

SIR,

I HAVE the honour to present my report for the year ending 31st December, 1913.

Serious interruptions during the year have interfered to a great extent with the carrying out of the arranged programme of work.

Office work was completely broken into for a time by the necessary packing up and removal into temporary offices during the reconstruction of the public buildings. Moving was commenced on February 18, and completed on March 3. Reconstruction work was sufficiently far advanced on September 15 to allow of the Geological Survey moving back into their new offices; this work was not finished until September 30.

During the year a considerable amount of time was devoted to the Survey collection of rocks and minerals in the Victoria Museum; this included the selection of specimens and arranging them in the new cases provided by the Department, and the displaying of new exhibits which have been added from time to time, partly donated by various people interested in the welfare of the museum and partly collected by officers of the Survey. This work is, it is believed, being appreciated by the general public.

The library of the Geological Survey is expanding, and during the year has demanded a good deal of attention. In the new offices increased shelf-space is available, and it has been possible to arrange the various publications of the library systematically in consequence. The number of publications received from abroad is continually increasing, and 30 bound volumes of standard scientific works have been purchased. The cataloguing and indexing of these have been duly attended to.

From time to time samples have been received from prospectors and others for determination, and this work has been carried out as well as available apparatus and reagents would allow. The establishment of the Government laboratory in connection with the Survey will greatly facilitate this portion of the work.

The Stanley River bulletin was completed on November 20, when the manuscript was forwarded for printing, accompanied by seven photographs and six plates comprising geological and topographical maps and geological sections. This report is to be issued as Bulletin No. 15 of the Geological Survey of Tasmania, entitled "The Stanley River Tinfield."

On November 25, in accordance with instructions received, I left Launceston for Zeehan, with the intention of carrying out an official examination of the Mt. Heemskirk tinfield. I

proceeded first to the Federation Mine, South Heemskirk, and was still at that centre when the year closed.

Although at the end of the year my examination of the district was not completed, I beg to append the following brief notes on the field as a whole:—

Notes on the Mt. Heemskirk Tinfield.

The Mt. Heemskirk tinfield includes an area of about 80 square miles, comprising a coastal strip extending from the Little Henty River on the south to Granville Harbour on the north, with a width of 5 to 6 miles.

Topographically, two distinct units are represented: (a) the rugged Heemskirk Range; (b) the coastal penplain. The Heemskirk Range rises to 2800 feet in a series of rounded peaks, and runs approximately north-west, and about parallel to the coast. The main mass of the range is granite, although on the east slates and sandstones make their appearance, and form part of the eastern slopes and foothills of the range. To the north-east diabase makes its appearance, and forms the extremity of the range in that direction. The range rises to about 2800 feet above sea-level, Mt. Agnew, a prominent peak in the southern portion of the range being the highest point. About 5 miles to the north-west is Mt. Heemskirk, connected by a low saddle known as The Gap with Gap Peak and North Heemskirk. North of this again, and separated therefrom by the valley of the Tasman River, is a prominent peak known as Donnelly's Look-out. The range is much broken, being dissected by streams flowing north into the Tasman River, east into the Pieman, south into the Little Henty, and west into the Pacific Ocean.

Partly surrounding this range is the coastal penplain. Although it is found to be cut through by various streams, and does not appear to be by any means level when travelling over it, yet when viewed from a distance it presents a strikingly regular surface to the eye, with a gradual slope seawards. The height of various ridges is approximately the same, hence the general level appearance. There can be no doubt but that this country represents an old land surface which has been subject to long continued degradational agencies, and which has been gradually worn down to base level. A subsequent uplift has rejuvenated the streams, which are at the present time once more engaged in cutting down their channels.

The geology of the district is interesting. The oldest rocks represented are sedimentaries of Pre-Silurian age, which occupy a large tract of country west of Zeehan. In the Heemskirk district they are largely metamorphosed owing to the intrusion, in Devonian time, of huge masses of igneous rocks. In the earliest stages of this period of igneous activity the magma intruded was very basic in composition, and consolidated under considerable pressure to form the gabbro occurring near the Comstock, and a smaller area to the south-west, now converted to serpentine, at Trial Harbour. The former occurrence has been largely altered to gabbro-amphibolite, owing perhaps to the pressure exerted by the huge granite mass which was intruded at a slightly later date. The ore deposits of the Heemskirk district are all connected with this series of igneous rocks.

At the close of this period of igneous activity another period of sedimentation probably followed, although all traces of any old sediments laid down at this time have long since been denuded. Towards the close of the Mesozoic era large masses of diabase were forced up into the overlying sedimentary rocks, probably in the form of sills. This rock is quite similar to that widely distributed throughout the island. In the Heemskirk district it occupies a considerable area to the north and north-east of Mt. Heemskirk, extending from a point near the Gentle Annie spur, on the cattle-track from Zeehan to Granville, across the Pieman River.

Denudation again proceeded, and in Tertiary times a river system was developed very different to that of the present day. The tin-bearing granite had been at this time deeply dissected, and a considerable amount of tin oxide had accumulated in the beds of the rivers. In some instances the grade of the river-beds became so flat that the burden of detrital material could not be carried off by the streams, and consequently was deposited, and so the secondary tin-ore deposits were formed.

About this time there ensued another period of volcanic activity, when masses of lava were poured out, covering portion of the old land surface and filling up some of the existing river valleys. This is represented by the basalt areas north-east, north, and north-west of Donnelly's Look-out. The full extent of this basalt area was not determined on this occasion. It extends nearly to the coast at Granville Harbour, there lying partly on Pre-Silurian slates, partly on granite; it also continues northwards some distance towards Corinna. Deep alluvial tin-leads almost certainly exist in this area. The outpouring of this basalt in Tertiary times was followed by a period of uplift, as a consequence of which the rejuvenated rivers commenced once more to cut down their channels. As a result of this action the basalt cover has been cut through, and is now represented by isolated patches, all at approximately the same level. Bed-rock has been exposed in most of the creeks between these patches, showing that the thickness of the basalt cover is generally small. Although not genetically connected with the ore deposits the basalt is important economically, for it has formed a protective covering to the secondary tin-ore deposits formed in the old river channels, which otherwise would doubtless have long since disappeared. On the other hand, since the outpouring of the basalt and subsequent uplift, degradational forces have done work which has also been of great economic value, in that the basalt cover has been cut through, and in places entirely denuded, so that the tin-bearing gravels have been exposed, without being entirely removed.

In the district are deposits of tin, copper, nickel, and iron, the first-named being by far the most important.

The tin-lodes occur within the borders of, or in close proximity to, the granite. This association is not accidental, but the tin is genetically associated with the granite.

Within the granite area are the Federation, R. Clarke's, Montagu, Empress, White Face, Chin Cornwall, Wakefield, Sweeney's, Healey and McIvor's, and Globe Mines on South Heemskirk, and the Peripatetic, St. Dizier, and Heemskirk

Tin Syndicate (the two latter alluvial mines) at North Heemskirk.

The St. Dizier and Heemskirk Tin Syndicate are on the border of granite and slate, partly on each formation. Within the slates, but very near the granite contact, are the Kelvin and Mayne's Mines at South Heemskirk.

Very little work is being done on any of these properties at the present time. It is unfortunate that a field such as this, on which an enormous amount of money has been spent in the past, and which has certainly many very promising features, should at the present time be almost deserted. This state of affairs calls for investigation and explanation. The matter will be dealt with in the forthcoming bulletin. A few general notes on the mining properties are here appended.

The Federation Mine is idle just now, but is a thoroughly genuine property, which warrants the judicious expenditure of further capital. Several distinct tin-bearing lodes have been proved, and some rich tin won from different parts of the property. Although rich tin does occur in places, the property is essentially a large low-grade proposition, which promises to keep a fair-sized mill supplied for a considerable time with payable ore. Facilities for exploitation and mining are excellent. The topography permits of development from adits; it also allows of water being stored at a high level and utilised for the generation of power. The Cumberland dam, a body of water estimated at 100,000,000 gallons, is stored at an elevation which allows of a head of 450 feet being obtained at the Federation battery site, with a race of about 1 mile in length and a pipe-column of about 1000 feet. The catchment area of the dam is, unfortunately, not large; but on the other hand, by raising the embankment (about 1 chain in length) and the bye-wash between 5 and 10 feet, the storage capacity will probably be doubled.

The progress of the property has been retarded in the past by lack of sufficient capital to enable necessary development work to be carried out, but it is to be hoped that for such a sound property this difficulty will soon be successfully overcome.

Mr. Richard Clarke is exploiting a rich tin-bearing quartz-tourmaline vein on Packer's Creek, below the Federation Mine, and is treating rich ore with his 3-head battery and concentrating table, worked by an overshot water-wheel. This property was formerly held by the old Prince George Company. It is opening up well, and vigorous prospecting and development work is justified.

In the Cliff Mine Messrs. H. Castle and J. Campbell have a property which is developing satisfactorily. Preparations are at present being made to work the property, and it is to be hoped that the owners will succeed in securing the necessary capital, for the property is one with bright prospects. Very little has been done in the way of developing the mine up to the present, although rich tin has been shown to exist.

The old Montagu Mine, now held by Messrs. E. Mulcahy and M. Bullen, is idle. Some alluvial tin has been won, and the rich tin said to have been won from the small amount of development work carried out indicates that the property is certainly deserving of a further trial. Little is to be seen at the present time, as the workings are full of water.

At the old Kelvin property work is being carried on in a small way by Mr. H. Williams and his two sons, only the richest ore being treated in a light prospecting 3-head battery. A small Wilfley table and short length of canvas strakes are employed, but the tin is extremely fine, and losses are probably heavy, although a fair amount of tin is being won.

Mayne's Mine is idle.

A little alluvial tin is being won in different creeks on the south end of the field, but the deposits remaining unworked are of small extent.

At Sweeney's Mine, about a mile south of the Cumberland dam, some rich alluvial tin was won from Pyke's Creek in the upper part of its course, and the lode-formation from which this was derived has been traced and is now being prospected. Entirely within granite, the ore is complex, carrying abundant blende and pyrite, a little galena and chalcopryite, in addition to some cassiterite. The formation appears to be about 60 feet wide, but little has been done so far to prove its extent and value.

None of the other properties on South Heemskirk are being worked.

In the northern end of the field there is no lode tin-mining going on.

At the Tasman River, however, work is being carried on by the Heemskirk Tin Syndicate, with very encouraging results, on a deposit of alluvial tin. A large area of ground has been secured, and prospecting work (by boring) is now being vigorously carried on, to definitely prove the extent of the tin-bearing ground. Water is brought on to the property from the Heemskirk River. The wash was being elevated by a 10-inch gravel-pump, with a total lift of 45 to 50 feet, belt-driven from Robey portable engine of about 40 indicated horsepower. Firewood is abundant. The plant installed, however, proved inadequate for the depth of ground encountered (30 feet), and as payable values existed, it was decided to temporarily suspend operations, prove the ground more systematically, and then instal a larger plant designed to deal with the deeper ground. Although the wash ahead of the present workings is partly covered by basalt, the thickness promises to be small, and the work now being carried out will definitely prove whether values are sufficient to pay for the removal of this overburden. The exact course of the old river, now a matter of some uncertainty, but which flowed about north, will also be determined by this boring. Prospects for this company are bright.

Excepting for a little alluvial work by single men or parties of two or three at various localities, no other work is being carried out at this end of the district.

The tram now being constructed will be of great benefit, not only to the Heemskirk Tin Syndicate, but will stimulate further prospecting of known deposits.

With reference to ore-deposits other than those of tin, no work is proceeding at the present time.

At Granville Harbour a little trenching has been done on a deposit which, at the surface, carries native copper. It is a contact-metamorphic deposit in Pre-Silurian slates near the contact of the Devonian granite. As a deposit of copper ore of economic value, it does not appear, from the work already

done, to be very promising, being complex in character, carrying abundant magnetite and iron pyrites, with apparently a little disseminated chalcopyrite. The decomposition of the latter mineral, the leaching of the copper, and its subsequent deposition under favourable conditions, as finely divided and arborescent native copper, led to the mistaken idea that a rich primary deposit of native copper existed, whereas the native copper is obviously of purely secondary origin.

McArthur's Copper Mine also appears to have been a deposit formed by secondary enrichment, the primary ore being low-grade.

Contact deposits of iron ore, sometimes of high grade, sometimes with blende and pyrites, occur at intervals in the contact-metamorphic aureole surrounding the granite. Little work has been done on any of these deposits, and all are now idle.

Nickel is known to occur in serpentine near Trial Harbour, and a small amount of prospecting disclosed some pockets of rich ore. At the present time this property is idle.

The field as a whole is dormant, but there are certainly some thoroughly genuine properties worthy of the attention of investors, and which, under efficient management, should yield good profits. The Heemskirk tinfield has been under a cloud for some years, but it is to be hoped that this is now passing. I confidently believe that the day is not far distant when this field will rank among our tin-producers, from lode as well as alluvial mining.

I have, &c.,

L. LAWRY WATERHOUSE, B.E.,

Assistant Government Geologist

W. H. WALLACE, Esq., Secretary for Mines, Hobart.

Geological Survey Office,

Launceston, April 6, 1914.

SIR,

I HAVE the honour to submit my annual report as Assistant Government Geologist for the year ending 31st December, 1913.

During the year under review I have, acting on instructions received, visited the following:—

1. The mineral districts of Mounts Jukes and Darwin, February 20 to May 1.
2. The copper lodes in the vicinity of Frankford, 1st October to 4th October.
3. The country south and west of Macquarie Harbour and extending southwards of Point Hibbs, 4th November to 19th December.

Following upon the field work in connection with the above investigations, and also those carried out at the close of the

preceding year, the following reports have been submitted, accompanied in each case by geological maps and sections:—

1. Preliminary report on the Preolenna coalfield and the Wynyard district, 3rd January.
2. Geological Survey Bulletin No. 13: "The Preolenna Coalfield and the Geology of the Wynyard District," 17th February.
3. Preliminary report on the Jukes-Darwin mining field, 19th May.
4. Report on the old Pandora sections in the vicinity of Frankford, 7th October.
5. Geological Survey Bulletin No. 16: "The Jukes Darwin Mining Field," 23rd October.

In addition to these reports I have, since the close of the year under review, completed—

Geological Survey Bulletin No. 18: "Geological Reconnaissance of the Country between Cape Sorell and Point Hibbs."

This was submitted on 23rd February, 1914. I have also partially completed a geological survey record dealing with the cosmic glass occurring in the Jukes-Darwin field. Its completion has been held over pending the receipt of certain information from the United States Geological Survey.

Some time was spent during the year in connection with the alterations and additions to the public buildings, and especially with the fittings and equipment for the new assay and chemical laboratories. This work continued from 22nd May to 7th June and from 17th to 21st June, a total of three weeks.

I now beg to offer a few general remarks upon the several districts dealt with in the above reports.

The Preolenna Coalfield.

In the bulletin dealing with this field I have, following the general scheme of these publications, treated of the topography and general geology, but have laid special stress on the economic geology of the field.

In the undeveloped state of the field no hard and fast deductions are justifiable, but there is no doubt that there exist seams of a very high-grade coal, superior in all respects to the other coal deposits of Tasmania. Trials carried out on the Tasmanian Government Railways have served to prove that this Preolenna coal can be substituted for the best New South Wales coal for mixing with our East Coast coal to form a mixture suitable for steam-raising under local conditions.

In attempting an estimate of the quantity of coal available it was found necessary to assume that three bores have proved coal to exist over a certain area. The sites of these bores are indicated in the bulletin, and as no commercially sound procedure is possible until such bores have been put down, the necessity for this is strongly urged upon the owners of the sections.

The conclusion is expressed that, after these bores have proved coal to extend to these points, there will exist every factor which, combined with careful and efficient management, is essential to the initiation and continuance of a profitable industry.

As regards the supposed occurrence of coal at Wynyard itself, the conclusion was arrived at that no possibility of such existed.

The Jukes-Darwin Field.

Bulletin No. 16 deals exhaustively with the physiography, general geology, economic geology, and the history of mining on the field, as well as furnishing a detailed description of all work which has been carried out on the mineral sections. Particular attention has been paid to the investigation of the ore-deposits, especially in regard to the question of genesis in relation to their persistency and extent. Although some important deductions were made concerning questions in general geology which have a definite bearing on this problem of genesis, and also concerning the ore-bodies themselves, no decisive opinion could be expressed concerning the mode of origin of all of the ore-deposits owing to the absence of many important criteria which it is hoped will be found available in the Mount Lyell field when a geological survey of that district is undertaken. From the evidence available, however, it was deduced that there exists every inducement to exploit certain specified ore-bodies in a bold and courageous manner. This must, however, be carried out on a large and comprehensive scale, as it is only by thus dealing with them that success can be hoped for—half-measures are almost certain to end in failure. The ore occurrences which are recommended as warranting this procedure are indicated in the bulletin.

Undoubtedly there exist large ore-deposits in this field which must ultimately produce considerable quantities of copper, silver, and gold. It is certainly a district which has not had that attention paid to it by capitalists that geological investigations have shown would be justified. The causes which have been instrumental in retarding the development of the field are discussed in the bulletin, and the policy to be adopted for future operations is outlined.

The Pandora Sections.

After an examination of the general geology of the district and the characteristics of the lode-formations, I arrived at the conclusion that, although patches of good copper ore may be met with, yet there was no likelihood of locating lodes important enough in size and value to constitute a payable copper-mining proposition. The experience in Tasmania has been that lodes of this character occurring in hard Pre-Cambrian quartzites are as a rule too inconstant in both value and size to be payable.

Point Hibbs District.

The conclusion arrived at in regard to this district was that there is every indication to warrant careful prospecting in certain specified localities.

As regards the copper-bearing deposits at the Birthday I formed the opinion that these cannot at present be regarded as constituting payable mining propositions, but that their value lies rather in indicating that copper ores are present in this area. This fact, when taken in conjunction with other geological features, justifies the recommendation made in the bulletin that prospecting for these copper deposits should be

confined to the vicinity of the Pre-Cambrian limestone and dolomite beds. The positions of the observed outcrops of limestone or dolomite are indicated in the geological map accompanying the bulletin.

There occur in two portions of the district outcrops of serpentine. Therefore, prospecting for osmiridium, as well as silver-lead lodes, would be justified.

Prospecting, however, both for the copper deposits and silver-lead lodes will present difficulties, as both the topographical features and the forest growth combine in obscuring the outcrops of the country-rock, as well as the possible ore-bodies.

There also occur deposits of fine-quality asbestos in the serpentine at Asbestos Point on Macquarie Harbour which would certainly merit investigation.

I have, &c.,

LOFTUS HILLS, M.Sc.,

Assistant Government Geologist.

W. H. WALLACE, Esq., Secretary for Mines, Hobart.

REPORT OF THE CHIEF INSPECTOR OF MINES.

Launceston, 25th May, 1914.

SIR,

I HAVE the honour to present my report for the year ending 31st December, 1913. I append diagram and statistical tables with reference to accidents which have occurred during the year.

Annexed are also reports received from the district inspectors, viz.:—From Mr. M. J. Griffin, Inspector for the Northern and Southern, Eastern and North-Eastern Divisions; Mr. James Harrison, Inspector for the Western and North-Western Divisions; and from Mr. C. H. Curtain, Inspector for the Lyell District.

The average number of men employed at the mines and smelting works throughout the State was, according to the official returns, 6106. The number of men killed by accident was 6; non-fatal serious injuries were 60. The death rate from accidents was, for the year, 0·982 per thousand, against 9·522 per thousand in 1912, and 0·762 per thousand in 1911.

The effects of the disastrous fire at the North Mt. Lyell Mine in October, 1912, hung like a pall over the industry in 1913. The Royal Commission appointed to inquire into the cause of the calamity and the loss of life involved reported thereon in January to the effect that the fire originated at the pump-house on the 700-foot level, but that the cause of it remained in the region of conjecture. After the flooding of the mine and the extinction of the fire the 1000-foot level was unwatered in the beginning of April, and towards the end of that month the mine was inspected by Mr. Alex. Montgomery, M.A., State Mining Engineer for Western Australia, who was commissioned by the Government to report on the condition of the Mt. Lyell Company's mines and the mining methods employed, as well as on certain specified questions affecting the safety of the workmen. His report was presented on the 9th May. It emphasised the importance of vigilance in supervising the open-cut works and of care in completely filling the underground excavations as thoroughly as possible with mullock, so as to depend less and less on timber as the means of support. As regards fire, he urged prevention as the first requisite, and that the recurrence of a disaster from that source should be made practically impossible. The mine was unwatered to its bottom level—1100 feet—in the beginning of June, when the last body of those who had perished was recovered.

During the past year the question of the establishment of rescue brigades at main centres in mining fields and of the maintenance of Government equipment in certain places has been considered, and a general scheme outlined. Power is proposed to be taken for the Governor to make regulations under the "Mining Act" for the supply and maintenance of the necessary breathing and other appliances for this work and

the formation of brigades, as well as for ambulance requisites and the training of men for the duties of first-aid. The subject will receive further attention this year, and no doubt a scheme suited to the requirements of the State will be formulated.

Several matters in respect of which the general rules can be improved were discussed with the inspectors during the year, and, after consideration, the following proposals were submitted to you as being desirable amendments to be introduced into the Act. They were laid before a mining conference held this year to frame a Mines Regulation Bill, and they received its approval.

Proposals.

1. A ventilation rule to the effect that the total quantity of carbon dioxide present shall not exceed 0.25 per centum by volume, and that the maximum temperature of the air in working-places is not to exceed 85 degrees F. measured by a dry bulb thermometer, and 80 degrees wet.

2. A rule that when the underground workings of adjacent mines are not more than 300 feet apart, the inspector is to report same with his recommendations in the matter of connecting them.

3. As soon as practicable after the opening of each level, the surface and all levels should be connected with each other by passage-ways independent of and separate from the main shaft or other principal entrance to the mine.

4. The entrances to escape-passes, &c., should be painted or otherwise marked, and the passes fitted with ladders, and kept in a state of efficiency.

5. Whenever an inspector is of opinion that existing connections with the surface in any mine form inadequate means of escape, he shall report the necessity for the provision of an additional outlet, either by shaft or adit, which the Minister may order to be constructed.

6. Detonators should be fixed only to the fuse by means of pincers provided for the purpose by the manager of the mine.

7. When, owing to simultaneous explosions in blasting, there is a doubt in counting the reports as to the occurrence of a missfire, a missfire must be deemed to have taken place.

8. When explosives exceeding 15 lb. weight are kept in lockers or magazines under ground, their distribution must be under the supervision of a person authorised by the manager.

9. The height of gates in shafts to be not less than 4½ feet.

10. Where not more than six men are employed underground, dress-changing facilities may be provided in the engine-house if no direct access exists from the changing-room to the boiler or engine.

11. Any person in charge of winding machinery to hold a medical certificate (to be renewed or endorsed when required by an inspector) to the effect that he is free from defective sight or hearing, or any other infirmity likely to interfere with his duties.

12. The manager of any mine is to produce to an inspector on request the plan of the mine.

13. Any obstruction of a travelling-way underground is to be reported to the inspector.

14. Suitable protected lights are to be provided wherever an inspector may direct, in addition to those already mandatory at plats and entrances to rises, &c.

15. Places of refuge during shaft-sinking or rising not to be more than 100 feet apart.

16. Sundry precautions as suggested in my last report with a view to preventing fires in mines, and provisions for warning men and bringing them to the surface were embodied in several proposed rules and submitted to the abovementioned conference.

The conference also considered further important suggestions made by its members.

Inspector Harrison has reported that, owing to the use of steam underground at the Magnet, the mine in the vicinity of the shaft is unduly hot, and also that in the event of a fire or burst of steam the get-away for the men through the passes to surface would be difficult. He proposes that a second long adit be driven south of the present one, which he considers would improve ventilation and facilitate egress from the mine, besides being good prospecting work.

The inconvenience and risk caused to miners by the employment of steam underground have led the inspectors to suggest an amending rule providing that no furnace nor boiler for the generation and use of steam underground shall be permitted unless with the consent of an inspector. This was also approved of by the conference above mentioned.

The year before last I urged that the Inspection of Mines Branch be entirely dissociated from the Geological Survey, as with the increasing extensions of the latter the union of the two was undesirable, and, in fact, impracticable. The proposal received your support, and also the assent of the late Government. The decision to carry it into effect has resulted in the appointment this year of a new Chief Inspector, who will take up his duties next month and enable me to devote my whole time and attention to the geological work.

In relinquishing the present position, I wish to place on record my appreciation of the painstaking and efficient discharge of their difficult duties by the district inspectors during my entire term of office.

I have, &c.,

W. H. TWELVETREES,
Chief Inspector of Mines.

W. H. WALLACE, Esq., Secretary for Mines, Hobart.

COMPARATIVE Table of Statistics of Accidents in and about the Mines of Tasmania from 1st July, 1892, to 31st December, 1913.

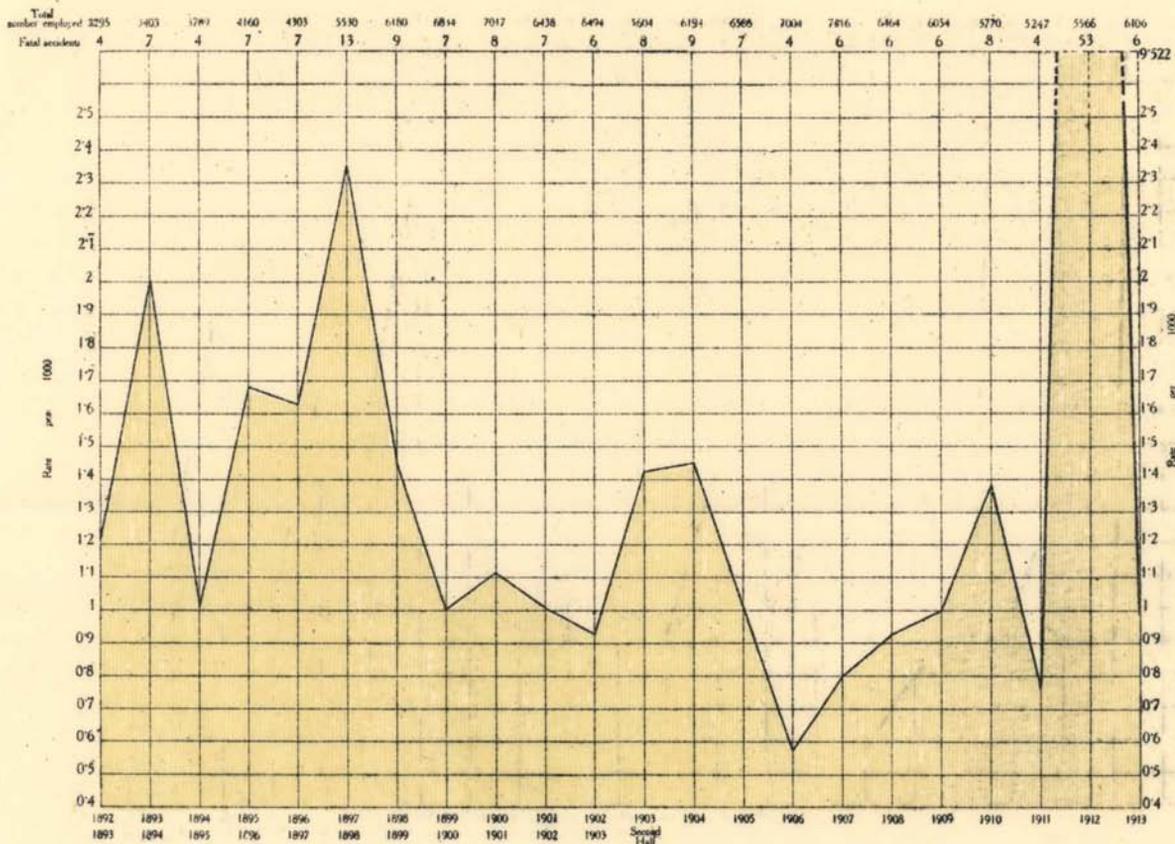
Period.	Number of Miners employed.	Number of Accidents.	Number of Persons.		Total Killed and Injured.	Average per 1000 Killed and Injured.	Average per 1000.	
			Killed.	Injured.			Killed.	Injured.
1 July, 1892, to 30 June 1893	3295	28	4	25	29	8·8001	1·214	7·586
" 1893 " 1894	3403	25	7	20	27	7·934	2·057	5·877
" 1894 " 1895	3789	26	4	24	28	7·390	1·058	6·332
" 1895 " 1896	4160	22	7	16	23	5·529	1·682	3·847
" 1896 " 1897	4303	36	7	31	38	8·831	1·627	7·204
" 1897 " 1898	5530	36	13	33	46	8·318	2·351	5·967
" 1898 " 1899	6180	35	9	34	43	6·957	1·456	5·501
" 1899 " 1900	6834	19	7	16	23	3·365	1·024	2·341
" 1900 " 1901	7017	29	8	23	31	4·417	1·140	3·278
" 1901 " 1902	6438	38	7	35	42	6·524	1·088	5·437
" 1902 " 1903	6484	44	6	43	49	7·557	0·925	6·632
" 1903, to 31 Dec., 1903	5604	27	8	20	28	4·977	1·428	3·560
1 Jan., 1904 " 1904	6192	73	9	65	74	11·951	1·454	10·497
" 1905 " 1905	6586	34	7	30	37	5·618	1·063	4·555
" 1906 " 1906	7004	65	4	61	65	9·280	0·571	8·709
" 1907 " 1907	7516	68	6	64	70	9·314	0·798	8·515
" 1908 " 1908	6464	60	6	58	64	9·900	0·928	8·972
" 1909 " 1909	6054	54	6	49	55	9·085	0·991	8·093
" 1910 " 1910	5770	63	8	57	65	11·265	1·386	9·878
" 1911 " 1911	5247	80	4	77	81	15·437	0·762	14·675
" 1912 " 1912	5566	60	53	53	106	19·044	9·522	9·522
" 1913 " 1913	6106	64	6	60	66	10·809	0·982	9·826

TABLE showing Rate per Thousand Killed and Injured in the different Divisions for the Year 1913.

Division.	Average Number of Men Employed.	Number of Accidents.	Number of Persons.		Total Number Killed & Injured.	Average per 1000 Killed and Injured.	Average per 1000.	
			Killed.	Injured.			Killed.	Injured.
Northern and Southern	527	10	1	9	10	18·975	1·897	17·077
North-Eastern	671	5	1	4	5	7·451	1·490	5·961
Eastern	542	8	1	8	9	16·605	1·845	14·760
North-Western	990	3	Nil	3	3	3·030	Nil	3·030
Western	3376	38	3	36	39	11·552	0·888	10·663
	6106	64	6	60	66	10·809	0·982	9·826

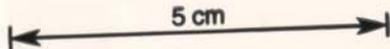
Diagram showing the ratio of Fatal Accidents
in Mines in Tasmania:

Rate per 1000 men employed.



ASO1

Photo Algraphed by John Vail Government Printer Hobart Tasmania.



ANALYSIS of Statistics for the Western Division.

Division.	Average Number of Men Employed.	Number of Accidents.	Number of Persons.		Total Number Killed & Injured.	Average per 1000 Killed and Injured.	Average per 1000.	
			Killed.	Injured.			Killed.	Injured.
Mount Lyell	1803	21	1	21	22	12·201	0·554	11·647
Zeehan, &c.	1573	17	2	15	17	10·807	1·271	9·535
	3376	38	3	36	39	11·552	0·888	10·663

TABLE showing the Number of Persons Killed and Injured in and about the Mines of Tasmania during the Year 1913.

PLACE OR CAUSE OF ACCIDENT.	INSPECTION DISTRICTS.												TOTAL.	
	Northern and Southern Division.		North-Eastern Division.		Eastern Division.		North-Western Division.		Western Division.					
	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Zeehan and other Districts.		Lyell District.			
Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	
UNDERGROUND— Falls of ground	1	...	1	...	2	...	4	
<i>Shaft Accidents—</i> Haulage	1	...	...	...	...	...	...	...	...	1	...	2	
Falling down passes and shafts	3	...	2	...	5	
Total	1	...	...	...	...	...	...	3	...	3	...	7	

<i>Miscellaneous (underground).</i>														
Haulage—														
Trams, &c. ....	...	2	...	...	...	1	...	...	...	...	...	3	...	6
Sundry accidents .....	...	5	...	...	...	...	...	1	...	1	...	7	1	14
Explosives .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total .....	...	7	...	...	...	1	...	1	...	1	1	10	1	20
<i>Total Underground</i> .....	...	8	...	...	...	1	...	2	...	5	1	15	1	31
ON SURFACE—														
Smelting-works .....	...	...	...	...	...	...	...	...	1	...	...	2	1	2
Machinery .....	...	...	...	...	...	...	...	...	1	2	...	...	1	2
Falls of stone	1	...	...	...	...	1	...	...	...	1	...	...	1	2
Tramways .....	...	...	1	...	...	1	...	...	...	1	...	2	1	4
Falls of persons .....	...	...	...	1	...	1	...	...	...	1	...	1	...	4
Explosives .....	...	...	...	...	1	1	...	...	...	1	...	...	1	2
Miscellaneous.....	...	1	...	3	...	3	...	1	...	4	...	1	...	13
<i>Total Surface</i>	1	1	1	4	1	7	...	1	2	10	...	6	5	29
GROSS TOTAL, 1913.....	1	9	1	4	1	8	...	3	2	15	1	21	6	60
Total during 1912.....	2	10	2	6	...	8	...	5	1	9	48	15	53	53

REPORTS OF INSPECTORS OF MINES.

MR. INSPECTOR GRIFFIN (Newstead) reports:—

I have the honour to submit my report as Inspector for the Northern and Southern, North-Eastern, and Eastern Divisions of the State for the year ending 31st December, 1913.

Number of accidents, 23. Casualties: Three fatal, 21 non-fatal; total, 24.

Of the Fatal Accidents.—Sidney Herbert Davis was killed whilst working with his brother and their partner, Charles Adam, on a shallow alluvial tin mine near Moina, in the Middlesex district. The ground was only 5 feet in depth. The men had undercut a portion to bring down the stuff. Davis worked close up to the angle at one end. When the fall was breaking away he stepped back sufficiently far to clear it, but, forgetting that a stump about 4 feet in height stood on the bank, he did not see his danger until too late to get clear, and was struck by the prong point of the timber on the back of the head and neck, and borne down against the side-wall, and expired within a few minutes from effects of skull-fracture and hæmorrhage. A sad accident where danger could be least anticipated by anyone.

Francis Talbot Trowbridge, a youth of 21 years of age, employed as "bin-boy" at the Arba Tin Mine, went to work on afternoon shift on the 26th June. His duties were to look after the sand-bins over the inclined haulage-line, operate levers to fill the skips as they descended on the tram-line beneath, and give signals by electric bell to the enginedriver on the bank above to raise or lower. The place was fairly well lighted by electricity after nightfall. He was seen at his post at 5 o'clock. An hour later shift foreman Peters went to the bins, and not finding anyone there, looked about for Trowbridge, and after searching for some time found his dead body lying on the 6-foot space between the double tram-line on the haulage incline. Apparently he must have fallen on to the line from a plank footway running across on fluming-bearers 10 feet above, and was caught and carried half way up the line by the ascending skip, and brought back to where the body was found (30 feet above the bins) by the descending one. There was no evidence to show how he got on to the line. It is surmised that he might have been taking a short cut to get to the top of the incline, where the boys used to go sometimes to get wood for their firepot, and that he slipped and fell from the foot-plank referred to; or that, after having knocked away the last skip sent up by him, he had immediately passed over the top of the bins, descended 3 feet to the foot-plank, and paused to see the full skip come out from beneath, and at that moment either slipped down or, having been overcome by dizziness, fell on to the line. He had received some injury to one of his eyes a few days previously when footballing, and was wearing a bandage over it when he went to work. No one is to blame for this unfortunate acci-

dent. Every reasonable precaution for the safety of the men working at the bins was taken. There are two approaches to the platform, with steps and railed gangways.

Walter James Malkin was killed at the Royal George Tin Mine on the 25th August by an explosion of gelignite. He went to work at 8 o'clock on Monday morning with his mate, George H. Cocks. They immediately proceeded to charge a 4-foot hole drilled on the previous Saturday into rock at top of an open-cut face. Cocks dropped the plugs of gelignite one by one into the hole, and Malkin, using a 6-foot tamping-stick, pressed them home. When the twelfth plug was thus inserted an explosion took place. Malkin was instantly killed, and Cocks received cuts on the head and a severe peppering of grit about the face and eyes. The explosives used were in good condition when given out of the company's main magazine on the Friday prior to the accident. Several holes were charged and fired by these men on that day, also on Saturday up to 4 p.m. One cardboard box of 5 lb. was left over. This was placed by Cocks in a cement cask in the open near the face. The weather was extremely cold; severe frosts on Saturday and Sunday nights. And although Cocks claims that this particular parcel was in good order, there cannot be any doubt but that it was in a hard state and not safe to be used when taken out of the cement cask in the morning. Even late in the afternoon of the same day two plugs out of what was left were found to be quite hard, the remainder slightly so. Cocks denied that any force was used in pressing the charge to the bottom of the hole, but admitted that the 12 plugs inserted were compacted into 10 inches of the bottom of the hole. This is significant. Gelignite in a hard or frozen state will not stand compression or blows without exploding. Our mining rules strictly forbid its use in such a state, yet in the face of all this and too oft-repeated warnings from the inspector, we have the fact of an old and experienced miner like George Cocks not only placing the hard plugs in the hole himself, but allowing Malkin, who was an inexperienced hand, to use the tamping-stick and bang them home.

Of the non-fatal accidents there is but little to be said. Fourteen out of the 21 were recorded only as serious accidents by reason of the sufferers being off work as a result of the injuries they received for periods in each case exceeding 14 whole days.

Ventilation of Mines.—On the whole the ventilation of both coal and metal mines has been fairly adequate. At the Tasmania Gold Mine some difficulty is being experienced at the close of the year through inrushes of carbonic acid gas at the bottom levels. The mine is ventilated by natural means, and good air is the rule in nearly every working place. At times, generally when sudden atmospheric changes occur, the men have to leave the western ends at bottom levels for a time; but they have had other places in the mine to go to. Latterly, however, these inrushes of gas given off from the country strata pervade the whole of the bottom workings. In November all the men had to be called out for a few hours; a sudden change in the direction of the wind neutralised the otherwise excellent down-cast current of air in Hart's shaft. Water was used as a tromp, and by this means the circulation was soon restored. Gas was again troublesome in December, and men

are now beginning to complain, not of the effect of this gas on their health, because they are not allowed to work in it, but on account of so much time being lost. The situation will now have to be faced, and mechanical appliances resorted to to lift this heavy gas from the bottom levels. Ventilation by natural means alone will no longer be adequate in this mine. The means used for warning the men in times of danger in this mine is by knocking on the compressor air-pipes which traverse every level and most other places where men are at work in the mine. This I find to be a most effective way of signalling in times of danger. Men are instructed to reply immediately they get a danger call. If by reason of the noise made by the machine they fail to hear, then their machine air-supply is cut off or a message is conveyed by other means. Signalling danger calls by means of air-pipes is the method used in big alluvial mines where the ventilating air-pipe is generally in use, and this method can be availed of in lode-mining equally as well. It would be well if this means of communicating danger calls were adopted in all the big mines in the State.

Sanitation.—The sanitation of the mines is fairly good all round. Proper latrine conveniences are provided, and if used as they should be there ought not to be anything to complain of in this direction.

Dust-destroying appliances are provided where at all necessary, both in connection with rock-drills or where dust becomes a nuisance from other causes.

Magazines and Explosives.—The magazines on the mines are kept in proper order, and the explosives are in a fit state for use when issued therefrom. The small distributing-magazines used on big mines are, as a rule, safe and sufficient to return unused explosives to. Some amendment, however, seems necessary in our mining rules making it incumbent on all persons using explosives on surface workings or open-cut mines to return at the close of each day to the main magazine or other proper receptacle on the mine all explosives left over after blasting operations. The main object of this would be to guard against the possibility of high explosives (nitro compounds) becoming hard or frozen. We have had several bad accidents, some fatal, through the use of gelignite when in a hard state.

Machinery Plants Erected or Added To during the Year.—S. and M. Mine, Moina.—An air-compressor plant installed. Ingersoll Rand Compressor No. 10, Imperial type, coreless inlet-valves, 2-stage high speed; capacity, 375 cubic feet per minute; driven by water, 40-inch Pelton wheel under 350 feet head-pressure. The machine-drills put in use are the "Ingersoll" hammer-drill of the butterfly-telescope pattern. These are small drills suitable only for boring "uppers." The adjustment is simple. A drill can be changed in two minutes by turning off the telescope air-pressure and allowing the machine to slide down the pedestal-bar. When reinserted it is moved up to and kept hard against the work by compressed air in the telescope tube. The whole plant, including air-receiver pipes, &c., is of a very complete nature, and is giving high efficiency.

The Tasmanian Consolidated Gold Mining Company (old East Tasmania), who commenced operations in June last,

erected new poppet-heads over the old shaft and have installed a winding-plant, steam-winch pattern, purchased from the Tasmania Gold Mine Company; also equipment—bailing-tank, safety-cage, and a small sinking pump. A large stationary boiler and Cameron sinking pump have recently been added to the plant.

At Lefroy the Golden Crest Gold Mining Company hired a steam-winch winding plant from the New Pinafore Company, and had it fixed up at the old "Reward" shaft, from which centre they are testing two lodes, the "Crest" on the north side, and the "Gift" to the south.

The New Pinafore Gold Mining Company removed one of their winding plants to the Golden Heart shaft for the purpose of prospecting the Clarence line of lode at the old 200-foot level, also testing the value of the deep lead alluvial to the eastward. Having proved this payable, they have now removed and re-erected their larger winding plant from the old main shaft to the site chosen, and on which a new shaft has been sunk to work the deep alluvial gutter.

The Guiding Star Tin Mining Company erected a 10-head battery with boiler and engine at their mine near Branhholm.

Higgs & Kerrison have installed a new 20-horse-power portable engine and centrifugal pump on their (Garfield Hill) tin mine near Gladstone.

The Pioneer Tin Mining Company imported a new 20-horse-power portable engine to operate their gravel-pump and machinery on their "Argonaut" tin mine near St. Helens.

At the Royal George Mine (Avoca) a second and more powerful electric plant for pumping had to be installed. A calcining plant for roasting the pyritic seconds obtained from the tin concentrating plant has been erected.

Quarry Accidents.—Fatal, 1; non-fatal, 2. Total, 3.

In the appended tabulated list will be found particulars in connection with these accidents. Prosecutions were instituted in two out of the three. In the case of Lefevre, the owner of the excavation at Upper Pyengana where the fatal accident occurred, proceedings were taken, not with a desire that anything like a severe penalty should be imposed, but in order that other owners of quarries and similar works may know that now, under certain sections of the "Mining Act," these and similar works come under the heading of the word "mine," and that any accident of a serious nature occurring thereon must be immediately reported to the nearest inspector of mines by the person in charge of the works. Neither Lefevre nor Mason had the least notion that they were required to report. The former was let off by paying 8s., court costs; Mason had to pay 5s. fine, with 8s. costs. In each case the accused pleaded guilty.

LIST of Accidents in Inspector Griffin's District for Year 1913.

Fatal, 3 ; non-fatal, 21 ; total, 24.

Date of Accident.	Name of M ne.	Locality.	Cause of Accident.	Name of Sufferer.	Married or Single.	Nature of Injuries.	Particulars.
1913. 3 Jan.	Anchor Tin Mine Ltd.	Lottah	Fall of earth and stone	Manning, Maurice	Married	Severe bruises about the back	Was engaged jumping a hole in open cut, and was caught by a small slip of stone and earth from bank above him. Off work 18 days
9 Jan.	Tasmania Gold Mine Ltd.	Beaconsfield	Blast from furnace	Bremner, Aubury	Single	Burns on right side of face and on hand	Stoking B.W. boilers ; was caught with back-draught and burned. Was off work 19 days
21 Jan.	S. & M. Mine Syndicate	Moina	Truck tipping against schute	Atkinson, Martin	Married	Thumb cut and bruised	Trucking underground ; truck bumped and tipped against chute, jamming his hand. Was off over 14 days
27 Jan.	Tasmania Gold Mine Ltd.	Beaconsfield	Caught in air-hoist	Brown, Walter	Ditto	Hand bruised and lacerated	Was working an air-hoist underground ; let it run too fast, and bucket handle caught his hand against pulley
29 Jan.	Ditto	Ditto	Lump of quartz rolling	Hudson, Robert	Ditto	Cut on second finger of right hand	Was cleaning down in Block 304 ; a piece of quartz rolled and cut his finger, blood poisoning supervened. Was off work 23 days
5 Feb.	Erseis Tin and General Mining Co., Ltd.	Derby	Jumping from a fluming	Stephens, Albert Edward	Single	Fracture of ankle of right foot	Whilst engaged at surface construction work, jumped from a high fluming, and fractured the ankle of his right foot. Not reported as having returned to work

7 Feb.	Tasmania Gold Mine Ltd.	Beaconsfield	Working of collapsible door	Wade, Louis	Ditto	Tip of finger crushed	While opening collapsible door of cage at 1370 level, got second finger of his left hand jammed. Off 30 days
14 Mar.	Mt. Nicholas Colliery Co.	Mt. Nicholas	Top coal on skip striking roof	Britton, Wm. H.	Ditto	Finger jammed, nail and flesh badly bruised	Was running a skip out of coal face; top coal caught against the roof and jammed his finger against skip. Off work 44 days
15 Mar.	Anchor Tin Mine Ltd.	Lottah	Foot jammed between truck wheel and guard wheel	Taggart, I.	Ditto	Foot badly bruised	This lad was running trucks to the battery, and got his foot jammed between the truck-wheel and guard-rail. Was off work 29 days
28 Mar.	Ditto	Ditto	Stone rolling	Speers, H.	Ditto	Bruised hand	Was loading a truck in quarry face, when a stone rolled and jammed his hand, bruising it. Was off work 18 days
4 April	Tasmania Gold Mine Ltd.	Beaconsfield	Machine-drill slipping	Barrett, Sidney	Ditto	Finger jammed	Was pulling down machine-drill in Hart shaft; it slipped, and jammed his finger against one of the clips. Was off work 19 whole days
11 April	Anchor Tin Mine Ltd.	Lottah	Fall off a barrow plank	Mulloy, Patrick	Ditto	Knee badly bruised	Was wheeling a barrow, the plank shifted; he fell to the ground, 2 feet, struck a rock, and got one of his knees badly bruised. Had not returned to work at end of 6 weeks
16 April	Tasmania Gold Mine Ltd.	Beaconsfield	Over-strain pushing truck	Littlejohn, Charles	Married	Left leg ricked above the ankle	Was pushing a loaded truck underground and ricked his left leg above the ankle. Was off work 24 days

LIST of Accidents in Inspector Griffin's District for Year 1913—continued.

Date of Accident.	Name of Mine.	Locality.	Cause of Accident.	Name of Sufferer.	Married or Single.	Nature of Injuries.	Particulars.
1913. 27 April	Tasmania Gold Mine Ltd.	Beaconsfield	Pick slipping	Smith, Frank	Married	Stab wound in left instep	At repairs work in Hart shaft; struck a piece of wood, pick slipped, and inflicted a stab wound in instep of his left foot. Not reported as having returned to work
14 May	Iris Tin Mine	Moina	Fall of earth and stump	Davis, Sidney Herbert Arnold	Ditto	Fatal. Fracture of base of skull	Was working with his brother and their partner, Chas. F. D. Adams, in open-cut tin-face, 5 feet in depth. A fall of earth brought down a stump, the pointed top of which struck him on the back of the head. Death was instantaneous
2 June	Briseis Tin and General Mining Co. Ltd.	Derby	Fall off a foot-bridge	De Little, Wm. Ver- non	Ditto	Two ribs broken	Fell off a footbridge on the mine, and had two of his ribs broken. Was off work 16 days
26 June	Arba Tin Mining Co.	Branxholm	Run over by skip on haulage	Trowbridge, Francis Tal- bot	Single	Fatal. Left thigh mangled, chest crushed, and ribs broken, scalp wound	Was employed as bin-boy on inclined haulage line. Had to work lever on platform, fill skips, and signal them away. Fell or got on to the line in the evening, and was run over and killed. No one saw the accident

2 July	Tasmania Gold Mine Ltd.	Beaconsfield	Stepped on a nail-point	Brown, Wm.	Married	Wound in foot from nail-point	Was repairing a schute underground, stepped on a nail-point. Returned to work after having his foot dressed, but was unable to continue. Was off 36 days
30 July	Briseis Tin and General Mining Co., Ltd.	Derby	Slipped down carrying a pipe	Clear, Daniel	Ditto	Abrasions and swelling on wrist	Was carrying an iron pipe with another man at surface workings, slipped and fell, injuring his wrist. Was 34 days off work
19 Aug.	Anchor Tin Mine Ltd.	Lottah	Jammed by stone in truck	Brown, George	Single	Finger-nail badly torn off	Whilst loading a truck with stone got his finger jammed, and nail badly torn off. Was off work over 14 days
25 Aug.	Royal George Tin Mine Co.	Avoca	Explosion of gelignite	Malkin, Walter James	Married	Fatal. Deep wound in chest, abrasions and laceration of face and scalp	Was assisting his mate, George Cocks, to charge a 4-foot drill-hole in open-cut face. Used gelignite in a partly frozen state, which exploded on being forced into the hole. Malkin was killed instantly
25 Aug.	Ditto	Ditto	Ditto	Cocks, George Henry	Ditto	Severe cut on temple, minor cuts and pepperi of grit about face and eyes	Was employed with Malkin as above, and as being the older and more experienced miner, should not have allowed the other unfortunate man to use force in tamping
14 Oct.	Briseis Tin and General Mining Co., Ltd.	Derby	Stone rolling from place	Johnson, Oscar	Single	Bone of ankle fractured	Was working in O.B. face, when a stone rolled behind him, pinning his ankle against another stone. Was off work 40 days
10 Nov.	Anchor Tin Mine Ltd.	Lottah	Hammer slipping	Cross, Herbert	Ditto	Two of small bones in back of right hand broken	Was turning a drill in open-cut workings when he received an accidental blow from hammer on back of his hand. Off work over 3 weeks

LIST of Quarry Accidents in Inspector Griffin's District for the Year 1913

Casualties.—Fatal, 1; non-fatal, 2; total, 3.

Date of Accident.	No.	Name of Quarry and Locality.	Owner of Quarry.	Cause of Accident.	Killed.	Injured.	Particulars of Accident.
1913. 23 Jan.	1	Lefevre's excavation for road material	James Lefevre	Fall of decomposed granite rock	1	—	Reginald Charles Chapple, aged 20 years, was employed by Lefevre in an open-cut excavation getting road material. The face of decomposed granite was 16 feet in depth. Chapple, who was inexperienced in that kind of work, was close in to the foot of the face picking, when a slip from the top took place, completely overwhelming him. He was buried for twenty minutes or so under the mass of soft stuff, and was quite dead when extricated. No one is to blame for this accident. The owner of the quarry, Lefevre, is ordinarily a careful man. It was an oversight allowing the new hand to work so close in.

13 Aug.	2	Knocklofty, North Hobart	Municipal Council of Hobart	Explosion of gelignite and powder	—
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1 Harry Smith, a labourer, aged 36, and married, proceeded to "bull" a hole 4 ft. 6 in. in depth, drilled in soft sandstone, at the quarry. He first put a handful of powder into the hole, and then prepared a primer—a half-plug of gelignite with cap and fuse attached—which he held over the hole while spitting the fuse. No sooner had he dropped the ignited fuse into the hole than explosion occurred. Smith received the force of the blast about the face and eyes, sustaining severe laceration and burns. It was at first thought that his sight was completely destroyed. Happily, however, this is not the case, and he was discharged from the Hobart Hospital after a couple of months, not very much the worse for his experience.

List of Quarry Accidents in Inspector Griffin's District for the Year 1913—continued.

Date of Accident.	No.	Name of Quarry and Locality.	Owner of Quarry.	Cause of Accident.	Killed.	Injured.	Particulars of Accident.
1913. 2 Oct.	3	Bellerive. Quarry or gravel-pit, Richmond-rd., Bellerive	Mr. Graham, Bellerive	Explosion of gelignite	—	1	Charles Ellston, aged 22 years, went to get a load of gravel for Mrs. Garlic, of Bellerive. Master Garlic, a lad, accompanied him. The gravel could be easily picked down, but Ellston must try explosives. The first charge missed fire. He inserted another; this missed also. He then bored a second hole 4 feet away, and charged it, when No. 3 missfire occurred. The place was then left one night. Ellston returned the next morning and tried to extract the charge, or charges, from No. 1 hole. He used a steel bar to gouge the stuff out. An explosion occurred, and he was badly injured; hands and face burned, some laceration, and eyes closed up. On inquiry at the Hobart Hospital a few days after the accident it was ascertained that Ellston was progressing favourably, and that his sight would not be permanently injured.

MR. INSPECTOR HARRISON (Zeehan) reports:—

The closing down of the local smelters caused a considerable depression, and was the means of causing the mines supplying low-grade ores to cease operations for the time being. The Montana, Western, Queen Extended, and others are keeping up a steady output.

Five-mile.—During the quarter the Zeehan and Dundas Blocks found it necessary to close down, as the water difficulty proved too heavy for further sinking operations with the appliances with which the mine was equipped. The plant has now been removed to the Cuni, re-erected, and shaft-sinking is now in progress. About 400 tons of copper-nickel ore have been shipped to Europe from the outcrop of lode; approximate value, £2200.

Copper-Nickel.—During the last quarter a plant has been purchased and a shaft put down 80 feet, lode cut, and about 400 tons of ore raised, giving a bulk assay of 10 per cent. nickel and 4 per cent. copper. The mine is opening up very well.

Dundas.—The closing down of the smelters has practically stopped all lead-mining in this district.

Mt. Read and Williamsford.—Hercules Mine: There has been no sale of ore during the last quarter through the closing down of the smelters, but about 1800 tons have been mined and delivered into the bins at Williamsford. The diamond-drill has proved very extensive bodies of ore going underfoot from No. 4 level, and the mine generally is looking well for a large output when called on.

Mt. Read Mine.—Still prospecting.

Ring Valley Mine.—Good results are still being obtained. Antimonial fahl and copper ore won and disposed of; value about £1300.

Penzance Tin Mine.—During the last quarter £620 worth of tin have been sent away. Latterly there has been a considerable improvement in the value of the ore treated, and much better results can be looked forward to.

Renison Bell.—Renison Bell Mine is still looking well and keeping up a steady output. During the last quarter some fresh discoveries of high-grade pyritic lode have been made.

Boulder Tin Mine.—New battery kept constantly employed. The company are now shipping high-grade pyrites, assay value, 40 per cent. sulphur. Returns for same are not yet to hand.

Montana Tin Syndicate.—Sluicing going on as usual, with payable results. The erection of a battery is now to be proceeded with.

Central Bell Mine.—Opened up well, and a dressing plant was erected, but found unsuitable, with the result that additions and alterations had to be made. These are now nearing completion, when another start will be made.

There are several good properties on this field, including the Federal, Dreadnaught, and others, on which prospecting work has been carried on during the quarter, with satisfactory results.

Cross River.—Prospecting on this field is steadily going on, and splendid results are being obtained by several of the companies at work.

Rosebery.—Primrose Mine: The closing down of the smelters caused a stoppage of the output, but the mine never looked better than it does at present. Driving south in main adit has proved a fresh make of ore, which will give 170 feet of backs.

Tasmanian Copper Mine.—During the last quarter 2050 tons of ore have been mined and delivered to the metal extraction works; value, £7594.

Metal Extraction Works.—It is somewhat difficult to obtain reliable information respecting the work going on. I understand there has been a shortening of hands there lately.

Farrell.—Mt. Farrell Mine is looking very well. No. 5 level is opening up splendidly. Eight thousand pounds worth of ore has been won during the quarter. Extensive prospecting is going on on the north leases (lately the Mackintosh).

Mt. Farrell.—Arrangements have been made to prospect the mine from No. 4 level of the North.

Stirling Valley Mine.—A pumping and winding plant has been purchased, and the erection of the same and sinking of mine shaft are to be proceeded with without delay.

Chester.—Closed down for the time being.

Comstock.—Block 10 Mine still pulling out pyritic ore. Small bunches of galena are met with.

Mt. Heemskirk.—Several small parties are working both lode and alluvial. On the south Williams and party have a small battery at work, giving excellent results. On the western slope, Clark & Son have also a 5-head battery at work, from which satisfactory results are obtained. On the southern slope Sweeney and party have also a 5-head battery, but there seems to be a want of capital to prospect the large formation for which the mill was erected. On the north side of the mount we have the Heemskirk Tin Prospecting Company, who have won 15.5 tons of tin during the last quarter. Twenty-three days were lost in removing the plant from No. 1 paddock to No. 2. This company has secured a large area of ground, which they have proved to be profitable to work.

I understand there are others prepared to work on similar lines when means of getting plant on to the field can be secured at reasonable cost. A tram is being constructed by the Government to connect this extensive tinfield with Zeehan, and it is being pushed ahead as fast as possible.

Stanley River.—The tributors who have taken over the Stanley River Mine are doing very well. Five men have won and sent away £1327 worth of tin ore for the quarter. I understand it is their intention to erect a battery.

Wilson River.—There are over 80 osmiridium miners on this field, and the reports that are received are of a satisfactory character. The Government is extending pack-tracks towards Mt. Ramsay. This will give prospectors an opportunity of getting into country that so far has received no attention.

Waratah.—The Mt. Bischoff Company are going steadily along. Mr. Millen has connected the North Valley workings by aerial tram with the main delivery station, and active development work is now going on there.

Bischoff Extended.—Mine still opening up well. Mill kept constantly employed. I understand arrangements are being made to duplicate it at an early date.

Wombat.—Mr. Wm. Cundy, the owner, is about to erect a battery. He has a fine strong tin-lode on the property.

Magnet.—Magnet Mine is looking well. Large bodies of high-grade galena opened up.

Whyte River.—Cleveland Tin Mine: There are several large bodies of pyritic ore opened up by open-cut and shallow adits; but more crushing power is required to make the mine a success.

Victoria Magnet is still prospecting.

Jasper Copper Mine.—During the quarter the company has erected a dressing plant to treat the ore now being raised from the new find, and also a large heap stored on the surface from the old working, but I am not in a position to say if the result is satisfactory or otherwise. At the time of my last visit the manager was breaking some very decent ore from the new workings.

Savage River.—About 50 men were employed in the district on the osmiridium, but that number will be considerably increased when the river goes down, which should be about the end of this month.

In conclusion, I may state that prospecting is going on in pretty well every part of my district, exclusive of what is being done under the supervision of Mr. Conder, the Mining Engineer.

LIST of Accidents in Inspector Harrison's District for the Year 1913.

Fatal, 2 ; non-fatal, 18 ; total, 20.

Date.	Mine.	Locality.	Cause of Accident.	Name of Sufferer.	Married or Single.	Nature of Injuries.	Killed.	Injured.	Particulars.
1913.									
1 Jan. 11	Jasper	Heazlewood	Fall of earth	Joseph Fox	Married	Muscles of back and hip bruised	—	1	Fox was caught by fall of loose earth while working in stope near the surface
2 Jan. 9	Metals Ex- traction	Rosebery	Caught in machiner	Timothy Gannon	Ditto	Lacerated finger	—	1	Hand caught in null machinery while in motion
3 Jan. 23	Comet	Dundas	Fall of earth	Walter Ravender	Single	Cut on face and shock to system	—	1	While working in stope of loose gossan a fall took place
4 Mar. 2	Smelters	Zeehan	Caught in machinery	John Holdham	Married	Bruises on chest and back	—	1	While attempting to put belt on while in motion. I had the place made secure for a man to stand in safety Holdham had a narrow escape
5 Mar. 3	Prospecting	Tullah	Explosion	Elis Scolyer	Single	Burns on face and eyes	—	1	Elis was working with his father in shallow adit ; while loading a hole it went off
6 Mar. 12	Chester	Pieman	Fell down	W. H. Odgers	Ditto	Hurt knee-cap	—	1	While getting away from a fire signal on surface fell and struck his knee on sharp rock
7 Apr. 18	Boulder	Renison Bell	Fall of derrick	F. R. Lowe	Ditto	Severe cut on jaw and bruises	—	1	Lowe was on a derrick dismantling it, when it fell down, and he came down 27 feet
8 June 3	Hercules	Mt. Read	Fall down a pass	George Day	Ditto	Bruises on body and arm	—	1	While clearing an ore-pass Day fell in
9 July 24	Renison Bell	Renison Bell	Caught in machinery	F. H. Gorey	Married	Injury to head	1	—	While driving winch his clothing got caught in shafting, and his head was brought in contact with the cog-wheels

10 Aug. 30	Ditto	Ditto	Fell down a pass	A. L. Sydney	Single	Fractured skull	-	1	While covering over an ore-pass, No. 3 level, Sydney fell in and down 50 feet
11 Sep. 2	Metals Ex- traction	Rosebery	Caught in lift	John McBain	Ditto	Ditto	1	-	McBain, age 17, native of Victoria, was killed by allowing his head to come in contact with balance weight of lift while ascending. Inquest held; verdict, "Accidental"
12 Sep. 9	Zeehan-Dundas	5-Mile	Caught by block	Percival Waller	Married	Lost first joint little finger	-	1	While drawing the pumps Waller got his hand in sheave of block
13 Sep 18	C o p p e r- Nickel	Ditto	Plank broke	James Henry	Single	Small bone of leg badly broken	-	1	While assisting to unload machinery from a railway truck a plank broke and Henry got caught
14 Oct. 2	Primrose	Rosebery	Fall of rock	John Jamieson	Ditto	Right leg broken	-	1	While barring down after firing, a rock struck him on the leg
15 Oct. 6	Renison Bell	Renison Bell	Stumbled	Henry Lumney	Ditto	Small bone of ankle broken	-	1	While filling a truck at aerial tram, stumbled and fell on flat sheet
16 Nov. 5	Hercules	Mt. Read	Fall off ladder	Robert Stanley	Married	Shock to system	-	1	While carrying charge of explosives, slipped and fell off ladder; no injuries, only shock
17 Nov. 12	Bi choff Ex- tended	Waratah	Struck by a stone	D. Crooks	Single	Scalp wound	-	1	Stone fell from stope overhead, bounced on timber, and struck Crooks on the head
18 Dec. 8	C o p p e r- Nickel	5-Mile	Fall off brace	Wm. Colson	Married	Back hurt and concussion of brain	-	1	While turning truck on flat sheet, slipped and fell into ore-bin; badly hurt
19 Dec. 18	Boulder	Renison Bell	Not stated	Robert Gil- low	Ditto	Sprained ankle	-	1	While working in battery, sprained his ankle
20 Dec. 19	Mt. Bischoff	Waratah	Fell off tram truck	Charles Smith	Ditto	Badly injured	-	1	Smith was driver on tramline at the sawmill; fell off, bruised chest, fractured rib, bruised arm and leg. This accident took place over two miles away from the mine

LIST of Quarry and Railway Accidents in Inspector Harrison's District for the Year 1913.

Non-fatal, 1; total, 1.

	Date.	Quarry.	Locality.	Cause of Accident.	Name of Sufferer.	Married or Single.	Nature of Injuries.	Particulars.
1	1913. Sep. 2	Railway	Stanley	Explosion	Thos. Lynch	Single	Badly burned	While bulling a hole on the Stanley - Balfour Line, Lynch had a premature explosion. Injuries to face and eyes, also to arms and hands, but the latter not serious. He did not lose his eyesight

MR. INSPECTOR CURTAIN (Queenstown) reports:—

Accidents.—It is to be noted that, apart from the sufferers themselves, little if any forethought could have prevented any of the casualties happening.

One proved fatal (Sharp's), and the facts and circumstances attached thereto may be repeated. He and his mate, Swain, were shovelling ore into a pass in a section of a large (20) stope, while others were "mullocking" the adjoining portions. This pass, that unexpectedly proved responsible for his death, was reasonably covered at the time. Both divisions were "barricaded" in order to permit "sectional mullocking," and it was into the other (Section 2) "wing" this was being diverted or intended at the time of the calamity. The pass necessary for this purpose, and capable of holding many tons of "mullock," became blocked, and to free or "spring" it customary blasting methods were resorted to. While waiting the latter's result, all sought safety in various parts of the stope, and, if thought advisable or necessary, could have left its precincts altogether. The men mentioned took shelter behind a "bulkhead" adjacent to their work, and had they remained there their safety would have been assured. The pass had evidently been hung up for some time, as in addition to the mullock a quantity of water had accumulated, and when the "let-go" took place, the inrush was so great, accompanied by the extinguishing of the lights, that it mounted and broke through the "barricade," and parts swept into the section where the men named were stationed. Fright evidently took possession of both, and believing the next (lump) section afforded better protection, they rushed towards it. Unfortunately, the pass they had just left intervened or was in the way, and the bulk of the overflow found its way into it. The quantity was not great, but being soft and mobile swept the covering off and the men either walked or were carried unconsciously into it.

After the impact abated cries were heard coming from its interior, where Swain was located, and sent to the surface. Immediately following Sharp's absence was noted, and on "running" the pass his lifeless body came through some 20 minutes later.

Health of the Miners.—This, as far as medical testimony is available, continues satisfactory. Four deaths are reported from pneumokoniosis; two of these men played important and active parts in the North Lyell fire disaster; one of the others was working for some time prior to his decease in excessively wet workings; while the other was not, to my knowledge, engaged in service where dust was prominent.

Five affected men remain in the district, four of whom are still actively engaged in their calling, but the fifth is incapacitated.

It is not certain that the whole or any of those cases can be primarily attributed to the conditions attending local mining. The trouble may have originated from sources foreign to the occupation, or the disease may have been contracted elsewhere and brought here. In support of this, it may be mentioned that our mines are moist and their rock temperatures in no instance exceed 60° Fah. This temperature is a recognised standard, and, combined with good ventilation,

contributes to the health of the miners. In this direction the hearty co-operation of the workmen is required, but for some reason they are apathetic and slow in assisting to keep their surroundings clean and wholesome, particularly in respect to the disposal of waste food, wrappers, and, at times, other more objectionable nuisances.

Fuse, Caps, Explosives, and Candles.—These necessities are obtained from reputed makers, and in no instance has complaint been received respecting their quality or efficiency. Acetylene is finding its way into use, and providing care is manifested in connection with the lamps, there is little doubt that its use will become more general in our mines.

Ropes and Cages.—Those in use are practically new, and in addition to the maker's certificate, have received periodical tests and inspections as required by the mining regulations.

Inspections.—During the year the following visits and inspections have been made to the various mines and works that have been in operation:—North Lyell, 75; Mount Lyell, 52; Lyell Blocks, 33; reduction works, 27; silica and limestone quarries, 26; Lyell Comstock, 13; Hall & Harvey's Creek, Lynchford, 10; McDowell P.A., 9; Tasman and Crown-Lyell Extended, 8; Guy's P.A., 7; Lake Margaret hydro-electric scheme, 5; Jukes district, 1; miscellaneous, 10, including explosives magazines; while 27 enquiries were held and attended to, in addition to the clerical work attached to this office.

LIST of Accidents in Inspector Curtain's Lyell District for 12 months, from the 31st of December, 1912, to the 31st December, 1913.

Fatal, 1 ; non-fatal, 21 ; total, 22.

Date.	Name of Mine.	Locality.	Cause of Accident.	Name of Sufferer.	Married or Single	Nature of Injuries.	Remarks.
1913. 2 Feb.	Mt. Lyell Mg. & Ry. Co., Mt. Lyell Mine	Gormans- ton	Run over by Haulage truck	George Hine	Single, age 14 years	Right foot crushed	His foot was run over while trying to get on a rake of trucks.
16 April	Ditto	ditto	Fall of rock drill	William Travers	Single, age 29 years	Concussion or slightly frac- tured head	While assisting to dismantle a rock drill, the machine slipped on the column, and struck his head.
5 June	Ditto (North Lyell Mine)	North Lyell	Crushed or jammed by a rake of timber trucks against the side of the main adit	James Jeffreys	Married, age 60 years	Side crushed, and three ribs broken	Meeting a horse-rake of timber trucks, got confused, and in- stead of retreating to a place of refuge, tried to secure safety by squeezing against the wall, but was caught and injured.
27 June	Mt. Lyell Mg. & Ry. Co's Re- duction Works	Penghana	Explosion of matte	Charles Timothy	Single, age 29 years	Burnt, and cut face	Sustained painful injury while playing a jet of water on es- caping matte, when an ex- plosion took place.

LIST of Accidents in Inspector Curtain's District—continued.

Date.	Name of Mine.	Locality.	Cause of Accident.	Name of Sufferer.	Married or Single.	Nature of Injuries.	Remarks.
1913. 12 July	Mt. Lyell Mg. & Ry. Coy., North Lyell Mine	North Lyell	Overflow or rush of stowing mullock	Joseph Sharp	Married, age 36 years	Suffocated	Sharp, with Swain and others, while waiting for a blast to free a mullock pass, sought safety behind a bulkhead, but left it, and walked or was swept into an ore pass, and was suffocated.
12 July	Mt. Lyell Mg. & Ry. Coy., North Lyell Mine	North Lyell	Overflow of stowing mullock	Frederick Wil- liam Swain	Married, age 41 years	Fractured skull	This accident was the same as that in which Sharp lost his life.
16 July	Mt. Lyell Mg. & Ry. Coy., Mount Lyell Mine	Gorman- ston	Piece of broken ore rolled down hill	James Patrick Morarity	Single, age 48 years	Bruised knee	While shovelling ore into a chute Morarity undermined a piece of loose spoil, which turning over, caught him.
5 Aug.	Mt. Lyell Mg & Ry. Lyell Com- stock Mine	Comstock, Nth. Lyell	Crushed be- tween body of "pilot" truck and guide or roller beam on surface in- cline haulage	George Tuscan	Widower age 75 years	Bruised back, shoulder, and hips	Was riding on truck of timber, but on nearing the end of its journey he is said to have forgotten the deflecting roller, under which he was jammed.

11 Aug.	Mt. Lyell Mg. & Ry. Co., Mount Lyell Mine	Gorman- ston	Fell or slip- ped off No. 11. surface ore-bench	John James	Single, age 23 years	Bruised back and shock	Foot slipped or ground gave way, and he fell about 35 ft.
21 Aug.	Mt. Lyell Mg. & Ry. Coy., North Lyell Mine	North Lyell	J a m m e d between two trucks	Alfred Henry Lewis	Married, age 32 years	Left forearm fractured	While leaning on his truck was run into by the following truck, at the 850 ft. level.
16 Sep.	Ditto	Ditto	Fall of rock	William Bayes	Married, age 34 years	Wounds to scalp, tongue, with bruised arms and shoulders	Was injured by a fall of rock while examining the roof of a stope after firing.
17 Sep.	Ditto	Ditto	Cage-bar & side of shaft	John Markey	Single, age 37 years	Right arm broken above the elbow	While travelling in the cage protruded his elbow, which was caught between safety- bar and shaft.
Ditto	Mt. Lyell Mg. & Ry. Coy., Mount Lyell Mine	Gorman- ston	A piece of broken spoil rolled off the "rill"	Chas. Randall	Single, age 21 years	Calf of right leg bruised	While shovelling ore into a chute a piece of it rolled over and injured him.
Ditto	Mt. Lyell Mg. & Ry. Co., North Lyell Mine	North Lyell	Fall off or from a winze ladder plat- form	James Park	Single, age 22 years	Extensive scalp wound	Fell from one platform in winze to the next below.
19 Sept.	Mt. Lyell Mg. & Ry. Co., Mount Lyell Mine	Gorman- ston	Slipping or turning over of a piece of broken ore	Wm. Daniels	Widower age 50 years	Compound frac- ture of left ankle	A piece of broken ore slipped, or rolled off the side of stope, and pinning his boot, caused him to fall.
3 Oct.	Mt. Lyell Mg. & Ry. Coy., North Lyell Mine	North Lyell	Slipped and fell off a low timber truck plat- form	Patrick Peter Long	Married, age 47 years	Three ribs frac- tured	While walking along a timber shed platform, slipped on a piece of loose timber.

LIST of Accidents in Inspector Curtain's District—continued.

Date	Name of Mine.	Locality.	Cause of Accident.	Name of Sufferer.	Married or Single.	Nature of Injuries.	Remarks.
3 Oct.	Mt. Lyell Mg. & Ry. Coy., North Lyell Mine	North Lyell	Fell down an ore pass	Percival Jones	Single, age 24 years	Laceration of brain, cuts, and shock	Fell 70 feet down open ore pass.
4 Oct.	Ditto	Ditto	Fall of ore, and collapse of timbers	Jas. Fitzgerald	Single, age 59 years	Scalp wounds, nose broken, and left arm bruised	Was shovelling ore in stope when a piece fell and dis- lodged the main timbers.
6 Nov.	Ditto	Ditto	Fell from 3rd or top- floor tim- bers	Jas. Sheridan	Single, age 21 years	Scalp wound	Was standing timbers in stope, when a piece he relied on for a hand-hold gave way, and pre- cipitated him to the level floor.
11 Nov.	Ditto	Ditto	Fall of piece of stack- timber	Frank Brown	Married, age 31 years	Big toe of right foot broken	While building a bulk-head in stope a piece fell on his foot.
12 Nov.	Ditto	Ditto	Crushed be- tween drive timbers and rake of trucks	Cornelius Berrisford	Single, age 47 years	Severely bruised, but no bones broken	Meeting the ore-trucks in the adit, he got confused, and was jammed against the side.
1 Dec.	Mt. Lyell Mg. & Ry. Coy., Red- uction Works	Peng- hama	Fall of accu- mulated but dis- lodged matte "ac- cretion	Percival John Butler	Single, age 19 years	Compound frac- ture of right forearm	Butler while attending his duties received the injuries stated.