AR1921

TASMANIA

REPORT

OF THE

ACTING-SECRETARY FOR MINES

FOR

YEAR ENDING DECEMBER 31

1921

Including Reports of the Inspectors of Mines, Director Geological Survey, Mount Cameron Water-Race Board, &c.

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Report of the Acting-Secretary for Mines.

Mines Department,
Hobart, 1st April, 1922.

SIR,

I HAVE the honour to submit my report on the Mines Department and the Mining Industry for the year ending 31st December, 1921.

As no appointment to the position of Secretary for Mines has so far been made, I am still performing the duties pertaining to that office as Acting-Secretary.

GENERAL REMARKS.

The aggregate value of minerals raised during the year was £822,851, being a decrease of £598,253 on the output for the previous year, which is not a matter of surprise when the phenomenal fall in the prices of all minerals and metals from the prices ruling in the early part of the year 1920 is taken into account. This collapse of the market, in conjunction with the increased cost of production, was the cause of a total cessation of operations in many instances.

The most marked decreases were in—silver, £109,191; lead, £110,027; and tin, £239,105

APPENDICES.

Appended will be found:—

Annual Report of Mt. Cameron Water-race Board.
Report of the Director of the Geological Survey
Report of the Chief Inspector of Mines.
Report of the Chief Inspector of Explosives.
Reports of the Inspectors of Mines.

AID TO MINING.

For the first portion of the year the metal market was depressed, and the low prices in conjunction with high smelting charges caused almost a cessation of mining. The position is now much more favourable. Silver and lead are quoted at fairly good prices, and the smelting charges have been substantially reduced. The ensuing years should witness a moderate revival of mining activity in the Zeehan district.

The aid given to mining on Zeehan has been much greater than the amount allocated for several years. This was occasioned by the number of men thrown out of employment by the low metal prices ruling in the first quarter of the term. Altogether, State assistance to the extent of £874 was given for 2063 feet of driving, being an average rate of 8s. 5d. per foot. Several lodes were cut, and some of these will yield an appreciable quantity of ore. It is now, however, evident that the radius of 2 miles from the Zeehan Post-office, over which the Aid to Mining is operative, has been extremely well tested to the depth which ordinary tributers can attempt. Hence future prospecting should range farther afield.

Discoveries of importance were made on the Zeehan-Queen, the Montana, the No. 2 Argent, and the No. 6 Argent. Of these, the very good development at the No. 6 Argent must take first place. In sinking a winze from the lowest, or 120-ft. level, to a depth of 40 feet, the lodes were found to have improved in an exceptional manner, both as regards size and the quality of the ore. This mine when properly opened should prove a good ore-producer. At the No. 2 Argent surface prospecting only has been possible. A good lode has been uncovered, and will be further tested when the mine is unwatered. The new electrical pumping unit is complete, and is a fine plant of its size, embodying all the latest improvements. A serviceable electrical winding plant is also about finished. Pumping will commence early in January. Several other tributes and mines are showing payable faces of ore, and the coming year should witness a good increase in the ore-production of the district.

During the year 573 samples were assayed for tributers and prospectors, and these entailed 1250 metal determinations. Also 98 mineral identifications were made free of charge, and various surveys were made gratuitously for State tributers.

The total quantity and value of ore sold during the year was as follows:—

	Quantity.	Value.
	Tons.	£ s. d.
Silver-lead ore...	700·0171	14,228 0 4
Pyritic ore	Nil.	Nil.
	700·0171	£14,228 0 4

NOTE.—Final statements for 122·7478 tons not yet received.

The amount received from ore sales was £8970 15s. 1d., which was distributed as follows:—

	£ s. d.
Paid to tributers	7,253 13 8
Royalty paid to lessees	202 5 8
Royalty paid to State	1,425 2 11
Miscellaneous payments to State	89 12 10
	£8,970 15 1

EXPENDITURE.	£ s. d.
Salaries	475 0 0
Wages	67 2 6
Office expenses	19 5 1
Travelling expenses	31 8 2
Assay material	106 8 8
Miscellaneous expenses	74 16 2
Assistance to prospectors	803 9 6
Advance to No. 6 Argent Prospecting Syndicate, No Liability	1,200 0 0
Advance to No. 2 Argent Prospecting Syndicate, No Liability	2,194 8 4
Costs *in re* Nike Company *v.* Coltson	287 16 11
Refund, royalty	1 6 5
	£5,261 1 9

RECEIPTS.		£ s. d.
Royalty paid by tributers...	£1,049 19 10	
Less rebate, pumping account, No. 2 Argent P.S.	35 4 5	
		1,014 15 5
Assay fees		62 19 0
Refund, half-cost of assay furnace		11 10 7
Refund for goods returned to McPherson Proprietary Limited		19 6 0
Sale of horse-collar		1 0 0
		£1,109 11 0

No. 2 Argent Prospecting Syndicate, N.L.

Purchase and Construction of Plant.—During the year, the Syndicate has paid in royalty £41 11s. 3d., and at the 31st December the account stood as under:—

	£	s.	d.
Cost of purchase and construction of plant...	2,646	11	3
Repaid by royalty	583	4	0
	£2,063	7	3

Running and Maintaining Pump and Plant.

	£	s.	d.
Expended during the year	Nil		
Credit by rebate royalty payments	35	4	5

The account at the 31st December stood as follows:

	£	s.	d.
Total expenditure	912	2	4
Total rebate	1,269	12	4
Credit	£357	10	0

No. 6 Argent Prospecting Syndicate, N.L.

The proceeds from ore sold on account of the Syndicate and its sub-tributers amounted to £7901 13s. 4d., from which the State received in royalty £627 14s. 1d., and in liquidation of loans and interest thereon £661 11s. 7d.

The total amount loaned to the syndicate is £4856. The amount repaid is £2085 19s. 1d., and the total interest paid is £101 19s. 10d.

GOLD.

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

	Ozs.
Beaconsfield	120·95
Lefroy	51·808
Lisle, Golconda	23·198
Mt. Claude	85·400
Mt. Cameron, Mt. Victoria, and Warrentinna	198·676
Mathinna	568·025
North-West and West Coasts	4,714·434
Total	5,762·491

Value, £28,395, equal to 5,340·094 oz. fine gold.

Beaconsfield.—Apart from some 112 oz. obtained by the Tasmania Gold Mine Limited from the old tailings, the output was 8·5 oz. only.

Lefroy and Back Creek.—Desultory prospecting has been carried on at Lefroy, but nothing of importance has been discovered.

At Back Creek, Gillam and party uncovered a long stretch of deep ground on the old White-Lead, and obtained some specimens of coarse ragged gold, but they, like their predecessors, failed to locate the source from which the specimens were shed.

Lisle.—The scheme to establish an extensive sluicing proposition, with the view of exposing the source of the alluvial gold found in the basin has not yet been matured.

The locality still attracts the attention of prospectors, and a party is driving an adit through "Donnelly's Terrace," once noted for its exceptional richness, in an endeavour to pick up a continuation of the lead.

Golconda, Panama.—A little prospecting is still being carried on, and at Mt. Brown three men have been sinking shallow shafts, but have not so far won any gold.

On the Paternoster-road, near St. Patrick's River, Messrs. Brock Bros. are tunnelling, and expect at an early date to cut a make of stone, the surface prospects of which are considered to be of an encouraging nature.

Forester Settlement.—A discovery of gold-bearing quartz was made in September last on the holding of Robert H. Linton by L. D. Edwards, who has since applied for a Reward Claim. A crushing of 6 tons, taken from the No. 1, or south, reef, gave a return of 12 oz. 15 dwt. of gold, and a similar quantity of stone from No. 2, or north, reef gave a return of 15 oz.; while an average sample of the tailings was found to contain by assay 7 dwt. 5 gr. of gold and 8 dwt. 12 gr. of silver. The sample of quartz forwarded with the application for Reward Claim assayed 18 oz. 2 dwt. 14 gr. of gold, and 8 oz. 17 dwt. 17 gr. of silver.

Several other sections, totalling an area of 183 acres, have been applied for as a result of the discovery.

Mt. Victoria.—At the Long Struggle Mine the crosscut has been advanced to a total of 530 feet. Three makes of stone were cut, all carrying gold, and that nearest the face, believed to be the same reef, showing 100 feet overhead, has been driven on for a distance of 30 feet with very encouraging indications.

Prospecting has been carried on by Messrs. Wallace, Hannah, Fowler, and Blair respectively, on their sections in the vicinity.

Mathinna.—The New Golden Gate Mine, which is now practically the only gold mine in operation in the State,

produced 538 oz. The average number of men employed was 18.

Mangana.—A little work was done on the Golden Entrance Mine; and at Tower Hill Dr. Thompson and others are on an irregular sandstone formation, which dollies fair prospects.

Long Plains.—Shore's Success Mine.—Driving was continued during the year for a further 400 feet in the lower tunnel, but no gold-bearing stone was met with. The average number of men employed was five.

SILVER-LEAD.

The quantity of silver produced was 348,658 oz., valued at £57,576.

The principal producers were:—	Ounces.	Value
Zeehan Mines—		£
Mt. Zeehan (Tas.)	4,130	707
Nike	18,453	2,935
Zeehan-Montana	1,603	278
Oonah	6,614	1,113
Swansea (Dunn)	1,654	287
Zeehan Queen	2,065	355
No. 6 Argent	35,010	5,604
No. 2 Argent	4,110	685
Others	13,748	2,342
	87,387	14,306
North Mt. Farrell	34,402	5,858
Magnet Mines	32,502	5,214
Round Hill	11,346	1,803
Mt. Lyell	183,021	30,395
Total	348,658	57,576

The quantity of lead produced was 1434·794 tons, valued at £32,341.

The principal producers were:—	Tons.	Value.
Zeehan Mines—		£
Mt. Zeehan (Tas.)	37·89	893
Nike	171·00	3,778
Zeehan Montana	18·05	425
Oonah	44·22	1,023
Zeehan Queen	12·694	293
Swansea (Dunn)	61·08	1,466
No. 6 Argent	237·33	5,225
No. 2 Argent	32·02	749
Others	83·51	1,977
	697·794	15,829
North Mt. Farrell	377	8,734
Magnet Mines	195	4,144
Round Hill	165	3,534
Total	1,434·794	32,241

Northern Division.—Mt. Claude—Round Hill Mine.—The main No. 1, or lowest, adit has been advanced to a total distance of 1420 feet, 700 feet of which is on the new development. An engine winze, with its accessories, has been sunk 60 feet, and this will be continued to 110 feet. The company suffered the loss, by fire, of its crib, changing, and compressing houses.

About 40 men were employed.

Eastern Division.—Scamander.—At the Lady Betty (formerly the Beulah Mine) prospecting has been carried on in the old workings, and a shaft has been sunk to a depth of 60 feet on the underlie side of the stone, which consists of quartz carrying chlorides.

Three men were employed.

North-Western Division.—Magnet Silver Mine.—Owing to the low price of metals the mine was closed on the 23rd March; output 463 tons. Metal contents—silver, 32,502 oz.; lead, 195·6 tons; gross value, £9358. Number of men employed, 104, from the 23rd March till the end of the year, only prospecting and developmental work has been carried out, with 23 men, as follows:—

No. 11 Level.—Driving south on the footwall to prospect the southern portion of the lode was carried out for 96 feet without meeting with success.

No. 12 Level.—The south hanging-wall ("A" drive) was driven 126 feet. The first 80 feet small veins of ore, from 1 to 8 inches, were followed, and although looking promising at times, nothing of value was met with. A crosscut across the lode-channel was put in to prospect between this drive and the hanging-wall for 100 feet, and with the exception of the last 15 feet, which was in dolomite, nothing of value was met.

No. 14 Level.—To prove the lode at this level the shaft, which had been previously sunk, was unwatered, the platt cut, and the crosscut driven 482 feet, when the lode was cut. The distance across the lode, where cut, was 61 feet, the footwall portion of it, 9 feet wide, disclosing fair grade ore; the balance, with the exception of small veins, being poor seconds until the hanging-wall was reached, where 2 feet of good milling ore was met with. No work has yet been done north or south on the lode to prove its value, but the prospects are encouraging, especially as a depth of 1000 feet has now been reached.

Mt. Jasper Mine.—Work has been principally confined to driving and stoping on a silver-lead formation on the "Right" Mine. Some nice first-class ore can be picked out, and the remainder is sent to the mill for treatment.

Western Division.—Mt. Zeehan (Tas.) Silver-Lead Mines Limited.—This company has continued work on its Britannia Mine, and cut the downward continuation in the lower or No. 2 adit of the ore-body worked in the past by Davenport and party. This has been very erratic, but some nice "firsts" have been picked out of the ore won, and arrangements are being made to bring the second-class, or milling, ore to the concentrating mill on Argent Flat for treatment.

Owing to the slump in metal values, the work of re-treating the tailings at the Argent mill was discontinued.

No. 2 Argent Prospecting Syndicate, No Liability.—No actual mining work has been carried on during the period under review by the No. 2 Argent Syndicate. Intermittent work, of very little actual importance from a mining point of view, has been carried on by various tributers and prospectors.

The mine being under water during the year, all work has been necessarily confined to the high ground and adit workings. The only discovery worth mention was a lode found by Wilby and party (sub-tributers). Two men are employed on this tribute. About 70 feet of driving has been done, and stoping is now in progress.

Surface Work.—Four stout "Gum Legs" were put in the head frame to strengthen and brace same preparatory to the installation of the new electric pump. Three strong distance pieces or bearers were added to the top of the head frame to carry the pump pulley, and one end of pulley hoisting-rope. A sky-shaft, to facilitate the working of the two cages was also added to the structure.

Machinery.—A very strong crab winch, bolted down to substantial bed logs was installed to raise and lower the electric pump in the main shaft. The crab winch is operated by man power, and serves the purpose for which it was installed very well indeed.

Winding Plant.—This consists of a 27-horsepower motor directly coupled to a worm wheel. On the worm wheel shaft is a pinion wheel, which gears with a spur wheel on the drum shaft. The motor and its connections are on a cast-iron bedplate, which in turn is bolted down to solid wooden bed logs. This plant was installed by the syndicate during the year, so that the mine is now well equipped with an efficient electric pumping and winding plant.

Four men were employed in connection with the above work.

Silver-lead Ore Consigned.

Month.	Tons.	Cwts.	Qrs.	Ag.	Pb.	Silver.	Metallic Lead.
						ozs.	tons.
January	...	...	...	...	...	...	...
February	...	...	...	...	...	...	...
March	...	...	...	...	...	...	...
April	4	13	...	144·0	31·0	669·60	1·44
May	7	3	...	87·6	78·0	697·84	5·57
June	...	...	...	...	...	...	...
July	9	13	...	55·7	57·5	537·50	5·54
August	4	16	...	84·0	72·0	403·20	3·45
September	6	4	...	58·0	63·0	359·60	3·90
October	...	...	...	...	...	...	...
November	9	16	3	104·6	73·4	1028·95	7·22
December	...	...	...	...	...	...	...
Total	42	5	3	...	...	3696·69	27·12

Approximate Gross Value:	£	s.	d.
3696·69 ozs. Silver at 3s. per oz.	554	10	0
27·12 tons Lead at £20 per ton	542	8	0
Total	£1096	18	0

Montana Mine.—Several tributers are at work. A little ore is being won by Turner and Waller, and the country they are in looks encouraging. Brown and party, who completed their electrical equipment and sank their new shaft, drove out and cut the formation previously worked by them. They are now stoping on nice-looking metal, and the prospects appear decidedly encouraging.

Dunn and Hill's Tribute.—The rise was connected to an upper adit, which they extended over the top of same, making the ventilation good, and the conditions of working much easier. They are mining some ore in the top adit over the rise, which is very erratic.

No. 6 Argent Mine.—The concentrating mill was completed and put into use, and the ore lying at grass was treated. The mine was closed down owing to the low price of metals, and pending an increase of capital.

Oonah Mine.—Some prospecting work has been carried out by State tributers. Bell Bros., in driving and rising on the formation, cut the previous year, have won some nice ore during the latter portion of this year, and the prospects are encouraging.

Nike Mining Company.—Work was continued on the usual lines during the early part of the year, but the increased costs of production, together with the low prices, compelled a cessation of mining operations.

Cornish and Brown are engaged on their tribute putting down an incline tramline on the hillside, and intend mining again below what was known as Delaney's old workings. With the present tariff operating, it should be payable now to mine the fine body of ore they have exposed.

Flaherty and mate have driven into the hill to cut some ore which Flaherty exposed on surface, but up to the end of the year had not met with any success.

Warren's Tribute.—In the main tunnel driving was continued, but no ore was produced. Some stoping was done in the top tunnel, and 4 tons of ore were won, valued at £79. The workings below the main tunnel are now free from water, and ore is being produced therefrom. There is a nice vein of ore in the bottom of the winze, which is down 100 feet; also a vein of 3 to 4 inches at the 60 feet intermediate level south.

Number of men employed, 2.

J. Coltson's Tribute.—This man, after sinking a winze to 100 feet from adit-level, holed through to surface for

ventilation, &c. He then equipped the winze with electrical hoist, and has opened up northerly and southerly on his formation. For the first month or so, when driving, the formation looked very discouraging, but towards the end of the year some nice "firsts" were showing in both ends, and it is to be hoped, will continue.

At various other places in and around Zeehan a good deal of work has been carried out by tributers and others with varying success, such as McDermott's, Kynance, Davern's, Quigley's, St. Clair and Mathers', Davenport's, F. Gardner's, &c.

North-East Dundas.—At the old Hercules Mine a rise was started from No. 5 level to connect up with the 5A level, and to then go on to No. 4 level, to be used as main ore pass. Some samples were broken also at different parts of the mine.

Samples were also broken at the Rosebery Mine, and sent to the old smelters at Zeehan for experimental purposes at the small flotation unit there. This work was all carried out by the Electrolytic Zinc Company of Australasia Limited, West Coast Department. The manager at the Zeehan works reports that good results are being obtained with this flotation unit.

Mt. Farrell District.—North Mt. Farrell Mine.—Productive operations were restarted after the annual overhaul on 26th January, and continued until February, the 25th, when, owing to the low metal market and the high wages and costs, production was discontinued, developmental work only being done. This continued until November, when production was again commenced, and is still being carried on.

The development work carried out consisted of the following:—The shaft was sunk a further 115 ft. to 440 feet below the "brace," and No. 6 level was opened out at a vertical depth of 102 feet below No. 5. The plat was cut, and a crosscut driven to intersect the lode-channel, which was met at 117 feet. This was found to be 50 feet wide at this point, and a drive north on the hanging-wall portion was advanced at the end of the year a distance of 34 feet, on an average width of 15 feet of high-grade ore.

No. 5 Level.—The main north drive was advanced 75 feet in milling ore, of an average width of 9 feet. Stoping has been carried out above this level, a total of 2611 tons (including development) of crude ore being produced herefrom.

No. 4 Level.—The north main drive was advanced approximately 200 feet, being now 780 feet north of the shaft. A nice run of seconds was developed in this driving, and stoping was carried out in the stopes above the level, the total tonnage produced being 896 tons.

No. 3 Level.—North main drive was extended 93 feet.

No. 2 Level.—At the south end of the No. 2 lode a prospecting drive was commenced to the west, and driven 60 feet. This opened up a short run of good-grade ore, which is still in the face.

Two rises were put up between Nos. 4 and 5 levels.

Total development work is as follows:—

Shaft-sinking	115 feet
Crosscutting	242 feet
Driving	489 feet
Rising	110 feet
Total footage	956 feet

The marketable ore produced was 646 tons, but the value of this is not yet known, as final settlements are not complete.

Average number of men employed for the 12 months, 97.

General.—The mine is developing well, the new level opening up better than usual, and extending to the south a considerable distance further than on the Nos. 4 and 5 levels.

Murchison and North Murchison Mines.—A little work has been done at these mines, but nothing of importance has been disclosed.

Mt. Lyell District.—Tasman and Crown Lyell Extended Mine.—Consequent upon the unfavourable results of prospecting undertaken at the Tasman and Crown Lyell Extended prior to the last cessation of operations, tenders were called for the purchase of the lease and plant, but as no tender was received, the plant and buildings were disposed of for £475. During the year the plant was dismantled, and the main portion was despatched to the mainland.

COPPER.

The quantity of copper produced was 6180·843 tons, valued at £463,163.

The Mt. Lyell Mining and Railway Company Limited—The ores and concentrates treated (as reported by the General Manager) were as follow:—

	Tons (dry).
Ore from the Company's Mt. Lyell Mine ...	82,664
Ditto from North Mt. Lyell Mine	41,710
Concentrates from the Company's Lyell Comstock and North Mt. Lyell ores...	16,483
Purchased ore from other mines	37
Total	140,894

Blister copper produced, 6220 tons, containing:—Copper, 6170 tons; silver, 183,020 oz.; gold, 4646 oz.; approximate value, £512,862.

Average number of men employed:—

Mining Department—		
At Company's Mt. Lyell Mine	351	
At North Mt. Lyell Mine	304	
At Lyell Comstock Mine	8	
At Crotty leases	26	
		689
Reduction Works Department (including Lake Margaret)		542
Railway Department—		
Mt. Lyell Railway	113	
North Lyell Railway	15	
		128
Total		1,359

Dividends paid during the year, nil.

Dividends paid from the inception of the Company to the 31st December, 1921, £3,830,009.

Copper produced from the inception of the Company to the 31st December, 1921, 174,544 tons fine.

Silver produced from the inception of the Company to the 31st December, 1921, 12,964,228 oz. fine.

Gold produced from the inception of the Company to the 31st December, 1921, 376,332 oz. fine.

The shortage of labour hitherto experienced entirely disappeared as the year advanced, there being both an increase in the number of men offering and a decrease in the number required for ore-production at the Mt. Lyell Mine, consequent on the commencement of hand-sorting and the expansion of milling operations at the reduction works.

Mt. Lyell Mine.—Development work included the construction of a further portion of the engine winze on the South Lyell workings between Nos. 5 and 8 levels, the excavation of engine-chamber at the former level, and connecting same with the main tunnel. Some driving work was also carried out for purposes of access and ventilation.

Ore-production was carried on in the underground workings only, at Nos. 6 to 9 levels inclusive, work in the open-cut consisting of the obtaining of filling for the underground stopes.

North Lyell Mine.—Only a minimum of development work was carried out at this mine during the year, in addition to a certain amount of diamond drilling at the 850-ft. and 925-ft. levels, which disclosed further accessions to the ore reserves in the northern portion of the mine.

Ore-production was actively carried on at each level from the 850-ft. to the 1100-ft., inclusive.

The precipitating plant was operated, as usual, for the extraction of copper in solution in the mine water.

Lyell Comstock Mine.—The winning of ore by open-cut methods was carried on in the first half of the year, but no ore was derived from the underground workings.

Reduction Works.—Smelting operations were carried on as usual in this department, it being necessary to keep one furnace only in blast throughout the year. The matte produced at the blast furnace was treated at the converter plant, the output of which was 6220 tons of blister copper, which was consigned to the Electrolytic Refining and Smelting Company's Works at Port Kembla for separation of the copper, silver, and gold.

During the year the hand-sorting of the North Lyell ore was commenced, in consequence of which a lesser tonnage of ore was sent direct to the blast furnace, and a greater to the concentrating mill.

A Hancock jig was added to the equipment of the concentrating mill.

The flotation concentrates and the greater part of the jig concentrates smelted were agglomerated in the Dwight-Lloyd sintering machine and the nodulizing plant preparatory to blast-furnace treatment.

Hydro-Electric Plant.—The Lake Margaret hydro-electric plant, as before, supplied the electric current for the company's power and lighting requirements.

TIN.

The quantity of metallic tin won was 790·395 tons, valued at £130,257; an average value of £164 15s. 11·97d. per ton.

The statistics for the year are:—

	Tons.	Value. £	Miners Employed.
Northern and Southern Division	·63	107	14
North-Eastern Division ...	391·70	64,131	313
Eastern Division	141·78	23,467	142
North-Western Division...	205·39	34,206	142
Western Division	50·895	8,346	88
Total	790·395	130,257	699

The decrease in the output of this metal is owing to depletion, mine stoppages, cost of production, and want of water. The shortage of water in the North-Eastern Division has been keenly felt for the past two or three years.

Northern Division.—The output was ·63 tons only, which came from the S. & M. Mine at Moina.

North-Eastern Division.—The output of tin was 391·70 tons, obtained as follows:—

Pioneer and Gladstone Districts.—

	Tons.	Tons.
Pioneer Tin Mine	120·05	
South Mt. Cameron	3·72	
Endurance	43·66	
Other claims	64·17	
		231·60

Ringarooma, Derby, and Branxholm Districts.—

Briseis Tin Mines	75·27	
Central	1·71	
Arba Tin Mine	34·45	
New Ruby Flat	15·99	
Other claims	29·15	
		156·57
Moorina District.— Weld Tin Mine		3·53
Straits Islands		...
Total		391·70

Eastern Division.—The output of tin was 141·78 tons, obtained as follows:—

Weldborough, Lottah, and Blue Tier Mines.—

	Tons.	Tons.
Star Mine	2·06	
Other claims	37·76	
		39·82
St. Helens Mines.—		
Argonaut	57·36	
Others	24.45	
		81·81
Avoca Mines.—		
Story's Creek	15·57	
South Esk	1·90	
Others	2·68	
		20·15
Total		141·78

North-Western Division.—The output of Tin was 205·390 tons, obtained as follows:—

	Tons.
Mt. Bischoff	192·630
Mt. Bischoff Extended	8·100
Weir's Bischoff Surprise	·103
Waratah Alluvial	—
Mt. Balfour	·600
Others	3·957
Total	205·390

Western Division.—The output of tin was 50·895 tons, obtained as follows:—

	Tons.
Dreadnought Boulder	2·550
Mt. Lindsay	·391
Heemskirk	5·405
Stanley River	2·596
Iris Tin Recovery	2·200
Montana	3·280
Renison Bell	18·900
Others	15·573
Total	50·895

Northern Division.—The S. and M. Syndicate, Moina.—The work done on this mine consisted of erection of concentrating mill and prospecting.

The output of ore was 27 cwt. (tin-bis-wolfram) and 2 cwt. of bismuth ore, valued at £125 14s. 5d , as per return dated 9th April, 1921.

For the first four months an average of 12 men was employed, after which, owing to high costs and low values of products making operations unprofitable, the number was reduced to two, who are keeping the mine in order ready for restarting when conditions permit.

A discovery of gray tin was made at Sea Elephant River, King Island, by Mr. N. H. White, in April, and a reward claim in respect of such discovery has been granted to him.

As a result of the discovery an area of over 900 acres has been applied for under mining leases in the locality.

North-Eastern Division (Derby).—The Briseis Tin and General Mining Company Ltd.—The output of black tin for the past 12 months was 104·150 tons, containing 75·27 tons of metallic tin, which realised £12,400. The average number of men employed was 80.

The amount of tin won was small partly on account of shortness of water during the first part of the year, and also to a great extent because the main working face was approaching the position of the diverted Ringarooma River. Winning tin was altogether discontinued in October, as the face, 100 feet high, had by that time been excavated as close to the River as was considered safe. All energy was then centred on the rediversion by which the river is to be brought southward along the western reef of the gutter, and then across the worked-out lead, to again join the river in its original course.

The total length of the diversion is half a mile, and it is carried on a sand-bank 100 feet high in places. Care is being taken to provide a comparatively water-tight bottom and sides for the channel, with provision against scour in flood time by protection of the scrub walls with stone, &c. The work is of considerable magnitude, and some difficulty on account of the depth of the lead below the present river level, and to the proximity of the hard granite reef or rim rock on the west to the high basalt hill to the north-east, as well as the necessity for using only cheap material in construction.

There has been no addition to plant of consequence.

Branxholm.—New Ruby Flat Tin Mine.—During the year some 42,423 cubic yards were treated, and 19 tons of tin were obtained therefrom. Average number of men employed, 7.

Cascade River.—Star of Peace.—Operations were started in August with the cutting of races, building dams, and erecting pumping plant for the return of the water for sluicing purposes. Tin recovered, 1 ton 16 cwt.

The plant is now being completed, and when in operation will enable the company to produce tin throughout the year.

Bradshaw's Creek.—Pioneer Tin Mine.—The strike of motor attendants, which occurred in October, 1920, caused the suspension of all sluicing on the Pioneer Mine for a period of eight months, and it was not until the end of June, 1921, that the men's executive allowed them to resume work on terms less favourable than the company had previously offered them, and which they had unanimously accepted. During this period the only work carried on was urgent repairs and pumping of mine drainage.

From July to December, 1921, 372,300 cubic yards of drift were sluiced, for a yield of 231 tons 13 cwt. of stream tin, valued at, approximately, £26,680; 62 men being employed.

The low price of tin and high cost of wages and all mining supplies necessitated drawing on the reserves of richer bottom ground, to a much greater extent than in the past, and no outlying ground can under present conditions be worked at a profit.

Garibaldi and Wyniford River.—Very little has been done in these localities. The Sheehan Bros., Berwood, and Wyniford Syndicates having suspended operations until a better market prevails.

South Mt. Cameron.—Endurance.—On this property, by a returned water system, two nozzles operate a most amenable face of sandy loam for a depth of about 20 feet, which will gradually increase as its banks approach the toe or base of the mount (Cameron) close by, whose sides it is stated contain residual wash of appreciable values. Twenty men are employed, and all recent returns have been most satisfactory.

Messrs. Harmon, Johnston, Watt, Combes, and Pickford, about make wages from the shallow flats and terraces on the river.

Gladstone and surrounding outliers—including (1) Ogilvie's and Rankins, (2) Grove Bros.', Amber Hill, (3) Fly-by-night, (4) Scotia Flats, (5) a Chinese proposition—all, more or less, suffer from the prevailing depression, and several are awaiting the completion of the proposed Mt. Cameron Water-race Deviation, which, it is believed, will revive the district. Some 7 miles further out, on the Shallamar Flats, Messrs. Cross Bros. are working a fairly deep proposition with a water service brought

in from the head waters of the Boobyalla Rivulet, which, for them (three men), gives satisfactory returns. At present they are building a couple of large wheels for power and elevating purposes that, in their opinion, will accomplish better results.

Moorina.—Echo-Weld Mines.—Having the primary right to the most serviceable water-supply the owners (Messrs. Thompson and Son), with a couple of men profitably work each of these propositions.

Weldborough and Lottah.—Both of those once noted centres can be classed together, as, apart from small co-operative or tribute parties, nothing in either location calls for mention.

St. Helens.—Argonaut Mine.—The completion of the new water-supply in the latter end of 1920 enabled sluicing to be carried on continuously for the greater part of the year, 1921, in two faces, and 156,700 cubic yards sluiced for a yield of 66 tons 11 cwt. of stream tin, with 25 men. Owing to the adverse conditions at present prevailing in mining, preparations are in hand for shutting down the steam plant, and working those portions of the property that can be treated with a hydraulic elevator and a reduced staff.

Avoca.—Royal George.—This once promising property remains idle, which is somewhat regrettable, as it possesses values that under ordinary circumstances should prove payable. Brookstead Estate: the owners (Messrs. Fitzgerald Bros), have accepted an option of the Badak Tin Syndicate, who have done a considerable amount of prospecting; the results, however, are kept private. South Esk: on this property a steam-pumping plant of limited capacity was installed, which did not permit the bottom to be reached, and consequently justice was not done to the proposition, which under more favourable circumstances may have proved payable. From 4 to 10 men were usually found employment.

Ben Lomond Republic Mines.—Outside a caretaker, who occupies his spare time prospecting, nothing prevails. It is currently reported that the company proposes to dispose of the plant and dismantle it.

Gipps Creek.—A few men have found employment working the alluvial, with which is associated about equal quantities of wolfram. A company known as the Cradle Creek, to test a lode of the latter, was formed, and did a fair amount of sinking and driving, but with the fall of

the metal market, suspended operations, which generally has had a depreciatory effect on the whole district.

The Story's Creek Tin Mining Syndicate.—The Mine was let on tribute to a party of 20 men in June, and with the exception of driving 24 feet to connect for air purposes no developmental work was carried out.

The following is the result of the seven months' operations:—

Tons treated, 1065. Yield—	£	s.	d.
Tungstic acid, 13 tons 15 cwt., value ...	416	16	0
Metallic tin, 16 tons 4 cwt., value	2,155	6	3
Total	£2,572	2	3

Average number of employees, 12·2.

A resumption of the erection of a compressor plant has been made, and the buildings over same are now in hand.

North-Western Division.—Mt. Bischoff Tin Mine.—General operations during the year of 1921 were greatly curtailed, due to the slump in tin prices, and the uncertainty of obtaining sales for the produced and producing metal. The number of men employed during the period were:—January, 250 men; February-October, 110 men; October-December, 40 men; an average over the whole period of only 114.

Development work was restricted to 1012 feet, mostly centred in the Brown face deposit and the Giblin lode, where ore of a grade suitable for profitable extraction has been exposed.

Two parties of tributers were at work during the year, but the same want of production-incentive resulted in a considerable curtailment.

The main mill was at work only 81 days in the year, and crushed 27,621 tons of ore, for the output as tabulated below:—

Company, 273 tons 17 cwt. 0 qr. 3 lb.; average grade, 63·65 per cent. tin.
Tributers, 27 tons 4 cwt. 3 qr. 9 lb.; average grade, 65·29 per cent. tin.

During the period the new large low-grade pyritic roasting furnace was completed at a cost of £4,600. In the nine months that it had been operating, 2472 tons of these concentrates were treated, and 83 tons of tin oxide recovered therefrom. The average feed-grade was 2½ per cent., and recovery 2¼ per cent. The concentrates contain 42 per cent. iron, and 48 per cent. tin. This furnace

is now treating the lowest-grade tin pyritic concentrates of any mine in the world, and has demonstrated the possibilities of retreatment profit from a reconcentration of what appears to be a valueless pyritic tail discard. The cost of production from these extremely low-grade concentrates has been £24 per ton of oxide.

The ore-reserve position remains very nearly the same as last reported, and is:—

Positive tons, 257,110; average grade, 0·35 per cent. Sn. Probable tons, 253,790. Total, 510,900 tons.

Waratah Tin-Sluicing Company.—This company held an option over the South Bischoff Company's leases, and drove a crosscut a distance of 360 feet, and carried out other prospecting work. A crushing of 21 tons of dirt yielded 1 ton of tin, assaying 65 per cent.

Western Division.—Heemskirk.—Federation Tin Mine.—The work at this mine included the construction of a tramline, with the assistance of the Government, from the end of the Comstock Tram to the mine, a distance of nearly 9 miles. It was started in March, and finished in June.

Upon completion of the tram a part of the mining plant which is to be erected was brought over it to the mine. Mining operations consisted of 798 feet of driving and rising.

Average number of men employed, 8.

At both North and South Heemskirk a few miners are making wages on tin oxide, won from alluvial ground.

North Dundas.—Renison Bell Mine.—For various reasons—the chief being the low comparative price ruling for tin—operations at the mine have been on a very restricted basis, by tributers and subtributers only. Towards the latter part of the year developmental work, by tunnelling at a shallow level, located some rich ore on the southern portion of the lease, on which further developmental work was in progress at the close of the period to which this report relates. The extent of ore referred to is not considered to be large. The ore is oxidised, and consists of gossan of excellent quality.

Crude ore treated for the year, 3383 tons; which, on concentration, produced 29·19 tons of tin oxide, containing 18·90 tons of metallic tin, the value of which was £2588 5s.

The number of men employed was 10.

Dreadnought Boulder Mine.—A little work was carried out on surface material by a few men.

Montana Tin Prospecting Syndicate.—Three tributers have done a considerable amount of dead work, and are now winning some nice tin oxide, and report prospects to be payable and encouraging.

Federation Tin Mine.—A main adit has been started just along the Dreadnought Boulder tramline, and on the lower section a few feet have been driven on a likely-looking formation. A little tin has been won by fossickers in this locality.

Mt. Lindsay and Stanley River.—A limited amount of work was carried out on the Mt. Lindsay Mine, as also at the Stanley Reward, where two tributers have been at work, but found results were not payable.

COAL.

The total quantity of coal raised amounted to 66,476 tons, valued at £63,446.

The raisings at the different collieries were:—

Colliery.	Tons Raised.
Mt. Nicholas	24,926
Cornwall	36,562
Cardiff-Jubilee	1,988
Spreyton	272
York Plains	662
Illamatha	546
Mount Cygnet	1,169
Preolenna	77
Others	274
Total	66,476

The Mt. Nicholas Coal Company Proprietary Limited.—Mining operations have been carried on during the whole of the year in the 6-ft. seam in this company's leases. The main gateway in the main longwall workings has been advanced a distance of 2·72 chains, making it a total distance of 62·72 chains in from the tunnel mouth. The seam in general is keeping at about its usual thickness, and the quality of the coal is well maintained.

The company is installing a Sirrocco ventilating fan, which is to be electrically driven, for ventilating these workings, and hopes to have it running at an early date.

No. 3 tunnel has also been worked during the year, and has been advanced a distance of 1½ chain, making it a total distance of 14·80 chains from the tunnel mouth.

This tunnel is also working the 6-feet seam, and the coal here is of good quality.

Eighty-four men and boys were employed above and below ground.

Jubilee Coal Mine.—Development work on this mine has been continued. The necessary material for the 2¼ miles of aerial ropeway for transmission purposes to the railway has been received, and awaits erection.

Other seams in the district upon which a little work has been done are—Silkstone, Fingal, and Mt. Christie. The output from the lastmentioned was 100 tons. Two men were employed.

At York Plains small quantities for malting and hop-drying purposes were raised, while the small outputs from the Spreyton and Illamatha Mines at Latrobe were disposed of locally.

Gatenby's, Hagley.—Mr. Gatenby reports as follows:—Owing to the high cost of labour, &c., it became impossible to work the mine through the vertical shaft. Therefore I have removed all machinery and buildings, and re-erected same outside, where the coal can be mined by a tunnel of a grade of 1 in 5. I drove this road myself about 70 feet, and connected it with the mine workings. The original shaft will now only be used for ventilation or escape. Since these alterations I am again placing the "ground shale" manure on the market, and have promise of a fair demand.

Latrobe.—Work of a desultory character has been done on the old proprietary works, now known as The Southern Cross Shale and Oil Works, to which has been added a separate company, registered as "The Victas Oil Shale Company," who are boring the adjoining lands, with results which are stated to be satisfactory.

BISMUTH.

A small parcel of 1 cwt. was won at the S. & M. Mine, Middlesex, valued at £21.

WOLFRAM.

The output of wolfram was as follows:—

	Tons.	Value. £
Avoca Mines	10·05	659
S. and M. Mine, Middlesex	·29	17
Total	10·34	£676

Middlesex.—All Nations Wolfram Mine.—The principal work has been surface prospecting. One open trench along course of No. 2 reef has been cut for a distance of 200 feet; width, 4 feet; depth, 6 feet.

Costeans.—Five chains of costeans have been opened up at different points over the section.

Open-cut on No. 4 reef, 70 feet long, to average depth of 7 feet.

Shafts.—One prospecting shaft has been sunk to a depth of 32 feet.

Drives.—Fifty feet of driving has been done.

LIMESTONE.

The Broken Hill Proprietary Company employed an average of 79 men at its quarry at Melrose, quarrying limestone for shipment to its works at Newcastle; and the Hydro-Electric Power and Metallurgical Company employed an average of 41 men at its quarry near Ida Bay, and at the works at Electrona in the manufacture of carbide of calcium. Work was suspended here for some time pending arrangements with the Government for further financial assistance.

IRON PYRITES.

The output was 606·5 tons, valued at £2579.

At the Chester Mine a lower adit was driven to cut the ore-body worked by open-cut method above, but before such ore-body was reached the manager received instructions to suspend operations. The manager and two men were retained, but work had not recommenced at the end of the year.

At the Susanite Mine, also, a lower adit was driven under the site of previous workings. It is hoped that payable silver-lead will be found, as well as pyrites.

On the old Queen lease, at Zeehan, Messrs. Parker and Cooper obtained some fine pyrites, but owing to the difficulty of disposing of their ore they ceased operations.

IRON ORE.

No iron ore has been produced during the year. On the sections in the Comstock District held by the Hoskins Iron and Steel Company Limited, two men are engaged driving adits to determine widths and values at lower levels. The manager (Mr. Thomas) states he is satisfied with the results to date.

At Davern's mine some work of a prospecting nature has been carried out.

OSMIRIDIUM.

The output for the year was 1750·655 oz., valued at £42,935, and the average number of men engaged was 336.

In the early part of the year, some 430 men were occupied in searching for and winning this metal, but the heavy fall in the price caused many to abandon the fields, and at the end of the year the returns showed that the number had been reduced to 265.

The price obtained varied from £35 in January to £27 10s. in April, May, and June, and dropped to £23 in July, but parcels during that month realised £24, £26, and £28 respectively. The price again fell in August to £23, and during September dropped to £20, and then to £18, at which price it thereafter remained until the end of the year.

Some nice metal has been discovered at the Castra River, and it is hoped that during the summer the river will be sufficiently low to allow of its being recovered.

BARYTES AND SCHEELITE.

No barytes nor scheelite was won during the year.

PAINTS AND PIGMENTS.

The Serpentine Paint Works, from earths obtained principally from Mowbray and Beaconsfield, have produced ochres and oxides that have found ready sale throughout the State and Commonwealth.

The Sulphate White-Lead and Paint Works Company have been idle for some time, but recently resumed operations with sufficient capital to carry them over the initial stages, lack of which, up to the present, has been their chief drawback.

ZINC.

The Electrolytic Zinc Company of Australasia Limited.—This company has continued the treatment of calcines from Broken Hill, and produced 1118 tons of slab zinc, of an approximate value of £30,241 18s.

The average number of men employed on the works was 841.

The first unit of the 100-ton zinc plant, absorbing 15,000 horsepower, and capable of producing 70 tons of slab zinc daily, was completed during the year. The remainder of the plant (the whole being designed to produce about 120 tons of zinc daily) will, it is anticipated, be completed during 1922, and will operate as soon as the remaining block of power (making a total of 30,000 horsepower) is available from the Hydro-Electric Department.

The electric current was switched on to the first unit of the new plant on the 21st November. Operations commenced on a small initial tonnage, which was steadily increased as various adjustments were made, and the whole unit was gradually brought into production.

OUTPUT.

RETURN showing the Quantity and Value of Mineral Products for the State of Tasmania, during the year ending 31st December, 1921 :—

Mineral.	Quantity.	Value.
		£
Gold ..... fine ozs.	5340·094	28,395
Silver..... ,,	348,358	57,576
Lead ..... tons	1434·794	32,241
Copper ..... ,,	6180·843	463,163
Tin ..... ,,	790·395	130,257
Coal ..... ,,	66,476	63,446
Wolfram ..... ,,	10·34	676
Bismuth ..... ,,	·05	21
Shale ..... ,,	868	1506
Iron Pyrites..... ,,	606·5	2579
Scheelite ..... ,,	...	...
Osmiridium ..... ozs.	1750·655	42,935
Asbestos ..... tons	...	...
Zinc ..... ,,	...	...
Barytes ..... ,,	...	...
Ochre..... ,,	15·	56
Total.....	...	£822,851

PLANS.

The total number of different plans now stocked by the Department is 95, and during the year 36 of these were revised for reproduction, 2 were recompiled, and 1 new locality compilation was made.

The number of copies reproduced by the Government Printer was 1040.

Large Scale Plans.—The draughting-room staff has continued the work of the compilation of new plans on a scale of 10 chains to an inch—a necessity referred to in my report for the year 1920—and four of these plans have been completed and printed. The recompilation is a matter which requires very careful attention, and the work is both slow and tedious, but satisfactory progress is being made therewith.

Underground Survey Plans.—During the year, the whole of the underground plans and sections of the various mines were brought from Launceston, and they are now filed in the office of the Chief Inspector of Mines, as required by "The Mines and Works Regulation Act, 1915." The work of examining and checking these has been taken over by the draughting staff, who have loyally and willingly undertaken the extra duties entailed thereby.

The new map of the West Coast, on a scale of 1 mile to an inch, has been issued, and has been very favourably commented upon.

GEOLOGICAL SURVEY BRANCH.

The Report of the Director of the Geological Survey is appended.

INSPECTORS OF MINES.

The reports of the Chief Inspector of Mines and the three inspectors are appended.

REVENUE.

The revenue for the year amounted to £11,248 14s. 11d.

The sum of £1460 0s. 5d. deposited as survey fees with applications for leases is not included in the above.

MINING MANAGER'S EXAMINATION.

One candidate only presented himself for examination during the year, and he was successful in obtaining sufficient marks to entitle him to a certificate, which was accordingly issued to him.

DEPARTMENTAL STAFF.

The following changes in the Departmental staff were made during the year:—

H. R. Driscoll, Clerk, transferred to Agricultural Bank, 1st March, 1921.

T. C. Button, appointed Clerk, on probation, Launceston Office, 1st July, 1921.

G. J. Edwards, appointed Draughtsman (on probation), Geological Survey Office, Launceston, from 11th July, 1921.

J. S. Purkiss, Inspector of Explosives and Magazine Keeper, died 24th July, 1921.

CONCLUSION.

In conclusion, I have to express my thanks to the officers of the Department for their loyal assistance at all times during the year, especially when, owing to vacancies on the staff any extra pressure of work necessitated their working after the usual office hours.

I also desire to thank the officers of the Mining Branch of the Department of Lands and Surveys for their ready and willing assistance.

I have the honour to be,

Sir,

Your obedient servant,

WM. A. PRETYMAN,
Acting-Secretary for Mines.

The Hon. the Minister for Mines, Hobart.

No. 1.

RETURN showing the Quantity and Value of Gold won from 1880 *to* 1921 *inclusive.*

Year.	Quantity.	Value.
	Ozs.	£
1880 to 1903 inclusive	1,265,836·95	4,905,706
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
1914	26,243·453	111,475
1915	18,547·338	78,784
1916	15,790·096	67,072
1917	14,496·464	61,577
1918	10,528·930	44,724
1919	7,686·470	32,650
1920	6,246·192	29,796
1921	5,340·094	28,395
	1,876,940·238	7,510,481

No. 2.

RETURN showing the Quantity and Value of Silver-Lead Ore produced from 1888 *to* 1921 *inclusive.*

Year.	Quantity.	Value.
	Tons.	£
1888 to 1903 inclusive	300,977·5	2,571,771
1904	51,138	203,702
1905	75,270·5	246,888
1906	87,117·75	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
1914	11,565·54	96,225
1915	10,382·95	91,689
1916	11,229·410	153,796
1917	9575·780	152,122
1918	7241·400	127,176
1919	*—	136,234
1920	—	261,166
1921	—	59,422
	—	6,886,113

* "Quantity" discontinued, as it has been found previous figures are misleading, concentrates, hand-picked ore, and crude ore having all been added and included under the one head.

No. 3.

RETURN showing the Quantity and Value of Blister Copper produced from 1896 *to* 1921 *inclusive.*

Year.	Quantity.	Value.
	Tons.	£
1896 to 1903 inclusive	52,154	4,186,805
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
1914	7509	*477,361
1915	7901	*709,167
1916	6305	*884,689
1917	5845	*841,583
1918	5559	*772,162
1919	5071	*557,710
1920	4837	*576,046
1921	6221	*493,271
	—	15,405,554

* Value of Gold contents deducted.

No. 4.

RETURN showing the Quantity and Value of Silver contained in Silver-Lead and Blister Copper during the Years 1919, 1920, *and* 1921.

Year.	In Silver Lead.		In Blister Copper.		Total.	
	Quantity.	Value.	Quantity.	Value	Quantity.	Value.
	Ozs.	£	Ozs.	£	Ozs.	£
1919 ...	296,719·27	71,831	228,624	53,733	525,343·27	125,564
1920 ...	453,411	118,898	169,948	47,869	623,359	166,767
1921 ...	165,637	27,181	183,021	30.395	348,658	57,576

No. 5.

RETURN showing the Quantity and Value of Lead included in Silver-Lead during the Years 1919, 1920, *and* 1921.

Year.	Quantity.	Value.
	Tons.	£
1919	2357·142	64,403
1920	3855·639	142,268
1921	1434·794	32,241

No. 6.

RETURN showing the Quantity and Value of Copper in Blister Copper and Copper Ore during the Years 1919, 1920, *and* 1921.

Year.	In Blister Copper.		In Copper Ore.		Total.	
	Q'ty.	Value.	Q'ty.	Value.	Q'ty.	Value.
	Tons.	£	Tons.	£	Tons.	£
1919	5014	503,977	13	984	5027	504,961
1920	4791	528,177	·75	60	4791·75	528,237
1921	6171	462,876	9·843	287	6180·843	463,163

No. 7.

RETURN showing Quantity and Value of Copper Matte exported during the Years 1902, 1903, *and* 1904 *to* 1921 *inclusive.*

Year.	Quantity.	Value.
	Tons.	£
1902	2500	50,112
1903	3727	83,624
1904–1921	—	—
	6227	133,736

No. 8.

RETURN showing the Quantity and Value of Copper Ore produced from 1896 *to* 1921 *inclusive.*

Year.	Quantity.	Value.
	Tons.	£
1896 to 1903 inclusive	23,736·5	298,292
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
1914	3287·75	18,680
1915	66	1367
1916	96·84	3765
1917	771·40	6171
1918	444·170	3944
1919	123	984
1920	1·50	60
1921	—	287
	41,893·13	579,204

No. 9.

RETURN showing the Quantity and Value of Tin exported from Tasmania from 1880 *to* 1904 *(compiled from Customs Returns only), Tin Ore produced during the Years* 1905 *to* 1918 *inclusive, and Metallic Tin produced during the Years* 1919 *to* 1921 *inclusive.*

Year.	Quantity.	Value.
	Tons.	£
1880 to 1904 inclusive	76,708·4	7,167,564
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
1914	2572·713	259,300
1915	2599·234	292,306
1916	2854·636	350,852
1917	2637·337	427,917
1918	2256·203	488,798
1919 (Metallic Tin)	1580·22	395,794
1920 (Metallic Tin)	1310·411	369,362
1921 (Metallic Tin)	790·395	130,257
	130,526·844	14,131,491

No. 10.

RETURN showing the Quantity and Value of Iron Ore produced from 1897 *to* 1921 *inclusive.*

Year.	Quantity.	Value.
	Tons.	£
1897 to 1903 inclusive	20,442	16,276
1904	6840	2975
1905	6300	2600
1906	2600	1100
1907	3000	1150
1908	3600	1600
1909-1921	—	—
	42,762	25,701

No. 11.

RETURN showing the Quantity and Value of Wolfram produced from 1899 *to* 1921 *inclusive.*

Year.	Quantity.	Value.
	Tons.	£
1899 to 1903 inclusive	57·25	2157
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
1914	46·873	4327
1915	94·685	11,115
1916	106·265	16,910
1917	172·190	28,714
1918	155·362	27,239
1919	120·907	26,613
1920	70·89	13,626
1921	10·34	676
	1247·732	172,293

No. 12.

RETURN showing the Quantity and Value of Coal raised from 1880 *to* 1921 *inclusive.*

Year.	Quantity.	Value.
	Tons.	£
1880 to 1903 inclusive	767,261	659,010
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*
1914	60,794	27,853*
1915	64,536·25	30,418*
1916	55,575	27,736*
1917	63,412	38,673*
1918	60,163	37,676*
1919	66,253	47,004*
1920	75,429	64,005*
1921	66,476	63,446*
	1,880,141	1,419,878

* Value at pit's mouth.

No. 13.

RETURN showing the Quantity and Value of Osmiridium produced during the Years 1910 *to* 1921 *inclusive.*

Year.	Quantity.	Value.
	Ozs.	£
1910	120	530
1911	271·88	1888
1912	778·77	5742
1913	1261·65	12,016
1914	1018·83	10,076
1915	247·048	1581
1916	222·150	1899
1917	332·079	4898
1918	1606·743	44,833
1919	1669·715	39,614
1920	2009·196	77,114
1921	1750·655	42,935
	11,288·716	243,126

No. 14.

RETURN showing the Quantity and Value of Barytes produced during the Years 1916 *to* 1921 *inclusive.*

Year.	Quantity.	Value.
	Tons.	£
1916	83	359
1917	52	234
1918	217	977
1919	399	1160
1920	1048	4163
1921	—	—
	1799	6893

No. 15.

RETURN showing the Quantity and Value of Bismuth produced from 1904 *to* 1921 *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
1914	5·619	1666
1915	5·5	1203
1916	3·51	1059
1917	4·212	895
1918	4·608	1038
1919	1·77	573
1920	·10	9
1921	·05	21
	74·059	23,052

No. 16.

RETURN showing the Quantity and Value of Asbestos produced from 1899 to 1921 inclusive.

Year.	Quantity.	Value.
	Tons.	£
1899	200	363
1900	128	113
1901	46·5	45
1902-1915	—	—
1916	15	30
1917	271	271
1918	2854	5008
1919	51	1275
1920	—	—
1921	—	—
	3565·5	7105

No. 17.

RETURN showing the Quantity and Value of Shale produced during the Years 1910 to 1921 inclusive.

Year.	Quantity.	Value.
	Tons.	£
1910	364	214
1911	500	250
1912	—	—
1913	130	130
1914	75	75
1915	—	—
1916	1286	1286
1917	—	—
1918	—	—
1919	600	900
1920	140	172
1921	868	1506
	3963	4533

No. 18.

RETURN showing the Quantity and Value of Iron Pyrites produced during the Years 1915 *to* 1921 *inclusive.*

Year.	Quantity.	Value.
	Tons.	£
1915	12,835·59	8945
1916	14,005·084	13,597
1917	7,685·549	7137
1918	5,105·600	4667
1919	3,456·95	4288
1920	4,440	7346
1921	606·5	2579
	48,135·273	48,559

No. 19.

RETURN showing the Quantity and Value of Zinc produced during the Years 1917 *to* 1921 *inclusive.*

Year.	Quantity.	Value.
	Tons.	£
1917	48	1968
1918	3822	152,880
1919	285	13,110
1920	9·3	334
1921	—	—
	4164·3	168,292

No. 20.

RETURN showing the Quantity and Value of Scheelite produced during the Years 1917 *to* 1921 *inclusive.*

Year.	Quantity.	Value.
	Tons.	£
1917	69	12,130
1918	216	39,252
1919	198·98	43,181
1920	105·09	17,905
1921	—	
	589·07	112,468

No. 21.

RETURN showing the Quantity and Value of Ochre produced during the Years 1918 *to* 1921 *inclusive.*

Year.	Quantity.	Value.
	Tons.	£
1918	100	200
1919	—	—
1920	—	—
1921	14	56
	114	256

No. 22.

RETURN showing Value of Minerals and Metal raised in Tasmania from 1880 *to* 1921 *inclusive.*

Mineral or Metal.	Value.
	£
Gold	7,510,481
*Silver-lead Ore	6,886,113
*Blister Copper	15,405,564
Copper Matte	133,736
Copper Ore	579,204
Tin	14,131,491
Iron Ore	25,701
Wolfram	172,293
Coal	1,419,878
Osmiridium	243,126
Barytes	6893
Bismuth	23,052
Asbestos	7105
Shale	4533
Iron Pyrites	48,559
Zinc	168,292
Scheelite	112,468
Ochre	256
Unenumerated prior to 1894	31,988
Total	£46,910,723

* Metallic contents and values are shown in Tables Nos. 4, 5, and 6.

No. 23.

RETURN showing the Amounts paid in Dividends by Mining Companies during the Year ending 31st December, 1921.

Mines.	Dividends.
	£ s. d.
Copper	...
Gold	...
Tin	120 0 0
Silver	...
Coal	5614 9 3
Scheelite	...
Total	£5734 9 3

No. 24.

RETURN showing the Average Number of Persons engaged in Mining during the Years 1880 to 1921 inclusive.

Year.	Number.	Year.	Number.
1880	1653	1901	6923
1881	3156	1902	5934
1882	4098	1903	6017
1883	3818	1904	6194
1884	2972	1905	6581
1885	2783	1906	7005
1886	2681	1907	7516
1887	3361	1908	6466
1888	2989	1909	6054
1889	3141	1910	5770
1890	2868	1911	5247
1891	3219	1912	5566
1892	3295	1913	6107
1893	3403	1914	4741
1894	3433	1915	3908
1895	4062	1916	3864
1896	4350	1917	4050
1897	4510	1918	4278
1898	6052	1919	4413
1899	6622	1920	5364
1900	7023	1921	4011

No. 25.

RETURN showing the Mining Companies registered during the Year ending 31st December, 1921.

Number of Companies.	Capital.
5	£33,300

In addition to the above, one Agent for a Foreign Company was registered.

No. 26.

RETURN showing the Average Number of Miners employed during the Year ending 31st December, 1921.

Division.	Number.
Northern and Southern	1059
North-Eastern	327
Eastern	349
North-Western	549
Western	1727
	4011

No. 27.

RETURN showing the Total Amount of Rents, Fees, &c., received by the Mines Department during the Year ending 31st December, 1921.

Head of Revenue.	Amount.		
	£	s.	d.
Rent of Auriferous and Mineral Land	9999	14	6
Fees, ditto ditto	815	16	0
Survey Fees	1460	0	5
Storage of explosives	433	4	5
Total	£12,708	15	4

No. 28.

RETURN showing the Total Area of Land and Number of Sluiceheads of Water applied for during the Year ending 31st December, 1921.

Mineral.	Number.	Sluiceheads.	Area.
			Acres.
Arsenic	3	...	120
Asbestos	1	...	80
Barytes	...	...	...
Bismuth	...	...	...
Chrysotile	...	...	...
Clay	2	...	8
Coal	12	...	2376
Copper	3	...	160
Gold	38	...	698
Guano	...	...	...
Iron	4	...	611
Limestone	1	...	320
Minerals	26	...	3844
Oil	1	...	640
Oxide	1	...	5
Porphyry Granite	...	...	...
Phosphate of Lime	...	...	...
Pyrites	...	...	...
Silver-lead Ore	9	...	220
Slate	1	...	5
Scheelite	...	...	...
Tin	60	...	1001
Talc	...	...	...
Timber Reserves	...	...	...
Machinery Sites	4	...	10
Mining Easements	7	...	25
Dredging Claims	5	...	36
Water Rights and Dam Sites	28	70	88
Licences to search for Coal or Oil	53	...	122,611
	259	70	132,858

No. 29.

RETURN showing the Total Number and Area of Leases and Licences issued during the Year ending 31st December, 1921.

Mineral.	No. of Leases.	No. of Sluiceheads.	Area.
			Acres.
Asbestos	1	...	80
Barytes	...	...	...
Bismuth	...	...	...
Coal	20	...	3740
Copper	5	...	260
Clay	1	...	4
Gold	39	...	530
Guano	...	...	...
Iron	12	...	620
Limestone	3	...	460
Machinery Sites	2	...	7
Minerals	24	...	2925
Molybdenite	...	...	...
Nickel	...	...	...
Osmiridium	...	...	...
Oxide	...	...	...
Plumbago	1	...	8
Scheelite	3	...	184
Shale	1	...	11
Silver-lead	6	...	335
Tin	108	...	2148
Wolfram	...	...	...
Zinc Lead	...	...	...
Dredging Claims	3	...	87
Water-rights	50	242	184
Mining Easements	8	...	45
Licences to search for Coal or Oil	53	...	122,611
	340	242	134,239

No. 30.

RETURN showing the Total Number of Leases and Licences in force on 31st December, 1921.

Mineral.	No. of Leases.	No. of Sluiceheads.	Area.
			Acres.
Asbestos	...	...	...
Bismuth	1	...	70
Barytes	6	...	230
Coal	56	...	12,786
Copper	28	...	1229
Clay	6	...	49
Chrysotile	...	...	...
Dredging Claims	29	...	413
Gold	92	...	1894
Iron	18	...	992
Limestone	7	...	1065
Mining Easements	97	..	621
Machinery Sites	34	...	152
Minerals	141	...	11,839
Manganese	1	..	63
Nickel	1	...	80
Osmiridium	4	...	83
Ochre	1	...	20
Plumbago	1	...	8
Pyrites	1	...	40
Silica	1	...	20
Slate	2	...	91
Scheelite	5	...	412
Shale	1	...	1488
Silver-lead	31	...	2653
Tin	639	...	13,489
Water-rights and Dam Sites	543	2060	2247
Wolfram	14	...	365
Zinc	2	...	77
Licences to search for Coal or Oil	51	...	117,031
	1813	2060	169,507

No. 31.

RETURN showing the Annual Value of Mineral Products for the State of Tasmania from 1880 *to* 1921 *inclusive.*

Year	Value.	Year.	Value.
	£		£
1880	554,031	1903	1,354,044
1881	602,723	1904	1,379,204
1882	556,306	1905	1,729,129
1883	560,873	1906	2,257,147
1884	468,302	1907	2,277,159
1885	518,885	1908	1,650,027
1886	489,966	1909	1,574,995
1887	593,256	1910	1,432,193
1888	616,733	1911	1,349,497
1889	504,718	1912	1,493,502
1890	444,210	1913	1,415,700
1891	528,388	1914	1,007,038
1892	526,909	1915	1,225,575
1893	627,909	1916	1,521,050
1894	732,764	1917	1,584,290
1895	575,692	1918	1,750,574
1896	662,058	1919	1,301,090
1897	1,006,140	1920	1,421,104
1898	1,071,084	1921	822,851
1899	1,660,622	Unenumerated prior to 1894	31,988
1900	1,888,695		
1901	1,763,896		
1902	1,378,406		£46,910,723

No. 32.

RETURN showing the Number and Area of Leases held under "The Mining Act," in force on 31st December, 1913 to 1921 inclusive.

Nature of Lease.	In force on 31st December, 1913.		In force on 31st December, 1914.		In force on 31st Dec. 1915.		In force on 31st Dec., 1916.		In force on 31st Dec., 1917.		In force on 31st Dec., 1918.		In force on 31st Dec., 1919.		In force on 31st Dec., 1920.		In force on 31st Dec., 1921.	
	No.	Area.	No.	Area.	No.	Area.	No.	Area.	No.	Area.	No.	Area.	No.	Area.	No.	Area.	No.	Area.
		Acres.		Acres.		Acres.		Acres.		Acres.		Acres.		Acres.		Acres.		Acres.
For Minerals, Silver, Tin, &c.	926	36,271	1129	37,785	907	36,437	872	34,458	876	36,203	796	32,011	823	31,006	795	30,043	901	31,719
For Coal, Slate, Shale, &c.	23	5660	26	6405	45	11,522	52	13,742	50	13,138	44	10,729	45	11,562	50	11,667	66	15,430
For Gold	54	988	95	2130	94	2026	85	1692	91	1761	43	657	32	537	65	1403	92	1894
Dredging Claims	30	329	36	403	29	351	30	437	30	401	23	323	31	482	30	410	29	413
Mining Easements	105	603	110	611	102	553	106	641	105	628	111	594	113	608	104	616	97	621
Machinery Sites	36	153	43	180	40	183	37	190	38	175	37	165	38	180	33	147	34	152
Licences to search for Coal or Oil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	51	117,031
Water-rights Mineral and Gold	546	1909 & 2034 sluice-heads	605	2449 & 2160 sluice-heads	568	1988 & 2135 sluice-heads	572	2302 & 2061 sluice-heads	557	2085 & 2035 sluice-heads	494	2121 & 1865 sluice-heads	551	2116 & 1975 sluice-heads	559	2094 & 1982 sluice-heads	543	2247 & 2060 sluice-heads

No. 33.

COMPARATIVE Statement of Revenue from Mines, being Rents, Fees, Storage of Explosives, &c. (exclusive of Survey Fees), paid to the Treasury for the Years ending 30th June, from 1882 *to* 1903, *and for Six months ending* 31*st December*, 1903, *and for the Years ending* 31*st December*, 1904 *to* 1921, *inclusive.*

Year.	Amount.			Year.	Amount.		
	£	s.	d.		£	s.	d.
1882	23,077	1	9	1903	17,776	14	3
1883	15,439	14	5	1903, 1 July to 31 Dec.	14,758	17	1
1884	6981	11	10	1904, Jan. to Dec.	16,631	8	2
1885	11,070	5	7	1905	20,208	17	0
1886	12,523	10	4	1906	24,136	12	5
1887	14,611	11	5	1907	24,794	7	7
1888	23,502	8	4	1908	20,311	3	0
1889	17,254	9	0	1909	22,804	1	5
1890	26,955	4	9	1910	22,221	18	0
1891	37,829	16	5	1911	20,556	15	10
1892	17,568	18	4	1912	17,639	19	11
1893	16,971	9	2	1913	19,410	17	8
1894	16,732	7	7	1914	14,087	0	6
1895	15,323	1	9	1915	17,679	3	6
1896	20,901	13	2	1916	14,678	19	10
1897	25,631	0	3	1917	14,669	7	2
1898	33,661	13	9	1918	17,833	14	9
1899	24,696	10	5	1919	15,388	7	7
1900	28,380	11	10	1920	16,767	11	6
1901	21,569	5	2	1921	11,248	14	11
1902	19,471	0	1				

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.

No. 34.

RETURN Showing the Average Annual Prices for Minerals during recent years.

	Ten-Year Average ended 1913.	Average for 1914.	Average for 1915.	Average for 1916.	Average for 1917.	Average for 1918.	Average for 1919.	Average for 1920.	Average for 1921.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Copper—Standard, Spot : per ton	67 13 3	59 11 3	72 12 9	116 1 3	125 2 5	115 11 6	90 19 4	97 12 5	69 8 8
Lead—Soft Foreign : per ton	15 3 6	18 13 9	22 17 8	30 19 6	30 0 0	30 2 8	28 3 11	38 4 7	22 14 6
Spelter : per ton	23 16 6	23 6 8	66 13 8	68 8 11	52 3 6	52 3 11	42 5 3	45 4 6	26 4 1
Tin—Standard, Spot : per ton	164 19 7	151 2 9	164 4 0	182 3 5	237 13 1	329 11 2	257 9 8	296 1 7	165 8 2
Silver—Standard, Spot : per oz.	s. d. 2 2·81	s. d. 2 1·32	s. d. 1 11·69	s. d. 2 7·32	s. d. 3 4·48	s. d. 3 11·57	s. d. 4 9·06	s. d. 5 1·67	s. d. 3 0·875

The figures given in these cases were supplied by the Australian Metal Exchange, and show the London Metal Exchange average prices from 1914 to 1921 inclusive, compared with the ten-year average ended 1913.

REPORT OF THE MOUNT CAMERON WATER-RACE BOARD FOR THE YEAR ENDING 31ST DECEMBER, 1921.

Gladstone, 10th March, 1922.

SIR,

WE have the honour to submit the report of the Board for the year ending 31st December, 1921.

We very much regret to have to report that there has been a falling-off in the receipts for water supplied, both under the fixed and royalty scales.

This is mainly attributable to the gradual working out of the known tin-bearing ground commanded by the race on the eastern side of the Ringarooma River, notably that at the Edina Flats, from which Mr. C. Barnes had been for some years obtaining good returns, Messrs. Higgs and Kerrison's show near the old Scotia claim, and others.

The serious aspect of the matter was discussed at the last annual meeting of the Board, when it was decided to recommend to you that a report might be obtained as to the advisability and possibility and cost of the deviation of the race at No. 4 syphon to the western side of the river. With your approval the services of Mr. Donald Fraser, surveyor and hydraulic engineer, were obtained, and at a subsequent meeting of the Board held at Gladstone on the 1st June, 1921, the report, specifications, and general estimates submitted by him were dealt with, and a resolution was adopted that the Government be urged to have the deviation carried out as early as possible.

With the view of obtaining all possible information, the Government Geologist (Mr. Loftus Hills) was instructed to visit and report upon the mineral resources of the area to be served by the proposed deviation, and the matter was referred by His Excellency the Governor to the Parliamentary Standing Committee on Public Works for investigation and report, with the result that such Committee, on the 5th August, 1921, recommended the appropriation of a sum of £7700 for the purpose of such deviation, and the amount was voted by Parliament in the schedule to "The Public Works Execution Act, 1921," and the Board will, after the conclusion of the business of the annual meeting to-day, go into the matter of having such deviation effected.

Race.—This is at present in good condition. Early in the year there was a breakaway at No. 13 embankment, but repairs were effected by the Manager and staff within three days, and no further breaks have occurred during the year.

Fluming.—The only fluming on the race—that at Old Chum Creek—is in good condition, and is not likely to require any attention for some time to come.

Syphons.—These are all in good order and condition, the constant attention of the Manager and his assistants in immediately applying Plymel paint to the coating where any signs of weathering occur effectually preventing any serious corrosion. Several members of the Board have inspected Nos. 4 and 5, and expressed satisfaction at their condition.

We again desire to express our appreciation of the able and satisfactory manner in which the Manager (Mr. H. Harvey) has carried out his duties during the year.

Rainfall.—The registered rainfall for the year was as follows:—Main intake, 39 inches 22 points; Little Mussel Roe intake, 37 inches 84 points.

Revenue.—The revenue for the year amounted to £559 9s. 1d., being a decrease of £425 11s. 5d. on the previous year.

Expenditure.—The expenditure amounted to £814 0s. 7d., being a decrease of £106 5s. 10d. on the previous year.

The statistics for the year are as follow:—

Average number of claims supplied per week, 9.
Greatest number supplied in any one week, 12.
Total number of heads supplied—Under fixed or cash scale, 206¾; under royalty or credit scale, 1492. Total, 1698¾.
Tin ore raised for the year:—Under fixed scale, 7 tons 10 cwt.; under royalty scale, 19 tons 18 cwt. 1 qr. 4 lb. Total, 27 tons 8 cwt. 1 qr. 4 lb.

Average number of men employed per week, 15.

Receipts.—Total receipts for the year—

	£	s.	d.
Water sold under fixed scale	109	14	6
Water sold under royalty scale	448	4	7
Rent of cottage	1	10	0
	£559	9	1

Expenditure—

	£	s.	d.
Salary and wages	699	10	0
Travelling expenses	56	10	10
Race-repairs	13	4	0
Syphon pipes	20	18	11
Stationery and printing	7	13	2
Insurance	7	19	5
Stores	5	14	3
Repairs to buggy	2	10	0
	£814	0	7

Paid to the Public Debts Sinking Fund for the year ended 30th June, 1921 (including moiety of rents of mineral land served by the race, £8 2s. 6d.) £73 0 11

We have the honour to be,
Sir,
Your obedient Servants,

WM. A. PRETYMAN, Acting-Chairman.
EDWARD L. HALL,
J. O. HUDSON,
CHAS. BARNES,
CECIL G. RYAN,
JOHN SIMPSON,
} Members

The Hon. the Minister for Mines.

GEOLOGICAL SURVEY OF TASMANIA.

REPORT FOR THE YEAR 1921.

A.—Correspondence.

The new system of registration and filing of correspondence installed in the previous year has produced excellent results, and affords greater facilities for the conduct of business than that previously in existence.

The total number of letters dealt with during the year amounted to 1292 inwards, and 1530 outwards, showing an increase on the previous year.

B.—Staff.

As a result of appeals under the "Public Service Act," the official titles of the geologists were altered. The Government Geologist is now the Director of the Geological Survey, and the assistant Government geologists are termed Government geologists.

With the increase in scope and amount of work of the Geological Survey, it became necessary, from the point of view of efficiency, to make one permanent and one temporary addition to the staff. The creation of the permanent office of Draughtsman to the Geological Survey will save the geologists spending a considerable time in making their plans and maps, and they will thus be able to devote a greater part of their time to field work. Mr. G. J. Edwards was appointed to this position on probation.

In connection with the increased amount of work in the Laboratory, and particularly in connection with the Coal Resources investigation, a temporary chemist was appointed for 12 months in the person of Mr. L. H. Bath.

Both of these officers have entered upon their duties with energy and enthusiasm.

I desire to express my appreciation of the special efforts put forward and the good work accomplished by Messrs. A. McIntosh Reid and W. D. Reid and Miss O'Keeffe during the whole of the year, and during the second six months of the year by Messrs. L. H. Bath and W. St. C. Manson.

C.—Increase in Scope of the Activities of the Geological Survey.

(1) *In the Field.*

I would refer, at this stage, to the general description contained in my annual report for the year 1920 of the proposed increase in scope of the functions of the Geological Survey. There is no need to repeat them here, but I shall indicate concisely what has been accomplished in this direction during the year.

(*a*) *Underground Water Supplies.*—Further progress in the field work on this subject has been made, and it is now recog-

nised as an important phase of the work of the Geological Survey. Details of the work will be found in a later portion of this report. This phase of our work is assuming a great importance, and the work of advising the numerous farmers and others who are making inquiries thereon shows an appreciation by the public of its importance and value.

(*b*) *Relation of Geology to Engineering Undertakings.*—Work on these lines has developed and, as will be seen later, important investigations have been made by the Geological Survey on the question, and important conclusions arrived at.

Evidence as to the bearing of geological structure on the problem of wharf construction at Bell Bay was given before the Tamar Commission during the year, and it was pointed out by me, and accepted by the Commission, that it was foolhardy to go on with the construction of wharves without carrying out the preliminary boring and surveys which had been recommended by me as necessary in view of the geological structure. It was shown conclusively in the evidence before this Commission that the geological structure was the crux of the whole problem at Bell Bay.

(*c*) *Soil and Subsoil Survey and Problem of Irrigation.*—Some advance in the question of the relation of soil and subsoil to irrigation has been made in connection with the geological survey of the country extending from Ross to Bridgewater. No progress has yet been possible, however, in regard to the preparation of a soil map of the State.

(*d*) *Provision of Boring Facilities and the Control of Boring Operations by the Geological Survey.*—The Government have definitely adopted the policy of carrying out boring operations and providing facilities for boring under the control of the Geological Survey. Six hand-boring plants were purchased early in the year, and provision made on the estimates for the purchase of both a plant suitable for water-boring and a diamond-drilling plant.

(2) *In the Laboratory.*

(*a*) *Analytical Work in Connection with Geological Investigations.*—Great advance has been made during the year in regard to the amount of analytical work in connection with the field work of the geologists. The addition of a chemist to the Laboratory staff enables an enormous amount of work to be carried out in connection with the Coal Resources investigation. This will be dealt with at a later stage of this report.

It cannot be too strongly urged that the availability of facilities for laboratory and analytical work is essential to the efficient carrying out of Geological Survey investigations.

(*b*) *Testing Industrial Processes.*—Continual development has taken place in the Laboratory in regard to this matter, and we are rapidly becoming recognised as the source of special information in this field, and the demand is continually growing for elaborate tests on those processes which are designed to convert our raw materials into marketable products. A number of these tests have already been made, and the necessity for a larger number in the near future confronts us.

(*c*) *Metallurgical Research.*—Following upon my recommendations made under this head in my report for the year 1920, the Government decided to develop researches along those

lines. Accordingly, the sum of £500 was placed on the estimates. It is thus possible to make a beginning to fill a very serious break in the steps towards the solution of metallurgical problems of great importance to Tasmania.

D.—Investigations Carried Out During the Year.

(1) *By the Geological Staff.*

The amount of field work carried out was so great that the area covered during the 12 months exceeds the total area previously mapped since the initiation of Geological Survey work. Apart from the fact that there was one additional geologist on the staff, this achievement was due to the location of portions examined being in the more settled areas of Tasmania, in connection with the Coal Resources investigation. The total area covered was approximately 2200 square miles.

(*a*) *Coal Resources Investigation.*—The field work in connection with this was completed during the year. It represented a task in field work of considerable magnitude. The whole of the Geological staff were engaged more or less completely on this work, but Mr. McIntosh Reid was responsible for by far the largest amount of field work.

Bulk parcels of representative coals, totalling in all 25 tons, were sent to Newcastle, to be submitted to washing tests.

The preparation of their respective portions of the Coal Resources publication, following upon their field work, occupied Messrs. McIntosh Reid and H. G. W. Keid until the end of the year.

(*b*) *Underground Water Resources of the Jericho-Richmond-Bridgewater Area.*—Following upon the investigation of the Underground Water Resources of the Midlands, the work was continued southwards to the River Derwent. Mr. P. B. Nye carried out this work, and after the completion of the field work he was occupied until the end of the year with the preparation of the report thereon. In this area there have been located a succession of sub-artesian basins similar to those in the midlands.

(*c*) *Examination of Dam-sites and Storage-basins.*—The co-ordination of work between the Hydro-Electric Department and the Geological Survey in this connection was continued during the year. In February I made an examination of the Florentine-Gordon area in regard to dam-sites and water-holding capabilities in connection with the Florentine power scheme. Although favourable dam-sites were located, it was shown on geological evidence that there was at least a very grave risk of the storage basin, being composed as it is of limestone, allowing the water to escape into the Junee River. These factors had a very important bearing on the consideration of the proposal.

I was also called upon to advise in regard to the dam foundations at the Great Lake.

In addition to the work carried out under this head for the Hydro-Electric Department, an examination was made for the special committee constituted by the Honourable the Minister for Mines to deal with the Glenorchy water-supply. An examination of the dam-site of the existing reservoir at Glenorchy was made, and found to be suitable for the raising of the

present dam. The proposed dam-site at the reservoir at a higher level was examined, and as a result certain preliminary work was advised in order that a definite opinion as to its safety could be made.

(*d*) *Gladstone Tinfield.*—In July I carried out an examination of that portion of the Gladstone Tinfield which would be served by the proposed deviation of the Mt. Cameron Waterrace. The examination showed that the tin resources of the area would justify the provision of cheap water by the Government.

(*e*) *Oil Shale at Quamby Bluff.*—In August I visited the new discovery of Tasmanite shale in the vicinity of Quamby Bluff, and definitely established that a new and undoubtedly valuable addition to the oil-shale reserves of the State had been located.

(*f*) *Examinations in Connection with Supposed Indications of Liquid Oil.*—This phase of the work of the Geological Survey has occupied a considerable amount of my time during the year. The discovery of supposed indications of liquid oil and the possibility of the creation of an oil boom based on no solid foundation, and doomed to ultimate collapse, was the determining factor towards my visiting the localities of the supposed discoveries in order to place the true facts before the public.

In October I thus visited Bruny Island, and proved that the supposed indications were not such as to warrant the belief that liquid oil occurred in the locality.

In November I visited the Barn Bluff-Pelion area, and in that field also demonstrated that the statements as to the existence of indications of liquid oil had been made on incomplete knowledge, and were not justified.

(*g*) *Australian National Research Council.*—I attended the meeting of the Australian National Research Congress in Melbourne in August, and had the opportunity of meeting there the leading geologists and scientists of the Commonwealth, and arranging several important matters in connection with the co-ordination of our research work with that being carried out on the mainland. Frequent personal contact with those engaged on the mainland and, if possible, in other parts of the world is really essential in order that our work and our ideas may be kept up-to-date.

(2) *By the Laboratory Staff.*

The number of samples received for determination by the Laboratory staff during the year constitutes a record, the total number of determinations made amounting to 4481, showing an increase of 1256 on the previous year, which was the highest up to that date, or an increase of 63 per cent. in three years. The work of this branch of the Geological Survey activities is continually increasing, both in regard to the demands made by the public and in connection with the systematic researches of the Geological Survey. The estimations have included practically every metal, and complete analyses have been made of rocks, ores, clays, kaolins, paint materials, cement, coal, coal-ash, water, &c. A very large number of distillation tests on oil shale have been made. The Coal Resources investigation has involved a large amount of work in the determination of calorific values, ignition point of coals, and fusibility of coal-

ash. In this connection the addition to the equipment of an efficient pyrometer and complete combustion furnaces has greatly added to the scope of our usefulness.

Considerable general technical advice has been given to pottery firms, as, for instance, Messrs. McHugh Bros., in regard to the testing of fire-clays, glazes, fusibility of clay mixtures, &c. In connection with the establishment of cement works in Launceston, research work has been done and general technical information in connection therewith has been supplied to Mr. E. G. Stone.

A large number of reports have been prepared on the industrial value of samples submitted.

Continual information is being supplied in regard to the correct method of taking samples. It is obviously quite useless to rely on the result of the analysis of a sample which is not representative of the deposit as a whole. Educational propaganda on this point must come from us.

An interesting and important phase of the work of the Laboratory during the year has been the examination of a large number of samples of more or less impure water submitted which were supposed to contain oil. No trace of oil whatsoever was found in any of them.

E.—Reports Prepared During the Year.

(1) *For Publication.*

(*a*) "The Underground Water Resources of the Midlands," by P. B. Nye, B.M.E.

This contains a comprehensive account of the general geology and topography of the midlands; the location and details of the sub-artesian basins, and the method of utilising the water therein; as well as a description of the soil-types in the area and their relation to irrigation.

(*b*) "The Progress of Geological Research in Tasmania since 1902," by Loftus Hills, M.B.E., M.Sc.

This is a summary of the present status of the knowledge of the geology of Tasmania, which was prepared for the Australasian Association for the Advancement of Science. Owing, however, to its not being printed by that body, because of lack of funds, and in view of important information contained therein, it was decided to bear part of the cost of publication with the Royal Society, and have it available for issue by the Department.

(*c*) "The Underground Water Resources of the Jericho-Richmond-Bridgewater Area," by P. B. Nye, B.M.E.

This is an account of the area extending from that dealt with in the report on the midlands above mentioned to the River Derwent. It deals with the same questions as the similar publication on the midlands, and the two publications are designed to deal comprehensively with the whole subject.

(*d*) "Preliminary Report on the Mt. Cygnet Coalfield," by A. McIntosh Reid.

(*e*) "The Mineral Resources of the Area to be Served by the Proposed Deviation of the Mt. Cameron Water-race," by Loftus Hills, M.B.E., M.Sc.

This report was submitted to the Public Works Committee as the basis of evidence before that body.

(*f*) " Preliminary Report on the Catamaran Coalfield," by A. McIntosh Reid.

(*g*) " Preliminary Report on the Strathblane and Hastings Coalfields," by A. McIntosh Reid.

(*h*) " Report on the Oil Shale at Quamby Bluff," by Loftus Hills, M.B.E., M.Sc.

(*i*) " Report on the Supposed Indications of Oil Shale at Rosevale," by Loftus Hills, M.B.E., M.Sc.

(*j*) " Preliminary Report on the Douglas River Coal Area," by H. G. W. Keid, B.Sc.

(*k*) " Report on the Supposed Indications of Oil on Bruny Island," by Loftus Hills, M.B.E., M.Sc.

This report was prepared in order to place before the public the facts as ascertained by the Geological Survey in regard to the supposed indications of oil. My conception of the duties and functions of the Geological Survey is that the public, who pay for the upkeep of the Geological Survey, should have available to them, at the time when they most want it, an unbiassed statement of the facts in regard to any question such as this, in order that they should know whether to invest their money or not. We are employed by the people to carry out such investigations as will enable us to give this information, and it would be unfair not to give it definitely and in straightforward and simple language when it is of value to them.

(*l*) " Search for Oil in Tasmania," by Loftus Hills, M.B.E., M.Sc.

This report was prepared under instructions to deal with a proposal that was being placed before the House of Assembly, which involved the handing over of oil prospecting in the whole of Tasmania to one company. It dealt comprehensively with the whole question of oil occurrence in Tasmania, and the nature of the misconceptions which had been leading certain people to hope that liquid oil could be obtained by boring.

(*m*) " Report on the Geological Composition and Structure of Porpoise Rock," by Loftus Hills, M.B.E., M.Sc.

A report was prepared, after a study of the specimens secured by the diver, on the geological structure and composition of the Porpoise Rock as relating to the method of its removal.

(2) *Departmental.*

In addition to the usual correspondence covering a wide range of subjects and problems, the following are the most important departental reports compiled during the year:—

(*a*) " Report on the Dam-site at Great Lake," by Loftus Hills, M.B.E., M.Sc.

(*b*) " Report on the Geological Conditions Affecting Dam-construction and Water-storage at the Glenorchy Reservoir Sites," by Loftus Hills, M.B.E., M.Sc.

(*c*) " Report on Geological Conditions Affecting Water-conservation in the Florentine and Gordon Valleys," by Loftus Hills, M.B.E., M.Sc.

(*d*) " Preliminary Report on the Coal Resources of the Area to be Served by the Proposed Railway from Picanini Point to Cole's Bay," by H. G. W. Keid, B.Sc.

(*e*) "Report on the Meeting of the Australian National Research Council," by Loftus Hills, M.B.E., M.Sc.

(*f*) "Report on the Development of the Renison Bell Tinfield," by Loftus Hills, M.B.E., M.Sc.

F.—Publications.

In view of the fact that such a large number of separate fields were included in the Coal Resources investigation, which would ordinarily be the subject of a separate publication, and because of the fact that the Coal Resources publication is not yet completed, the number of such separate publications issued during the year is not a criterion of the amount of work accomplished.

The following publications were issued during the year 1921:—

(1) Bulletin No. 32, "Osmiridium in Tasmania," by A. McIntosh Reid. (15th October, 1920.)

This publication is a very important one, and has been in very wide request. The available copies are now limited in number, although 1000 were printed.

(2) Underground Water-supply, Paper No. 1, "The Underground Water Resources of the Midlands," by P. B. Nye, B.M.E. (25th March, 1921.)

This is the first of a new series of publications designed to deal with the underground water-supplies of various districts in Tasmania.

G.—The Supplying of Information.

As indicated in my last year's report, this phase of the work of the Geological Survey is an important one, and is continually on the increase, both by personal application and by letter.

(1) *Personal Applications.*

During the year 1320 personal interviews have been attended to by the Geological Survey staff. Of these, 1000 were referred to the Laboratory staff for the determination and analysis of samples submitted, and 320 were attended to by the Geological staff.

(2) *By Correspondence.*

Inquiries from all over the world are constantly coming in regard to the geology and mineral resources of the State. Replies to these letters mostly involve the compilation of comprehensive reports. As indicated in dealing with the total number of letters during the year, the number of such inquiries has increased. During the year inquiries have been received from all parts of the Commonwealth, New Zealand, Papua, Japan, United States, Canada, Mexico, Argentine, Czechoslovak, Latvia, Switzerland, and Poland.

H.—Mineral and Rock Collections.

Owing to the staff being fully occupied on current investigations, no attention has been possible on the type collections of minerals, rocks, and fossils at the Victoria Museum, Launceston.

I.—Library.

The number of publications received by means of our exchange list was 788.

Acknowledgments must here be made to the proprietors of the following Tasmanian newspapers for free copies presented by them:—"Examiner," "Daily Telegraph," "Mercury," and "Zeehan and Dundas Herald."

J.—The Relation of the Geological Survey to the Teaching of Geology in Tasmania.

The aspect of this matter covered in my report for 1920 is an important one, but no definite result has been attained by our efforts to establish a Chair of Geology at the University and the co-operation of such a department with the Geological Survey. Our efforts, however, will be continued during the coming year.

L.—Work to be Completed and Undertaken During the next Twelve Months.

(1) *Completion of the Coal Resources Investigation.*

The field work for this is completed, and there remains the laboratory work and the preparation of the publication in all its details. This will occupy some time.

(2) *Mt. Bischoff Investigation.*

This will be undertaken by Mr. A. McIntosh Reid, assisted by Mr. H. G. W. Keid, during January.

(3) *The Investigation of the Ore Deposits of the Magnet-Mt. Jasper Region.*

This will be carried out by Mr. P. B. Nye, starting in January, the more difficult portions being carried out by myself, in conjunction with Mr. Nye.

(4) *The Investigation of the Oil Shale Resources of Tasmania.*

This will be undertaken during the year, including both the examination of the oilfields themselves and investigations on a commercial scale of the correct method of retorting. It is essential to determine not only the exact amount and value of the oil shale reserves, but also to do what has not yet been done, namely, to determine the design of retort most suited to the particular type of shale. Arrangements are being made to conduct the retorting investigations in Melbourne, using the plant of the Victorian Geological Survey, so as to save the expense of equipping such a plant in Tasmania. The investigations will be carried out at this plant by Mr. W. D. Reid.

(5) *The Investigation of the Gold Belt extending from Beaconsfield, through Lefroy and Golconda, to Mt. Victoria and Mathinna.*

This will be undertaken by myself. This investigation is badly needed, as there is evidence to show there must still remain valuable gold deposits in addition to those already

worked. The problem is to discover the method of determining the unimportant areas from the main gold-bearing lodes.

(6) *Clay Deposits.*

It is hoped that before the end of the year a start will be made on the systematic investigation of our clay deposits, and the carrying out of research work in regard to the manufacture of porcelain and earthenware therefrom.

(7) *Urgent Investigations.*

Provision must be made in the above programme for investigations which crop up and which are of an urgent character.

LOFTUS HILLS, M.B.E., M.Sc.,
Director Geological Survey.

To the Secretary for Mines, Hobart.

REPORT OF THE CHIEF INSPECTOR OF MINES.

Chief Inspector of Mines Office,
Hobart, Tasmania.

SIR,

I HAVE the honour to submit my annual report for the year 1921 in connection with the inspection of mines.

The industry was greatly affected by the collapse of the metal market, but owing to natural conditions this State did not suffer to the same extent as other parts of the world. The prices of metals became so low as to render production unprofitable, except in very special circumstances, which condition discouraged prospecting and developmental work.

The average number of persons employed in the industry for the year was 4011, being a decrease of 1355 compared with the previous year.

There were three fatal accidents, causing the death of three persons. The death-rate per thousand persons employed was 0·748. Two of the accidents were underground accidents, and one a surface accident. One fatality occurred while opening up an ore-pass into a stope which was covered by several feet of ore. The man was working the broken ore into the pass, unsupported, when a run of ore took place, carrying him into the pass. The method of carrying out the operations could not have been done in a more unsafe manner, and it is probable that almost any reasonable precaution would have obviated the occurrence. The scope of the inquiry at the coronial inquest was limited to such an extent that it was considered necessary to hold a further inquiry under the "Mines and Works Regulation Act." The evidence as to the occurrence was such that it was considered necessary to bring in a new regulation to prevent recurrence of such conditions. The other underground fatality was caused by working down dangerous ground on the hanging-wall. The ground was known to be dangerous, and the men were employed making it safe. The occurrence can only be attributed to an error of judgment. The surface fatality occurred at the surface haulage station. A miner not employed near the operations desired to speak to one of the men employed at the station. He proceeded into the gallery, and not noticing that empty trucks were attached to a tail-rope, had his head jammed between a truck and the lip of a bin-sheet, receiving injuries which caused death.

There were 37 accidents which caused the injured persons to be absent from work for more than 14 days, 37 persons being affected, being an average of 9·224 per thousand persons employed in the mines. Ten of the accidents caused fracture or loss of fingers or toes; the remainder were of a slight character, but sufficiently grave to bring them under the definition "serious."

There were several extensive settlements of ground during the year, but each case was under close observation, and so did not cause injury to any of the employees. In one case the settlement was very serious and extensive, and it was estimated that

half a million tons of rock was in movement. The occurrence was under close observation for some years before, and every precaution was made to obviate danger to the employees. The occurrence was one associated with the mining of large ore-bodies, and was a large settlement of the hanging-wall which settled downwards and towards the footwall, the downward movement extending about 6 feet. The movement was finally controlled by the filling and by ore-pillars.

There was a case of spontaneous combustion in a metal mine, due to decomposition of the pyritic matter in the ore-body, which has given cause for considerable anxiety, but with the methods advocated this should be controlled to ensure safety to those employed. A considerable amount of attention has been given to ventilation of coal and metal mines, and the conditions have been considerably improved. At two of the principal coal-mines provision is being made which will ensure good results.

It was found necessary to insist on more efficient types of brakes being used on several winding-engines.

The necessity for the careful examination of ropes was demonstrated by the breakage of a new rope, which had been in use only four months. The rapid deterioration was attributed to corrosion from acid mine-water. The rope was condemned for the purpose of raising and lowering persons, and preparation made for its replacement. A truck of ore was placed in the cage at the lowest level, and when raised about 2 feet the rope fractured at a point 280 feet above the shoe.

In 21 cases it was found necessary to institute legal proceedings for breaches of the provisions of the Act. In 19 cases convictions were obtained, and two cases were dismissed.

The reports of the district inspectors are attached.

I have, &c.,

J. O. HUDSON, Chief Inspector of Mines.

W. A. PRETYMAN, Esq.,
Acting-Secretary for Mines, Hobart.

COMPARATIVE Table of Statistics of Accidents in and about the Mines of Tasmania from 1st July, 1892, to 31st December, 1921.

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 1892	3295	28	4	25	29	8·8001	1·214	7·586
,, 1893 ,, 1893	3403	25	7	20	27	7·934	2·057	5·877
,, 1894 ,, 1894	3789	26	4	24	28	7·390	1·058	6·332
,, 1895 ,, 1895	4160	22	7	16	23	5·529	1·682	3·847
,, 1896 ,, 1896	4303	36	7	31	38	8·831	1·627	7·204
,, 1897 ,, 1897	5530	36	13	33	46	8·318	2·351	5·967
,, 1898 ,, 1898	6180	35	9	34	43	6·957	1·456	5·501
,, 1899 ,, 1899	6834	19	7	16	23	3·365	1·024	2·341
,, 1900 ,, 1900	7017	29	8	23	31	4·417	1·140	3·278
,, 1901 ,, 1901	6438	38	7	35	42	6·524	1·088	5·437
,, 1902 ,, 1902	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	3·569
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
,, 1914 ,, 1914	4741	69	9	62	71	14·977	1·896	13·081
,, 1915 ,, 1915	3908	71	6	67	73	18·679	1·535	17·144
,, 1916 ,, 1916	3864	53	2	51	53	13·716	0·517	13·198
,, 1917 ,, 1917	4050	50	2	48	50	12·345	0·493	11·852
,, 1918 ,, 1918	4279	50	5	45	50	11·684	1·168	10·516
,, 1919 ,, 1919	4413	58	1	57	58	13·143	0·226	12·917
,, 1920 ,, 1920	5364	52	2	50	52	9·694	0·372	9·322
,, 1921 ,, 1921	4011	40	3	37	40	9·972	·748	9·224

ANALYSIS of Statistics for 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.
Mt. Lyell	1359	22	3	19	22	16·188	2·208	13·980
Zeehan, &c.	368	4	...	4	4	10·869	...	10·869

Diagram showing the ratio of Fatal Accidents in Mines in Tasmania

Rate per 1000 men employed

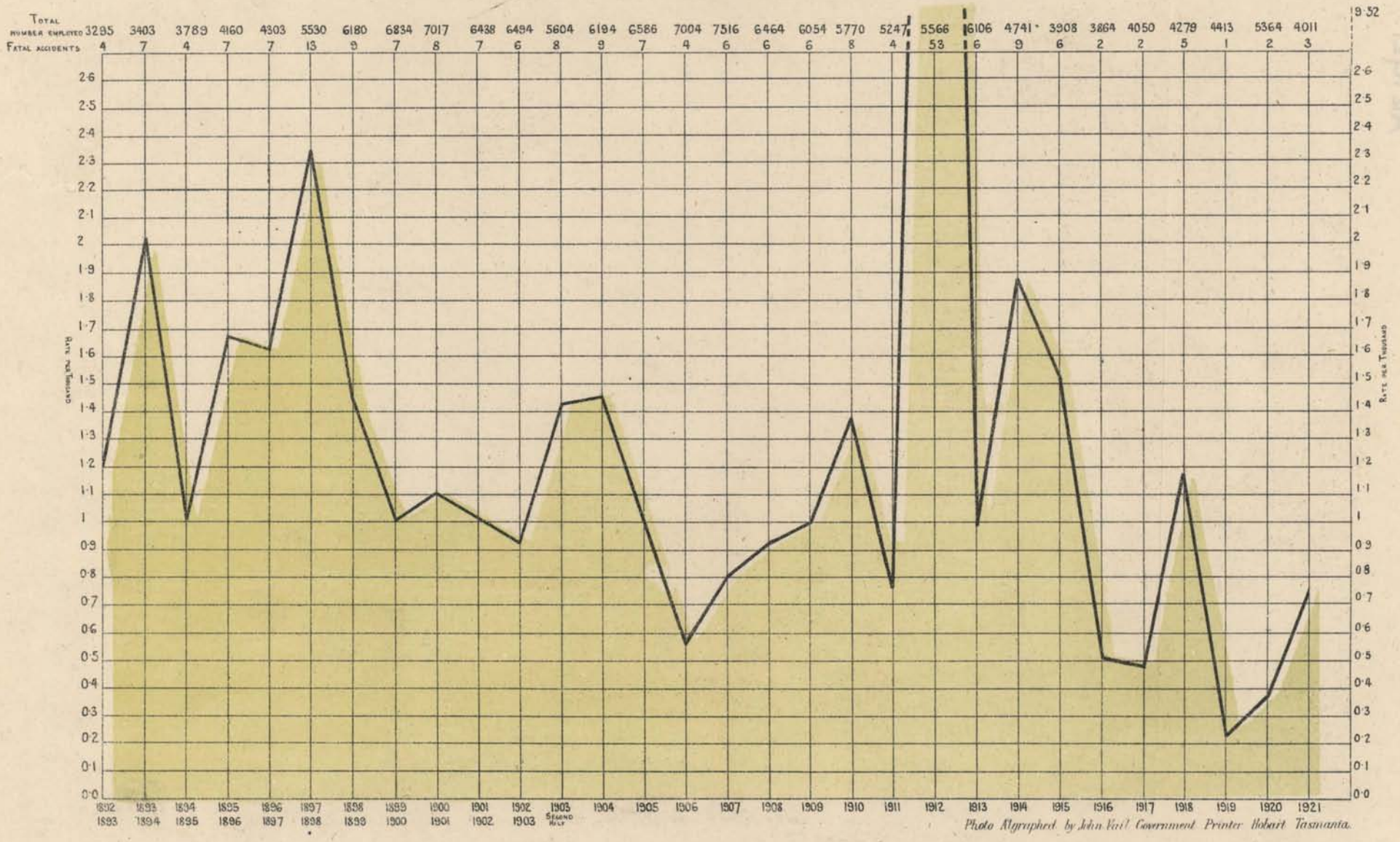

Photo Algraphed by John Vail Government Printer Hobart Tasmania.

5 cm

TABLE showing Rate per Thousand Killed and Injured in different Divisions for the Year ending December, 1921.

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	1059	5	...	5	5	4·721	...	4·721
North-Eastern	327	2	...	2	2	6·116	...	6·116
Eastern	349	7	...	7	7	20·057	...	20·057
North-Western	549	...	..	...	...	...	...	...
Western	1727	26	3	23	26	15·055	1·737	13·318

TABLE showing the Number of Persons Killed and Injured in and about the Mines of Tasmania during the Year 1921.

Place or Cause of Accident.	Inspection Districts.													
	Northern and Southern Division.		North-Eastern Division.		Eastern Division.		North-Western Division.		Western Division.				Total.	
									Zeehan and Districts.		Lyell District.			
	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured	Killed.	Injured.	Killed.	Injured.
Underground—														
Falls of ground	...	...	...	...	...	...	...	...	...	...	1	1	1	1
Shaft Accidents—														
Falling down passes and shafts.....	...	...	...	...	...	...	...	...	...	...	1	1	1	1
Total	...	...	...	...	...	...	...	...	...	...	2	2	2	2
Miscellaneous (underground).														
Haulage.....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Trams, &c.	...	1	...	...	...	3	...	...	...	...	...	3	...	7
Sundry accidents.....	...	1	...	...	...	3	...	...	.	1	...	3	...	8
Explosives	...	...	...	...	...	...	...	.	...	...	...	...	...	...
Total	...	2	...	...	...	6	...	...	...	1	...	6	..	15
Total Underground	...	2	...	...	...	6	...	...	...	1	2	8	2	17

On Surface—														
Smelting works	...	...	...	...	...	...	...	...	...	...	...	3	...	3
Machinery	...	...	...	...	...	...	...	...	...	...	...	1	...	1
Tramways	...	...	...	...	...	1	...	...	...	1	1	3	1	5
Falls of persons	...	1	...	...	...	...	...	...	...	2	...	2	...	5
Explosives	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Miscellaneous	...	1	..	2	...	1	...	...	...	...	...	2	...	6
Sluicing	...	...	...	...	..	...	...	...	...		...	...	...	...
Total	...	2	...	2	...	2	...	...	...	3	1	11	1	20
Gross Total	...	4	...	2	...	8	...	...	...	4	3	19	3	37

REPORTS OF INSPECTORS OF MINES.

MR. INSPECTOR CURTAIN reports:—

Accidents.—The list submitted furnishes the particulars and number of casualties that have taken place in this varied and extensive district during the past year. None were attended with permanent or evil results, as all the sufferers have returned to work again.

Health of the Miners.—This, on the whole, which embraces over 1000 men, has been satisfactory, as replies received from the medical officers in the various centres go to show that, apart from ordinary ills, nothing special has called for attention.

Ventilation.—This generally has been reasonably satisfactory. In both of the principal collieries, however, exception has had to be taken regarding the circulation and diffusion of the "current," which at times, and in sympathy with atmospheric influence, has not complied with the stipulations prescribed by the regulations, and the mine books were minuted, to the effect that under such circumstances the number of men employed underground should not exceed that for which an adequate quantity of pure air had been provided.

Dust.—Where rock-drills are in use underground, satisfactory reticulated water services are likewise provided; and to guard against any evil arising from this source, colliery managers are requested to keep their main roads and general travelling-ways reasonably free from it.

Changing and Bath Houses.—Apart from metalliferous mines, no others provide such accommodation, which is somewhat anomalous, as the coalminer usually returns from his work black and grimy, and in most instances needs a wash and change even more so than most metalworkers. Yet, to the present, those most interested have made no move in the direction indicated, and the management's invariable reply is, "that the custom is not general in collieries, and the service would not be used if inaugurated." This, however, is questionable, as the same plea or objection was similarly used against its introduction into metal mines, that has since become universal, reciprocal with which the State colliery in Victoria has a building suitably subdivided between youths and adults for this purpose. It is fitted with a reticulated water-service, both for hot, cold, plunge, and shower baths, also chain pullies for hanging and drying working clothes, and lockers for the safe custody of other suits, the whole being under the supervision of a caretaker, who is responsible for the men's comfort and belongings, thereby relieving the latter's home-circle of these duties, which, under present-day principles, should neither be imposed or expected.

Magazines and Inflammable Liquid Depots.—Those registered and situated in the intervening centres between Stanley and Gladstone have received periodical inspection, and in most cases found clean and reasonably satisfactory.

Explosives.—None but the best recognised brands of favourably known and well-established manufacturers have come under notice, and the respective samples examined have been found pliant and satisfactory. A prosecution was entered and successfully maintained against a resident of Gladstone, who was fined accordingly, for selling explosives without a permit

General.—Outside the principal mines, prospectors have been fairly busy at Alberton, Mathinna, Mangana, Tower Hill, Mt. Horror, Golconda, Panama, Lebrina, Back Creek, Avoca, Brookstead, Ben Lomond, Scamander, and the Moina districts, but as these centres will be dealt with in the Secretary for Mines' report, there is no need for a repetition; suffice it to state that gold has received the chief consideration, and there is every reason to believe a revival will take place in this direction during the ensuing year.

LIST of Accidents in Inspector Curtain's District for the Year 1921.

Fatal 0, Serious 14.

Date of Accident.	Name of Mine.	Locality.	Cause of Accident.	Name of Sufferer.	Married or Single, and Age.	Nature of Injuries.	Killed.	Injured	Particulars.
1921.									
Jan. 17	Mt. Nicholas Coal Mining Co.	Mt. Nicholas	Axe	Reginald Goff	Married, 23 years	Cut off first joint of forefinger	—	1	Missed his mark while preparing a sleeper to put under rails, and axe came down on forefinger
Jan. 21	Cornwall Coal Mining Co.	Cornwall	Run over by skip	Alexander John Parsons	Single, 23 years	Foot bone fractured	—	1	Slipped while spragging skips, and caught foot under wheels
Jan. 22	Mt. Nicholas Coal Mining Co.	Mt. Nicholas	Struck by piece coal	David Wm. Llewellyn	Married, 52 years	Cut finger	—	1	Piece of coal struck hand while barring down
Jan. 26	Briseis Tin Mining Co.	Derby	Slipped	Joseph Mulhearn	Married, 55 years	Sprained knee-joint	—	1	While loading tin-ore into wagon, slipped and strained knee
Feb. 2	Round Hill Mine	Cethana	Wagon overturned	George Grundy	Married, 40 years	Cut face & bruised arm	—	1	Truck of mullock overturned in wrong direction and spoil knocked man into creek some feet below
Feb. 2	ditto	ditto	Jammed between truck an mine timbers	Charles Harding	Married, 40 years	Broken rib	—	1	Tried to pass loaded truck in motion and was caught between truck and timbers
Mar. 14	Cygnet Coal Mine	Cygnet	Tripped against wheel	Thomas Cowen	Married, 30 years	Bruised knee and hip	—	1	While tipping a dray of coal, struck the wheel, and injured hip and knee

Mar. 31	ditto	ditto	Lifting a skip	John Langdon	Married, 30 years	Strained shoulder	1	While lifting a skip on to rails at No. 2 pit, strained his shoulder
June 2	Mt. Nicholas Mine	Mt. Nicholas	Fall of piece of coal	William Brittan	Married, 63 years	Bruised right foot	1	Piece of coal fell from face and bruised his foot
July 19	Broken Hill Prop. Ltd.	Melrose	Cemented nodule fell from face	Walter Barker	Single, 16 years	Fractured skull, broken collarbone and forearm	1	While steel-carrying, piece of cemented material fell from face and struck him
July 14	Cornwall Coal Mining Co.	Cornwall	Struck by piece of timber	Leslie Blair	Married, 31 years	Slight skull fracture and scalp wound	1	Piece of timber came through chute and struck Blair on head
July 15	ditto	ditto	Moving skip	Stephen Targett	Married, 23 years	Lacerated hand	1	Attempted to stop a moving skip with a pick when same struck hand and lacerated it
Sept. 7	Echo & Weld T.M. Co.	Moorina	Axe slipped	Charles David Britton	Single, 17 years	Cutting four toes (two amputated)	1	While cutting log, axe slipped, cutting four toes, and eventually causing the amputation of two
Dec. 1	Mt. Nicholas Colliery	Mt. Nicholas	Truck buffers	William Mott	Married, 66 years	Crushed thumb	1	Was pulling trucks between railway station and screens and got hand caught between buffers of a wagon

Mr. Inspector Vaudeau (Zeehan) reports:—

I have the honour to submit my report as Inspector under "The Mines and Works Regulation Act, 1915," "Explosives Act, 1916," and "The Inflammable Liquid Act, 1920," for the year ending 31st December, 1921.

Accidents.—The tabulated list attached contains an account of four accidents, only one of these occurring underground. As most of the managers report all accidents, however trivial, it is pleasing to be able to state that this was the only accident reported during the year as having occurred underground. This, at the time of happening, was not thought much of, but the eye got worse and it was thought advisable for the man to go to Zeehan and see the doctor. As a result of the accident, the man lost 24 working days.

During my inspections I have had several lots of dangerous and affected ground brought down, so the record is a good one.

All the other accidents occurred at one works and to returned soldiers. Three other accidents at these works were also reported, the men losing respectively 12, 9, and 13 days; but are not registered, as the loss of 14 working days constitutes a serious accident under the Act. At these works they appeared to have a run of "bad luck." With a little more care the whole of the accidents could have been avoided.

There is no need to further enumerate the tabulated accidents here, as the list gives the necessary information.

Another accident occurred, not due to mining. On Sunday, the 4th of December, Claude Stanley Cooke, aged 16 years, with a mate, was using gelignite with detonators and short lengths of fuse, to blow up frogs at what is known in Zeehan as the State Mine Dam. He had thrown in two charges, which had exploded all right. On the third attempt, which he describes as follows, the charge went off in his left hand:—He held the gelignite, detonator, and 4-inch piece of fuse in his right hand, lit it with a match, and then passed the charge to his left hand (he being left-handed) to throw it into the water. He had the hand behind him ready to throw when the charge exploded. The doctor found it necessary to take the hand off at the wrist. The lad stated he got the explosives at home, which his father had left there, he having used some more of it blowing up stumps, &c., for firewood when in from the osmiridium diggings.

Ventilation.—This at three mines was found unsatisfactory, but the management met me and carried out my wishes, making it quite all right.

At another mine, owing to the class of ore being mined, things at times are not at all satisfactory. On two occasions it was found necessary to request that the men be removed from these workings owing to the presence of dense fumes caused by the rapid oxidation of the pyritic ore, which in this instance is lying over a band of oxidised ore of a highly payable nature. It was the manager's intention to mine all this ore downwards by open-cut (glory hole) methods, and was endeavouring to open up the mine so that this method could be made use of, but owing to the slump in metal values it was found necessary to mine this rich band of oxidised ore on footwall of the deposit to try and keep things going. The trouble

was that every now and again the pyritic ore came down lower into the oxidised zone, and wherever exposed in the workings trouble eventuates through the rapid oxidation of the sulphur contents. In October it was found necessary to seal off portion of these workings owing to the ore being on fire.

The management considered they could handle these workings by natural ventilation by rising to surface and higher workings. They were told that the more openings there were the worse things would become. My remarks were disbelieved, but they have found them in every instance since to be correct. I recommended that an exhaust system of ventilation be put in to deal with these workings until such time as they could be dealt with as open-cut workings. By this method the ventilation could be regulated and controlled, and the fumes, when given off, extracted without having to diffuse them through the workings to the hurt of the workmen.

Mining work at this particular level was stopped by the management late in the year, and I trust will not be opened again until economical conditions are such that the ore can be mined as a whole by open-cut methods. There will be times when even by this method they will not be able to work, owing to fumes, but on the whole it will be much more healthy and safer for the workmen.

Apart from the above, the ventilation on the whole was reasonably good.

Change-houses.—I had to request that a few improvements be made. The accommodation is now much more satisfactory. At one mine the management, on being requested to put in change-house in compliance with the Act, considered the men would not use it. However, on being completed it was quickly made use of, and the surfacemen have since asked me to get the place enlarged, so that they could also make use of it.

Latrine Accommodation.—This has been improved in two instances. On the whole it is reasonably satisfactory.

Health.—As far as I can ascertain, one man was ordered out of a mine at Zeehan, owing to pneumoconiosis—that is the only one I have heard of—and on the whole, judging by outward appearances, the men in this district will easily compare with those in other places.

At one mine a small rock-machine was put into use without a water-jet. The management was requested to make this available, and promised to do so. The material had just come to hand from Melbourne on my last visit to the mine in December last. Elsewhere, where rock-drills are used, water is supplied for all purposes of allaying dust.

Explosives and Magazines.—Now and again cases of gross neglect regarding storage underground have been noted, resulting in explosives absorbing moisture to such an extent that I have had to condemn same. Warning was given that if better conditions did not prevail drastic action would be taken. This has brought marked improvement.

I had one complaint regarding the nature of some gelignite. They stated it burnt and did not explode properly. I took some of it and tested it by "open test," and found it quite satisfactory, up to eight plugs exploding thereby. On the whole, apart from the above, the physical characteristics of the

explosives have been satisfactory. Detonators have been satisfactory. Various tests were made of the fuse, and in all cases were also satisfactory. Five magazine licences were not renewed, and two new ones were issued. One permit to sell explosives and one to convey same were not renewed. Only on one occasion was a magazine found in an untidy and dirty condition. On each visit since it has been found O.K.

Ropes and Cages.—Taken as a whole, these have been kept in a satisfactory condition. On a few occasions I have had to request that cages be tested, in compliance with the Act.

Machinery.—At one mine a request was made that post-brakes be put in in place of band-brake then in use, owing to their not being able to hold a full truck without putting air against the load. I also wrote the Machinery Inspector in this connection. I am hoping to find this attended to on my next visit to the mine. Otherwise the general condition appeared to be reasonably safe.

Quarterly Returns for Statistical Purposes, as Required by Section 65 of "The Mines and Works Regulation Act, 1915.—Several persons failed to send the necessary information to this office, as required, so legal action was taken against them, and I am thankful to say that it has had the desired effect.

Inflammable Liquid Depots.—Those registered and licensed in my district have been kept clean and reasonably satisfactory, as required by the Act.

General.—The various mines and works in my district have been regularly inspected, as the importance of the operations called for. There was a considerable reduction in the number of men employed at some mines during the year, but as a good deal of time is taken up in getting to these, it has not made a marked difference in the time occupied, as might be expected. My experience has been that it is necessary to keep in as close a touch when only a few men are employed as when many are, for conditions of safety. Several recommendations have been made regarding improvements of working conditions, and, apart from two occasions, I have always been met in a fair manner by the management and tributers, and herewith express my appreciation.

A good deal of work has been carried out in the way of inspecting and reporting, as instructed by the Honourable the Minister for Mines, under "The Mines Development Act, 1912," and "The Mining Act, 1917," during the period under review; also a special inspection was made of a huge settlement at the Mt. Lyell Mine, and a report made in connection therewith. Many of the osmiridium diggings were visited and inspected. Apart from a few instances, the general condition of these were found to be reasonably safe.

LIST of Accidents in Inspector Vaudeau's District for the Year 1921.

Fatal 0, Serious 4.

Date of Accident.	Name of Mine or Works.	Locality.	Cause of Accident.	Name of Sufferer.	Married or Single, and Age.	Nature of Injuries.	Killed.	Injured.	Particulars.
1921. July 30	Old Smelters, Electrolytic Zinc Co. of Aus., Ltd., West Coast Dept.	Austral, Zeehan	Struck by handle of crab-winch	Archibald Thomas Jarvis	Married, 27 yrs.	Broken right fore-arm	—	1	The man was engaged with three others "wrecking" steel ore-bins. These were in the act of coming over, when the men let go of the handles of the crab-winch, as previously agreed on. Jarvis did not get clear in time, and one of the handles struck him on the fore-arm. He lost 32 days from work
Oct. 1	North Mt. Farrell Mine	Tullah	Piece of dirt or spark off pick point	Archibald Cowie	Married. 45 yrs	Iritis in the left eye	—	1	The man was working some ground down in a "rise," when a piece of dirt or a spark flew off pick point into his eye. He lost 24 days owing to the accident
Oct. 13	Old Smelters, Electrolytic Zinc Co. of Aus., Ltd., West Coast Dept.	Austral, Zeehan	Slipped and fell from roof of boiler shed	Archibald Thomas Jarvis	Married, 27 yrs.	Scalp wounds, bruises, and shock	—	1	The man was tarring a roof about 14 feet high. He was shifting his position, when he slipped and fell, the contents of the tar-pot covered his head, &c. He also received the injuries stated. Lost 18 days' work

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

Date of Accident.	Name of Mine or Works.	Locality.	Cause of Accident.	Name of Sufferer.	Married or Single, and Age.	Nature of Injuries.	Killed.	Injured.	Particulars.
1921. Oct. 31	Old Smelters, Electrolytic Zinc Co. of Aus., Ltd., West Coast Dept.	Austral, Zeehan	Struck by falling timber, &c.	William Brampton	Single, 27 yrs.	Cut on head, bruises, and shock		1	Man was employed dismantling a coke-bin shed, and at the time of the accident was working by himself. He was seen a few minutes before levering off a side strut, and when found was partially stunned, and the frame of building had collapsed. According to Brampton the building collapsed suddenly when he was levering off the strut. He fell off the timber he was standing on, on to his head. He lost 23 days from work

Mr. Inspector Williams (Queenstown) reports:—

I have the honour to submit the following report upon the work of inspection and administration of the various Acts delegated to this office within the Lyell Inspection District for the year ended on the 31st December, 1921:—

I was absent from the district from the 26th March to the 30th April inclusive, during which time Mr. Inspector Curtain carried out the duties of this office.

Due regard was given to obtaining a reasonable observance of the machinery of "The Mines and Works Regulation Act, 1915." As hitherto, the principal mines and works commanded the greater number of underground and surface inspections, and consequent upon the smaller mines being idle, the work of inspection was latterly confined to the first mentioned. Production and maintenance of safe working conditions received much consideration, and in that connection necessity for barring down or otherwise dealing with unsafe ground, for proper erection of square set timbers, and for offering some security against ground within the influence of lines of weakness by bulking or filling were conspicuous in the entries made in the record books. An application of that degree of vigilance essential for good results was not manifest on several occasions, particularly in respect to barring down unsafe ground.

Settlements of Ground.—There were three extensive settlements of ground and several minor occurrences of the kind, which continued to emphasise the care that is necessary in respect to structural weaknesses of the ore-bodies. A majority of the settlements occurred during the off-shifts or periods of temporary idleness at the affected places, while in other cases ample warning was given, and no person was injured as a result of the settlements.

Extended failure of the hanging-wall country occurred at one mine early in the year, and an extensive area of ground, covering the major portion of the hanging-wall workings and extending from the surface in the open-cut workings to the third working level, subsided with gradual outward and downward movements. Contortion and other distress of workings ensued, but filled areas and pillars and other ore *in situ* controlled the subsidence, and occasion did not arise to require a withdrawal of the men from the mine. The movement area was not quiescent at the close of the year.

A second occurrence involved the collapse of a stope section. A rill stope strip had been mined partly on square set timber and partly with bulking. Subsequently further ore-breaking was proceeded with on the footwall side, and this was attended with an extensive settlement of "backs." Inquiries revealed that portion of the bulking had been displaced, and that any effectual blocking of the square sets had been interrupted by the work in progress at that period. Sufficient warning was given to enable the miners to make a safe exit from the stope. A fall of ground on the hanging-wall side with an extension of movement in the "backs" towards the footwall-side necessitated a discontinuance of operations in, and an immediate filling of, an open-stope. The weaknesses were located previously, and as a settlement was apparent, precautions were required to ensure a safe exit of the miners.

The policy of open-stoping, as applied to large ore-bodies associated with defined lines of weakness, is likely to be accompanied with settlements of ground, consequently safety is best served by offering some security against the ground within the influence of those weaknesses before failure of the ground becomes apparent. This principle was not regularly observed, was observed in a minority of the lesser settlements, and differences between the mines and this office existed in respect to precautionary measures necessary.

Accidents.—Twenty-two accidents, entailing a like number of casualties, were recorded under the provisions of Section 26 of "The Mines and Works Regulation Act, 1915." There were three fatalities, and 19 casualties attended with non-fatal injuries, as against one of the former and 21 of the latter recorded during the previous year. In addition, several accidents, one of which was attended with fatal results, occurred in connection with surface machinery. These were accepted and dealt with by the Machinery Department.

Two of the fatal accidents recorded occurred underground, and one was connected with surface operations, at which the deceased was not employed. Each was associated with circumstances which suggested callousness of possible results attending hazardous procedures adopted.

In one case a miner was standing unsupported on broken ore which had assembled over and choked the mouth of a pass, and was endeavouring to free the ore, when it caved and precipitated him down the pass.

In the second case a miner was engaged barring down subsequent to blasting operations in a stope, when he was struck by a small quantity of ground which fell from the rising and shaken hanging-wall at which he was barring and under which he was standing. The wall was known to be badly affected, and there was ample scope for a safe procedure.

The third fatality concerned truck and wagon operations at the surface ore-bins supplying a haulage. A miner, who was not concerned with the work, ventured in the gallery of the ore-bins while loaded and empty trucks were being simultaneously travelled in the gallery, was caught between the leading empty truck and a bin-chute, and sustained fatal head injuries.

At subsequent coronial inquests the juries found that the deaths were due to accidental causes.

Owing to the limited scope of the inquest into the fatality first mentioned, and as a similar accident had occurred during the previous year, a special inquiry was held under the provisions of Section 9 of the Act into the methods of working at passes and all matters and things connected with or relating to the safety or well-being of persons employed in connection with passes. Several irregularities and unsafe practices were revealed, and Regulation 18 was established in respect of dealing with broken ore assembled over, on, or adjacent to passes.

Of the non-fatal accidents, eight occurred underground and 11 occurred on the surface. The injuries sustained and the causes thereof are summarised in the tabulated list accompanying this report, consequently a resumé only is devoted thereto.

Fractures were sustained in three cases, but the circumstances were not of serious moment, and an exercise of reasonable care would have averted the results recorded. In one case a person sustained the loss of two joints of a finger consequent upon an injury sustained while placing a truck of ore in an underground tipler. A prevention of this accident depended upon the care exercised by the individual. The injuries sustained in the remainder of the accidents, although painful in some cases, were of a non-serious nature, and no permanent disablement resulted. In one case, where a person was struck by hot flue-dust, it was found necessary to declare the method of working to be unsafe, and to request that measures be taken to prevent a future similar accident.

Prosecutions.—Legal proceedings were instituted in 11 instances, four of which concerned the allaying of dust from rock-drilling operations. The proceedings in one case related to a breach of the regulations committed during the previous year, and the contravention and result in each of the remainder are shown in the appended tabulation:—

Contravention.	Result.
Section 72.—Use of threatening, abusive, and insulting language about a mine.	Mine labourer: Convicted and ordered to pay costs amounting to 8s.
Section 72.—Guilty of riotous behaviour about a mine.	Mine labourer: Convicted, fined 5s., and ordered to pay costs amounting to £1 4s.
General Rule 13 of the Schedule.—Failure to use an appliance for the prevention of dust from rock-drilling operations.	Miner: Conviction recorded, without costs.
	Miner: Convicted, fined 11s., and ordered to pay costs amounting to 9s.
	Miner: Convicted and ordered to pay costs amounting to 10s.
	Miner: Convicted, fined £2, and ordered to pay costs amounting to 9s.
General Rule 13 of the Schedule.—Failure to use, when necessary, an appliance for sanitation.	Miner: Convicted and ordered to pay costs amounting to 10s.
General Rule 37 of the Schedule.—Riding in a cage with tools.	Platelayer: Convicted, fined 2s. 6d., and ordered to pay costs amounting to 8s. 6d.
	Platelayer: Convicted, fined 2s. 6d., and ordered to pay costs amounting to 8s. 6d.
Regulation 17.—Getting off a moving conveyance on a haulage plane.	Official: Convicted and ordered to pay costs amounting to 10s.
Regulation 17.—Getting on a moving conveyance on a haulage plane.	Official: Convicted and ordered to pay costs amounting to 10s.

Health and Sanitation.—Surveillance of matters appertaining to health and sanitation was maintained. "Crib" places and underground latrine accommodation were reasonably well cared for, although isolated instances of neglect to provide disinfectants and maintain the places in a sanitary condition were encountered in respect to the latter. One instance of failure to use, and several instances of failure to make proper use of, the latrine accommodation came under notice, but no offender was located. A majority of the employees appreciate and make proper use of the means provided, but persons unknown are too uncouth to care for themselves or for the well-being of their fellow workmen.

Surface latrine accommodation was reasonable in some cases, while in other cases the arrangements were objectionable. In consequence of dual control of these arrangements, a correction of the unsatisfactory conditions was not undertaken by this office, but necessity therefor was referred to the local authority. The desired result had not been produced at the close of the year.

Instances of injudicious disposal of food scraps underground were observed, but to a lesser extent than hitherto. In one case an offender was located and prosecuted for exemplary purposes.

The improved condition of underground roadways attained during the previous year was not regularly maintained. In one mine a partial reversion to objectionable conditions once prevalent was encountered, and although the retrogression was frequently promulgated for correction, the objectionable condition prevailed on the principal working level at the close of the year.

Due regard was given to a repression of nuisances attributable to dust and fumes in and about the mines and works. Four persons were prosecuted for failing to use appliances for the prevention of dust during rock-drilling operations underground, and several instances of insufficient precautions to allay dust were met with cautionary measures. Suppression of dust at the bins at an open-cut workings and a primary breaker-station produced comfortable conditions for persons employed at those places. An extended prevention of dust at a sampling plant and alleviation of nuisances due to dust and fumes at portion of a reduction works were sought, but the desired results had not been produced at the close of the year.

An underground employee was reported to be suffering from pulmonary tuberculosis, and his withdrawal from the mine was obtained in conformity with Regulation 10.

Ventilation.—Ventilation received much attention at the principal mines, and some improvement of conditions ensued, but the results anticipated were not produced, and differences pre-existent were not satisfactorily assuaged.

At one mine an additional opening was made to the surface, and a 30-inch "sirocco" fan, with a reputed displacement efficiency of 16,000 cubic feet of air per minute, was installed as a filling pass to assist the natural ventilation. This innovation improved underground conditions in some respects, but further improvement was desirable, and was reasonably practicable. Limitation of the quantity of air available with incomplete distribution has mitigated the results sought. Although not so rife as hitherto, instances of lingering smoke

and fumes were encountered. Improvement in this respect was largely due to a campaign of regulating blasting operations that was undertaken at the mines. Regulation of blasting operations is commendable, but blasting down of unsafe ground without restriction is essential for safety, consequently a removal of one evil tended to produce a second evil in places where the circulation of air was not well cared for, and necessity for producing a circulation of air sufficient for the immediate removal of smoke and fumes remains paramount. No instance of the thermometrical requirements of the Act being exceeded was encountered.

Machinery and General.—Customary attention was directed to the efficient maintenance of ropes, brakes, cages, and attendant appliances upon which safety depends. Two ropes were condemned and replaced with new ones; early replacement of a second rope was counselled, and effected; and several new ropes were installed to replace those in use before condemnation of the latter by this office became necessary. One rope, in use at a vertical shaft, fractured under circumstances whereby no person was subject to danger. Rapid deterioration of the rope was observed, and it was condemned for raising or lowering persons, and preparations were made for its replacement, but owing to a misunderstanding in respect to a use of the rope for other purposes, a truck of material was placed in the cage at the shaft bottom, and when the load was lifted 18 inches the rope parted 280 feet from the shoe. The rope, which was new when installed, had been in use less than four months, and the rapid deterioration was due to mine acid-water, together with slight wear, chafing of the brace-timbers, which lessened resistance to the water by removing the compound, and an exposure of the rope unnecessarily in the shaft, which was extremely wet.

One cage was condemned and ordered to be replaced, owing to the safety-catches failing to suspend the load when tested, and tests of four cages had been allowed to become long overdue, but these were satisfactory when undertaken. One deficient brake was required to be corrected. Otherwise, and according to entries made in the record books, matters appertaining to the safety of machinery appeared to be not slighted.

Bathing and changing accommodation and facilities for rendering first-aid were equal to former standards, and there were no innovations or alterations in connection therewith. No complaint upon any matter was received at this office under Section 12 of the Act.

Explosives.—Administration of the provisions of the "Explosives Act," and that section of the "Mines and Works Regulation Act" relating to explosives, received due consideration. One new magazine, the erection of which was commenced during the previous year, was completed, and licensed for the storage of detonators. The use of four magazines was discontinued.

The conditions of storage now may be ascribed as reasonably satisfactory. Isolated instances of improper handling of explosives were observed, but carelessness was not rife. Nitrocompounds of Cape manufacture and the A.E.C. quarry Monobel were used principally, and no complaint was made to this office relative to the quality thereof. Deterioration, principally

associated with age, in respect to quantities of nitro-compounds amounting to 10,500 lb., entailed the placement of restrictions upon its use. A small quantity only was condemned and ordered to be destroyed.

Frequent tests were made of the safety-fuse in use. and at one period certain defective characteristics were encountered which necessitated added care during handling and use. Recommendations for the observance of precautions to contend with the defect and avert accident were made, but in one case the recommendations were slighted and a premature explosion resulted. The person in charge of the work was cautioned for the neglect.

A second premature explosion occurred during the firing of a " blister " underground, and a miner sustained abrasions about the face, but was not incapacitated from work. The evidence obtained pointed to faulty fuse. Nothing untoward in respect to the detonators used came under notice. Landing of imported explosives at the port of Strahan was supervised as occasion demanded.

Inflammable Liquids.—Consequent upon a supersedence of " The Inflammable Oils Act of 1910," by " The Inflammable Liquid Act of 1920," which ensued during the year, the question of storage was reviewed generally. Without causing undue harassment, alterations were obtained in respect to existing premises to make for some conformity with the new Act. One new depot was erected, and the erection of a second depot was commenced, but not completed at the close of the year. Several users of mineral spirit at Strahan were requested to erect depots, but consequent thereon negotiations were entered upon for a lease of portion of the magazines at Swan Basin, and nothing had materialised at the close of the year. Improved conditions of storage of inflammable liquids will ultimately obtain.

LIST of Accidents in Inspector Williams' District for the Year 1921.

Fatal, 3 ; non-fatal, 19 ; total, 22.

Date.	Name of Mine.	Locality.	Cause of Accident.	Name of Sufferer.	Married or Single, and Age.	Nature of Injuries.	Killed.	Injured.	Particulars.
1921.									
Jan. 20	Mt. Lyell Mine	Gormanston	Fall of ground	A. Fairbairn	Married, 32 yrs	Lacerated scalp and chipped scull	—	1	Struck by a small quantity of friable ore that was disturbed from the roof of a stope when poling a reared pass
Feb. 15	ditto	ditto	Jammed by a truck	E. R. Stevens	Single, 18 yrs.	Fractured forearm	—	1	When pulling a truck of ore along a gallery his arm was jammed between the truck and the chute of an ore pass
Feb. 16	Mt. Lyell Co.'s Open Cut Workings	Comstock	Fell from a ladder	W. G. Parsons	Married, 62 yrs.	Fractured ankle	—	1	While repairing the roof of a building, a ladder upon which he was standing turned, and he fell to the ground, a distance of 9 feet
Feb. 26	Mt. Lyell Mine	Gormanston	Ore rolled on him	J. Dinco	Single, 25 yrs.	Crushed foot	—	1	When working at a heap of broken ore a piece of ore rolled on to his foot
Mar. 31	Mt. Lyell Co.'s Works	Queenstown	Fell down an embankment	H. Cantrill	Married, 76 yrs.	Lacerated face and minor abrasions	—	1	While oiling a locomotive on a bridge he stepped on a dislodged plank, slipped, fell through the handrailing, and rolled down an embankment

LIST of Accidents in Inspector Williams' District for the Year 1921—continued.

Date.	Name of Mine.	Locality.	Cause of Accident.	Name of Sufferer.	Married or Single, and Age.	Nature of Injuries.	Killed.	Injured.	Particulars.
1921.									
April 2	Mt. Lyell Mine	Gormanston	Truck jumped roadway	L. Fenech	Single, 27 yrs.	Bruised thigh	—	1	While pushing a truck it jumped the roadway and jammed him against the gallery timber
April 6	ditto	ditto	Precipitated down an ore pass	W. J. Craig	Married, 48 yrs.	Fatal	1	—	He was endeavouring to free a choked pass, and was standing upon the broken ore assembled over the pass, when the ore caved and precipitated him down the pass
April 23	Mt. Lyell Co.'s Works	Queenstown	Lifting machinery	W. Ion	—	Ruptured blood vessel	—	1	When lifting a piece of machinery he ruptured a blood vessel
May 12	Mt. Lyell Mine	Gormanston	Fall of ground	C. Murphy	— 34 yrs.	Fatal	1	—	While barring down, subsequent to blasting operations, he was struck by a piece of ground which fell from the affected hangingwall at which he was barring and under which he was standing
May 19	North Lyell Mine	North Lyell	Truck canted	R. Williams	Married, 59 yrs.	Injured wrist	—	1	While assisting to place a derailed truck of ore on the roadway, the truck canted and jarred his wrist
May 31	Mt. Lyell Co.'s Copper Reduction Works	Queenstown	Unexpected fall of hood accretions	J. Blackwood	—	Burst finger	—	1	When barring hood accretions at a converter vessel, a quantity fell unexpectedly, and caused the bar he was using to jamb his finger on a rail

June 13	Mt. Lyell Co.'s Reduction Works	Queenstown	Striking a tuyere bar with his open hand	J. S. Morris	Married, 48 yrs.	Sprained wrist	—	1	He was bumping a bar into a tuyere hole with the flat of his hand, and thereby sustained the injury
July 21	ditto	ditto	Splash of molten slag entered his boot	J. Brodie	Married, 55 yrs.	Burnt foot	—	1	While breaking the crust on a ladle of molten slag, a splash of the slag fell into his boot
Aug. 1	Mt. Lyell Mine	Gormanston	Slipped on timber	J. Cooper	Married, 44 yrs.	Fractured rib	—	1	When crossing a plat he slipped on some timber, fell, and struck his side on a nearby truck
Aug. 9	ditto	ditto	Finger jammed in tippler	J. Boyd	Single, 20 yrs.	Crushed finger	—	1	While pushing a truck of ore into a tippler his finger was jammed between the truck and tippler ring. Subsequently two joints of the finger were amputated
Aug 12	North Lyell Open-cut Workings	North Lyell	Lump of mullock rolled on to his leg	C. Counsel	—	Bruised leg	—	1	While shovelling mullock into a truck a lump of mullock rolled from the heap and struck him
Aug. 27	North Lyell Mine	ditto	Slipped on roadway	A. Frohmader	Single, 20 yrs.	Lacerated knee	—	1	When hurrying along the main tunnel he slipped and fell on the roadway
Oct. 26	Mt. Lyell Co.'s Reduction Works	Queenstown	Struck by hot flue dust	C. R. Callow	Married, 27 yrs.	Burns on face, arms, and legs	—	1	During the wetting of hot flue dust a burst of the dust occurred, and portion struck him
Oct. 26	ditto	ditto	Foot caught under moving truck	F. Spray	Married, 49 yrs.	Sprained toe	—	1	While trucking flue dust his foot was caught under the buffer of the truck

LIST of Accidents in Inspector Williams' District for Year 1921—continued.

Date.	Name of Mine.	Locality.	Cause of Accident.	Name of Sufferer.	Married or Single, and Age.	Nature of Injuries.	Killed.	Injured.	Particulars.
1921.									
Oct. 29	North Lyell Mine	North Lyell	Rolling cask got out of control	M. Harper	Single, 19 yrs.	Crushed hand	—	1	While rolling an empty cask down an incline the cask slipped away, and in attempting to arrest it his hand was jammed against a post
Nov. 1	Mt. Lyell Co.'s Reduction Works	Queenstown	Truck ran on his foot	J. Daley	Single, 28 yrs.	Injured foot	—	1	A truck ran off a flat sheet on to his foot
Dec. 17	Mt. Lyell Co.'s Main Haulage	Gormanston	Caught by moving truck	B. Windsor	Widower, 41 yrs.	Fatal head injuries	1	—	He ventured in the gallery of a surface ore-bin during ore-running operations, and was crushed between a moving empty truck and a bin chute

REPORT OF THE CHIEF INSPECTOR OF MAGAZINES AND EXPLOSIVES.

SIR,

I HAVE the honour to submit my annual report in connection with the Explosives and Inflammable Liquids Act for the year 1921.

The imports for the year were:—	Lbs.
Monobel	23,150
Gelignite	147,500
Blasting gelatine	9,000
Gelatine dynamite	1,500
Ligdyn	18,000
Powder	18,225
Detonators	195,000

The quality of the explosives landed in the State was satisfactory. It was found necessary to place restrictions on a large quantity of explosives, owing to deterioration due to long storage, and a small quantity was destroyed owing to its being unsafe for use. It was also found necessary to restrict the use of one shipment of fuse, owing to lateral bursting. Two accidents occurred underground which were attributed to faulty fuse.

The storage and landing of explosives were generally satisfactory, but it was found that such was not the case with the storage of exempted quantities, and neglect in this direction was the cause of the death of a boy, who obtained detonators from an abandoned house. In one case legal proceedings were taken for storing explosives without a licence, a conviction being obtained.

There were three accidents due to explosives: A boy, 11 years of age, while playing with detonators, caused an explosion, which resulted in his death. A boy, 16 years of age, was killing frogs in a pond by throwing a plug of gelignite. A charge exploded in his hand, causing the loss of the hand. A miner employed in a stope fired a blister. The charge exploded prematurely, causing slight injury to his face and body.

"The Inflammable Liquids Act" came into force during the year, and the altered conditions have created considerably increased supervision, principally in inaugurating the improved conditions of storage. The importation of liquid oils has greatly increased, and at present four firms are importing and are erecting new stores at Launceston and Hobart.

Revenue.—	£	s.	d.
Magazine licences, 72	72	0	0
Licences to store, 40	45	0	0
Permits to sell, 179	44	15	0
Permits to import, 15	30	0	0
Permits to convey, 20	5	0	0
Registered premises, 103	25	15	0
	£222	10	0
Magazine rents	£186	15	7
Total revenue	£409	5	7

I have, &c.,

J. O. HUDSON,

Chief Inspector of Magazines and Explosives.

W. A. PRETYMAN, Esq.,

Acting-Secretary for Mines, Hobart.

John Vail, Government Printer, Tasmania.