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(No. 27.)

TASMANIA

REPORT

OF THE

DIRECTOR OF MINES

FOR

YEAR ENDED 31ST DECEMBER

1944

Presented to both Houses of Parliament by His Excellency's Command.

TASMANIA:
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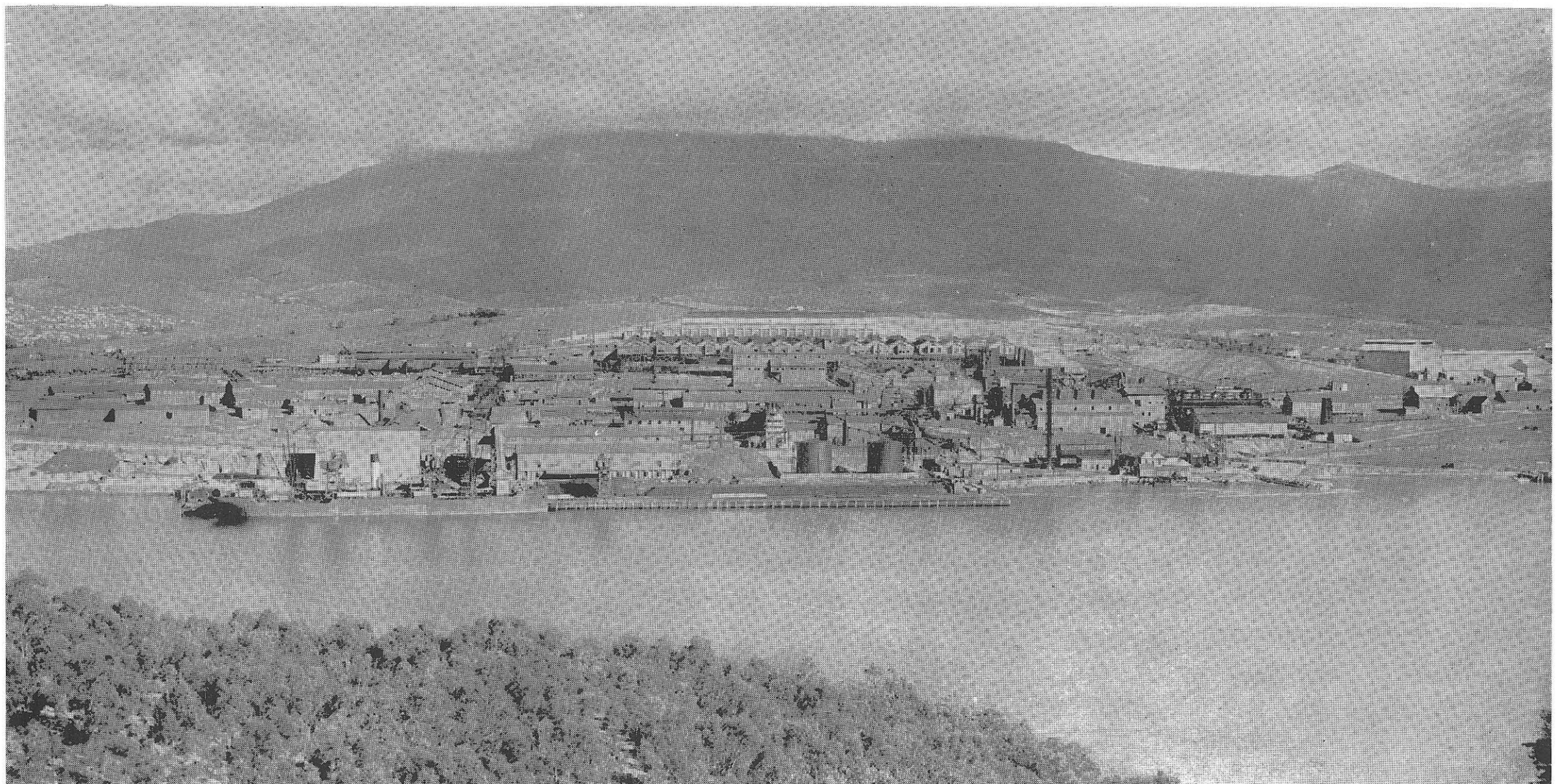
TABLE OF CONTENTS.



Electrolytic Zinc Company of Australia Limited, Risdon.

REPORT OF THE DIRECTOR OF MINES.

Department of Mines,
Hobart.

SIR,

I HAVE the honour to present my report on the Mining Industry of the State for the year ended the 31st December, 1944.

MINERAL PRODUCTON.

The total value, in Australian currency, of the output of minerals and mineral products was £3,066,245, as compared with £3,266,668 for the previous year, representing a decrease of £200,423.

Sharp declines were recorded in the production of copper, lead, silver, scheelite, and zinc, but there was a further recovery in the output of wolfram and an early completion of major developmental programmes should improve the production of scheelite and tin.

The combined output of carbide, cement, and limestone was less and there was a decrease in the output of gold, cadmium, bismuth, ochre, pyrites, and silica, but there was an increase in the production of asbestos, kaolin, talc, and osmiridium.

Coal mining was free from industrial stoppages and the output was 143,641 tons, production being held at a high level to compensate restricted importations of mainland coal.

The number of persons directly employed in mining, quarrying, and metallurgical operations was 5439, as compared with 5535 for the previous year. A small number of men was released from military services for employment in mines, but these releases were insufficient to balance diversions and wastages, and there was a continued shortage of labour in the mining industry.

Labour depletions, loss of markets, incidences of mining taxation, and restrictions on undertakings absorbing non-metallics contributed more to the decline in production and value of minerals and mineral products than any exhaustion of the mineral potential. The capacity production of many projects was greater than the recorded output, and several projects were reduced to inactivity under war-time conditions.

The Electrolytic Zinc Company of Australasia Limited was in continuous operation at Risdon in processing zinciferous calcines imported from the mainland and arising from the calcining of concentrates recovered from the selective concentration of Tasmanian ores. Production from imported calcines was 57,311 tons of zinc, valued at £1,318,153, 210·28 tons of cadmium, valued at £94,206; and 12·86 tons of cobalt oxide, valued at £5917. Calcines actually processed from Tasmanian ores returned 21,405 tons of slab zinc, 46·05 tons of cadmium, 952 tons of lead, 135,700 oz. of silver, and 0·38 ton of cobalt oxide. An average number of 1591 men was employed at these works.

The Tasmanian ores resulted from continued exploitation of the extensive occurrences of complex zinc-lead sulphides at the Rosebery and Hercules mines on the West Coast, where an average of 415 men was employed in mining, milling, and calcining operations. The combined quantity of ore mined was 148,894 tons. Selective flotation resulted in the recovery of 44,096 tons of zinc concentrates, 9681 tons of lead concentrates, and 4462 tons of copper concentrates. The recoverable quantity of metallics was fixed at 20,833 tons of zinc, 7038·5 tons of lead, 381·75 tons of copper, 39·68 tons of cadmium, 9744·5 oz. gold, and 846,489 oz. of silver. Lead concentrates were exported and zinc concentrates were calcined at Zeehan and despatched to Risdon for processing.

The Mount Lyell Mining and Railway Company Limited continued to function as the major producer of copper. The output of crude ore from surface and underground mining was 1,480,062 tons, being 48,275 tons less than for the previous year. The greatest output from the productive sections was 1,346,853 tons from the West Lyell opencut workings. Shortage of skilled mine labour necessitated a transfer of all employees from the Lyell-Comstock Mine and this mine was closed down in consequence.

At the concentration plant 1,475,889 tons of ore was milled for a selective recovery of 43,013 tons of copper-sulphide concentrate and 53,461 tons of iron-pyrite concentrate. The copper concentrate, together with 3296 tons of high-grade ore and 132 tons of copper precipitate extracted from mine waters, was smelted for a recovery of 9897 tons of blister copper.

Normal operations at the refinery resulted in an output of 9831 tons of electrolytic copper, and the cell residue returned 6443 oz. of gold and 38,047 oz. of silver.

Of the iron-pyrite concentrate recovered by selective flotation of low-grade ores, 29,136 tons were exported to the mainland for use in the manufacture of fertilisers.

Activities continued to be characterised by progressive advances in mining and metallurgical practices as applied to the handling of large volumes of low-grade ores. Operations substantially added to the total output of gold and silver, and afforded direct employment for 1549 men.

In September, ore reserves were assessed at 12,882,000 tons of an assay value of 1·14 per cent copper, 0·075 oz. silver, and 0·012 oz. gold per ton.

Marketing disabilities and labour depletions continued to retard the mining of silver-lead and zinc-lead ores and the output of lead declined from 8632·72 to 8226·5 tons.

Operations by the Electrolytic Zinc Company at the Rosebery and Hercules mines accounted for the greater portion of the output. The Farrell Mining Company, Tullah, maintained an overseas market, but the through-put of ore declined to 7683 tons owing to the labour shortage. Ore treatment resulted in the recovery of 1620 tons of concentrate, containing 1188 tons of lead and 143,640 oz. of silver. Planned exploration and development work are essential for the location of new makes of ore, as depletion of known reserves is materially reducing the life of the mine.

Conditions of marketing were adverse to a resumption of operations at small silver-lead mines, reduced to inactivity under war-time controls, and there were no developmental or productive activities. These mines were of collective importance to the State in pre-war years and endeavours are being made to rehabilitate the customs buying of small parcels of ore.

Metallic tin in the product from lode and alluvial mining was 809·671 tons, valued at £235,612 sterling. The output was 139 tons less than for the previous year.

Diversions of labour from the industry reduced production at several mines and an absence of new producers were responsible for the decrease in output.

Aberfoyle Tin N.L., operating on a lode series; Renison Associated and Mount Bischoff mines, mining and milling tin-pyrite ores; and Briseis Consolidated, sluicing a deep lead, were the principal producers and contributed 599·64 tons to the total output of metallic tin.

Hydraulic mining was continued by Goshen Tin Mines N.L. on areas of alluvial ground at St. Helens; the Endurance Tin Mining Company was engaged in sluicing shallow ground and in transferring plant to a new location; and underground mining was continued on the wolfram-tin lodes at the Storey's Creek Mine. The output of concentrate from these operations contained 100·713 tons of metallic tin.

Small mines, miscellaneous parties, and individual operators continued to be engaged on alluvial, lode, and granitic occurrences throughout the State. These activities were of collective importance in tin-mining, the output of tin-oxide containing 109·318 tons of metallic tin.

Operations by Briseis Consolidated were characterised by the removal of 217,000 cubic yards of basaltic overburden and the sluicing of 711,000 cubic yards of drift for a recovery of 265·5 tons of tin-oxide, containing 191·14 tons of metallic tin.

A progressive development policy was pursued by Aberfoyle Tin N.L. to provide for future mining and milling of the multiple lode series. The quantity of ore mined and milled was 18,021 tons. Concentrates sold were 311·964 tons of tin-oxide, containing 237·725 tons of metallic tin and 68·536 tons of wolfram.

Renison Associated Tin Mines made a forward move in milling innovations for increasing the through-put and stepping-up the recovery of tin-oxide from pyritic ores.

An important development was the completion of a modern bucket dredge for working an extensive area of alluvial ground on Dorset Flat at South Mount Cameron. Continuous operation of this plant will materially add to the total output of tin for the State.

In quantity and value, silver continued as an important product, but the output was governed by activities in base-metal mining, and as there was a reduction in these productive activities, the output of silver receded to 1,028,176 oz., valued at £107,957 sterling. Operations by the Electrolytic Zinc Company on zinc-lead ores at Rosebery and Williamsford, and by the Mount Lyell Company, on copper ores at Queenstown, contributed largely to the total production, but the output from these operations was substantially augmented by silver-lead ore from the Farrell Mine at Tullah.

Progress was made in projects designed for increasing the production of tungsten ores. There was an increase in the output of wolfram, but production of scheelite was depressed, pending reconstruction of mining and milling practices at the King Island Scheelite Mine.

Operations at the King Island Scheelite Mine were largely confined to development of the opencut workings, for an increased output, and to the installation of new crushing, concentrating, and magnetic separating units, together with a new power-house and auxiliary units, workshops, buildings, and housing necessary for increasing the through-put of ore and stepping-up the recovery of scheelite concentrate. The old milling plant was used for the treatment of 3260 tons of ore and was then closed down. The quantity of marketable concentrate produced was 32 tons. Larger-scale opencutting and commissioning of the new milling plant will comprise a major development in the mining industry.

Provision of labour and a reversion to two shifts enabled the Storey's Creek Mine to restore mining operations to a higher productive level. Ore mined and milled was 12,936 tons, and resulted in a recovery of 167·5 tons of wolfram and 42·3 tons of tin concentrates. Lode dimensions and values were maintained and the mine potential induced the company to proceed with a constructive developmental programme, including the sinking of a new shaft and the installation of a new milling plant.

The 68·536 tons of wolfram concentrate marketed from operations by Aberfoyle Tin N.L. was a substantial contribution to the total production.

The balance of the output of 241·875 tons of wolfram accrued from operations at small mines at Gipp Creek and in the Moina district.

Developments have enhanced the tungsten potential of the State, and, consistent with stable markets and prices, production can be increased to meet an expansion in consumption requirements.

The output of gold was largely governed by activities in base-metal mining and as there was a reduction in these productive activities, the output receded from 17,245·25 oz., valued at £144,860 sterling, to 16,653·38 oz., valued at £139,886 sterling.

Operations on zinc-lead ores by the Electrolytic Zinc Company at the Rosebery and Hercules mines accounted for 9744·5 oz., and 6443 oz. were extracted from copper ores mined by the Mount Lyell Company. The balance of the output resulted from the cyanidation of battery tailings, treatment of tin concentrate recovered from the mining of gold-bearing stanniferous alluvials, and from miscellaneous operations on auriferous alluvials.

The market price of osmiridium remained constant at £A30·65 per oz., with a net available price ranging down to £A28·28 per oz. Production increased from 89·695 oz. to 107·02 oz. Adamsfield was the principal field of activities. Two gravity plants and a small number of ground sluicers operated to produce 94 oz. The balance of the output came forward from old workings in the Waratah district. An absence of new discoveries, gradual exhaustion of ground within the working capacity of small claimholders, drift of miners from the various fields, and slow progress with gravity-sluicing projects have restricted productive developments.

The Australian Commonwealth Carbide Company at Electrona, the Goliath Portland Cement Company at Railton, and the Broken Hill Proprietary Company Limited at the Melrose Quarries continued as the principal producers of calcium carbide, cement, and limestone. The total output of combined products was 166,647 tons, valued at £404,219, as compared with 195,101 tons, valued at £356,947, for the previous year. There was an increase of 1250 tons in the output of calcium carbide and a reduction of 32,840 tons in the quantity of limestone exported for the iron and steel industry, largely as the result of labour depletions. There was an increase of 3136 tons in the output of cement, but the pre-war production rate continued to be depressed by wartime restrictions in building industries and public works.

The potential resources of asbestos, bauxite, kaolin, limestone, silica, ochre, and other members of the group of non-metallic minerals continued to attract attention for new industries.

Kaolin, other than clay used in the manufacture of bricks and earthernwares, continued to be produced in increasing quantities for State industries, including the manufacture of paper. The quantity marketed was 2538 tons greater than that for the previous year. Beneficiation of crude kaolin at Surges Bay is to be undertaken by the installation of a de-gritting plant.

Ochre mining was less active, the quantity exported decreasing to 74·5 tons.

Progress was made in the mining and milling of asbestos-bearing serpentine at Zeehan and the output of fibre increased to 102·99 tons.

The output of silica used in metallurgical and manufacturing industries decreased to 5432 tons.

There was no material activity in talc mining, four tons being produced from a deposit at Gawler.

The high-level production of Tasmanian coals continued to demonstrate their suitability for the fuel requirements of several industries where imported coals were formerly used.

The Cornwall Coal Company continued as the major producer and increased activities resulted in a record production of 100,110 tons. Pillar extraction, bord and pillar work, and developmental operations resulted in an output of 83,811 tons from the Cornwall Colliery, whilst 16,299 tons accrued from mechanised coal-winning at the Mount Nicholas Coal Mine.

An output of 18,125 tons of coal resulted from a regular advancement of productive places at the Jubilee Colliery. Preparations were made for the introduction of a coal-cutting machine and it is expected that a change-over to mechanised coal-getting will be made in the coming year.

A roof subsidence interrupted coal production at the Stanhope Coal Mine and the output reduced to 7861 tons. A reversion was made from long-wall to bord and pillar working, but recovery of collapsed places and developmental work had not been sufficiently advanced to restore production to normal requirements at the close of the year.

Encouraging seam developments occurred at the Langloh Coal Mine at Hamilton. The series was systematically bored and established continuity of seams and a substantial volume for future mining. The coal is of good quality and is well suited for domestic and regular steaming purposes. Production increased to 6640 tons and operations afforded employment for 20 men.

The balance of the output of coal accrued from operations at small collieries in the eastern, southern, and north-western districts, but there were no new developments in connection with these activities. Exploratory work on the Merrywood coal series in the Avoca district was followed by the driving of a tunnel for planned coal production.

Developmental and productive operations are reviewed in detail by district inspectors in the appended reports.

ALUMINIUM.

Interest in the bauxite resources of the State was intensified by progress in the proposal to establish an aluminium production industry within the Commonwealth. Commonwealth and State Governments agreed to the provision of £3,000,000 for setting up the industry in Tasmania. The project was placed under the control of a Commission and investigations were commenced into processes commercially and technically suitable for the production of ingot aluminium. The smelter section is to be suitably sited and the potentialities of the State are being examined in regard to the supply of ore and other materials. Deposits of bauxite occur at Ouse, Swansea, Campbell Town, Cressy, St. Leonards, Rosevale, Myalla, and in the Tamar Valley. All deposits are to be surveyed and tested to determine the suitability of the ore for the commercial extraction of alumina. An establishment of this project will be of moment in industrial developments within the State.

OIL-SHALE.

Endeavours failed to induce interest in the commercial utilization of oil-shales of the Mersey Valley for the extraction of fuel oils. Structural and physical conditions for underground mining and the low-grade nature of the shale retarded the establishment of an industry.

QUANTITY AND VALUE OF MINERALS.

STATISTICS RELATING TO THE MINING INDUSTRY FOR THE YEAR ENDING 31ST DECEMBER, 1944.

Mineral.	Mineral Divisions.					Total Quantity.	Value.
	Northern and Southern.	Eastern.	North-Eastern.	North-Western.	Western.		
							£
Asbestos .... (tons)	....	....	....	....	102·99	102·99	2,242
Bismuth .... (tons)	....	....	....	·151	....	·151	126
Copper .... (tons)	....	....	....	....	10,212·75	10,212·75	633,188
Cadmium .... (tons)	....	....	....	....	39·68	39·68	17,840
Cobalt Oxide .... (tons)	....	....	....	....	·38	·38	175
Coal .... (tons)	7,941	132,405	....	3,295	....	143,641	122,673
Carbide, Cement, and Limestone .... (tons)	19,650	....	....	140,729·1	6,268	166,647·1	404,219
Gold .... (fine oz.)	49·449	367·283	38·368	2·357	16,195·932	16,653·380	139,886
Kaolin .... (tons)	5·25	....	....	4,188	....	4,193·25	4,778
Lead .... (tons)	....	....	....	....	8,226·5	8,226·5	205,661
Monazite .... (tons)	....	....	....	·1	....	·1	2
Ochre, Red .... (tons)	....	....	....	54	..	54	141
Ochre, Yellow .... (tons)	17·5	....	....	3	....	20·5	92
Osmiridium .... (oz.)	94·001	....	....	13·019		107·02	2,619
Pyrites .... (tons)	....	....	....	....	29·136	29,136	36,419
Rutile .... (tons)	....	....	....	·5	....	·5	18
Scheelite .... (tons)	....	....	....	32·21	....	32·21	10,842
Silica .... (tons)	21	..	....	25	5,386	5,432	2,409
Silver .... (fine oz.)	....	....	....	..	1,028,176·29	1,028,176·29	107,957
Talc .... (tons)	....	....	....	4	....	4	16
Tin .... (tons)	3·158	312·350	315·814	102·675	75·674	809·671	235,612
Wolfram .... (tons)	....	236·361	....	5·514	....	241·875	86,749
Zinc .... (tons)	....	....	....	....	20,833·15	20,833·15	567,702
Total Value	....	....	....	....	...	....	£2,581,366
Total Value Australian Currency	....	....	..	....	..	....	£A3,066,245
Average Number of Men Employed	1,944	538	350	512	2,095	5,439	....

The Electrolytic Zinc Company of Australasia Limited recovered 57,311 tons of zinc, valued at £1,318,153; 210·2799 tons of cadmium, valued at £94,206; and 12·8621 tons of cobalt oxide, valued at £5917, from other than Tasmanian ores; and employed an average of 1591 men at Risdon.

ASBESTOS.

RETURN showing the Quantity and Value of Asbestos produced from 1899 to 1944 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
1920–1936	—	—
1937	2	29
1938	4·25	68
1939	—	—
1940	—	—
1941	3·5	120
1942	7	20
1943	18·25	365
1944	102·99	2242
Total	3703·49	£9949

BISMUTH.

RETURN showing the Quantity and Value of Bismuth produced from 1904 to 1944 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
1922	—	—
1923	—	—
1924	—	—
1925	—	—
1926	—	—
1927	—	—
1928	—	—
1929	—	—
1930	·97	475
1931	1·75	1015
1932	1·02	541
1933	1·32	705
1934	—	—
1935	·328	146
1936	—	—
1937	·216	78
1938	·871	396
1939	·623	296
1940	·565	270
1941	·032	16
1942	·02	10
1943	·309	241
1944	·151	126
Total	82·234	£27,367

BARYTES.

RETURN showing the Quantity and Value of Barytes produced to 31st December, 1944.

Year.	Quantity.	Value.
	Tons.	£
Prior to 1916	50	100
1916	83	359
1917	52	234
1918	217	977
1919	558	1886
1920	1029	4116
1921–1924	—	—
1925	3·5	16
1926–1928	—	—
1929	9·5	24
1930–1932	—	—
1933	5	15
1934–1935	—	—
1936	33	66
1937	76	174
1938	—	—
1939	—	—
1940	36	58
1941	11·2	43
1942–44	—	—
Total	2163·2	£8068

COAL.

RETURN showing the Quantity and Value of Coal raised to 31st December, 1944.

Year.	Quantity.	Value.
	Tons.	£
Previous to 1880	145,114	115,000
1880 to 1903 inclusive	767,261·5	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
1922	69,238	61,016
1923	80,718	70,797
1924	75,988	66,555
1925	81,698	70,424
1926	102,358	90,401
1927	112,056	99,802
1928	128,500	106,558
1929	130,291	105,877
1930	138,716	110,253
1931	123,828	98,004
1932	111,853	86,733
1933	116,573	85,848
1934	113,633	81,262
1935	123,714	86.134
1936	132,264	92,269
1937	91,121	66,883
1938	83,753	61,991
1939	99,392	74,460
1940	83,136	63,688
1941	109,714	85,311
1942	134,442	108,241
1943	145,882	117,361
1944	143,641	122,673
Total	4,557,756	£3,547,419

COPPER.

The production for the year was 10,202·75 tons, valued at £633,188.

RETURN showing the Quantity and Value of Copper in Blister Copper, Copper Ore, and Zinc Lead Ore during the Years 1919 *to* 1944 *inclusive.*

Year.	In Zinc Lead Ore.		In Blister Copper.		In Copper Ore.		Total	
	Qty.	Value.	Q'ty.	Value.	Q'ty.	Value.	Q'ty.	Value.
	Tons.	£	Tons.	£	Tons.	£	Tons.	£
1919	...	...	5014	503,977	304	4651	5318	508,628
1920	...	...	4791	528,177	·75	60	4791·75	528,237
1921	...	...	6171	462,876	9·843	287	6180·843	463,163
1922	...	...	5616	391,535	—	—	5616	391,535
1923	...	...	6063	435.282	1·7	131	6064·7	435,413
1924	..	...	6698	457,386	—	—	6698	457,386
1925	...	...	6539	436,661	—	—	6539	436,661
1926	...	...	6915	454,854	—	—	6915	454,854
1927	...	...	5811	362,988	—	—	5811	362,988
1928	...	...	6421	444,802	—	—	6421	444,802
1929	...	...	8690·01	740,985	—	—	8690·01	740,985
1930	...	...	9940·68	620,578	—	—	9940·68	620,578
1931	...	...	9833·1	416,309	—	—	9833·1	416,309
1932	...	...	10,995	399,646	3·2	116	10,998·2	399,762
1933	...	...	10,734	395,109	5	177	10,739	395,286
1934	...	...	8,202	267,126	6·5	216	8208·5	267,342
1935	...	...	13,036	464,007	—	—	13,036	464,007
1936	...	...	13,040	556,734	—	—	13,040	556,734
1937	...	...	12,382	757,311	37·92	2021	12,419·92	759,332
1938	...	...	12,700·62	578,893	28·802	1345	12,729·422	580,238
1939	...	...	13,453	668,561	—	—	13,453	668,561
1940	...	...	11,570·2	717,356	1·8	108	11,572	717,464
1941	...	...	11,642·1	721,810	2·834	175	11,644·934	721,985
1942	529·580	32,827	11,255·132	697,818	·478	30	11,785·09	730,675
1943	464·38	28,791	10,684	662,408	—	—	11,148·38	691,199
1944	381·75	23,6`6	9831	609,522	—	—	10.212·75	633,188
Total	1,375·710	85,284	238,027·742	13,752,711	402·827	9317	239,806·279	13,847,312

The Mount Lyell Mining and Railway Company Limited. Return for the Calendar Year 1944.

Ore and metal-bearing material smelted:—

Source of Material.	Tons (Dry).
Ore:—From the Company's North Lyell Mine	3,296
Concentrates:—From the Company's North Lyell Mine, Lyell Comstock Mine, Crown Lyell Mine, and West Lyell Mines ore	43,013
Purchased ore	....
Total	46,309

Source of Material.	Tons (Dry).
Limestone delivered at works (tons)	6,268
Silica delivered at works	5,386
Pyritic concentrate shipped from Regatta Point (tons), approximate value £A41,504	29,136

Blister copper produced, 9,897 tons, containing:

Copper (tons)	9,831	Approximate value £A1,051,101.
Silver (oz.)	38,047	
Gold (oz.)	6,443	

Average number of men employed—

Mining Department—At the Company's		
North Lyell Mine	10	
Ditto, Lyell Comstock Mine	25	
Ditto, Crown Lyell Mine	....	
Ditto, Royal Tharsis Mine	131	
Ditto, West Lyell Mines	430	
Miscellaneous	205	
		801
Reduction Works Department (including Lake Margaret)		640
Railway Department—Mount Lyell Railway		108
Total		1,549

Copper produced from the inception of the Company to the 31st December, 1944, 396,620 tons.

Silver produced from the inception of the Company to the 31st December, 1944, 15,366,738 oz. (fine).

Gold produced from the inception of the Company to the 31st December, 1944, 488,439 oz. (fine).

Dividends paid during the year, £116,250 = 1s. 6d. per share.

Dividends paid from the inception of the Company to the 31st December, 1944, £6,665,944.

CADMIUM.

The quantity recovered was 39·68 tons, valued at £17,840, compared with 40·34 tons valued at £18,072 for 1943.

RETURN showing the Quantity and Value of Cadmium recovered for the Years 1936 *to* 1944.

Year.	Quantity.	Value.
	Tons.	£
1924-1936	114·3057	31,713
1937	45	18,161
1938	49	18,636
1939	48	16,249
1940	50	18,242
1941	47·07	21,087
1942	41·39	18,462
1943	40·34	18,072
1944	39·68	17,840
Total	474·7857	£178,462

CEMENT, CARBIDE, AND LIMESTONE.

The combined value of output from these three industries amounted to £404,219, as compared with £356,947 for 1943.

GOLD.

The quantity won was 16,653·38 oz., fine, valued at £139,886, as compared with 17,245·253 oz., valued at £144,860 for 1943.

RETURN showing the Quantity and Value of Gold won to 31st December, 1944.

Year.	Quantity.	Value.
	Oz.	£
Previous to 1867 and up to 1879 inclusive	131,583	512,557
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
1922	3,431·486	15,998
1923	3,684·124	16,639
1924	4,625·600	21,563
1925	3,523·870	15,037
1926	4,222·748	17,936
1927	4860·7	20,649
1928	3603·43	15,306
1929	5596·88	23,772
1930	4467·2	18,975
1931	4759·31	22,118
1932	5937·17	34,943
1933	6672·74	41,783
1934	5612·26	38,930
1935	8342·68	59,255
1936	17,600·47	123,386
1937	20,276·31	143,138
1938	22,199·961	158,022
1939	19,984·066	154,471
1940	19,170·968	161,035
1941	19,908·498	167,229
1942	18,353·364	154,168
1943	17,245·253	144,860
1944	16,653·38	139,886
Total	2,249,255·701	9,732,137

GRANITE (RED).

RETURN showing the Quantity and Value of Red Granite produced during the Years 1935 to 1944 inclusive.

Year.	Quantity.	Value.
	Tons.	£
1935	284	1432
1936	568	3209
1937	187	923
1938	173	885
1939	246	1300
1940	330	2031
1941	658·5	5661
1942	355	2937
1943–44	...	...
Total	2801·5	18,378

IRON PYRITES.

RETURN showing the Quantity and Value of Iron Pyrites produced during the Years 1915 to 1944 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
1922	8,276	18,620
1923	11,882	26,737
1924	—	—
1925	—	—
1926	—	—
1927	—	—
1928	—	—
1929	—	—
1930	—	—
1931	506·7	253
1932	274	150
1933	1498	1498
1934	12,030	12,030
1935	25,555	25,555
1936	34,071	34,071
1937	40,630	43,723
1938	50,277	62,845
1939	54,229	67,786
1940	37,819	47,274
1941	40,076	50,093
1942	34,449	43,061
1943	33,203	41,504
1944	29,136	36,419
Total	462,046·973	£560,178

KAOLIN.

RETURN showing the Quantity and Value of Kaolin produced during the Years 1940 to 1944 inclusive.

Year.	Quantity.	Value.
	Tons.	£
1940	835·5	988
1941	1130	1428
1942	1098	1334
1943	1655	2438
1944	4193·25	4778
Total	8911·75	10,966

LIMESTONE.

RETURN showing the Quantity and Value of Limestone produced during the Years 1919 to 1936 inclusive.

Year.	Quantity.	Value.
	Tons.	£
1919–1922 inclusive	200,454	199,470
1923	100,113	122,428
1924	146,140	146,140
1925	124,670	124,670
1926	153,707	153,219
1927	169,522	167,373
1928	98,654	79,050
1929	68,176	66,597
1930	100,251	94,977
1931	55,268	49,490
1932	90,335	18,725
1933	110,347	33,048
1934	174,767	44,877
1935	254,438	68,367
1936	262,101	71,243
Total	2,108,943	£1,439,674

LEAD.

The output was 8226·5 tons, valued at £205,661, as compared with 8632·72 tons, valued at £215,817 for 1943.

RETURN showing the Quantity and Value of Lead included in Silver Lead during the Years 1919 *to* 1944 *inclusive.*

Year.	Quantity.	Value.
	Tons.	£
1919	2357·142	64,403
1920	3855·642	142,268
1921	1434·794	32,241
1922	4925·880	118,257
1923	4786·057	127,542
1924	4559·110	154,881
1925	5525·99	197,452
1926	5892·58	183,167
1927	5583·12	135,403
1928	4786·78	101,616
1929	5983·07	138,793
1930	4237·84	77,590
1931	2189·47	29,024
1932	2694·06	32,637
1933	2644·12	30,987
1934	1507	16,723
1935	1488	21,390
1936	7563·04	134,413
1937	9116·62	212,492
1938	10,652·21	163,102
1939	11,020·96	173,670
1940	13,550·85	338,771
1941	11,753·47	293,837
1942	9360·42	234,011
1943	8632·72	215,817
1944	8226·5	205,661
Total	154,327·445	£3,576,148

NICKEL.

RETURN showing the Quantity and Value of Nickel produced from 1927 *to* 1944 *inclusive.*

Year.	Quantity.	Value.
	Tons.	£
1927	86·2	14,656
1928	10	1697
1929	85·44	14,765
1930	11·76	1999
1931	0·2	45
1932	0·55	136
1933	8·65	1948
1934-37	—	—
1938	19·75	3604
1939-44	—	—
Total	222·55	£38,850

OCHRE.

RETURN showing the Quantity and Value of Ochre produced during the Years 1918 *to* 1944 *inclusive.*

Year.	Quantity.	Value.
	Tons.	£
1918	100	200
1919	—	—
1920	—	—
1921	14	56
1922	—	—
1923	—	—
1924	20	50
1925	—	—
1926	38	69
1927-1941	—	—
1942	21	53
1943	380	1681
1944	74·5	233
Total	647·5	£2342

OSMIRIDIUM.

The quantity of metal won during the year was 107·02 oz., valued at £2619, as compared with 89·695 oz., valued at £2087 for 1943.

RETURN showing the Quantity and Value of Osmiridium produced during the Years 1910 *to* 1944 *inclusive.*

Year.	Quantity.	Value.
	Oz.	£
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	1668·715	39,614
1920	2009·196	77,104
1921	1750·655	42,935
1922	1173·924	35,512
1923	673·423	19,642
1924	364·805	10,617
1925	3365·543	103,570
1926	3202·5	61,908
1927	632·777	7456
1928	1627·186	42,458
1929	1324	30,624
1930	952·7	16,235
1931	1279·54	18,028
1932	784·95	9075
1933	548	4843
1934	487·7	4622
1935	234·82	2103
1936	280·6	3862
1937	586·42	9077
1938	190·87	2976
1939	283·065	5014
1940	464·740	11,604
1941	206·578	4212
1942	142·094	2930
1943	89·695	2087
1944	107·02	2619
Total	30,290·666	£654,190

SHALE.

RETURN showing the Quantity and Value of Shale produced during the Years 1910 *to* 1944 *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
1922	40	100
1923	1101	1094
1924	1576	1526
1925	820	559
1926	2127	1475
1927	3150	2050
1928	9052	7754
1929	4299	2982
1930	5428	4356
1931	1402	600
1932	1907	1074
1933	3401	1483
1934	3276	1630
1935	30	15
1936–1944	—	—
Total	41,572	£31,231

RETURN showing the Quantity of Oil Distilled from Shale.

Year.	Name of Company.	Gallons.
1910	Tasmanian Shale and Oil Company	4800
1915	Railton-Latrobe Shale Oil Co. N.L.	24,000
1927–1928	Australian Shale Oil Corporation	65,000
1929	Goliath Portland Cement Company	2200
1930	Goliath Portland Cement Company	20,101
	Tasmanite Shale Oil Company Ltd.	35,000
1931	Tasmanite Shale Oil Company Ltd.	31,915
1932	Tasmanite Shale Oil Company Ltd.	79,236
1933	Tasmanite Shale Oil Company Ltd.	56,958
1934	Tasmanite Shale Oil Company Ltd.	37,905
1935–44	Tasmanite Shale Oil Company Ltd.	—
	Total	357,115

SCHEELITE.

RETURN showing the Quantity and Value of Scheelite produced during the Years 1917 *to* 1944 *inclusive.*

Year.	Quantity.	Value.
	Tons.	£
1917	69	12,130
1918	216	39,252
1919	198·98	43,181
1920	105·09	17,905
1921–1937	—	—
1938	30·53	6193
1939	170·695	33,301
1940	275·48	49,120
1941	246·913	42,700
1942	215·332	71,353
1943	199·201	68,908
1944	32·21	10,842
Total	1759·431	£394,885

SILVER.

The output was 1,028,176·29 oz. (fine), valued at £107,957, as compared with 1,116,575·67 oz., valued at £117,241 for 1943.

RETURN showing the Quantity and Value of Silver contained in Silver-Lead, Blister Copper, Copper Ore, Zinc Lead Ore, and Gold Ore during the Years 1919 *to* 1944 *inclusive.*

Year.	In Silver-Lead.		In Blister Copper.		In Copper Ore.		In Gold Ore.		In Zinc Lead Ore.		Total.	
	Quantity.	Value	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Oz.	£	Oz.	£	Oz.	£	Oz.	£	Ozs.	£	Oz.	£
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
1922	674,886	104,926	119,699	18,511	...	...	...	...	...	...	794,585	123,437
1923	516,073·61	73,742	122,528	17,597	...	...	...	...	...	...	638,601·61	91,339
1924	494,782	75,398	147,376	22,439	...	...	...	...	...	...	642,158	97,837
1925	597,012·67	86,283	133,181	19,226	...	...	...	...	...	...	730,193·67	105,509
1926	632,066	80,597	134,587	17,394	...	...	...	...	...	...	766,653	97,991
1927	640,575	75,135	101,207	11,889	...	...	...	...	...	...	741,782	87,024
1928	564,056	66,386	105,270	12,515	...	...	...	...	...	...	669,326	78,901
1929	714,939	78,252	149,424	16,308	...	...	...	...	...	...	864,363	94,560
1930	518,641	41,485	182,978	14,583	...	...	...	...	...	...	701,619	56,068
1931	242,950	16,104	148,782	9650	...	...	...	...	...	...	391,732	25,754
1932	301,854	24,399	161,634	12,905	...	...	...	...	...	...	463,488	37,304
1933	361,768	29,394	127,562	10,414	...	...	...	...	...	...	489,330	39,808
1934	194,747	18,401	89,940	8726	...	...	...	...	...	...	284,687	27,127
1935	191,044	24,780	132,857	17,543	...	...	...	...	...	...	323,901	42,323
1936	803,269	71,886	103,189	9150	...	...	...	...	...	...	906,458	81,036
1937	977,552	88,252	83,233	7518	...	...	...	...	...	...	1,060,785	95,770
1938	1,152,568	98,913	66,982	5758	...	...	...	...	...	...	1,219,550	104,671
1939	1,207,604	111,893	70,512	6417	...	...	...	...	...	...	1,278,116	118,310
1940	1,549,859	155,596	58,659	5854	119	13	44	4	...	...	1,608,681	161,447
1941	1,282,795	134,693	43,830	4601	113	12	...	...	...	...	1,326,738	139,306
1942	207,050	21,739	36,207	3802	...	...	...	...	946,804·44	99,414	1,190,061·44	124,955
1943	193,070	20,273	44,321	4653	...	...	...	...	879,184·67	92,315	1,116,575·67	117,241
1944	143,640	15,082	38,047	3994	...	...	...	...	846,489·29	88,881	1,028,176·29	107,957
Total	15,078,568·55	1,731,499	2,983,598	393,444	232	25	44	4	2,672,478·40	280,610	20,734,920·95	2,405,582

TALC.

RETURN showing Quantity and Value of Talc produced during the Years 1928 *to* 1944 *inclusive.*

Year.	Quantity.	Value.
	Tons.	£
1928	32	96
1929	23	45
1930	13·35	53
1931	15	58
1932	5	17
1933	8·75	22
1934	5·5	16
1935	—	—
1936	3	8
1937-1943	—	—
1944	4	16
Total	109·6	331

TIN.

The output was 809·671 tons, valued at £235,612, as compared with 948·817 tons, valued at £246,218 for 1943.

RETURN showing the Quantity and Value of Metallic Tin exported from Tasmania from 1873 *to* 1904 *(compiled from Customs Returns only), and Metallic Tin produced during the Years* 1905 *to* 1944 *inclusive.*

Year.	Quantity.	Value.
	Tons.	£
1873–1879 inclusive	16,429	1,054,923
1880 to 1904 inclusive	53,695·88	7,167,564
1905	2724·05	362,670
1906	3130·925	557,266
1907	3039·925	501,681
1908	3164·56	421,580
1909	3157·84	418,165
1910	2590·707	399,393
1911	2767·135	513,500
1912	2599·775	543,103
1913	2807·287	531,983
1914	1809·899	259,300
1915	1819·463	292,306
1916	1998·245	350,852
1917	1846·135	427,917
1918	1579·342	488,798
1919	1580·22	395,794
1920	1310·411	369,362
1921	790·395	130,257
1922	679·440	112,407
1923	1160·390	236,955
1924	1108·450	275,014
1925	1129·662	297,515
1926	1096·16	322,526
1927	1105·74	317,593
1928	1140·14	258,676
1929	640·36	130,014
1930	511·77	69,592
1931	588·83	70,634
1932	793·92	109,767
1933	957	190,041
1934	952·49	219,246
1935	1131	258,919
1936	1004·06	206,656
1937	1089·839	260,673
1938	1278·617	244,037
1939	1249·877	282,798
1940	1430·198	367,127
1941	1255·729	328,340
1942	1148·048	297,919
1943	948·817	246,218
1944	809·671	235,612
Total	132,042·452	£20,526,858

WOLFRAM.

RETURN showing the Quantity and Value of Wolfram produced during the Years 1899 *to* 1944 *inclusive.*

Year.	Quantity.	Value.
	Tons.	£
1899 to 1903 inclusive	57·34	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
1922	19·26	1024
1923	96·86	6150
1924	54	2785
1925	174·170	14,658
1926	83·15	5265
1927	148·57	9896
1928	176·15	12,094
1929	151·86	18,358
1930	112·6	12,216
1931	0·29	16
1932	—	—
1933	104·05	7,301
1934	194·19	27,375
1935	232·13	29,345
1936	207·13	28,323
1937	291·04	71,643
1938	299·104	63,348
1939	227·604	44,356
1940	234·304	42,319
1941	235·502	42,536
1942	183·23	58,397
1943	230·025	82.965
1944	241·875	86,749
Total	4945·346	£839,402

ZINC.

RETURN showing the Quantity and Value of Zinc produced during the Years 1917 *to* 1944 *inclusive.*

Year.	Quantity.	Value.
	Tons.	£
1917	48	1968
1918	3822	152,880
1919	285	13,110
1920	9·3	334
1921–1923	—	—
1924	2748·75	90,485
1925	3112·69	110,691
1926	5377·75	183,362
1927	6326·2	181,242
1928	7112	188,691
1929	6977	185,964
1930	943	19,322
1931–1935	—	—
1936	18,769	283,105
1937	23,481	525,824
1938	25,366	356,452
1939	25,021	366,176
1940	26,262	715,632
1941	24,468·6	666,768
1942	21,472·15	585,116
1943	21,078·81	574,398
1944	20,833·15	567,702
Total	243,513·40	£5,769,220

ELECTROLYTIC ZINC COMPANY OF AUSTRALASIA LIMITED.

RETURN FOR THE YEAR 1944.

EXTRACTION FROM ORES AND CONCENTRATES:
RISDON.

From other than Tasmanian Ores—

Zinc	57,311 tons
Cadmium	210·2799 tons
Cobalt oxide	12·8621 tons

From Tasmanian Ores—

Zinc	21,405 tons
Cadmium	46·05 tons
Cobalt oxide	·38 tons
Lead	952 tons
Silver	135,700 oz.

Men Employed—

The average number of men employed was 1591.

WEST COAST DIVISION.

Ore Mined—

	Tons.
From Hercules Mine	47,438
From Rosebery Mine	101,456
Total	148,894

Concentrates Produced—

	Tons.
Zinc concentrates	44,096
Lead concentrates	6,981
Copper concentrates	3,862
	57,639

Recoverable Quantity in Ores Mined—

Zinc	20,833·15 tons
Lead	7,038·50 tons
Copper	381·75 tons
Cadmium	39·68 tons
Silver	846,489·29 oz.
Gold	9,744·53 oz.

Average Number of Men Employed—

Hercules Mine	74
Rosebery Mine	316
Zeehan Smelters	25
Total	415

QUANTITY AND VALUE OF METALS AND MINERALS RAISED.

RETURN showing Quantity and Value of Metals and Minerals Raised in Tasmania as at 31st December, 1944.

Mineral or Metal.	Quantity.	Value.
		£
Asbestos (tons)	3,703·49	9,949
Barytes (tons)	2,163·2	8,068
Bismuth (tons)	82·234	27,367
Cadmium (tons)	474·7857	178,462
Carbide, Cement, and Limestone (tons)	2,495,530·1	3,491,608
Carbide to 1936 (now under Carbide, Cement, and Limestone) (tons)	62,090	1,212,207
Cement to 1936 (now under Carbide, Cement, and Limestone) (tons)	525,391	2,004,014
Coal (tons)	4,557,756	3,547,419
Cobalt Oxide (tons)	4·88	2,219
Copper (Blister) to 1918 (now shown under Silver and Copper) (tons)	166,600	13,788,527
Copper Matte (tons)	6,227	133,736
Copper Ore to 1918 (now under Copper) (tons)	41,768·63	577,873
Copper (from 1919) (tons)	239,806·279	13,847,312
Dolomite (tons)	10	25
Gold (fine oz.)	2,249,255·701	9,732,137
Granite (Red) (tons)	2,801·5	18,378
Graphite (tons)	17	26
Ilmenite (tons)	550	1,256
Iron Ore (tons)	46,177	31,770
Iron Pyrites (tons)	462,046	560,178
Kaolin (tons)	8,911·75	10,966
Lead (from 1919) (tons)	154,327·445	3,576,148
Limestone to 1936 (now under Carbide, Cement, and Limestone) (tons)	2,108,943	1,439,674
Manganese (tons)	·6	3
Monazite (tons)	32·6	488
Nickel (tons)	222·55	38,850
Ochre (tons)	593·5	2,201
Osmiridium (oz.)	30,290·666	654,190
Rutile (tons)	·5	18
Red Oxide (tons)	57·5	150
Scheelite (tons)	1,759·431	394,885
Silica (tons)	57,722	25,253
Shale (tons)	41,572	31,231
Silver Lead to 1918 (now shown under Silver and Lead) (tons)	1,083,897·821	6,429,291
Silver (from 1919) (fine oz.)	20,734,920·95	2,405,582
Talc (tons)	109·6	331
Tin (tons)	132,042·452	20,526,858
Wolfram (tons)	4,945·346	839,402
Zinc (tons)	243,513·4	5,769,220
Total	....	£91,317,272

STATISTICS OF PRODUCTION.

RETURN showing the Annual Published Value of Mineral Products for the State of Tasmania from 1880 to 1944 inclusive.

Year.	Value.	Year.	Value.
	£		£
1880	554,031	1914	1,007,038
1881	602,723	1915	1,225,575
1882	556,306	1916	1,521,050
1883	560,873	1917	1,582,322
1884	468,302	1918	1,597,694
1885	518,885	1919	1,301,090
1886	489,966	1920	1,421,104
1887	593,256	1921	822,851
1888	616,733	1922	1,013,415
1889	504,718	1923	1,219,456
1890	444,210	1924	1,496,804
1891	528,388	1925	1,700,861
1892	526,909	1926	1,808,847
1893	627,909	1927	1,621,027
1894	732,764	1928	1,593,828
1895	575,692	1929	1,790,653
1896	662,058	1930	1,270,114
1897	1,006,140	1931	894,986
1898	1,071,084	1932	897,168
1899	1,660,622	1933	1,053,373
1900	1,888,695	1934	1,037,351
1901	1,763,896	1935	1,387,511
1902	1,378,406	1936	1,979,637
1903	1,354,044	1937	2,653,822
1904	1,379,204	1938	2,294,735
1905	1,729,129	1939	2,520,282
1906	2,257,147	1940	3,137,330
1907	2,277,159	1941	3,055,838
1908	1,650,027	1942	2,832,189
1909	1,574,995	1943	2,686,664
1910	1,432,193	1944	2,581,366
1911	1,349,497	Value of production 1867-1943, previously unrecorded	2,066,118
1912	1,493,502		
1913	1,415,700		
		Total	£91,317,272

STATISTICS OF MINING COMPANIES.

RETURN showing the Amounts Paid in Dividends by Mining Companies during the Year ending 31st December, 1944.

Mines.	Dividends.
	£ s. d.
Copper	65,753 0 0
Gold	...
Tin	49,334 0 0
Silver	...
Coal	3525 0 0
Scheelite	...
Zinc	*270,000 0 0
Total	£388,612 0 0

* This amount represents total dividends out of Tasmanian and ex-Tasmanian profits.

RETURN showing the Mining Companies Registered during the Year ending 31st December, 1944.

Number of Companies.	Capital.
1	£5000 0 0

In addition to the above, 1 agent for foreign companies under the Mining Companies (Foreign) Act, 1884, was registered. No syndicates under Part V. of the Mining Companies Act, 1884, were registered.

RETURN showing the Total Number of Leases and Licences in Force on 31st December, 1944.

Mineral.	Number.	Number of Sluiceheads.	Area
			Acres.
Asbestos	1	...	10
Barytes	1	...	10
Bismuth	...	...	...
Coal	31	...	5942
Clay	2	...	78
Copper	1	...	33
Copper-Nickel	...	...	...
Dolomite	...	...	...
Granite	4	...	30
Gold	113	...	1948
Iron	5	...	298
Limestone	6	...	491
Lead-Zinc	1	...	80
Molybdenum	...	...	...
Minerals	40	...	5412
Marble	...	...	...
Manganese	1	...	10
Osmiridium	1	...	10
Ochre	2	...	24
Pyrites	1	...	80
Quartzite	1	...	8
Scheelite	3	...	281
Shale	3	...	117
Silica	1	...	10
Silver	10	...	337
Stone	4	...	67
Sand	1	...	5
Serpentine, &c.	3	...	240
Tin	353	...	9818½
Wolfram	7	...	158
Mining Easements and Machinery Sites	82	...	633¾
Licences to Search	2	...	1800
Water Licences	300	1343	2062¼
Total	980	1343	29,993½

RETURN showing the Total Amount of Rents, Fees, &c., received by the Mines Department during the Year ending 31st December, 1944.

Head of Revenue.	Amount.
	£ s. d.
Rent of Auriferous and Mineral Lands	6166 8 10
Fees, Auriferous and Mineral Lands	320 12 7
Survey Fees	322 6 6
Fees under the Explosives and Inflammable Liquids Act	2465 3 10
Total	£9,274 11 9

RETURN showing the Total Area of Land and Number of Sluiceheads of Water Applied for during the Year ending 31st December, 1944.

Mineral.	Number.	Sluiceheads	Area.
			Acres.
Asbestos	...	...	...
Bismuth	...	...	...
Barytes	...	...	...
Clay	...	...	...
Coal	3	...	395
Dolomite	...	...	...
Gold	4	...	70
Granite	...	...	...
Iron	...	...	...
Lead	...	...	...
Limestone	...	...	...
Manganese	...	...	...
Minerals	...	...	...
Nickel-Silver	...	...	...
Ochre	...	...	...
Phosphate	...	...	...
Serpentine	...	...	...
Talc	...	...	...
Tin	31	...	476
Wolfram	1	...	80
Machinery Sites and Mining Easements	4	...	16
Water-rights and Dam Sites	14	32	12
Licences to search for Coal	1	...	900
Total	58	32	1949

RETURN showing Total Number and Area of Leases and Licences Issued during the Year ending 31st December, 1944.

Mineral.	Leases.	Sluiceheads.	Area.
			Acres.
Asbestos	...	...	...
Barytes	...	...	...
Clay	...	...	...
Copper	...	...	...
Copper-Nickel	...	...	...
Coal	1	...	20
Granite	...	...	...
Gold	7	...	131
Iron Ore	...	...	...
Limestone	2	...	137
Minerals	...	...	...
Manganese	...	...	...
Nickel	...	...	...
Ochre	1	...	20
Quartzite	...	...	...
Silver	...	...	...
Silica	...	...	...
Silver-Lead	...	...	...
Stone	4	...	242
Tin	48	...	1096
Wolfram	...	...	...
Water-rights and Dam Sites	30	97	74
Licences to Search for Coal and Oil	...	...	...
Mining Easements and Machinery Sites	6	...	129
Total	99	97	1849

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 31st December, 1903, and for the Years ending 31st December, 1904 to 1944 inclusive.

Year.	Amount.			Year.	Amount.		
	£	s.	d.		£	s.	d.
1882	23,077	1	9	1913	19,410	17	8
1883	15,439	14	5	1914	14,087	0	6
1884	6981	11	10	1915	17,679	3	6
1885	11,070	5	7	1916	14,678	19	10
1886	12,523	10	4	1917	14,669	7	2
1887	14,611	11	5	1918	17,833	14	9
1888	23,502	8	4	1919	15,388	7	7
1889	17,254	9	0	1920	16,767	11	6
1890	26,955	4	9	1921	11,248	14	11
1891	37,829	16	5	1922	14,184	7	3
1892	17,568	18	4	1923	13,224	11	9
1893	16,971	9	2	1924	14,678	13	11
1894	16,732	7	7	1925	14,229	8	7
1895	15,323	1	9	1926	15,163	15	7
1896	20,901	13	2	1927	16,887	9	9
1897	25,631	0	3	1928	14,313	12	0
1898	33,661	13	9	1929	14,665	10	7
1899	24,696	10	5	1930	11,166	7	2
1900	28,380	11	10	1931	11,520	1	10
1901	21,569	5	2	1932	10,097	18	6
1902	19,471	0	1	1933	9459	6	9
1903	17,776	14	3	1934	11,166	2	11
1903, 1 July to 31 Dec.	14,758	17	1	1935	10,548	10	0
1904, Jan. to Dec.	16,631	8	2	1936	11,023	11	3
1905	20,208	17	0	1937	12,206	10	1
1906	24,136	12	5	1938	11,177	11	5
1907	24,794	7	7	1939	11,556	5	1
1908	20,311	3	0	1940	11,018	3	9
1909	22,804	1	5	1941	10,835	18	8
1910	22,221	18	0	1942	9,509	18	2
1911	20,556	15	10	1943	9,449	9	7
1912	17,639	19	11	1944	8,952	5	3

The above Statement does not include Stamp Duties upon Transfer of Leases and Tax payable upon Dividends, from which sources large sums are derived.

RETURN showing the Number and Area of Leases Held under the Mining Act in force on 31st December, 1930 to 1944 inclusive.

Nature of Lease.	In force on 31st Dec., 1930.		In force on 31st Dec., 1931.		In force on 31st Dec., 1932.		In force on 31st Dec., 1933.		In force on 31st Dec., 1934.		In force on 31st Dec., 1935.		In force on 31st Dec., 1936.		In force on 31st Dec., 1937.		In force on 31st Dec., 1938.		In force on 31st Dec., 1939.		In force on 31st Dec., 1940.		In force on 31st Dec., 1941.		In force on 31st Dec., 1942.		In force on 31st Dec., 1943.		In force on 31st Dec., 1944.	
	No.	Area.	No.	Area.	No.	Area	No.	Area.	No.	Area.	No.	Area.	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.		Acres.		Acres.		Acres.		Acres.		Acres.		Acres.
For Minerals, Silver, Tin, &c.	418	18,321	379	17,101	284	13,320	326	16,734	444	18,716	500	19,802	585	21,096	603	21,368	595	23,497	463	18,843	474	16,838	436	15,892	377	15,135	333	15,075	423	16,517·50
For Coal, Stone, Shale, &c.	32	9960	25	7223	32	6104	39	7495	51	8439	47	6635	48	7249	50	6778	43	4904	49	6683	53	6517	56	7151	53	6732	53	6683	60	7032
For Gold	40	830	57	999	77	1987	128	3879	167	3987	162	3190	155	3183	22	2619	117	2491	108	1850·5	110	1759·5	106	2041	75	1176	59	914	113	1948
Dredging Claims	30	353	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mining Easements	73	504	77	434	48	316	79	475	94	578	107	629	112	634	112	663	97	630	86	617·25	85	616·25	83	529	83	511·25	78	570·75	82	633·75
Machinery Sites	18	117	20	209	18	120	17	119																						
Licences to search for Coal or Oil	3	1080	1	800	1	320	2	790	2	3670	2	4200	5	10,900	6	10,600	2	1180	2	1180	—	—	—	—	—	—	1	900	2	1800
Water-rights, Mineral and Gold	364	2095 & 1558 sluice-heads	388	2078 & 1546 sluice-heads	391	2448 & 1473 sluice-heads	400	1905 & 1650 sluice-heads	403	2015 & 1760 sluice-heads	447	2092 & 1835 sluice-heads	466	1963 & 2034 sluice-heads	467	2243 & 2049 sluice-heads	448	1834 & 2191 sluice-heads	388	2172·75 & 1574 sluice-heads	395	2183 & 1478 sluice-heads	386	2065 & 1428 sluice-heads	346	2031·75 & 1586 sluice-heads	293	2015·25 & 1319 sluice-heads	300	2062·25 & 1343 sluice-heads

TABLE showing the Average Annual Prices for Minerals During Recent Years.

	Average for **1931.**	Average for **1932.**	Average for **1933.**	Average for **1934.**	Average for **1935.**	Average for **1936.**	Average for **1937.**	Average for **1938.**	Average for **1939.**	Average for **1940.**	Average for **1941.**	Average for **1942.**	Average for **1943.**	Average for **1944.**
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Copper—Standard, spot: per ton	38 7 9	31 14 7	32 11 4	30 6 4	31 18 1	36 12 6	60 5 9 Electrolytic.	45 16 9 Electrolytic.	49 17 7 Electrolytic.	62 0 0 Electrolytic.	62 0 0 Electrolytic.	62 0 0 Electrolytic.	62 0 0 Electrolytic.	62 0 0 Electrolytic.
Lead—Soft Foreign: per ton	13 0 7	12 0 9	11 16 1	11 1 0	14 5 8	16 7 9	23 6 1	15 6 5	15 13 7	25 0 0	25 0 0	25 0 0	25 0 0	25 0 0
Spelter: per ton	12 9 0	13 13 10	15 14 11	13 15 6	14 0 0	14 6 11	22 6 8	14 1 7	14 14 0	25 15 0	25 15 0	25 15 0	27 5 0	27 5 0
Tin—Standard, spot: per ton	118 9 1	135 18 10	194 13 4	230 7 5	225 14 6	208 6 6	242 6 7	189 12 1	226 5 6	256 12 3	261 8 0	259 10 0	259 10 0	289 17 6
Silver—Standard, spot: per oz.	s. d. 1 2·593	s. d. 1 5·842	s. d. 1 6·144	s. d. 1 9·208	s. d. 1 9·951	s. d. 1 9·647	s. d. 1 9·65	s. d. 1 9·066	s. d. 1 8·461	s. d. 2 1·048	s. d. 1 11·439	s. d. 1 11·439	s. d. 1 11·439	s. d. 1 11·439
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s.	£ s. d.
Osmiridium per oz.	14 7 9	11 11 0	8 16 9	9 11 2	9 0 0	12 10 0	15 12 6	15 0 4	17 15 0	24 0 0	20 7 2	20 12 4	23 10 11	24 10 6
Wolfram: per ton	64 0 0	62 16 0	81 2 6	94 0 0	175 0 0	161 5 0	325 19 0 $W.O._2$	289 0 0 $W.O._3$	271 0 0 $W.O._3$	250 0 0 $W.O._3$	250 0 0 $W.O._3$	437 10 0 $W.O._3$	500 0 0 $W.O._3$	500 0 0 $W.O._3$
Nickel: per ton	183 15 0	234 7 6	235 0 0	225 0 0	200 0 0	178 4 0	145 0 0	182 10 0	185 0 0	...	...	...	...	...

AID TO MINING.

The policy of assistance to mining was continued under the provisions of the Aid to Mining Act. Several grants were made for the development of mines, purchase of plants, provision of supplies of water, and for other purposes allied with mining. Sustenance allowance was granted to organised parties for prospecting in approved localities but no discoveries of economic moment resulted.

An amount of £813 was expended and afforded employment for approximately 30 men. The value of ore raised by assisted parties was £8720. Repayments made against advances totalled £654.

War-time conditions did not favour lead and gold mining, but interest was sustained in the production of tin, wolfram, scheelite, and other minerals in short supply for the requirements of war. National Security (Minerals) Regulations, with provision for loans to ventures concerned with the production of strategic minerals, continued to be exercised in financing projects directed to the production of tungsten and tin.

THE AID TO MINING ACT, 1927.

STATEMENT OF RECEIPTS AND PAYMENTS OF THE MINING TRUST FUND FOR YEAR ENDED 31ST DECEMBER, 1944.

RECEIPTS.	£ s. d.	PAYMENTS.	£ s. d.
Balance, 31st December, 1943	9,557 11 6	Sustenance allowance	....
Repayment of loans	217 8 8	Assistance	813 9 7
Hire drilling plant	57 0 0	Insurances	3 0 6
Appropriation Act, 1943-44—		Inspection of plant	1 0 0
Item 18—New Catamaran Collieries Pty. Ltd.	756 2 9	Total payments	817 10 1
Item 22—Drilling costs, Lease 303P/M, New River	352 18 1	Excess of receipts over payments	10,123 10 11
	£10,941 1 0		£10,941 1 0

THE AID TO MINING (FEDERAL GRANT) TRUST FUND.

(22 Geo. V. No. 92, and 26 Geo. V. No. 8, and 2 Geo. VI. No. 68.)

RECEIPTS AND PAYMENTS STATEMENT.

RECEIPTS. Item.	March, 1935 (commencement) to 31st Dec., 1944. £ s. d.	1st Jan., 1944. to 31st Dec., 1944. £ s. d.
Provided by—		
Commonwealth £25,750		
State 9,250	35,000 0 0	....
Transfer of balance from—		
The Aid to Mining (Federal Grant) Trust Fund, 1936-37 (1 Edw. VIII. No. 20)	1,883 18 2	....
The Aid to Mining (Federal Grant) Trust Fund, 1937-38 (1 Geo. VI. No. 32)	798 9 11	....
Other credits—		
Batteries	99 13 2	....
Advances	7,153 18 7	233 3 2
Plants and operation thereof	11 18 8	....
Metallurgical investigations	0 7 11	....
Staff	0 10 10	....
Balance brought forward period ended 31st December, 1944	....	3,192 11 3
	£44,948 17 3	£3,425 14 5

PAYMENTS. Item.	March, 1935 (commencement) to 31st Dec., 1944. £ s. d.	1st Jan., 1944 to 31st Dec., 1944. £ s. d.
Prospecting	1,584 6 6	....
Batteries	1,328 14 0	....
Advances	22,770 18 6	....
Plants and operation thereof	6,711 9 11	....
Metallurgical investigations	1,237 3 4	....
Roads and tracks	6,486 8 8	....
Transport	829 10 10	....
Staff	574 11 1	....
Total payments	41,523 2 10	....
Excess receipts over payments	3,425 14 5	3,425 14 5
	£44,948 17 3	£3,425 14 5

GOLD MINING ENCOURAGEMENT ACT, 1940.

(Commonwealth Act, No. 38 of 1940.)

RECEIPTS AND PAYMENTS STATEMENT OF THE GOLD MINING ENCOURAGEMENT (COMMONWEALTH) DEPOSIT ACCOUNT FOR THE YEAR ENDED 31ST DECEMBER, 1944.

RECEIPTS.	£	s.	d.	PAYMENTS.	£	s.	d.
Balance brought forward, 31st December, 1943	1,563	12	8	Advances	....		
Repayments	436	7	4	Excess receipts over payments	2,000	0	0
Interest	....						
	£2,000	0	0		£2,000	0	0

STATEMENT OF LOANS UNDER THE AID TO MINING ACT, 1927.

EXPENDITURE.

Year.	Federal Funds. £	s.	d.	The Mining Trust Fund and Other Funds. £	s.	d.	Total. £	s.	d.
1935	8,398	11	4	2,298	14	8	10,697	6	0
1936	10,462	3	7	2,807	12	10	13,269	16	5
1937	3,902	17	7	1,983	9	6	5,886	7	1
1938	3,337	2	7	1,937	1	0	5,274	3	7
1939	658	13	10	2,721	11	1	3,380	4	11
1940	866	3	5	4,188	5	4	4,984	8	9
1941	2	17	3	1,019	15	3	1,022	12	6
1942	....			1,433	3	3	1,433	3	3
1943	....			634	12	6	634	12	6
1944	....			813	9	7	813	9	7
Total	£27,628	9	7	£19,767	15	0	£47,396	4	7

REPAYMENTS.

Year.	Federal Funds. £	s.	d.	The Mining Trust Fund and Other Funds. £	s.	d.	Total. £	s.	d.
1935	300	4	9	87	10	0	387	14	9
1936	1,286	12	5	1,078	5	11	2,364	18	4
1937	1,244	15	5	2,246	13	9	3,491	9	2
1938	3,796	4	7	422	15	3	4,218	19	10
1939	716	19	2	390	4	0	1,107	3	2
1940	599	6	2	944	3	9	1,543	9	11
1941	240	7	11	684	3	8	924	11	7
1942	357	7	10	262	11	4	619	19	2
1943	1,091	5	8	1,486	1	0	2,577	6	8
1944	233	3	2	653	16	0	886	19	2
Total	£9,866	7	1	£8,256	4	8	£18,122	11	9

DRILLING.

Departmental drilling plants were in constant operation, partly on hire to the holders of mining tenements and partly in drilling areas reserved against occupation under the provisions of the Mining Act. Expenditure on all fields was £3130 12s., of which amount £643 16s. 8d. was repaid under drilling agreements.

Boring of the tin-bearing deep lead north of the Scotia workings at Gladstone was suspended. The campaign was designed to determine the course and nature of the lead and the sufficiency of a yardage of low-grade drifts for large-scale working.

A planned boring campaign was pursued on an extensive area of alluvial ground at Herrick.

A series of diamond-drill holes was bored for the Hamilton Coal Company at Hamilton and established the structural set-up of the coal seams at the Langloh Mine. An adequate reserve of coal was proved and the drilling enabled the development of the mine to be planned on a methodical basis.

An extensive drilling campaign was commenced on deposits of dolomite at Smithton to determine grades and volumes for an economic assessment of possibilities for industrial exploitation.

DETAILS OF EXPENDITURE ON DRILLING DURING THE YEAR ENDED 31ST DECEMBER, 1944.

Plant.	Location.	Amount. £	s.	d.
Diamond Drill, No. 3	Weldborough	89	12	0
Diamond Drill, No. 3	Hamilton	291	15	3
Diamond Drill, No. 3	Smithton	585	8	1
Calyx Drill	Winnaleah	894	10	9
Calyx Drill	Seymour	219	10	10
Surge Drill	Gladstone	491	1	2
Surge Drill	Herrick	558	13	11
		£3,130	12	0

DRILLING RESULTS.

CANADIAN LONGYEAR JUNIOR STRAITLINE DIAMOND DRILL.

This plant was employed in drilling at Hamilton where a series of six holes was bored for the Hamilton Coal Company on the Langloh leases. An additional three holes were bored outside the mining tenements to test the extension and behaviour of the coal seams. A total of 1163 feet was core-drilled and reserves exceeding 2,000,000 tons of coal were established. The structure and disposition of the seams were studied and a suitable plan of colliery development was submitted to the Company.

The plant was then moved to Smithton, where drilling was commenced, under agreement, for the Broken Hill Proprietary Company Limited. The area being explored is part of an extensive tract of dolomite in which patches of high-grade material are known to occur. Seven holes, aggregating 422 feet, were drilled and boring is to be continued.

Calyx Drill.

The Calyx plant was engaged in locating and tracing a deep lead system in an area north of Winnaleah. Twenty-six bores, totalling 2106 feet, were put down and succeeded in locating and exploring the main buried stream-channel, but significant tin values were not encountered.

The plant was then moved to Seymour and planned boring was commenced to test the coal-bearing strata in the neighbourhood of the flooded workings of the Seymour Colliery. The first bore had reached a depth of 184 feet at the end of the year. Coal seams were intersected at 12 feet and 138 feet, but strata troubles were revealed and results were not encouraging at this location. Boring is to be continued.

Surge Drill.

The Surge plant completed the required programme of boring at the Mount Bischoff Tin Mine, was returned to the Scotia area at Gladstone for a brief period of boring on the deep lead, and was then detailed to tracing an extension of tin-alluvials at the Golden Sovereign Mine, Herrick.

Thirty holes, aggregating 3111 feet, were bored along the course of the deep lead north from the Scotia workings at Gladstone, and results were consistent with those previously obtained in this area.

The tin-bearing drifts being sluiced by the Golden Sovereign Mining Company were followed by planned boring, but tin values were too low for profitable working. The boring campaign was then extended to cover a large area of alluvial ground exterior to the mining tenements. Thirty-eight holes, aggregating 3166 feet, were bored, and ancient gutters with granite bedrock were traced out and tin values were located, but the grade was too low for economic exploitation. Unfavourable results within and exterior to the leases influenced the Company to suspend operations.

DEPARTMENTAL ACTIVITIES.

Technical services continued to be usefully directed to the economics and geology of mineral occurrences, to research in ore-dressing, to boring coal and metalliferous deposits, and to the general development of mining.

The value of innovations in metallurgical research has been exemplified by results attending the application of flotation and gravity concentration to the recovery of tin-oxide from sulphide ores, and by an increase in the volume of ore-dressing investigations. Metallurgical research will be invaluable to the future development of the industry, and essential equipment is being added to in order that services may be rendered in fields of both metallics and non-metallics. The planned establishment of new analytical and metallurgical laboratories is materialising, as acquired property becomes available for occupation and as war-time building restrictions ease.

The trend of markets and metal prices has been a feature of investigation in order that opportunities may be developed to rehabilitate base-metal and non-metallic projects adversely affected by war-time controls. Several producing projects have been depressed by labour depletions and the capacity of mining to absorb labour has been regularly surveyed to provide for allocations as men become available for employment. The incidences of mining taxation and restrictive controls on financing projects have been the subject of special investigations, directed to the easing of controls and the encouragement of financing ventures for the exploration and development of the mineral resources.

Changes in the inspectorial staff and difficulties in obtaining suitably qualified officers, under war-time conditions, affected the regularity of inspection services, but the position is improving and every endeavour is being made to maintain full surveillance of conditions governing the health and safety of persons employed in mines, quarries, and works.

MINES DRAFTING BRANCH.

The number of working plans in use and which are kept up to date is 220.

Instructions issued to surveyors	58
Diagrams received from surveyors	39
Diagrams drawn on leases	202
Consolidated and other diagrams drawn	10
Lithographs entered to date	77
Various tracings prepared	56
Tracings for Launceston office	61
Manuscripts entered to date	13
Underground surveys examined	23
Geological plans compiled and tracings made	10

STAFF.

Mr. L. F. Egan was appointed to the position of Inspector of Mines and Explosives on 27th July, 1944.

Mr. R. J. Muir was appointed to the position of Inspector of Mines and Explosives on 17th November, 1944.

Miss J. Sullivan was appointed to the position of typist on 27th July, 1944.

Mr. J. R. A. Falconer resigned from the position of Registrar of Mines at Zeehan, and Mr. G. H. Waterworth was appointed to the vacancy on 10th August, 1944.

Dr. S. Warren Carey was appointed to the position of Government Geologist on 27th November, 1944, in place of Dr. D. E. Thomas who resigned his appointment on 26th February, 1944.

LEGISLATION.

By Act of Parliament the Mining Act, 1929, was amended in several particulars and thereby made more serviceable in controls pertaining to the occupation of land and water for mining purposes. The regulations have yet to be revised.

APPRECIATION OF SERVICES.

Appreciation is recorded of the loyal and efficient services rendered by officers of the Department, including officers of the Mining Drafting Branch, Wardens of Mines, and Registrars of the several mining districts.

APPENDICES.

The following reports are appended:—

Geological Survey.
Chief Chemist and Metallurgist.
Chief Inspector of Mines.
Chief Inspector of Explosives.
Inspectors of Mines and Explosives.
Mount Cameron Water-race Board.

I have the honour to be Sir,

Your obedient servant,

W. H. WILLIAMS, Director of Mines.

APPENDIX I.

REPORT OF THE GEOLOGICAL SURVEY.

The Government Geologist (Dr. S. Warren Carey) reports:—

Staff.

The Government Geologist, Dr. D. E. Thomas, resigned on February 26th, and the position was vacant until my appointment on November 27th. Messrs. Blake and Hughes were absent on war service. The work of the geological survey was, therefore, carried on for the greater part of the year by Messrs. Henderson and Keid, aided in the field by Mr. K. Kendall, who was temporarily appointed as a junior field assistant on March 3rd.

Field Investigations.

The following investigations were carried out by the geological survey:—

Dr. Thomas.—Examination and sampling of known dolomite outcrops in the Smithton district. Report submitted.

Mr. Henderson.—Systematic examination of the Mt. Farrell mineral area (work still in hand at end of year); Preliminary geological reconnaissance of proposed dam-sites on the Lower Derwent for Hydro-electric purposes; Preliminary geological examination of proposed Arthur Lakes Hydro-electric scheme. Report submitted; Search for deposits suitable for development by open-cut methods in the east coast coalfields; Sampling of the Great Pyramid Mine, Upper Scamander, for ore dressing investigations; Examination of the Oonah oil shale area. Report submitted.

Mr. Keid.—Examination of the Bell Hill Tin Mine, Weldborough; Investigation of the reported occurrence of bitumen in the Port Davey area. Report submitted; Examination of tin leases at Coles Bay. Report submitted; Examination of clay deposits near Hobart; Examination of Huxley's leases at St. Helens. Report submitted; Underground water supply for the Hydro-electric substation at Longford. Report submitted; survey of the future possibilities of the Gladstone tinfield. The survey was still in progress at the end of the year.

Reports by Messrs. Henderson and Keid are appended.

Field Geologist Q. J. Henderson reports:—

Nearly six months were spent in the Farrell district, continuing the systematic geological survey of the area. with special reference to the mineral deposits. The survey included a detailed study of the Farrell mine for the purpose of determining the geological features affecting the future prospects of the Farrell Mine and the general rehabilitation of silver-lead mining in the Farrell district.

The knowledge of the geological structure of the Farrell district has been considerably advanced by detailed geological mapping, and resulted in a better understanding of the relationship of the ore deposits to the geological structure.

By the end of the field season at Tullah, five square miles had been geologically mapped, and the Farrell line of lode had been traced for three miles. Although this line of lode is continuous over such a length, the Farrell Mining Company is the only operating mine. It can be said that undoubted prospects exist, and only await a vigorous prospecting and developmental programme to initiate productive silver-lead mining.

Apart from the time spent on the systematic geological survey, the following field investigations were undertaken:—

Lower Derwent Dam Sites.

A preliminary examination was made of five possible dam sites, upstream from Macquarie Plains, in connection with the future development of a low head hydro-electric power scheme by the Hydro-Electric Commission. The geological conditions were discussed with engineers of the Commission in order that constructional factors might be properly assessed.

Hydro-Electric Scheme at Arthur Lakes.

A preliminary examination was made of the proposed hydro-electric scheme at Arthur Lakes to determine if there were any geological factors affecting the feasibility of the scheme which concerned two possible constructions, one being by means of a flume around the edge of the Western Tiers, and the other involving a direct tunnel to the intake of the pipeline to the power-house. From the brief examination, it appeared that there was no geological feature to render either proposed scheme impracticable.

East Coast Coalfields.

The coalfields at Seymour, Douglas River, Denison River, St. Albyns, Llandaff, and Mount Paul were re-examined for the purpose of ascertaining if there were any coal occurrences suitable for the application of open-cut methods of mining. In almost every case the ratio of overburden to coal was either unfavourable at the outcrop, or increased so rapidly as to render open-cut methods impracticable. One area, in the vicinity of Llandaff, gives indications of a suitable tonnage being available to warrant development, but the grade, as indicated by outcrop samples, proved to be too low.

Great Pyramid Tin Mine.

A visit was made to the abandoned Great Pyramid Mine at Upper Scamander and a bulk sample of low grade, siliceous, tin ore was obtained for C.S.I.R., Melbourne, to enable research to be continued in the recovery of cassiterite by flotation.

Oonah Oil-Shale Area.

As little information was available in the records of the Geological Survey regarding this area, an investigation was made to determine if it offered any inducement for development, either by virtue of higher oil content than the average Latrobe shale, or better mining facilities. Subsequent prospecting did not indicate any such advantages.

Field Geologist H. G. W. Keid reports:—

Weldborough Tin Field.

The latter part of 1943 was occupied in investigations in the Weldborough district. These investigations were completed on the 13th January, 1944. It was hoped that further development of the Bell's Hill Tin Mine, and increased production of tin from the field in general, would result.

A sampling campaign at Bell's Hill showed only low grade ore and increased output from the Weldborough tin field is doubtful. The Weldborough tin field is one of the oldest tin fields in Tasmania, and must be regarded as approaching exhaustion.

Port Davey.

Port Davey was visited and supervision was exercised of the expenditure of a State grant of £300 to Mr. H. E. Evenden for the purpose of prospecting for bitumen.

Some geological mapping was carried out and the available evidence was definitely opposed to the possibility of discovering bitumen *in situ*. It was evident that such fragments of bitumen, as were found, were water-borne. This finding was in agreement with opinions expressed by previous investigators.

Coles Bay.

An examination was made of mineral leases held by Mr. L. D. McRae at Coles Bay. The preliminary examination occupied six days and it was considered advisable that boring be carried out to test the grade of tin-bearing alluvial deposits occurring there.

A hand-boring campaign was carried out under my supervision. One hundred and sixty-eight bores were completed, ranging from 3 to 20 feet, and aggregating 1,463 feet. It was calculated that 98,000 cubic yards of wash of an average grade of 8·6 oz. tin oxide per cubic yard were proved with a potential yield of 23·5 tons of tin oxide. A dam site, considered suitable and adequate for mining operations, has been selected and operations should soon be undertaken.

Clay Deposits.

An examination was made of clay deposits near Hobart.

Tin Leases at St. Helens.

An examination was made of tin leases held by Mr. E. W. Huxley at St. Helens. Check boring was carried out, an investigation was made of water supplies, and a report was submitted upon an application for financial assistance to purchase and install sluicing plant.

Water.

A bore of a depth of 64 feet was put down at the Hydro-electric substation at Longford and confirmed the opinion that a small supply of water would be available for general purposes.

Coal.

Whilst in the Longford district a bore was put down at Loatta to prove the occurrence of coal at shallow depths.

Gladstone Tin Field.

The latter part of the year was occupied in investigating the possibilities of the Gladstone Tin Field. The investigation was not completed at the end of the year.

Reports.

Reports were prepared and submitted on each of the areas which were the subject of investigation or testing.

APPENDIX II.

REPORT OF THE CHIEF CHEMIST AND METALLURGIST.

The Chief Chemist and Metallurgist (Mr. W. St. C. Manson) reports:—

Determinations and Analyses.

Determinations were made of gold, silver, tin, lead, aluminium, arsenic, antimony, cerium, beryllium, barium, bismuth, boron, calcium, chlorine, chromium, osmiridium, phosphorus, thorium, tungsten, titanium, zinc, and zirconium.

Analyses were made of ores, minerals, clays, rocks, coal, shale, bauxite, water, &c.

The number of determinations approximated 3,500.

Ore Dressing Investigations.

Mt. Bischoff Tin Mine.

Comprehensive investigations were undertaken for the Minerals Production Division of the Commonwealth Department of Supply and Shipping. The majority of the investigations concerned the application of sulphide rejection by flotation prior to concentration of the tin by tabling, &c. The most important addition to information relating to this treatment was the application of flotation to "Greisen" ore wherein it has been found that an alkaline pulp with lime to a p.H. value of approximately 11 has been most effective in reducing the tin loss in the floated sulphides to an absolute minimum. Details of this work are shown in the following investigation:—

Investigation No. 205/44. (*Greisen Ore.*)

(From Underground Workings.)

Summary.

1. Flotation rejection of sulphides in previous tests have shown high cassiterite losses in flotation concentrates, and the majority of these losses are associated with talc flotation. Sizing analysis of the cassiterite in a flotation concentrate indicates that most of it is of grain sizes recoverable by gravity concentration and this is also shown by concentration tests by vanning and super-panner.

2. Mineragraphic examination of concentrates from flotation concentrates by F. L. Stillwell shows that a fair proportion of the cassiterite exists as either composite grains or coated with thin films of talc.

3. Various re-agents were tested to modify or depress the flotation of talc to obtain information relative to possible reduction of the tin content of flotation concentrates. None of the re-agents tested showed any improvement with the exception of lime alone or in combination with re-agent 637. High p.H. values by the addition of lime considerably reduced the tin loss in flotation concentrates. Flotation of pyrrhotite and pyrite is possible with lime at p.H. values of 11 by activation of the sulphides with copper sulphate. Comparative tests with a mill product from "40" mill resulted in a recovery of 52·3 per cent. of the tin, at a p.H. of 7·7 without lime, and by the addition of lime to p.H. values of 10·6 and 11·4 in rougher and cleaner stages the recovery was increased to 72·5 per cent.

4. Rougher flotation tests with the ore sample using 1 lb. copper sulphate, lime, 1 lb. sodium ethyl xanthate, 0·1 lb. pine oil and, in one case, re-agent 637, gave the following results:—

TABLE 1.

Test No.	Variable Flotation Conditions. Reagents lbs. per ton / Minutes.	p.H.	Rougher Flotation Concentrate.	
			Per Cent. Tin.	Per Cent. Tin Distribution.
20	...	5.6	0.35	32.1
18	CaO 2/10	8.4	0.41	36.0
14	CaO 3/10	9.5	0.34	27.0
19	CaO 3/10 + 0.25 reagent 637/2	9.3	0.24	18.5
15	CaO 3/10 (*a*)	9.2	0.43	36.6
16	CaO 3/20	9.4	0.23	18·7
17	CaO 6/10	11.4	0.18	12.8

(*a*) Lime added before copper sulphate. Sulphur rejection in this test was 5 per cent. lower than Test 14 (93·9 & 88·8).

5. *Test No.* 22.—Stage ball mill reduction and wet screening to minus 85 mesh, cleaner flotation rejection of sulphides with re-agents indicated by test work, classification and table concentration of the flotation tailings resulted in a recovery of 72·8 per cent. of the tin in a concentrate containing 67·37 per cent tin. This recovery is 11·9 per cent. higher than test No. 6, previously reported (27.7.44). The cleaner flotation concentrate of test No. 22 contained 5·3 per cent. of the total tin as compared with 26·3 per cent. in Test No. 6.

TABLE 2.—*Details of Tests Nos.* 22 and 6.

	Test No. 22.	Test No. 6.
Composite Cassiterite Concentrates per cent. Tin	67.37	37.5
Recovery of Tin, per cent	72.81	60.9
Cleaner Flotation Concentrates, per cent. weight	60.25	76.8
Cleaner Flotation Concentrates, per cent. Tin/per cent. Tin distribution	0.07/5.3	0.31/26.31
Rougher Flotation, lbs. CaO/lbs. 637	5/0.2	Nil
Rougher Flotation, p.H.	10.9	6.0

The sulphides were activated with copper sulphate in both tests.

6. The various re-agents tested to depress talc result in improved and controllable flotation conditions, but talc is only partially depressed. Rougher flotation concentrates Nos. 14 to 20 contained approximately 27 to 36 per cent of talc, and cleaner concentrates 13, 21, and 22 contained approximately 28, 17·7 and 17·4 per cent respectively. The quantity of talc floated in the cleaner concentrate of test No. 22 with lime and 637 was approximately one-third of that floated in the rougher concentrate of test No. 20, using similar re-agents but without depressants.

Flotation Rejection of Sulphides, &c.

Previous test work has shown that high losses of cassiterite occur in sulphide flotation concentrates and amounted, in tests Nos. 6 and 7, to 26 and 23 per cent of the total tin, respectively. Re-agents used were copper sulphate, sodium ethyl xanthate and cresylic acid. Cresylic acid alone floats a considerable quantity of talc, and it has been shown in test No. 7 that the majority of the cassiterite in the flotation concentrates reports in the flotation of the talc. The primary rougher flotation concentrate of test No. 7 contained 44·56 per cent of the total tin, but by tabling and flotation of the table concentrate 17·37 per cent of the tin was recovered.

Any increase in recovery by reduction of the cassiterite content of flotation concentrates is primarily dependent upon the grain sizes of the contained cassiterite for any application of gravity concentration, and sizing analysis and concentration tests were undertaken to obtain the desired information.

Examination of Primary Flotation Products from Test No. 7.

The primary rougher flotation concentrate of test No. 7, representing 46 per cent. of the sample consisted mainly of talc, together with some dolomite, sulphide, and cassiterite, and the treatment to which it was submitted consisted of table concentration to a pyritic concentrate and cleaner flotation with re-agents as shown above.

This cleaner flotation concentrate was examined as follows:—

TABLE 3.—*Sizing Analysis of Cassiterite in Flotation Concentrate.*

Size.	Per cent. Tin Distribution.
+300 Mesh	34.1
−300+700 „	60.2
−700 „	5.7

The flotation concentrate was screened and vanned with the following results:—

TABLE 4.—(*Weight Percentages refer to Total Ore Sample*).

Product.	Per Cent.		Per cent. Tin distribution (overall).
	Weight.	Tin.	
200 Mesh	3.92	2.36	10.05
−200 Mesh, vanned concentrate	0.43	16.7	7.80
−200 Mesh, vanned tailing	3.05	0.89	2.94
Composite	7.40	2.58	20.79

The plus 200 mesh fraction was concentrated on a Haultain super-panner, and a recovery was obtained of 70 per cent. of the tin in the fraction in a concentrate containing approximately 15 per cent. of tin.

These examinations show that although the cassiterite is generally of small grain size it can be concentrated by gravity methods. Free grains of cassiterite occasion very small loss in sulphide flotation with the re-agents used in the test work, and consequently the high cassiterite contents of sulphide flotation concentrates with the "Greisen" ore is probably occasioned by composite or coated grains of cassiterite with minerals that are floated. Samples of the vanned and super-panner concentrate containing approximately 15 per cent. of tin were forwarded to F. L. Stillwell for mineragraphic investigation. Dr. Stillwell reported as follows:—

"An examination of this product in transmitted light shows the presence of a number of cassiterite grains which are apparently free, while other grains of cassiterite are attached to particles of talc. Some observed grains of cassiterite are wholly embedded in talc, which, in some cases, forms more than half the grain. A systematic examination of grains mounted in Canada balsam has given the following approximate estimate of the different types of grains:—

Cassiterite	7·7
Cassiterite-Gangue	8·2
Cassiterite-Sulphide	1·4
Cassiterite-Gangue-Sulphide	1·2
Sulphide	71·1
Gangue	6·4
Sulphide-Gangue	4·0
	100·0

Examination of a polished briquette in reflected light showed 10·3 per cent. of apparently free cassiterite grains, and, as these grains constitute a large proportion of the total tin in the product, the examination was extended.

When the apparently free particles of cassiterite are more critically examined, it is found that they frequently possess a film of talc attached to a portion of their surface. A review of these grains of apparently free cassiterite with a low power objective showed that more than two-thirds of them possessed visible partial skins of talc. In some cases the talc film is recognisable only with a high-power objective, so that it may pass unobserved during the usual systematic count. Further, when it is remembered that a talc film may be attached to the unobserved underside of the remaining one-third of the cassiterite grains, it may be assumed that most of the free cassiterite grains possess partial attached films of talc. Such films may be only a micron in thickness and are seldom attached to more than a portion of the grain, so that the cassiterite grain must be normally regarded as a uniform grain, and no degree of crushing would ever separate the talc film from the cassiterite surface. Nevertheless, the presence of such partial films must affect the surface properties of the cassiterite grain and whenever talc tends to float, the cassiterite grain will tend to do likewise.

This peculiar feature can be traced to the nature of the ore body in which grains of cassiterite are embedded in masses of talc. When crushed, the soft talc tends to break along its prominent cleavage in preference to the contact planes of cassiterite and talc. The hard crystal of cassiterite is eventually fractured and broken before the skin of talc is disengaged from its original surface."

Reduction of Cassiterite Content of Flotation Concentrates.

It has been shown that cassiterite in flotation concentrates can be concentrated by gravity methods and the mineragraphic investigation quoted indicates that sulphide flotation under conditions which depress or modify the flotation of talc should result in a reduction of the cassiterite content of same. Alternatively, it may be possible to remove the coatings of talc from the cassiterite and thereby assist towards the objective.

Test Work.

Qualitative tests, with a pulp sample of high talc content, were performed using various modifying agents to obtain information for selection of re-agents for flotation tests. Without re-agents to modify talc flotation talc floats readily with a frother only and the froth is very voluminous and difficult to control. Of the re-agents tested, the following

were selected for flotation tests:—Gelatine, starch, tannic acid, lime, and American cyanamid re-agents of the 600 series. Pulps were flocculated with gelatine, starch, and lime.

Rougher Flotation Tests.

Sample Used, No. 347.—Mill product supplied in pulp form from " 40 " mill and stated to be No. 4 spigot product.

An amount of 9·3 per cent. of the sample was plus 120 mesh screen size, and assay values were 1·05 and 19·42 per cent. tin and sulphur, respectively. Copper sulphate, sodium ethyl xanthate, and pine oil were used in all tests, and the quantities were 1, 0·5, and 0·1 pounds per ton, respectively. All p.H. values quoted were determined with a glass electrode electrometer. A flotation test, without modifying agents, resulted in a flotation concentrate amounting to 74·5 per cent. by weight and containing 0·54 per cent tin, or 40·8 per cent of the total.

Tests with the addition of gelatine, starch, tannic acid, 637, and 639 showed no reduction in the tin contents of the flotation concentrates.

Two pounds of lime per ton added 5 minutes after the copper sulphate resulted in a flotation concentrate amounting to 70·6 per cent by weight containing 0·38 per cent tin, or 26·7 per cent. of the total, or 14·1 per cent. less than without the lime. A duplicate test with more intense agitation resulted in a further reduction to 18·7 per cent of the total tin. The p.H. values of these tests were 10·7 and 10·1, and the conditioning period for the lime was 10 minutes. A test with the addition of soda ash (4 lbs per ton) to a p.H. value of 9·8 resulted in the high loss of 48·8 per cent. of the total tin in the flotation concentrate.

Cleaner Flotation and Concentration Tests (No. 347).

Description and Summary of Results.

(Constant Conditions, Rougher Float.)

Copper Sulphate, 1 lb. per ton/5 minutes.

Ethyl Xanthate, 0·5 lb. per ton/5 minutes.

Test No. 347/2.—Rougher and one-stage cleaner flotation without gangue depressants followed by table concentration of the flotation tailings resulted in a recovery of 52·3 per cent., with a concentrate containing 48·8 per cent. tin. The cleaner flotation concentrate contained 0·55 per cent. tin, or 38·7 of the total. p.H. value 7·7.

Test No. 347/3.—Similar to test No. 2, but with the addition of ½ lb. of re-agent No. 639 in rougher float. Recovery by vanning 57·6 per cent. with a concentrate containing 54·3 per cent. tin. Frother used—pine oil.

Test No. 347/4.—Similar to No. 3 and with similar results. The cleaner flotation concentrate of this test was submitted to two further stages of cleaner flotation, the first of which was without re-agent addition other than frother, and resulted in the rejection of an additional 2·1 per cent. of the total tin from the flotation concentrate; in the second float 0·6 $CuSO_4$, 1·0 CaO, and 0·5 lbs. NaEX, respectively, were added, and a further 6·7 per cent. of the tin was rejected. The p.H. value of the pulp with CaO was 10·4.

Test No. 347/5.—Rougher and cleaner flotation with the addition of 2 and 1 lbs. of CaO in rougher and cleaner stages respectively; p.H. values of pulps, 10·6 and 11·4. Some cassiterite was present in the cleaner flotation tailings. Recovery by vanning of the flotation tailings amounted to 72·5 per cent. in a concentrate containing 61·5 per cent tin. The cleaner flotation concentrate represented 66·8 per cent. by weight, contained 0·26 per cent. tin, or 17·5 per cent. of the total. This test shows a recovery of 20·2 per cent. in excess of test No. 2, and a reduction of the tin distribution in the flotation concentrate of 21·2 per cent.

Test No. 347/6.—This test was similar to test No. 5, but with the addition of ½ lb. of re-agent 637 in the rougher float. Results were similar to test No. 5.

Rejection of sulphides by flotation was in excess of 94 per cent. in all tests, and they contained from 0·26 to 0·55 per cent. tin. Flotation concentrates ranged from 64·1 in test No. 6 to 73·5 in test No. 2, per cent. weight.

Rougher Flotation Tests with Ore Sample No. 205.—Stage ball mill ground to minus 85 mesh screen size by wet screenings.

Sequence of addition of re-agents: $CuSO_4$, CaO, NaEX, 637, and pine oil, with the exception of test No. 15, in which the CaO was added before the $CuSO_4$.

TABLE 5.

Test No.	Flotation Conditions. Roughers in lbs. per ton / Minutes.							Rougher Flotation Concentrate. Per Cent.				
	$CuSO_4$	CaO	NaEX	637	Pine Oil	Flotation	p.H.	Weight	Tin	Tin Distribution	Sulphur	Sulphur Dist.
20	1/5	—	1/5	—	0.1	/4	5.6	78.2	0.35	32.1	24.3	94.6
18	"	2/10	"	—	"	/6	8.4	81.1	0.41	36.0	24.0	96.4
14	"	3/10	"	—	"	/5	9.5	75.6	0.34	27.0	25.1	93.9
19	"	"	"	0.25/2	"	/6	9.3	69.9	0.24	18.5	25.9	89.6
15	"	"	"	—	"	/5	9.2	76.0	0.43	36.6	23.6	88.8
16	"	3/20	"	—	"	/6	9.4	71.0	0.23	18.7	25.5	89.6
17	"	6/10	"	—	"	/7	11.4	66.4	0.18	12·8	27.7	91.1

Tests Nos. 21 and 22.—Stage ball mill grinding to minus 85 mesh size by wet screening. Weight of ore for each test, 6K.G.

Cleaner flotation with copper sulphate, lime, sodium ethyl xanthate, and T43 (Timbrol re-agent), referred to as mixed xanthates, and in the proportion of 2 to 1, re-agent 637, and pine oil. The quantities of xanthates and copper sulphate used are somewhat high and no doubt could be reduced in mill operation. Hydraulic classification of the flotation tailings in an upward current of 20 mm./second, and table concentration of the classified products. In test No. 21 the table concentrates were treated as follows:—The table concentrate from the classifier overflow was panned to a finished concentrate and the concentrate from the spigot product is as produced by tabling. In test No. 22 the grade of finished concentrate is considerably higher than those of test No. 21, and the table concentrate (spigot) was subjected to four stages of cleaner flotation to remove sulphides with minimum loss of cassiterite. The table concentrate from the classifier overflow was subjected to flotation and panning. Difficulty was experienced in the flotation of the table concentrates with cassiterite reporting in the sulphide concentrates, but this is probably due to the small quantities submitted to flotation.

These tests are a duplication, test No. 22 being undertaken for confirmation of test No. 21, which shows an increased recovery, by flotation rejection of sulphides and tabling, of over 10 per cent. of previously reported tests.

Flotation Conditions for Both Tests.

Re-agents—Pounds per Ton/Minute.

	Rougher.	Cleaner.
Copper Sulphate	1/5	0·25/5
Lime	5/20	1/10
Mixed Xanthates	1·25/5	0·5/5
Re-agent 637	0·2/2	0·2/2
Pine Oil	0·1	0·05
p.H. Value (*a*)	10·9-11·0	11·2
Flotation	/5-7	/5-7

(*a*) Determined at the conclusion of flotation.

Results.

TABLE 6.

Test No. 21.

Product.	Per Cent. Weight.	Per Cent. Tin.	Per Cent. Distribution.
Cassiterite Concent., Spigot...	0.84	41.6	39.69
Cassiterite Concentrate, C/overflow	0.55	56.4	35.22
Cleaner Flotation Concentrate	58.42	0.08	5.30 32.2 %s
Vanned Talling C/overflow...	0.22	3.91	0.98
Table Middling, Spigot	0.99	1.39	1.57
Table Middling, C/overflow...	1.20	1.38	1.89
Table Tailing, Spigot.....	3.09	0.56	1.96
Table Tailing, C/overflow...	34.69	0.34	13.39
Composite	100.00	0.88	100.00
Composite Concentrates.....	1.39	47.46	74.91
Ratio of Concentration 71.9	...	..	...

The percentage sulphur distribution in the cleaner flotation concentrate amounted to approximately 93 per cent.

TABLE 7.

Test No. 22.

Product.	Per Cent. Weight.	Per Cent. Tin.	Per Cent. Distribution.
Cassiterite Concent., Spigot...	0.48	65.2	39.33
Cassiterite Concentrate, C/overflow	0.38	70.1	33.48
Cleaner Flotation Concentrate	60.25	0.07	5.30
Flotation Concentrate from Spigot Concentrate....	0.46	3.15	1.82
Vanned Tailing from C/ov. Concentrate...	0.45	4.59	2.59
Table Middling, Spigot	0.93	1.30	1.52
Table Middling, C/overflow...	1.72	0.96	2.07
Table Tailing, Spigot.....	3.09	0.55	2.14
Table Tailing, C/overflow....	32.24	0.29	11.75
Composite	100.00	0.8	100.00
Composite Concentrates.....	0.86	67.37	72.81
Ratio of Concentration 116	...	...	...

TABLE 8.

Comparison of Tests Nos. 21, 22, and 13.

	Test 21.	Test 22.	Test 13.
Composite Cassiterite Concentrates, per cent tin	47.46	67.37	49.26
Recovery of Tin, per cent	74.91	72.81	68.5
Cleaner Flotation Concentrate, per cent. tin.....	0.08	0.07	0.2
Cleaner Flotation Concentrate, per cent. tin distribution...	5.3	5.3	15·24
Cleaner Flotation Concentrate, per cent. weight	58.42	60.25	66.3
Cleaner Flotation Concentrate, per cent. sulphur.....	32.2	31.74	27.62
CaO added lbs. per ton / minutes conditioning.....	5/20	5/20	3/10
p.H. Value of Pulp, rougher.....	11.0	10.9	9.9
p.H. Value of Pulp, cleaner.....	11.2	11.2	10.8

Test 13 is not reported in detail, and is shown above for comparison. The effects of additional lime and time of conditioning in tests Nos. 21 and 22 show a comparative reduction with test No. 13 of 10 per cent. of the total tin in the cleaner flotation concentrates. With the exception of the quantity of lime and conditioning period, test No. 13 is similar in detail to test No. 21.

TABLE 9.

Test No. 22.—*Sulphur Distribution.*

Product.	Per Cent. Weight.	Per Cent. Sulphur.	p.c. Sulphur Distribution.
Cassiterite Concent., Spigot...	0.48	1.33	0.03
Cassiterite Concentrate, C/overflow	0.38	0.51	0.01
Cleaner Flotation Concentrate	60.25	31.74	93.87
Flotation Concentrate from Spigot Concentrate ...	0.46	38.84	0.88
Vanned Tailing from C/ov. Concentrate	0.45	27.18	0.60
Table Middling, Spigot.....	0.93	28.52	1.30
Table Middling, C/overflow	1.72	6.49	0.55
Table Tailing, Spigot.....	3.09	3.31	0.50
Table Tailing, C/overflow ...	32.24	1.43	2.26
Composite	100.00	20.37	100.00

TABLE 10.

Test No. 22.—*Sizing Analysis of Composite Cassiterite Concentrates.*

Product.	Per Cent. Weight.	Per Cent. Tin.	Per Cent. Tin Distribution.
+100 Mesh	10.26	67.0	10.12
—100+200 Mesh	36.23	65.7	35.15
– 200+300 ,,	22.62	68.6	22.85
—300+700 ,,	29.23	70.5	30.35
—700 ,,	1.66	66.8	1.63

TABLE 11.

Sizing Analysis of Ore.

(Stage Ball Mill Ground and Wet Screened to Minus 80 Mesh Screen Size.)

Mesh Size.	Weight. Per Cent.	Per Cent. Cum
+100	7·17	7·17
+120	8·05	15·22
+150	13·08	28·30
+200	14·06	42·36
—200	57·64	100·00

TABLE 12.

Analysis of Ore Sample.

	Per Cent.
Tin	0·88
Iron	32·30
Sulphur	20·20
Lime	0·64
Magnesia	3·46
Copper	0·03
Bismuth	Trace
Arsenic	0·10
Lead, Antimony, Zinc	Nil
Acid Insoluble	34·68

Analysis of Acid Insoluble.

	Per Cent.
Silica	61·78
Iron (expressed as Fe_2O_3)	4·00
Alumina	1·82
Lime	Trace
Magnesia	28·27
Cassiterite	3·13

Summary of Other Investigations.

North Valley Mill Tailings.

(Investigation No. 186/44.)

Concentration tests on approximately —200 mesh fraction. Classification of the sample resulted in a product for test work amounting to 68 per cent of the original sample, and containing 80 per cent. of the tin. Assay value of product 0·39 per cent. tin and 96 per cent. of the tin was —200 mesh size. Forty per cent of the tin was recovered by tabling, and it was estimated that 80 per cent. of this amount could be recovered to a finished concentrate. This recovery would amount to 25 per cent. of the sample of tailings as received, or 0·085 per cent. tin. Comparatively heavy gangue minerals occasion difficult table concentration with fine cassiterite.

"Forty" Mill Tailings.

(Investigation No. 187/44.)

Investigation similar to 186/44 over-all estimated recovery 31 per cent, or 0·056 per cent tin.

"Greisen" Ore.

(Investigation No. 350-352.)

Examination of products from test at "Forty" Mill. The three samples examined were battery discharge, crude mill table concentrate, and table tailing. These samples contained 1·02, 2·42, and 0·52 per cent. tin, respectivey. Calculated recoveries on these assays amounted to 62·5 with a ratio of concentration 3·8. Sizing analyses were undertaken and recoveries at each sizing derived. Recoveries were low to 44 mesh, and from 60 mesh to infrasizer fraction 1 recoveries were high.

Pig Flat Ore.

Battery Box Discharge.

(Investigation No. 422/44.)

This sample contained 0·87 per cent tin, and it had been reported that a very low recovery was obtained by milling this ore. Seventy per cent. of the tin was finer than infrasizer fraction 2, and 55 per cent. was of 20-micron size and finer.

Table Pyritic Concentrate.

From "Greisen" and Pig Flat Ores.

(Investigation No. 423/44.)

The ore was reduced by batteries fitted with 12 mesh screens. Sizing analysis showed 34 per cent. plus 85 mesh containing 19 per cent. of the total tin and 26·4 per cent. —200 mesh containing 41 per cent. of the tin. Sizing analyses and determination of free and composite grains of cassiterite were determined. Cassiterite occurs as composite grains in all sizes to 200 mesh which was the finest size examined. Plus 30 mesh concentrate contained 70 per cent. of the contained tin as composites and —120 +200 the percentage of cassiterite as composites amounted to 27. Sizing analysis of cassiterite present as composite grains show that 21, 21, and 23 per cent were —500 mesh size in fractions +60 mesh, +85 mesh to 120 mesh, and +150 mesh to +200 mesh, respectively.

"Forty" Mill Product.

(Investigation No. 425/44.)

"Forty" mill product, stated to be obtained from the classifier overflow and No. 4 spigot. Flotation test was conducted for comparison with a test undertaken by Department of Supply and Shipping at Waratah. The test was undertaken to float talc and sulphides separately with cresylic acid and copper sulphate and xanthate, respectively. Results checked closely and the losses of tin in the flotation concentrates were 35 (Waratah) and 34·3 (Mines Department). A flotation test using high lime and re-agent 637, as reported in investigation No. 205/44, reduced the loss of tin in the flotation concentrates from 34 to 10 per cent.

Renison Associated Tin Mines.

Mill Sampling.

A mill sampling campaign was undertaken with the object of obtaining mill samples for investigation of recoveries and performances of the various mill units. Mill treatment at the rate of 2·5 tons per hour consists of ore reduction by jaw crusher and sizing by vibrating screen to ¾″ size. The +¾″ size is fed to stamp batteries fitted with ¼″ screens and the —¾″ product is fed to a 6′ by 30″ Hardinge pebble mill. The battery and ball mill discharges are sized in a drag classifier operating in closed circuit with the ball mill. The classifier overflow is stated to be substantially —150 mesh size.

The ground ore is submitted to rougher flotation to reject the majority of the sulphides and the re-agents used for flotation consist of copper sulphate, sodium ethyl xanthate, and cresylic acid. The sink product from the flotation unit is then classified and concentrated by tabling. The crude mill concentrate containing approximately 20 per cent. tin is subjected to batch flotation and kieving for the production of sale concentrate.

The mill test over a 5-day period indicated a recovery of 62·69 per cent in a concentrate containing 17·15 per cent tin. The following tabulation shows the four mill products to the stage of concentration already referred to:—

Product.	Per Cent.		Per Cent.
	Weight.	Tin.	Tin Distribution.
Sulphide Tailing.....	63.55	0.29	17.23
Gravity Tailing.....	32.54	0.66	20.08
Table Concentrates.....	3.91	17.15	62.69
Composite Head	100.00	1.07	100.00

Detailed examination of these products was undertaken and several suggestions were made which should improve recoveries.

An interesting feature of the investigation is that the recovery obtained by treatment of the mill-ground ore in the laboratory by standardised ore dressing investigation procedure, including flotation rejection of sulphides and tabling, was practically identical to that of the derived mill recovery.

Mt. Cleveland Tin Mine.

(Investigation No. 94/44.)

Gossaneous ore from Luck's Lode and Khaki deposits was submitted to concentration test by tabling, and, after reduction to 12 mesh and 36 mesh, recoveries of 62 and 70 per cent. were obtained. Primary concentration after reduction to 36 mesh, followed by middling re-treatment after grinding to —150 mesh, resulted in a recovery of 75 per cent.

(Investigation No. 63/44.)

A sample of pyritic ore obtained from Henry's and Hall's lode was submitted for concentration tests. The main sulphide present in the sample was pyrrhotite, together with minor amounts of chalcopyrite, sphalerite, and stannite. The sample was subjected to two types of treatment:—(1) Reduction to —85 mesh flotation rejection of sulphides and table concentration. This treatment resulted in recovery of 67·8 per cent. in a concentrate containing 35·8 per cent. tin. The flotation sulphide concentrate amounted to 22·6 per cent. by weight and contained 1·07 per cent. tin, or 10·6 of the total. (2) Treatment consisted of primary reduction to 36 mesh, and concentration to pyritic table concentrates followed by secondary reduction of the table middlings and tailing to —150 mesh, and re-tabling of same followed by roasting and concentration resulted in a recovery of 75 per cent. of the tin.

Investigations into the sulphide flotation concentrate referred to in (1) showed the reason for the high tin loss in the product. Tin occurring as cassiterite in this product was, in the main, of grain sizes that could be effectively recovered by gravity concentration, but they were found to exist as composites with and rimmed with stannite, and the association of this mineral would be the reason for these particles being present in the product. This evidence is regarded as the reason for the higher recoveries obtained by concentration to sulphide concentrates followed by roasting, &c.

In conclusion, I desire to record my appreciation of the services rendered by the laboratory staff.

APPENDIX III.

REPORT OF THE CHIEF INSPECTOR OF MINES.

The Chief Inspector of Mines (Mr. W. H. Williams) reports:—

Mines and Works Regulation Act.

The average number of men employed in mining, quarrying, and metallurgical operations was 5439, as compared with 5535 for the previous year.

Accidents.

The total number of accidents, registered under the provisions of Section 23 of the Act, was 73, as against a like number for the previous year. The 73 accidents resulted in injury to 75 persons.

The appended tables relate to—

(1) Fatalities and non-fatal casualties at mines, quarries, and works, which involved absence from work for more than 14 days.

(2) The average number of persons employed and the rate per 1000 persons employed of fatal and non-fatal injuries in the State and in each mineral division.

There were an additional four accidents in the northern and southern division, three more in the north-eastern division, an additional three in the eastern division, three less in the north-western division, and a decrease of seven accidents in the western division.

Three accidents were attended with fatal injuries to four persons, as compared with six accidents involving fatal injuries to six persons for last year. One fatal accident occurred in each of the eastern, northern and southern, and western mineral divisions.

No fatality occurred in underground workings, the three accidents being associated with operations in surface workings at mines and quarries.

The most serious fatality involved the death of two miners and severe injuries to a motor-truck driver. The accident was due to the explosion of an unreported misshole, by "bulling" operations in a hole that had been bored in the immediate vicinity. Reference is made to the mishap in the report of the Chief Inspector of Explosives.

The second fatality occurred at the sluicing face of a tin mine. Soft tin-granite was being sluiced when a slab of granite slipped from the face and struck a miner who was working alone in the opencutting at the time of the accident.

The third fatal accident occurred at a stone quarry and was due to a small piece of rock falling from the face of the quarry and striking a workman on the head.

Of the 70 accidents causing non-fatal injuries to a like number of persons, 55 were of a miscellaneous nature. Twenty-one of the accidents occurred in underground workings and 34 were allied with surface operations. Two casualties were due to falls of ground in underground workings and three persons were non-fatally injured by falls of ground in opencut workings. Three surface accidents and four underground accidents were allied with haulage and trucking operations. A coal miner was seriously injured when flitting a coal-cutting machine, and two persons were severely burnt by explosions of molten carbide.

The rate per 1000 persons employed fatally injured was 0·735, as compared with 1·084 for the previous year.

The rate per 1000 incapacitated for more than 14 days was 13·054, as compared with 12·104 for the previous year.

Prosecutions.

Legal proceedings were instituted in several cases where the commission of offences against the legislation was more serious than could be satisfied by cautionary measures.

Action was taken against two persons for failing to use appliances provided for the suppression of dust during rock-drilling operations. A miner was prosecuted for the unauthorised removal of explosives from a mine, and legal proceedings were instituted in several instances of grave acts of misconduct.

Inspectorial.

The inspectorial staff was brought to normal level and every care was directed to the health and safety of those employed in the industry. The appended reports cover the activities of all inspectors.

COMPARATIVE Table of Statistics of Accidents in and about the Mines of Tasmania from 1st July, 1892, to 31st December, 1944.

Period.	Number of Miners Employed.	Number of Accidents.	Number of Persons		Total Killed and Injured.	Average per 1000 Killed and Injured.	Average per 1000.	
			Killed.	Injured.			Killed.	Injured.
1 July, 1892, to 30 June 1893	3295	28	4	25	29	8·8001	1·214	7·586
" 1893 " 1894	3403	25	7	20	27	7·934	2·057	5·877
" 1894 " 1895	3789	26	4	24	28	7·390	1·058	6·332
" 1895 " 1896	4160	22	7	16	23	5·529	1·682	3·847
" 1896 " 1897	4303	36	7	31	38	8·831	1·627	7·204
" 1897 " 1898	5530	36	13	33	46	8·318	2·351	5·967
" 1898 " 1899	6180	35	9	34	43	6·957	1·456	5·501
" 1899 " 1900	6834	19	7	16	23	3·365	1·024	2·341
" 1900 " 1901	7017	29	8	23	31	4·417	1·140	3·278
" 1901 " 1902	6438	38	7	35	42	6·524	1·088	5·437
" 1902 " 1903	6484	44	6	43	49	7·557	0·925	6·632
" 1903, to 31 Dec., 1903	5604	27	8	20	28	4·977	1·428	3·569
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	0·748	9·224
" 1922 " 1922	3835	31	4	27	31	8·083	1·043	7·040
" 1923 " 1923	4785	64	2	63	65	13·584	0·417	13·166
" 1924 " 1924	5264	72	1	73	74	14·057	0·189	13·867
" 1925 " 1925	5110	62	2	61	63	12·328	0·391	11·937
" 1926 " 1926	5309	54	5	52	57	10·736	0·941	9·794
" 1927 " 1927	5044	70	5	65	70	13·877	0·991	12·886
" 1928 " 1928	5170	47	1	46	47	9·090	0·193	8·897
" 1929 " 1929	4986	59	17	55	72	14·440	3·409	11·031
" 1930 " 1930	4606	55	4	52	56	12·158	0·868	11·289
" 1931 " 1931	4391	38	8	35	43	9·792	1·821	7·970
" 1932 " 1932	4605	71	4	67	71	15·418	0·868	14·549
" 1933 " 1933	4510	77	7	71	78	17·295	1·552	15·742
" 1934 " 1934	4843	108	4	105	109	22·506	0·826	21·680
" 1935 " 1935	5409	142	1	141	142	26·252	0·184	26·067
" 1936 " 1936	5432	97	4	96	100	18·409	0·736	17·673
" 1937 " 1937	5876	107	5	103	108	18·379	0·850	17·529
" 1938 " 1938	5891	103	2	102	104	17·654	0·339	17·315
" 1939 " 1939	5928	87	2	87	89	15·013	0·337	14·676
" 1940 " 1940	6000	103	2	102	104	17·333	0·333	17·000
" 1941 " 1941	5856	85	5	85	90	15·368	0·853	14·515
" 1942 " 1942	5572	89	4	86	90	16·152	0·718	15·434
" 1943 " 1943	5535	73	6	67	73	13·188	1·084	12·104
" 1944 " 1944	5439	73	4	71	75	13·789	0·735	13·054

* Mount Lyell disaster.

TABLE showing Rate per Thousand Killed and Injured in different Divisions for the Year 1944.

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	1944	9	1	8	9	4·629	0·514	4·115
North-Eastern	350	7	...	7	7	20·000	...	20·000
Eastern	538	8	1	7	8	14·869	1·858	13·011
North-Western	512	4	...	4	4	7·812	...	7·812
Western	2095	45	2	45	47	22·434	0·954	21·480
Total	5439	73	4	71	75	13·789	0·735	13·054

ANALYSIS of Statistics of Accidents for Western Division.

Division.	Number of Miners Employed.	Number of Accidents.	Number of Persons		Total Number Killed & Injured.	Average per 1000 Killed and Injured.	Average per 1000.	
			Killed.	Injured.			Killed.	Injured.
Mount Lyell	1549	26	2	26	28	18·076	1·291	16·785
Zeehan, &c.	546	19	...	19	19	34·798	...	34·798
Total	2095	45	2	45	47	22·434	0·954	21·480

APPENDIX IV.

REPORT OF THE CHIEF INSPECTOR OF EXPLOSIVES.

The Chief Inspector of Explosives (Mr. W. H. Williams) reports:—

Explosives Act, 1916.

The imports of explosives were as follows:—

	Lb.
Monobel	14,550
Gelignite	620,750
Gelatine dynamite	82,900
Blasting powder	5,850
Ligdyn	25,000
Ajax	25,000
	Number.
Detonators	636,400
	Feet.
Primacord	1,000

Attention was directed to ensuring that all compounds were in good chemical and physical condition at the date of importation and that there was no deterioration to render the explosives inert at the time of use. Small quantities of nitro-compounds deteriorated to an advanced degree, due largely to faulty storage, and were ordered to be destroyed.

An excessive frequency of miss-fires caused some concern, but investigations traced the main cause to faulty fuse-heads in electric detonators, and this defect was remedied in subsequent importations. Improved control in the sheathing and tying of current and leg wires, testing of electric detonators prior to use, and proper conditioning of firing apparatus, usefully contributed to a reduction of miss-shots.

An experiment with primacord for the instantaneous detonation of multiple charges was successful and the use of primacord is to be adopted, wherever practicable, in group firing at one mine.

One serious accident occurred in connection with the use of explosives. In this case, two persons were killed and one was injured. The accident occurred at an opencut workings and was due to the explosion of a previously miss-fired charge which had not been reported. The explosion was caused by the "bulling" of a hole which was apparently bored in the immediate vicinity of the miss-hole. The holes were toe-holes, directed to lifting the bottom ground, and measures were later introduced to relocate all toehole positions by survey, with good effect in the control of miss-fires.

A second explosive accident occurred when two experienced miners overlooked the time factor, after inserting a lighted "primer" in a 15-foot toe hole. The charge exploded before they retreated to safety. Fortunately, the miners were not seriously injured.

Inflammable Liquids Act, 1929.

There were no major installations and pump storage continued to be restricted by petrol rationing. There was an absence of fires and accidents in connection with the storage of inflammable liquids. Irregularities in practices were remedied without recourse to legal proceedings.

APPENDIX V.

REPORTS OF INSPECTORS OF MINES.

Inspector K. A. Rae, Queenstown, reports:—

Employment.—The average number of persons employed in the mining industry was 1549, representing a decrease of 28 in the number employed last year. All these persons were employees of the Mount Lyell Mining and Railway Company Limited.

Accidents.—Twenty-six accidents, causing fatal injuries to two persons and non-fatal injuries to 26 persons, were registered under the provisions of the Mines and Works Regulation Act, as compared with 30 accidents, causing fatal injuries to three persons and non-fatal injuries to 27 persons during the previous year.

Seventeen accidents, causing fatal injuries to two persons and non-fatal injuries to 17 persons, were associated with surface operations, while nine accidents, causing non-fatal injuries to nine persons were allied with underground mining practices. Twelve accidents were caused by carelessness on the part of the persons concerned or their work-mates, and 14 accidents were due to misadventure.

Of the accidents allied with surface operations, two miners were killed and a truck driver was severely injured when a miss-fired charge exploded. Evidence established that one of the miners knew a miss-fire existed close to where he was working, but he considered it far enough away to be safe, and, with his mate, he had loaded and fired three bull-charges. On firing a fourth charge a heavy explosion occurred and hurled a quantity of rock over the three men. The miss-fired charge had been left from a group of toe-holes fired several months previously and had not been reported to the ganger in charge of operations.

A smelter foreman was crossing an ore bin when one of the cover planks gave way and caused him to fall. The plank had not been properly secured. He sustained a dislocated shoulder.

A miner was boring boulders on the floor of an opencut with a popper machine when he overbalanced and fell about three feet with the machine across his leg. He sustained a fractured leg.

Two men were involved in accidents while working on an opencut face as a result of loose rock falling from above where they were working. One man sustained a concussion and a broken jaw while the other suffered slight concussion. An assistant to a power shovel driver ventured in front of the shovel after completion of a shovelling operation and was struck by a stone which fell from the face. His leg was broken. Whilst repairing a motor-truck body a carpenter stepped into the service pit and sustained a foot injury.

A carpenters' labourer sustained an injured foot when he slipped on a plank.

Minor injuries were sustained in the balance of the surface accidents, although the periods of incapacity exceeded 14 ordinary days.

Of the nine underground accidents, one resulted in a miner having his ankle broken by a stone which fell from the roof. The cause of the injury was due to neglect when the miner failed to provide overhead covering after being instructed to do so. The remaining accidents were not of serious moment.

Safety.—Inspection work was regularly directed to the production and maintenance of safe working conditions. Representations in regard to safety were made to employers and employees, as occasion demanded, and reasonable co-operation has been given by all concerned. In all mining operations strict attention was directed to the removal of unsafe ground before persons were allowed to work beneath it. In underground workings no uncontrolled

rock movements were encountered and safe mining conditions were maintained by the judicious use of timber and sand filling whenever structural weaknesses were observed.

Ladderways, shaft equipment, lighting conditions, ore-pass coverings and protection, life-lines, angles of batter at opencut faces, explosives in transit and in use, surface and underground transport, and many other details of mining practices were regularly inspected. In general, satisfactory conditions have been maintained. In the crushing, milling, and smelter sections of works and in the various extensive workshops allied with mining operations, similar care and inspection have been exercised. Reasonably safe conditions have been maintained.

Ventilation.—Ventilation of underground workings and surface buildings has received due attention. One surface building required extra ventilation, and, following appropriate representations, a suitable exhaust fan was installed. There were no excessive temperatures and ventilating conditions were generally satisfactory.

Health and Sanitation.—Regular supervision was maintained in connection with conditions affecting the health of employees in mines and works. Crib-places, changing and bathing accommodation, and latrines have been kept in reasonably good order. Strict supervision was exercised in the control of atmospheric dust. With the co-operation of officials, improvements and reasonable conditions have been achieved by the appropriate use of suction fans, water sprays, and adequate ventilation. Underground crib-places are being provided with concrete floors and are regularly painted. First-aid stations are being kept in a high-class manner and effective work has been done by the officers in charge of this work.

Explosives.—One fatal accident, reviewed under the heading of "Accidents," occurred when two miners proceeded to bull a hole which they had bored near a miss-fired charge which had remained loaded for approximately three months. Three bull-charges had been fired in a normal manner, but, when the fourth charge of about 2 lbs. of gelignite was fired the adjacent "sleeping" charge exploded. This miss-fired charge consisted of about 45 lbs. of ammonium nitrate gelignite, and, in consideration of the fact that this type of explosive rapidly deteriorates unless stored under proper conditions, it was remarkable that inertness had not developed. The miss-fire occurred when several toe-holes had been fired electrically in series.

Following the accident a Departmental examination was made of the system of electrical shot-firing and of methods of testing detonators and equipment. Useful information was assembled and its adoption has been beneficial in practice. The major cause of miss-shots with electric shot-firing was traced to faulty fuse-heads in the detonators and the defect was referred to the manufacturers for correction in future make-up of detonators.

A second explosive accident was due to lack of care by two experienced miners. A lighted primer had been inserted in a 15-foot toe-hole but the miners overlooked the time factor and the charge exploded before they had retreated to safety. Minor injuries were sustained to exposed parts of their bodies, due mainly to gravel shot out by the blast.

Encouraging results have been obtained at an opencut workings by adopting a modern practice of using a well-hole drill to bore 5 to 6-inch diameter holes to the full depth of the quarry face and loading the holes with large diameter cartridges, spaced or decked at calculated intervals. The following details of this experimental blast are of interest:—

Well drill holes were spaced two at 25 feet and five at 20 feet and bored vertically to a depth of 56 feet along a 53-foot face, thereby allowing three feet of the hole to reach below the floor of the bench. The burden on the holes varied from 14 to 20 feet at the toe, and 975 pounds of A.N. gelignite, "60" 5" x 24" cartridges, were used as a base charge in the seven holes. In charging each hole the first cartridge of explosive was attached to a length of detonating fuse (Primacord, plain), long enough to reach the full length of the hole and allow for joining at the top. Decking or spacing of the upper charges was effected by filling in stemming material until the calculated distance was reached, and, after tamping, the required charge of A.N. gelignite "50" 5" x 24" was placed and then the stemming again put in until the hole was completely charged. The spacing of the charges was planned to give the best fragmentation effect and varied up to 20 feet between charges. This type of loading would not be practicable with ordinary detonation but is excellent when fired with detonating fuse, as this has the effect of detonating each individual cartridge simultaneously. The ends of the primacord fuse from the seven holes were jointed to a main fuse line, carried to the bottom of the face, and connected with the fuse from the toe-hole. A six-foot length of capped safety fuse was attached to the free end of main fuse and the whole series of charges exploded when the No. 6 detonator exploded the detonating fuse.

The total charge, including 80 lbs. used in the toe-holes, was 1710 lbs. of gelignite and 570 feet of primacord fuse, and the firing resulted in 11,500 tons of ore being broken. The test illustrated that it is practicable to use a churn drill in this class of rock and that satisfactory results can be obtained in breaking out the toe and face in one operation.

The effectiveness of detonating fuse is impressive and it appears that the safety of blasting operations will be improved with the use of primacord. Factors in its favour are:—It is not readily affected by water; it will withstand high shock and temperatures without detonation; it causes rapid and complete detonation of charges and eliminates the use of a sensitive detonator in contact with the nitro-compounds.

Machinery.—Maintenance and protection of machinery and appliances received the attention demanded by the provisions of the Mines and Works Regulation Act. No accidents of a serious nature were recorded in connection with machinery. The records of regular inspections and tests kept by registered managers were examined, checked, and found satisfactory.

Prosecutions.—Legal proceedings were taken against five persons for contraventions of the Mines and Works Regulation Act. Two persons were prosecuted for failing to use water to allay dust whilst operating rock drills. Each offender was convicted, fined £1, and ordered to pay costs amounting to 8s. 6d. A miner was proceeded against for having removed explosives from a mine without the written permission of the manager. He was convicted, fined £10, and ordered to pay 9s. costs.

Two persons were charged with unseemly behaviour but the case was adjourned *sine die*, owing to one of the accused being involved in a serious accident prior to the time of the court sitting.

In another instance legal proceedings were contemplated in regard to failure to use safety-lines at an opencut workings, but the legality of the position was uncertain and a set of rules is to be established to remove any degree of uncertainty in regard to the necessary use of safety-lines.

Explosives Act.—Supervision has been maintained in respect of the importation, landing, and transport of explosives.

Explosives landed at Regatta Point for Queenstown were:—

	Lb.
Polar A.N. gelignite "50" 1¼"	350,000
Polar A.N. gelignite "50" 5" x 24"	1,750
Polar A.N. gelignite "60" 5" x 24"	7,500
Polar A.N. gelatine dynamite "75" ⅞"	80,000
Polar A.N. gelatine dynamite "75" 5" x 24"	1,250
Polar quarry monobel 1¼"	750
Total	441,250
	Number.
Detonators, No. 6 L/A	300,000
Detonators, No. 6, electric	4,000
Fuse igniters	45,000
	Cases.
Safety fuse, in reels	400
	Feet.
Detonating fuse (primacord)	1,000

With the exception of a small percentage of electric and ordinary detonators, no trouble was experienced in the storage or use of any explosives.

Attention was given to the testing of the burning rate of safety fuse and this was found satisfactory.

Inflammable Liquids Act.—Inspections were made of the premises licensed under the provisions of the Inflammable Liquids Act. Reasonable conditions have been maintained.

No alterations were made to the storage capacities of the various depots.

The Workers' (Occupational Diseases) Relief Fund Act.—Certificates, indicating that 47 new employees were free from disease, were received and registered.

Applications were made by 57 persons for examination for the effect of industrial disease. In 13 instances the applicants were found to be suffering from silicosis, but four of these persons had been certified as suffering from silicosis during previous years.

A comparative analysis of the affected cases is as follows:—

	1943.	1944.
Incapacitated (affected by silicosis 100 per cent)	1	2
Partial incapacity (over 50 per cent affection)	Nil	3
Partial incapacity (50 per cent affection)	Nil	3
Partial incapacity (under 50 per cent affection)	7	5
Totals	8	13

Included in the above tabulation are four cases examined and certified in previous years. The details of these cases are as follows:—

Incapacity Due to Silicosis. Per Cent.	Age of Person Affected. Years.	Work Years in Mining Operations. Years	Previous Examination.	Result of Examination in 1944.
60	49	23 underground 4 surface	1941	No change
50	45	26 underground 3 surface	1940	No change
50	43	23 surface	1939	No change
60	47	26 underground 5 surface	1939	Increase from 40% to 60%

The following tabulation illustrates the ages and length of service in mining operations of the nine persons found to be suffering from silicosis during the year under review:—

Certified Incapacity due to Silicosis. Per cent.	Age of Person Affected. Years.	Length of Service in Mining Occupations. Years.
100	48	21 underground, 5 surface
100	52	29 underground
70	61	21 underground, 18 surface
50	65	30 underground, 12 surface
40	50	23 underground
40	41	18 underground
40	48	25 underground, 4 surface
20	56	10½ underground
20	38	10 underground

General.—Regular visits of inspection were made to the Storey's Creek and Aberfoyle mines in the Avoca district until an inspector was appointed to the district.

Appreciation is recorded of the co-operation afforded by officials and employees of the various mines and works in the execution of services directed to the preservation of health and safety.

Mining Operations and Production.

Copper.

The Mount Lyell Mining and Railway Company Limited.—The output from all mines was 1,480,062 tons of ore, representing a decrease of 48,275 tons, as compared with the production of last year. Production fell by 19,972 and 28,303 tons from surface and underground operations respectively.

Surface mining at the West Lyell group of mines, which includes the West Lyell, Prince Lyell, Royal Tharsis, and Lyell Tharsis section of the opencut workings, produced 1,346,853 tons of ore, representing a decrease of 19,972 tons, as compared with the previous year.

In the underground sections the greatest shortage occurred at the Lyell Comstock mine following a decision to close the mine and transfer all employees to the surface and underground workings at the West Lyell and Royal Tharsis mines. This step was necessary owing to a shortage of skilled labour. The output alone from the Lyell Comstock mine declined by 23,540 tons.

The Royal Tharsis mine continued at full capacity in the underground section and produced 118,345 tons of ore, being 6031 tons less than the previous year. The decline was probably due to the extensive work required in timbering and forming the new galleries on Nos. 2, 4, and 6 levels as portions of the lower stopes extended up to these levels.

The Crown Lyell mine remained idle but pillar extraction resulted in an increase of 1268 tons of ore from the North Lyell mine.

The following tabulation represents the disposition of ore production:—

	Year 1943. Tons.	Year 1944. Tons.
North Lyell Mine	2,905	4,173
Lyell Comstock Mine	34,231	10,691
Royal Tharsis Mine	124,376	118,345
West Lyell Opencut Mines	1,366,825	1,346,853
Totals	1,528,337	1,480,062

Underground mining work was restricted to ore-breaking for production. Disabilities under war-time conditions retarded operations in the opencut mining sections. Transport and excavation equipment, on order, has not been delivered, and this factor delayed the planned ore-breaking and overburden removal operations.

Diamond drilling was continued for the purpose of testing the assay values of the known ore reserves at the West Lyell mines.

Additions to opencut equipment included one 20-ton semi-trailer motor-truck, a bulldozer, and a well-hole drilling plant. Two major changes in established practice are being experimented with. The well-hole drilling plant is being used to bore 5 to 7-inch diameter vertical holes to the full depth of the face. A series of these holes is specially loaded with explosives and primacord detonating fuse is used. The object is to break a large tonnage of rock in one operation as against several firings under the old system. The second experiment is to let all ore-breaking in the open cuts on a contract system.

In addition to ore mined at the West Lyell mines, 317,814 tons of overburden was broken and transported to dumps, making a combined total of 1,664,667 tons of material removed.

One 9-ton electric locomotive was added to underground transport equipment.

Reduction Works.—The concentration plant operated for 357 days and processed 1,475,889 tons of ore for an extraction of 43,013 tons of copper concentrates and 53,461 tons of iron-pyrite concentrates. The copper concentrate was smelted and 29,136 tons of iron-pyrite concentrate was shipped from Regatta Point for use in the manufacture of acid.

The smelting plant treated the copper concentrate, together with 3296 tons of high-grade ore and 132 tons of precipitates, recovered from copper-bearing water from the mines, and produced 9897 tons of blister copper.

Under normal running conditions, the refinery processed the blister copper for an output of 9831 tons of electrolytic copper. The cell residue was shipped for treatment and returned 38,047 oz. of silver and 6443 oz. of gold.

A flue-dust plant, comprising six units, has been completed and is operating with marked success. A large proportion of fine copper-dust, formerly carried away with the flue draft, is now collected in this new filter plant, together with the heavier dust which used to be recovered after settling in the flue. The apparent effectiveness of this plant will improve the metallurgical results and will eliminate an amount of unpleasant work necessary in periodical cleaning of the main flue.

A plant to extract copper from mine drainage waters was completed and is operating successfully. Scrap tin plate, obtained from cannery works at Hobart, is used in place of scrap iron, to precipitate the copper.

Additional facilities have been provided at Regatta Point for the storage of iron-pyrite concentrates.

Productive activities of the Mount Lyell Company are shown in the following comparative tabulation:—

	1943.		1944.	
	Weight.	£	Weight.	£
Copper (Electrolytic) ..	10,684·000 tons	662,408·000 S.	9,831·000 tons	609,522·000 S.
Silver	44,321·000 oz. f.	4,653·705 S.	38,047·000 oz. f.	3,994·935 S.
Gold	7,220·000 oz. f.	60,648·000 S.	6,443·000 oz. f.	54,121·200 S.
Pyritic concentrate (shipped)	33,203·000 tons	41,503·150 A.	29,136·000 tons	36,420·000 A.
Limestone (quarried)	5,659,·000 tons	1,980·650 A.	6,268·000 tons	2,388·575 A.
Silica (quarried)	7,033·000 tons	2,502·702 A.	5,386·000 tons	2,318·001 A.

S. = Sterling value A. = Australian currency. f. = fine.

Inspector H. A. Vaudeau, Upper Burnie, reports:—

Employment.—The average number of men employed in mining, quarrying, and metallurgical activities was 855, as compared with 816 for the previous year. Operations afforded employment for 302 men in portion of the north-western and 553 persons in the western divisions, exclusive of Mount Lyell. Shortage of labour for mining continued to be very acute and this, together with other operating disabilities, contributed to reduced production at an important group of mines.

Accidents.—Twenty-one accidents were registered under the provisions of the Mines and Works Regulation Act, 1915. Eleven accidents occurred underground and 10 were associated with surface operations. There were no fatalities. An exercise of merited care would have averted several of the accidents. Three men lost 15 days' work and others were incapacitated for periods ranging from 16 to 58 days. One person is still suffering a protracted period of incapacity. In this case, the employee was standing on a haulage track in front of the leading truck of a rake of trucks when the rake was moved up the haulage. He was knocked over and caught under the leading truck with the result that he sustained severe leg injuries. The injured person trespassed on the track under unusual conditions and was not seen by the employee in charge of the haulage. Measures have been instituted to avoid similar future accidents.

An employee sustained an injured thumb when placing a machine bar in a truck and was incapacitated for 58 days.

An underground employee was unloading timber from a cage when he slipped, causing a cap to fall on his left foot. He sustained a fractured instep and was incapacitated for 45 days.

A surface employee was engaged replacing a derailed truck when he was knocked down by a full rake of moving trucks. He sustained a dislocated jaw, spinal injuries, contused chest, and shock. He was unaware of the oncoming trucks until it was too late to get clear. An improved system was introduced for controlling the movement of trucks.

A man was spalling ore when a "scat" flew, struck him in the right eye, and caused him to be incapacitated for more than 14 days.

An employee was placing a truck under a chute when he noticed a forward set of trucks moving along the line. He attempted to reach the brake but slipped and a wheel of one truck ran over his foot, causing toe injuries.

A person was pushing a truck of ore along a level when his foot slipped and caused him to strain his right side. He sustained a hernia and was incapacitated for 28 days.

A miner was boring from a stage which he and his mate had erected when the stage collapsed and caused him to sustain a leg injury.

The remainder of the accidents was such as are more or less common to mining without being due to faulty material or machinery. In the majority of these cases an exercise of more care by the injured persons would have averted the accidents.

Safety.—At one mine exception was taken to a proposal to quarry with 75-foot benches and it was agreed to reduce the height to 50 feet, but with the introduction of a wagon rock drill the bench-height was reduced to approximately 20 feet and thereby afforded more control of safety than would have been the case with high benches. Large-scale operations were contemplated, involving new equipment and reconstruction of practices, and suggestions were made for a submission of proposals to head office for consideration in respect to matters affecting health and safety, and to avert difficulties in regard to future controls. There was no response to the suggestions and later developments confirmed all anticipations regarding the development of unsatisfactory conditions.

Occasionally it was necessary to object to steep batters in opencut workings, but generally faces were maintained in a better condition.

Rills in stopes still cause concern and it is frequently necessary to request that they be kept flatter for safety.

Every encouragement has been extended to officials and employees to keep all affected ground barred down, but cases continued to arise where it was necessary to have defective conditions rectified during the course of inspection to minimise the possibility of serious accident. In many cases badly affected ground was barred down with a minimum effort and illustrated the grave danger to which men were exposed.

Constant care has been necessary in the extension of bulking and other systems of timbering, in the improvement of ladderways, and in the control of details of mining practices for the production and maintenance of safe working conditions.

Health and Sanitation.—Much attention was directed to matters affecting health and sanitation. Complaints regarding filthy habits of underground employees at one mine were relieved by verbal representations, but elimination of malpractices was not completely attained. It was difficult to obtain evidence of misconduct for the purpose of legal proceedings, but endeavours are to be made to overcome the nuisances that have been created.

Deficiencies in first-aid equipment, supplies of pure drinking water, and in latrine arrangements were corrected at one quarry.

Conditions have been improved in many places but care continued to be necessary in controlling conditions, particularly those relating to the formation and drainage of underground roadways.

At one mill conditions of dust caused much concern and it was necessary to order a cessation of milling until such time as measures were taken to eliminate the dust nuisance. Improved conditions resulted, but additional controls are still necessary. At another works atmospheric dust was creating a nuisance, but conditions were corrected as required.

The introduction of a waggon rock drill at a quarry was followed by discontent in regard to the allaying of dust. A water attachment was provided and reduced the trouble appreciably, but it was not reasonably practicable to use water with this type of machine under all ground conditions. The question of dust control was under consideration at the close of the year.

Ventilation.—Ventilation of mine workings continued to receive careful attention and there were improvements, but the ventilation of dead-ends and similar places could be bettered. There were no excessive underground temperatures.

Explosives.—Due regard was given to an observance of the requirements of the Explosives Act and that portion of the Mines and Works Regulation Act relating to explosives. No instance of defective explosives was encountered and no complaint was received regarding the quality of the nitro-compounds, detonators, and the fuse in use.

Unloading and despatch of explosives at the port of Burnie was attended to as occasion demanded. Some difficulty was experienced in having the explosives removed from the wharf to the storage magazines in a satisfactory

manner, but appropriate measures were taken and overcame the difficulty. Conditions of storage were generally satisfactory. Defective storage arrangements were observed and corrected at one mine.

Machinery, Ropes, &c.—Maintenance and protection of machinery and appliances received the attention demanded by the provisions of the Act. Safety cages and winding and haulage ropes were kept under close observation. Official contact has been maintained with the Inspector of Machinery in regard to protection of machinery.

There was one breakage of a haulage rope when in use. A rope had been in use for 17 months in an inclined shaft when, for some unaccountable reason, it fractured. The usual examinations had been made of the rope and there was nothing to indicate advanced wear nor was there any visible corrosion externally or internally. A section from one of the broken ends was tested at a rope-testing station with satisfactory results. No damage was done in the shaft and research failed to reveal the cause of the fracture.

Prosecutions.—Legal action was taken against four persons under Section 74 of the Mines and Works Regulation Act, 1915. One person, while standing on a plat, threw dirty water into the face of a miner ascending in a cage in a main shaft. He was fined £5 with 6s. 6d. court costs. Another person used insulting language to an official and was fined £3 with 14s. costs. Two men were convicted and fined £2 9s. 2d. for fighting on a mineral lease.

The Workers' (Occupational Diseases) Relief Fund Act.—The following tabulation gives particulars regarding the persons who applied to be examined for compensation or release from protected employment:—

Percentage Incapacity due to Silicosis, &c., Certified by Local Doctors.	Percentage Incapacity Certified by Referee Doctors.	Age of Person.	Length of Time in Mining Operation.
%	%	Years.	Years.
Nil	Not refereed	38	16
20	20	63	40
Examined twice, 10 and 20	Nil	46	24
50	Not refereed	55	29
20	Nil	38	16
Full compensation	Not refereed	60	30
30	Nil	56	20
50	Nil	42	13
Nil	Not refereed	35	10

A considerable amount of work was involved in attending to matters pertaining to this Act. Clean certificates were granted to persons starting work as required.

Inflammable Liquids Act.—Occasional irregularities were encountered in storage and handling of inflammable liquids, but these were corrected as and when required.

General.—Despite reduced activities by small parties and labour depletions under war-time controls, the duties of this office were heavy.

Insistence on the production and maintenance of reasonably satisfactory conditions was attended with some unpleasantness, but there was a general response to requirements, and, on the eve of my retirement from the service, appreciation is recorded of the co-operation that has been afforded me by officials and employees in carrying out duties that have been concerned with the health and safety of those employed in the industry.

Mineral Resources—Reports, Examinations, and Prospects.—A large amount of work was involved in matters concerning the development of the mineral resources. Exploratory examinations were made of several areas to ascertain the possibile existence of bauxite.

Operations and Production.

Asbestos.

Tasmanian Asbestos Pty. Ltd., Zeehan.—The fibre extraction mill operated during the early part of the year on ore recovered from opencutting on the serpentine spur at the Five Mile.

During the development of the opencuts a tramline was laid around the hill, bins were erected, a gravity aerial ropeway was installed, and additional equipment was provided for the control of atmospheric dust in the mill.

The installation of an additional fibre-extraction unit increased the through-put of the mill and resulted in an improved extraction of fibre.

Following a completion of the additions to mining and milling facilities, productive operations were resumed. Asbestos rock mined and milled from the opencut near the mill was 1422 tons, from which 66·36 tons of fibre was extracted, valued at £1327. Production of ore from the opencuts on the main hill was 834 tons, of which 785 tons was milled for a recovery of 34·75 tons of fibre, valued at £853. Operations afforded employment for 22 men.

Bauxite.

Some prospecting work was carried out by two parties, one near the intake of the Ulverstone water-supply on the Gawler River and the other at Myalla, Flowerdale River, and Rocky Cape. Ore of a promising grade was disclosed at Myalla.

Numerous samples were sent in from other places, but the analysis was not encouraging.

Cadmium.

The recoverable quantity of cadmium, in ores produced by the Electrolytic Zinc Company of Australasia Limited, from the Read-Rosebery mines, was 39·68 tons, valued at £17,777.

Clay.

No clay was produced for the manufacture of bricks.

Pearson's Clay Pit, Clay Siding.—This clay pit was worked for the requirements of Associated Pulp and Paper Mills, Burnie. The General Superintendent of the mills reports as follows:—

"*Clay Pit.*—A new area, 100 feet square, was opened up by removal of overburden to clay level and the working of this area by a regular system of benches 8 feet deep was commenced in March.

A 2-foot gauge tramway, connecting this pit with the railway siding, was completed early in the year.

Operations have been greatly hindered by the collection of water in the pit and the difficulty of its removal.

During the year 4058 tons of crude clay were delivered to the mills, almost all of this coming from the new pit.

Later in the year overburden was stripped from an extended area 200 feet square, surrounding the new pit area. This will allow extension of the new pit as required.

A motor-driven winch was put into use in November for hauling clay trucks out of the pit.

A storage shed which had been built during the previous year at the railway siding has been extended so as to allow the storage of about 400 tons of bagged clay.

In order to improve communications with the pit, opportunity was taken to run a bulldozer, which was used for removing overburden, over a track about three miles long, leading from the main road at a point about one mile west of the Detention River Bridge to the Government Railway—Burnie to Stanley. This track can be used only in dry weather.

As regards future developments, the area now being worked has been bored to a depth of 28 feet and it is expected that operations will ultimately extend to this depth, mining clay at the rate of 4500-5500 tons per annum.

Clay Treatment.—No alteration was made during the year to the method of clay treatment at the mills, which is by elutriation in cone classifiers, to remove grit.

A storage shed to accommodate 1300 tons of clay is being erected at the mills. A new treatment plant including mixers and classification equipment will soon be under construction."

The clay delivered to the mills was valued at £4772. An average of six men was employed.

Copper.

An output of 381·75 tons, valued at £23,668·5 resulted from operations by the Electrolytic Zinc Company of Australasia Limited at Rosebery. This product continued to be recovered by flotation stripping of copper sulphides from the zinc-lead ores.

Gold.

The recorded output of gold was 9747·877 oz. fine, valued at £81,982·167. Of this production, 9744·52 oz. was recovered from the zinc-lead-sulphide ores mined by the Electrolytic Zinc Company at the Read-Rosebery mines.

A party worked during week-ends and recovered 1·52 oz., valued at £12·768, from beach sands at Doctors Rocks.

A farmer at Camp Creek obtained 0·837 oz., valued at £7·031.

G. Clark did some ground sluicing and dishing on the old recreation ground at Zeehan and sold 1 oz., valued at £8·4. Trenching was carried out in search of the formation from which the gold had been shed, but with negative results.

Some prospecting work was carried out by Messrs. Bert Cross and party on the Gold Reserve at Camp Creek, Upper Mt. Hicks, but nothing of value was disclosed.

Graphite.

As far as is known, no graphite was exported, but latterly some work was done on graphitic-schists at East Ulverstone.

Iron.

Limited prospecting was carried out on the eastern and southern side of Mt. Duncan. There was no production.

Limestone.

A quantity of 273·6 tons of limestone was broken and despatched from Lower Scotchtown to the Associated Pulp and Paper Mills at Burnie. No return was received from the occupier of a deposit at Irishtown, but it is understood that some farmers have produced small quantities for soil treatment on their farms.

Osmiridium.

Very little work was carried out on the old diggings in the Waratah district. Four men were at Bald Hill and the 19-mile Creek at different times, but the only recorded production was 2·71 oz., valued at £66·349.

Ochre.

There was no production from the yellow ochre deposits at Penguin Creek. Some 54 tons of red ochre was broken at Pearson's Farm, Spalford, and sold for £141·5. There appears to be a fairly extensive deposit of ochre in this locality. The deposit of yellow ochre at Smithton was intermittently worked for an output of three tons, valued at £18.

Monazite.

A sample of 2 cwt. of monazite was sent to the mainland from the east coast of King Island. This monazite was extracted from the mineral sands at Fraser River.

Scheelite.

At the King Island Scheelite N.L., Grassy, King Island, 3,260 tons of crude ore was treated at the old mill for a recovery of 32·212 tons of scheelite. Quarrying and milling were then suspended for the purpose of expediting the programme of reconstruction of mining and milling practices for stepping-up the production of scheelite The following information has been supplied by the Superintendent:—

"The activities of the Company comprised—

(*a*) Preparation of its quarry for the supply of 17,000 tons of ore per month to the new mill.
(*b*) Erection of a new gravity and flotation concentrator of 700 tons daily ore capacity.
(*c*) Erection of a diesel electric power house.
(*d*) Erection of auxiliary buildings, comprising housing, stores, and workshops, &c.

Quarry Preparation.—This comprised the removal of overburden and the construction of roads within the quarry to the ore delivery point in the new mill. Equipment comprises three diesel shovels (one 2½ cubic yard North West, one 2½ cubic yard and one ⅜ yard Ruston-Bucyrus), one D. 8 Le Tourneau tractor 'dozer and 11-cubic yard Carryall, six 5-cubic yard steel-body White motor-trucks. Overburden removed comprised 62,800 cubic yards of sand, plus 164,000 tons of rock.

Erection of New Concentrator.—Prior to 1st January, 1944, the excavations for the coarse ore bin, fine ore bin, and ball mill sections had been completed. During the current year we have erected—

(*a*) An ore delivery and coarse crushing section, comprising a 300-cubic feet steel hopper, 4′ x 11′ 6″ apron feeder, and 42″ x 48″ jaw crusher, sitting on a concrete ore bin of 550 tons rillable capacity. Capacity 800-1000 tons run of mine ore to —8″ in eight hours.
(*b*) A medium crushing section, comprising Ross feeder, two 3′ Taylor T.Y. gyratories, 6′ diameter rotary drum washer, three 4′ x 8′ cataract screens, three belt conveyors of 36″, 30″, and 23″ widths, Jeffrey feeders, dust elimination plant, magnet, a 160-ton wood and steel surge bin, and a 1500-ton capacity fine ore bin of similar construction. Capacity 1000 tons —8″ to —½″ size per 24 hours.
(*c*) A fine crushing and grinding section comprising eight push-plate feeders, conveyor weightometer, 24″ and 18″ belt conveyors, three 4′ x 8′ cataract screens, three 4′ x 6′ Hummer screens, 42″ x 18″ high speed rolls, bucket elevator, one 8′ x 23′ Dorr multizone and two 8′ x 26′ straight classifiers, two 6′ x 6′ Ruwolt grate ball mills, one 16″ x 24″ and four 24″ x 36″ Denver jigs and auxiliary Wilfley pumps. Capacity 30 tons —½″ ore to —60 mesh per hour.
(*d*) A flotation section comprising two 8′ x 31′ x 12′ dia. Dorr bowl classifiers, one 80′ torque thickener with two triplex diaphragm pumps, 7′ Denver conditioner, a No. 24 Denver 8-cell flotation machine, two No. 11 Wilfley tables and auxiliary reagent mixing and feeding units and Wilfley pumps and pulp samplers. Capacity 13 tons —150 mesh solids per hour.
(*e*) A gravity concentration section comprising 30 No. 11 Wilfley tables, three Fahrenwald sizers, a Dorr 60′ torque, and a 25′ type A thickener with diaphragm suction pumps, Wilfley pumps and pulp sampler. Capacity 17 tons —60 +150 mesh feed solids per hour.
(*f*) A crude concentrate cleaning section comprising two 25′ dia. thickeners, two 6-twin disc American filters, one 4′ x 35′ and one 6′ x 26′ Lowden drier oil fired, an oil fired rotary tube roaster, four Rapid magnetic separators, Toledo-Berkel dial scale and auxiliary equipment as vacuum and filtrate pumps, small compressor, 12″ x 18″ Denver cleaner jig and 2′ 6″ x 6′ cataract vibrating screen. Capacity 12 tons crude gravity concentrate to sale grade plus filtration and drying of seven tons flotation concentrate per 24 hours.

The above units have been housed in steel or wood frame buildings covered with fibrolite. Sections A and B commenced operating on 10th October and one-half of C and E on the 13th November, all on barren material for running in and crew training purposes. About 350 tons of ore are being milled daily, six days per week. The remaining half of sections C and E will be commissioned later and will raise the mill throughput to 700 tons daily. Section F is now being run in, but the flotation section D is not expected to be ready for use until later.

The water-supply is pumped from the Grassy River adjacent to the mill, which is built on the beach, on the footwall side of the quarry. The mill contains 160 motors, totalling 1600 name-plate H.P., of which 140 and 1432 H.P. will be in operation and the remainder will comprise standby units.

Power House.—This comprises two Bellis Morcom diesel engines driven generator sets, one of 495 K.W. and one of 418 K.W. capacity, plus 500 cubic foot (free air) compressor driven by a 135 H.P. Crossley diesel engine.

Power generation was commenced mid-year and the units are housed in a steel frame fibrolite-covered building, with room for a third generating set.

Auxiliary Buildings and Plant.—These comprise two fuel oil storage tanks, each 50,000-gallon capacity, a fuel unloading station with pumps, a large lubricants store, large general store, machine shops, garage, and general office, all grouped around the mill. All are wood frame fibrolite-covered buildings.

General.—Production of sale grade scheelite will commence early in the new year."

Silica.

Pearson's Leven silica quarry was worked according to the demand for silica from the mainland, the quantity being limited to 25 tons, valued at £50.

Silver-Lead.

Farrell Mining Co. Ltd., Tullah.—Crude ore mined and milled was 7683 tons, for a recovery of 1620 tons of concentrates, containing 143,640 oz. silver and 1188 tons of lead, valued at £44,782·2. The average number of men employed was 58.

The General Manager reports as follows:—

"*Power.*—The transformer was badly burnt out by lightning and caused a delay of two days; otherwise the hydro-power was continuous and satisfactory.

Treatment Plant.—The crusher section and flotation plant worked satisfactorily during the year, but, through shortage of milling ore, operated only a little more than half-time.

Mining Operations: No. 7 Level.—The north drive was advanced a further 93 feet, making the total distance from crosscut 259 feet. The drive was extended on the lode which although patchy, produced payable milling ore over 50 feet. The ore occurred on the foot and hanging walls, with a horse of mullock in the centre of the wide drive, which in places was over a width of 21 feet.

South Drive.—A rise was lifted 48 feet on the lode south and then stopped owing to shortage of miners.

Main Crosscut.—The main crosscut was advanced 25 feet and a chamber was cut preparatory to sinking a winze to test the main lode below No. 7 level. Progress has been slow owing to working only one shift.

No. 1 Level.—The eastern crosscut in the footwall was advanced a further 89 feet, making the total distance from main drive 282 feet without change.

The south-western crosscut was driven a further 94 feet; total from main drive 181 feet. At the end of this crosscut a rise was lifted to the surface holing through near mullock tip. This rise will facilitate the mullocking of the stopes.

Stoping.—Stoping has been carried out at Nos. 7 and 6 levels south of the main shaft, and at Nos. 4, 3, and 2 levels north of shaft. The stopes have produced payable ore, the north stope at No. 2 level being highly productive of excellent ore, carrying high silver values.

General.—The geological structural examination has been continued by the Mines Department geological staff. This work, when plotted, should be helpful to the future of the field generally, especially in regard to the occurrence of payable ore in the schists and slates.

Our operations during the year under review have been most difficult owing to the shortage of miners and the fact that we are only working one shift, which makes it difficult to get rid of the mullock from development work. This retards progress and development work, which is so essential in mining."

Zeehan.—An old-age pensioner did some prospecting work for a short period on the old Spray lease but exposed nothing of value.

Tin.

Department of Supply and Shipping (Mineral Production Division), Mount Bischoff Tin Mine, Waratah.—The Manager, Mr. J. T. Eddy, supplies the following information:—

"*North Valley Mine.*—Additional buildings—

(*a*) Tool and fuse sheds at No. 5 level.

(*b*) Magazine at No. 5 level.

(*c*) E.C.'s at No. 4 and 2 levels.

(*d*) New crib house with central heating at No. 5 level.

(*e*) Woodshed at change house.

Duckboards have been installed between the lines on the levels for foot-traffic. A haulage is being installed from No. 7 level to above mill crusher.

North Valley Mill.—A new grizzley installed over the crusher. Both stamp batteries increased in speed to 100 revs. to increase output.

Several table tops changed to improve recoveries. Piping from water-supply tank to mill renewed. Battery closed to form crib house and Canadian fire-stove installed. Ball mill and Worman pump installed to treat middlings. One International hydraulic tip-truck purchased to convey concentrates from North Valley to calciner.

Pig Flat.—Electric shovel has been completely overhauled. Duckboards installed for foot-traffic.

Greisen Ore Body.—A compressor installed for underground and surface. Ore bin built to fill main line trucks. Crib house with central heating constructed, W.C. installed. Pipelines for air and water installed as required. Trucking line relaid and drains cleaned. Lighting installed along trucking line.

40 *Mill.*—Another 5-head battery was installed to treat Greisen ore. Hydro-sizers installed. Automatic samplers made and installed. Feed launders from battery to sizers renewed. Jigs were reconditioned. Two 25-H.P. motors rewound and placed in service on batteries. Five tables have been reconditioned. Three new tables were installed. Concentrate boxes at the ends of each table removed, tables raised, and launders installed to gravitate concentrates direct to calciner. New slime plant building almost completed with two Wilfley tables to treat middlings and tails. New 20′ x 7′ thickener tank was made and installed to work in conjunction with slime plant. Crib house and W.C. provided for mill hands.

Calciner.—New building was constructed and strake tables were made and installed to treat slimes.

Power Supply.—To curtail the use of power so as to meet peak loads, meters have been installed on consumers in the township. This has cut down consumption by 50 per cent. Extra street lights have been installed in town. New gates have been installed on No. 2 machine in power station, also a relay valve on No. 4 machine. Pipe line outside power house has been scaled and tarred.

Development—

North Valley Mine—Driving 286 feet.

Greisen Lode—Driving, 241 feet; Crosscutting, 36½ feet; rising, 41 feet.

	Ore Mined. Tons.	Ore Treated. Tons.
North Valley Mine	16,319	12,979
Greisen Lode	5,048	4,880
Pig Flat	28,684	28,172
White face	368	458
Total	50,419	46,489

	Treated.	Concentrates Recovered. Tons.	Grade. %	Metallic Tin. Tons
Calciner ..	4084	136·7	66·36 tin	90·725

Tributers' Production, 5·55 tons metallic tin.

Diamond Drilling, 1364 feet on the Greisen Lode.

The latest estimate of ore reserves developed during the year by driving, rising, crosscutting, and diamond drilling on the Greisen Lode was calculated at 95,900 tons, averaging 0·85 per cent to 0·90 per cent Sn.

This includes 26,000 tons below main tunnel level from West Fault to Line F. Deducting 4200 tons mined, leaves 91,700 tons of the above grade. The 4880 tons milled for the year averaged 0·82 per cent Sn.

The 28,172 tons treated from Pig Flat assayed 0·62 per cent Sn., whilst during the last four months of the year the grade was 1·05 per cent Sn. for 9400 tons treated. It appears that the portion of the Pig Flat face from whence the high values were obtained is the eastern extension of the Greisen Lode, though still in a decomposed state.

At North Valley 12,979 tons of ore were treated for an average head value of 0·76 per cent Sn. Ore reserves calculated in August were 15,860 tons, averaging 0·80 per cent Sn., approximately sufficient for twelve months supply to the treatment plant. Broken ore in shrinkage stopes at the end of the year totalled 3340 tons.

The extension southwards on the No. 2 level at North Valley for a distance of 55½ feet disclosed a narrow lode having a width of 16", averaging 0·75 per cent Sn. At the No. 4 level the South Drive advanced 202 feet. The first 116 feet assayed 0·80 per cent Sn. over a width of 4 feet and has since been stripped in places to 14 feet wide, averaging about 1 per cent Sn. From 116 feet a blank was disclosed to 161 feet. The remaining 41 feet assayed 0·53 per cent Sn., for a width of 2 feet.

Preparations were commenced for bringing No. 7 level into production, and it is anticipated to obtain a fair amount of good grade ore.

Tributers.—Three parties (Packett, Campton, and Housego) consisting of six men are tributing in the bed of the Waratah River, re-treating old tailings."

Departmental statistics of production were:—Products treated, 49,583 tons for 160·356 tons of concentrates, containing 98·35 tons of metallic tin, valued at £28,905·6. The average number of men employed was 97 on the surface and 23 underground.

Housego, in cleaning up below the Mount Bischoff Tin Mine alluvial workings, obtained 0·368 ton of concentrate, containing 0·223 ton of metallic tin, valued at £60.

S. A. Betts and W. Pryde, working at Ritchie Creek, Waratah, won 0·07 ton tin-oxide, containing 0·059 ton of tin, valued at £12·885.

A. Langmaid and partner prospected for tin north-easterly from the Mount Bischoff leases, but made no discovery of moment. The locality is considered to be one of prospective merit.

Renison Associated Tin Mines N.L., Renison Bell.—Ore mined and milled was 10,562 tons for a recovery of 110·08 tons of concentrates, containing 72·426 tons of metallic tin, valued at £21,045.

The General Manager reports:—

"Ore mined during the period was won from the Battery and Dalcouth workings. Mine development has been pushed ahead in three sections of the Company's workings, namely the Battery, Dreadnought South, and Renison Bell Glory Face workings. Shortage of suitable labour has somewhat handicapped the work, but good progress has been made, particularly at the Battery workings, where at No. 1 face a considerable tonnage of ore has been developed. At No. 3 face development work is proceeding satisfactorily. No. 2 face at these workings has, in the course of mining operations, opened up particularly well and a large body of ore is available for open-cut mining.

In the mill attention has been given to the losses of fine tin (minus 500 mesh material) in the gravity concentrating section of the plant. In order to minimise these losses, a slime plant consisting of a double-deck revolving rotary table and a fast running Diester table to dress the rotary table concentrates were installed. The overall recovery has been stepped-up from 52 per cent to 63 per cent.

In order to increase the output from the mine, the Company is installing rolls to replace the stamper batteries and is installing a new Ball Mill and Classifier in order to overcome the present excessive sliming. It is hoped to have the new plant completed in June, 1945, when the throughput of the mill will be increased to 500 tons per week."

J. S. Fenton sluiced approximately 620 cubic yards of ground for 0·398 ton of tin-oxide, containing 0·247 ton of metallic tin, valued at £72·845.

J. Pepper working on Pine Hill ground-sluiced 35 yards of ground for 0·037 ton of concentrate, containing 0·022 ton of tin, valued at £6·6.

At Ex Gorge *A. J. Salmon* continued to prospect the lode previously worked. He burnt and hand-crushed seven tons of ore for 0·109 ton of concentrate, containing 0·074 ton of metallic tin, valued at £20·54.

At the Ex River *J. Copping* has been prospecting. He produced 0·054 ton of tin-oxide, containing 0·029 ton of tin, valued at £8·7.

At the Five-Mile Area *Casey and Smith* were treating material from old dumps. Approximately 155 tons were processed for 1·737 tons of concentrate, containing 0·939 ton of metallic tin, valued at £263·03.

From the same area *J. Wallace* produced 0·054 ton of tin-oxide, containing 0·029 ton of metallic tin, valued at £8·7.

Balfour Area.—*E. Bayley* sent away 0·367 ton of concentrate, containing 0·27 ton of tin, valued at £21. The tin-oxide was won from Specimen Hill. The old field is now deserted.

Heemskirk Area. At South Heemskirk *E. Coleman*, as a spare-time job, has been doing some development work on a known ore occurrence. He produced 0·167 ton of concentrate, containing 0·096 ton of tin, valued at £24·9. An option of purchase was let to the Mount Lyell Company and investigational work is to be carried out.

W. Higgins, at Maynes, South Heemskirk, did some crosscutting from the Battery-level adit without striking good values.

A. Robertson produced 0·096 ton of ore at South Heemskirk. The concentrate contained 0·046 ton of tin, valued at £13·27.

Working at North Heemskirk *R. Smith* produced 0·150 ton of ore, containing 0·095 ton of tin, valued at £28·5.

H. G. Watson was engaged at the old Eureka Tin Mine, North Heemskirk. He recovered 1·885 tons of ore, containing 0·671 ton of metallic tin, valued at £197. There are possibilities in this locality.

Gattenby and Paterson were intermittentlyy engaged in treating mineral sands at Fraser River, King Island. Production was 0·29 ton of tin-oxide, containing 0·196 ton of tin, valued at £50·86.

Experimental work has been carried out to determine the commercial possibilities of the mineral sands, which contain ilmenite, zircon, rutile, tin, and monazite, but there has been no forward development.

Razorback Tin Mine, Dundas.—A working option was let to Mr. Eric Brock and the person in charge of the operations, Mr. J. Hodge, reports as follows:—

"For the past year we have driven diagonally across the lode for approximately 100 feet from the main adit, going north on the line of lode. This contained good values in a gossan and pyritic gangue. The first 70 feet went 1 per cent tin.

We then commenced to rise and have risen 60 feet through good milling gossan with values better than 1 per cent tin.

It is our intention when we break through to the surface to drive on the footwall from the 40-foot mark in the rise in the gossan as far as possible towards the top section.

The option-holder has visited the mine and the top section has been sampled. We are pleased with the results, practically all the samples being good milling ore.

We hope to get two more men and drive on the lode south from Westerway's Tunnel on the top section, as there is a large gossan outcrop in this locality. Trenches assay well and it is desired to test the formation deeper.

Two men have been employed on the top section and driving has been commenced."

Zinc-Lead-Copper.

Electrolytic Zinc Company of Australasia Limited, Rosebery, Williamsford, and Zeehan.—The Hercules mine produced 47,438 tons of ore and the Rosebery mine produced 101,456 tons of ore, the total of 148,894 tons being treated at the concentrating mill at Rosebery for a recovery of 44,096 tons of zinc concentrates, 9681 tons of lead concentrates, and 4462 tons of copper concentrates. The concentrates contained 20,833·15 tons of zinc, valued at £567,703·338, 7038·5 tons of lead, valued at £175,962·5, 381·75 tons of copper, valued at £23,668·50, 39·68 tons of cadmium, valued at £17,777, 9744·52 oz. of gold, valued at £81,954, 846,489·29 oz. of silver, valued at £88,881·375, making a total of £955,946·713. The average number of men employed at the mines and works at Rosebery and Williamsford was 389. An average of 25 men was employed at the calcining works at Zeehan, where zinc concentrates from Rosebery were calcined and despatched to Risdon for final treatment.

The Superintendent, Mr. F. G. Burns, supplied the following information regarding developmental work:—

"*Diamond Drilling.*

Footage bored during the year—

Rosebery Mine	2,619
Hercules Mine	3,231
Total	5,850

The main development from diamond drilling was intersecting good grade ore on the eastern side of 'A' lode on No. 4 level. This lode is now known as 'O' lode. Other drilling gave useful information and extensions of known ore bodies.

Prospect Drilling.

Footage bored during the year was 2602 on the Ring P.A. and Black P.A. areas.

The Ring P.A. drilling was very disappointing, no payable ore being intersected.

On the Black P.A. area one bore disclosed tin values over a fair width, but subsequent drilling proved very difficult owing to the broken nature of the ground and the prospect was abandoned.

Development.

Rosebery Mine—

Driving.	Cross-cutting.	Rising.	Winzing.	Total.
ft.	ft.	ft.	ft.	ft.
64	94	695	27	1457

Included in these figures is 374 feet of drilling on No. 10 level. This driving and subsequent diamond drilling proved that the width of the ore body was comparable with other parts of the mine.

Hercules Mine—

Driving.	Cross-cutting.	Rising.	Winzing.	Total.
ft.	ft.	ft.	ft.	ft.
258	18	39	152	467

The main development was the opening up of 'O' lode from 5B level.

Ore Production.

Ore production for the year was again below normal owing to the shortage of manpower and absenteeism. Developmental work was also restricted for the same reason.

Remarks.

No fatal accidents occurred during the year.

Following a dispute over the weight of ore in trucks, contractors decided to work on wages from 24.11.44, and were still on wages at the close of the year.

A second bulldozer (Allis-Chalmers) which had been on order for some time was delivered at the close of the year.

There has been no major change in mining methods but preparations are being made to mine a fair tonnage of ore by opencutting.

Milling continued on a reduced tonnage due to shortage of production from the mines. Otherwise milling conditions were normal, with no material alterations in the mill."

Talc.

Messrs. Allan Pearson and party obtained the right to mine talc at Beulah Farm, Gawler. Hand-boring was carried out and an area was then stripped with a bulldozer to uncover the talc. Actual production was not materially active, only 4 tons, valued at £16, being produced and exported.

Inspector L. F. Egan, Launceston, reports:—

Employment.

The average number of men employed in the Launceston division was 882 compared with 897 for the previous year. This decrease was due largely to the absorption of men into other industries and labour depletions under wartime conditions.

Accidents.

Fourteen accidents, causing fatal injuries to one person, and non-fatal injuries to 13 persons, were registered under the provisions of the Mines and Works Regulation Act, compared with 11 accidents, causing non-fatal injuries to 11 persons, registered during the previous year. Eleven of the accidents occurred on the surface, and three happened underground.

The victim of the surface fatal accident had only one eye, and was known to be hard of hearing. A slab of granite, estimated to weigh approximately five tons, slipped from the face and crushed him to the ground causing instantaneous death.

Crushed fingers resulted from two accidents caused by falling rocks. One person strained the muscles in his back when lifting a bag of tin in an awkward position, and another jarred the muscles of his back when forced to jump off the haulage by a whipback of rope. When falling stone struck a truck, causing it to run forward, one man sustained compound fractures of his right leg and left ankle. Fluid on the elbow resulted from a severe bruise received when a man, who was levering out a boulder, had his arm jammed against the face. Other injuries caused by surface accidents were hernia, fractured wrist, a broken fibula, and bone broken in hand.

Each of the three underground accidents resulted in injured fingers, and one sufferer had to have a section of his finger amputated.

Safety.

Constant supervision was exercised in the effort to ensure safe working conditions at all mines and works. On one of the larger alluvial mines, the establishment of safer working batters was considered essential, and the co-operation of the management was enjoined to accomplish the desired result.

At another mine the steepness of the batter combined with heavy rains rendered its continued operation unsafe.

In view of these factors and the low grade of ore being mined the show was discontinued. Strict attention was paid to ensuring the observance of all other provisions necessary for safe working on all shows, big and small, in the inspectorate.

An indication of the care exercised over blasting practices is evinced by the absence of explosive accidents.

Health and Sanitation.

Efforts were directed by the Department to ensure that crib-houses, change-houses, latrines, &c., were maintained in clean and hygienic conditions. The placing of first-aid equipment at suitable points throughout some of the larger mines was an innovation. The control of dust received constant attention and a fair standard was maintained.

Explosives.

Personal supervision was exercised over the importation and landing of explosives at Launceston, and satisfactory certificates of analysis were received in each case. Six cases, in one cargo, exhibited signs of superficial wetness, but an examination of the contents revealed no deterioration. It was ascertained that penetration of the water was due to a worn hatch-cover. This cover was replaced by a new one. No defective nitro-compounds, safety fuse, or detonators were encountered throughout the inspectorate.

Machinery.

In co-operation with the Inspector of Machinery all mining machinery was kept under surveillance. Wartime conditions mitigated against the introduction of much new machinery with the result that, in only a few cases, was it necessary to require the installation of safety guards, rails, &c.

Inflammable Liquids Act.

Provisions of the Inflammable Liquids Act were policed without untoward incident, the handling and storage of inflammable goods being carried out in a satisfactory manner. The total number of licences issued again decreased, due mainly to petrol rationing. At the same time, several new installations were inspected and recommendations for their licencing were forwarded to the Chief Inspector.

Mineral Resources.

One application for financial assistance was received, and a report was furnished thereon. Every opportunity was taken to encourage the economic exploitation of the mineral resources. Areas visited in this regard included Bell's Hill, Lefroy, South Mount Victoria, South Mount Cameron, and St. Helens. A survey of clays of possible economic importance was carried out, and samples and reports were furnished to the Department. Attention was focussed on at least one deposit of clay which has now been worked.

Mining Operations and Production.

Gold.

A further decrease in gold production is shown by an output of 452·51 fine ozs., valued at £3,791·14 sterling, compared with 478·11 fine ozs., valued at £3,976·15 sterling, for the previous year. Lessened activity, due to wartime restrictions on gold mining, could have accounted for this falling-off in production.

Prospecting for gold has been continued in the South Mount Victoria area. Some fairly promising prospects have been uncovered, and increased activity is anticipated with the lifting of wartime restrictions.

Miscellaneous—Lisle and Nabowla.—Production was confined to the first and last quarters, when 3·73 oz. fine gold, valued at £31·31 sterling, was produced by fossickers.

Lefroy.—Chum Creek Cyaniders (in succession to Lefroy Dumps Syndicate) treated 1,200 tons of tailings, in the first half of the year, for a recovery of 42·35 fine oz., valued at £355·75 sterling.

Mathinna.—Golden Gate Dumps treated 5,721 tons of sand for a recovery of 358·10 fine oz., valued at £3,008 sterling. In addition 145 lbs. of slag yielded 5·37 fine oz., valued at £45 sterling. Figures for 1943 were 6,966 tons treated for a recovery of 401·41 fine oz., valued at £3,371·86 sterling. A protracted dry spell, with consequent water shortage, was responsible for the falling-off in production for 1944.

Miscellaneous Fossickers at St. Helens, South Mount Cameron, and Lefroy, produced 5·56 fine oz., valued at £46·74 sterling.

Endurance Tin Mining Company.—In the treatment of tin concentrate, this Company recovered 37·41 fine oz., valued at £314·29 sterling.

New River and Ringarooma.—Gold prospecting, in these areas, was non-productive.

Tin.

A marked decline in tin production is again evinced in the figures for 1944. The output of metallic tin was 653·72 tons, valued at £190,156·23 sterling. Production thus dropped 142·72 tons, representing a sterling value of £16,518·90. Any seeming inconsistency in the comparative values can be ascribed to an increase in the sterling price from £259·5 to £300 per ton, which came into force in the second quarter of the year. One contributing factor to the lower production was the temporary cessation of major operations at the Endurance Mine pending the transfer of the plant to a new set-up.

Increased operating difficulties at the Briseis Consolidated Mine, Derby, resulted in a lowered output.

Storey's Creek Tin Mining Company N.L.—Ore mined and treated for the year represented 12,936 tons as against 10,556 tons for 1943. Increased tonnage milled amounted to 2,380 tons, as compared with the increase of 1,334 tons for 1943 over 1942.

Metallic tin, in 42·3 tons of concentrates produced, was 28·42 tons, valued at £8,216·25 sterling. Work was commenced on the installation of a new mill and much preliminary work has been accomplished. The construction of this mill is part of a programme involving the sinking of a new main shaft at a strategic point on the main lode system. The policy of the company has been one of progress and constructive development. The average number of men employed was 93. A new hall was constructed to assist in meeting the social needs of the community.

Aberfoyle Tin N.L.—Ore mined and milled totalled 18,021 tons, and resulted in an extraction of 311·964 tons of concentrate, containing 237·725 tons of metallic tin, valued at £68,801 sterling.

In the underground section, shaft-sinking, below No. 5 level, was suspended due to increased water being met in sinking operations. To cope with this water, a Pamona heavy duty dewatering pump was ordered, but was not delivered at the close of the year.

Surface development included the construction of a new mill around the existing plant, which continued to operate. Good progress has been made and it is anticipated that the new mill will be in commission early in the new year.

A community mess-hall and appurtenances was erected at the mine for the benefit of unmarried employees and is giving satisfaction. The company is to be commended for the provision of this amenity.

Goshen Tin, St. Helens.—Production of 38·7 tons of tin-oxide, containing 28·19 tons of metallic tin, valued at £8,194·47 sterling. was obtained from four faces, all being worked intermittently as circumstances, involving new "blower" sites, permitted. The "Bog," No. 2 face, has been discontinued. Ground treated in the first nine months totalled 147,500 cubic yards. Employment figures fluctuated from 33, in the first quarter, to 27 in the last quarter. The average for the year was 27 men.

Tasman Tin, Lottah.—Taken over by a local syndicate, this concern is now known as the Anchor Mine, and operations are confined to test sampling by treating ore broken from selected faces. Tin won from these operations, which date from September, totalled 1·683 tons of oxide, containing 1·17 tons metallic tin, valued at £351·45. Four men were employed in non-productive work, during the third quarter, the number being increased to six, in the fourth quarter.

Bryce and Eddy, Recreation Reserve, Weldborough.—Limited production was pursued by this party, the output being 0·332 ton tin-oxide, containing 0·145 ton metallic tin, valued at £38.

Waverly.—Operations were suspended owing to lack of manpower.

V. A. Walker, Owner of the Waverly was engaged on non-productive work in the vicinity of Weldborough.

W. X. X. Mines, Moorina.—Controlled by Mr. A. Walton Bird, employment was afforded for four men. A total of 21,240 cubic yards was treated for a recovery of 9·832 tons concentrate, containing 6·6755 tons metallic tin, valued at £1,957·82 sterling.

Miscellaneous parties operating in the vicinity of Weldborough, Lottah, Moorina, and Blue Tier accounted for 3·54 tons metallic tin, valued at £1,006·72 sterling. An average of 21 men contributed to this production.

Shean Bros., Bradshaw's Creek.—Production was limited to the first six months only, labour shortage being advanced as the reason for non-production in the second half of the year. The output of tin-oxide was 2·864 tons, containing 2·135 tons metallic tin, valued at £640·44 sterling.

Eastern Leads.—Sluicing was continued for an output of 6·632 tons of concentrate, containing 4·9 tons of metallic tin, valued at £1,428 sterling. Deeper ground, encountered on the main lead, compelled the owners to move to another site, pending the installation of hydro-electric power. Average value of ground treated was in the vicinity of 1·15 lb. metallic tin per cubic yard.

Endurance Tin Mining Company N.L.—Productive operations on this mine were confined to the working of shallow ground on the north end of the leases. An output of 61·577 tons of tin-oxide, containing 44·125 tons of metallic tin, valued at £13,237·53 sterling, resulted from the sluicing of 192,900 cubic yards of ground. Employment was afforded for 49 men. Development work included the removal and re-erection of the barge and pump on the Clifton site.

H. V. and L. Woods, Bradshaw's Creek.—An increased production was recorded from this mine where three men were engaged, as compared with one man in the previous year. The output was 6·118 tons of tin concentrate, containing 4·4912 tons of metallic tin, valued at £1,323·33 sterling, representing an increase of 3·0234 tons metallic over 1943. Value of ground treated was estimated to be 2 lb. metallic tin per cubic yard.

Dorset Terraces (Walsh and Wood).—Operations were re-commenced here at the beginning of the second quarter. Production was 1·88 tons of tin-oxide, containing 1·38 tons of metallic tin, valued at £414·10 sterling. Three men were employed.

Briseis Consolidated N.L.—Depletion of area on the stripped overburden level, due to several large slips occasioned by heavy rains, brought about a vigorous policy of development. This necessary concentration of effort resulted in a lowered tin production for the twelve months. Drift treated totalled 711,000 cubic yards, a drop of 37,000 cubic yards on 1943. Overburden removed was 217,000 cubic yards representing an increase of 14,000 cubic yards compared with the previous year. The output of tin concentrate was 265·5 tons, containing 191·14 tons of metallic tin, as against 253·44 tons metallic tin for 1943. Sterling value of 1944 production was £55,188·47. Average number of men employed was 140.

Miscellaneous.—Miscellaneous parties operating in the Herrick, Bradshaw's Creek, and South Mount Cameron areas accounted for 8·53 tons of metallic tin, valued at £2527·36 sterling. In all, an average of 13 men was engaged. A subsidiary production of 0·95 fine oz. of gold resulted from these operations.

Star Hill, Gladstone.—During the last quarter, production declined owing to a shortage of firewood for the steam-pumping plant. The disability was due to a shortage of labour. At the same time, preliminary work was commenced on the installation of electric pumping equipment,

and the construction of a transmission line from the nearest source of hydro-electric power. Yardage figures were available for the first quarter only, 7,500 cubic yards being sluiced for a recovery of 2·393 tons of tin concentrate, containing 1·62 tons of metallic tin, valued at £420·39 sterling. The annual production was 10·524 tons of tin-oxide containing 7·35 tons of metallic tin, valued at £2,139 sterling. Five men were employed.

Dorset Dredge.—The erection of a modern bucket-dredge was completed during the last quarter, and dredging for three months resulted in a through-put of 174,000 cubic yards of ground for a recovery of 3·979 tons of concentrate, containing 2·31 tons of metallic tin, valued at £692·78 sterling. The number of employees increased from 16, in the first quarter, to 32 in the last quarter. The usual initial difficulties were met with, as is normal when commencing operations with a plant of this nature, but these troubles had been largely overcome at the close of the year.

Miscellaneous.—Miscellaneous parties at Derby and Winnaleah were engaged in intermittent sluicing and recovered 3·983 tons of tin-oxide, containing 2·66 tons of metallic tin, valued at £750 sterling. Men engaged in this production averaged 11.

Arba Tin Mine, Branxholm.—Values and production were maintained on the main Groper face although interuptions occurred from "slips" in the wet winter months. The output was 25·868 tons of tin-oxide, containing 19·16 tons of metallic tin, valued at £5,598·96 sterling. Operations afforded employment for 10 men.

Ruby Flat.—Protracted dry weather retarded sluicing activities. Production was 5·428 tons of concentrate containing 3·9 tons of metallic tin, valued at £1,159·40 sterling. Five men were employed.

Baker's Discovery.—Operations were limited to three months of the year owing to inadequacy of the water supply for sluicing. Production was 2·355 tons of tin-oxide, containing 1·69 tons of metallic tin, valued at £506·25 sterling.

Miscellaneous.—Miscellaneous parties, in the Branxholm area, were handicapped by the abnormally dry weather and a resultant water shortage during the winter months. Evidence of this is illustrated in the annual production figure of 1·75 tons metallic tin, valued at £507·95 sterling, against the previous year's production of 4·92 tons metallic tin. Thirteen prospectors were engaged.

Strait Islands.—Some prospecting work was carried out by a Melbourne company on Cape Barren, certain areas being bored. Sluicing operations were of a limited nature, production being 0·972 ton of tin-oxide, containing 0·6 ton of metallic tin, valued at £178·12 sterling. Employment figures fluctuated between 1 and 8, the yearly average being 6 men.

Bell Creek Tin.—As the supply of water permitted, gravity sluicing was continued at this mine for an output of 6·95 tons of tin-oxide, containing 5·15 tons of metallic tin, valued at £1,532·15 sterling.

Golden Sovereign, Herrick.—Productive operations were confined to the first nine months of the year and resulted in an output of 2·322 tons of concentrate, containing 1·64 tons of metallic tin, valued at £454·17 sterling. Planned boring was carried out and, although the tin-drifts were traced out, values were too low for profitable working and the project was abandoned.

Banca Tin Mine, Winnaleah.—Intermittent operations by various small tribute parties resulted in an output of 1·1 tons of tin-oxide, containing 0·83 ton of metallic tin, valued at £234·06.

Wolfram.

Wolfram production was further increased, the output being 241·875 tons, as against 230·025 for 1943. Value of the production was assessed at £86,749 sterling. Principal producers were the Storey's Creek and Aberfoyle Mines. Some production was recorded from the Moina, Mt. Pelion, and Gipps Creek areas.

Storey's Creek Mine.—Output was increased by 25·5 tons of wolfram, the total production being 167·5 tons, containing 121·1 tons tungstic trioxide, valued at £60,550 sterling.

Aberfoyle Mine.—Wolfram production amounted to 68·536 tons, containing 48·571 tons tungstic trioxide, valued at £24.285 sterling.

Gipps Creek.—Small producers contributed 0·32 ton of wolfram, valued at £106·65 sterling.

Miscellaneous.—Miscellaneous operators in the Mt. Pelion-Moina districts were responsible for an output of 5·514 tons of wolfram, valued at £1,808 sterling. Approximately nine men were engaged.

Bismuth.

Production of bismuth was confined to the Moina area, the only contributor being the Shepherd and Murphy Mine. Metallic bismuth recovered totalled 0·151 ton, valued at £126 sterling. Five men were engaged.

Limestone.

Principal producer was the Broken Hill Pty. Co. Ltd., from the quarry at Melrose, the total output being 88,258 tons, valued at £38,613 Australian currency. A further decrease in manpower was responsible for a reduced production. Absenteeism also is stated by the management to be an important factor contributing to the lessened output. This reduction in output, compared with 1943, represents 34,535 tons, the average employment figure being 71, compared with 85 in 1943.

Other producers yielded 6,219·5 tons, valued at £5,719.

Cement.

Goliath Portland Cement, Railton.—This company continued to operate in a progressive manner, points of interest being the preliminary work in the formation of a new bottom bench, and the introduction of waggon drills. Additional raw material storage bins were constructed to enable more detailed control to be exercised in the composition of special cements for specific purposes.

In the production of cement, 67,247 tons of limestone and 504 tons of iron ore were treated. An average number of 103 men was employed.

Red Ochre.

Two parcels, containing 17½ tons and valued at £74, were obtained from a deposit at Mowbray. Work here was spasmodic, two men being employed as occasion warranted.

Clay.

A 5¼-ton test parcel of clay, valued at £6, was extracted from a deposit at Relbia. Work was of short duration, two men being employed in producing the parcel.

Inspector D. Besford, Hobart, reports:—

Employment.

The average number of persons directly employed in coal mines, works, and quarries, including the small coal mines in the North-Western Division, was 2,160, compared with 2,237 for the previous year. The distribution of employment was as follows:—

Coal mining	278
Limestone	47
Quarries	64
Osmiridium and tin	19
Works	1752
Total	2160

Accidents.

One fatal accident occurred during the year when a small piece of stone fell from the face of a quarry and struck a workman on the head whilst he was engaged loading stone into a motor-truck, about 12 feet from the toe of the quarry face.

In addition to the fatal accident, twelve persons were involved in accidents which caused incapacitation for fourteen days. Six of the accidents occurred underground, and six were associated with surface operations.

Four of the underground accidents were caused by falls of coal or stone at the working faces. One person sustained a sprain when lifting, and a second person was injured as the result of being jammed between a prop and a coal-cutting machine as it was being taken around a curve under its own power.

Three accidents occurred at a metallurgical works. In one case, an official sustained a fractured spine as the result of falling into an empty bin. He has since returned to work. One person slipped on a wet floor and sustained a fractured ankle. An employee was boring wood with an electric drill when the auger jammed and caused the drill to turn. The cable twisted around his arm and fractured it. Two accidents occurred at a second works and resulted in burns from molten carbide. One accident was of a serious nature and the injured person was incapacitated

for several months. The other surface accident occurred at a coal mine. In this case, an employee sustained an injured thumb when spragging skips.

With the exception of the workman who sustained a fractured leg, when jammed between a roadside prop and the coal-cutting machine, all employees have since returned to work.

Safety.

Attention has been paid to the safe working of mines, works, and quarries, including the suppression and treatment of dust. Extraction of pillars in coal mines called for special attention, as the pillars have been standing for some considerable time and safe extraction is difficult. The ventilation of these workings is not the least difficult as most of the old roadways had been blocked by the heaving of floors. The quality of the timber supplied to the workmen for the support of the workings was of better standard and gave no reason for complaint. The necessary factor for increasing safety was the erection of the timber without delay by the workmen. It is gratifying to report that the extraction of the pillars has been carried out with only one reportable accident. The cause of this accident was not attributed to the method of working.

At one coal mine, the manager introduced a system of working which was not considered suitable under the seam conditions. Particular attention had to be directed to the developing conditions to ensure that workmen were not exposed to danger. After meeting with difficulties which had been foreseen, the method was abandoned in favour of the generally-accepted "bord and pillar" system of mining. The applied method of advancing longwall is only suitable where seam working produces sufficient and suitable material for building efficient pack-walls. This seam did not produce any packing material, and material could not be economically taken into the mine. The introduction of the longwall system caused uneasiness amongst the employees and temporarily upset the harmonious working of the mine.

The introduction of arc-wall coal-cutting machines into collieries called for the direction of special attention to electrical installations and dust production. Conditions were generally damp and little dust was produced, but, in order to reduce the dust nuisance, it was suggested that ordinary hand-operated water-sprays might be sufficient. At one other mine, a "booster" fan was installed and gave satisfactory results as a sufficient velocity of air was maintained at the face to carry away the dust from the face without the operators being exposed thereto. The only other detail necessary was to ensure that men were not permitted to work within a certain distance on the return side of the coal-cutting machine. Frequent tests were made to ensure that proper safeguards were incorporated and operated satisfactorily to ensure that workmen were not subject to unnecessary risks when handling electrical equipment underground. Close inspections were necessary owing to rough conditions under which equipment must be installed and used. It was necessary to require additional safeguards, in some cases, and to insist on periodical tests and examinations by qualified persons. Where tests did not prove satisfactory, the use of the apparatus was ordered to be discontinued until the defect was remedied. Electrical equipment was thus kept to a satisfactory degree of safety. Inspections and tests have been carried out with a safety lamp at all coal mines. Tests were also made in some of the old workings and at the edges of the pillars, in the pillar workings, to ensure that no accumulations of gas were present in places which are sometimes neglected. Tests were made of several miss-fired detonators, and miss-shots were closely investigated as it was felt that electrical detonators had deteriorated and were not giving full satisfaction. An investigation was made into the cause of miss-fire shots at one mine where ordinary detonators were being used and, by instructing the workmen and the management in the adoption of certain precautions, the number of miss-fires was reduced considerably.

Shot-firing at quarry faces had to be investigated, as it was suggested that there was a possibility of electric wires being damaged by flying pieces of stone. Recommendations were made to the quarry owners concerned, and, if adhered to, will minimise this possibility when firing short breaking-up shots. Close attention has been given to quarry faces, as some are gaining considerable height, and the safe working of the high faces calls for special care. On occasion, it was found necessary to withdraw the workmen, and order batters to be made safe, and ledges to be cleared of loose material.

Ventilation.

No inflammable gas was found in any of the coal mines. Careful tests were made in some unventilated old roads, considered suitable for gas accumulations, but inflammable gas was not detected. In some cases the roadways contained "blackdamp," but this gas was cleared by ventilation before workmen were permitted to enter the roadways.

Ventilation of some of the coal mines is by natural means. This has not been considered adequate where workings are distant from mine openings, and it was necessary to order the installation of suitable ventilating fans.

Attention had to be paid to the ventilation of the working places and the proper distribution of air through the mines. The proper ventilation of the working places in "pillar section" involved much work, as temperatures were higher in those workings than generally met with in other workings, due to old roads being closed and airways being difficult to maintain, owing to the roof collapsing or the floor heaving. This is a natural consequence when pillars are being extracted, and the efficient ventilation of the working places becomes a constant problem. Wet and dry bulb temperature readings have been taken regularly in all working places and airways to keep the conditions continually under observation. Although temperature recordings were within the limits prescribed by the Mines and Works Regulation Act, it was necessary to stop some working places which were not considered satisfactory for the safe working of individuals.

Regular ventilation tests have also been carried out to ascertain that the requirements of the Act were fulfilled in connection with the quantity of air produced for the efficient ventilation of the mine. In the majority of cases the quantity and quality of the air was found to be adequate.

Machinery.

The machinery was generally maintained in good order, and much work has been done in testing and inspecting to ensure that this is so controlled. The electrical machinery has been regularly examined and tested, as it is felt that safety can be achieved only by paying strict attention to examinations and tests. New installations at the coal mines have been given special attention to ensure that they are installed in a satisfactory and safe manner. The proposed introduction of a set of rules relating to the use of electricity and electrical machinery in coal mines will relieve the amount of work that has been involved in ensuring the safety of electrical equipment.

Health and Sanitation.

Attention has been directed to matters affecting the health of employees at the various mines, works, and quarries, and certain recommended works have been carried out to allay dust, to improve crib-rooms and change-rooms, and to provide latrines. It was found necessary to order innovations to be made to one crushing plant where dusty conditions were creating a nuisance to the workmen. Improved working conditions resulted when the innovations were made. Complaints regarding dust and fumes at some of the works were received and investigated. Remedial measures were recommended and carried out with beneficial results. It was found that, in some cases, improvements could be effected by the workmen fulfilling their personal obligations to control nuisances, and if strict attention is paid to the use of sprays, where provided, improved working conditions would result.

The provision of new crib-rooms and change-houses has been carried out at some of the quarries which were without such facilities. New places were provided at some works to replace old types considered to be unsuitable. The production of dust during coal-cutting with the arc-wall machine was investigated, and steps were taken to prevent the workmen being exposed to excessive amounts thereof.

The provision of suitable latrines was carried out at quarries and mines where conveniences were not considered adequate.

Explosives.

Attention was directed to the storage and use of explosives and to the provision of properly constructed magazines to replace unsuitable buildings and provide storage facilities where none existed. Investigations were made into an excessive number of miss-fired shots and disclosed that an inferior batch of electric detonator fuse-heads was imported, and was causing the trouble. Detonator leg-wires were considered to be insufficiently insulated for use in damp surroundings and this matter was discussed with manufacturers' representatives, with a view of improving the type of covering, a deficiency claimed to have been due to war restrictions. Tests of miss-fired detonators collected at the mine where electrical shot-firing was carried out disclosed that the majority of miss-fires was due to faulty fuse-heads, although some might have been caused by an excessive amount of current leakage, due to faulty insulation of the shot-firing circuit, including

the detonator leg-wires or faulty apparatus. It was necessary to order the use to be discontinued of some of the shot-firing apparatus, considered to be a likely cause of miss-firing detonators.

Tests were made of several ordinary types of detonators which had been recovered from miss-fired shots, and the majority of these was found to be in such a condition that they were capable of being fired by ordinary fuse. Investigations pointed to the miss-fires being due to damp conditions. Instructions were issued for the use of a proper compound for the sealing of detonator and fuse, and miss-fires have been reduced to a minimum. Insistence on the recovery of the miss-fired detonator tendered to minimise the dangerous consequences of miss-fired shots.

Inflammable Liquids.

There were no new installations during the year. One application was received for the storage of drums of petrol, but investigations showed that the store-room was a concrete building, and the storage of drums could not be allowed as the conditions were not in accordance with the Inflammable Liquids Act.

General.

Prospecting was carried out in a new area during the latter part of the year and the prospects were considered bright.

An application was made for a lease on the Merrywood coalfield in the Avoca district, and the development of a new mine was commenced in the latter part of the year.

Some prospecting was carried out in the vicinity of the Fingal Coal Mine by the Cornwall Company with a view to opening up a new mine in this area.

Operations and Production.

The total output of coal was 143,635 tons, valued at £122,676 at the mine bins, and an average number of 278 persons was employed in production. The corresponding figures for the previous year were 145,882 tons, valued at £117,361, and 280 persons employed.

Although the majority of coal mines produced a greater quantity than in the previous year, the total output from the working mines showed a reduction of approximately 2,000 tons, due to larger producing mines showing reduced outputs. The Jubilee Coal Mine showed the largest reduction of 3,755 tons, Stanhope Coal Mine showed a reduced output of 2,620 tons, Fingal 1,175 tons, and Mount Nicholas, 1,150 tons. With the exception of Aberdeen Coal Mine, all other mines showed increased outputs. Langloh Coal Mine, Hamilton, showed the largest increase. The output was 3,705 tons greater than for the previous year, and this represented an increase of over 100 per cent. Cornwall increased its output by 2,111 tons, and Mount Christie, a very small mine, increased production by more than one hundred per cent. Illamatha Mine, Spreyton, produced 20 per cent. more coal than during the previous year.

Fingal-Mt. Nicholas-Dalmayne Coalfield.

The Cornwall Coal Mine continued to be the chief coal producer of the State. The output again increased and reached a total of 83,811 tons, valued at £67,339. An average of 131 persons was employed. The corresponding figures for the previous year were 81,700 tons, valued at £65,360, and 133 persons employed.

As in the previous year, most of the coal resulted from pillar extraction, but, with the introduction of the arc-wall machine into the main heading section, the development of this area is proceeding. Some of the pillar sections have been worked out, and men are engaged on coal filling behind the machine. The machine section is situated about one and three-quarter miles inside the mine.

The Jubilee Coal Mine produced 18,125 tons, valued at £16,660, and employed an average of 45 persons, the corresponding figures for the previous year being 21,880 tons, valued at £19,593, with an employment of 47 persons. The reduced output did not appear to be attributable to any disturbance in working conditions. Infiltration of surface water into the underground workings caused some difficulty,, as the quantity exceeded the capacity of the pumping plant. This disability was temporary. Work of preparing for the installation of an arc-wall coal-cutting machine was commenced and production from this machine should be achieved during the coming year. Transport of coal from the mine bins to the rail-head was occasionally interrupted by a shortage of motor-tyres and breakages to the motor-truck.

Mount Nicholas Coal Mine produced 16,299 tons of coal, valued at £13,038, and employed an average of 35 persons, compared with an output of 17,450 tons, valued at £13,960, and 34 persons, for the previous year. Output at the old tunnel was reduced during the year owing to thinning of the seam, and work was commenced in a new tunnel in an eastern area. This development involved the building of a new railway for transport of coal to the gravity haulage, and contributed to the reduced output.

The Fingal Coal Mine produced 3,154 tons of coal, valued at £1,477, and employed an average of 4 persons, compared with 4,329 tons, valued at £2,165, and 3 persons, for the previous year. Production continued by hand labour in a 6-feet section of the coal seam. The long distance to productive faces and the absence of a ventilating fan reacted against the output of coal. Dalmayne Coal Mine showed a slight increase in production, being 2,330 tons, valued at £1,463, as compared with 2,249 tons, valued at £1,301, for the previous year. The erection of bins at the mine assisted to increase the production with less labour, but a large fault was encountered in the main heading, and will create difficulties.

Avoca Coalfield.

The Stanhope Coal Mine showed a large reduction in output, being 7,861 tons, valued at £8,863, as compared with 10,481 tons, valued at £11,388, for the previous year. An average of 10 men was employed. The reduced output was due to the adoption of an unsuitable method of mining. The longwall system was adopted, but resulted in uncontrolled roof subsidences. A reversion was then made to the "bord and pillar" system, which is more suitable for the seam conditions at this colliery.

The Mount Christie Coal Mine increased production to 825 tons, valued at £805, and employed 2 men. The productive workings were abandoned and a new tunnel opened up at a higher level, where prospect boring has been done.

Upper Derwent Coalfield.

The Langloh Coal Mine, Hamilton, increased production to 6,640 tons, valued at £6,640, as compared with 2,935 tons, valued at £2,721, for the previous year. The number of men employed was 20. Improved working conditions resulted from the completion of an air-shaft and the installation of a ventilating fan. An electric arc-wall coal-cutting machine and electric boring machines were installed, and increased the production of coal. The seam is of good average quality and finds a ready market.

York Plains Coal Mine increased production slightly to 781 tons, valued at £1,170, and employed four persons. The method of working this 2 feet 6 inches seam of semi-anthracite coal is by longwall hand-mining, packing material being obtained from the 7-inch band of stone in the middle of the seam, and 2 feet of following stone.

Sandfly-Cygnet Coalfield.

The output from the Sandfly Coal Mine increased to 514 tons, valued at £776. Two men were employed. This coal is classed as semi-anthracite, and is used chiefly for hop-drying, where a smokeless fuel is essential. Hand-mining methods are adopted in a seam which is from 3 feet 3 inches to 3 feet 6 inches thick.

The Mersey Coalfield.

The output from this field was 3,267 tons, valued at £4,392, as compared with 3,290 tons, valued at £3,817, for the previous year. The output was approximately constant, but the men employed reduced from 16 to 10 and the value of coal was increased.

The Illamatha Coal Mine produced the largest quantity and employed the greatest number of men, the figures being 1,874 tons, valued at £2,563, and an average of five persons, as compared with 1,554 tons, valued at £1,872, and eight persons for the previous year. This mine is worked on modified longwalling, and the seam has averaged about 24 inches in thickness, which is considered a good thickness for a coal seam in this field. A series of faults was encountered to the east of the shaft, and work was concentrated on the western side. Another shaft is to be sunk for ventilation purposes as soon as the present workings are advanced sufficiently.

The Aberdeen Coal Mine produced 804 tons, valued at £1,028, and three persons were employed, as compared with 849 tons, valued at £925, for the previous year. Re-conditioning was necessary in the main tunnel, and delayed productive mining for some time. A small fan was installed which improved the ventilation and created better working conditions.

The Tarleton Coal Mine operates on a very thin seam, the thickness reducing to a low level of fourteen inches during the year. The method of mining is step long-walling and hand-wheeling to surface bins. This seam is 30 feet below surface level and surface connections are made for ventilation, which is generally satisfactory. The output was 589 tons, valued at £802, for two persons employed, as against 558 tons, valued at £655, for the previous year.

Carbide, Limestone, and Silica.

Limestone was quarried at Ida Bay, Junee, and Granton, 31,955 tons being produced, and valued at £33,690. An average of 47 persons was employed. Production for the previous year was 24,728 tons, valued at £19,294.

Most of the limestone is used in the manufacture of calcium carbide, approximately 23,000 tons being supplied to the Carbide Company at Electrona. About 7,000 tons were supplied to the Electrolytic Zinc Company at Risdon. Granton Lime Works produced 2,152 tons. The lime is chiefly used for building purposes and for application to soil. There was only 21 tons of silica quarried, but it is expected that a large quantity will be required when the manufacture of Ferro Silicon is resumed in the forthcoming year.

The Australian Commonwealth Carbide Company produced 10,632 tons of carbide, valued at £233,488, and employed an average of 161 persons, as compared with 9,382 tons, valued at £187,640, for the previous year. No Calcium Silicide was produced, the output for the previous year being 417 tons, valued at £35,393. Preparations are being made for the production of Ferro Silicon, and for the manufacture of carbon black.

Ore Treatment.

The Electrolytic Zinc Company worked continuously, and produced 78,204 tons of slab zinc, valued at £1,885,855. Cadmium production amounted to 249·96 tons, valued at £112,046, and 13·241 tons of cobalt oxide, valued at £6,092, was produced. In addition to the above, approximately 30,000 tons of superphosphate was produced. An average of 1,591 persons was employed at the Risdon works.

Tin.

The output of metallic tin was 3·6 tons, valued at £1,078. The total output resulted from alluvial mining at Cox Bight.

Osmiridium.

The production of osmiridium increased to 94 ozs., valued at £2,323, as compared with 84·52 ozs. for the previous year.

No production of Kaolin was reported from Surges Bay.

APPENDIX VI.

REPORT OF THE MOUNT CAMERON WATER-RACE BOARD FOR THE YEAR ENDING 31ST DECEMBER, 1944.

SIR,

We have the honour to submit the report of the Mount Cameron Water Race Board for the year ending the 31st December, 1944.

The production of tin-oxide from all activities serviced by the race was 22·1728 tons, as compared with 27·7902 tons for the previous year, and 33·9772 tons for 1942.

There was a decline of 2·7647 tons in production by users of water on a royalty basis, and a decrease of 2·8527 tons in the output of users of water on a fixed scale of payment.

Revenue was £94 11s. 2d. less than for the previous year. Expenditure was £47 3s. 10d. less, due mainly to adjustments in salaries and wages and to less expenditure on repairs to races, syphons, dams, and culverts. The reduced operational expenditure was insufficient to compensate the continued decline in production, and a net loss of £136 2s. 9d. resulted in the working of the race as compared with a deficit of £88 15s. 8d. recorded for the previous year.

The declining production continues to be of serious moment to the financial outlook of the Board. Operational costs have been kept at a minimum but the ageing condition of the race system presents a constant possibility of heavy expenditure in maintenance and replacements, and there is no immediate prospect of revenue meeting expenditure. Members of the Board agree that the incurrence of a reasonable deficit is merited in the preservation of the race, as it services a small mining community and contributes largely to the stability of the Gladstone township. Preservation of the race is also desirable as a possible source of post-war employment.

Races.

Growths of acquatic weed and other vegetation have increased and have impaired the flowage capacity of the main and branch races. Financial arrangements were made for conditioning races, but labour could not be obtained and proposed work on the main races lapsed. Two branch races were cleared and a further endeavour will be made to condition all races during the coming year.

Syphons.

The metal syphon near Moore's cottage has required constant care owing to advanced corrosion. Repairs by concrete lining were found to be impracticable and an early replacement is desirable.

The wood-stave section of the Ringarooma syphon has been causing some concern, and replacement may be necessary in the near future.

The Edina concrete syphon and the concrete section of the Ringarooma syphon are in good order. Other syphons have been maintained in serviceable condition and the trestling of the Ringarooma syphon continues to exhibit no further weakness.

Flumings.

The flume-tunnel and flumings are in good order.

Dams.

All dams were maintained in serviceable condition. The intake wall of the main race at the Great Mussel Roe River is being held in serviceable condition pending the availability of suitable labour for its replacement.

Buildings.

Necessary repairs and improvements were carried out at the cottages occupied by the channel-keepers.

General.

An extension of the transmission line of the Hydro-Electric Commission to Gladstone will afford an opportunity to mining interests to consider mining possibilities in localities outside the compass of gravitational sluicing and to augment activities where insufficient water is normally available from the race system. One user of water has contracted for supply of power in order to step-up productive operations.

We have the honour to be,

Sir,

Your obedient servants,

W. H. WILLIAMS,
Chairman of the Board.

CECIL RYAN, }
GEO. MALLINSON, } Members.

The Hon. the Minister for Mines, Hobart.

STATEMENT FOR THE YEAR ENDING 31ST DECEMBER, 1944.

Rainfall.

The registered rainfall for the year was as follows:—

Great Mussel Roe .... 40 inches 32 points
Little Mussel Roe .... 40 inches 6 points.

Revenue.

The revenue for the year amounted to £758 14s. 10d., being a decrease of £94 11s. 2d. against that of the previous year.

Disbursements.

The Expenditure for the year amounted to £894 17s. 7d., being a decrease of £47 3s. 10d. against that of the previous year.

Statistics.

The statistics for the year are as follows:—

Average number of claims supplied per week	5
Greatest number supplied in any one week	8
Total number of heads supplied under:—	
Fixed or cash scale	268
Royalty or credit scale	1764

Tin ore raised—

	tons.	cwt.	qr.	lb.
Under royalty scale	14	11	1	24
Under fixed scale	7	11	3	27
	22	3	1	23

Average number of men employed per week—12.

Statement of Receipts and Payments of the Mount Cameron Water-race Suspense Account for the Year ended 31st December, 1944.

Receipts.

	£	s.	d.
Water sold under fixed scale	107	0	0
Water sold under royalty scale	623	14	10
Water sold for domestic purposes	28	0	0
Total receipts	758	14	10
Excess payments over receipts	136	2	9
	£894	17	7

Payments.

	£	s.	d.
Salaries and wages	836	5	10
Travelling expenses	4	5	8
Insurance	8	19	7
Stores	3	6	0
Repairs to races, syphons, dams, and culverts	6	12	6
Repairs to channel-keepers' cottages	11	1	5
Repairs to telephones	1	1	0
Cartage	2	6	2
Child Endowment Pay Roll Tax	20	19	5
	£894	17	7

H. H. Pimblett, Government Printer, Tasmania.