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TASMANIA

REPORT

OF THE

DIRECTOR OF MINES

FOR THE

YEAR ENDED 31ST DECEMBER,

1960



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TASMANIA:  
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## TABLE OF CONTENTS

	Page
Report of the Director of Mines .....	5
Mines .....	5
Metal Prices .....	5
Exploration .....	6
Research .....	6
Iron Ore .....	6
Legislation .....	7
Operations and Production .....	7
Cadmium .....	7
Cobalt Oxide .....	7
Copper .....	7
Gold .....	8
Iron Oxide .....	8
Lead .....	8
Manganese Dioxide .....	9
Osmiridium .....	9
Pyrite .....	9
Silver .....	9
Sulphur .....	9
Tin .....	9
Tungsten (Scheelite) .....	13
Tungsten (Wolfram) .....	13
Zinc .....	13
Zinc Sulphate .....	14
Clay .....	14
Dolomite .....	14
Kaolin .....	14
Limestone .....	15
Ochre .....	16
Pebbles .....	16
Silica .....	16
Construction Materials .....	16
Fuel Materials .....	17
Foreign Ores .....	18
Revenue .....	19
Leases and Licences .....	19
Mineral Prices .....	20
Mineral Production Since 1880 .....	21
Statistics Relating to the Mineral Industry for the Year ended 31st December, 1960 .....	22
Return Showing Value of the Mineral Industry with Aus- tralian Metal Prices .....	23
Departmental Activities .....	23
Aid to Mining .....	23
Statement of Receipts and Payments of the Mining Trust Fund for the Year ended 31st December, 1960 .....	23
Drilling .....	23
Warden's Court .....	24
Mine Manager's Certificates .....	24
Staff .....	24
Mines Draughting Section .....	24
Appreciation of Services .....	24
Report of Geological Survey of Tasmania .....	25
Report of Chief Chemist and Metallurgist .....	28
Report of Chief Inspector of Mines .....	29
Report of Chief Inspector of Explosives .....	31
Reports of Inspectors of Mines and Explosives .....	32
Report of the Ringarooma and Cascade Water Board .....	34
Report of the Mt. Cameron Water-Race Board .....	35



## REPORT OF THE DIRECTOR OF MINES

Department of Mines,  
Hobart, 30th June, 1961.

THE HONOURABLE THE MINISTER FOR MINES.

I HAVE the honour to present my report on the mining industry for the year ended 31st December, 1960.

The total value of the industry based on Australian metal prices was £A13,387,290 as compared with £A12,766,261 for 1959. The increase is accounted for by increased production of gold, scheelite, silver and wolfram. The production of lead, tin and zinc showed a slight decline, but in the case of zinc due to an increase in the Australian price the value of production exceeded that of last year by a small margin. The value of non-metallic minerals showed an increase as compared with 1959 but construction materials recorded were less in value.

Coal production at 297,670 tons showed a decline of 1698 tons from 1959 which represented a record production of 299,368 tons.

The coal washing plant installed by the Cornwall Coal Co. at Fingal to treat coal produced from the Cornwall Mine at St. Marys and the Duncan Mine at Fingal operated throughout the year. A plant was also installed by the Stanhope Coal Mine at Avoca and functioned during the latter part of the period under review. In both cases a higher quality product was supplied to consumers and in the case of the Stanhope Mine lower cost mining by mechanization became possible. Since the close of the year a slight downward trend in production has become evident and the change over to oil in place of coal by some consumers is causing concern throughout the industry.

The average number of men employed was 8299 representing an increase of 63 men.

### MINES

No new mines were opened, but King Island Scheelite (1947) Ltd. which had suspended operations in 1958 because of market conditions re-commenced productive operations early in the year and has expanded progressively following the improved price for tungsten minerals.

The Illamatha Colliery which was responsible for a small production of coal on the North-West Coast ceased operations because of difficult min-

ing conditions and uncertain markets. The Jubilee Coal Mining Co. N.L. at St. Marys encountered difficulties in maintaining production and observing proper mining practices. Operations were suspended and the mine closed.

Zeehan Mines Pty. Ltd., which operated on a silver-lead lode at Zeehan ceased operations towards the end of the year as a result of exhaustion of ore reserves. Geological indications do not favour the chances of location of further reserves.

### METAL PRICES

*Copper.*—The price of copper in Australia is fixed weekly by the Copper Producers Association and is based on the London Metal Exchange quotation. The average for the year was £A323 per ton. World copper markets were affected by strikes in Chile, but Australian production reached a record level and there is a large surplus available for export. World production of copper is in excess of consumption and the price is trending downwards with a consequent effect on the Australian price.

*Lead and Zinc.*—Quotas imposed on imports of concentrates by the United States on 1st October, 1959, continued to operate and restraints on production or sales by producers resulted in a rise in the London market price. The average Australian price for lead was £100 per ton which has remained unaltered since December, 1958. The average price for zinc was £112 per ton which is in advance of last year's price. The International Lead-Zinc Study Group which is concerned to bring supply and demand into balance met on two occasions.

*Tungsten.*—There was an improvement in the market price of this metal from an average of 128s. 2d. per unit in 1959 to 182s. 5d. per unit in 1960. Operations of the King Island Scheelite Mine which had to be suspended in August, 1958, because of market conditions, were recommenced in January, 1960, on a restricted scale, and were progressively increased during the year. The scale of operations by the Storeys Creek Tin Mining Company which produces wolfram and tin has been substantially increased and this, added to the output from Aberfoyle Tin N.L., has maintained wolfram production on a generally higher level.

*Tin.*—The Australian price of tin is based on the Singapore price with adjustments for freight and other charges and the Singapore price is related to the London Metal Exchange price. Improved trading conditions have been obtained with reduced quantities of metal coming forward from Russia and China and members of the International Tin Agreement have had their production quotas lifted and the Buffer Stock Manager has been able to reduce stocks without causing a significant reduction in price. The average Australian price for 1960 was £1039 per ton as compared with £1058 for 1959. There has been a substantial increase in tin imports into Australia during 1960 in order to provide for the growing needs of the tin plate industry. Consumption has exceeded domestic production by over 1250 tons. Representations have been made by the Tin Producers Association to the Commonwealth Government for a subsidized tin price to encourage production but without success. This State has made application to the Commonwealth on behalf of Tasmania, New South Wales, Queensland and Western Australia for dividends from tin mining to be tax free. This, if granted, should encourage capital investment in the industry.

#### EXPLORATION

Large areas of the State continue to be held as Exploration and Special Prospector's Licences and investigations have been continued by the various companies concerned. Generally, however, there has been a slowing in the tempo of activities; areas being examined have been reduced and efforts concentrated on anomalies revealed by geophysical work. In my last report reference was made to the activities of one company in drilling a particularly interesting anomaly. Work has been retarded because of mechanical troubles and the isolated position of the drilling, but some progress has been made and further work is planned. Active prospecting on existing leases has been continued by operating companies both on the West Coast and on the East Coast and encouraging results have been reported.

The Department is now obtaining more technical staff and more intense geological mapping directed towards the investigation and exploration of the mineral resources will be possible. The active field programme in the West, North-West and South-West has been continued and further work is planned. Maps as part of a complete geological atlas of the State are being published as field work is completed. Five maps have been issued to date and work on a new geological map of the State is nearing completion.

In addition to diamond drilling undertaken by mining companies the Department has had four plants in continuous operation, two churn drills being engaged mainly on boring for supplies of underground water and two diamond drills on mineral deposits. One diamond drill has been testing the coal measures of the Fingal Valley and the other iron ore deposits near Penguin, an occurrence of molybdenite near Scottsdale and limestone deposits required for an important industry operating on the North-West Coast. The Department has now added a new diamond drill to its plant and has an additional churn drill on order. It is planned to use the new churn drill in investigation of potential tin bearing areas in the North-East in an effort to

stimulate the tin mining industry, and another diamond drill is to be commissioned for testing areas being selected by the Department on the West Coast.

The Department's interest in the iron ore deposits has been maintained and further drilling has been undertaken.

#### RESEARCH

This section of the Department's activities has continued to provide valuable services to the mining industry. During the period under review research into molybdenite at Scottsdale was undertaken and this was later followed by diamond drilling which unfortunately did not disclose a sufficient concentration of ore for economic development. Nickel from a deposit at Beaconsfield was also the subject of a research programme to determine the best method of treatment should development be undertaken. A method for treatment of alluvial pyritic concentrates was also established for the principal producer in the State. Beneficiation tests on diamond drill cores from the iron deposits at Savage River were undertaken with satisfactory results. The laboratory was also responsible for investigation of a process for the treatment of clay deposits to produce a product capable of use in the paper making industry at Burnie. A process has been evolved and there is every possibility that an industry will be established and obviate the necessity of bringing supplies of clay from overseas.

#### IRON ORE

Diamond drilling has been continued throughout the year at the Savage River Iron Deposits. The track to this section of the field was improved to allow easier access by vehicles, and it was extended to the sites selected for future holes.

Six diamond drill bore-holes totalling 4770 feet were drilled in the southern section during the year, all holes intersecting ore. The intersections of ore in these bore-holes confirm that the orebody is continuous and that it maintains approximately the same grade over the length of orebody drilled. The bore-holes in the southern section to date prove that this section of the orebody is continuous for a length of at least 3000 feet, and drilling will continue in order to determine the extensions of the known ore.

The diamond drill bore-holes previously drilled on the Northern Section are some 6500 feet north of this year's drilling and indicate that the orebody is at least 8500 feet in length.

A geophysical survey party continued the magnetometer survey in the area during the year, and the results of this work indicate that the orebodies extend further south than was originally thought.

When the bore-hole at present being drilled is completed an assessment will be made to determine the volume and grade of ore which has been proved to date. Laboratory investigations indicate that the grade of ore available is capable of commercial exploitation and the object of the current work is to establish a sufficient volume of ore of commercial grade to interest a company capable of exploiting the deposits and setting up a steel industry. The work undertaken by the Department must only be regarded as exploratory, but with encour-

aging results. At the close of the year negotiations were in progress with a financial group interested in continuing present work to the stage where the economics of establishing a steel industry could be demonstrated.

### LEGISLATION

#### THE MINING ACT 1929

It is pleasing to record that a re-print of the Mining Act and Regulations incorporating all amendments became available during the year.

#### THE EXPLOSIVES ACT 1916 AND THE INFLAMMABLE LIQUIDS ACT 1929

The old Regulations under both these Acts were rescinded and new Regulations were made covering modern requirements for the storage, transport, manufacture and sale of explosives,

inflammable liquids and certain dangerous commodities. These Regulations are now available together with the relative Acts in consolidated form.

#### THE AID TO MINING ACT 1927

New Regulations under this Act were made following an extensive amendment to the Act in 1958. Copies of the Act and Regulations in consolidated form have been printed.

#### THE MINES AND WORKS REGULATIONS ACT 1915

The Rules under this Act are being brought into conformity with present practices and trends in the mining industry and in accordance with Australia wide standards formulated at conferences of the Chief Inspectors of Mines of the States. It is expected that the new Rules will be made during 1961.

## OPERATIONS AND PRODUCTION

### 1.—METALLICS

#### CADMIUM

Quantity produced:—

	Tons	Value £
1924-56 .....	961	891,026
1957 .....	50	78,682
1958 .....	56	84,663
1959 .....	53	85,077
1960 .....	52	83,498
Total .....	1,172	£1,222,946

This is a by-product obtained by the Electrolytic Zinc Company of Australasia Limited at its Risdon Works from zinc concentrates produced from the Rosebery and Williamsford mines.

#### COBALT OXIDE

The source of the 0.70 tons of cobalt oxide of value £784 was the same as that of cadmium above.

#### COPPER

#### THE MOUNT LYELL MINING AND RAILWAY COMPANY, LIMITED, QUEENSTOWN RETURN FOR 1960.

	Tons
<b>Mining—</b>	
Overburden removed .....	2,302,998
Ore mined (West Lyell) .....	1,990,026
Limestone delivered to works .....	5,414
Silica .....	5,210
<b>Reduction—</b>	
Concentrates smelted .....	46,761
Precipitate smelted (North Lyell and Comstock) .....	26
Blister copper produced .....	10,757
Containing Copper 10,682 tons	
Gold .. 6,919 ozs.	
Silver 45,157 ozs.	
Pyrite concentrate shipped .....	53,919
Total Value of Production .....	£3,699,840

Average Number of Men Employed—

Mining—Open cut .....	541
Underground .....	52
Surface .....	988

Total .....

1,581

Production from the inception to 31st December, 1960—

Copper .....	529,722 tons
Gold .....	571,238 ozs.
Silver .....	15,839,944 ozs.

Inspector Braithwaite reports that the rate of overburden removal has been stepped up by the placing of a contract with an outside firm for the removal of 2 million cubic yards during 1960/61. This advance in overburden removal will allow greater control over the grade of ore mined and this will even out excessive fluctuations in the grade of ore delivered to the mill.

Underground exploration of the Crown Lyell mine continued and comprised 349 feet of rising, 1158 feet of driving and 2128 feet of diamond drilling. Ore production from this development amounted to 9111 tons of which 718 tons went direct to the smelter thus allowing a reduction in the quantity of silica used as a flux.

Work has commenced on the erection of a very large cover over the storage pit at the West Lyell crusher and on a crushing and screening station for producing road metal and aggregate.

#### ELECTROLYTIC ZINC COMPANY OF AUSTRALASIA LIMITED, ROSEBERY

This company, reviewed under Zinc, produced 6797 tons of copper concentrate containing 609 tons of copper valued at £196,996.

**GOLD**

Quantity produced—	oz.	Value £
Prior to 1957 .....	2,431,611	12,647,977
1957 .....	19,442	303,788
1958 .....	20,976	327,749
1959 .....	20,260	316,567
1960 .....	23,015	359,613
<b>Total .....</b>	<b>2,515,304</b>	<b>£13,955,694</b>

**THE MOUNT LYELL MINING AND RAILWAY COMPANY LIMITED, QUEENSTOWN**

This Company recovered 6919 oz., valued at £108,110, from sludge in the electrolytic copper refinery.

**ELECTROLYTIC ZINC COMPANY OF AUSTRALASIA LIMITED, ROSEBERY**

Concentrates produced by this Company contained 15,790 oz., valued at £246,697.

**DORSET TIN DREDGING AND STOREYS CREEK TIN MINING CO. N.L. (DORSET TIN DIVISION) SOUTH MOUNT CAMERON**

From the tin concentrates of this dredge (reviewed under Tin) 100 oz., of gold were recovered before the change of ownership and 202 oz., afterwards, a total production from the property of 302 oz., valued at £4708.

**MISCELLANEOUS**

The Endurance Tin Mining Co. N.L., recovered 4 oz., valued at £54 from tin concentrate produced at the Clifton workings. Mr. L. V. Cocks of Fingal sold 1 oz., and a small lot valued at £5 was lodged with a bank.

**IRON OXIDE**

Quantity produced—	Tons	Value £
Prior to 1956 .....	71,947	64,895
1957 .....	5,775	7,056
1958 .....	4,266	5,418
1959 .....	5,062	7,395
1960 .....	3,497	5,503
<b>Total .....</b>	<b>90,547</b>	<b>£90,267</b>

**A. PEARSON, PENGUIN**

Operations at the Iron Cliffs Mine, the sole producer, were carried out by three men with a front-end loader. The haematite produced (3269 tons of value £4505) was used in cement manufacture and the limonite (228 tons of value £998) in coal gas generation.

**LEAD**

Quantity produced—	Tons	Value £
1919-56 .....	257,703	12,050,864
1957 .....	11,595	1,315,429
1958 .....	12,902	1,124,977
1959 .....	13,223	1,322,305
1960 .....	12,183	1,218,381
<b>Total .....</b>	<b>307,606</b>	<b>£17,031,956</b>

**COPPER**

Quantity and value of production:—

Year	From Tin Ores		From Lead-Zinc Ores		In Blister Copper		In Copper Ores		Total	
	Tons	£	Tons	£	Tons	£	Tons	£	Tons	£
1919-1956 .....	183	73,531	5,668	1,293,688	329,912	38,194,290	404	10,581	336,167	39,572,090
1957 .....	89	30,263	627	212,320	9,763	3,309,749	.....	.....	10,479	3,552,332
1958 .....	.....	.....	669	205,465	10,187	3,124,569	.....	.....	10,855	3,330,034
1959 .....	.....	.....	508	159,873	10,585	3,341,261	.....	.....	11,093	3,501,134
1960 .....	.....	.....	609	196,996	10,682	3,460,846	.....	.....	11,291	3,657,842
<b>Total .....</b>	<b>272</b>	<b>£103,794</b>	<b>8,081</b>	<b>£2,068,342</b>	<b>371,129</b>	<b>£51,430,715</b>	<b>404</b>	<b>£10,581</b>	<b>379,885</b>	<b>£53,613,432</b>

**ZEEHAN MINES PTY. LTD., ZEEHAN**

This company ceased mining on 30th June, and milling on 17th July. Production to that date amounted to 2883 tons of concentrates containing 2055 tons of lead valued at £131,457 from 18,164 tons of crude ore.

All proved ore reserves were mined out and while further development was hindered by water, geological indications were against the possibility of finding further reserves.

**ELECTROLYTIC ZINC COMPANY OF AUSTRALASIA LIMITED, ROSEBERY**

This Company, reviewed under Zinc, produced 10,905 tons of lead concentrates and the total content of the lead, zinc and copper concentrates was 9483 tons valued at £1,002,725.

**FARRELL MINING CO. LTD., TULLAH**

Development work was confined to No. 9 Level South, where the drive was extended to open up ore being worked on the level above. Although the ore won during this work was not of high grade, values are expected to improve when the lode is stoped.

Milling 4505 tons of crude ore, 390 tons less than in the previous year, the company increased its concentrate production from 971 tons to 991 tons. Lead content dropped 8 tons to 645 but value rose by £8000 to £73,300. The silver content is shown under that heading. Average employment was 41 men (27 surface and 14 underground).

**MANGANESE DIOXIDE**

This is recovered as a sludge in the electrolysis of zinc sulphate at the Risdon works of the Electrolytic Zinc Company of Australasia Limited, the original source being the ore in its West Coast Mines. The production of 156 tons was valued at £1625.

**OSMIRIDIUM**

Quantity produced—

	oz.	Value £
1910-56 .....	30,977	699,102
1957 .....	66	5,945
1958 .....	42	3,424
1959 .....	3	60
1960 .....	.....	.....
Total .....	<u>31,088</u>	<u>£708,531</u>

**PYRITE**

Quantity produced—

	Tons	Value £
1915-56 .....	1,058,083	1,910,580
1957 .....	76,340	228,993
1958 .....	68,110	204,330
1959 .....	73,000	219,000
1960 .....	53,919	161,757
Total .....	<u>1,329,453</u>	<u>£2,724,660</u>

This is produced and exported by the Mount Lyell Mining and Railway Company Limited for sulphuric acid manufacture.

**SILVER**

Silver is nowhere mined for itself but is a valuable by-product from copper, lead and tin ores. The current producers are shown below:—

Producer	Source	Quantity oz.	Value £
E.Z. Co. of A/asia Ltd.	Copper & Lead Concentrate	1,145,762	486,948
Zeehan Mines Pty. Ltd.	Lead Concentrate	89,518	38,046
Farrell Mining Co. Ltd.	Lead Concentrate	68,119	28,941
Mt. Lyell M. & R. Co. Ltd.	Refinery Sludge	35,157	19,192

**SULPHUR**

This is produced as sulphuric acid in the roasting at Risdon of the zinc concentrates from the Rosebery and Hercules mines of the Electrolytic Zinc Company of Australasia Limited.

Production of sulphuric acid was 25,698 mono tons, valued at £117,590.

**TIN**

Quantity produced—

	Tons	Value £
1873-1956 .....	141,471	28,762,217
1957 .....	777	764,171
1958 .....	883	883,111
1959 .....	890	942,698
1960 .....	884	920,040
Total .....	<u>144,905</u>	<u>£32,272,237</u>

**ABERFOYLE TIN N.L., ROSSARDEN**

Inspector Morris reports that the ore treated in the mill was 65,550 tons, a decrease of 13,675 tons compared to the previous year. Tin concentrate production was 754 tons containing 548 tons of tin valued at £569,982. Details of the wolfram production are given under Tungsten. The average number of employees was 271 (87 surface, 184 underground).

Development comprised 303 feet of rising and 4136 feet of driving and cross cutting. Five diamond drill holes of total footage 1590 were put out from underground stations, four in the south end of the mine to verify results obtained by surface drilling and one in the centre of the mine testing the hanging wall.

## SILVER

## QUANTITY AND VALUE OF PRODUCTION

Year	From Tin and other Ores		From Silver-Lead Ore		From Copper Ore		From Lead-Zinc Ore		Total	
	Oz.	£	Oz.	£	Oz.	£	Oz.	£	Oz.	£
1919-56	59,550	24,492	16,780,368	2,478,569	3,309,103	529,904	13,301,016	3,768,478	33,450,037	6,801,443
1957	28,598	11,697	159,313	65,092	36,647	14,964	1,034,315	423,009	1,258,873	514,762
1958	..	..	157,225	62,223	34,407	13,616	1,156,824	457,779	1,348,456	533,618
1959	..	..	206,455	85,203	31,318	12,947	1,079,389	445,096	1,317,162	543,246
1960	..	..	157,637	66,987	35,157	19,192	1,145,762	486,948	1,348,556	573,137
Total	88,148	£36,189	17,460,998	£2,758,074	3,446,632	£590,623	17,717,306	£5,581,310	38,723,084	£8,966,206

RENISON ASSOCIATED TIN MINES N.L.,  
RENISON BELL

Production was from exploration and development, except for a small amount of open cutting at the Black Face Area, and amounted to 133 tons of concentrate containing 84 tons of tin valued at £87,049 from 11,788 tons of ore.

The average number of men employed was 55 of whom 21 were underground.

Development consisted of 2049 feet of driving and rising in the Battery Workings and 488 feet in the Black Face Area. A total of 38 diamond drill holes with an aggregate depth of 12,123 feet was completed during the year but three of these were commenced in 1959. All holes were started from the surface.

During the year the old Boulder Tramway to the Battery Workings was replaced by a road on the same formation and a new ball mill and a second vanner were installed in the Mill.

DORSET TIN DREDGE, SOUTH MOUNT  
CAMERON

In June, the Department of National Development sold the Dorset Dredge and property to Storeys Creek Tin Mining Co. N.L. The dredging undertaking then became known as the Dorset Tin Division of Storeys Creek Tin Mining Co. N.L.

Before the sale the dredge treated, on behalf of the Department of National Development, 575,000 cubic yards for production of 43 tons of concentrate, containing 32 tons of tin valued at £29,054. Average employment was 43 men.

STOREYS CREEK TIN MINING CO. N.L.,  
STOREYS CREEK AND SOUTH MOUNT  
CAMERON

This Company, reviewed under Tungsten, produced tin concentrates from the mine at Storeys Creek containing 29 tons of tin valued at £30,505.

The Dorset Tin Division at South Mount Cameron dredged 753,000 cubic yards of gravels for the production of concentrates containing 54 tons of tin valued at £49,189. Exploration during the year consisted of testing for possible extension of the Pioneer lead and for occurrences of clay (see *Clay*). From October to the end of the year 14 holes having a total depth of 1486 feet were drilled at the Pioneer mine.

ENDURANCE TIN MINING CO. N.L. SOUTH  
MOUNT CAMERON

The volume of gravel sluiced was 465,000 cubic yards from the Clifton workings and adjacent shallow deposits, for production of 70 tons of concentrate, containing 52 tons of tin. The producer realized £47,740 from the sale of this concentrate.

During the year, four holes were drilled, in a traverse some 250 feet ahead of the present workings, to check and extend knowledge from previous boring. Total footage in the 4 holes was 370 feet.

Average employment was 40 men. On another lease, kaolin was produced for paper making.

## BRISEIS TIN N.L. DERBY

Production from the main Ringarooma workings was 8 tons of concentrate containing 6 tons of tin valued at £6140. An average of 20 persons were employed and 20,000 cubic yards of gravels were sluiced. During September the Company dismantled its plant and commenced to shift to an area known as the Valley workings, a few miles from Derby on the highway to Branxholm. Productive operations in the new area had not started by the end of the year.

## STAR HILL SYNDICATE, GLADSTONE

This Syndicate sluiced 90,000 cubic yards of gravels for the production of concentrate containing 18 tons of tin valued at £18,555. An average of 5 men were employed.

## GOSHEN TIN MINES, ST. HELENS

At the Groom River Mine 78,000 cubic yards of gravels were sluiced for the production of 9 tons of tin in concentrate of value £8903. An average of 7 seven men were employed in sluicing, race maintenance and treatment.

## SMALLER PRODUCERS

Many miners and prospectors throughout the State produced small quantities of concentrates by reason of either small-scale or part-time working. The list hereunder gives the number of men engaged (either full or part time) at each place, the quantities of tin in concentrates sold, and the values.

Name	Locality and Description	Men	Tons	Value £
<b>BRANXHOLM</b>				
Edwards, A. S. ....	Ormuz Mine .....	2	2.13	2,197
Holmes, J. & L. ....	Ruby Flat .....	2	0.18	182
Dunn, B. G. ....	Ruby Flat .....	1	0.21	217
Smith, F. G. ....	Ruby Flat .....	1	0.95	995
Stevens, W. G. ....	Ruby Flat .....	1	0.20	207
Walsh, L. ....	Black Creek near mouth .....	2	3.48	3,608
<b>DERBY</b>				
Coombes, T. ....	Main Creek .....	1	0.02	24
Cotton, G. C. ....	Cascade River, above Cascade Dam .....	1	0.02	22
Flakemore, L. ....	Ringarooma River .....	1	0.10	104
Gibbons, C. ....	Derby .....	1	0.39	401
Hyde, C. T. ....	.....	1	0.15	155
Hyde, R. G. ....	.....	1	0.02	17
Kerrison, R. ....	Ringarooma River beaches .....	1	0.91	947
Machen, A. G. ....	Main Creek .....	1	1.24	1,300
McWatters & Sheehan	.....	2	0.10	105
Melville, J. ....	Ringarooma River beaches .....	1	0.09	96
Merritt, L. ....	Ringarooma River beaches .....	1	0.16	163
Merritt, T. G. ....	Ringarooma River beaches .....	1	0.74	769
Mott, J. ....	.....	1	0.03	33
Mundy, T. H. ....	.....	1	0.01	14
Rainbow, R. L. ....	Banca Mine .....	1	2.45	2,540
Richardson, P. A. ....	Ringarooma River beaches .....	1	0.22	226
Wolfe, R. J. ....	.....	1	0.09	96
<b>GLADSTONE</b>				
Bartels, J. A. ....	.....	1	0.10	111
Burrell, T. M. ....	.....	1	0.19	195
Crawford & Moore	.....	1	0.15	161
Elizabeth Syndicate	Lark Creek .....	2	0.66	678
Fletcher, S. ....	Edina Mine .....	1	0.58	607
Groves, B. G. R. ....	.....	1	0.13	131
Groves & Brown	.....	2	0.14	140
Johanson, B. ....	.....	1	0.02	23
King, E. K. ....	Head of Amber Creek .....	1	1.28	1,341
Kirton, K. S. ....	North of Mt. Cameron .....	1	0.04	36
Lawry, L. A. ....	.....	1	0.23	236
Lawry, R. & Richardson, D.	.....	1	0.30	315
Moore, B. S. ....	.....	1	0.04	37
Moore, L. H. ....	.....	1	0.25	261
Richardson & Groves	.....	1	0.14	142
Richardson, E. M. ....	.....	1	0.08	78
Richardson, K. ....	.....	1	0.12	128
Watt, J. ....	.....	1	0.14	145

## SMALLER PRODUCERS—Continued.

Name	Locality and Description	Men	Tons	Value £
MISCELLANEOUS				
Crane, A. ....	Falls Creek .....	1	0.01	8
Fitzallen, T. ....	Avoca .....	....	0.04	41
Henderson, Estate of late J. ....	.....	1	0.17	174
Jones, L. R. ....	.....	1	0.05	49
King, A. P. ....	.....	1	0.20	209
King, C. D. ....	Melaleuca Lagoon .....	1	1.33	1,376
McCulloch, W. M. ....	.....	1	0.03	26
Maynard, L. V. ....	Flinders Island .....	1	0.14	153
Mundy, W. ....	Coles Bay .....	1	0.05	52
Rosier, J. ....	.....	1	0.00	3
Sajben, J. ....	Gipps Creek .....	2	0.06	62
Wolley, A. ....	.....	1	0.11	110
MOORINA—WELDBOROUGH				
Boon, W. L. ....	Junction of Frome and Weld Rivers .....	1	1.80	1,872
Lambert, J. ....	.....	1	0.03	34
Mullins, F. J. ....	.....	1	0.04	43
Mullins, H. J. ....	.....	1	0.26	264
Russell, V. ....	Weldborough .....	1	0.20	212
Weldborough Tin Mines .....	W.X.X. Mine, Moorina .....	4	6.47	6,756
MT. CAMERON-PIONEER				
Artis, L. ....	South Mt. Cameron .....	1	0.07	76
Cox, G. ....	Boobyalla R. ....	1	0.10	109
Cunningham, D. ....	South Mt. Cameron .....	1	0.07	68
Kerrison, E. ....	Vicinity of Pioneer .....	1	0.07	71
Kerrison, J. & M. J. ..	Vicinity of Pioneer .....	2	2.90	3,026
Slatter, G. H. ....	Wyniford River .....	1	0.26	269
Wood, V. ....	Mussel Roe R. ....	2	7.75	8,042
ST. HELENS				
Berwick, J. C. ....	.....	1	0.45	471
Berwick, W. ....	Rosebud Mine .....	1	0.08	80
Cleland Bros. ....	.....	1	0.10	111
Kerrison, D. ....	.....	1	0.16	171
Kerrison, S. M. ....	.....	1	0.80	82
Kirwan, M. ....	.....	1	0.18	185
Kirwan, W. C. ....	Bell Creek Mine .....	1	0.34	358
Moses, H. T. ....	Constable Creek .....	1	0.43	451
Reynolds, J. P. ....	.....	1	0.32	340
WARATAH				
Allen, E. ....	Griesen Ore Body and Big Stope .....	1	0.53	549
Brook & Party ....	Shovel Lode .....	2	0.60	618
Glozier, M. G. ....	North Valley .....	1	0.11	117
Gonion, H. ....	Don Hill .....	1	0.01	13
Housego, C. ....	Kayser Lode .....	1	0.81	840
Housego, J. ....	Waratah Creek .....	1	0.81	840
Housego, W. ....	North Valley .....	1	0.61	635
Kelly & Rist ....	The Pound .....	2	0.14	152
Kelly Party ....	Thompson's Lode .....	2	0.25	256
Neighbour, C. ....	Happy Valley .....	1	0.02	24
Prouse, J. ....	40 Mill, dressing spillage .....	1	0.47	488
Prouse Party ....	Eastern Lode (Black Tank) North Valley— tailings retreatment .....	2	0.58	615
Wills, L. W. ....	Hillside below Shovel Lode .....	1	0.04	39
WEST COAST				
Clarke Party ....	Grand Prize, Dundas .....	2	1.52	1,580
Coleman, W. E. ....	Wakefield, Trial Harbour .....	1	0.09	89
Coleman, W. G. ....	.....	1	0.02	25
Cook & Smith ....	.....	2	0.09	90
Dunkley & Field- house .....	Assembling treatment plant in Zeehan (ball mill, classifiers, float cell and vanners) ....	2	....	....
Hodge, W. J. ....	Razorback, Dundas .....	2	2.26	2,341
Laffer, R. S. ....	St. Dizier Mine, Heemskirk, erecting hydraulic plant .....	1	....	....
Towndrow Party ....	Exe River .....	2	0.25	260

**TUNGSTEN (SCHEELITE)**

Quantity produced—	Tons	Value £
1917-56 .....	13,134	14,225,372
1957 .....	1,445	1,880,539
1958 .....	731	438,365
1959 .....	Nil	Nil
1960 .....	420	265,382
<b>Total .....</b>	<b>15,730</b>	<b>£16,809,658</b>

**KING ISLAND SCHEELITE (1947) LTD., GRASSY**

Inspector Egan reports that this Company resumed mining on 11th January on a limited scale, employing 34 men for the first quarter. Output was steadily increased and the number of employees rose in the last quarter to 107 the average for the year being 71. An acid leach plant was installed during the year to condition pyritic concentrates.

Production was 420 tons of concentrates containing 291 tons of  $WO_3$  valued at £235,074 from the treatment of 103,884 tons of ore.

**TUNGSTEN (WOLFRAM)**

Quantity produced—	Tons	Value £
1899-1956 .....	9,402	6,227,265
1957 .....	549	384,984
1958 .....	495	188,639
1959 .....	891	426,179
1960 .....	1,106	731,653
<b>Total .....</b>	<b>12,443</b>	<b>£7,958,720</b>

**ABERFOYLE TIN N.L., ROSSARDEN**

Wolfram concentrates produced contained 258 tons of  $WO_3$  valued at £234,840. This Company is reviewed under Tin.

**STOREYS CREEK TIN MINING CO. N.L., STOREYS CREEK**

Tonnage milled increased by 13,689 tons to 44,729. Production of wolfram concentrate was 749 tons containing 546 tons of  $WO_3$  valued at £450,291. Tin concentrates were also produced at this mine, containing 29 tons of tin valued at £30,505, as well as at the Dorset Tin Division of the Company (54 tons valued at £49,189).

Investigation of methods of tailings disposal resulted in a decision to use as much as possible for stopp fill, dumping a small amount of the coarse fraction on the surface. Construction included additions to the office, an ablation block at the single quarters, installation of a 3' Symons Shorthead Crusher and commencement of work on a new compressor house for the installation of a 1950 c.f.m. compressor.

Development consisted of 2575 feet of driving and crosscutting, 825 feet of rising and 77 feet of main shaft sinking. In addition 7290 feet of diamond drilling was done in 25 holes from underground stations. Surface exploration was continued with geological mapping and diamond drilling along the strike of the orebody north and south of the mine. In this work 4 holes were driven of total footage 4837 feet. The average number of persons employed was 129 (57 surface, 72 underground).

**ZINC**

Quantity produced—	Tons	Value £
1919-56 .....	498,614	23,510,368
1957 .....	26,118	2,635,476
1958 .....	29,023	2,650,370
1959 .....	27,928	2,980,598
1960 .....	27,191	3,054,714
<b>Total .....</b>	<b>608,829</b>	<b>£34,831,526</b>

**ELECTROLYTIC ZINC COMPANY OF AUSTRALASIA LIMITED RETURN FOR 1960****EXTRACTION FROM CONCENTRATES: RISDON****From other than Tasmanian Ores—**

Zinc .....	93,341	tons
Cadmium .....	202	tons
Cobalt Oxide .....	22	tons
Superphosphate .....	87,212	tons

**From Tasmanian Ore—**

Zinc .....	26,889	tons
Cadmium .....	59	tons
Cobalt Oxide .....	0.7	tons

**Manufactured product—**

Ammonium Sulphate .....	49,642	tons
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**Men employed—**

The average number of men employed: 2837.

**WEST COAST DIVISION****Ore Mined—**

	Tons
From Hercules Mine .....	213
From Rosebery Mine .....	211,843
<b>Total .....</b>	<b>212,056</b>

**Concentrates Produced—**

	Tons
Zinc Concentrates .....	57,372
Lead Concentrates .....	10,905
Copper Concentrates .....	6,797
<b>Total .....</b>	<b>75,074</b>

**Recoverable Quantity in Ore Mined—**

Zinc .....	26,191	tons
Lead .....	9,484	tons
Copper .....	609	tons
Cadmium .....	52	tons
Silver .....	1,145,761	oz.
Gold .....	15,790	oz. (fine)
Cobalt Oxide .....	0.7	tons
Manganese Dioxide .....	156	tons
Zinc Sulphate .....	123	tons
Sulphur as Sulphuric Acid .....	25,000	mono-tons

**Total Value of Production—£5,141,919**

**Average Number of Men Employed—**

Hercules Mine .....	16
Rosebery Mine .....	647
<b>Total .....</b>	<b>663</b>

## ROSEBERY AND HERCULES MINES

Development at Rosebery consisted of 1435 feet of driving and cross-cutting and 1408 feet of rising, not including sub-levels and ore passes from main levels to sub-levels. A total of 6577 feet of diamond drilling was completed during the year. Of this 1990 feet were pilot and blast holes, 2190 were surface holes at Rosebery and 1340 feet at Hercules.

Reconstruction work at Hercules started with the construction of a jeep road from Williamsford to the mine and continued throughout the year.

Classified mill residue has replaced surface material as filling in the lower levels at Rosebery and has proved most satisfactory. The development of the lowest level at Rosebery, No. 14, has commenced with drives both north and south and a cross-cut was driven 620 feet east into the hanging wall to provide a site for diamond drilling.

The housing programme was continued and ten more houses for employees were completed in the Primrose area.

## RISDON WORKS

The Anode Casting Plant installed at the close of the previous year was tested and following slight modifications was brought into operation.

In the Electrolytic Section an additional fifth unit comprising 36 cells was installed and placed in operation, a new germanium rectifier being used for the conversion of power.

The Despatch and Bulk Handling Depot for Superphosphate adjacent to the Bagging Section was commenced and should be operating early next year.

A new screening section was added to the Dross Plant, large extensions were made to the Fitting Shop and a change house capable of accommodating 450 men was constructed.

Tasmanian and imported concentrates were roasted and the calcine, 239,966 tons in sum, processed. Many by-products were produced following the basic process, such as zinc dust, die-casting alloys, superphosphate and ammonium sulphate fertilizers, zinc sulphate and sulphuric acid. The total value of production was £16,114,212.

## ZINC SULPHATE

This is a by-product from the treatment of zinc concentrates by the Electrolytic Zinc Company of Australasia Limited. The quantity produced was 123 tons and the value £4705.

## 2.—NON-METALLIC MINERALS

## CLAY

Quantity Produced—	Cubic Yards	Value, £
1958 .....	121,531	74,176
1959 .....	125,495	100,620
1960 .....	116,038	113,607
<b>Total</b> .....	<b>363,064</b>	<b>£288,403</b>

Company	Clay, cu. yd.	Value £	No. of Men	Product
Agrippe Pottery Pty. Ltd., Relbia .....	530	157	2	Pipes
Burnie Brick Co., Cooe .....	8,500	3,130	13	Bricks
John Campbell Pty. Ltd., Launceston .....	522	322	12	Bricks
Clays Pty Ltd., and McHugh Bros. Pty. Ltd., Launceston .....	2,291	2,291	22	Pipes
Crisp & Gunn Co-op Ltd., West Hobart ..	24,216	28,590	51	Bricks
Goliath P. C. Co. Ltd., Railton .....	5,488	4,898	2	Cement
Granton Brick Ltd., Granton .....	15,975	20,625	24	Bricks
Hobart Brick Co., New Town .....	18,944	15,222	25	Bricks
Huttons Bricks Pty. Ltd., Prospect .....	14,917	14,917	18	Bricks
Luck Brick & Pipe Pty. Ltd., Dulverton ..	7,032	7,032	18	Bricks
Machens Bricks, Kings Meadows .....	14,000	14,000	27	Bricks
Wunderlich Pty Ltd., Laira & Launceston ..	2,500	500	24	Tiles

## DOLOMITE

Quantity produced—	Tons	Value £
Prior to 1956 .....	9,478	28,664
1957 .....	1,176	3,359
1958 .....	2,585	7,437
1959 .....	2,907	8,119
1960 .....	2,678	6,947
<b>Total</b> .....	<b>18,824</b>	<b>£54,546</b>

## CIRCULAR HEAD DOLOMITE AND TRADING CO. PTY. LTD., SMITTON

This Company, the sole producer, employed an average of 2 men. A 4" drill hole was sunk in the bottom of the open cut with a view to further deepening.

## KAOLIN

Quantity produced—	Tons	Value £
1940 to 1956 .....	97,704	362,354
1957 .....	6,038	39,226
1958 .....	3,302	20,469
1959 .....	1,195	5,733
1960 .....	964	5,062
<b>Total</b> .....	<b>109,248</b>	<b>£431,844</b>

## ENDURANCE TIN MINING CO. N.L., SOUTH MOUNT CAMERON

This Company, reviewed under Tin, produced 964 tons of kaolin, valued at £5062 from deposits on its leases. Two men were employed.

## STOREYS CREEK TIN MINING COMPANY N.L., SOUTH MOUNT CAMERON

The Dorset Tin Division carried out test drilling on two areas, showing the presence of quantities of clay, from which kaolin suitable for paper making can be obtained. On Brown's Area 25 holes of total footage 549 were drilled in the south block and 36 of total footage 523 in north. On Scott's Area 56 holes were drilled having a total depth of 741 feet.

## LIMESTONE

QUANTITY AND VALUE OF PRODUCTION, AND USAGE.

Years	Manufacture of Cement		Manufacture of Carbide		Chemical and Metallurgical		Agriculture and Other		Totals	
	Tons	£	Tons	£	Tons	£	Tons	£	Tons	£
1919-56 .. ..	2,855,994	1,457,996	462 164	495,820	3,915,453	2,030,449	421,769	454,089	7,655,080	4,438,354
1957 .. .. .	153,618	126,557	20,264	44,542	15,309	22,643	15,928	27,133	205,119	220,875
1958 .. .. .	179,171	161,254	21,104	42,237	23,458	30,777	11,295	23,905	235,028	258,173
1959 .. .. .	170,930	136,872	22,074	41,881	24,121	39,556	13,095	22,551	230,220	240,860
1960 .. .. .	152,720	116,518	24,291	42,891	24,896	47,675	13,301	22,784	215,208	229,868
<b>Totals .. ..</b>	<b>3,512,433</b>	<b>1,999,197</b>	<b>549,897</b>	<b>667,371</b>	<b>4,002,937</b>	<b>2,171,100</b>	<b>475,388</b>	<b>550,462</b>	<b>8,540,655</b>	<b>5,388,130</b>

**THE AUSTRALIAN COMMONWEALTH  
CARBIDE COMPANY, IDA BAY AND  
ELECTRONA**

This Company produced 11,231 tons of Calcium Carbide and employed an average of 158 persons at the works. Production was 395 tons higher than last year when an average of 160 persons were employed. In addition 166 tons of Acetylene Black was produced, 8 of the men being employed on this.

The new lime kiln has not yet been completed but it is expected that it will be in operation during the coming year and increased production should result.

From the Ida Bay quarry 24,291 tons of limestone valued at £42,891 were shipped to the works at Electrona, the average number of employees being 25.

**GOLIATH PORTLAND CEMENT CO. LTD.,  
RAILTON**

In the production of 108,161 tons of cement 152,720 tons of limestone valued at £116,518 were used, an average of 28 men being employed in the quarry. Total employment (including asbestos-cement manufacture) was 288. Diamond drilling was carried out to test for limestone reserves, 930 feet being drilled in 7 holes.

Of particular interest during the year was the installation of a 9' 6" x 36' 8" x 1500 H.P. cement mill, with internal water cooling system and compressed air atomization of cooling water. Dust creating locations are connected to an electrostatic dust precipitator, and the cement is passed through a vibrating screen before being transported to storage by a Fuller Kinyon pump. This installation necessitated adding a 1250 KVA transformer to the sub-station.

Other matters of interest included:

1. The building of a new mill room and motor room with filtered air ventilation and equipped with a 2 ton and a 12½-ton overhead crane.
2. Erection of a new 8-ton overhead crane to service the main materials storage and extension of the main storage area and craneway by 90 feet.
3. Installation of a Power-Curve conveyor in the bagging shed for truck loading.
4. Purchase of a Halco Stenuick drill for the quarry.

5. Installation on the railway siding of a bulk cement loading depot, including a railway weighbridge.
6. Installation of a bulk cement receiving and despatching depot in Hobart.
7. Addition of a Spectro Photometer to the laboratory equipment.
8. Installation of a jaw crusher to break oversize clinker.

**WRIGHT STEPHENSON PTY. TD.,  
PULBEENA**

Production totalled 4443 tons of limesands valued at £5554 for use in agriculture. Employment remained stable at 2 men. An addition was a petrol driven locomotive for transferring full rakes to the foot of the haulage.

**MELROSE AGRICULTURAL LIME  
QUARRIES, EUGENANA**

Crushed and broken limestone was used for a variety of purposes including railway ballast, concrete aggregate, and road construction material. Production amounted to 6969 cubic yards valued at £9430 and an average of 8 men were employed.

**RAILTON LIMEWORKS, RAILTON**

Mr. A. R. Blenkhorn's production of ground and burnt limestone amounted to 4684 tons valued at £5766, an average of 4 men being engaged.

**THE MOUNT LYELL MINING AND RAIL-  
WAY CO. LTD., HALLS CREEK**

This Company, reviewed under Copper, quarried 5414 tons of limestone valued at £7467. This was either used in the smelter as a flux, or burnt to lime for use in the reduction works.

**A. R. BEAMS, FLOWERY GULLY**

From his Quarry, Crushing Plant and Lime Kiln, Mr. Beams produced:—

	£
416 tons Agricultural Limestone, valued at .....	684
2340 tons Limestone for Chemical and metallurgical purposes, valued at .....	2,808
460 tons Burnt Lime for various purposes, valued at .....	3,210
<b>Total .....</b>	<b>£6,702</b>

Six men were employed.

MINERAL SUPPLIES PTY. LTD.  
ULVERSTONE

This Company sold 10 tons of garden lime valued at £55.

R. K. SULZBERGER, FLOWERY GULLY

Five men were employed in the production of 12,567 tons of limestone, valued at £25,137, for chemical purposes.

OCHRE

Quantity produced—

	Tons	Value £
1918 to 1956 .....	1,921	4,457
1957 .....	22	148
1958 .....	66	645
1959 .....	59	436
1960 .....	31	219
<b>Total .....</b>	<b>2,099</b>	<b>5,905</b>

A. PEARSON, SPALFORD

Production of ochre from this pit was 31 tons, valued at £219.

PEBBLES

A. PEARSON, ULVERSTONE

The collection of pebbles for grinding was continued on the beaches around Ulverstone. The output was 515 tons, valued at £3,800.

SILICA

Quantity produced—

	Tons	Value £
1936 to 1956 .....	136,270	81,193
1957 .....	6,552	4,622
1958 .....	6,639	6,068
1959 .....	6,519	7,657
1960 .....	5,231	6,885
<b>Total .....</b>	<b>161,222</b>	<b>106,425</b>

THE MOUNT LYELL MINING & RAILWAY  
CO. LTD., QUEENSTOWN

This company, reviewed under Copper, quarried 3381 tons of silica, valued at £4376, for use in the smelter.

3.—CONSTRUCTION MATERIALS

Quantities produced—

	Cubic Yards	Value £
<b>Building stone:</b>		
Freestone .....	100	600
	<b>100</b>	<b>600</b>
<b>Crushed and Broken Stone:</b>		
Basalt .....	2,119	3,058
Dolerite .....	410,646	664,318
Limestone .....	31,502	40,059
Other .....	192,658	100,108
	<b>636,925</b>	<b>£807,543</b>
Gravel .....	814,812	363,468
Sand .....	21,844	17,459
Other Road Materials	8,100	2,025

The largest producers were Government and Local Government authorities, accounting for 224,476 cubic yards of crushed and broken stone valued at £408,506, and 743,190 cubic yards of gravel, valued at £330,940.

FREESTONE, AUSTINS FERRY

This quarry was worked intermittently by Mr. Pollard and Mr. Finlayson, the total output being 100 cubic yards.

BASALT

This was quarried by Associated Forest Holdings Pty. Ltd., for its roads in the Hampshire district and by the Wynyard Municipal Council at Table Cape.

DOLERITE

This rock, being both suitable and widespread, was quarried most extensively for road and concrete making by governmental authorities and commercial firms.

Quarry	Men	Cu. yd.	Value £
Bain's, Dynnyrne .....	6	9,186	10,975
Grubb's, Moonah .....	7	22,828	26,468
Hillier Regan's, Orielson .....	12	14,787	22,180
Hobart, New Town .....	28	101,525	126,784
Launceston, Mowbray .....	16	30,949	38,519
Nelson's, Dynnyrne .....	9	11,481	10,368
Rouse's, St. Leonards .....	7	13,909	18,545
Stone's, Devonport .....	5	580	1,052
McHugh's, Launceston .....	6	364	486

LIMESTONE

G. J. Weilly and Sons Pty. Ltd., quarried 24,500 cubic yards of limestone, of value £30,625, at Glenorchy for construction purposes. Twelve men were engaged. From the Melrose Agricultural Lime Quarries, Eugenana, 4392 cubic yards, valued at £8,142, were produced in addition to that for agriculture.

OTHER CRUSHED AND BROKEN STONE

These rocks are mainly quarried in the Burnie district where Mr. J. H. Bugg produced 110,000 cubic yards of siltstone valued at £28,250 from the Marine Board's quarry at Wivenhoe. Devon Metal Supplies crushed 15,715 cubic yards of quartz schist valued at £21,990 from their Wivenhoe quarry. From a dolomite quarry at Fahey's Lane the Circular Head Municipal Council produced 12,490 cubic yards valued at £3747.

GRAVEL AND SAND

Clean sand and gravel were obtained from many small pits, principally in the South Arm, Flowerdale and Beaconsfield districts. From the latter 14,539 cubic yards were obtained on royalty payments. The Mt. Lyell Company collected 34,967 cubic yards of conglomerate gravel and boulders valued at £27,323 from King River deposit for road-making. Messrs. Woodfield and French produced 7500 cubic yards of sand valued at £2850 from Beaconsfield, employing 11 men in all.

## 4.—FUEL MATERIALS

## COAL

Quantity produced—	Tons.	Value £
Prior to 1957 ....	7,196,638	7,361,105
1957 .....	268,140	534,111
1958 .....	276,268	550,859
1959 .....	299,368	621,494
1960 .....	297,670	673,543
<b>Total</b> .....	<b>8,338,084</b>	<b>£9,739,112</b>

Inspector Besford reports that the revival of 1959 was maintained, only a slight fall of 1698 tons in production being recorded. The number of employees decreased from 307 to 297, of whom 205 were underground. The production per man-year again increased significantly to 1452 tons for underground employees and 1002 overall.

## CORNWALL COLLIERY, ST. MARYS

This colliery increased production to 128,529 tons valued at £284,634 at the mine and employed an average of 135 persons. The output was a record and was 9 per cent higher than the previous year which was also a record for the mine.

## JUBILEE COLLIERY, ST. MARYS

This colliery worked for only one month and produced 1643 tons valued at £3697. Operations had to cease when ventilating conditions deteriorated at the face and there was no prospect of improvement. The 21 displaced workmen found employment at the Cornwall Company's mines.

## DUNCAN COLLIERY, FINGAL

The Cornwall Coal Co. produced 60,996 tons valued at £138,443 from this mine and employed an average of 58 persons. The output was 2628 tons higher than the previous year for the same number of employees.

The endless-rope haulage was installed, the reorganizing of surface layout was completed and the new ventilating fan was installed, so that the mine is now laid out to handle much larger outputs. All production units underground were transferred into the Main Heading with machine mining concentrated in a panel to the right hand side and hand mining parties operating in the Main Heading and places to the left. Machine mining is carried out by means of an arc-wall coal cutting machine and loader delivering into shuttle-cars which in turn deliver to a belt conveyor. Conveyor belts convey the coal out to the main endless rope haulage and deliver into tubs which are then hauled to the surface.

The coal washing plant which was completed at the end of last year, operated during the whole of the year and washed coal from both the Duncan and Cornwall Collieries. Problems in connection with excess moisture content in the washed product were partly solved by the installation of a centrifuge at a cost of several thousand pounds but the solution is not yet complete.

## FINGAL COLLIERY, FINGAL

This colliery produced 30,223 tons valued at £67,295 and employed an average of 29 persons. The figures for the previous year were 33,539

tons valued at £73,785 and 30 persons. The production was 3316 tons less than last year, the decrease being caused chiefly through more difficult conditions which were encountered in the Main Heading Sections where the seam became thinner and haulage more difficult. Large falls occurred in the Main Return Airway and also in the Main Tunnel.

## BARBER'S COLLIERY, FINGAL

Mr. E. Barber increased production to 4912 tons valued at £9332 and employed an average of 6 persons. Production was about one thousand tons higher than last year and one more workman was employed. A second entrance was made to provide a second means of egress and return airway and it has now become necessary to install the ventilating fan in order to provide adequate ventilation to develop the mine.

## SEYMOUR COLLIERY, SEYMOUR

Messrs. Yates and Haas increased production from this mine to 5359 tons valued at 11,302 and employed an average of 3 men. The seam maintained a thickness of 4½ feet with a very hard roof and floor. The coal is of very good quality and appears somewhat different from the usual Tasmanian coals. When burnt in the grate it gives off dense black smoke and soot and also produces very hot conditions. The coal is extracted by blasting and requires a large amount of explosive by reason of its hard nature. This cost plus the cost of transport to St. Marys places a great strain upon the economics of mining in the area.

## NEW STANHOPE COLLIERY, AVOCA

This colliery produced 14,221 tons valued at £35,553 and employed an average of 17 men. Production was nearly 2000 tons greater than last year with the employment of two men more. Operations continued on the same pattern as last year from a seam which maintained the same characteristics. The installation of the coal washing plant was completed and commenced operating towards the latter part of the year. It appeared to be functioning satisfactorily.

## MOUNT CHRISTIE COLLIERY, AVOCA

Mr. R. C. Fenton produced 1730 tons valued at £3515 and employed two men. The production was of the same order as last year.

## MERRYWOOD COLLIERY, AVOCA

Production from this colliery was 41,797 tons valued at £91,124 and an average of 24 persons were employed. The corresponding figures for the previous year were 41,792 tons valued at £72,786 and 22 persons. Operations continued on the same pattern as last year with scraper chains operating in one section and hand mining in the other, all operations being by the bord and pillar method of mining underground. Production from the opencut operations fell by 2000 tons, but overburden removal continued as usual and production from these operations can be increased at any time should demand arise.

**LANGLOH COLLIERY, HAMILTON**

The Hamilton Coal Co. produced 5374 tons valued at £19,081 and employed an average of 14 persons. The corresponding figures for the previous year were 6035 tons valued at £20,166 and 12 persons. Attempts are being made to re-open the Main Heading and development will be carried out in the area ahead. Haulage will be easier when the heading is re-opened as the present haulage is tortuous. Demand for this coal has fallen off considerably and the owners are now the only consumers and they will be unable to consume the whole of the output.

**SANDFLY COLLIERY, KAOOTA**

Mr. O. L. Roberts produced 2333 tons valued at £7052 and employed an average of 4 persons. Operations continued on the same pattern as last year and normal conditions prevailed.

**ILLAMATHA COLLIERY, SPREYTON**

Messrs. Bound Bros. increased production to 552 tons valued at £2515, two men being engaged. Operations continued on the same pattern as last year under very difficult conditions. The sole consumer, the Ovaltine Factory at Quoiba, informed the operators that they would be converting to oil and the mine closed at the end of the year.

**5.—FOREIGN ORES**

The total value of the products of three large works treating foreign ores imported into Tasmania was approximately £17,720,900.

**ALUMINIUM**

The Australian Aluminium Production Commission treated imported bauxite at Bell Bay to produce 11,654 tons of aluminium, a decrease of 1196 tons. Preliminary steps were taken to increase production to 28,000 tons per year. An average of 769 persons were employed and local products such as coal and limestone were consumed in the processes.

**FERRO ALLOYS**

The Broken Hill Proprietary Co. Ltd., continued construction of a plant at Bell Bay for the production of ferro alloys.

**ZINC, CADMIUM, COBALT OXIDE AND SUPERPHOSPHATE**

The Electrolytic Zinc Co. of Australasia Ltd., Risdon, described under Zinc, produced zinc from Broken Hill concentrates together with small quantities of cadmium and cobalt oxide as by-products. The sulphuric acid derived from roasting the concentrates was used in making superphosphate fertilizers from phosphate rock imported from Nauru, Ocean and Christmas Islands.

**TITANIUM DIOXIDE**

Australian Titan Products Pty. Ltd. at Heybridge produced 11,482 tons of titanium dioxide from 24,077 tons of Western Australian ilmenite concentrates, an average of 366 people being employed. The output was 1322 tons greater than in 1959.

New water treatment and titanium tetrachloride plants and a new boiler of 35,000 lb. capacity were brought into use.

## REVENUE

Return showing the Revenue Collected during the Year ending 31st December, 1960.

Head of Revenue	Amount £
Public Works and Services—Mines Department .....	8,417
Rent of Auriferous and Mineral Lands .....	16,441
Fees, Auriferous and Mineral Lands .....	1,510
Survey Fees .....	656
Fees under the Explosives and Inflammable Liquids Act .....	14,646
Rent and Sale of Government Property .....	56
<b>Total</b> .....	<b>£41,726</b>

Comparative Statement of Revenue from Mines, being Rents, Fees, Storage of Explosives, &c., Paid to the Treasury during the Years 1954 to 1960.

Year	Amount £
1954 .....	11,757
1955 .....	22,858
1956 .....	24,260
1957 .....	23,827
1958 .....	22,187
1959 .....	32,288
1960 .....	41,726

The above Statement does not include Stamp Duties upon Transfer of Leases.

## LEASES AND LICENCES

Return showing the Total Number of Leases and Licences in Force on 31st December, 1960.

Leases and Licences	Number	Number of Sluiceways	Area (Acres)
Barytes .....	1	.....	10
Bauxite .....	1	.....	130
Clay .....	19	.....	860
Coal .....	51	.....	11,549
Copper .....	1	.....	33
Copper-Nickel .....	1	.....	30
Dolomite .....	4	.....	309
Easement Licences .....	61	.....	704
Feldspar .....	2	.....	15
Granite .....	3	.....	25
Gold .....	31	.....	810
Iron .....	1	.....	50
Iron Ore .....	1	.....	9
Limestone .....	14	.....	472
Minerals .....	83	.....	17,379
Mica .....	2	.....	80
Nickel .....	8	.....	369
Osmiridium .....	6	.....	95
Ochre .....	2	.....	28
Scheelite .....	10	.....	663
Silica .....	3	.....	35
Silver-Lead .....	16	.....	1,241
Stone .....	33	.....	5,182
Serpentine .....	2	.....	80
Sand .....	3	.....	317
Sand and Gravel .....	5	.....	1,760
Tin .....	256	.....	8,285
Tin-Wolfram .....	4	.....	370
Wolfram .....	8	.....	107
Wolfram-Gold .....	3	.....	120
Water Licences .....	197	1,036	1,242
<b>Total</b> .....	<b>832</b>	<b>1,036</b>	<b>52,359</b>

Return showing Number and Area of New Leases and Licences Issued during the year ended 31st December, 1960.

Leases and Licences	Number	Area (Acres)	Sluiceways of Water
Clay	4	53	....
Coal	5	1,584	....
Dolomite	2	237	....
Feldspar	2	15	....
Gold	4	120	....
Iron Ore	1	9	....
Limestone	2	21	....
Mica	2	80	....
Minerals	13	1,740	....
Osmiridium	1	10	....
Sand and Gravel	3	333	....
Serpentine	2	80	....
Silver-Lead	2	712	....
Stone	4	592	....
Tin	57	932	....
Wolfram	6	154	....
Water licences	17	169	56
<b>Total</b>	<b>127</b>	<b>6,809</b>	<b>56</b>

Return showing Number and Area of Leases and Licences Applied for during the Year ended 31st December, 1960.

Leases and Licences	Number	Area (Acres)	Sluiceways
Clay	2	13	....
Dolomite	2	237	....
Gold	6	60	....
Gravel	1	50	....
Osmiridium and Chrome	2	50	....
Stone	2	81	....
Tin	32	1,076	....
Uranium	1	50	....
Wolfram	2	20	....
Water Licences	10	49	14
<b>Total</b>	<b>60</b>	<b>1,686</b>	<b>14</b>

Return showing the Total Number and Areas of Authorities to Prospect held during the year ended 31st December, 1960.

Type of Authority	Number	Area
Permits to enter on private land including owners' consents	10	11,000 acres
Exploration licences	8	33,647 sq. miles
Special prospectors' licences	5	10,971 acres
Prospectors' licences	66	3,300 acres
Miners' rights	68	34 acres
Licences to search for coal and oil	4	7,160 acres

### MINERAL PRICES

Table showing the Average Australian Annual Prices for Minerals During Recent Years.

Mineral	1957			1958			1959			1960			
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	
Copper	per ton	340	4	9	307	13	5	314	10	0	323	6	8
Lead	per ton	115	4	3	87	5	8	100	0	0	100	0	0
Zinc	per ton	102	7	7	91	7	11	106	6	5	112	8	6
Tin	per ton	990	19	8	997	6	7	1,058	1	5	1,039	13	4
Silver	per oz.	0	8	2	0	7	11	0	8	3	8	6	6
Osmiridium	per oz.	90	0	0	80	0	0	20	0	0	20	0	0
Gold	per fine oz.	15	12	6	15	12	6	15	12	6	15	12	6
Wolfram	per unit (WO <sub>3</sub> )	148/5			91/11			128/2			182/5		
Scheelite	per unit (WO <sub>3</sub> )	148/5			91/11			128/2			182/2		

## MINERAL PRODUCTION SINCE 1880

Quantity and Value of Mineral Production as at 31st December, 1960

<i>Mineral</i>	<i>Total Quantity</i>	<i>Value £A</i>
<b>METALLIC MINERALS—</b>		
Antimony .. .. . (tons)	3	1,017
Bismuth .. .. . (tons)	84	29,644
Cadmium .. .. . (tons)	1,172	1,222,946
Cobalt Oxide .. .. . (tons)	11	8,489
Copper (Blister) to 1918 (now shown under Silver and Copper)		
Copper .. .. . (tons)	166,600	13,788,527
Copper Matte .. .. . (tons)	6,277	133,736
Copper Ore to 1918—(now shown under Copper) .. .. . (tons)	41,769	577,873
Copper from 1919 .. .. . (tons)	379,885	53,613,432
Crocoite .. .. . (specimens only)	..	533
Gold .. .. . (fine oz.)	2,515,304	13,955,694
Ilmenite .. .. . (tons)	550	1,256
Iron Oxide (including Hematite, Limonite and Magnetite) (tons)	90,547	90,267
Lead (from 1919) .. .. . (tons)	307,606	17,031,956
Manganese .. .. . (tons)	1	3
Manganese Dioxide (from 1957) .. .. . (tons)	576	5,191
Monazite .. .. . (tons)	33	607
Nickel .. .. . (tons)	233	40,518
Osmiridium .. .. . (oz.)	31,088	708,531
Pyrites .. .. . (tons)	1,329,453	2,724,660
Rutile .. .. . (tons)	1	18
Scheelite .. .. . (tons)	15,730	16,809,658
Silver Lead Ore to 1918 (now under Silver and Lead) .. .. . (tons)	1,083,898	6,429,219
Silver from 1919 .. .. . (fine oz.)	38,723,084	8,966,206
Sulphur as Sulphuric Acid (from 1957) .. .. . (mono tons)	96,706	435,602
Tin .. .. . (tons)	144,905	32,272,237
Wolfram .. .. . (tons)	12,443	7,958,720
Zinc .. .. . (tons)	608,829	34,831,526
Zinc Sulphate (from 1957) .. .. . (tons)	655	24,340
<b>NON-METALLIC MINERALS—</b>		
Asbestos .. .. . (tons)	3,980	17,142
Barytes .. .. . (tons)	2,205	8,239
Clay—(from 1958)		
Brick .. .. . (cubic yds.)	303,961	265,138
Tile .. .. . (cubic yds.)	13,926	1,643
Other .. .. . (cubic yds.)	45,177	21,622
Dolomite .. .. . (tons)	18,824	54,546
Graphite .. .. . (tons)	40	107
Kaolin .. .. . (tons)	109,248	431,844
Limestone—		
Agricultural and other .. .. . (tons)	475,388	550,462
Chemical and Metallurgical .. .. . (tons)	4,002,937	2,171,100
Carbide .. .. . (tons)	549,897	667,371
Cement .. .. . (tons)	3,512,433	1,999,197
Ochre .. .. . (tons)	2,099	5,905
Pebbles (from 1957) .. .. . (tons)	2,502	18,954
Silica .. .. . (tons)	161,222	106,425
Talc .. .. . (tons)	333	1,077
<b>FUEL MINERALS—</b>		
Coal .. .. . (tons)	8,338,084	9,739,112
Shale .. .. . (tons)	41,572	31,231
<b>CONSTRUCTION MATERIALS</b>		
Building Stones—		
Granite (Red) .. .. . (cubic yds.)	1,966	33,474
Freestone .. .. . (cubic yds.)	518	3,409
Other .. .. . (cubic yds.)	5	10
Gravel (from 1958) .. .. . (cubic yds.)	2,132,112	967,534
Sand (from 1958) .. .. . (cubic yds.)	56,786	45,787
Crushed and Broken Stone—(from 1958)		
Basalt .. .. . (cubic yds.)	39,841	43,295
Dolerite .. .. . (cubic yds.)	1,212,447	2,142,280
Limestone .. .. . (cubic yds.)	75,931	97,631
Sandstone .. .. . (cubic yds.)	4,286	1,511
Other .. .. . (cubic yds.)	329,988	223,075
Other Road Materials .. .. . (cubic yds.)	9,100	3,225
		£231,314,752

**STATISTICS RELATING TO THE MINERAL INDUSTRY FOR THE YEAR  
ENDED 31st DECEMBER, 1960.**

Mineral	Total Quantity	Value £A.
<i>Metallic Minerals:</i>		
Cadmium ..... (tons)	52	83,498
Cobalt Oxide ..... (tons)	0.7002	784
Copper ..... (tons)	11,291	3,657,842
Gold ..... (fine oz.)	23,015	359,613
Iron Oxide ..... (tons)	3,497	5,503
Lead ..... (tons)	12,183	1,218,381
Manganese Dioxide ..... (tons)	156	1,625
Osmiridium ..... (ozs.)	Nil	Nil
Pyrites ..... (tons)	53,919	161,757
Scheelite ..... (tons)	420	265,382
Silver ..... (fine oz.)	1,348,556	573,137
Sulphur as Sulphuric Acid ..... (mono tons)	25,698	117,590
Tin ..... (tons)	884	920,040
Wolfram ..... (tons)	1,106	731,653
Zinc ..... (tons)	27,191	3,054,714
Zinc Sulphate ..... (tons)	123	4,705
Value of Metallic Minerals .....	.....	£11,156,224
<i>Non-Metallic Minerals:</i>		
Barytes ..... (tons)	Nil	Nil
Clay:		
Brick ..... (cubic yds.)	104,829	104,561
Tile ..... (cubic yds.)	2,500	500
Other ..... (cubic yds.)	8,709	8,546
Dolomite ..... (tons)	2,678	6,947
Kaolin ..... (tons)	964	5,062
Limestone:		
Agricultural ..... (tons)	12,841	19,574
Carbide ..... (tons)	24,291	42,891
Cement ..... (tons)	152,720	116,518
Chemical and Metallurgical ..... (tons)	24,896	47,675
Other ..... (tons)	460	3,210
Ochre ..... (tons)	31	219
Pebbles ..... (tons)	515	3,800
Silica ..... (tons)	5,231	6,885
Value of Non-Metallic Minerals .....	.....	£366,388
<i>Fuel Minerals:</i>		
Coal ..... (tons)	297,670	£673,543
<i>Construction Materials:</i>		
Crushed and Broken Stone:		
Basalt ..... (cubic yds.)	2,119	3,058
Dolerite ..... (cubic yds.)	410,646	664,318
Limestone ..... (cubic yds.)	31,502	40,059
Sandstone ..... (cubic yds.)	Nil	Nil
Other ..... (cubic yds.)	192,658	100,108
Building Stone:		
Freestone ..... (cubic yds.)	100	600
Granite ..... (cubic yds.)	Nil	Nil
Other ..... (cubic yds.)	5	10
Gravels ..... (cubic yds.)	814,812	363,468
Sand ..... (cubic yds.)	21,844	17,459
Other Road Materials ..... (cubic yds.)	8,100	2,025
Value of Construction Materials .....	.....	£1,191,105
Total Value with Australian Metal Prices .....	.....	£13,387,260

*Manufactured Products:*

## Product—

Product—	Total Quantity (tons)
Acetylene Black .....	166
Ammonium Sulphate .....	49,642
Carbide .....	11,231
Cement .....	108,161
Superphosphate .....	87,212

*Production from other than Tasmanian Ores:*

## Product—

Product—	Total Quantity (tons)	Value £A.
Aluminium .....	11,654	3,158,234
Cadmium .....	202	287,520
Cobalt Oxide .....	22	24,440
Titanium Dioxide .....	11,482	2,955,196
Zinc .....	93,341	10,129,836

£16,555,226

Average number of men employed—8,299.

RETURN SHOWING VALUE OF THE MINERAL INDUSTRY WITH AUSTRALIAN  
METAL PRICES

	Value £A		Value £A
1956 .....	14,374,621	1959 .....	12,766,261
1957 .....	12,591,687	1960 .....	13,387,260
1958 .....	11,838,054		

**DEPARTMENTAL ACTIVITIES**

**AID TO MINING**

*Assistance.*—The amount of financial assistance expended was £9834 as compared with £4596 for 1959. This was principally due to expenditure on a coal washing plant to which reference was made in my previous report. Assistance was also provided to enable a company to transfer its sluicing plant to the old Valley Mine near Derby. Advances were also made to two other parties engaged in alluvial tin mining operations on the East Coast, and a small operator on the West Coast was assisted to timber his workings on a tin lode.

*Plant—Mt. Bischoff Mine, Waratah.*—The work of reconditioning the treatment plant for the benefit of tributors operating at the old Mt. Bis-

choff Mine was continued and the calciner was rebuilt. Large expenditure has not been justified and reconditioning has been limited to works necessary to maintain the plant as an operating unit.

*Mining Plant.*—This equipment which was purchased last year for hire to small operators for testing and developing discoveries has remained with tribute parties at the old Mt. Bischoff Mine, Waratah. There has been a disappointing demand for the equipment which has not been used to the extent anticipated when it was decided to have mining equipment available to enable small parties to test occurrences which previously remained untested because of lack of capital to purchase necessary machinery.

STATEMENT OF RECEIPTS AND PAYMENTS OF THE MINING TRUST FUND FOR THE YEAR ENDED  
31st DECEMBER, 1960.

<i>Receipts.</i>	<i>Payments.</i>
Balance 31st December, 1959 .....	Assistance .....
13,554 4 11	9,833 16 8
Repayment of loans .....	Maintenance tribute plant Mt. Bischoff
418 6 10	1,942 19 3
Interest on loans .....	Purchase of mining plant .....
139 6 8	167 3 1
Tribute royalty .....	Total .....
102 0 8	11,943 19 0
Hire mining plant .....	Balance to next Account .....
24 10 0	7,294 10 1
Appropriation Act 1960-61 .....	£19,238 9 1
5,000 0 0	
£19,238 9 1	

**DRILLING**

**DIAMOND DRILLING.**

Two crews were engaged continuously by the Department in drilling for Departmental projects and for hirers and drilling was also undertaken for the Department by a firm of contractors. Particulars of the boring are as follows:—

**JUNIOR STRAITLINE AND MINDRILL E 1000 DRILLS.**

The former machine carried on drilling a hole near Fingal to test the coal measures from 141 feet to completion at 715. The next hole was undertaken with the E 1000 machine so that a greater depth could be reached. At the end of the year the advance was 176 feet to give a total of 750 feet for the year. The drilling was characterized by extremely bad ground in the uppermost 150 feet or so of hole consisting of broken dolerite which caps the sediments. The cost was £3387.

**GOLDFIELDS No. 10 DRILL.**

This machine proceeded with the testing of the iron ore deposit at Ferndene near Penguin. No. 1 Hole was advanced from 136 to 252 feet and No. 2 driven to 155 feet to complete the particular campaign. The footage for the year was 270 at a cost of £1047. Here again hard and broken ground made conditions very difficult and costly.

The machine was then taken to Mount Stronach to test at depth a granite outcrop containing molybdenite. Two holes were drilled of total depth 232 feet at a cost of £1195. This was easy drilling country but severe on bits.

**MINDRILL F 20C DRILL.**

This new hydraulic-feed machine was first put into service on clay foundation testing for a large factory. Six holes were drilled for the hirer with a total depth of 387 feet at a cost of £543.

Still further testing of a limestone deposit for a hirer was carried out, the total footage being 930 at a cost of £1648. Details are as follows:—

Drill hole No.	Depth feet
1 .....	147
2 .....	153
3 .....	215
4 .....	142
5 .....	223
6 .....	30
7 .....	20

**CONTRACTOR'S PLANT.**

The Department's programme of testing the iron ore deposits at the Savage River was continued, and the contractors, Associated Diamond Drillers Pty. Ltd., drilled a total of 4491 feet at a charge of £25,555. Details are as follows:—

Drill hole No.	feet
4 (from 225 feet) to .....	995
5 .....	1,020
6 .....	704
7 .....	877
8 .....	554
9 .....	666

## CHURN DRILLING.

Two drills were constantly engaged in boring for water and in foundation testing. The total footage drilled was 3941 at a cost of £7174, including the cost of casing left in water bores.

Details are as follows:—

Number of bores	Total Footage	Object
2	114	Foundation testing for oil tanks at Burnie.
22	2021	Boring for underground water supplies, Smithton district.
18	1446	Boring for underground water supplies, Oatlands district.
5	360	Boring for underground water supplies, Sandford district.

In the Smithton district every hole but one abandoned at 150 feet obtained a supply of water ranging from 150 to 400 gallons per hour, the average being 300. Depths varied between 55 and 171 feet.

All bores put down in the Oatlands district between Tunnack and Woodbury struck water, but one subsequently dried up. The supplies ranged from 80 to 300 gallons per hour and depths from 40 to 136 feet.

In the Sandford district one bore was abandoned dry at 103 feet and in another near the sea the water was saline. The two others completed gave from 80 to 150 gallons per hour at depths from 36 to 150 feet.

## WARDEN'S COURT

*J. Dunham v. Smith and Others.*

This case related to a hearing by the Warden of Mines, Devonport, to determine the compensation payable to landowners whose properties at Forth were partly occupied by a mining lease applied for by J. Dunham under the Mining Act, 1929 as application 366P/M. The amount of compensation was fixed by the Warden and the lease has been issued.

*W. Slipper (nee Barnett) v. A. J. Stone*OBJECTION TO APPLICATION 564P/M—27 AC.  
LILLICO'S BEACH

This application was set down for hearing by the Warden of Mines, Devonport, on 8th December, 1960, but as a result of the application for lease being withdrawn the hearing was abandoned.

## MINE MANAGER'S CERTIFICATES

Certificates were issued by the Board without examination to the following applicants who presented Mine Managers' Certificates issued by recognized authorities in other states:—

Metalliferous Mine Certificate—Norman Arthur Gilberthorpe and Dayrell Wolff.

## STAFF

The following were the staff movements during the year:—

Officer & Position	Remarks
Fitzgerald, J., Clerical Assistant	Resigned
King, R., Clerical Assistant	Appointed.
Foley, J., Clerk	Appointed.

Hill, L., Storeman—Appointed.

Olds, H. L., Inspector of Mines and Explosives—Resigned.

Braithwaite, J. B., Inspector of Mines and Explosives—Appointed.

Keid, H. G. W., Chief Geologist—Retired.

Blake, F., Geologist—Retired.

Tetlow, P., Geologist—Resigned.

Baird, J., Geologist—Resigned.

Jack, R. H., Geologist—Appointed.

McNeil, R. D., Geologist—Appointed and Resigned.

Longman, M., Geologist—Appointed.

MacLeod, W. N., Geologist—Appointed.

Threader, V. M., Geologist—Appointed.

Nankivell, P. B., Draughtsman—Appointed.

Dowl, G. J., Draughtsman—Transferred.

Hinks, J. L., Draughtsman—Resigned.

Domeney, E., Draughtsman—Appointed.

Gillespie, F. C., Ceramic Technologist—Resigned.

Thompson, K. A., Cadet Chemist—Resigned.

Fyfe, R. W., Cadet Chemist—Appointed.

## RETIREMENTS

I desire to place on record appreciation of the services rendered to the Department by Mr. H. G. W. Keid (Chief Geologist) and Mr. F. Blake (Geologist) who reached the retiring age during the year.

## MINES DRAUGHTING SECTION

Year 1960.

Number of working plans in use and kept up-to-date	240
Working plans renewed and additional plans brought into use	4
Manuscripts brought up-to-date for reproduction	5
Manuscripts traced for reproduction	2
Lithographs printed	218
Lithographs entered to date for sale	110
Miscellaneous plans and tracings prepared	35
Mineral diagrams drawn	44
Mineral leases drawn in duplicate	72
Mineral leases drawn and described subject to survey	63
Underground mining plans examined and checked	2
Photostats of diagrams forwarded to Launceston Office	107
Exploration and Special Prospectors Licences	22

## APPRECIATION OF SERVICES

Appreciation is recorded of the services rendered by officers of the Department, including officers of the Mines Draughting Section, Warden of Mines and Registrar of Mines in the several mining districts.

J. G. SYMONS, Director of Mines.

## REPORT OF THE GEOLOGICAL SURVEY OF TASMANIA, 1960.

Terence D. Hughes, B.Sc., Chief Geologist.

During 1960 some notable staff changes occurred within the Geological Survey. Mr. H. G. W. Keid, Chief Geologist, reached the retiring age during the year after serving as Chief Geologist for fourteen years. Mr. Keid first joined the survey in 1920 and rejoined it in 1942. He was appointed Chief Geologist in 1946.

Mr. F. Blake, who joined the Geological Survey in 1927, had served continuously with the Department until his retirement at the end of 1960.

Geologist J. Baird resigned in February, 1960 and Geologist R. D. McNeil in June. R. Jack, M. J. Longman, V. M. Threader and W. N. MacLeod were appointed geologists during the year.

As at the end of 1960 the staff of the Geological Survey consisted of the following:—

- T. D. Hughes, B.Sc., Chief Geologist.
- I. B. Jennings, B.Sc., Senior Geologist.
- A. H. Blissett, B.Sc., Senior Geologist.
- W. N. MacLeod, M.Sc., Ph.D., Geologist.
- R. Jack, B.Sc., Geologist.
- V. M. Threader, B.Sc., Geologist.
- M. J. Longman, B.Sc., Geologist.
- K. L. Burns, B.Sc., Geologist.
- A. B. Gulline, B.Sc., Geologist.
- W. L. Matthews, B.Sc., Geologist.
- G. Everard, B. A., Mineralogist and Petrologist.
- M. Z. Stefanski, M.Sc., Regional Geologist (Temporary).
- Mrs. Noreen Longman, B.Sc., Publications Officer and Librarian (Temporary).
- R. D. Gee, Geological Scholarship.
- D. I. Groves, Geological Scholarship.
- A. Jackson, Senior Field Assistant.
- B. Cox, Field Assistant.
- K. T. Kendall, Senior Draughtsman.
- P. B. Nankivell, Draughtsman.
- E. E. Domeney, Junior Draughtsman.

The principal work of the geological survey may be divided into three main categories: Regional Mapping; Economic Geology; Engineering Geology and Hydrology.

**REGIONAL MAPPING***I. North-West Coast Centres*

The staff for year consisted of I. B. Jennings, Senior Geologist; W. L. Matthews, Geologist; A. V. Jackson and B. E. Cox, Field Assistants.

At the beginning of the year this team was based at Sheffield, but after the publication of the Sheffield 1-mile Geological Map Sheet the base was transferred to Wynyard in preparation for mapping the Table Cape and Burnie sheets. A small amount of reconnaissance mapping was carried out in these areas. This chiefly concerned the Tertiary beds at Table Cape, the Wynyard Glacials and the Precambrian rocks at Rocky Cape.

In connection with the preparation of the 8-mile geological map of the State, a good deal of work was carried out in areas where information was lacking. Reconnaissance maps of the Smithton, Woolnorth and Cape Grim sheets were prepared and some work done on the Quamby and Frankford sheets. In addition to this, a general compilation from known geology and photo interpretation was made of portions of the Valentines Peak and Mackintosh sheets.

*II. Zeehan Centre*

The staff for the year consisted of A. H. Blissett, Senior Geologist; A. B. Gulline, Geologist; several temporary field assistants.

Regional mapping was continued on the Zeehan Quadrangle (Sheet No. 50). Up to April 8th 1960, camps were set up by helicopter at Upper Duck Creek, Little Henty River, Huskisson River, Western Hills and Mt. Professor. In addition, work was carried out from camps at Granville Harbour, Firewood Siding (on the Zeehan-Strahan railway line) and North Heemskirk. Between May 18th and May 20th, part of the Pieman River section was examined from the Hydro-Electric Commission camp on Eureka Plains. Following the geophysical survey made by geophysicists from the Bureau of Mineral Resources over the Razorback-Grand Prize district up to the end of March, a detailed geological examination was made of that area between June 6th and July 8th. The remainder of the year was devoted to investigations round Zeehan, Dundas, Renison Bell and east of the Queenstown road.

By the end of the year, work on the Zeehan Quadrangle was well advanced and the final stages of mapping were planned for the 1961 summer programme.

*III. Port Davey Centre*

The resident geologist was M. Z. Stefanski who continued regional mapping north of Port Davey and on the Ironbound Range. Early in the year the mapping of this area came under the guidance of Senior Geologist I. B. Jennings who commenced a regional study of the stratigraphic and structural problems involved in this complex area. In the field he examined rock units round Bathurst Harbour, Bathurst Channel, Port Davey and the Ironbound Range. Towards the end of the year he prepared a field programme for the following summer's work.

*IV. Arthur River Area*

Geological mapping was undertaken in an area south of the Arthur River. Opportunity was taken to map this very inaccessible area because of the availability of a helicopter and the co-operation of the Forestry Department who had established camps in this area. W. L. Matthews and R. D. McNeil were in charge of the mapping.

*Brighton 1-mile Map Sheet*

F. Blake continued the mapping of this sheet.

*Devonport 1-mile Map Sheet*

K. L. Burns continued the mapping of this sheet.

*Geological Map of Tasmania*

The preparation of the 8-mile geological map of Tasmania was almost completed. Further reconnaissance mapping was carried out by T. D. Hughes, I. B. Jennings, F. Blake, M. J. Longman and W. L. Matthews.

**ECONOMIC GEOLOGY***Iron*

The magnetite deposits at the Savage River continued to attract great interest and many visiting geologists from other States and overseas

were conducted over the area. Boring continued throughout the year and the No. 10 hole was well advanced at the end of the year. The bores continued to show good magnetite intersections. Supervision of this work was undertaken by T. D. Hughes and I. B. Jennings. W. L. Matthews carried out survey work.

At the Iron Cliffs area, Penguin, two bore holes were drilled to test at depth a promising limonite outcrop. This work was supervised by K. L. Burns, who has reported on the area. M. J. Longman conducted a survey of a mixed hematite and limonite deposit at Penguin Creek.

A small magnetite deposit at Loyetea was examined by T. D. Hughes.

#### *Tin*

In preparation for a seismic survey by the Bureau of Mineral Resources, several alluvial tin areas in the north-east were examined by R. Jack. He commenced an investigation of tin in greisen near Branxholm with the object of recommending a drilling campaign.

Alluvial tin prospects in two localities in King Island were examined by T. D. Hughes. The Stormsdown Mine at Zeehan was reported on by A. H. Blissett, who with A. B. Gulline investigated the Razorback-Grand Prize Area, which early in the year was the scene of a geophysical survey by the Bureau of Mineral Resources.

#### *Gold*

Gold prospects at Narrawa Creek, Moina and at Lisle were examined by R. Jack, and J. Baird reported on prospects near Mathinna and Fingal.

#### *Silver-Lead*

Due to the imminent closure of the Oceana Mine at Zeehan, an examination and report on the mine workings was undertaken by R. Jack.

#### *Copper*

Copper prospects at Denison Bay, western Port Davey, were examined by M. Z. Stefanski.

#### *Molybdenite*

The molybdenite prospect at Mt. Stronach near Scottsdale was investigated further by drilling. Two bores drilled in the granite failed to intersect any concentration of molybdenite.

#### *Coal*

Coal reserves at Merrywood were assessed by T. D. Hughes. Portion of the Fingal Coalfield was surveyed by J. Baird, who recommended sites for future bores. Drilling continued in this area, but progress was slow due to the cover of dolerite talus.

#### *Wollastonite*

The wollastonite deposits at Hampshire were re-assessed by M. J. Longman. Many samples were taken and a comprehensive map prepared. Certain beds in the limestone contain appreciable percentages of wollastonite.

#### *Mica*

A preliminary examination of a mica prospect at Gladstone was made by R. Jack.

#### *Clay, Stone, Gravel*

Brick-making materials at Kingston and Claremont and a clay deposit at St. Marys were examined by F. Blake; a report on a quarry site for dolerite near Hobart was prepared by R. Jack; gravel deposits near the Huon River and at East Risdon were investigated by T. D. Hughes.

#### *Limestone*

A geophysical survey by the Bureau of Mineral Resources, followed by a drilling campaign by the Department, were undertaken on the property of the Goliath Cement Company at Railton for the purpose of assessing future reserves. Visits to Railton were made by T. D. Hughes and I. B. Jennings.

#### *Engineering Geology and Water Supply*

The geology of the proposed factory site for A.P.P.M. at Wesley Vale was investigated by T. D. Hughes and K. L. Burns. Later, a drilling campaign was completed using both diamond and hand drills.

Land slips at Beauty Point were reported on by F. Blake.

A dam site for the Ulverstone Council was investigated by T. D. Hughes.

The Tourist Department requested the aid of the Department in questions relating to a thermal spring at Hastings. These were answered by T. D. Hughes.

Underground water possibilities at Bruny Island, East Tamar, Scamander, Orielson and Sorell were investigated by F. Blake, and I. B. Jennings examined water resources on properties in the Redpa District. W. L. Matthews prepared comprehensive tables with details of Departmental drilling in the Smithton, East Coast and Midlands Districts.

### MINERALOGIST AND PETROLOGIST

Petrographic work for the year included the examination of suites of rocks collected in the following localities:

Arthur and Lawson Rivers,  
Iron Cliffs, Penguin,  
Ironbound Range,  
Savage River.

In addition, over fifty specimens of rocks, minerals, concentrates, slags, &c., from the geological staff, chemical laboratory and general public were examined and reported on.

### GEOPHYSICAL SURVEYS

The Bureau of Mineral Resources carried out geophysical surveys at the request of the Department of Mines in the following localities.

#### *Savage River*

An extension of the earlier magnetometer survey revealed further large anomalies.

#### *Heazlewood*

The association of magnetite with the nickel mineral heazlewoodite in the old Lord Brassey mine prompted a magnetometer survey in the vicinity of the mine.

#### *Dundas*

An electromagnetic, self potential and magnetometer survey was made in the area between the Razorback and Grand Prize mines in the hope of picking up anomalies due to sulphides with which the tin is associated.

#### *Railton*

A survey using composite methods was undertaken on the Goliath Portland Cement Company's leases in an endeavour to ascertain the depth to the top of the limestone below the clay overburden,

*North-East Coast*

The airborne scintillograph survey of North-Eastern Tasmania was continued this year with a Cessna aircraft based at St. Helens and Launceston. Anomalies recorded in previous years were checked on the ground by T. D. Hughes and W. Pitulej.

*Helicopter Operations*

The use of a Bell G2 helicopter from Helicopter Utilities Pty. Ltd. of Sydney greatly facilitated regional geological mapping in remote areas where conventional transport is impossible or unduly slow and expensive. The helicopter conveyed parties to and from camps south of the Arthur River from Trowutta, to the Ironbound Range in the south west from Lune River, and to various camps in the Zeehan-Rosebery area from Zeehan.

**MAPPING AND ENGINEERING DRAUGHTING SECTION**

The Senior Draughtsman, K. T. KENDALL, reports as follows:—

This year's activity featured the preparation and printing of the "Structural Map of Tasmania" on a scale of eight miles to one inch, structural data being furnished by the Tectonic Map Committee of the Tasmania Division, Geological Society of Australia.

Compilation of the new eight mile "Geological Map of Tasmania" is nearing completion and will be published next year. The introduction of new techniques in fair drawing and printing will facilitate production of this and future geological maps.

Twenty three black and white geological maps, sections and diagrams were prepared as line blocks for inclusion in Technical Reports No. 4 (1959) which was printed during the year.

A black and white topographical map of "South-West Tasmania" was compiled from aerial photographs and published at a scale of two hundred chains to one inch. This map replaces the less accurate "South-West Sketch" map of the same area.

Cartographic work was undertaken on behalf of the Regional Establishments at Zeehan, Wynyard and Port Davey, including the preparation of base maps for the "Zeehan" and "Du Cane" sheets of the Geological Atlas one mile series.

A conference of Chief Draughtsmen of State Geological Surveys and the Bureau of Mineral Resources was attended in Adelaide. The meeting dealt with various technical problems relating to the production of geological maps.

The balance of time was used in preparing topographical, geological and engineering plans related to normal field services.

**PUBLICATIONS**

Publications for the year were:—

## 1. Structural Map of Tasmania.

This was published in co-operation with the Tectonic Map Committee and is on the scale of 8 inches to 1 mile. This is a companion map and on the same scale as the Geological Map to be published in 1961.

## 2. Technical Reports No. 5

A list of geological reports contained in Technical Report No. 5 is as follows:—

**ECONOMIC AND GENERAL GEOLOGY.**

1. Woolnough's Brick Materials, Claremont: by F. Blake.
2. Additional Prospecting by G. Lowe at Mathinna: by J. Baird.

3. Permian Rocks of Cradle Mountain: by K. L. Burns.
  4. Gold Prospecting near Fingal, North-East Tasmania: by J. Baird.
  5. Stormsdown Mine, Zeehan (R. Fieldhouse and D. Dunkley): by A. H. Blissett.
  6. Notes on Tin Prospect, Rekara, King Island: by T. D. Hughes.
  7. Non-Metallic Minerals of Tasmania: by T. D. Hughes.
  8. Cambrian Rocks of the Dolcoath Anticline: by K. L. Burns.
  9. Thermal Springs, Hastings: by T. D. Hughes.
  10. Geological Reconnaissance of the Arthur River Area: by R. D. McNeil.
  11. Denison Copper Prospect, Western Port Davey: by M. Z. Stefanski.
  12. Clay Near St. Marys: by F. Blake.
  13. Geology of the Rapid River Area: by W. L. Matthews.
  14. Application for Two Gravel Leases near the Junction of the Huon and Picton Rivers: by T. D. Hughes.
  15. Alleged Tin Discovery, Bruni Island: by T. D. Hughes.
  16. Drilling at Mt. Stronach Molybdenite Prospect: by T. D. Hughes.
  17. Examination of Radiometric Anomalies Between Gladstone and St. Helens: by W. Pitulej.
  18. Report on the Oceana Mine, Zeehan: by R. Jack.
  19. Brick-Making Materials Near Dulverton: by T. D. Hughes.
  20. D. Brown's Mica Prospect, Gladstone: by R. Jack.
  21. Radiometric Anomalies, Bicheno and Coles Bay Area: by T. D. Hughes.
  22. Gravel Deposits, Housing Estate, Risdon (2nd Report): by T. D. Hughes.
  23. Alluvial Gold Prospect, Bessells Creek, Lisle: by R. Jack.
  24. Magnetite Deposit at Loyetea: by T. D. Hughes.
  25. Quarry Site, Proctor's Road: by R. Jack.
  26. Gold Mine, Narrawa Creek, Moina: by R. Jack.
  27. Areas Selected for Geophysical Work, North-Eastern Tin Field: by R. Jack.
  28. Brick-Making Materials at "Bowenwood", Kingston: by F. Blake.
  29. Geological Sequence in Recent Drilling Near the Goliath Cement Company's Works, Railton: by I. B. Jennings.
  30. The Iron Cliffs Mine, Penguin: by K. L. Burns.
  31. Tin Mineralization Near Mt. Razorback, Dundas: by A. H. Blissett and A. B. Gulline.
  32. Savage River Iron Deposits—Progress Report: by T. D. Hughes.
  33. Notes on the Geology of Portion of South-West Tasmania: by I. B. Jennings.
- COAL.**
34. Coal Reserves at Merrywood: by T. D. Hughes.
  35. Proposed Drilling on the Fingal Coalfield: by J. Baird.

**ENGINEERING GEOLOGY.**

36. Landslips at Beauty Point: by F. Blake.
37. Proposed Dam Site, Isandula: by T. D. Hughes.
38. Notes on Geology of the Proposed Factory Site for Associated Pulp and Paper Mills at Wesley Vale: by T. D. Hughes and K. L. Burns.  
Supplementary Report: by T. D. Hughes.

**PETROGRAPHICAL NOTES.**

39. Notes by G. Everard on Specimens Collected in Various Localities—
  - (a) Zeehan District.
  - (b) North Heemskirk Area.
  - (c) Savage River Iron Ore Deposits.
  - (d) Port Davey District—North Bond Bay and Ironbound Range.
  - (e) Smithton District—Black River.
40. An Occurrence of Hornblende Picrite in North-Eastern Tasmania: by M. J. Longman.

**UNDERGROUND WATER.**

41. Possibilities of Underground Water at "Lennonville", Bruny Island: by F. Blake.
42. Underground Water on A. V. Brown's Property, Mt. Direction, East Tamar: by F. Blake.
43. Underground Water at Scamander: by F. Blake.
44. Underground Water on Dr. E. G. Dixon's "Park Lane" Property, Orielton: by F. Blake.
45. Underground Water on Mr. N. S. Kirby's "Kidbrook" Property, Sorell: by F. Blake.
46. Water Boring on J. F. Bell's Property, Redpa: by I. B. Jennings.
47. Results of Drilling for Underground Water in the Smithton District: by W. L. Matthews.
48. Results of Drilling for Underground Water on the East Coast: by W. L. Matthews.
49. Results of Drilling for Underground Water in the Midlands: by W. L. Matthews.

## REPORT OF THE CHIEF CHEMIST AND METALLURGIST.

The Chief Chemist and Metallurgist, Mr. W. St. C. Manson,  
M. Aus. I.M.M., reports:—

Analyses were made of ores, minerals, rocks, ferrous and non-ferrous alloys, clays, coal, water, mill and research products associated with ore dressing investigations.

Ore dressing research and associated mill operations and advice thereon continue to be a major activity. The ceramic testing section has been active, and 59 samples of clay were processed during the year.

Determinations made during the year were as follows:—

Types	Number
Aluminium .....	122
Antimony .....	3
Arsenic .....	17
Barium .....	12
Bismuth .....	2
Cadium .....	6
Calcium .....	70
Carbon .....	150
Chlorine .....	55
Chromium .....	32
Coal Analyses .....	79
Cobalt .....	10
Copper .....	84
Gold .....	52
Iron .....	1,057
Lead .....	66
Magnesium .....	56
Manganese .....	186
Mercury .....	1
Molybdenum .....	38
Nickel .....	46
Niobium .....	3
Phosphorus .....	214
Potassium .....	17
Qualitative Tests .....	52
Radio-Activity Tests .....	1
Silicon .....	124
Silver .....	36
Sodium .....	13
Sulphur .....	263
Tantalum .....	3
Tin .....	826
Titanium .....	151
Tungsten .....	170
Uranium .....	Nil
Vanadium .....	16
Water Analyses .....	20
Miscellaneous .....	174
Total .....	4,227

Research investigations undertaken during the year were as follows:—

Types	Number
Clay .....	5
Tin .....	1
Iron .....	2
Mica .....	3
Total .....	11

### PUBLICATIONS

A list of reports contained in Technical Reports No. 5 is as follows:—

#### Ceramics and Ore Dressing.

1. Reg. No. 50—Roll Crushing of Prepared Clay for Brick Manufacture: by F. C. Gillespie.
2. Reg. Nos. 96 to 102—Clays for Ceramic Tests: by F. C. Gillespie.
3. Reg. No. 181—Shale for Extrusion Tests: by F. C. Gillespie.
4. Reg. Nos. 190-193—Preliminary Investigation for Surges Bay Materials: by F. C. Gillespie.
5. Reg. Nos. 564, 574-577, 594, 595—Extrusion and Water Absorption Tests on Bore Samples: by F. C. Gillespie.
6. Reg. No. 585/59—Suitability of a Kaolin for Firebricks: by F. C. Gillespie.
7. Reg. Nos. 765-767—Efflorescing Salts in Brickmaking Shale. Luck Bros. Pty. Ltd: by F. C. Gillespie
8. Reg. Nos. 768-769—Luck Brothers, Dulverton. Comparison of Extrusion and Pressing of Bricks from Clay and Shale: by F. C. Gillespie.
9. Reg. Nos. 884-906—Luck Brothers, Dulverton. Brick-making Test on Bore Samples of Clay and Shale: by F. C. Gillespie.
10. Reg. Nos. 998 and 999—The Effect of Fine Crushing of Raw Materials on Brick Strength: by F. C. Gillespie.

## REPORT OF THE CHIEF INSPECTOR OF MINES.

(Compiled by the Assistant Chief Inspector of Mines, Mr. P. M. Johnstone, B.E.,  
M. Aus. I.M.M.)

The Chief Inspector of Mines, Mr. J. G. SYMONS, B.E., M. Aus. I.M.M. reports:—

**THE MINES AND WORKS REGULATION  
ACT, 1915**

**EMPLOYMENT**

The average number of persons employed in the mining, metallurgical and quarrying industry during the year was 8299. This represents an increase of 63 men which arose from the re-opening of one, and stepped up output from another, hard rock mine in the tin and tungsten group. The employment in the other metalliferous groups and in the coal groups was but slightly less, in spite of the closure of one silver-lead and one coal mine.

**ACCIDENTS**

The number of registered accidents was 93, in which 92 men were injured and one killed. In calculating the rates per thousand, 825 employees in the total of 8299 were disregarded because their employers do not submit accident reports. The dissection of accidents according to the class of mining shows much reduced percentages of employees injured underground in copper and in tin and tungsten mining, the rate in the former group having been halved. On the other hand the surface rates in lead-zinc and tin and tungsten mining increased to 4 and 3 times respectively the average for the industry as a whole.

**DESCRIPTION OF FATAL AND SERIOUS  
ACCIDENTS**

*Fatal*

A. Brentegani, Aberfoyle Tin, Rossarden: Struck by fall of hanging wall.

*Serious*

L. H. McGiveron, Cornwall Colliery, St. Marys: Loco. knocked prop causing bar to fall on a man riding on top of the loco; broken ribs and internal injuries.  
R. L. Wise, Duncan Colliery, Fingal: Struck by fall of roof coal; broken ribs and doubly broken leg.

W. B. Daley, Mt. Lyell Co., Queenstown: Trod on loose board and fell to floor below; broken back.  
A. J. Simmonds, Mt. Lyell Co., Queenstown: Bumped by tractor; broken ribs.  
G. M. Murfit, Mt. Lyell Co., Queenstown: Foot jammed by trolley wheel; broken.  
K. F. Lovett, Mt. Lyell Co., Queenstown: Lorry steering wheel spun in hand; broken hand.  
A. C. Williams, Mt. Lyell Co., Queenstown: Jammed against wall by truck; broken leg.  
I. M. Turner, Mt. Lyell Co., Queenstown: Stepped and fell on end of ladder; injury to perineum.  
D. F. McKenzie, Mt. Lyell Co., Queenstown: Struck by stone rolling down rill; broken pelvis.  
J. L. Hamill, Mt. Lyell Co., Queenstown: Scaffold rope gave way; broken head.  
L. Thorpe, E. Z. Co., Rosebery: Struck by fall of ground; broken leg.  
P. J. Dunn, E. Z. Co., Rosebery: Slipped under lorry wheel; broken leg.  
W. R. Coward, E. Z. Co., Rosebery: Struck by stone rolling down rill; broken leg.  
H. H. Jones, Aberfoyle Tin, Rossarden: Tripped and fell; broken leg.  
R. Stewart, Renison Associated Tin, Renison Bell: Struck by fragment when clutch housing burst by disintegration of pressure plate; lost eye.  
A. Paterson, Renison Associated Tin, Renison Bell: Hands caught between winch drum and base whilst freeing rope; lost finger, badly lacerated hands.  
P. Woolley, Bain's Quarry, Dymnryne: Spalling hammer turned in hand; broken arm.  
A. V. Bain, Bain's Quarry, Dymnryne: Leg jammed between bearing and jaw of crusher when jack slipped; broken.  
H. R. Brooks, Hobart Quarries, New Town: Struck by stone dislodged by his safety rope from quarry face; broken ribs and collar bone.  
T. A. Jones, Crisp & Gunn's Brickworks, West Hobart: Clothing caught in screw conveyor whilst removing cover; lost arm.  
M. Reddington, E. Z. Co., Risdon: Foot caught in gears of overhead travelling crane; crushed foot.  
V. Kalytis, E. Z. Co., Risdon: Struck by winch handle when rope jerked by load; broken arm.  
G. Lee, Australian Titan Products, Heybridge: While oxycutting steel supported on empty inflammable liquid drums ignited fumes; burnt legs and stomach.

**LOCATION OF ACCIDENTS**

Type of Mining	Underground Number of Persons—				Surface Number of Persons—				Total Number of Persons—			
	Employed	Killed	Injured	Per Cent Injured	Employed	Killed	Injured	Per Cent Injured	Employed	Killed	Injured	Per Cent Injured
Coal .....	205	...	7	3.4	92	...	...	...	297	...	7	2.4
Copper .....	51	...	2	3.9	1,530	...	15	1.0	1,581	...	17	1.1
Silver-lead-zinc .....	293	...	17	5.8	439	...	13	3.0	732	...	31	4.2
Tin and Tungsten .....	277	1	18	6.9	414	...	10	2.4	691	1	21	3.2
Quarries, Works, &c. ....	...	...	...	...	4,173	...	16	0.4	4,173	...	16	0.4
Total .....	826	1	38	4.7	6,648	...	54	0.8	7,474	1	92	1.2
Not reported .....	...	...	...	...	825	...	...	...	825	...	...	...
					7,473				8,299			

## COMPARATIVE TABLE SHOWING RATES PER THOUSAND KILLED OR INJURED

Period	Number of Persons Employed	Number of Accidents	Number of Persons			Number per Thousand		
			Killed	Injured	Total	Killed	Injured	Total
1892 - 1930*								
1931 - 1940†								
1941	5856	85	5	85	90	0.853	14.515	15.368
1942	5572	89	4	86	90	0.718	15.434	16.152
1943	5535	73	6	67	73	1.084	12.104	13.188
1944	5439	73	4	71	75	0.735	13.054	13.789
1945	5178	46	2	44	46	0.386	8.497	8.883
1946	5255	63	1	62	63	0.19	11.798	11.989
1947	5316	74	.....	74	74	.....	13.920	13.920
1948	5399	67	3	64	67	0.555	11.854	12.409
1949	5659	65	1	64	65	0.176	11.308	11.484
1950	5892	62	2	62	64	0.339	10.524	10.862
1951	5928	49	2	50	52	0.337	8.335	8.772
1952	6820	62	1	61	62	0.147	8.944	9.091
1953	7370	73	6	67	73	0.801	9.091	9.892
1954	7289	75	3	72	75	0.411	9.877	10.289
1955	7095	98	4	96	100	0.563	13.531	14.094
1956	7692	130	4	126	130	0.520	16.381	16.901
1957	8137	79	.....	80	80	.....	10.786	10.786
1958	8309	103	3	100	103	0.399	13.303	13.702
1959	8236	92	2	91	93	0.269	12.256	12.525
1960	8299	93	1	92	93	0.133	12.309	12.443

\* See Report of Director of Mines—1954.

† See Report of Director of Mines—1956.

## INCIDENCE OF ACCIDENTS

Place and Cause of Accident	Number of Persons Killed	Number of Persons Injured (incapacitated for over 14 days).
<i>Section A.—Metalliferous Mines—</i>		
1. Below Ground:		
(a) Explosions	.....	.....
(b) Falls of Ground	1	4
(c) Falling down Shafts, &c.	.....	.....
(d) Other Causes	.....	27
2. Above Ground:		
(a) Machinery in Motion	.....	5
(b) Other Causes	.....	31
3. Accidents in Batteries, Ore-dressing, Smelting and other Metallurgical Works, &c.	.....	18
Total Metalliferous Mines (A)	1	85
<i>Section B.—Coal Mines—</i>		
4. Below Ground:		
(a) Mine Explosions (fire, damp, &c.)	.....	.....
(b) Explosives (dynamite, &c.)	.....	.....
(c) Falls of Earth	.....	4
(d) Other Causes	.....	3
5. Above Ground:		
(a) Machinery in Motion	.....	.....
(b) Other Causes	.....	.....
Total Coal Mines (B)	.....	7
Total All Mines (A and B)	1	93

## INSPECTION

Mr. A. E. Hemsley, relieving Inspector of Mines and Explosives on the coal fields concluded his work there and was transferred to Launceston in a similar capacity, until the transfer of Mr. L. W. Morris, Inspector of Mines and Explosives, Queenstown, was completed. Mr. J. B. Braithwaite was appointed to fill the Queenstown position.

## SHOTFIRERS' PERMITS

Permits to act as shotfirers at particular quarries were issued to 20 men during the year after viva voce examination by the inspectors.

## REPORT OF THE CHIEF INSPECTOR OF EXPLOSIVES

(Compiled by the Assistant Chief Inspector of Explosives, Mr. P. M. Johnstone, B.E., M. Aus., I.M.M.)

The Chief Inspector of Explosives, Mr. J. G. SYMONS, B.E., M. Aus. I.M.M. reports:—

### EXPLOSIVES ACT, 1916

The following quantities of explosives were imported during the year at the ports shown:—

	Currie	Hobart	Launceston	Burnie	Strahan	Ulverstone	Devonport	Total
Nitro-compounds (lb.)	97,750	301,500	1,302,100	344,800	1,485,200	.....	.....	3,531,350
Detonators, &c.	20,000	250,000	.....	.....	.....	243,625	430,000	943,625

There were 39 shipments landed, an increase of two, and each was inspected on arrival. A close watch was maintained on fireworks and information was freely exchanged with the Chief Inspectors of the other States on the various new types put up by overseas manufacturers. Arrangements were completed for the erection of a new magazine at Dilston to replace the out-moded Launceston Magazine.

### ACCIDENTS

Three accidents occurred in which two men were injured. Considerable damage was caused by fireworks exploding in a shop window, apparently having been ignited by a magnifying glass. A shotfirer sustained serious leg injuries from a premature explosion in a quarry and in

the other case a man's hand and face were wounded when a detonator exploded in his hand for no ascertainable reason.

### INSPECTION

Trial shipments of gelignite plugs without end-waxing were successful in that no especial deterioration of the explosive occurred.

A permit was granted for the manufacture and use on a large mine of mixtures of ammonium nitrate and mineral oil or molasses and water as a blasting agent. Results have been good and a permit was issued to another opencut mine.

An additional Inspector of Explosives (Mr. A. E. Hemsley), was appointed and stationed at Burnie to cover the increasing number of inspections required in the North-West.

### INFLAMMABLE LIQUIDS ACT, 1929

The following quantities in tons of inflammable liquids were imported in bulk during the year through the ports shown:—

Liquid	Hobart	D'port	Bell Bay	Narracoopa	Total
Aviation Gasolene	2,130	.....	923	.....	3,053
Benzol	540	.....	.....	.....	540
Kerosene Aviation	5,719	.....	.....	.....	5,719
Kerosene, Lighting	2,162	991	.....	.....	3,153
Kerosene, Power	700	2,028	.....	.....	2,728
Motor Spirit, Premium	38,267	20,085	17,764	.....	76,116
Motor Spirit, Regular	30,443	14,637	17,840	600	63,520
Total	79,961	37,741	36,527	600	154,829
Tank Ships (No.)	25	14	9	1	49

There were nine more tank ships than in the previous year and the quantity landed was 31,784 tons more.

### ACCIDENTS

Slight injuries were incurred by a lorry driver when a drum of calcium carbide exploded whilst being unloaded. No definite cause was found. No accidents with inflammable liquids were recorded. A man was severely burnt on the legs and stomach by the explosion of fumes from a drum which had contained carbon disulphide. He was using the drum to support a steel joint whilst he cut it with an oxy-acetylene torch. The drum was correctly marked "Highly Inflammable",

### INSPECTIONS

At the 30th June the number of licensed premises was 1715, an increase of 49 in 12 months.

The year was marked by the commencement of construction on a port installation at Burnie for white oil and the continued increase in L.P. Gas and lighting kerosene installations and in the provision of catering facilities at service stations. Routine inspections were carried out and particular attention given to the emergency venting of small tanks and to the control of spillage of inflammable liquids in the harbours and at sea.

## REPORTS OF THE INSPECTORS OF MINES AND EXPLOSIVES

**Inspector L. W. MORRIS, A.W.A.S.M.,  
M. Aus. I.M.M. Launceston,  
reports:—**

**Inspector D. BESFORD, M. Aus. I.M.M.,  
Hobart reports:—**

### EMPLOYMENT

The average number of persons employed in the industry was 1532, of whom 255 were engaged underground.

During the year the Inspectoral activities in the district were increased by the commencement of building, by the Broken Hill Co. Pty Ltd., of a Ferro-manganese plant at Bell Bay, and by an agreement between the Director of Mines and the Hydro-Electric Commission whereby the works at Poatina became subject to the provisions of the Mines and Works Regulation Act, 1915, for a trial period.

### ACCIDENTS

There were 18 accidents registered as having caused 14 days or more lost time; of these 1 was fatal, 1 serious and 16 minor.

The fatal accident occurred when a miner was struck by a fall of ground.

### HEALTH, SANITATION AND SAFETY

Inspections have been directed to maintaining adequate ventilation, sanitation and safety practices in the mines, quarries and works. In some cases, ventilation is capable of improvement and efforts are being made to this end. Generally, change houses, crib rooms, amenities are satisfactory. Safety measures in some cases underground can be improved and the use of hydraulic fill in two mines is being investigated, better stope filling methods being necessary for greater safety in these two instances.

### AID TO MINING

Applications for assistance have been investigated. Advice, and, where considered justified, financial help, have been given. However, requests for aid under the Act have been limited in this inspectorate.

### EXPLOSIVES AND INFLAMMABLE LIQUIDS

Explosive and inflammable liquids storages have been periodically inspected, and kept to the required standard.

The clearing and roadwork for the new Government Magazine at Dilston has proceeded during the year. The Hydro-Electric Commission have completed several temporary magazines, and are preparing to establish a Central Magazine at Blackwood Creek, to service operations at the Poatina project.

Nine shipments of explosives were imported in good condition. Each shipment was inspected, loading and transport to the magazine was supervised, and necessary documents checked.

Routine checking of inflammable liquids storages continued throughout the year; new installations were inspected, and if approved, passed for licensing. Inspector D. R. Bonham and other Inspectors of Explosives supervised importation of eight shipments of inflammable liquids at Bell Bay without any serious incident.

### EMPLOYMENT

The average number of persons employed at mines and works operating under the Mines and Works Regulation Act was 462, a decrease of 7 compared with the previous year.

### ACCIDENTS

Eight accidents resulting in non-fatal injuries to eight persons were recorded under the provisions of the Act. Seven accidents occurred underground and one occurred on the surface. In the seven underground accidents, four persons received injuries as a result of falls of coal or stone; three of the accidents occurred at the coal face and one occurred while carrying out repairs along the roadway.

A miner received a fractured thigh due to a fall of coal when he was engaged in connecting the detonator lead wires to the shotfiring cable preparatory to firing a round of shots.

A locomotive assistant received injuries to his chest when he was crushed while riding on a train of full trucks. The locomotive driver and the assistant unloaded some timber at the side of the road on their journey in. When hauling out the full trucks, the wheels of the locomotive came into contact with one of the timbers which had evidently been placed too close to the rails, pushing it forward into the foot of one of the supporting props which was dislodged. This allowed the cross bar to fall across the top of the locomotive and the assistant who was riding on the back of the locomotive was crushed between the fallen beam and the front of the first skip in the train.

Other accidents were of a less serious nature and the workmen involved resumed their normal duties after a short absence.

### SAFETY

Attention has been directed to the safe working of the undertakings. Regular inspections have been made of all working places, and all coal mines have been regularly tested for the presence of gas by means of the safety lamp. Dust surveys were carried out to check atmospheric dust concentrations and the resulting counts were found satisfactory. Generally, roof conditions were safe, but there were instances when it was thought necessary to order additional supports or the removal of dangerous roof or sides.

Underground machinery was examined and generally found in safe condition, any necessary adjustments being carried out without delay. No electrical accidents were recorded during the year.

### VENTILATION

Main underground air currents were checked by anemometer to ascertain whether adequate ventilation was being produced to comply with the requirements of the Act. The effective distribution of the air was checked and hygrometer readings were regularly recorded in each underground working place. Temperatures were

generally well below the prescribed maxima. The ventilation of the underground working places at one mine deteriorated to such an extent that the workmen had to be withdrawn and the mine was closed. Excess air leakages occurred at another mine due to the absence of permanent stoppings between the main intake and main return airways. A few brick stoppings were installed but many more are required in order to achieve satisfactory results at the working face where the air is most needed.

#### EXPLOSIVES AND INFLAMMABLE LIQUIDS

Magazines and inflammable liquids installations were regularly inspected and were generally found to comply with the requirements but in some cases storage premises had to be given attention in order to conform with the requirements of the Act.

**Inspector J. B. BRAITHWAITE, B.C.E.,  
B.M.E., M.Aus.I.M.M., A.M.I.E.  
Aust., Queenstown, reports:—**

#### EMPLOYMENT

In this district, the average number of persons employed in the industry was 2343, distributed as follows:—

Quarry or Opencast .....	549
Other Surface .....	1,429
Underground .....	365
	<hr/>
	2,343

#### ACCIDENTS

The Mines and Works Regulation Act requires the reporting of all accidents resulting in the loss of 14 days or more and a total of 52 was reported for the year.

No deaths resulted, but the injuries were serious in 9 of the accidents which occurred on the surface, and in 4 of those occurring underground. In opencast workings, one man suffered a broken leg when a rolling stone struck his air hose and caused him to fall down the rill. Four men suffered broken bones in connection with motor vehicles, one being run over while delivering firewood, two being struck in garages, while the fourth was injured when a steering wheel spun and broke a bone in his hand. One man suffered back injuries when he fell owing to loose flooring boards moving during the erection of plant, while another lost the end of a finger while throwing timber onto a trolley. One man lost an eye when the clutch plate on a diamond drill disintegrated and burst the surrounding housing. Underground, two men suffered broken legs owing to falling stones, one had his foot jammed by a trolley and a fourth lost an index finger when his hands were pulled under the drum of a winch.

Of the 39 minor accidents, 7 were injuries to back or other muscles due to strain, and 10 were injuries to hands or fingers.

#### HEALTH AND SAFETY

Regular visits were paid to all mines and works in the inspectorate and a careful watch kept on working conditions as regards safety and hygiene. Special visits were also made on several occasions at the request of the union representatives and ruling given on particular points of safety.

#### AID TO MINING

Financial assistance was granted, or approved, to three parties in connection with mining or treating tin ores.

#### EXPLOSIVES AND INFLAMMABLE LIQUIDS

The landing of all explosives imported through Regatta Point was supervised. Magazines in the area were inspected and the distribution and use of explosives for mining purposes checked. New inflammable liquid storages were checked against the approved plans prior to the granting of licences.

#### PROSECUTIONS

Jeno Schvarcz was prosecuted under Rule 22 of Division IV of the General Rules for all Mines and Works for removing explosives from the Rosebery Mine. He was found guilty and fined £2 and 9s. costs.

**Inspector H. L. OLDS, A.S.T.C., A.M.  
Aus. I.M.M., Hobart, reports:—**

#### EMPLOYMENT

In the southern division the average number of persons employed in mining and allied industries was 3054, comprising 217 in quarries and alluvial workings and 2837 in works.

#### ACCIDENTS

A total of 12 accidents was recorded during the year of which 6 were serious, 3 each in quarries and works. Machinery was involved in the last named 3, one man losing an arm in a screw conveyor, one crushing his foot in a gear train and the third suffering a broken arm from a flying winch handle.

**Inspector L. F. EGAN, A.M. Aus.  
I.M.M., Burnie, reports:—**

#### EMPLOYMENT

The average number of persons employed was 932 an increase of 111 men on the previous year.

#### ACCIDENTS

There were only 3 accidents, two of a minor nature, registered as having caused 14 days lost time or more. The serious accident occurred when a man used an empty carbon disulphide drum to support a steel joist whilst he cut it with an oxy-acetylene torch. The inflammable vapours emanating from the drum were exploded by the flame, severe burns to the stomach and legs resulting.

#### HEALTH AND SAFETY

Frequent and regular inspections were made of mines and works, special attention being given to face conditions in quarries, open cuts and gravel pits. In addition a watchful eye was kept on the underground operations of tributors at Mount Bischoff.

An amendment in 1957 to General Rule 20 of Part II of the Schedule to the Mines and Works Regulation Act affords a great degree of control

over blasting operations, and examinations were conducted and Shot Firers' Permits issued to satisfy the requirements of the Act. This has eliminated the employment of inexperienced men as shot firers.

A feature of inspection work was the insistence upon hygienic dust free conditions on all mines and works. It cannot be claimed that complete success was achieved in this direction but constructive efforts at improving dusty conditions were made.

#### EXPLOSIVES AND INFLAMMABLE LIQUIDS

A rearrangement of territory and the appointment of Mr. A. E. Hemsley as Inspector of Explosives and Inflammable Liquids to the North-

West Coast has done much to ease the burden of the administration of the Explosives Act and Inflammable Liquids Act. Unloading of explosives and discharge of oil tankers is now under his supervision.

One blasting accident was reported during the year. This occurred when a gravel contractor in the Circular Head area bulled a hole with a fuse too short for safety. After lighting the 10" fuse and dropping it down the hole he attempted to tamp the hole with water. Before he had time to finish, the charge exploded and he sustained serious lacerations to the neck from flying gravel. This man was not the holder of a Shot Firers' Permit but was operating his own quarry by himself.

### REPORT OF THE RINGAROOMA AND CASCADE WATER BOARD FOR THE YEAR ENDED 31st DECEMBER, 1960

SIR,

We have the honour to submit the report of the Ringarooma and Cascade Water Board for the year ended 31st December, 1960.

The Cascade section of the race continued to be used and maintained by Briseis Tin N.L. at a rental of £211 per year.

There was an increase in revenue from the sale of water for mining purposes resulting mainly from the operations of one producer, but in view of the very substantial expenditure necessary to maintain the Ringarooma Race, the Board decided at its meeting in February that this section of the Race should be closed. A report was submitted to the Government and the action of the Board was approved subject to the final closure being deferred until water supplies to the townships of Branhholm and Legerwood were arranged through the Rivers and Water Supply Commission. Alternative water supplies to these towns have not yet been provided and the Board has continued to supply water although main-

tenance has been reduced to a nominal level. The Race continues to deteriorate and maintenance has been limited to essential work sufficient to maintain a flow of water for the benefit of residents of Branhholm and Legerwood. The decision to close the Race was reached after every avenue to increase revenue and reduce maintenance had been investigated over a number of years. It was felt that a continued operational loss of at least £3000 per year with additional capital expenditure could not be justified in view of the mounting losses of over £60,000.

There will be a continued loss of a small amount until the Ringarooma system is finally closed. The Cascade section will be retained under rental to Briseis Tin N.L.

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

J. G. SYMONS, Chairman.  
H. K. TURNER, Member.  
N. P. EDWARDS, Member.

The Hon. the Minister for Mines,  
Hobart.

*Statement of Receipts and Payments of the Ringarooma and Cascade (Water) Suspense Account for the Year ended 31st December, 1960.*

Receipts.		Payments.	
	£ s. d.		£ s. d.
Revenue from sale of water from Ringarooma Race—		Ringarooma Race—	
Mining purposes .....	£910 9 10	Wages—Caretakers .....	1,966 4 7
Town supplies .....	429 0 0	Wages—Maintenance .....	639 15 7
	1,339 9 10	Interest on capital cost of Ringarooma and Cascade Water System .....	311 6 7
Rent of Cascade Race and Dams .....	211 0 0	Supervision .....	180 0 0
Miscellaneous .....	15 2 9	Rent of private land .....	169 3 2
		Stores for maintenance .....	117 6 9
Total revenue .....	1,565 12 7	Transport expenses .....	111 15 0
Balance (Loss) .....	2,144 9 4	Pay Roll Tax .....	66 16 5
		Workers Compensation Insurance .....	53 7 4
		Contribution towards drainage of private land .....	50 0 0
		Telephone charges .....	41 6 6
	£3,710 1 11		£3,710 1 11

## REPORT OF THE MOUNT CAMERON WATER RACE BOARD FOR THE YEAR ENDED 31st DECEMBER, 1960.

SIR,

We have the honour to submit the report of the Mt. Cameron Water Race Board for the year ended 31st December, 1960.

Production of tin oxide from water supplied was 40,657 tons as compared with 44,072 tons last year.

The operational loss was £415 which represents an increase of £136 over 1959. Revenue from the sale of water was £2378 which is an increase of £59 as compared with 1959. During 1959 an amount of £60 was received from hire of pipes so that the aggregate revenue from all sources for 1959 and for 1960 was the same. Expenditure for 1960 was £2793 which was £136 greater than the previous year. This is accounted for by one extra pay day falling within the year and to the payment of additional insurance premiums for workers' compensation and on buildings at Gladstone.

Water supplied for mining purposes remained almost constant with that of last year.

The race system has been maintained in good order.

It is desired to record appreciation of the services of the Manager and the Channel Keepers.

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

J. G. SYMONS, Chairman.  
H. K. TURNER, Member.  
H. C. LAWRY, Member.

The Hon. the Minister for Mines,  
Hobart.

### STATISTICS FOR THE YEAR ENDED 31st DECEMBER, 1960

<i>Registered Rainfall</i>	
Great Mussell Roe .....	59 inches 17 points
Little Mussell Roe .....	58 inches 37 points
<i>Water Services</i>	
Average number of claims supplied per week .....	3
Greatest number supplied in any one week .....	4
Number of sluiceways supplied:—	
Royalty Scale .....	106
Fixed Scale .....	2,092
Total .....	2,205

<i>Production and Employment</i>				
Tin oxide produced—				
	tons	cwt.	qrs.	lbs.
Royalty Scale .....	40	12	3	12
Fixed Scale .....	—	—	1	5
Total .....	40	13	0	17
Average number of men employed per week—				
Royalty Scale .....				1
Fixed Scale .....				7
Total .....				8

### *Statement of Receipts and Payments of the Mt. Cameron Water Race Suspense Account for the year ended 31st December 1960.*

<i>Receipts.</i>				<i>Payments.</i>					
		£	s.	d.			£	s.	d.
Sale of Water—					Salary and Wages .....		2,503		6 0
Fixed Scale .....	2,215		10	0	Insurance .....		65		11 4
Royalty Scale .....	66		9	5	Pay Roll Tax .....		60		10 3
Domestic use .....	95		10	0	Tools and general requisites .....		55		17 1
					Car allowance—Manager .....		50		0 0
					Hire of bulldozer .....		40		0 0
Balance (Loss) .....					Electrical work—Manager's residence .....		15		0 0
					Freight .....		2		14 8
							2,792		19 4
							£2,792		£2,792
									19 4
									4