

TASMANIA

REPORT

OF THE

DIRECTOR OF MINES

FOR

YEAR ENDED 31st DECEMBER

1946

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



TASMANIA:

H. H. PIMBLETT, GOVERNMENT PRINTER, HOBART

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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 on the 31st December, 1946.

The total value, based on Australian prices, of the output of minerals and mineral products was £2,953,167, as compared with £2,622,806 for the previous year, representing an increase of £330,361. On the basis of Sterling metal prices the value of the production was £3,190,033.

Production of copper, coal, gold, lead, silver, scheelite, and zinc was substantially greater and increases occurred in the output of barytes, cadmium, granite, haematite, kaolin, and ochre. The combined output of calcium carbide, cement, and limestone increased, but there were decreases in the production of asbestos, osmiridium, pyrites, silica, talc, tin, and wolfram.

The number of men employed in mining, quarrying, and metallurgical operations was 5255, as compared with 5178 for the previous year. There was a shortage of suitable labour and recorded outputs were less than the production capacities at several mines in consequence.

The capacity of the mineral potentialities of the State to respond to improving markets and prices has been significant with rising trends in the output of metals and activities have been characterised by forward moves in the possibilities of rehabilitating silver-lead mining. The implementation of a policy to enable concessional areas to be acquired has induced financial interests to enter upon planned programmes of mineral exploration and it is anticipated that productive developments will ultimately accrue therefrom. A phase of instability developed in the marketing of tungsten minerals and the market price receded. Wolfram mining was depressed, but the condition of instability was temporary and an early rising in production is expected. Depletions at established mines and the absence of new producers reacted against the output of tin, which was the lowest for fifteen years.

Coal mining continued to be characterised by freedom from major industrial stoppages, and the output increased from 149,077 to 158,751 tons.

The Electrolytic Zinc Company of Australasia Limited was in continuous operation at Risdon, processing zinciferous calcines imported from the mainland and arising from the calcining of concentrates recovered from the selective treatment of Tasmanian ores. Production from imported calcines was 59,309 tons of zinc, valued at £1,596,924; 196·848 tons of cadmium, valued at £83,707, and 15·248 tons of cobalt oxide, valued at £7014. Calcines actually processed from Tasmanian ores returned 17,007 tons of slab zinc, 30·4 tons of cadmium, 663 tons of lead, 99,666 oz. of silver, and 0·2 ton of cobalt oxide. An average number of 1656 men was employed at these works.

The Tasmanian ores resulted from continued exploitation of the extensive occurrences of zinc-lead sulphides at the Rosebery and Hercules mines on the West Coast, where an average of 441 men were employed in mining, milling, and calcining operations. The combined quantity of ore mined and milled was 124,563 tons. Selective flotation resulted in the recovery of 37,502 tons of zinc concentrates, 7857 tons of lead concentrates, and 2964 tons of copper concentrates. The recoverable quantity of metallics was fixed at 17,990·08 tons of zinc, 5723·58 tons of lead, 245·88 tons of copper, 33·74 tons of cadmium, 8049·23 oz. of gold, and 727,648·76 oz. of silver. The lead concentrates were exported and the zinc concentrates were calcined at Zeehan and despatched to Risdon for processing.

The Mount Lyell Mining and Railway Company Limited again functioned as the major producer of copper. The output of crude ore from surface and underground mining was 1,485,653 tons, being 16,483 tons more than for the previous year. Surface mining accounted for 1,399,151 tons, and 86,459 tons resulted from underground operations at the Royal Tharsis and North Lyell mines. Copper precipitate recovered from mine waters amounted to 43 tons.

The concentration plant treated 1,481,759 tons of ore for a selective recovery of 41,689 tons of copper-sulphide concentrate and 58,043 tons of iron-pyrite concentrate. The copper concentrate, together with 3894 tons of high grade ore and a quantity of copper precipitate extracted from mine waters, was smelted for a recovery of 9201 tons of blister copper.

Normal operations at the refinery resulted in an output of 9134 tons of electrolytic copper. The cell residue returned 34,194 oz. of silver and 6140 oz. of gold.

Of the iron-pyrite concentrate recovered by the selective flotation of the low-grade ores, 37,294 tons were exported to the mainland for use in the manufacture of fertilisers.

A rising trend in the output of zinc-lead and silver-lead ores offered expectations of a rehabilitation of the production of lead which had declined from 13,550·85 tons in 1940 to 6298·44 tons in 1945. A recovering overseas market, rising metal prices, and export privileges contributed to a restoration of interest in the lead-ore potential, but a shortage of suitable labour continued to be a retardant in actual production.

Operations by the Electrolytic Zinc Company at the Rosebery and Hercules mines accounted for the greater portion of the output of 6890·58 tons of lead. The Farrell Mining Company, Tullah, was the only producer of straight silver-lead ores, but a revival of interest in the exploration and development of the silver-lead potential portends a revival of production activities on other mining fields.

The Farrell Mining Company mined and milled 8852 tons of ore for a recovery of 1655 tons of silver-lead concentrate containing 1167 tons of lead and 134,450 oz. of silver. Future prospects were enhanced by the intersection of high-grade ore at No. 8 level, below the earlier stoping levels, and by the location of further occurrences of payable ore on the upper levels. Ore developments have materially appreciated the productive life of the mine.

Metallic tin in the product from lode and alluvial mining was 700·886 tons and represented the lowest production since 1931, when the recorded output was 588·83 tons. Shortage of labour, ore depletions, and the absence of new discoveries contributed to the gradual decline in tin mining.

Aberfoyle Tin N.L., operating on a multiple lode series; Renison Associated and Mount Bischoff mines, mining and milling tin-pyrite ores; Briseis Consolidated, sluicing and ancient river-lead; and Dorset Tin Dredge, operating on river flats, continued as the principal producers and contributed 507·939 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 operations on a deep lead and on areas of shallow ground, and underground mining was continued on the wolfram-tin lodes at Storey's Creek Mine. The output of concentrate from these operations contained 54·949 tons of metallic tin.

Small mines and miscellaneous parties 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 137·998 tons of metallic tin.

The modern bucket dredge installed by Commonwealth Minerals Production Directorate, remained in continuous operation at Dorset Flat and treated 1,698,000 cubic yards of alluvial ground for a recovery of 142·853 tons of concentrate, containing 104·23 tons of metallic tin and 420·696 oz. of gold.

Operations by Briseis Consolidated on the Cascade deep-lead were disrupted by a collapse of basalt overburden following saturation from protracted wet seasons, and resulted in an abandonment of major operations. Sluicing was then confined to relatively shallow ground on the upstream side of the main face. Production amounted to 132·15 tons of tin oxide, containing 95 tons of metallic tin, and resulted from the removal of 99,000 cubic yards of overburden and the treatment of 479,700 cubic yards of drifts.

The Endurance Tin Mining Company completed the transference of the electric barge and sluicing plant to the Clifton workings and resumed sluicing on the deep lead. A total of 661,100 cubic yards of ground was treated for a recovery of 52·725 tons of concentrate, containing 38·411 tons of metallic tin.

Aberfoyle Tin N.L. continued to pursue a progressive policy of modernising mining and milling facilities to augment the through-put and step-up recoveries from mining the multiple lode series at Rossarden. Production amounted to 314·334 tons of tin concentrate, containing 224·7 tons of metallic tin, and 30·563 tons of wolfram, and resulted from the mining and milling of 24,085 tons of ore,

Operations by Commonwealth Minerals Production Directorate at the Mount Bischoff Tin Mine were merged into a Commonwealth-State project, as an alternative to a cessation of operations, to determine if, under reconstructed mining and milling practices, reserves of low-grade ore could be economically exploited. The project was placed under the control of a Board of Management and a programme of mine development and purchase and installation of new milling units was proceeded with to replace gravity concentration and calcination with flotation and gravity concentration, as a medium for stepping-up the effective recovery of tin-oxide in the treatment of tin-pyrite ores.

Shortage of suitable labour hampered operations by Renison Associated Tin Mines in the mining and milling of tin-pyrite ores at Renison Bell. Production was mainly from the Battery Lode, which responded well to development and profitable mining resulted. This lode is only one unit of an extensive lode system which presents logical prospects for a planned programme of exploration to determine the economic merits of capitalising for a comprehensive approach to mining and milling practices of a major nature.

A total of 11,429 tons of tin-pyrite ore was mined and milled for a recovery of 120·778 tons of concentrate containing 84 tons of metallic tin.

A phase of recession in prices and instability in demand occurred in the marketing of tungsten ores, but an early recovery ensued and the combined output of wolfram and scheelite concentrate advanced to 784·373, as compared with 738·65 tons for the previous year.

Progressive quarrying and milling practices were maintained at the King Island Scheelite Mine. The recorded through-put of ore was 94,100 tons and resulted in a recovery of 627·8 tons of scheelite concentrate. Ore reserves were assessed at 1,763,692 tons and further exploration is to be directed to an appreciation thereof.

Storey's Creek Mine continued as the major producer of wolfram, 123 tons of concentrate being returned from the mining and milling of 8637 tons of ore. In addition, 25 tons of concentrate, containing 16·1 tons of metallic tin, was recovered. Lode features remained constant, but developmental operations and prosecution of the planned programme of reconstruction were hampered by a shortage of suitable labour.

Small producers in the Moina district contributed to the total output of 156·573 tons of wolfram and developments throughout the State have continued to establish a tungsten potential sufficient to meet market requirements much in excess of those available.

There was a slight increase in the production of gold, but there was no reef mining, the recorded output of 15,361 oz. accruing mainly from the mining of copper and zinc-lead ores. Small quantities of gold resulted from the cyanidation of battery tailings, the treatment of tin concentrates recovered from the working of gold-bearing stanniferous alluvials and from minor activities on auriferous alluvials.

The market price of osmiridium was £A34·35 per oz., but the recorded output declined from 108·75 to 94·522 oz. Adamsfield was the principal field of activities, the osmiridium workings in the Waratah district being almost deserted.

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 main producers of calcium carbide, cement, and limestone. The total output of combined products was 127,999.5 tons, valued at £A342,163, as compared with 107,452 tons, valued at £A273,588, for the previous year. There was an increase of 180 tons in the output of calcium carbide and a reduction of 11,751.5 tons in the quantity of limestone exported for the iron and steel industry due largely to labour shortages. Production of cement was 32,199 tons more than for the previous year.

The Australian Commonwealth Carbide Company used products from the mineral resources of the State in the manufacture of 227 tons of ferro-silicon, valued at £A7616.

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

Kaolin, other than clay used in the manufacture of bricks and earthenwares, continued to be produced in increasing quantities, the total output being 6330.5 tons, as compared with 5718 tons for the previous year.

Small quantities of ochre were mined and exported.

Production of asbestos disappeared with a suspension of operations by C.S.R. on the asbestos-bearing serpentines at Zeehan. High-quality short fibre was being produced and was usefully contributing to the shortage of asbestos for sheeting and moulds, essential in the building industry, but infrequency in vein concentrations was instrumental in an abandonment of the project.

Rehabilitation of the natural stone industry was proceeded with following a lifting of wartime restrictions. Developmental and quarrying operations were restored at Coles Bay, and 60 tons of red granite was marketed. The colour and texture of this granite continues to be of outstanding merit and the areal extent provides a commercial basis for expansion in production.

The recorded output of 158,751 tons of coal was a new high level in the coal mining industry.

The Cornwall Coal Company continued as the major producer and operations at three collieries

resulted in a total output of 105,352 tons. Pillar extraction, bord and pillar work, and developmental operations resulted in an output of 80,257 tons at the Cornwall Colliery, whilst 21,875 tons accrued from mechanised coal-winning at the Mount Nicholas Coal Mine. Small-scale mining was pursued at the Duncan Colliery, Fingal, the output being 3220 tons.

A production of 17,603 tons of coal represented a small increase in output at the Jubilee Coal Mine. Faulty seam conditions retarded machine work and production was further hampered by incursion of water following excessive falls of rain.

The bord and pillar system of mining was completely restored and enabled the Stanhope Colliery to be worked under more settled conditions. Production increased to 9781 tons.

The Langloh Coal Mine, at Hamilton, was progressively developed, but shortage of labour hampered production, the total output being 11,094 tons.

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 therewith.

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

Aluminium.

The Commonwealth-State project for the production of ingot aluminium in Tasmania continued to rest with a Commission, set up to control the industry. The activities of the Commission were directed to the testing of deposits of bauxite in Tasmania and in mainland States to provide an adequate reserve of commercial ore; to fixing sources of supplies of coal, limestone, cryolite, and other materials essential to the industry; to determining metallurgical processes and providing for design of plant most suitable for commercial and economic adoption; to selection of plant sites; and to arranging for the generation and supply of electric power. A site for the plant has been selected on the Tamar River, in the vicinity of Launceston, and the near future should witness material progress in the preparatory works related to the establishment of this major industry.

QUANTITY AND VALUE OF MINERALS.

STATISTICS RELATING TO THE MINING INDUSTRY FOR THE YEAR ENDING 31ST DECEMBER, 1946.

(No. 62.)

Mineral.	MINERAL DIVISIONS.					Total Quantity.	Value.
	Northern and Southern.	Eastern.	North-Eastern.	North-Western.	Western.		
Bismuth (tons)	....	....	....	392	....	392	£ 293
Barytes (tons)	....	....	....	....	33	33	70
Copper (tons)	....	....	....	....	9,379.88	9,379.88	716,212
Coal (tons)	12,353	143,407	....	2,991	....	158,751	137,736
Cadmium (tons)	....	....	....	....	33.74	33.74	15,116
Cobalt Oxide (tons)	....	....	....	....	.2	.2	92
Carbide, Cement, and Limestone (tons)	10,729.5	....	111,552	....	5,708	127,999.5	342,163
Granite (Red) (tons)	....	60	....	....	....	60	600
Gold (fine oz.)	22.519	724.071	425.379	....	14,190.018	15,361.987	132,296
Haematite (tons)	....	....	....	4.5	....	4.5	6
Kaolin (tons)	188.5	....	6,142	....	....	6,330.5	11,886
Lead (tons)	....	....	....	....	6,890.58	6,890.58	340,509
Ochre (tons)	....	....	....	255	....	255	437
Osmiridium (oz.)	93.312	....	....	1.210	....	94.522	2,581
Pyrites (tons)	....	....	....	....	37,294	37,294	49,145
Scheelite (tons)	....	....	....	627.8	....	627.8	165,264
Silica (tons)	1,057	....	....	51	4,829	5,937	2,798
Silver (fine oz.)	....	....	....	....	896,292.76	896,292.76	187,428
Talc (tons)	....	....	....	49	....	49	192
Tin (tons)	3.456	276.246	290.267	46.434	84.483	700.886	240,584
Wolfram (tons)	....	153.563	....	3.010	....	156.573	44,553
Zinc (tons)	....	....	....	....	17,990.08	17,990.08	800,072
Total Value .....	....	....	....	....	....	....	£3,190,033
Total Value Australian Currency .....	....	....	....	....	....	....	£A2,953,167
Average Number of Men Employed	2,039	508	250	463	1,995	5,255	

The Electrolytic Zinc Company of Australasia Limited, recovered 59,309 tons of zinc, valued at £1,596,924; 186,848 tons of cadmium, valued at £83,707; and 15,248 tons of cobalt oxide, valued at £7014, from other than Tasmanian ores; and employed an average of 1656 men at Risdon.
 The Australian Commonwealth Carbide Company Limited, Electrona, produced 227 tons of ferro-silicon, valued at £7616.

W. H. WILLIAMS, Director of Mines.

ASBESTOS.

RETURN showing the Quantity and Value of Asbestos produced from 1899 to 1946 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
1945.....	276·36	7193
1946.....	—	—
Total.....	3979·85	£17,142

BARYTES.

RETURN showing the Quantity and Value of Barytes produced to 31st December, 1946.

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
1942-45.....	—	—
1946.....	33	70
Total.....	2196·2	£8138

BISMUTH.

RETURN showing the Quantity and Value of Bismuth produced from 1904 to 1946 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
1922-1929.....	—	—
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
1945.....	·529	373
1946.....	·392	293
Total.....	88·155	£28,033

COAL.

RETURN showing the Quantity and Value of Coal raised to 31st December, 1946.

Year.	Quantity.	Value.
	Tons.	£
Previous to 1880.....	145,114	115,000
1880 to 1904 inclusive	828,370·5	710,952
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
1945.....	149,077	125,719
1946.....	158,751	137,736
Total.....	4,865,584	£3,810,874

COPPER.

The production for the year was 9379·88 tons, valued at £716,212.

RETURN showing the Quantity and Value of Copper in Blister Copper, Copper Ore, and Zinc Lead Ore during the Years 1919 to 1946 inclusive.

Year.	In Zinc Lead Ore.		In Blister Copper.		In Copper Ore.		Total	
	Qty.	Value.	Qty.	Value.	Qty.	Value.	Qty.	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.....	529·58	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	23,666	9831	609,522	—	—	10,212·75	633,188
1945.....	275·51	17,080	7197	446,214	—	—	7472·51	463,294
1946.....	245·88	18,714	9134	697,498	—	—	9379·88	716,212
Total.....	1,897·10	121,078	254,358·742	14,896,423	402·827	9317	256,658·669	15,026,818

The Mount Lyell Mining and Railway Company Limited.
Return for the Calendar Year 1946.

Ore and metal-bearing material smelted:—	Tons
Source of Material.	(Dry).
Ore:—From the Company's North Lyell Mine	3,894
Concentrates:—From the Company's North Lyell Mine, Lyell Comstock Mine, Crown Lyell Mine, and West Lyell Mines ore	37,795
Purchased ore	.....
Total	41,689
Source of Material.	Tons
(Dry).	
Limestone delivered at works (tons)	5,708
Silica delivered at works	4,829
Pyritic concentrate shipped from Regatta Point (tons), approximate value £A49,145	37,294
Blister copper produced, 9201 tons, containing:	
Copper (tons) 9,134	} Approximate value £A972,828.
Silver (oz.) 34,194	
Gold (oz.) 6,140	
Average number of men employed—	
Mining Department—At the Company's	
North Lyell Mine	6
Ditto, Lyell Comstock Mine	2
Ditto, Crown Lyell Mine	.....
Ditto, Royal Tharsis Mine	101
Ditto, West Lyell Mines	409
Miscellaneous	191
	709
Reduction Works Department (including Lake Margaret)	631
Railway Department—Mount Lyell Railway	96
Total	1,436

Copper produced from the inception of the Company to the 31st December, 1946, 412,950 tons.
Silver produced from the inception of the Company to the 31st December, 1946, 15,425,172 oz. (fine.)
Gold produced from the inception of the Company to the 31st December, 1946, 499,434 oz. (fine.)
Dividends paid during the year, Nil.
Dividends paid from the inception of the Company to the 31st December, 1946, £6,665,944.

CADMIUM.

The quantity recovered was 33·74 tons, valued at £15,116, compared with 29·38 tons valued at £13,161 for 1945.

RETURN showing the Quantity and Value of Cadmium recovered for the Years 1936 to 1946.

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
1945	29·38	13,161
1946	33·74	15,116
Total	537·9057	£206,739

CEMENT, CARBIDE, AND LIMESTONE.

The combined value of output from these three industries amounted to £342,163, as compared with £273,588 for 1945.

GOLD.

The quantity won was 15,361·987 oz. fine, valued at £132,296, as compared with 13,049·804 oz. valued at £111,452 for 1945.

RETURN showing the Quantity and Value of Gold won to 31st December, 1946.

Year.	Quantity. Oz.	Value. £
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	7,086·470	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
1945	13,049·804	111,452
1946	15,361·987	132,296
Total	2,277,677·492	9,975,885

GRANITE (RED).

RETURN showing the Quantity and Value of Red Granite produced during the Years 1935 to 1946 inclusive.

Year.	Quantity. Tons.	Value. £
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
1943-45.....	...	...
1946.....	60	600
Total.....	2861·5	18,978

IRON PYRITES.

RETURN showing the Quantity and Value of Iron Pyrites produced during the Years 1915 to 1946 inclusive.

Year.	Quantity. Tons.	Value. £
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
1924-1930.....	—	—
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
1945.....	40,168	50,208
1946.....	37,294	49,145
Total.....	539,508·973	£659,531

KAOLIN.

RETURN showing the Quantity and Value of Kaolin produced during the Years 1940 to 1946 inclusive.

Year.	Quantity. Tons.	Value. £
1940.....	835·5	988
1941.....	1130	1428
1942.....	1098	1334
1943.....	1655	2438
1944.....	4193·25	4778
1945.....	5718	11,562
1946.....	6330·5	11,886
Total.....	20,960·25	34,414

LIMESTONE.

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

Year.	Quantity. Tons.	Value. £
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 6890.58 tons, valued at £340,509, as compared with 6298.44 tons, valued at £157,459 for 1945.

RETURN showing the Quantity and Value of Lead included in Silver Lead during the Years 1919 to 1946 inclusive.

Year.	Quantity.	Value.
	Tons.	£
1919-1924.....	21,918.625	639,592
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
1945.....	6298.44	157,459
1946.....	6890.58	340,509
Total.....	166,515.465	£4,074,116

NICKEL.

RETURN showing the Quantity and Value of Nickel produced from 1927 to 1946 inclusive.

Year.	Quantity.	Value.
	Tons.	£
1927-1931.....	193.6	33,162
1932.....	0.55	136
1933.....	8.65	1948
1934-37.....	—	—
1938.....	19.75	3604
1939-46.....	—	—
Total.....	222.55	£38,850

OCHRE.

RETURN showing the Quantity and Value of Ochre produced during the Years 1918 to 1946 inclusive.

Year.	Quantity.	Value.
	Tons.	£
1918-1924.....	134	306
1925.....	—	—
1926.....	38	69
1927-1939.....	—	—
1940.....	3.5	9
1941.....	—	—
1942.....	21	53
1943.....	380	1681
1944.....	74.5	233
1945.....	66	191
1946.....	255	437
Total.....	972	£2979

OSMIRIDIUM.

The quantity of metal won during the year was 94.522 oz., valued at £2581, as compared with 108.75 oz., valued at £2665 for 1945.

RETURN showing the Quantity and Value of Osmiridium produced during the Years 1910 to 1946 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
1945.....	108.75	2665
1946.....	94.522	2581
Total.....	30,493.938	£659,436

SHALE.

RETURN showing the Quantity and Value of Shale produced during the Years 1910 to 1946 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	
1936-1946	—	—	
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
1935-46	Tasmanite Shale Oil Company Ltd.....	—
	Total	357,115

SCHEELITE.

RETURN showing the Quantity and Value of Scheelite produced during the Years 1917 to 1946 inclusive.

Year.	Quantity.		Value.
	Tons.	£	
1917-1920	589.07	112,468	
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	
1945.....	527.54	158,093	
1946.....	627.8	165,264	
Total.....	2914.771	£718,242	

SILVER.

The output was 896,292.76 oz. (fine), valued at £187,428, as compared with 816,157.38 oz., valued at £102,101 for 1945.

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 1946 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.	£	O. s.	£	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
1945	136,390	17,188	24,232	2917	...	...	...	...	655,535.38	81,996	816,157.38	102,101
1946	134,450	28,102	34,194	7127	...	...	...	...	727,648.76	152,199	896,292.76	187,428
Total	15,349,408.55	1,776,789	3,042,024	403,488	232	25	44	4	4,065,662.54	518,805	22,447,371.09	2,695,111

TALC.

RETURN showing Quantity and Value of Talc produced during the Years 1928 to 1946 inclusive.

Year.	Quantity.		Value.	
	Tons.	£	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		
1945.....	152·75	532		
1946.....	49	192		
Total.....	311·35	1055		

WOLFRAM.

RETURN showing the Quantity and Value of Wolfram produced during the Years 1899 to 1946 inclusive.

Year.	Quantity.		Value.	
	Tons.	£	Tons.	£
1899 to 1904 inclusive.....	72·84	3304		
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		
1945.....	211·11	69,896		
1946.....	156·573	44,553		
Total.....	5313·029	£953,851		

TIN.

The output was 700·886 tons, valued at £240,584, as compared with 801·239 tons, valued at £240,369 for 1945.

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 1946 inclusive.

Year.	Quantity.		Value.	
	Tons.	£	Tons.	£
1873-1879 inclusive.....	16,429	1,054,923		
1880 to 1905 inclusive.....	56,419·93	7,530,234		
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.....	1800·899	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		
1945.....	801·239	240,369		
1946.....	700·886	240,584		
Total.....	133,544·577	£21,007,811		

ZINC.

RETURN showing the Quantity and Value of Zinc produced during the Years 1919 to 1946 inclusive.

Year.	Quantity.		Value.	
	Tons.	£	Tons.	£
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		
1945.....	15,609	407,307		
1946.....	17,990·08	800,072		
Total.....	273,242·48	£6,821,751		

* 1917, 1918 have been deleted. Product of Broken Hill.

ELECTROLYTIC ZINC COMPANY OF AUSTRALASIA LIMITED.

RETURN FOR THE YEAR 1946.

EXTRACTIONS FROM ORES AND CONCENTRATES:
RISDON.

<i>From other than Tasmanian Ores—</i>	
Zinc	59,309 tons
Cadmium	186,848 tons
Cobalt oxide	15,2481 tons

<i>From Tasmania Ores—</i>	
Zinc	17,007 tons
Cadmium	30.4 tons
Cobalt oxide .....	.2 tons
Lead	663 tons
Silver	99,666 oz.

Men Employed—
The average number of men employed was 1656.

WEST COAST DIVISION.

<i>Ore Mined—</i>	
From Hercules Mine	39,756 Tons.
From Rosebery Mine	84,807
Total	124,563

Concentrates Produced—

Zinc concentrates	Tons. 37,502
Lead concentrates	7,857
Copper concentrates	2,964
Total	48,323

Recoverable Quantity in Ores Mined—

Zinc	17,990.08 tons
Lead	5,723.58 tons
Copper	245.88 tons
Cadmium	33.74 tons
Silver	727,648.76 oz.
Gold	8,049.23 oz.

Average Number of Men Employed—

Hercules Mine	62
Rosebery Mine	321
Zeehan Smelters	28
Total	411

QUANTITY AND VALUE OF METALS AND MINERALS RAISED.

RETURN showing Quantity and Value of Metals and Minerals Raised in Tasmania as at 31st December, 1946.

Mineral or Metal.	Quantity.	Value.
Asbestos	(tons) 3,979.85	£ 17,142
Barytes	(tons) 2,196.2	8,138
Bismuth	(tons) 83.155	28,033
Cadmium	(tons) 537.9057	206,739
Carbide, Cement, and Limestone	(tons) 2,730,981.6	4,107,359
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) 4,865,584	3,810,874
Cobalt Oxide	(tons) 5.33	2,447
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) 256,658.669	15,026,818
Dolomite	(tons) 10	25
Gold	(fine oz.) 2,277,667.492	9,975,885
Granite (Red)	(tons) 2,861.5	18,978
Graphite	(tons) 17	26
Ilmenite	(tons) 550	1,256
Iron Ore	(tons) 46,181.5	31,776
Iron Pyrites	(tons) 539,508.973	659,531
Kaolin	(tons) 20,960.25	34,414
Lead (from 1919)	(tons) 167,516.465	4,074,116
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) 972	2,979
Osmiridium	(oz.) 30,493.938	659,436
Rutile	(tons) .5	18
Scheelite	(tons) 2,914.771	718,242
Silica	(tons) 75,927	35,598
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.) 22,447,371.09	2,695,111
Talc	(tons) 311.35	1,055
Tin	(tons) 133,544.577	21,007,811
Wolfram	(tons) 5,313.029	953,851
Zinc	(tons) 273,242.48	6,821,751
Total .....	....	£96,555,303

STATISTICS OF PRODUCTION.

RETURN showing the Annual Published Value of Mineral Products for the State of Tasmania from 1880 to 1946 inclusive.

Year.	Value.	Year.	Value.
	£		£
1880	554,031	1916	1,521,050
1881	602,723	1917	1,580,354
1882	556,306	1918	1,444,814
1883	560,873	1919	1,301,090
1884	468,302	1920	1,421,104
1885	518,885	1921	822,851
1886	489,966	1922	1,013,415
1887	593,256	1923	1,219,456
1888	616,733	1924	1,496,804
1889	504,718	1925	1,700,861
1890	444,210	1926	1,808,847
1891	528,388	1927	1,621,027
1892	526,909	1928	1,593,828
1893	627,909	1929	1,790,653
1894	732,764	1930	1,270,114
1895	575,692	1931	894,986
1896	662,058	1932	897,168
1897	1,006,140	1933	1,053,373
1898	1,071,084	1934	1,037,351
1899	1,660,622	1935	1,387,511
1900	1,888,695	1936	1,979,637
1901	1,763,896	1937	2,653,822
1902	1,378,406	1938	2,294,735
1903	1,354,044	1939	2,520,282
1904	1,379,204	1940	3,137,330
1905	1,729,129	1941	3,055,838
1906	2,257,147	1942	2,832,189
1907	2,277,159	1943	2,686,664
1908	1,650,027	1944	2,581,366
1909	1,574,995	1945	2,201,324
1910	1,432,193	1946	3,190,033
1911	1,349,497	Value of production 1867-	
1912	1,493,502	1945, previously un-	
1913	1,415,700	recorded	2,067,650
1914	1,007,038		
1915	1,225,575		
		Total.....	£96,555,303

RETURN showing the Total Number of Leases and Licences in Force on 31st December, 1946.

Mineral.	Number.	Number of Sluiceways.	Area
			Acres.
Asbestos	...	...	...
Barytes	1	...	10
Bismuth	...	...	...
Coal	31	...	5563
Clay	4	...	196
Copper	1	...	33
Copper-Nickel	...	...	...
Gravel	1	...	31
Granite	4	...	30
Gold	56	...	992
Iron	5	...	298
Limestone	6	...	493
Lead-Zinc	1	...	80
Molybdenum	...	...	...
Minerals	36	...	5282
Marble	...	...	...
Manganese	...	...	...
Osmiridium	1	...	10
Ochre	2	...	24
Pyrites	1	...	80
Quartzite	1	...	8
Scheelite	3	...	281
Shale	3	...	117
Silica	1	...	10
Silver	11	...	377
Stone	5	...	322
Sand	2	...	15
Serpentine, &c.	3	...	240
Tin	260	...	6830
Wolfram	1	...	20
Mining Easements and Machinery Sites	83	...	744
Licences to Search	...	...	...
Water Licences	256	1131	1994
Total	779	1131	24,080

STATISTICS OF MINING COMPANIES.

RETURN showing the Amounts Paid in Dividends by Mining Companies during the Year ending 31st December, 1946.

Mines.	Dividends.
	£ s. d.
Copper	...
Gold	...
Tin	25,687 0 0
Silver	...
Coal	4112 0 0
Scheelite	...
Zinc	* 330,000 0 0
Total	£359,799 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, 1946.

Number of Companies.	Capital.
Nil.	Nil.

In addition to the above, 2 agents for foreign companies under the Mining Companies (Foreign) Act, 1884, were registered. No syndicates under Part V. of the Mining Companies Act, 1884, were registered.

RETURN showing the Total Amount of Rents, Fees, &c., received by the Mines Department during the Year ending 31st December, 1946.

Head of Revenue.	Amount.
	£ s. d.
Rent of Auriferous and Mineral Lands	5939 17 8
Fees, Auriferous and Mineral Lands	518 7 1
Survey Fees	913 13 0
Fees under the Explosives and Inflammable Liquids Act	2258 3 11
Total	£9,630 1 8

RETURN showing the Total Area of Land and Number of Sluiceways of Water Applied for during the Year ending 31st December, 1946.

Mineral.	Number.	Sluiceways.	Area.
			Acres.
Asbestos .....	...	...	...
Bismuth .....	...	...	...
Barytes	1	...	80
Clay	7	...	160
Coal .....	...	...	...
Dolomite	1	...	64
Gold	9	...	198
Galena	1	...	60
Iron .....	...	...	...
Lead	4	...	320
Limestone	1	...	12
Manganese .....	...	...	...
Minerals	4	...	3078
Silver	8	...	334
Nickel	5	...	249
Stone	1	...	2
Sand	1	...	5
Talc .....	...	...	...
Tin	37	...	1490
Zinc	1	...	40
Machinery Sites and Mining Easements ...	6	...	281
Water-rights and Dam Sites	14	51	17½
Licences to search for Coal .....	...	...	...
Total	101	51	6390½

RETURN showing Total Number and Area of Leases and Licences Issued during the Year ending 31st December, 1946.

Mineral.	Leases.	Sluiceways.	Area.
			Acres.
Asbestos .....	...	...	...
Barytes .....	...	...	...
Clay .....	...	...	...
Copper .....	...	...	...
Copper-Nickel .....	...	...	...
Coal	2	...	619
Granite .....	...	...	...
Gold	2	...	30
Iron Ore .....	...	...	...
Limestone	1	...	196
Minerals .....	...	...	...
Manganese .....	...	...	...
Nickel .....	...	...	...
Ochre .....	...	...	...
Quartzite .....	...	...	...
Silver	1	...	40
Silica .....	...	...	...
Silver-Lead .....	...	...	...
Stone	3	...	296
Tin	9	...	498
Wolfram .....	...	...	...
Water-rights and Dam Sites	20	50	18
Licences to Search for Coal and Oil .....	...	...	...
Mining Easements and Machinery Sites	2	...	5
Total	40	50	1702

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 1883 to 1903, and for Six Months ending 31st December, 1903, and for the Years ending 31st December, 1904 to 1946 inclusive.

Year.	Amount.	Year.	Amount.
	£ s. d.		£ s. d.
1883.....	15,439 14 5	1915.....	17,679 3 6
1884.....	6981 11 10	1916.....	14,678 19 10
1885.....	11,070 5 7	1917.....	14,669 7 2
1886.....	12,523 10 4	1918.....	17,833 14 9
1887.....	14,611 11 5	1919.....	15,388 7 7
1888.....	23,502 8 4	1920.....	16,767 11 6
1889.....	17,254 9 0	1921.....	11,248 14 11
1890.....	26,955 4 9	1922.....	14,184 7 3
1891.....	37,829 16 5	1923.....	13,224 11 9
1892.....	17,568 18 4	1924.....	14,678 13 11
1893.....	16,971 9 2	1925.....	14,229 8 7
1894.....	16,732 7 7	1926.....	15,163 15 7
1895.....	15,323 1 9	1927.....	16,887 9 9
1896.....	20,901 13 2	1928.....	14,313 12 0
1897.....	25,631 0 3	1929.....	14,665 10 7
1898.....	33,661 13 9	1930.....	11,166 7 2
1899.....	24,696 10 5	1931.....	11,520 1 10
1900.....	28,380 11 10	1932.....	10,097 18 6
1901.....	21,569 5 2	1933.....	9,459 6 9
1902.....	19,471 0 1	1934.....	11,166 2 11
1903.....	17,776 14 3	1935.....	10,548 10 0
1903, 1 July to 31 Dec.	14,758 17 1	1936.....	11,023 11 3
1904, Jan. to Dec.	16,631 8 2	1937.....	12,206 19 1
1905.....	20,208 17 0	1938.....	11,177 11 5
1906.....	24,136 12 5	1939.....	11,556 5 1
1907.....	24,794 7 7	1940.....	11,018 3 9
1908.....	20,311 3 0	1941.....	10,835 18 8
1909.....	22,804 1 5	1942.....	9,509 18 2
1910.....	22,221 18 0	1943.....	9,449 9 7
1911.....	20,556 15 10	1944.....	8,952 5 3
1912.....	17,639 19 11	1945.....	9,108 18 6
1913.....	19,410 17 8	1946.....	8,716 8 8
1914.....	14,087 0 6		

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, 1932 to 1946 inclusive.

Nature of Lease.	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.		In force on 31st Dec., 1945.		In force on 31st Dec., 1946.	
	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
For Minerals, Silver, Tin, &c.	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	373	14,665	320	13,291
For Coal, Stone, Shale, &c.	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	63	6687	64	7059
For Gold Dredging Claims	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	55	955	56	992
Mining Easements	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	81	760	83	744
Machinery Sites	18	120	17	119																										
Licences to search for Coal or Oil	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	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	264	2005 & 1230 sluice-heads	256	1994 & 1131 sluice-heads

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

	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.	Average for 1945.	Average for 1946.	
	£ s. d.														
Copper—Standard, spot : per ton	32 11 4	30 6 4	31 18 1	36 12 6	60 5 9	45 16 9	49 17 7	62 0 0	62 0 0	62 0 0	62 0 0	62 0 0	62 0 0	75 10 0	
Lead—Soft Foreign : per ton	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	25 0 0	48 17 6	
Spelter : per ton	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	25 15 0	27 5 0	27 5 0	42 16 3	
Tin—Standard, spot : per ton	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	300 0 0	342 15 0	
Silver—Standard, spot : per oz.	1 6·144	1 9·208	1 9·951	1 9·647	1 9·65	1 9·066	1 8·461	2 1·048	1 11·439	1 11·439	1 11·439	1 11·439	2 6	4 1·75	
Osmiridium per oz. ...	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	24 10 6	27 17 7	
Wolfram: per ton	81 2 6	94 0 0	175 0 0	161 5 0	325 19 0	289 0 0	271 0 0	250 0 0	250 0 0	437 10 0	500 0 0	500 0 0	462 10 0	400 0 0	
					W.O. ₃										
Gold : per f. oz.	6 4 10	6 17 8	7 2 6	7 0 4	7 1 3	7 2 6	7 15 2	8 8 0	8 8 0	8 8 0	8 8 0	8 8 0	8 10 10	8 12 3	

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 £408 was expended and afforded employment for 15 men. Repayments made against advances totalled £2012.

THE AID TO MINING ACT, 1927.

STATEMENT OF RECEIPTS AND PAYMENTS OF THE MINING TRUST FUND FOR YEAR ENDED 31st DECEMBER, 1946.

RECEIPTS.			PAYMENTS.		
	£	s. d.		£	s. d.
Balance, 31st December, 1945	10,688	7 4	Sustenance allowance	127	10 0
Repayments of loans	310	0 9	Assistance	280	19 4
Hire drilling plant	76	10 0	Insurances	3	0 6
Sale of plant	60	0 0			
			Total payments	411	9 10
			Excess of receipts over payments	10,723	8 3
	£11,134	18 1		£11,134	18 1

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.				PAYMENTS.										
Item.	March, 1935 (commencement) to 31st Dec., 1946.			1st Jan., 1946, to 31st Dec., 1946.			Item.	March, 1935 (commencement) to 31st Dec., 1946.			1st Jan., 1946, to 31st Dec., 1946.			
	£	s.	d.	£	s.	d.		£	s.	d.	£	s.	d.	
Provided by—							Prospecting	1,584	6	6				
Commonwealth	£25,750						Batteries	1,328	14	0				
State	9,250						Advances	22,785	5	7				
	35,000	0	0				Plants and operation thereof	6,711	9	11				
Transfer of balance from—							Metallurgical investigations	1,237	3	4				
The Aid to Mining (Federal Grant) Trust Fund, 1936-37 (1 Edw. VIII. No. 20)	1,883	18	2				Roads and tracks	6,486	8	8				
The Aid to Mining (Federal Grant) Trust Fund, 1937-38 (1 Geo. VI. No. 32)	798	9	11				Transport	829	10	10				
Other credits—							Staff	574	11	1				
Batteries	99	13	2				Total payments	41,537	9	11				
Advances	8,724	6	0	201	17	0	Excess receipts over payments	4,981	14	9	4,981	14	9	
Plants and operation thereof	11	18	8											
Metallurgical investigations	0	7	11											
Staff	0	10	10											
Balance brought forward period ended 31st December, 1946				4,779	17	9								
	£46,519	4	8	£4,981	14	9		£46,519	4	8	£4,981	14	9	

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, 1946.

RECEIPTS.			PAYMENTS.		
	£	s. d.		£	s. d.
Balance brought forward, 31st December, 1945	2,000	0 0	Advances		
Repayments			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.				REPAYMENTS.							
Year.	Federal Funds.		The Mining Trust Fund and Other Funds.		Total.	Year.	Federal Funds.		The Mining Trust Fund and Other Funds.		Total.
	£	s. d.	£	s. d.	£ s. d.		£	s. d.	£	s. d.	£ s. d.
1935	8,398	11 4	2,298	14 8	10,697 6 0	1935	300	4 9	87	10 0	387 14 9
1936	10,462	3 7	2,807	12 10	13,269 16 5	1936	1,286	12 5	1,078	5 11	2,364 18 4
1937	3,902	17 7	1,983	9 6	5,886 7 1	1937	1,244	15 5	2,246	13 9	3,491 9 2
1938	3,337	2 7	1,937	1 0	5,274 3 7	1938	3,796	4 7	422	15 3	4,218 19 10
1939	658	13 10	2,721	11 1	3,380 4 11	1939	716	19 2	390	4 0	1,107 3 2
1940	866	3 5	4,188	5 4	4,984 8 9	1940	599	6 2	944	3 9	1,543 9 11
1941	2	17 3	1,019	15 3	1,022 12 6	1941	240	7 11	684	3 8	924 11 7
1942			1,433	3 3	1,433 3 3	1942	357	7 10	262	11 4	619 19 2
1943			634	12 6	634 12 6	1943	1,091	5 8	1,486	1 0	2,577 6 8
1944			813	9 7	813 9 7	1944	233	3 2	653	16 0	886 19 2
1945	14	7 1	2,687	9 8	2,701 16 9	1945	1,368	10 5	3,176	11 2	4,545 1 7
1946			408	9 4	408 9 4	1946	201	17 0	1,810	0 9	2,011 17 9
Total	£27,642	16 8	£22,863	14 0	£50,506 10 8	Totals	£11,436	14 6	£13,242	16 7	£24,679 11 1

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 £2026 12s. 10d., of which amount £607 was repaid under drilling agreements.

Diamond drilling was continued on the coal series at Hamilton.

A small air-operated diamond-drilling plant was engaged in testing extensive deposits of limestone at Ida Bay.

A percussion plant was used by the Australian Aluminium Production Commission in testing bauxite occurrences at St. Leonards.

A second percussion plant was detailed to Smithton and was engaged in boring for underground water for farming requirements.

DETAILS OF EXPENDITURE ON DRILLING DURING THE YEAR ENDED 31ST DECEMBER, 1946.

Plant.	Location.	£	s.	d.
Junior Straitline Diamond Drill	Smithton	6	5	4
Junior Straitline Diamond Drill	Hamilton	344	12	1
Junior Straitline Diamond Drill	Tullah	461	6	7
Mitchell Diamond Drill	Ida Bay	432	11	3
Surge Drill	Myalla	55	18	3
Surge Drill	Smithton	725	19	4
		£2,026	12	10

DEPARTMENTAL ACTIVITIES.

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

Delays in delivery of laboratory units have been a retarding factor in providing the planned assemblage of equipment for metallurgical research, but installed units and facilities regularly demonstrate the high value of services rendered in a solution of problems affecting the metallurgy of complex ores and in the beneficiation of coals and non-metallic materials.

A forward policy was preserved for financially assisting prospectors and producers, for maintaining progressive programmes of boring, for improving facilities for metallurgical investigations, and for affording technical services to the industry. The trend of markets and metal prices has been kept under observation, potential mineral areas have been appraised and concessional areas have been granted to provide encouragement for planned exploration. Material interest is now being centered in regions of the West Coast and it is anticipated that activities by major organisations will result usefully to the advancement of mining.

STAFF.

The Mining Districts of the State were reconstituted and the following were appointed as Wardens of Mines for the respective districts:—

District.	Warden of Mines.
South-Western	W. H. Williams
North & North-Eastern	J. R. Rex
Western & North-Western	H. R. Dobbie
Central	G. F. Sorell

Miss J. Thornbury was appointed Typiste as from the 14th February, 1946.

Mr. E. C. Briggs resigned as Chief Clerk and Accountant as from the 1st August, 1946.

Dr. S. Warren Carey resigned as Government Geologist as from the 24th October, 1946.

MINES DRAFTING BRANCH.

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

Instructions issued to surveyors	93
Diagrams received from surveyors	30
Diagrams drawn on leases	100
Consolidated and other diagrams drawn	14
Lithographs entered to date	100
Various tracings prepared	105
Tracings for Launceston office	42
Manuscripts entered to date	15
Launceston working plans examined and brought up to date	12
Underground surveys examined	8
Geological plans compiled and tracings made	Nil

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.

DETAILS OF EXPENDITURE ON DRILLING DURING THE YEAR ENDED 31st DECEMBER, 1946.

Location.	Plant.	Amount.
Launceston	Launceston Diamond Drill	244 12 7
Launceston	Launceston Diamond Drill	481 6 7
Launceston	Launceston Diamond Drill	482 11 3
Launceston	Launceston Diamond Drill	25 18 3
Launceston	Launceston Diamond Drill	225 19 4
		1,478 18 10

APPENDIX I.

REPORT OF THE CHIEF GEOLOGIST.

The Chief Geologist (Mr. H. G. W. Keid, M.Sc.) reports:—

Staff.

The field staff for the year comprised the Government Geologist, Dr. S. W. Carey and Field Geologists, Q. J. Henderson and H. G. W. Keid.

Messrs. K. Kendall and M. Haywood were employed as temporary field assistants.

On October 24th, the Government Geologist resigned from the position to occupy the Chair of Geology at the University of Tasmania.

Mr. Hughes, who had returned from war service at the end of 1945, was absent on leave from the end of February to attend a course of study at the University of Sydney. He rejoined the staff on 16th December.

Mr. Blake returned to office duties on December 13th after a period of six years' service with the Army.

From the 4th October, Mr. Henderson was absent on long-service leave.

Field Investigations.

The following reports were submitted covering field work completed during the year:—

Dr. S. W. Carey, Government Geologist:

(1) Report on the Peat, Lignite, and Brown Coal Deposits of King Island.

In this report Dr. Carey establishes the fact that a quantity of low-grade fuel exists on King Island and suggests that it may compare more than favourably with firewood as a fuel.

(2) Report on an Aerial Reconnaissance Flight from Hobart to Smithton.

This report records observations made during a three-hour flight from Hobart to Smithton and gives details of broad structural features observed from the air.

(3) Preliminary Report on the Possibility of Underground Water at Glenorchy.

Dr. Carey suggests methods of tapping the potential supplies of water available to the Council and estimates their quantity.

(4) Preliminary Report on Underground Water Supply Prospects at Lawrenny.

In this investigation Dr. Carey was accompanied by Field Geologist Q. J. Henderson, jnr. The report summarises the possibilities of obtaining underground water supplies on the individual runs of the Lawrenny Estate.

H. G. W. Keid, Field Geologist:

In the early part of the year, the field work on the Blue Tier quadrangle, commenced in 1945, was continued and was completed in May. The period from May to October was spent in the preparation of plans and reports on the areas covered in the 1945 field work. The following reports were submitted:—

(1) The Eddystone Quadrangle (No. 25).

(2) Tin Prospects of the Blue Tier Quadrangle (No. 33).

These two reports cover most of the country extending from Boobyalla to St. Helens, which lies to the eastward of the Blue Tier. The work was intended to determine the tin potential of the area and in each instance, areas were selected which were considered to be worthy of testing by boring.

At the end of October, and for a portion of November, a search was carried out, on behalf of the Railway Department, for a deposit of sand suitable for moulding purposes. A report was submitted.

At the end of November an examination was made of a deposit of sand situated at Randall's Bay. The sand deposit is situated on a Public Works Department reserve and boring was recommended to determine its extent and quality.

Q. J. Henderson, Field Geologist:

Mr. Henderson completed an examination of the Aberfoyle Mine and surrounding district. His report on the tin tungsten deposits of the Aberfoyle area summarises the structural features of the Aberfoyle ore bodies. The report is accompanied by three plans.

Some time was spent in the Lawrenny district assisting the Government Geologist in his investigations on that estate.

Cataloguing of Plans:

Some time was spent during the year by the staff of the Geological Survey in cataloguing the maps and plans of the survey.

APPENDIX II.

REPORT OF THE CHIEF CHEMIST AND METALLURGIST.

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

DETERMINATIONS AND ANALYSIS.

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.

A considerable number of bauxite samples were analysed for the Department and the Mineral Resources Survey. The number of determinations made approximated 5000.

*ORE DRESSING INVESTIGATIONS.**Aberfoyle Tin Mining Co.*

Present mill practice includes bulk flotation of sulphides in order to reject penalizable impurities from tin and wolfram concentrates. Sulphides present in the ore have been identified as chalcopryrite, pyrite, sphalerite, stannite, arseno-pyrite, and galena. Pyrite and chalcopryrite predominate. Existing bulk flotation product assays

approximately 10 per cent of copper and 20 to 30 oz. of silver per ton. Mill products were submitted for investigation with the object of testing methods of differential flotation to produce a sulphide concentrate of higher grade for realization of copper and silver values. Samples were ground to various sizes, including minus 200 mesh screen. Depression of pyrite with lime and cyanide and flotation of chalcopryrite resulted in the increase of copper content from 10 to 18 per cent, but with only a recovery of 54 per cent of the copper in the flotation concentrate. Mineragraphic examination and sizing analysis showed substantial quantities of chalcopryrite—pyrite composites in the concentrates to 300 mesh sizes. Fine grinding and selective flotation is ineffective in the production of a high-grade copper concentrate with good recovery because of the existence of composite grains and further with such fine grinding the copper concentrate is contaminated with slimed pyrite.

Mt. Bischoff.

(No. 2/46.) A sample of mill pulp from the soft ore at Pig Flat, containing 0.3 per cent tin, was submitted to concentration tests for the production of low-grade pyritic tin concentrates. Mill recovery amounted to 27.6 per cent with ore crushed through 12 mesh battery screens and a laboratory test resulted in a recovery of 31.7 per

cent. Examination of tailings showed composite particles of cassiterite and gangue in fair quantities to sizes down to 150 mesh B.S. Screen and amended treatment by primary concentration of the minus 12 mesh product followed by grinding the primary tailings to minus 150 mesh and re-concentration resulted in a higher recovery amounting to 47.8 per cent.

(No. 163/46.) An ore sample from the same locality was crushed to minus 36 mesh and a recovery of 39.5 per cent was obtained by table concentration. Low recoveries with ore from Pig Flat are occasioned by fine grain sized cassiterite of less than 30 microns.

(No. 485/46.) An ore sample, consisting of an equal weight mixture of Greisen and Hard Pig Flat ores, was submitted to a minus 85 mesh ball mill grind, flotation rejection of sulphides and table concentration of the flotation sink product. Tin recovery amounted to 43 per cent and sulphide rejection 71 per cent. The ore contained 0.79 per cent tin and 16.9 per cent of sulphur.

(No. 950-1/46.) A sample of mill battery discharge through a 12 mesh battery screen (aperture 1 m.m.) was submitted to concentration tests. The sample contained 0.57 per cent tin and 17 per cent sulphur and was stated to be Greisen ore from "A," "B," and "F" glory holes. Table concentration of the minus 12 mesh material, to produce a pyritic concentrate containing 3 per cent of tin, resulted in a recovery of 58 per cent. Treatment by screening through 72 mesh screen and ball mill grinding of oversize to minus 72 mesh screen, followed by flotation rejection of sulphides, using copper sulphate xanthate, eucalyptus, and lime to produce a p.H. value of 11 and table concentration of the flotation sink product resulted in a recovery of the cassiterite in an 11 per cent concentrate of 62.3 per cent. Sulphide rejection amounted to 92.5 per cent or 48.5 per cent of the sample and contained 18 per cent of the total tin with an assay value of 0.22 per cent.

(No. 972/46.) Greisen ore from "F" glory hole. This sample was submitted to similar treatment by grinding to minus 72 mesh, flotation and table concentration as described for No. 951-1/46. Recovery amounted to 71.4 per cent in a concentrate assaying 19.7 per cent of tin. The sample contained 0.73 per cent tin and sulphur 25.5 per cent. The flotation sulphide product amounted to 76.6 per cent by weight, assayed 31.8 per cent sulphur, and 0.16 per cent tin, and contained 95.3 and 16.7 per cent of the total sulphur and tin respectively.

(No. 951-2/46.) This sample of mill tailings was submitted to sizing analysis and examinations which showed loss of cassiterite as composites with gangue minerals and loss of free recoverable cassiterite in finer sizings which indicated inefficient mill operation in treatment of slimes.

(No. 764/46.) A sample of calcine from the Edwards furnaces, containing 3.25 per cent tin, was concentrated on a Wilfley table to produce a sale grade concentrate. Recovery amounted to 84 per cent.

Storeys Creek Mine.

(No. 935/47.) A sample of jig seconds was submitted for research investigation: The sample consisted mainly of pyrite, wolfram, and cassiterite, with a minor quantity of non-sulphide gangue. The sample contained 12.2 per cent of tungstic oxide and 3.86 per cent of tin. It was stated that existing mill treatment could not produce marketable concentrates from this jig product which had consequently been stored for possible treatment. Research was desired to investigate the prospects of concentration in saleable form of the wolfram and cassiterite contents of the sample. Preliminary investigations by electromagnetic separation showed that the greater portion of the pyrite was magnetic and could not be separated by this means from the wolfram. Digestion of the pyrite with 15 per cent sulphuric acid did not affect its magnetic properties and this property prevented the production of a high-grade wolfram concentrate by electromagnetic treatment. Wolfram and cassiterite were both present as composite particles predominately in the coarser fractions. Sizing analysis of the sample showed: +10 mesh 12.6 per cent, +22 mesh 83 per cent, +36 mesh 18.5 per cent, +60 mesh 0.8 per cent, and -60 mesh 1.1 per cent. Successful treatment of the sample was obtained as follows: Roll crushed to minus 16 B.S. Screen and treatment by magnetic separation. The pyritic magnetic and non-magnetic products were then given separate and similar treatments by ball mill grinding and screening to minus 52 mesh, flotation rejection of pyrite and table concentration for production of marketable concentrates. The test treatment resulted in recoveries of 82 per cent of the wolfram and cassiterite. The wolfram concentrate assayed 67 per cent tungstic oxide, 0.75 per cent tin and 0.45 per cent sulphur and the tin concentrate 58.6 per

cent tin, 5.73 per cent tungstic oxide, 3.1 per cent sulphur. It is anticipated that the quality of the tin concentrate could be increased in mill operation.

Dorset Dredge.

(No. 888-90/46.) Department of Supply and Shipping, Herrick, submitted samples of jig tin concentrates and seconds for extraction tests of gold by chlorination. The concentrates and seconds contained 4 and 3 oz. of gold per ton and 99 and 95 per cent of the gold was extracted with chlorine consumptions of 8 to 18 lbs. per ton respectively. Chlorination occupied a period of six days.

Jamesonite from Waratah.

(No. 932/46.) A sample of Jamesonite ore was obtained for research investigation of methods of concentration. Jamesonite is represented by the formula $4\text{PbS} \cdot \text{FeS} \cdot 3\text{Sb}_2\text{S}_3$, which corresponds to the following percentage composition: Lead 40.3 per cent, antimony 35.1 per cent, iron 2.7 per cent, and sulphur 21.9 per cent. The ore was reduced to 6 mesh and a sample was assayed with the following results: Lead 12.8 per cent, antimony 10.3 per cent, zinc 2.5 per cent, arsenic 1.9 per cent, copper 0.45 per cent, iron 10.3 per cent, sulphur 16.5 per cent, bismuth nil, and acid insoluble 41.8 per cent. The major minerals were: Jamesonite, pyrite, and sphalerite. Minor constituents were: Arseno-pyrite, pyrrhotite, marcasite, galena, tetrahedrite, and pyrrargyrite. Jamesonite with the associated silver minerals, tetrahedrite and pyrrargyrite were the valuable constituents. The ore sample contained 7.4 oz. of silver per ton.

Mineragraphic investigation by C.S.I.R. indicates that the ore has a banded character ranging from more or less pure jamesonite and sphalerite to a fine intergrowth of jamesonite and sphalerite. The intergrowth of these minerals would require extremely fine grinding to liberate them. This feature, together with the closely related specific gravities of jamesonite and pyrite (5.5-6.0/4.9-5.2) in addition to the soft nature of jamesonite precludes the possibility of high recovery and grade by gravity concentrations.

Flotation tests showed that jamesonite has somewhat similar reactions to flotation reagents as galena. In particular this applies to critical p.H. values for flotation and also that high concentrations of sodium cyanide have little if any depressing action on the jamesonite. The mineral can be floated with promoters such as xanthates without the use of metallic salts such as copper or lead and is effectively depressed with sodium dichromate in a similar manner to galena. Jamesonite, however, under certain conditions in pulps, is unstable or chemically reactive in the presence of various reagents and it is indicated that some flotation of pyrite is caused by activation related to this feature.

Investigations indicated two methods of selective flotation which showed promising results. These methods are: (1) Bulk flotation of sulphide minerals followed by selective flotation of jamesonite incorporating depression of pyrite, &c., with lime and high concentrations of sodium cyanide; and (2) Bulk flotation followed by selective depression of the jamesonite with sodium dichromate. The first method resulted in a recovery of 75 per cent of the lead in a concentrate assaying 25.5 per cent lead, 22.3 per cent antimony, 6.8 per cent iron, and 11.4 per cent of insoluble, and the second method resulted in a recovery of 78 per cent in a concentrate of similar quality as shown in the first method. Pilot plant operations would be essential for valuation of either of these types of treatment as firstly results would vary considerably with ore grade which is known to be variable and secondly selective flotation methods with this ore could only be thoroughly tested by continuous pilot plant operations. Chemical treatment of jamesonite concentrate by digestion with boiling 10 per cent caustic soda solution at atmospheric pressure resulted in a 90 per cent extraction of the antimony and should marketing conditions be unfavourable for a lead-antimony concentrate this method of separation could be investigated as a basis for separation of the lead and antimony and production of metallic antimony.

COAL RESEARCH.

Beneficiation of coals by rejection of impurities of comparatively high ash and specific gravity by jigging, pneumatic tabling and heavy media separation is finding increased commercial applications. All applied methods of separation are dependent upon the higher specific gravity of impurities and investigations have been commenced to obtain information on the possibilities of beneficiation of Tasmanian coals. The procedure used throughout this work has been float and sink separation of fractions of the samples in mixtures of organic liquids with densities ranging from 1.3 to 1.8. Chemicals used were shellite, carbon tetrachloride, and acetylene tetrabromide.

Typical results of beneficiation tests are shown. Tests were conducted on air dried samples and results of beneficiation tests, including gross British Thermal units, are expressed on a moisture free basis. Samples were obtained by departmental officers of coal representing commercial grades from large coal to slack.

Cornwall Large Coal (on 4" × 2" screen.)

Sample 687.—Weight received 24 lbs.

Description.—A generally dull coal with a minor proportion of thin bands of lustrous black coal and an occasional band of stone and sub-grade coal up to $\frac{3}{8}$ " thick; a considerable proportion of the coal shows faces smeared with films of white clay. No freestone was observed.

Sizing Analysis—

Screen Aperture.	Weight, Per Cent.	Cumulative.
+3"	13.4	13.4
—3" +1½"	66.3	79.7
+¾"	15.4	95.1
+½"	3.2	98.3
+10 mesh B.S.	1.0	99.3
+36 mesh B.S.	0.5	99.8
—36 mesh B.S.	0.2	100.0
	100.0	

Beneficiation Results—

Treatment.	Per Cent.		B.T.U's.	Per Cent.		Per Cent. Distribution.		
	Wgt.	Ash.		V.C.M.	F.C.	Wgt.	Ash.	B.T.U's.
No beneficiation	100.0	18.4	11360	29.0	52.5	100.0	100.0	100.0
Separation at Sp.G. 1.8	97.8	17.3	11540	29.3	53.3	97.8	92.1	99.4
Separation at Sp.G. 1.7	96.0	16.7	11640	29.4	53.9	96.0	87.3	98.4
Separation at Sp.G. 1.6	94.9	16.5	11690	29.4	54.0	94.9	85.1	97.7
Separation at Sp.G. 1.5	86.1	14.8	11980	29.7	55.5	86.1	69.2	90.8
Separation at Sp.G. 1.4	70.7	13.0	12260	30.0	57.0	70.7	50.0	76.3

The sink product at 1.8 Sp.G. amounted to 2.2 per cent and contained 66 per cent of ash.

Cornwall Slack (through 2" × 1" screen.)

Sample 689.—Weight received 30 lbs.

Description.—Coal similar to 687, except that some free stony matter was visible.

Sizing Analysis—

Screen Aperture.	Weight, Per Cent.	Cumulative.
+1½"	Nil	....
—1½" +¾"	35.5	35.5
+¾"	32.7	68.2
+½"	16.3	84.5
+10 mesh B.S.	10.5	95.0
+36 mesh B.S.	5.0	100.0
—36 mesh B.S.	100.0	

Beneficiation Results—

Treatment.	Per Cent.		B.T.U.	Per Cent.		Per Cent. Distribution.		
	Wgt.	Ash.		V.C.M.	F.C.	Wgt.	Ash.	B.T.U.
No beneficiation	100.0	25.8	10040	28.1	46.1	100.0	100.0	100.0
Separation at Sp.G. 1.8	82.7	19.1	11170	29.4	51.5	82.7	61.4	92.0
Separation at Sp.G. 1.7	78.9	17.9	11390	29.7	52.4	78.9	54.7	89.5
Separation at Sp.G. 1.6	72.7	16.1	11690	30.1	53.8	72.7	45.5	84.7
Separation at Sp.G. 1.5	61.8	13.7	12130	30.6	55.7	61.8	32.8	74.7
Separation at Sp.G. 1.4	39.8	10.4	12740	32.1	57.5	39.8	16.1	50.5
Untreated —36 mesh fines	5.0	30.1	9280	28.5	41.4	5.0	5.8	4.6

The degree of beneficiation achieved was considerable, 12.3 per cent of stony matter carrying 68.7 per cent of ash being rejected at Sp.G. 1.8 with the loss of only 3.4 per cent of the total B.T.U's. If the untreated —36 mesh fines are combined with the beneficiated product separated at Sp.G. 1.8 the resultant mixture totals 87.7 per cent of the original sample and averages 19.8 per cent ash. The coal is non-coking and contains only 0.29 per cent of sulphur. It will be noted that with the large coal (No. 687) practically no beneficiation could be effected without loss in weight and heating value. The ash could be reduced from 18.4 to 14.8 per cent with a loss of 13.9 per cent of weight and 9.2 per cent of the calorific value.

LANGLOH FINE COAL.

Sample No. 313.—Weight received 57 lbs.

Description.—All —2 inches. A soft dull coal with seams of highly lustrous black coal. Crystalline calcite was present as small free plates in the finer fractions and as facings and seams up to ¼-inch thick in the lump coal.

Sizing Analysis—

Screen Aperture.	Weight, Per Cent.	Cumulative.
—3" +1½"	8.0	8.0
+¾"	26.1	34.1
+¾"	24.1	58.2
+10 mesh B.S.	18.9	77.1
+36 mesh B.S.	9.5	86.6
—36 mesh B.S.	13.4	100.0
	100.0	

Beneficiation Results—

Treatment.	Per Cent.			B.T.U.	Per Cent. Distribution.		
	Wgt.	Ash.	CaCO ₃		Wgt.	Ash.	CaCO ₃
No beneficiation	100.0	23.7	7.4	.....	100.0	100.0	100.0
Separation at Sp.G. 2.0	81.4	19.6	5.4	11590	81.4	67.3	59.0
Separation at Sp.G. 1.9	81.0	19.4	5.3	11630	81.0	66.3	58.0
Separation at Sp.G. 1.8	80.4	19.1	5.2	11680	80.4	64.8	56.5
Separation at Sp.G. 1.7	77.1	17.7	4.8	11940	77.1	57.5	50.3
Separation at Sp.G. 1.6	73.9	16.6	4.7	12130	73.9	51.8	46.9
Separation at Sp.G. 1.5	65.0	14.5	4.3	12520	65.0	40.0	38.0
Separation at Sp.G. 1.4	47.7	12.0	4.1	12990	47.7	24.2	26.5
Untreated —22 mesh fines	13.5	29.3	10.7	9590	13.5	16.7	19.6

Sulphur in all fractions, 0.4 per cent.

Heavy solution separation of the +22 mesh material at Sp.G. 2.0 shows a recovery of 81.4 per cent by weight of the coal with a reduced ash content of 19.6 per cent. The calcite content was reduced from 7.4 to 5.4 per cent. The sink reject at this density represented 5.1 per cent by weight of the original sample and assayed 74.1 per cent ash. This reject product contained 31 per cent of calcite. The minus 22 mesh material, representing 13.5 per cent by weight and containing 29.3 per cent of ash, was treated by froth flotation and yielded a further 10.4 per cent of cleaned coal with an ash content of 17.5 per cent. This float contained 4.9 per cent of calcite and the waste flotation tailing contained 31.4 per cent of calcite and a total of 72.3 per cent of ash.

The combined treatment by separation at Sp.G. 2.0 and flotation of the minus 22 mesh product resulted in a recovery of 91.8 per cent by weight with a reduction in calcite content from 7.4 per cent in the original sample to 5.4 per cent in the beneficiated products. The ash content was reduced from 23.7 to 19.4 per cent. The combined waste product amounted to 8.2 per cent with a calcite content of 31.2 per cent and a total of 73.4 per cent of ash.

Spreyton, No. 714/47. Coal from this district is generally of very low ash content, but contains excessive quantities of sulphur.

Sink and float treatment at 1.8 Sp.G. showed that 95 per cent of the coal could be recovered with an ash content of 9 per cent, whereas the original sample contained 12.6 per cent of ash. The sizing analysis of the commercial grade coal is shown below:—

Screen Aperture.	Per Cent Weight.
—3" +1½"	8.9
—1½" +¾"	29.3
+¾"	27.9
+10 mesh B.S.	19.3
+36 mesh B.S.	8.9
—36 mesh B.S.	5.7

The sample contained 6.3 per cent of sulphur and at the sizing shown no reduction in sulphur content resulted by floating at Sp.G. 1.8. Iron sulphide is present as thin seams through the coal and it is evident that any process designed for reduction of sulphur content would primarily entail fine crushing to liberate it from the coal.

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 5255, as compared with 5178 for the previous year.

There was a continued shortage of suitable labour for planned developmental and productive operations at the principal mines and works.

Accidents.

The total number of accidents, registered under the provisions of Section 23 of the Act, was 63, as against 46 for the previous year. The 63 accidents resulted in injury to a like number of 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 each of the northern and southern, north-eastern, and north-western divisions; three less in the eastern division; and an increase of eight accidents in the western division.

There was one fatality and this was allied with surface operations at an alluvial-tin mine in the north-eastern division. The cause of the accident was due to the breaking of a link connecting two trucks being raised on an inclined haulage. The breaking of the link allowed the rear truck to rapidly descend the haulage and strike an employee who was working near the foot thereof. The inflicted injuries proved fatal.

Of the 62 accidents causing non-fatal injuries to a like number of persons, 22 occurred underground and 40 were allied with surface operations. Seven of these accidents occurred at coal mines, 36 at metalliferous

mines, 4 in quarries, and 15 accidents happened at metallurgical and other works. Three casualties were due to falls of ground. One resulted from an explosion in an acetylene gas generator; one casualty resulted when an employee was struck by a fragment of stone "flying" during the progress of blasting operations; whilst the remainder was due to causes of a miscellaneous nature.

The rate per 1000 persons employed fatally injured was 0.19, as compared with 0.386 for the previous year.

The rate per 1000 persons employed incapacitated for more than 14 days was 11.798, as compared with 8.497 for the previous year.

Having regard for the hazardous nature of many aspects of the mining industry and the percentage of mishaps due to minor causes, the accident incidence continued to reflect creditably upon the control, management, and inspection of operations at mines, quarries, and works.

Prosecutions.

Legal proceedings were instituted against four persons for offences too serious to be satisfied with cautionary measures.

Action was taken in two cases where employees had failed to use appliances for the prevention of dust during rock-drilling operations. Two persons were prosecuted for unseemly conduct on a mining tenement.

Health and Sanitation.

Constant regard was given to matters pertaining to health and sanitation, close surveillance being exercised in the suppression of atmospheric dust. Conditions of dust arising from the mechanised cutting of coal caused some concern and measures are to be implemented to reduce the nuisance to a reasonably practicable minimum.

Inspectorial.

The inspectorial staff was maintained at normal level and officers conscientiously functioned in matters pertaining to the health and safety of those employed in the industry. The appended reports cover the activities of all inspectors.

TABLE showing Rate per Thousand Killed and Injured in different Divisions for the Year 1946.

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	2039	11	...	11	11	5.394	...	5.394
North-Eastern	250	4	1	3	4	16.000	4.000	12.000
Eastern	508	9	...	9	9	17.716	...	17.716
North-Western	463	7	...	7	7	15.118	...	15.118
Western	1995	32	...	32	32	16.040	...	16.040
Total	5255	63	1	62	63	11.989	0.190	11.798

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	1436	17	...	17	17	11.838	...	11.838
Zeehan, &c.	559	15	...	15	15	26.833	...	26.833
Total	1995	32	...	32	32	16.04	...	16.04

COMPARATIVE Table of Statistics of Accidents in and about the Mines of Tasmania from 1st July, 1892, to 31st December, 1946.

Table with columns: Period, Number of Miners Employed, Number of Accidents, Number of Persons (Killed, Injured), Total Killed and Injured, Average per 1000 Killed and Injured, Average per 1000 (Killed, Injured). Rows list years from 1894 to 1946.

* Mount Lyell disaster.

Faded table with columns similar to the main table, likely a continuation or summary of the data.

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	33,250
Gelignite	750,800
Gelatine Dynamite	2,500
Blasting Powder	9,250
Sporting Powder	2,250
Ligdyn	27,800
Ajax	15,100
Detonators	510,800
	Number.
	Feet.
Cordtex Detonating Fuse	55,450

Customary 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.

Minor instances of faulty compounds and detonators were observed, but general condition of the explosives, as imported and as passed into use, was satisfactory.

In one case, miss-fires were found to be due to faults in an electric exploder and not to the detonators being used. An instance of this nature amply demonstrated the absolute necessity for maintaining the equipment, provided for exploding electric detonators, in good order and condition.

With the exception of an emergency consignment of detonating fuse, which was condemned owing to detected faults, the detonating fuse regularly imported for group-blasting gave results sufficiently satisfactory for permanently establish its efficiency and reliability.

An impending shortage in the supply of nitro-compounds led to the importation of a quantity of T.N.T. for experimental use in opencast blasting operations. Reasonable results were obtained under dry conditions and with a high detonation rate, but climatic conditions and disadvantages allied with use in powder form precluded its use as an approved explosive for mining.

Carelessness in the keeping or disposal of a small quantity of explosives resulted in a youth losing a hand. Three youths found a quantity of gelignite, detonators, and safety fuse. Each inserted a length of fuse in a detonator and endeavoured to obtain an explosion. One held the detonator in his left hand, ignited the fuse and held the detonator until an explosion occurred, with the result that his hand was shattered off at the wrist. Incidents of this nature are difficult to control without sensible care by those responsible for the purchase, keeping, and disposal of the explosives.

Inflammable Liquids Act, 1929.

There was marked activity in the re-commissioning of petrol pumps placed out of use under wartime conditions, installation of new outfits, building of compounds for storage in 44-gallon drums, alterations to bulk-storage depots, and in the provision of new terminals for future storage of petrols and kerosenes.

There were no fires or accidents in connection with the handling and storage of inflammable liquids. Irregularities in practices were remedied without recourse to legal proceedings and endeavours were made to minimise the fire and explosion hazards allied with the handling and storage of these liquids.

APPENDIX V.

REPORTS OF INSPECTORS OF MINES AND EXPLOSIVES.

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

Employment.—The average number of persons employed in the mining industry was 1437, representing a decrease of 34 in the number employed last year. With the exception of one person engaged in the production of barytes, all were employed by the Mount Lyell Mining and Railway Company Limited.

Accidents.—Seventeen accidents, resulting in non-fatal injuries to seventeen persons, were recorded under the provisions of the Mines and Works Regulation Act, as compared with 12 accidents causing fatal injuries to two persons and non-fatal injuries to ten persons recorded during the previous year.

Eleven of the accidents, attended with non-fatal injuries to a like number of persons, were allied with surface operations, while six accidents resulting in non-fatal injuries to six persons, were associated with underground mining practices.

Ten persons were injured as the result of misadventure; six accidents were due to carelessness, either by the person concerned or by other workmen associated with them and the cause was not established in the case of one accident.

As all accidents registered are those which have caused the injured person to lose not less than 14 working days, the severity of the 17 accidents may be stressed as follows:—The total number of working days lost was 666, ranging from 14 to 108 days in the various cases, or an average of 39 working days for each accident.

Of the accidents allied with surface operations, one occurred during blasting operations at an opencut working. In this instance, a miner, engaged in boring rocks, some 550 feet away from a place where a toe hole was being chambered by the firing of bulling charges, was struck by a small stone which flew out of the hole when a charge was fired. The blow caused a fracture of his right leg, and involved an absence from work of 108 ordinary working days.

While assisting the driver of a tractor, engaged in drawing a light truck on a two-foot gauge railway, a man slipped and fell as he stepped from the tractor when it was approaching a dead end. In falling, his right arm became pinned on a rail by the leading wheels of the front bogie of the truck. The arm was so severely crushed that amputation was necessary and incapacitation for 90 working days resulted.

When working at a small silica quarry, an experienced miner fired a "blister" on a large rock, near the top of a long sand rill, and apparently walked across the rill just below this stone before he had cleaned the broken rock away. It is assumed that a piece of rock fell from a height of four or five feet, struck the miner on the side of his head and caused a fractured skull. The injury resulted in amnesia and the injured person was unable to recollect incidents and circumstances prior to and after the accident. As there was no witness to the accident, the cause of the injury was not established with certainty.

A person was employed clearing a blockage of slag from the forehearth spout of a blast furnace and turned away as his mate struck the slag with a bar, causing the slag to scatter. Portion of the scattered slag entered his boot and inflicted burns which resulted in a loss of 34 working days.

A boiler-maker was incapacitated for 21 days as the result of a fragment of steel penetrating his eye when he was engaged chipping a hot weld.

Injuries sustained by six persons in accidents of a less serious nature occasioned absences from work ranging from 14 to 30 days. One of these accidents resulted when a long drill steel rolled and jammed a finger of the sharpener as he proceeded to draw a drill from a stock on the floor. He sustained a fractured finger.

An attendant was using a spanner to open a by-pass valve of a pump, in underground workings, when the spanner slipped and resulted in a jar which caused the development of a hernia. He was incapacitated for 70 days.

A miner was removing timber from a stope when his leg caught between a truck and a timber set. He sustained injuries which caused him to be absent from work for 53 days.

When lifting a stone into a truck, a trucker was inflicted with a hernia which caused him to be incapacitated for 42 days.

Another trucker was hit on the head by a small stone which bounced over the top of the chute door of an ore pass after the door had been closed. This accident was the result of neglect by the workman who had installed the door.

A piece of 8-inch by 2-inch board had been left on the top of a rock pile by a machine man, and later, a miner, engaged in shovelling near the toe of the rock pile, was hit by the board when it slid down the rill. The board struck his hand and broke a bone causing him to lose 22 working days. This accident was due to carelessness.

A platman slipped when unloading heavy timber from a cage at an underground plat of a shaft and one of his fingers was jammed between two pieces of timber. Amputation of the first joint of the finger was necessary.

One other accident occurred during surface operations and has been registered under the provisions of the Inspection of Machinery Act. It is referred to under the heading "Machinery" of this report.

Safety.

Inspection work was regularly directed to the production and maintenance of safe working conditions. Reasonable co-operation resulted when representations were made to employers and employees in the interest of safety.

In all mining operations, strict attention was directed to the removal of unsafe ground before persons were permitted to work beneath it. In several instances it was necessary to withdraw men from opencut workings and to supervise the barring down of unsafe ground.

Following an investigation into the practice of "bulling charges" being fired at opencut workings for the purpose of chambering the bottom of drill holes, several innovations were made with the object of preventing accident.

In underground mining, ground movement has been controlled by the use of timber and filling and no uncontrolled falls have occurred. In some instances it was necessary to direct the use of additional timber and filling.

Attention was directed to the better supervision of electric cables used in connection with power shovels and to a proper supervision of motor trucks when tipping over embankments.

Ladderways, shaft equipment, lighting, ore-pass covers, angles of batter in opencuts, explosives in transit, and in use, surface and underground transport and many other details of mining practice, have been regularly examined and reasonably safe conditions have been maintained.

In the crushing, milling, and smelter sections of works and in the various workshops allied with mining operations similar controls were exercised.

Ventilation.

Ventilation of underground workings and surface buildings received due attention and minor alterations and improvements were required to be made.

No excessive temperatures were encountered in any underground workings and all stopes, drives, and dead ends appeared to be adequately ventilated.

Health and Sanitation.

Regular supervision was maintained in connection with all 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.

Supervision has been given to the control of atmospheric dust arising from mining operations and many konimeter dust samples were taken in underground workings and surface buildings.

In two instances it was necessary to prosecute miners at an opencut working for failing to use water to allay dust during rock-drilling operations.

Konimeter investigations of atmospheric dust have revealed several unsound conditions in places, both underground and at surface, where other means of detection had failed. In all such cases managements have co-operated in implementing measures to remedy the conditions.

First-aid stations have been kept in good order and effective service has been rendered in the treatment of injuries.

Explosives.

One mishap, already mentioned under the heading of "Accidents", occurred at an opencut working when a "bull-charge" was fired. Additional supervision and a better use of protective chain screens, in front of toe holes were obtained and hazards in the "bulling" of holes have been materially reduced.

Owing to supply difficulties, manufacturers were unable to deliver sufficient detonating fuse to meet requirements and obtained a quantity of old fuse from the New Zealand army stores. One consignment of 5000 feet of this fuse was received by the Mount Lyell Company and was found to be faulty when used in the opencut workings. Comprehensive tests were made, and, as a result, the fuse was withdrawn from use and destroyed.

All other detonating fuse received has proved satisfactory.

During the year 990 lbs. of T.N.T. explosive were imported and tested in opencut mining work. Reasonably satisfactory results were obtained when fired in dry down holes with a strong primer attached to detonating fuse. The use of this explosive was not favoured as compared with ordinary gelignites.

All A.N. Gelignite, A.N. Gelatine Dynamite, safety fuse, and detonators used during the year have proved satisfactory.

Machinery.

Maintenance and protection of machinery and appliances received the attention required by the provisions of the Mines and Works Regulation Act.

One serious accident occurred when an experienced small-winch driver had his arm caught between the winch drum and wire rope of a small electrically driven tugger hoist. Injuries sustained necessitated amputation of his arm.

In co-operation with the Inspector of Machinery, an extensive enquiry was made into this accident, but it was not possible to definitely establish the cause. It was assumed that the driver slipped and fell while he was operating the hoist and inadvertently thrust his hand under a coil of the rope as it wound on the drum. Additional safety devices and operational controls were introduced with the object of preventing similar accidents.

The records of the regular tests and inspections kept by the registered managers of the mines and works were examined and checked.

Prosecutions.

Legal proceedings were instituted against four persons for offences under the provisions of the Mines and Works Regulation Act.

Two persons were prosecuted for failing to use water to allay dust during rock-drilling operations at an opencut working. Each person was convicted and fined £2 with 4s. 6d. costs.

Two persons were prosecuted for unseemly behaviour on a mining lease. One was convicted as the aggressor and the case against the other person was dismissed.

Explosives Act.

Supervision was maintained in respect of the importation, landing, and transport of explosives. The following explosives were landed at Regatta Point:—

<i>For Queenstown—</i>		lb.
Polar A.N. Gelatine Dynamite, "75", 3" x 3½"		26,450
Polar A.N. Gelatine Dynamite, "75", 5" x 24"		12,350
Non-Polar A.N. Gelignite, "60", 1½" x 7"		24,400
Polar A.N. Gelignite, "50", 13" x 1¼"		186,250
Polar A.N. Gelignite, "50", 1¼" x 7"		51,500
Polar A.N. Gelignite, "50", 5" x 24"		10,000
Trinitrotoluene (T.N.T.), powder		990
Total		311,940

	Number.
Detonators, No. 6 L/A	250,000
Detonators, No. 6 Electric	4,400
Fuse igniters	6,500
	Cases.
Safety fuse, in reels	258
	Feet.
Plastic and plain Cordtex Detonating Fuse	104,000

For Butler's Gorge—

	lb.
Polar A.N. Gelatine Dynamite, "75", 1½" x 7"	4,000
Polar A.N. Gelnignite, "50", ¾" x 3½"	4,000
Total	8,000

With the exception of one consignment of plain cordtex detonating fuse, referred to under the heading of "Explosives", all explosives imported were in a satisfactory condition, and developed no faults in storage or use.

All safety fuse gave satisfactory results when tested for burning rate and quality.

Provision is afforded in five licensed magazines for the storage of 268,450 lb. of nitro compounds and 122,000 detonators.

Satisfactory conditions were noted during inspections of these magazines and other premises licensed under the provisions of the Explosives Act.

Inflammable Liquids Act.

During the year one licence, covering the storage of 250 gallons of mineral spirit, was cancelled, and no new licences were applied for.

Seventeen licences, covering the storage of 15,160 gallons of mineral spirit, 1540 gallons of mineral oil, and 27,254 pounds of carbide, are in force. Satisfactory conditions have been maintained at the various premises.

The Workers' (Occupational Diseases) Relief Fund Act.

Certificates, indicating that 147 new employees were free from disease, were received and registered.

Applications were made by 40 persons for examination for industrial diseases. Three persons were certified by local Medical Officers as suffering from disease, two from silicosis and one from pneumokoniosis. In one case where a person was certified as suffering from 30 per cent pneumokoniosis, the employer appealed against this decision and, an examination by a Referee Medical Officer reversed the diagnosis and this resulted in a clear certificate being issued.

The following is a comparative analysis of the affected cases:—

	1945.	1946.
Incapacitated (affected by silicosis 100 per cent)	1	Nil
Partial incapacity (over 50 per cent affection)	3	Nil
Partial incapacity (50 per cent affection)	Nil	1
Partial incapacity (under 50 per cent affection)	9	1
Total	13	2

The following tabulation provides further particulars of the persons found to be affected during 1946:—

Certified incapacity due to silicosis.	Age of person affected.	Length of Service in Mining Operations.
Per Cent.	Years.	Years.
50	48	18 years underground in metal-liferous mines. 1½ years underground in coal mines.
20	42	17 years underground in metal-liferous mines.

General.

Industrial relations have continued on a reasonable basis, and, at a conference held in April, between the Employees' Unions and the Management of the main industrial enterprise in this district, it was decided to continue work under the existing agreement until March 31st, 1947.

A continued shortage of labour, both skilled and unskilled, retards the mining industry. This shortage is influenced to some extent by a shortage of housing and suitable boarding accommodation.

Exceptionally heavy rain and snow adversely affected production at opencut workings during the latter part of the year.

In addition to the inspection work in this district, visits were made to the mines at Rosebery, Williamsford, and Zeehan during a period of absence of the district inspector.

Aid to Mining.

Reports were prepared and advice was given in regard to prospecting ventures in the Queenstown and Zeehan districts.

Accompanied by representatives of a mainland industry using asbestos, investigations were made of an asbestos occurrence south of the Spero River. Owing to the isolated location of this deposit it was decided that exploratory work would not be carried out at present.

Two claims for gold and a promising surface prospect of silver-lead have been taken up in the Queenstown area and it is hoped that useful work will be done at these claims within a short time.

MINING OPERATIONS AND PRODUCTION.

Barytes.

One man was intermittently employed in surface trenching and produced 33 tons of good quality barytes from a lease, held by Minerals (Vic.) Pty. Ltd., at Howard Plain.

The barytes was exported for treatment at the Company's works at South Melbourne.

Copper.

The Mount Lyell Mining and Railway Company Limited.—The output from all mines was 1,485,653 tons of ore, representing an increase of 16,483 tons, as compared with the production last year.

An increase of 8,114 tons resulted from surface mining at the West Lyell group of mines, where 1,399,151 tons of ore was produced from the West Lyell and Prince Lyell mines. Production increased by 8369 tons from underground mining operations.

The increased production from the underground mines was mainly derived from the Royal Tharsis mine, which, working, under more favourable conditions, accounted for an increased output of 8484 tons of ore.

No ore was broken at the Lyell Comstock mine, but 43 tons of copper precipitates resulted from the treatment of mine drainage water.

The North Lyell mine, working on ore from pillars left during earlier stoping, produced 118 tons less than in the previous year.

The following tabulation represents the disposition of ore production:—

	Year 1945.	Year 1946.
	Tons.	Tons.
West Lyell Opencut Mines	1,391,037	1,399,151
North Lyell Mine	4,684	4,566
Lyell Comstock Mine	40	43
Royal Tharsis Mine	73,409	81,893
Totals	1,469,170	1,485,653

Underground mining work was restricted to ore breaking and the extension of the main gallery timbers as the stopes of the Royal Tharsis mine rose to three intermediate levels. Towards the end of the year these timber galleries had been nearly completed on No. 2 and No. 4 levels over the length of lode.

In addition to the ore mined at opencut workings, 312,033 tons of overburden was broken and transported to dumps, making a total of 1,711,184 tons of material removed from opencut workings.

Progress towards the implementation of the scheme for increasing production from opencut workings by the use of additional plant is shown by the following account of the auxiliary equipment put in commission during the year:—Five 20-ton capacity semi-trailer trucks, one 2½-yard capacity electric-powered shovel, two bulldozers, five waggon drills, and a heavy type self-propelling well-hole drill.

Industrial unrest in America has delayed the delivery of a 7 x 5 ft. jaw crusher, which is to be installed at West Lyell. This crusher is to be placed close to the main ore transfer-pass and will handle all ore transported from the open-cut workings before it enters the pass. By thus controlling the maximum size of the ore pieces, it is expected to accelerate the ore flow from the mine to the mill and also greatly reduce the cost of secondary breaking.

The preparatory work completed for the installation of this large crushing unit consists of a tip-pocket, concreted and fitted with steel plates, and connected with a concrete-lined pit 43 feet deep and having sectional dimensions of 33 feet by 33 feet. A crusher pit 18 feet deep and having sectional dimensions of 12 feet by 12 feet has been constructed below the main pit.

From the floor of the lower pit, 50 feet from the surface, it is planned to build a conveyor belt tunnel, 12 feet by 12 feet section, of over 120 feet in length and an 18-degree rising slope. A conveyor belt five feet wide will be installed and this will carry the crushed ore into the main transfer pass. Excavational work for the tunnel is progressing.

At West Lyell, diamond drilling was continued throughout the year for the purposes of checking and exploring the ore reserves. Some additional ore was located.

At the Reduction Works, the concentration plant operated for 352 days and processed 1,481,759 tons of ore for an extraction of 41,689 tons of copper concentrates and 58,043 tons of pyritic concentrates. The copper concentrate was smelted and 37,294 tons of pyritic concentrate was shipped from Regatta Point for use in acid manufacture.

Inspector L. F. Egan, Upper Burnie, reports:—

Employment.—The average number of men actively engaged in mining and metallurgical work in the Burnie Division was 823. This represents an encouraging increase as compared with the previous year, when the average employment figure was 793. Approximately half of the average number of men engaged in the industry was employed at Rosebery and Williamsford on the West Coast and it is of interest to record that of this total only 165 were employed underground.

Of the remainder of the inspectorate, embracing as it does King Island, Waratah, Farrell, Renison Bell, Zeehan, and all non-metallic mineral leases, the average number employed underground was 63.5. Thus, the total average employment figure for underground workers was 228.

The tendency has been noted among miners to drift to the cities and more heavily populated parts, attracted by the promise of more congenial working conditions. The danger of such a development in the mining industry is easily seen and on one big mine, at least, the management have embarked on a programme of providing special amenities and comforts for the men in order to offset this drift. Listed among these amenities might be mentioned the provision of specially heated hygienic and comfortable crib-places for underground employees. Change houses and shower rooms have received constant attention and another innovation was the institution of a "miners' school" or course of instruction under actual working conditions in a portion of the mine specially set apart for the purpose.

Under the control and guidance of a competent and experienced all round miner, cadets or young men without previous underground experience were given a course of six weeks' practical instruction in a number of phases of machine drilling, driving, stoping, &c., as well as timbering. To the inexperienced new employee this represented an easy short cut to the more lucrative mining on contract rates. As a result many were attracted to underground mining who otherwise would not have bothered.

Accidents.—A total number of 21 accidents, necessitating in each case absence from duty for at least 14 clear working days, was registered. Of these 11 occurred underground and may be grouped as follows:—Rope accidents—2; rock-drill accidents—5; miscellaneous—4.

The first rope accident occurred when an underground miner twitching, and thereby tightening, the anchor rope of a scraper, allowed his finger to get caught when the twitch slipped. Painful lacerations necessitated his absence from work for more than 14 days.

The other rope accident happened when a shift boss, with the drum of a scraper hoist revolving at idling speed, was winding the rope back on to the drum. He was guiding the rope with his left hand, when an unobserved loose end caused his hand to go under the rope on the drum. He received painful flesh injuries to the first and second fingers of his left hand.

The smelting plant, which operated for 279 days, treated the copper concentrate, together with 3894 tons of high-grade ore and a quantity of copper precipitates, recovered from mine drainage water, and produced 9201 tons of blister copper.

Under normal running, the Refinery treated the blister copper for a return of 9134 tons of electrolytic copper. The cell residue was shipped for treatment and returned 34,194 oz. of silver and 6140 oz. of gold.

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

	1945. Weight.	1946. Weight.
Copper (tons) (Electrolytic)	7,197	9,134
Silver (oz. f.)	24,214	34,194
Gold (oz. f.)	4,853	6,140
Pyritic concentrates (tons shipped)	40,168	37,294
Limestone (tons) (quarried)	5,171	5,708
Silica (tons) (quarried)	4,199	4,829

Gold.

In addition to the gold recovered from the pyritic ore mined by the Mount Lyell Company, a prospector obtained 0.788 oz. of fine gold, valued at £6.786, from a brief period of working in the Macquarie Harbour district.

Of the five rock-drill accidents, four occurred through the rock drill (generally a telescope machine) falling and inflicting injury to the operator. In one instance the staging, from which the miner was operating, collapsed and serious injury was narrowly averted when his fall was checked by a landing stage ten feet below.

The four accidents, listed as miscellaneous, occurred to the victims in the execution of their routine tasks. Strained backs resulted, in two cases, from excessively heavy lifts while, in two cases, rolling lumps of ore caused injury to the legs of the miners concerned.

Of the surface accidents, four occurred to men engaged in their normal work in a large ore dressing plant. Strains occasioned by heavy lifts caused internal injuries to two men. Accidents of a simple nature caused four men to lose at least 14 clear working days. One of these occurred through a hand-cranked engine back-firing and fracturing a wrist. Two others occurred when the employee, in each instant, slipped and fell, fracturing a leg. A stone, falling from a conveyor belt, rebounded past protective railing and struck a carpenter's labourer on the head, inflicting injuries which necessitated his absence from work for a period exceeding 14 clear working days.

Safety.—In all instances, where accidents have been reported, the fullest enquiries have been made. Accident statements have been obtained wherever possible from the accident victim and any unusual features, which might have had some bearing on the occurrence, have been noted. Comments and suggestions have been solicited from witnesses, in the hope that some constructive scheme might be evolved whereby similar accidents could be avoided in the future. Herein, it must be mentioned that on all gazetted mines and works throughout the inspectorate a splendid spirit of co-operation exists between the managements and this Department in the campaign of accident prevention.

In the policing of the Mines and Works Regulation Act, the greater emphasis is placed on the achievement of safe working conditions and frequent visits of inspection have been made to all mines and works. Strict attention has been given to all phases of underground safety, as for example, the support of heavy ground, the establishment of safe working rills, the freeing of "backs" or walls from loose "scats", the maintenance of safe working heights of backs above floors or filling, as the case may be. This is to mention but a few of the many and varied phases of underground inspection work which must be enforced if safe and satisfactory working conditions are to be obtained.

In the handling and use of explosives, a rigid code of procedure is outlined in the Mines and Works Regulation Act and in the interests of safety a rigid adherence to these prescribed rules was required.

On all surface mines, opencuts and works, efforts were directed, during inspections, to remedying any unsafe feature which might have developed, as for example, too steep a batter on the face of an opencut, unprotected surface passes, rises or other openings into which a person could accidentally stumble, clearing down of loose rocks from the faces of opencuts, and the examination and testing of life lines. In one case, the manager was required to erect an approved type of shelter for the protection of employees during blasting.

Machinery.—Metallurgical and ore dressing plants have been inspected for the purpose of satisfying the provisions of the Mines and Works Regulation Act, relating to machinery. Where necessary, the installation of guard rails has been required and matters of greater import have been referred to the Inspector of Machinery, with whom a spirit of collaboration and mutual help has been maintained.

Health and Sanitation.—Throughout the year unremitting efforts were directed to the establishment of optimum hygienic and sanitary conditions at all mines and works. A serious dust problem at one large ore dressing plant continued to cause deep concern, and although, at the end of 1946, the condition had not been completely remedied, some improvement was recorded. By reason of the fact that a changed metallurgical practice is to be instituted it is anticipated that vastly improved conditions will result. The changed metallurgical practice is a proposal to eliminate certain impurities by flotation as against the present practice of complete elimination by drying, screening, and magnetic separation. In addition, work has been put in hand to install a washing unit in the medium crushing section of the plant. It may be said of this plant that conditions auger well for the coming year.

Mining companies were required where necessary to effect repairs to change house, crib-places, &c. On one mine, electrical clothes drying appliances were introduced. One company, controlling two large West Coast mines, has installed modern crib-rooms underground, as well as on the surface. Features of these rooms include tubular electric heaters, electric light, adequate ventilation, rat proofing, hygienic flat topped tables, and individual chairs of tubular steel construction. In addition, hot plates are provided for tea cans, &c.

Satisfactory latrine arrangements have been required at all mines and works.

Ventilation.—Operating on one shift only and thus allowing a sixteen-hour interval between shifts, underground air has been kept reasonably clear and free from injurious explosive dust and fumes. Where necessary, however, ventilating aids have been required, from time to time, such as the extension of Safanco fan ducts, the introduction of additional rises, &c. Altogether, reasonably satisfactory ventilating conditions have obtained underground at all mines and works throughout the inspectorate.

Explosives Act, 1916.—Departmental control was exercised over the importation, conveying and handling of two cargoes of explosives during the year. Importations included the following:—

Nitro-compounds	1,293 cases
Quarry Monobel	155 cases
Blasting powder	5 cases
No. 6 Detonators	65,000

During the unloading of the first shipment, using wooden trays, two cases of Polar A.N. 50 fell from the tray on to the deck of the ship below. Fortunately, no one was injured by the fall and the explosives remained stable, but point was lent to the opinion that net slings were a safer method than the trays. As a result the use of wooden trays was discontinued in later shipments and heavy net slings were substituted.

Inflammable Liquids Act, 1929.—Increased activity was noted among the Oil Companies in the number of applications for licences for petrol pumps, temporarily out of use and in the number of applications to instal new units. Control was exercised over the selection of sites and the provisions of the Act were policed in regard to the details of such installations. In the course of ordinary travel, throughout the inspectorate, opportunity has been taken to check up on existing installations and to require rectification of dangerous defects where necessary, such as leaking hoses, lack of fire extinguishers, &c. In no case was it found necessary to institute legal proceedings.

The Workers' (Occupational Diseases) Relief Fund Act, 1928.—Five applications for compensation under the Act were received and in each case clinical and X-ray examinations were arranged for the applicants. Details of such examinations were as follows:—

	Age.	Percentage Incapacity.	Employment, underground mining. Years.
Applicant No. 1	36	Nil	10
Applicant No. 2	47	Nil	19
Applicant No. 3	33	Nil	8
Applicant No. 4	45	Nil	10
Applicant No. 5	26	Nil	2

Records of examinations of all new employees, examined at the mines, were kept and, subject to the authority of the Workers' (Occupational Diseases) Relief Fund Board, the Act was administered in the Burnie Division.

Aid to Mining Act, 1927, and Mineral Resources.—In the Zeehan area reports were prepared on two silver-lead propositions. The first proposition was allowed to lapse when the applicant for assistance realised that he had pegged his claim over an existing tenement. As a result of the examination of the second proposition, a recommendation was made that the prospectors be granted £40 to be expended, on a £ for £ basis, in the sinking of a shaft at a strategic point on the lease. With the money thus made available a depth of 25 feet was achieved and encouraging values were met with. Pumping problems have the prospect held up at the moment.

Acting on instructions from the Director of Mines a copper-silver-gold proposition was investigated at Natone. To this end a systematic survey and sampling campaign of existing workings was effected and a report prepared. The conclusion was reached that further prospecting, preferably by diamond drilling, was warranted. At the close of the year no arrangement, under the provisions of the Aid to Mining Act, had been entered into by the owner.

During the year attention was directed to the presence of peat in the bed of an old lake system of the post tertiary period in the Smithton-Irishtown area. An occurrence of lignite was also examined and, in each case, samples were obtained and submitted for analysis. Varying ash contents and lack of cover conspired to make accurate conclusions difficult and further prospecting would be necessary before any conclusive evidence will be available.

Interest in the possible use of these materials for fuel purposes has been stimulated by the report that a large scale paper manufacturing company on the North West Coast is changing the fire grates in furnaces from wood fuel to coal. The investigation of the deposits is still proceeding.

MINING OPERATIONS AND PRODUCTION.

Cadmium.—Valued at £15,116, the production of Cadmium from the West Coast mines of the Electrolytic Zinc Co. of Australasia Ltd., reached the figure of 33.74 tons, representing an increase of 4.36 tons, as compared with 1945, when the output was 29.38 tons, valued at £13,161.

Copper.—Production of copper in the Burnie Division was confined to the Electrolytic Zinc Co. of Australasia Ltd. at Rosebery and Williamsford. Here, the total of 245.88 tons resulted from the subsequent treatment of the copper-sulphides recovered in the flotation treatment of the lead-zinc ores. The sterling value of this was assessed at £18,714. Apart from this company, some prospecting was performed on copper shows at Natone and Temma. No production resulted from these two places, but the revival of interest in prospecting for copper gives cause for satisfaction.

Gold.—In the production of 8049.23 ounces of gold for the whole of the Burnie Division, the Electrolytic Zinc Co. of Australasia Ltd. was the sole contributor. The sterling value of this was placed at £69,319, as against £86,636 Australian. Activity elsewhere in the inspectorate was confined to a little unproductive fossicking in the Doctor's Rocks area.

Osmiridium.—Two sales of osmiridium were recorded at the end of the year, the production being from the Nineteen Mile Creek area on the road to Corinna from Waratah. The output was 1.2103 ounces, and two men were responsible therefor.

Ochre.—Yellow ochre, for use in the manufacture of colouring materials, was produced in small quantities from Deep Creek, Smithton. The entire production of 8.5 tons, valued at £A59, was sold to a mainland firm.

Limonite.—Limonite produced in the Penguin area was used in connection with the manufacture of town gas. Total output was 242 tons, valued at £A368.

Red Ochre.—Mined at Spalford. The total recorded production of red ochre was 4.5 tons, valued at £10. This was shipped to the mainland.

Hematite.—The output of hematite was 3.5 tons, valued at £A6. This was recovered in the mining of limonite in the Penguin pits.

Silica.—In the first quarter of the year, 51 tons of silica were quarried at Ulverstone and shipped to the mainland.

Limestone.—The Associated Pulp and Paper Mills of South Burnie absorbed 2053 tons from the limesand pits near Smithton. The pits were acquired by the company during the year and their estimate of the value of the limesand produced is £A816. The work was carried out by contract, two men being employed.

Talc.—A total of 49 tons of talc, valued at £192, resulted from underground operations on the Gawler deposit.

Scheelite.—The entire production of scheelite from the Burnie Division resulted from the operations by King Island Scheelite N.L., at Grassy, King Island.

King Island Scheelite N.L., Grassy, King Island.—Employing an average of 158 men, the recorded throughput of this company was 130,545 tons of ore, from which 627.8 tons of scheelite were recovered. The concentrates were estimated to contain 412,365 tons of tungstic trioxide, valued at £165,264 sterling.

The mine manager, Mr. K. S. Black, reports as follows:—

Development.—A new bench, 50 feet above sea level, was opened up early in the year as a main production bench and yielded mostly high-grade ore. Stripping of overburden on the 150 and 170 feet was continued to allow for the westward extension of all production benches.

Ore Reserves.—On the 31st October, 1946, ore reserves were assessed at 1,763,692 tons of proved and payable ore. At the present rate of extraction this is equal to twelve years' life. Another limited diamond drilling programme is about to commence, and it is likely that this will prove additional ore in substantial quantities.

Research.—A programme of research was undertaken with the primary object of determining an economical flotation process for adoption in the mill.

During the year the 8-cell Denver Flotation plant, included in the original designs, was installed in the mill and was run on large scale tests for four months. The results showed that a total mill recovery rate of 85 per cent of head value could reasonably be expected if the mill were converted to all or part flotation.

Construction.—The following major construction and modification works were undertaken during the year:—

Coarse Ore Bin: The design of a reconstruction of the bottom of the Coarse Ore Bin, of a new type of apron feeder to replace Ross feeder, &c.

Secondary Crushing Plant: The design, fabrication, and installation of a new washing plant to replace the unit originally designed.

Main Mill: The design, construction, and installation of a Sulphide Flotation Plant to remove pyrite from rougher concentrates.

Completion of the installation of the originally designed Scheelite Flotation Plant.

Reconstruction of the mill sampling equipment.

Reconstruction of the mill water supply system.

Alterations to layouts of jigs and tables.

The installation of a Tailings Disposal Plant.

Concentrate Cleaning: The main units were dust-proofed. The installation of a second dryer was completed.

One vacuum filter was altered to suit the handling of flotation concentrate.

Power Plant: One new Worthington 300 K.W. Generating Set was erected and put into service.

Store: Extension of storage facilities in the main store building

Township.—The gradual expansion and development of the township was continued throughout the year, 10 houses being completed. The men's camp and single staff quarters were enlarged. The recreation hall was equipped as a picture theatre and established as an important amenity for the community.

The construction of a Bush Nursing and Baby Health Centre was commenced for the Tasmanian Government Health Department.

General.—The operation of the mine during the year under review was at times very difficult, due to the many shortages of essential supplies accentuated by the inadequacy of the shipping service."

Silver Lead.—Farrell Mining Co. Ltd., Tullah.

The General Manager, Mr. R. D. Midson, reports as follows:—

Production—

	Tons.
Crude ore mined and milled	8,853
Lead concentrates produced	1,655
Metallic lead produced therefrom	1,167
	oz.
Fine silver produced therefrom	134,450
Total Gross Value (Sterling)	£85,789

"Average number of men employed.—Surface 30; underground 36.

"Power.—No major interruptions of the power supply occurred during the year, the total lost time, with eight power failures, being 7 hours 45 minutes. Most power failures were due to lightning storms.

"Treatment Plant.—The crushing and flotation plants gave satisfactory service, but were not run to capacity.

"Mining Operations.—Development No. 8 Level: South Drive. The south drive was advanced to 210 feet from the auxiliary shaft, the last 110 feet of driving containing good values varying from six feet to two feet of highly payable ore. A rise was connected to No. 7 Level for ventilation purposes.

North Drive: This drive was advanced to a point 160 feet from the auxiliary shaft and a crosscut was commenced to cut the Quartz Footwall Lode which lies to the east of the main workings.

No. 7 Level, North Drive.—The face was advanced 14 feet on a lode formation carrying bands of zinc-blende.

No. 5 Level, North, Quartz Lode.—Considerable prospecting work was carried out in the intermediate drive 50 feet above No. 5 Level, where highly payable values were discovered and opened up. The ore is of good quality and its full extent has not yet been determined.

No. 4 Level, South.—Approximately 130 feet of cross-cutting and driving to test the Quartz Lode was unproductive.

No. 4 Level, Main Drive South.—The face was advanced 118 feet, a payable lode averaging two feet of ore being opened up over a length of 58 feet.

No. 4 Level, Quartz Footwall Lode, North.—Approximately 40 feet of cross-cutting and driving failed to locate payable values.

No. 3 Level, North.—In order to pick-up the Quartz Footwall Lode an abandoned cross-cut was extended a distance of 80 feet and the lode opened up for 55 feet. Payable ore was located and a rise connected from No. 4 Branch Stope. Further work was suspended pending picking-up operations at No. 4 Branch Stope, which will connect with these workings.

No. 1 Level, North.—Considerable prospecting work was carried out by means of cross-cuts and drives, the mullock being used for filling No. 2 North Stope. No payable ore was located.

No. 1 Level, South.—The main drive was extended for a distance of 51 feet in order to test the country south of the old South Winze. No values.

"Diamond Drilling.—During the year the Mines Department's diamond drill was hired for surface drilling, and 539 feet of drilling was carried out north of the mine workings. Payable values were not located and the country will be further tested until the northern boundary of the Company's lease is reached.

Stopping.—The following tonnages were broken from the various stopes during the year:—

	Tons.
No. 8 Level, South Stope	283
No. 7 Level, South Stope	981
No. 7 Level, North Stope	255
No. 6 Level, South Stope	226
No. 5 Level, North Stope	1,573
No. 5 Level, South Stope	118
No. 4 Level, Branch Stope	1,272
No. 4 Level, South Stope	74
No. 3 Level, North Stope	1,998
No. 2 Level, North Stope	903
Total	7,683

From development work 1,170."

Apart from the activities of the Farrell Company, improved market prices contributed to revival of interest in the prospects of the silver-lead-zinc ores of the Zeehan field.

Special prospecting licences, embracing approximately 4800 acres, were granted, and a preliminary survey was followed by the inauguration of an intensive diamond drilling campaign, which is proceeding. Subsequently, the area was taken over by Broken Hill interests, operating under the title of "Zeehan Explorations".

Zeehan Explorations.—The following brief report covering the activities of Zeehan Explorations has been received:—

“At Zeehan, North Broken Hill Ltd. and Broken Hill South Ltd. have, under the name of “Zeehan Explorations”, taken an option over a concession of 4800 acres and several smaller leases. Operations commenced in July, and have consisted chiefly of a geological study of the field, aided by the use of the diamond drill. At the close of the year, five holes had been drilled aggregating 2294 feet. Considerable difficulty was encountered, due to the extensive weathering and alteration of the limestone in which most of the holes were sited. Only a small proportion reached their objectives, but results were encouraging. An average of three technical staff and two labourers were engaged, apart from the diamond drill contractor and operators.”

Swansea Silver Lead Mine.—Interest has again been directed to the Swansea leases, where Mr. J. J. Hill proposes to make an early start on re-opening the mine. Mr. Hill has approximately five tons of ore, won during his previous operation of the mine, stored on the surface awaiting sale.

Mr. G. W. S. Clark and Son.—This party carried out some very interesting prospecting work on a 30-acre prospecting claim north of the Zeehan Exploration holdings. The work consisted of extensive surface prospecting—trenching and sinking of prospect holes—and the sinking and equipping of a 6 foot by 3 foot 6 inches prospecting shaft to a depth of 30 feet. A formation, carrying splashes of galena, was penetrated, but could not be considered payable milling ore. The formation is sufficiently encouraging to warrant further investigation.

Gold Boring and Prospecting Company.—This company commenced operations on the Copper-Nickel leases at the Five-Mile and also on the Lead Blocks leases.

Work at the Copper Nickel Mine consisted of rehabilitating the former shaft and setting the surface plant in order. The shaft was de-watered and the underground workings were examined. Plant difficulties were encountered at this stage and prevented a start being made on underground operations. The mine was allowed to again fill with water.

Pending the de-watering and re-opening of the mine, a 500-ton supply of firewood, for the boiler, was laid in. In the meantime, the company continued prospecting operations at the Lead Blocks and produced some 10 tons of silver-lead ore which was stored at grass.

TIN.

No generally noticeable increase in activity accompanied a rise in the price of tin, although Renison Associated Tin Mines N.L. increased production from 76·207 tons metallic tin in 1945, to 84 tons in 1946. Details of the principal tin producers and prospectors are given hereunder:—

Mt. Bischoff Tin Mine, Waratah.—Mr. H. F. Pearson, mine manager, supplied the following report on activities:—

“Mining operations were continuous throughout the year, with greater attention being paid to the Greisen ore body. Mining of ore was stopped at the North Valley section on the 15th February, 1946, and the mill continued running until the 30th August, 1946, on ore drawn from the shrinkage stopes. Mining ceased on No. 5 Bench on the 25th June, 1946, due to low-grade ore in the face.

“Boring was later done ahead of the face, but showed only very low values.

“The following are the tonnages broken in the various places:—

Southern Slopes:			
		Tons.	Tons.
No. 5 Bench	.....	5,455	
Greisen	.....	13,678	
North Valley	.....		19,133
			1,182
	Total		20,315
Tons Milled:			
		Tons.	
“40 Mill”	.....	19,052	
North Valley	.....	7,192	
	Total		26,244

“During the year 600 feet 6 inches of development was done of which 10 feet was done in the North Valley section. The total was made up as follows:—

Driving	.....	302' 6"
Cross-cutting	.....	88' 0"
Rising	.....	210' 0"
Average number of employees		98

“40 Mill.—Prior to the joint Commonwealth-State control, it had been decided to remodel this mill by the addition of fine grinding units, flotation units, a new table section and a slime treatment section. Early in the year, orders were placed for the bulk of this machinery. Due to industrial troubles and shipping delays, the work of installation was very much retarded and the programme was far behind schedule when the year ended.

		Tons.
Pyritic concentrate produced	.....	2,305
Pyritic concentrate calcined	.....	2,272
Tin concentrate produced	.....	65·887
Metallic tin in tin concentrate	.....	43·965
Pyritic concentrates on hand at 1st January, 1946, estimated to contain	.....	4·7
Pyritic concentrates on hand at 31st December, 1946, estimated to contain	.....	5·7
		—
		1·0
		—
Total tin produced for year	.....	44·965

“Tributers produced 1·873 tons tin from alluvial workings in the Waratah River Valley at North Valley.”

Renison Associated Tin Mines, N.L., Renison Bell.—Mr. H. E. Edwards, General Manager, has supplied the following report on operations:—

“Production.—During the period 11,429 tons of crude ore were mined and treated. Of 120·77 tons of tin concentrates produced, the metallic content was 84·002 tons.

“Mining: Battery Workings—

- No. 1. An intermediate level was driven 60 feet.
- No. 2. This opencut was the principal producing face.
- No. 2A. A 100-foot cross-cut was extended through the ore body and a 40-foot rise was completed to the surface.
- No. 3. Glory holing was commenced.
- No. 4. A rise was put through 51 feet to the surface from the end of No. 3 cross-cut. Belling started around this rise.
- No. 5. A cross-cut was commenced and advanced 24 feet without cutting the lode.

“Dalcouth Workings.—Intermediate Tunnel No. 3 Level advanced from 21 feet to 90 feet.

“Dreadnought South Workings.—An intermediate cross-cut was advanced 14 feet.

“Milling.—The mill has been operated on a two-shift basis.

Average value of the crude ore milled was 1·22 per cent tin. The overall recovery, by chemical assay, was 61·6 per cent.

“Amenities.—A housing scheme was started and a change house, for mill employees, has been built.

“General.—During the period under review steady progress has been made in equipping the mine and mill despite shortage of personnel.”

J. S. Fenton's Tin Mine, Renison Bell.—Gravity sluicing was intermittently pursued on a holding, on the opposite side of the gully from the Cable workings of Renison Associated Tin Mines, for a recovery of 0·161 ton of concentrates, containing 0·094 ton of metallic tin valued at £32 sterling.

Razor Back Tin Mine, Dundas.—Mr. W. J. Hodge, Manager of the Razor Back Tin Mine, has submitted the following report:—

“A small amount of prospect driving, north of the Big Cut, was carried out in a fair tin-bearing gossan. A large amount of rich tin-bearing ore has been proved and the party is hopeful of putting a small plant on the mine in the near future.”

The Grand Prize Mine, The Five-Mile.—Messrs. Casey and Smith pursued some prospecting work at this mine. Results of testing, however, were not encouraging, and work was discontinued.

South Mt. Heemskirk.—Work on Mr. E. Coleman's leases was confined to prospecting and there was no recorded production.

A. J. Salmon's Mine, Exe Gorge.—Continuing his prospecting campaign, Mr. A. J. Salmon confined his attention to the southern end of the leases and advises having found some very encouraging prospects. No report was made of sales of ore.

J. Copping's Tin Mine, Exe River.—Owing to sickness, little productive mining was performed during the year. No sales were recorded.

Zinc-Lead-Copper.—The treatment of the zinc-lead-copper ores of the Read-Rosebery field was continued throughout the year by the Electrolytic Zinc Co. of Australasia Ltd at the Rosebery mill. Details of ore treated and concentrates produced are as follows:—

	Tons.
Crude ore mined, <i>ex</i> Hercules	39,756
Crude ore mined, <i>ex</i> Rosebery	84,807
Total	124,563

	Tons.
Crude ore treated, <i>ex</i> Hercules	39,756
Crude ore treated, <i>ex</i> Rosebery	84,807
Total	124,563

Concentrates produced:

	Tons.
Zinc	37,502
Lead	7,357
Copper	2,964

Recoverable quantities and value of metals contained therein:

Metal.	Tons.	Value. (Gross) Sterling.
Lead	5,723.58	282,841
Zinc	17,990.08	800,072
Copper	245.88	18,714
Silver	727,648.76 (f.oz.)	152,199
Gold	8,049.23 (f.oz.)	69,319
Cadmium	33.74 tons valued at	£A15,116.

Employment.—The average number of men employed was as follows:—

	Surface.	Underground.
Hercules Mine	14	48
Rosebery Mine	204	117
Zeehan Smelters	23	.....
Total	246	165

Inspector R. J. Muir, Launceston, reports:—

Employment.—The average number of men employed in mining and associated operations, other than coal mining, was 735, as compared with 750 for the previous year, the decrease being partly due to a drastic reduction of operations at one large mine, and to the general shortage of labour. With an ample supply of labour available the foregoing figures would have been materially increased.

Accidents.—Eight accidents were registered under the Mines and Works Regulation Act. In one case the injuries received were fatal. Six of the accidents occurred on the surface and two underground. Of the two underground accidents one was caused by a fall of rock and resulted in injuries to the chest, a broken knee-cap and a broken ankle, and in the other case an employee's finger, which had been cut on a piece of quartz, became septic and caused the injured person to be absent from his employment more than 14 working days. Of the surface accidents, one resulted fatally and was due to a connecting link between two trucks breaking, allowing one truck to run down an incline and strike an employee who sustained multiple injuries to the right leg, which proved fatal. In a second case, an employee sustained two fractured toes when a steel girder fell on his foot. Another person slipped on a greasy pipe and strained the muscles of his leg. In another case, a workman was shifting an electric motor when he slipped and jammed his hand, resulting in the amputation of the first joint of a finger. A workman was leading a horse and dray at a quarry when the heel of his boot was caught under the wheel of the dray and he was thrown to the ground. He sustained fractured ribs and lacerations. In the last case, an employee was walking down a six-inch step when he slipped and broke a bone in the ankle.

Apart from the above accidents a machinery accident occurred at works subject to the provisions of the Mines and Works Regulation Act. In this case an employee was caught in some gearing and sustained a broken leg.

The following report of the year's activities was received from the Mine Superintendent, Mr. F. G. Burns:—

“Diamond Drilling:

	Feet.
Rosebery Mine	2,251
Hercules Mine	2,538
Total	4,789

In addition to this footage, two deep holes of 1124 feet and 1304 feet were bored from the surface at the Rosebery Mine to test the ore body below the present workings. Both these bores intersected payable ore.

“Development.—The following is a summary of development footages and production for the year ended 26th June, 1946:—

	Driving.	X-cutting.	Rising.	Winzing.	Total.
Rosebery Mine	73	23	255	Nil	351
Hercules Mine	4	.....	132	Nil	136

In addition, the main shaft from 9-10 Levels was partly stripped to full dimensions, and the plat cut on No. 10 Level.

Ore production:

	Stopping.	Development	Total.
			Tons.
Rosebery Mine	77,078	2,428	79,506
Hercules Mine	37,729	302	38,031

Ore production and development work were again below normal owing to the shortage of manpower.

Remarks.—There has been no major change in mining methods, but experiments carried out with blast hole mining have proved very encouraging.

A large battery locomotive for hauling Granby trucks on No. 8 Level was put into commission during the year.

An air operated door, which was installed on the main ore pass is working satisfactorily.

A considerable yardage of overburden was removed by the bulldozers from the ‘opencuts’ to allow ore to be broken by opencut methods.

Milling.—The milling rate for the year ended 31st December, 1946, was 15.1 tons per hour. No major alterations were made in the milling plant during the above period.”

There was one explosive accident. Boys were playing with some explosives which had been found, when a detonator exploded and resulted in one boy having to have one hand amputated at the wrist.

Safety.—Endeavours were made to devote the usual attention to the production and maintenance of safe operating conditions. With this in view regular inspections were made of the larger metalliferous mines, quarries, and works and as often as time permitted visits were made to the smaller mines. Appreciation is expressed of the co-operation received from the various managements to assist in the maintenance of safe working conditions. At one alluvial mine the method of working was considered unsafe, and the owner, after discussion, agreed to cease operations until more satisfactory arrangements could be made. At a large alluvial mine a considerable movement of ground took place, due to particularly heavy rains over a period, and caused the abandonment of the main working face, with a resulting curtailment of the activities.

Health and Sanitation.—Constant attention was given to ensuring that crib-houses and change-houses situated at major mines were kept in a clean and tidy condition.

At one of the larger works, a canteen was installed to serve cheap wholesome meals to the employees. The suppression of the dust menace was reasonably good, at the majority of places inspected, both on the surface and underground, but it is always kept in mind that continuous improvement in dust control must be the aim.

The usual assistance was given to the Chairman of the Workers' (Occupational Diseases) Relief Fund Board by arranging the necessary examinations of underground workers.

Explosives.—Personal supervision was given to the importation of explosives at Launceston. The Marine Board, Devonport, carried out the supervision at that port. No unusual incidents were reported and, in each

instance, a satisfactory certificate of analysis was produced. The explosives were in good order and condition although in a few instances some cases had become slightly damaged during shipment. No reports were received of defective explosives or safety fuse. The one accident, as mentioned under accidents, was not due to faulty explosives, but to persons handling explosives without a knowledge of the care and precautions that should be taken when dealing with them.

Machinery.—Very little new machinery was installed but, in co-operation with inspectors of machinery, inspection of installed machines was carried out. In a few instances minor alterations were made in the interests of safety.

Inflammable Liquids.—With the gradual return to normal conditions there was an increased number of applications for new licences, and a considerable amount of time was devoted to examinations of new installations and in satisfying numerous enquiries in connection with the storage of inflammable liquids.

No unusual incidents were reported in connection with the storage of inflammable liquids. With the increased number of installations, more time is required for administration and inspection in connection with the Inflammable Liquids Act and Regulations, but it is impossible to give the desired attention to this work along with other duties.

Aid to Mining.—Together with the ordinary duties of inspection, advice was given to miners and suggestions made where it was considered that more satisfactory and economical mining would result. As required, reports were furnished in connection with applications for assistance under the Aid to Mining Act. Other reports of a miscellaneous nature were forwarded, from time to time, concerning various phases of mining activities.

Mining Operations and Production.

TIN.

The quantity of tin produced for the year was lower than that for the previous year, the decrease being due mainly to the curtailment of operations by one of the large alluvial tin mines. The output was 563-9349 tons metallic tin, valued at £195,201-62 sterling, compared with 658-09 tons for 1945. It was pleasing to note that the sterling price of tin increased to £357 early in the year and remained steady at that figure.

W.X.X. Mine, Moorina.—Owing to the death of the owner, production ceased at this mine during the last quarter of the year. During the period of operations, employment was given to five men who produced 4-5614 tons tin concentrate, containing 2-9051 tons metallic tin, valued at £991-58 sterling.

Miscellaneous, Moorina.—An average of three men was employed in and around Moorina on small prospects with a resultant production of 0-5465 ton tin concentrate, containing 0-3114 ton metallic tin, valued at £106-90 sterling.

Weld Tin Syndicate, Weldborough.—This syndicate carried out preparatory and prospecting work during the first half of the year, but during the second half 1360 cubic yards of ground was sluiced for a recovery of 0-4397 ton tin concentrate, containing 0-2936 ton metallic tin, valued at £104-81 sterling. Employment was given to two men throughout the year.

Miscellaneous, Weldborough.—A quantity of 4-1792 tons tin concentrate, containing 2-7723 tons metallic tin, valued at £974-54 sterling, was obtained from the small mines, and on an average 11 men were engaged.

Cambria Mine, Weldborough.—R. Symons and partner retreated some of the old dumps and obtained 0-8103 ton tin concentrates, containing 0-6310 ton metallic tin, valued at £225-27 sterling.

Anchor Mine, Lottah.—This mine worked spasmodically and gave employment to an average of five men. During the first half of the year work was mainly confined to overburden removal, approximately 7000 tons of material being removed to uncover what was considered some payable ore. Ore treated amounted to 2040 tons, for a recovery of 4-1755 tons tin concentrate, containing 2-9944 tons metallic tin, valued at £1021-37 sterling.

Miscellaneous, Lottah.—Only one parcel of tin concentrate, weighing 0-3151 ton, was produced, and this contained 0-219 ton metallic tin, valued at £75-65 sterling.

Miscellaneous, Goshen and Goulds Country.—An average of three men was employed at the small mines. Production consisted of 0-8597 ton tin concentrate, containing 0-5716 ton metallic tin, valued at £193-89 sterling.

Albion Tin Syndicate, Priory.—This syndicate continued to work with diesel engines driving a pressure pump for the nozzling, and a gravel pump for elevating. Engine troubles were experienced, due to the power capacity being too low for the expected duty. However, the two men, employed, produced 2-1541 tons tin concentrate, containing 1-3976 tons metallic tin, valued at £480-18 sterling.

Goshen Tin Mines, St. Helens.—This company continued to work the Bog No. 2, Argonaut and George's Bay faces, but had to contend with a number of difficulties such as labour shortages, floods, water shortage, and lower ground values. The method of working was not materially altered, the usual gravity sluicing and hydro-elevation being the accepted practice. Production dropped considerably compared with the previous year. In 1945, 35-5549 tons metallic tin was obtained compared with 16-54 tons of metallic tin contained in 22-7862 tons tin concentrates, valued at £5866-04 sterling, for the year under review. The average number of men employed was 18, and 219,300 cubic yards of alluvial material were treated.

Bell Creek Tin Mine, St. Helens.—Owing to shortage of water for sluicing, production did not commence at this mine until the second quarter of the year. A total of 19,000 cubic yards of alluvial ground was treated for a production of 7-6576 tons of tin concentrate, containing 5-6975 tons metallic tin, valued at £2034-01 sterling. This mine afforded employment for four men.

Miscellaneous, Priory, St. Helens, and Scamander.—The five men employed on the small alluvial mines in these districts produced 0-8613 ton tin concentrate, containing 0-6303 ton metallic tin, valued at £223-58 sterling. Some prospecting was carried out in the vicinity of Wolfram Creek, but results were not promising.

Aberfoyle Mine, Rossarden.—This important producer of tin and wolfram continued operating with a progressive policy throughout the year. The new concentrating plant, which was brought into operation in 1945, continued to perform satisfactorily without any major alterations. The throughput of the plant was stepped-up from 470 tons to 580 tons per week by increasing the daily working hours to eleven. An overall recovery of 85 per cent was maintained for the year. The erection of new and larger ore and mullock bins at Spier's Shaft was commenced, late in the year, to give a greater reserve capacity between production and treated tonnages. Six new cottages for miners and seven huts for single men and a garage for the ambulance were constructed and some improvements were made in other amenities. On an average, 43 men were employed on the surface and 79 underground.

The major portion of the 24,085 tons of ore mined resulted from operations on the Nos. 3, 4, 5, and 6 Levels, No. 6 Level being the lowest producing one. A considerable amount of development work was done on the two lower levels and the total development work amounted to 3009 feet. In addition to this, 2453 feet of exploratory diamond drilling was carried out. Production amounted to 314-3361 tons tin concentrate, containing 224-7093 tons metallic tin, valued at £77,142-44 sterling.

Storey's Creek Tin Mine, Storey's Creek.—An average of 78 men was employed at this mine in the production of tin and wolfram. Production figures are shown under "Wolfram". Tin produced amounted to 25 tons of concentrates, containing 16-1 tons metallic tin, valued at £5565-30 sterling, and this was obtained from the treatment of 8637 tons of ore. Owing to shortage of labour, there were no new installations and very little development work was done. The major development work was 330 feet of driving on the 1A lode at No. 4 Level. The new electric winder for the proposed new vertical shaft and crushing equipment was delivered at the mine. This will be installed, as labour becomes available, in fulfilment of the reconstruction plan at present in hand.

Miscellaneous, Storey's Creek and Avoca.—An average of two men, working small prospects, produced 0-6696 ton of tin concentrate, containing 0-4645 ton metallic tin, valued at £165-82 sterling.

Miscellaneous, Scottsdale.—Intermittent work was carried out by three men in this district and production amounted to 0-3670 ton tin concentrate, containing 0-2164 ton metallic tin, valued at £77-25 sterling.

Miscellaneous, Ringarooma.—Some interest was taken in mining in this area, the average number of six men was engaged at the small mines, mainly in prospecting operations. Production was 0-4871 ton of tin concentrate, containing 0-3269 ton metallic tin, valued at £111-10 sterling.

Arba Tin Mine, Branxholm: (W. A. Walsh).—Production from the mine was obtained from the Groper face workings where it was necessary to work a considerable quantity of old ground. Repairs to water race and equipment were responsible for a decline in the production of tin as compared with the previous year. Nine men were employed. Production was 4·5526 tons tin concentrate, containing 3·3716 tons metallic tin, valued at £1189·56 sterling, as compared with a metallic tin production of 15·7557 tons for the previous year.

Bakers Discovery, Branxholm.—Owing to an inadequate supply of water and shortage of labour, sluicing operations were confined to about three months of the year. Employment was found for two men during this period and one man was engaged during the remainder of the year in prospecting and general repairs. A total of 3500 cubic yards of tin-bearing formation was treated for a recovery of 0·5201 ton tin concentrate, containing 0·3017 ton metallic tin, valued at £107·71 sterling.

Ruby Flat Mine, Branxholm.—Towards the end of the year this mine was disposed of by Messrs. Walsh and Ebrall to Walsh and Company. Activities were confined to sluicing various small shallow patches of alluvial ground, with a resultant production of 3·6016 tons tin concentrate, containing 2·48 tons metallic tin, valued at £868·82 sterling. Employment was given to four men.

Miscellaneous, Branxholm.—An average of eight men were employed, throughout the year, at the various small mines and in prospecting in this district. These activities resulted in a production of 4·1400 tons tin concentrate, containing 2·7879 tons metallic tin, valued at £955·08 sterling.

Briseis Mine, Derby.—Normal operations were carried on until about the middle of the year when, due to very heavy rains and deterioration of the amount of overburden removed during the war years, the drift face receded to such an extent as to render the system of overburden removal inoperative with a resulting cessation of work at the main face. During the latter half of the year, operations were confined to the working of relatively shallow ground on the upstream side of the main face, and to dismantling of plant and preparation of an inventory of saleable equipment. The average number of men employed was reduced to 80 and the curtailment of operations was evidenced by a reduction in production to 132·05 tons tin concentrate, containing 95 tons metallic tin, valued at £31,610·49 sterling, as compared with 167·68 tons metallic tin for the previous year. The overburden removed amounted to 99,000 cubic yards and the drift treated was 479,700 cubic yards.

Miscellaneous, Derby.—Production amounted to 3·6663 tons tin concentrate, containing 2·3954 tons metallic tin, valued at £832·26 sterling. These smaller mines employed an average of six men. The operations at the old "Valley" mine, previously carried out by J. Hornby, were taken over by a small syndicate, but no alteration was made in the method or scale of operations.

Miscellaneous, Herrick and Winnaleah.—A total of 3·0901 tons tin concentrates, containing 2·2723 tons metallic tin, was won from small alluvial workings, and these operations gave employment to two men.

Banca Tin Mine, Winnaleah.—T. B. Dutton continued to work this mine, carrying out sluicing operations when water was available. Production amounted to 0·5067 ton tin concentrate, containing 0·3535 ton metallic tin, valued at £126·20 sterling.

H. V. and L. Wood, Bradshaws Creek.—An average of one man was employed and sluiced 3600 cubic yards of alluvial ground for a recovery of 1·4050 tons tin concentrate, containing 1·0207 tons metallic tin, valued at £364·39 sterling.

Eastern Leads Mine, Bradshaws Creek.—W. J. Ponting and Sons continued to operate this mine with an average of four men, but winter rains and floods carried away one syphon and inflicted a cessation of sluicing operations. In consequence, production declined to 1·4713 tons tin oxide, containing 1·0943 tons metallic tin, valued at £372·83 sterling, as compared with 3·7621 tons metallic tin for the previous year.

O. J. Walsh and Hookway, Bradshaws Creek.—During the last quarter of the year this party commenced sluicing operations on the Wyniford River, but operations were retarded by the large quantity of stone in the alluvial wash. Production was 1·7933 tons tin concentrate, containing 1·2471 tons metallic tin, valued at £445·21 sterling, and two men were employed.

Miscellaneous, Bradshaws Creek and South Mt. Cameron.—A production of 4·5620 tons tin concentrate, containing 3·1890 tons metallic tin, valued at £1120·77 sterling, was obtained from the small alluvial mines in these districts. Employment varied from four to nine men.

Dorset Dredge, South Mt. Cameron.—This dredge, operated by the Department of Supply and Shipping, carried on normal production throughout the year, dredging 36·80 acres of the Dorset Flats, the amount of alluvial material treated being 1,698,000 cubic yards, for a recovery of 142·8552 tons tin concentrate, containing 104·2318 tons metallic tin, valued at £36,169·52 sterling. The alluvial gold produced is recorded under "gold". A prospecting programme was carried out in an endeavour to increase the known volume of payable dredging ground, but results did not indicate any large new areas. Employment was given to an average of 39 men.

Endurance Tin Mine, South Mt. Cameron.—An increase in production resulted as compared with the previous year. A prior completion of the installation of the electrically-driven gravel-pump barge at the Clifton face enabled the maximum time, during the year, to be allotted to production. A total of 661,100 cubic yards of alluvial material was treated for a recovery of 52·7268 tons tin concentrate, containing 38·4125 tons metallic tin, valued at £13,713·26 sterling. In addition to the major project, small areas of shallow ground were worked. Forty-four men were employed.

Mt. Cameron Water Race, Gladstone.—An average of 11 men took advantage of the Government Race Scheme and purchased water on a royalty basis for carrying out sluicing operations. Their production amounted to 16·6171 tons tin concentrate, containing 11·6626 tons metallic tin, valued at £4020·36 sterling, obtained from the treatment of 46,948 cubic yards of material.

Star Hill Syndicate, Gladstone.—The benefits derived from the installation of a new electrically-driven plant were pronounced by a greatly increased production. Water is purchased from Mt. Cameron Water Race, on a contract basis, and fed into a dam from which it is pumped with electric pressure pumps to the nozzles for sluicing. From the sluicing of 57,000 cubic yards of alluvial material, 23·2031 tons tin concentrate, containing 16·7822 tons metallic tin, valued at £5738·36 sterling, were obtained, as compared with a production of 0·1865 tons metallic tin for 1945.

Miscellaneous, Gladstone.—In addition to those obtaining water from the Mt. Cameron Water Race, 13 men found employment at the small mines in this district and from these operations a production of 3·7977 tons tin concentrate, containing 2·7074 tons metallic tin, valued at £957·58 sterling, resulted.

Strait Islands.—Some production resulted from operations at Cape Barren and Flinders Islands. Four men were employed in small-scale sluicing and produced 0·7803 ton tin concentrate, containing 0·43 ton metallic tin, valued at £146·75 sterling.

Shepherd and Murphy Mine, Moina.—Portion of this mine was let on tribute and other parts were worked by the owner. The majority of the production came from the underground workings. In each case, a mixed concentrate was produced, the wolfram and bismuth contents being shown under the respective headings. Tin production was 4·9091 tons concentrate, containing 2·3569 tons metallic tin, valued at £841·42 sterling. The number of men employed reached five, but the average was three men.

F. G. Townsend, Moina.—Activities were mainly confined to prospecting. One parcel of mixed concentrates was produced the tin content of which was 0·2277 ton concentrate, containing 0·0754 ton metallic tin, valued at £26·92 sterling.

WOLFRAM.

The price of wolfram declined to £375 sterling and there was a decrease in production of 54·55 tons, as compared with the previous year. Storey's Creek and Aberfoyle mines were the main producers. The total production amounted to 156·5767 tons wolfram, valued at £44,537·64 sterling.

Storey's Creek Mine.—This mine was the major producer, the output being 123 tons wolfram containing 88·5 tons of tungstic tri-oxide, valued at £35,382·5 sterling. Mining operations are reviewed under "Tin".

Aberfoyle Mine.—This mine produced 30·5642 tons wolfram, containing 21·5521 tons of tungstic trioxide, valued at £8709·05 sterling. Operations are reviewed under "Tin".

Shepherd and Murphy Mine.—The mixed concentrate produced at this mine contained 2·7848 tons of wolfram, valued at £437·21 sterling.

F. G. Townsend, Moina.—One parcel of mixed tin and wolfram concentrate was produced from these workings, the tungstic trioxide content being 0·0222 ton, valued at £8·88 sterling.

GOLD.

Gold production again showed an increase, the recorded output being 468·913 fine oz., greater than for the previous year. This was mainly due to the production from the retreatment of old tailings at the Golden Gate Mine, Mathinna. Very little activity was evidenced in gold mining, either in alluvial or lode types. The total gold production for the year amounted to 1171·971 fine oz., valued at £10,090·68 sterling.

Golden Gate Dumps, Mathinna.—Activities at this undertaking gave employment to an average of eight men and were confined to cyanidation of portion of the old dumps at the Golden Gate Mine. The plant operated almost continuously, without major alterations, and treated 9182 tons of tailings for a recovery of 789·84 oz. of bullion, containing 724·71 fine oz. of gold, valued at £6234·25 sterling.

Dorset Dredge.—Along with the tin production, which has been reviewed under "Tin", a considerable amount of alluvial gold is recovered from the tin concentrate by the use of amalgamation plates. Production consisted of 458·92 oz. of bullion which, after smelting, contained 420·696 oz. fine gold, valued at £3622·20 sterling.

Eastern Leads Mine.—Alluvial gold, extracted from tin concentrates recovered from sluicing operations, contained 2·733 fine oz., valued at £23·53 sterling.

Miscellaneous.—Production from the old gold-fields of Beaconsfield, Nabowla and Lisle, Lefroy and Gladstone was small and mainly from small prospects and alluvial operations. The output amounted to 24·471 fine oz. of gold, valued at £210·7 sterling.

BISMUTH.

Production amounted to 0·3926 ton metallic bismuth, valued at £293·14 sterling, and was contained in a parcel of mixed concentrates from the Shepherd and Murphy Mine, Moina. The price of bismuth remained constant at £746·67 sterling.

LIMESTONE.

Most of the limestone produced was shipped out of the State for use as a flux in iron smelting, but, due to shortage of labour the recorded output of 35,740·5 tons was 14,769 tons less than for the previous year. The remainder of the limestone is used for agricultural purposes and the manufacture of lime.

Broken Hill Pty. Ltd., Melrose Quarries.—The average number of men employed for the year was 32, which is only about one-fifth of the number required for normal operations. No major alterations were made at the quarries and work proceeded on a reduced scale. Production consisted of 33,378 tons limestone, valued at £A21,901.

Melrose Agricultural Lime Works.—These works, which grind waste screenings, from the B.H.P. Quarries, for agricultural purposes, also operated on a reduced scale, as the amount of screenings available was insufficient to meet the demand. Production amounted to 1843 tons limestone, valued at £A1683, and employment was given to three men.

Railton Lime Works.—Employment was given to two men at these works, mainly operating three old-type lime-kilns for the production of burnt lime. The majority of the limestone used was obtained from the nearby Goliath Portland Cement Works. To supplement this supply, 63 tons of limestone, valued at £A44, were quarried by the Railton Lime Works.

J. R. Dally, Flowery Gully.—This quarry and lime kiln were taken over by a company known as the Launceston Lime Products, which intends to reconstruct the business and increase the output considerably. However, by the end of the year no major alterations had taken place and J. G. Dally continued as manager and two other men were employed. Limestone production was 502·5 tons, valued at £A125·63.

CEMENT.

Goliath Portland Cement Company, Railton.—This company operated continuously to satisfy numerous orders for their product, including large consignments for the Clark Dam, which is under construction. Construction work, undertaken during the year, included the erection of a canteen for employees where a hot meal may be obtained at a minimum cost. Additions to the housing scheme for employees, further work in connection with the new Asbestos Cement Sheet Factory, and a dust collector on the exhaust air from the Bagging House were improvements noted during the period under review. During the year a superannuation scheme was instituted by the company for the benefit of employees. A total of 106,393 tons of limestone and 798 tons of iron ore were quarried for the production of cement, and operations afforded work for 130 men.

CLAY.

Increased amounts of clay were quarried for use in paper manufacture and for brick making. The following pits being under the jurisdiction of this office:—

Endurance Clay Deposits, South Mt. Cameron.—A. Pearson worked this deposit to supply the Associated Pulp and Paper Mills, Burnie. Five men were employed in operations which consisted of hand picking the clay from the seam to obtain a clean and grit-free product. Overburden was removed by scoop or bulldozer. Clay produced amounted to 6142 tons, valued at £A10,756·25.

Relbia Clay Pit.—A. Pearson operated this pit, for part of the year, to obtain two small parcels which were shipped to the mainland. Whilst operating, two men were employed and 10·5 tons of clay, valued at £A16, were produced.

Haines Brickworks, Dulverton.—With the housing shortage, the works were busily employed throughout the year in the manufacture of bricks. A total of 2245 tons of clay was quarried and used in these operations. Seven men were employed.

Inspector D. Besford, Hobart, reports:—**Employment.**

The average number of persons directly employed in mines, quarries, and works was 2249, compared with 2153 for the previous year. The distribution was as follows:—

Coal Mining	276
Limestone Quarries	37
Quarries and Brickworks	124
Osmiridium and Tin	19
Works	1,793
Total	2,249

Accidents.

No fatal accidents occurred during the year, and of the seventeen accidents, causing incapacitation for at least fourteen working days, thirteen were associated with surface operations at mines, quarries, and works, and four occurred underground.

Nine persons were injured when handling material or appliances, three accidents were associated with handling trucks, two were due to falls of stone, one was caused by an explosion of acetylene gas in a small gas generator, one man sustained injuries when he slipped and fell, and one man was struck by a piece of flying stone whilst he was spalling.

Eight of the thirteen accidents resulted in foot injuries; four in hand injuries; three in fractured ribs; one in a leg injury; and one in an injury to the back.

With the exception of the leg injury all the injured persons have returned to work, without suffering permanent disablement.

The most serious accident occurred when a portable acetylene gas generator burst as a result of an internal explosion. The workman, who was engaged in charging the generator, which was of the lighthouse type, placed the charged carbide container on top of the apparatus above the generator which contained the water. The carbide apparently entered the generator in excess quantity and an excess amount of acetylene gas was evolved. The gas commenced to escape from the insecure joint around the container, and also through the spring-loaded safety valve on top of the generator. With the intention of stopping the escape of gas, the workman screwed down the nuts on top of the springs, and thus prevented the safety valve from operating at the safe working pressure. An excess pressure resulted inside the chamber causing the gas to explode. The explosion caused the generator to burst, and, in bursting, the container was projected against the workman, inflicting internal injuries including fractured ribs. Although the accident was regarded as dangerous, the workman recovered and resumed his normal employment. The generator was destroyed by the explosion. Similar types of acetylene gas generators were discarded as the type was regarded as a contributing factor in the accident.

A serious accident occurred in a coal mine and resulted in a miner sustaining a fractured leg when a large piece of stone fell from the roof while he was filling a skip with coal. The stone came away from a "feather edge" near the coal face, a not uncommon happening in this particular layer of stone, which directly overlies the coal seam. Many accidents have occurred as a result of falls of this unstable layer of stone, and the management of the mine insists that the stone be pulled down. The workman concerned, in this case, failed to observe these instructions and this was the direct cause of the mishap. The accident further emphasises the necessity for pulling down this section of stone prior to any work being done underneath. If the stone is unyielding, adequate temporary supports should be inserted.

Safety.

Attention has been again directed to the safe working of mines, works, and quarries, and the maintenance of healthy conditions of employment.

Operations at mines and works have generally been conducted in a safe manner, but, occasionally, it has been found necessary to suggest measures to ensure greater protection of employees, and, at times, to insist on workmen protecting themselves. As pointed out in my previous report, underground workmen often delay the setting of timber until they have finished cleaning out a place, instead of erecting supporting timber to protect themselves during the cleaning up process. This aspect has been watched during underground inspections, and there has been occasion to withdraw miners from places having too large an area of unsupported roof. It is considered that at least one accident could have been avoided by adopting this simple precaution.

The quality of the timber supplied to most mines has generally been satisfactory, but it was found that very poor quality timber was being erected in two sections of one mine, and instructions were issued for better quality timber to be delivered to the workmen.

Extraction of pillars, at one mine, continued without any serious mishap, but conditions became very difficult in one section, towards the end of the year, as roadways became very low due to excessive roof weight, on the remaining pillars, causing excessive floor-heave. The maintenance of sufficient height had to be insisted upon. The ventilation of working places in this section was also difficult, due to collapse of airways.

Pillar extraction commenced at one other mine, as workings approached within the safe distance of old workings. The extraction of these pillars had to be carefully watched, and the installation of additional chocks and timber was considered necessary in some cases, in order that safe exits were readily available to the workmen in the event of severe weighting.

Underground electrical machinery has been regularly inspected and tested, to ensure that it is maintained in a safe manner. Where any equipment was found to be below the required standard, suitable precautionary measures were ordered, to prevent possible injury to workmen. In some cases, it was considered necessary to order the discontinuance of some machines which failed to pass a satisfactory test.

The efficient ventilation of working places has continued to occupy attention, and, where ventilation was considered inadequate, workmen were withdrawn until conditions were rectified.

Close attention has been paid to conditions of dust in and around the various mines and works to ensure that workmen are not exposed to injurious dust. Where ventilation was considered inadequate to carry away the dust generated by operations, water sprays were ordered to be provided and used.

Some complaints were investigated in connection with generated dust, and steps were taken to remedy observed defects. In some cases it was found necessary to order the cleaning up and salt treatment of mine roadways, in order to prevent dust being raised when men and horses travel along the roads.

All mines were regularly tested with the safety lamp for inflammable gas, but no gas was found. Old roadways and pillar workings were regularly examined, and tests made at the edges of the "Goaf" failed to disclose any trace of inflammable gas.

Complaints were again received and investigated regarding flying stones from blasting at one quarry in the Hobart area, but it could not be established, beyond doubt, that stones had been propelled from shots fired in the quarry, and suggested precautions appear to have been taken in most cases. Investigations are made during inspections to ascertain that proper precautions are taken during blasting. Quarries were inspected regularly, and in some cases men had to be withdrawn from sections where the face was considered dangerous. Necessary work was immediately undertaken to provide a safe face condition.

The overburden at some quarries is very friable and requires frequent inspection. Particular attention has been paid to overburden inspection and the removal of dangerous overburden has been ordered where these conditions existed.

Close scrutiny of the ledges around quarry faces has been made and where loose material was found to be dangerous, instructions were issued for instant removal. These ledges require frequent cleaning, as loose material collects rapidly, especially during wet weather, and, very soon, becomes dangerous to the workmen below.

Ventilation.

Main air currents have been regularly measured with the anemometer, and have generally been found greater than that required by the Act, and adequate for the mine. In most cases, a large amount of the air, produced by the fans, is lost before it reaches the working faces. Some working places were found to be insufficiently ventilated, and it was considered necessary to withdraw the workmen. Brattice was difficult to procure, and caused some inconvenience in some sections, but, in some cases, more use could have been made of the available brattice.

Good air currents were maintained at the faces of two mines, where coal-cutting and loading machines operated, but at other mines, sufficient effort was not made to conduct the air into each place worked by machines, and operators were exposed to dusty conditions while machines cut the coal. It will be necessary to adopt alternative methods of dealing with dust on machines, owing to this lack of air.

Wet and dry bulb temperatures have been recorded regularly during my visits, and have generally been found to be within the limits prescribed by the Mines and Works Regulation Act. Two working places in one section of a mine registered readings of 70° Fahrenheit wet bulb, and 70½° Fahrenheit dry bulb, and 69½° Fahrenheit wet bulb, and 70½° Fahrenheit dry bulb. These two places were immediately stopped and the miners withdrawn, both places being considered unfit for work. All other places were found to have temperatures ranging between 67½° Fahrenheit wet bulb, and 69° Fahrenheit dry bulb, down to 46° Fahrenheit wet bulb, and 49½° Fahrenheit dry bulb, this latter registration being recorded in a machine place where the velocity of air was high. Ninety per cent of the working places underground registered temperatures below 65° Fahrenheit wet bulb, and 67° Fahrenheit dry bulb; the remaining ten per cent registering up to 67½° Fahrenheit wet bulb and 69° Fahrenheit dry bulb.

Workmen were withdrawn from some places where the ventilation was considered inadequate, even though wet and dry bulb readings were found fairly satisfactory, as workmen should not have to work in stagnant air conditions, as evidenced by fog. It is the duty of the management to see that sufficient air is conducted right into the working place in order to provide healthy working conditions. Difficulties sometime occur in ventilating working places, but these difficulties are generally capable of solution.

Machinery.

Inspections and tests were carried out to ascertain whether the underground electrical equipment was maintained in a safe manner. When the insulation resistance was found low, the equipment was classed as unsafe, and was not allowed to be used until the resistance was brought to the required minimum standard. In some instances it was difficult to maintain a high insulation resistance in the various underground circuits, due to the very damp conditions in some mines, and much time had to be spent in localizing leakage paths, which sometimes were found to be plugs and adaptors. Switchboard panels also allowed leakage due to excessive moisture, and these panels had to be dried out repeatedly. In some cases, leakage could be prevented by regular attention by some appointed competent person, as portable face machinery is subjected to severe treatment by miners and others, and, occasionally, the equipment is damaged. Trailing cables are especially liable to rough handling, and examinations have disclosed damaged insulation. These cables should receive regularly careful examination by some competent person at least daily.

One serious occurrence was reported during one visit to a mine. A miner stated that he had received a shock when he attempted to lift an electric drilling machine from the floor in the mine. Enquiries disclosed that the Earth Leakage had been operating frequently, and some person put in a stick to prevent the circuit opening. This had the effect of removing the safety protection from the drill, and a short between one of the phases and earth caused the frame of the drill to become charged with the phase voltage, and when he contacted the frame, he received an electric shock, which could have had fatal

consequences. It was not possible to find who was responsible for this foolish act, but it does point out the necessity of having a competent electrician at the mine to attend to the electrical apparatus, for an electrician would have immediately investigated the cause of the operation of the Earth Leakage Trip.

During one visit, the Earth Leakage was tested and did not operate satisfactorily. Investigation showed that the resistance coil had burnt out, due to the passage of excess current, and this rendered an open circuit, and made the unit inoperative. It could not be established how long the unit had been out of commission, as only the test disclosed the fault. It was suspected that interference had been the cause.

The testing of other units some times disclosed faults, and time was spent in localizing and adjusting the faults in some cases, but when it was not possible to adjust on the spot, the units were not allowed to be used until the fault was remedied.

The earthing of frames of motors, starters, and other equipment was tested, by means of a Circuit Testing Ohmmeter, and often disclosed faults, which were soon remedied. The effective earthing of frames and covers of equipment is essential for the protection of attendants, in the event of a short circuit. Effective earthing includes low contact resistance to earth, including the earth electrode itself, and this latter unit should be tested regularly to ensure that the resistance is less than 2 ohms.

Complaints were received regarding inefficient brakes on a battery locomotive at one mine, and instructions were issued for the daily examination and testing of these brakes, to ensure effective operation.

Health and Sanitation.

Matters affecting health have been given due attention at the various mines and works, and suggestions for improving conditions were carried out.

Complaints regarding dust exposure were received and investigated and it was possible to effect improvements. In some cases dusty conditions were found to be due to neglect on the part of workmen, and the matter was taken up with those concerned.

Dusty conditions were found when dry calcines from the mainland were being unloaded from a ship. This matter is one which ought to be dealt with by authorities in other States. The material should be treated prior to shipment, as it is not possible to treat the dry calcines in the hold of the vessel.

Underground working places were closely watched, and, where conditions were considered unhealthy, the workmen were withdrawn until healthy conditions were restored.

A complaint regarding inadequate supply of hot water for bathing in one section of a metallurgical plant could not be established and all bathrooms at the works were found in good order, and ample supplies of hot water were available.

Explosives.

Some cases of faulty storage of explosives were found during the year, and adjustments were ordered and carried out.

A complaint was investigated regarding explosive in a hard condition, but the explosive was found to be safe.

One complaint regarding miss-fired shots was investigated. On occasions one or two, only, of a series of shots would explode, leaving the remaining two or three shots, which would fire after being re-connected. The shot-firing cable was found to be in good condition, but upon opening up the Rack-bar-Exploder, it was found that the armature was loose, and revolved unevenly between the poles of the magnet. It was then discovered that one of the screws, supporting the bearing of the armature, had worked loose, and had found its way underneath the automatic contact at the bottom of the case, thus preventing the effective connection, when the rack-bar reached the bottom of its stroke. When the screw was replaced, the series of shots fired satisfactorily, and no more miss-fires occurred.

Some miss-fired detonators were recovered, and, when tested, were found to be faulty. These were destroyed.

Miners have been instructed in the proper handling and use of detonators and explosives wherever it was thought necessary, in order that proper methods could be adopted.

Shot firing cables were examined and tested regularly. Galvanometers were used for testing electric detonators, to ensure that only detonators having good electrical circuit were taken into the mine.

The carriage of explosives into one mine by means of an approved explosives truck continued during the past year, with satisfactory results.

A quantity of detonators for disposal was also examined, and samples were tested, prior to certification for sale.

The construction of a suitable detonator container was also discussed with an outside authority who desired assistance in the matter of carrying detonators.

Inflammable Liquids.

Work was confined to inspections of existing installations, to ensure that petrol pumps were maintained in a satisfactory condition, and that the provisions of the Inflammable Liquids Act were fulfilled. Where any breach was observed, owners of installations were instructed to remedy it, and this was done without the necessity of prosecution. Sites for new storage depots were also inspected during the year.

General.

Some time was spent in the preparation of a suitable set of Electrical Rules for the Installation and Use of Electricity in Coal Mines.

Investigations were made in connection with applications to purchase Crown land in the district.

Prospecting was carried out in the Mt. Elephant area, but, after producing a small amount of coal, operations were abandoned.

Operations and Production.

The total output of coal was 158,751 tons, valued at £137,736 at the mine bins, an average of 276 persons being employed. The corresponding figures for the previous year were 149,077 tons, valued at £125,719, and 279 men being employed. The increase in production is approximately 5.82 per cent on the previous year's figures and represents an increase of 35 tons per employee. The output per employee was 575.185 tons for the year, compared with 534.3 tons for the previous year.

Of the fifteen coal mines, ten showed increased production and five showed reduced outputs.

The Jubilee Coal Mine showed the largest increase for the year, producing 3473 tons more than the previous year with the same number of employees. Fingal Coal Mine also increased production by more than 3000 tons by employing a greater number of workmen. Increased production of 2362 tons resulted from operations at the Duncan Coal Mine at Fingal, and an increase of nearly 2000 tons was shown at the Stanhope Coal Mine. Increases of more than 1600 tons were obtained at the Langlosh Coal Mine, Hamilton, and the Merrywood Coal Mine, Avoca.

The Cornwall Coal Mine showed a reduction in output of nearly 3000 tons, but had a less number of employees.

Carbide production was slightly higher than the previous year, but the production of Ferro-silicon was less and no Calcium Silicide was produced.

There were reduced outputs of all other minerals, zinc production, from imported calcines, being nearly 6000 tons less than the previous year.

Fingal-Mount Nicholas-Dalmayne Coalfields.

The Cornwall Coal Mine continued to be the chief producer of the State, and produced 80,257 tons, valued at £64,204, and employed an average of 121 persons, being 26 on the surface and 95 underground. The corresponding figures for the previous year were 83,253 tons, valued at £65,001, and 127 persons, being 23 on the surface and 104 underground. The reduction of nine underground workmen would be responsible for some reduction in output, but absenteeism was responsible for a loss exceeding 4000 tons. Shortage of railway trucks resulted in a direct loss of more than 2000 tons, electric power failure for more than 1000 tons, mechanical breakdowns for 800 tons, and there was one day's loss of work due to an industrial dispute, resulting in a loss of 330 tons.

Pillar extraction became more difficult, due to excessive floor heave, and collapse of airways, and was further reduced during the year, work in the right hand section being abandoned at the end of the year.

The Arc-Wall coal-cutting machine continued operation in the main heading section where the thickness of the coal seam is below normal. Difficulties in cutting were increased, owing to lack of adequate electric power resulting from voltage drop over a long transmission distance underground. The normal cutting time for the machine is in the vicinity of ten minutes, but due to low voltage the machine, at times, occupies thirty minutes in cutting a place.

Driving of the new tunnel, to the west, was continued, and a good area of coal appears to be developing. A new fan was installed to ventilate this section, and a haulage engine is to be installed in order to accommodate several parties of miners.

Work was continued in a small way in the Blue Seam and a small output resulted.

Water caused difficulties in the Eastern Section workings and some large falls of roof occurred. This section is approaching the outcrop and difficulties will increase, especially if heavy rainfall is experienced. There is not much cover, and the water from the mountain will probably penetrate the overlying strata.

The Mount Nicholas Coal Mine produced 21,875 tons, valued at £17,509, and employed 32 persons, compared with 21,790 tons, valued at £17,431, and 35 persons for the previous year.

Most of the output was won by mechanical means, but some hand mining was carried out in seams, above and below the main seam.

The prospecting drive was extended into the seam above, and bad roof conditions were encountered. The drive collapsed, but was reconditioned, and is being further extended to test the seam.

The length of haulage from the face to the mine bins is rapidly becoming too great for the single battery locomotive, and an order has been placed for a cable reel to act as a gathering unit to assist in speeding transport.

The Jubilee Coal Mine produced 17,639 tons of coal, valued at £14,713, and employed an average of 37 persons, compared with 14,166 tons, valued at £13,061, and the same number of persons for the previous year. There has been an increase of 94 tons per person employed at the mine, and although the output is slightly less than that produced in 1944, the output per person is 70 tons higher than in 1944. It would appear that the increase is due in some measure to the Arc-wall coal-cutting machine, and also to pillar extraction which was commenced during the year.

The new machine section advanced through a faulted area, which caused some difficulties, especially with regard to ventilation. It will be necessary to drive a road back to the outcrop, and install a new fan, in order to ventilate these workings.

A haulage breakdown resulted in a week's stoppage, and heavy rainfall was responsible for the collapse of the upcast shaft, and main ventilating fan, thus causing a further stoppage of work. A new exit had to be driven, and the fan was installed in a new position.

Excessive water accumulation inside the mine also caused difficulties, as pumping facilities are on a limited scale.

Dalmaine Coal Mine produced 2171 tons, valued at £1461, and employed four persons. The output was slightly less than that for the previous year, as the mine was stopped for several weeks owing to the road being damaged by the excessive rains. The main heading is standing on what appears to be a large downthrow fault, and production came from the left side of the heading.

The Fingal Coal Mine produced 5455 tons, valued at £5033, and employed an average of seven persons at the mine. The corresponding figures for the previous year were 2074 tons, valued at £1036, and three persons were employed. The output has been increased by the employment of additional miners, and this was made possible by concentrating on the ventilation of the mine, which was improved by the installation of a ventilating fan. This fan is to be replaced by a larger fan when electric power becomes available at the mine. The road to the mine was also improved slightly, but is still in bad condition for motor transport. A new motor lorry was purchased and reduced delays in transporting the coal from the mine to the railway siding at Fingal Station.

Avoca Coalfield.

The Stanhope Coal Mine produced 9781 tons, valued at £10,850, and an average of 22 persons were employed, compared with 7822 tons, valued at £8541, and the employment of 20 persons for the previous year.

A ventilating fan was installed to replace the furnace ventilation, which could not be regarded as a satisfactory arrangement. The new fan introduced better ventilation through the roads, but faces did not receive corresponding benefits, owing to difficulty in procuring brattice to conduct the air into the places. The ventilating fan, which is of the propeller type, is capable of producing sufficient quantity to efficiently ventilate all the working places.

The coal cutting machine continued to operate successfully. A new trailing cable was procured, and this enabled the removal of the precautionary measures which were imposed to permit the use of the old cable.

The main heading was reconditioned during the year, and opening out of the collapsed area is proceeding. The main output was obtained from places to the east of the main heading, in a seam which maintained a good thickness, having fairly good roof and floor conditions, but a little faulting caused roof conditions to deteriorate in some places.

The Mount Christie Coal Mine produced 1085 tons, valued at £1187, which was approximately the same as the previous year. Difficulties due to faulted conditions still hamper operations, and caused ventilation difficulties. A new air connection was made to the surface to improve the conditions.

The Merrywood Coal Mine produced 3724 tons, valued at £2938, and employed an average of eight persons, as compared with 2090 tons, valued at £1733, and the employment of five persons for the previous year.

Transport difficulties continue to be the chief cause of loss in production, as the eighteen miles of road transport from the mine to the railway siding at Avoca, is difficult in parts, and requires good motor trucks. The flooding of the St. Paul's River also caused stoppages at the mine. The road crosses the river in two places, and flooding in the winter, at these points, is not infrequent.

A new outlet was made to the surface and this is to be used for haulage out of the mine. The site of the outlet at the surface is better situated for handling coal, and new bins are to be erected at this point and the old tunnel will be used for ventilation purposes only.

Upper Derwent Coalfield.

The Langloh Coal Mine produced 11,094 tons, valued at £11,094, and employed an average of 26 persons. The corresponding figures for the previous year were 9431 tons, valued at £9,431, and 26 persons employed.

Most of the output was produced from the Arc-wall coal-cutting machine, the seam maintaining the same conditions as previously.

Difficulty was again experienced in electric power requirements, and voltage drop, at times, rendered cutting difficult.

The entry of water into the mine caused bad roof conditions in parts, and caused some large falls due to the breaking and displacing of timber.

York Plains Coalfield.

York Plains Coal Mine produced only 691 tons, valued at £1036, and employed three persons, as compared with 797 tons, valued at £1205, and the employment of three persons for the previous year. The loss of 100 tons was due chiefly to water troubles, arising from influxes following excessive falls of rain. The coal is chiefly consumed by hop driers, and the loss, although comparatively small, was of some consequence to consumers.

Sandfly-Cygnets Coalfield.

Sandfly Coal Mine produced 568 tons, valued at £872, and employed two men. Some pillar extraction was carried out in the old tunnel, and a new tunnel was opened up to develop the area to the east of the old workings. A downthrow fault was encountered shortly after opening up the seam, and this, together with water inflow, caused difficulties in operations. The output was slightly higher than that for the previous year.

The Mersey Coalfield.

The output from this field was 2991 tons, valued at £4263, and an average of 10 persons was employed.

The Illamatha Coal Mine produced 1421 tons, valued at £2014, the Aberdeen Coal Mine 1198 tons, valued at £1677, and the Tarleton Coal Mine 372 tons, valued at £572.

All these mines operate in a very thin seam measuring between fourteen and twenty inches in thickness, and the output is chiefly used by the Ovaltine Factory at Quoiba, near Devonport, where it is found suitable for mixing with coals from other parts of the State. Owing to the thinness of the seam, the Tarleton Mine ceased operations.

Ore Treatment.

The Electrolytic Zinc Company treated 154,780 tons of imported and Tasmanian calcines, compared with 168,453 tons for the previous year. The reduction was due to shortage caused by shipping difficulties, and the plant was on two-thirds production for several weeks due to this cause.

Zinc recovery amounted to 76,316 tons, valued at £1,755,268, compared with 83,773 tons, valued at £1,926,779 for the previous year. In addition, 217 tons of cadmium, valued at £97,327, 15.25 tons of cobalt oxide valued at £7014, and approximately 32,000 tons of Superphosphate were produced. The production of zinc dust, zinc sulphate, and high-grade Die-cast Alloy also form important parts of the works.

The works have been maintained in a satisfactory condition and where conditions have required rectifying, remedial measures have been carried out without delay.

In order to reduce the amount of fumes and dust which are produced when the plant is closed down for weekly overhaul, it was decided to install a new auxiliary ventilating system, and when this is completed, improved conditions are expected.

The construction of a new "Flash-roasting" and "Contact-acid" plant was commenced, and when this is in operation the production of acid, and consequently the output of superphosphate, should increase.

An average of 1656 persons was employed at the works.

Carbide, Limestone, and Silica.

The Australian Commonwealth Carbide Company produced 5866 tons of carbide, valued at £145,902, and employed an average of 136 persons on production. The corresponding figures for the previous year were 5686 tons, valued at £136,464, and 143 employed.

Although the production of carbide was slightly higher than the previous year, it is still about 5000 tons less than the production in 1944. Shortage of essential materials, which are obtained from the mainland, is the cause of reduced output. One furnace only operated during the greater part of the year.

The production of Ferro-silicon ceased during the first quarter of the year. Production consisted of 227 tons, valued at £7616, compared with 1314 tons, valued at £50,580 for the previous year. The number of persons engaged on production was reduced from 31 in the previous year to six for the first quarter of the current year.

The production of a high-grade Carbon Black was commenced. This material was previously procured from Canada, and the production in Tasmania should be a great asset to Australian consumers.

Excavation work commenced for the installation of a larger electric furnace for the production of carbide, but the work is likely to be delayed, owing to shortage of essential materials.

Limestone was produced at Ida Bay and Granton. The total output declined to 14,345 tons, valued at £16,510, and 37 persons were employed. The corresponding figures for the previous year were 18,999 tons, valued at £23,637, 49 persons being employed.

Approximately 10,000 tons of limestone was delivered to the Carbide Works at Electrona, compared with 15,500 tons for the previous year. Owing to the shortage of coke used in the process of producing carbide it was only possible to work one furnace at the works, and the demand for limestone decreased.

Opportunity was taken to recondition the railway track into the quarry at Ida Bay, and production ceased during the greater part of this reconditioning period.

Slightly more limestone was delivered to the Zinc Works at Risdon.

A boring programme was carried out in order to test a new area of limestone at Ida Bay, and it is proposed to develop this area in the near future, as it contains a very large quantity of high-grade limestone.

Granton Limeworks produced 2275 tons, valued at £1161, and employed an average of seven men.

Silica production amounted to 1057 tons, valued at £1213, compared with 3739 tons, valued at £4120 for the previous year. The smaller output was due to reduced demand owing to the cessation of production of Ferro-silicon and Calcium Silicide.

Tin.

The output of metallic tin was 3.427 tons, valued at £1058, compared with 3.965 tons, valued at £1187, for the previous year.

Osmiridium.

The production of osmiridium decreased to 93.3125 ounces, valued at £2545, compared with 103.633 ounces, valued at £2539, for the previous year. The output resulted from operations in the Adamsfield area.

Kaolin.

The output of kaolin from Surges Bay decreased to 228 tons, valued at £1114, compared with 260.5 tons, valued at £1132, for the previous year. The reduced output was due to a land slide at the quarry caused by heavy mainfall.

Granite.

The production of granite from Coles Bay was resumed and 60 tons, valued at £600, was produced, 10 men being employed.

Quarries.

The quarries operating under the provisions of the Mines and Works Regulation Act continued in the production of materials, chiefly for the building industry. An average of 123 persons was employed, compared with 96 persons for the previous year. Although a greater number of persons was engaged during the year, shortage of labour has prevented a larger output of bricks and stone for building.

The operation of some of the quarries is becoming increasingly difficult, owing to great thickness of overburden and high faces, but it is pleasing to record that no serious accident was reported.

Correction, 1945 Report.—The seam at the Merrywood Coal Mine is stated to measure "more than seventeen feet". This should read "more than seven feet".

APPENDIX VI.

REPORT OF THE MOUNT CAMERON WATER-RACE BOARD FOR THE YEAR ENDED 31ST DECEMBER, 1946.

SIR,

We have the honour to submit the report of the Mount Cameron Water-Race Board for the year ended 31st December, 1946.

Production of tin-oxide from all activities, serviced by the race, was 27·891 tons, as compared with 15·8031 tons for the previous year. The output under fixed scale improved by 11·2322 and there was a slight increase of 0·8558 ton under the royalty scale of payment for water.

Revenue was £135 1s. 4d. more than for the previous year, but there was an increase of £105 6s. 7d. in expenditure, and a net loss of £182 11s. 11d. resulted in the working of the race system.

There was an expenditure of £3305 19s. 4d. from a special appropriation, on the installation of a new concrete syphon, and repairs to portion of the Ringarooma Syphon, and this made the aggregate operating deficit £3488 11s. 3d., as against £437 10s. 7d. for the previous year.

There was no improvement in the number of claims supplied and the inclined output was mainly the result of increased activities by the major producer, following a transfer from steam to electric power-sludging. This producer accounted for the entire revenue on the fixed scale rate and steadied a rapidly deteriorating position in the economics of the working of the system. Members of the Board have been conscious of the deterioration in finances, but have agreed that the incurrence of a reasonable deficit has been merited because the race system preserves employment for a small number of men in the production of an essential metal and contributes to the stability of the Gladstone township. The high overall deficit was occasioned by necessary capital expenditure in replacing and conditioning ageing units, no extensions of the system being made to service areas of unpredictable productive possibilities.

Races.—All races were maintained sufficiently to service requirements, but a programme of conditioning has been planned for the coming year to improve the hydro-capacity.

Syphons.—An expenditure of £2879 7s. 2d. was incurred in completing the new 27" diameter flexible concrete syphon, together with bridges and intake and outlet boxes, to replace the old 30"-27" metal syphon. The new system delivers a larger volume of water and is a commendable innovation in the system.

A portion of the old wooden trestling collapsed and disrupted the concrete section of the Ringarooma Syphon. A metal filling-piece was inserted, the trestling was repaired and the service was restored at a cost of £326 12s. 2d. As the period of future usefulness of this syphon is uncertain an investigation has been made of the cost of replacement and an examination of mining possibilities is in progress to determine the merits of capitalising this major work.

Arrangements were made for a replacement of the Cybele Syphon, which has been causing concern for some time.

Other syphons have been maintained in serviceable condition.

Flumings.—Necessary minor replacements and repairs have been made to the system and all flumes were placed and maintained in good order.

Dams.—Dams were held in serviceable condition and arrangements were completed for an early reconstruction of the intake weir on the Great Mussel Roe River.

Buildings.—There was an expenditure of £15 9s. 3d. on urgent repairs to cottages occupied by employees, but further improvements in living amenities have been planned for future attention.

General.—The availability of electric power continued to afford an opportunity for mining interests to consider productive possibilities in localities outside the compass of gravitational sluicing and to implement projects on a power or power plus gravitational basis, but there were no major developments, although renewed interest was evinced in alluvial-tin potentialities with the rising trend in metal prices.

We have the honour to be,

Sir,

Your obedient servants,

W. H. WILLIAMS, Chairman of the Board.
C. G. RYAN, } Members.
V. C. DAWE, }

The Hon. the Minister for Mines.

STATEMENT FOR THE YEAR ENDED 31ST DECEMBER, 1946.

Rainfall.

The registered rainfall for the year was as follows:—
Great Mussel Roe 55 inches 27 points.
Little Mussel Roe 55 inches 97 points.

Revenue.

The revenue for the year from sale of water amounted to £925 6s. 10d., being an increase of £135 11s. 4d., against that of the previous year.

Disbursements.

The Net Expenditure for the year amounted to £1197 18s. 9d., being an increase of £105 6s. 7d. 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	7
Total number of heads supplied under:—	
Fixed or cash scale	757·33
Royalty or credit scale	1365
Tin ore raised—	
	tons. cwt. qr. lb.
Under royalty scale	16 12 1
Under fixed scale	11 5 2 3
	27 17 3 8

Average number of men employed per week—13.

Statement of Receipts and Payments of the Mount Cameron Water-race Suspense Account for the Year Ended 31st December, 1946.

RECEIPTS.

	£	s.	d.
Water sold under royalty scale	610	13	6
Water sold under fixed scale	302	13	4
Water sold for domestic purposes	12	0	0
Total receipts	925	6	10
Excess payments over receipts	182	11	11
	£1,107	18	9

PAYMENTS.

	£	s.	d.
Salaries and wages	858	12	6
Pay-roll tax	24	13	7
Repairs to races, syphons, dams, and culverts—			
Wages	£125	9	5
Materials, &c.	25	18	8
	151	8	1
Repairs, &c., channel keeper's cottages	15	9	3
Petrol	5	16	8
Printing	3	14	0
Insurance	9	0	10
Electric light, manager's residence	39	3	10
	£1,107	18	9