

TASMANIA

REPORT

OF THE

DIRECTOR OF MINES

FOR THE

YEAR ENDED 31ST DECEMBER,

1961



TASMANIA:
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1962

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REPORT OF THE DIRECTOR OF MINES

Department of Mines,
Hobart, 25th June, 1962.

THE HONOURABLE THE MINISTER FOR MINES.

I HAVE the honour to present my report on the mining industry for the year ended 31st December, 1961.

The total value of the industry based on Australian metal prices was £A13,379,477 as compared with £A13,387,290 for 1960. There were increases in the production of copper, gold, scheelite and zinc but the output of lead, silver, tin and wolfram declined. The value of non-metallic minerals and of construction materials showed only slight variation from 1960 figures. The most significant movement was in the production of coal which recorded a decline of 41,842 tons from the previous year. This was accompanied by a fall in employment from 297 men in 1960 to an average employment of 258 men in 1961. These figures illustrate a serious downward trend in production and employment in the coal mining industry and unless expanded markets for coal can be developed it seems that the place of the coal mining industry in the economy of the State will decline permanently.

The average employment in the mining industry was 8493 men representing an increase of 194 men. Increased production of copper, scheelite and zinc provided employment for an additional 151 men, and operation of refineries employed a further 50 men. Although sales of tin decreased slightly the increased market price for this metal stimulated activity in this section of the industry and employment was provided for 10 more men. There was also increased employment in the production of crushed and broken stone. Apart from the fall in employment in the coal mining industry, there was a significant decline in employment in the production of cement resulting from economic measures for credit restrictions, and due to the closure of Zeehan Mines Pty. Ltd. in 1960 there was a net decrease in the employment in lead production.

MINES

No new mines were opened during 1961 and all existing mines continued in production. Increased activity by small tin producers was recorded as a result of the more favourable market price for tin which averaged £A1178 for the year as compared with an average of £A1040 for 1960.

METAL PRICES

Copper.—The average Australian market price of copper for 1961 was £A307 per ton as compared with £A323 for 1960. The Copper Bounty Act, 1958, was extended until 31st December, 1963, and the bounty payable was reduced from £45 to £35 per ton as from 1st January, 1961. However, at the same time an amendment was made to the import duty on copper and the "floor" below which duty on copper applies was raised from £275 to £290. An amount of £15 is added as an allowance for freight and other charges. Consequently bounty is payable when the price of copper is £A305 as against £A290 per ton previously. The overall effect has been to increase the guaranteed price to producers for copper sold for use in Australia to £A340 per ton.

Lead and Zinc.—The quotas imposed by the United States on the import of lead and zinc were maintained. There was a general easing in the price of zinc which averaged £A102 in 1961 as compared with £A112 in 1960. The Australian production capacity is in excess of market requirements and it would appear that new market outlets, notably in Asia, must be developed to enable producers to attain full scale production. Lead is produced as a co-product with zinc and the existing market position for this product is unfavourable and there has been voluntary restriction of production. There are possibilities of developing markets in Asia as industrial expansion proceeds in that area. The Australian price was maintained at £A100 per ton for the first three quarters of the year but it receded to £A97 per ton in the last quarter.

The International Lead and Zinc Study Group set up by the United Nations has met and a special Working Group has been appointed to make an examination of the long-term problems of the industry and the possibilities of solution.

Tungsten.—The price of tungsten which is the basis for the sale of wolfram and scheelite declined during 1961 to an average of 143s. 2d. per unit as compared with 182s. 5d. per unit in 1960. Prices ranged from 165s. per unit in January 1961 to a low of 106s. per unit in November 1961 and was quoted at 123s. in December 1961. Market reports indicate that the fall in price has been due to sales at a discount by Communist Bloc countries. Increased prices are dependent upon a fall in supplies from this source and

increased demand by manufacturers of machine tools and special steels. The forecast for 1962 is not favourable.

The ruling market position has caused a reduction in production of wolfram by the Storeys Creek Tin Mining Company N.L. King Island Scheelite (1947) Ltd. which has a contract for sale of its production continued operations on an expanded scale.

Tin.—The average Australian price of tin for 1961 was £A1178 per ton as compared with £A1039 per ton for 1960. This reflects the upward movement in tin prices on the London Metal Exchange which has resulted from increased demand and a world shortage in production. Under the International Tin Agreement, regulation of exports of tin by the producing countries is exercised and excessive price fluctuations are controlled by operations of the Buffer Stock Manager who buys or sells tin in order to maintain a price within an agreed range. Exports became unrestricted towards the end of 1960 but as sufficient supplies were not coming forward to meet the demand of consumers the price continued to rise. The position was partly met by release of supplies from the Buffer Stock and by sales from Italian and Canadian stockpiles but by June the Buffer Stock Manager had exhausted his supplies of prompt tin which deprived the International Tin Council of its only weapon for controlling price. The remaining controlling factors consist of Italian and Canadian stockpile releases and a quantity of low grade tin held by the U.S.A. outside its strategic stockpile. This reserve has been made available to the market in small quantities but each release has caused price movements.

At the close of the year the position was that a new agreement was still being negotiated by the International Tin Council and until this has been completed open market operations will determine the price of tin. Forecasts for 1962 indicate that there will be a considerable gap between production and consumption which can be bridged only by increased production. Malaya is maintaining production at a maximum level but existing conditions in Indonesia, Bolivia and the Congo may not ensure additional tin exports from these sources.

However, the most dominant single factor is the United States strategic stockpile and any decisions which may be made as to release of any portion and also as to whether U.S.A. may finally decide to join the International Tin Agreement.

The price level in Australia is based on the Singapore price which reflects movements in the London Metal Exchange. The price ranged from £A1030 per ton in January 1961 to £A1291 in August 1961 and the ruling rate at the end of the year was £A1239 per ton—an average of £A1178. Tin is sold by Tasmanian producers as a concentrate and the price at Launceston is based on a 70% concentrate which is adjusted according to the assay value of individual consignments. The price for concentrates payable to producers ranged between £A590 per ton in the early months of the year to an average of £A735 per ton during the remainder of the year.

The effect of the improved price has been to stimulate exploration activities by larger producers and some small operators have been assisted to commence productive work on ground previously uneconomic for working.

EXPLORATION

Large areas of the State continue to be held for exploration purposes although activities are on a reduced scale. The higher price for tin is causing increased interest in areas of potential value and as a result some areas not fully investigated in the past are being subjected to geological examinations and drilling to determine their potential value for productive mining.

Active prospecting of existing leases has been continued by the larger companies and two companies have increased the areas held under lease. The company which holds an Exploration Licence to search for oil in Bass Strait has completed an airborne aeromagnetic survey involving flying of 11,000 line miles. The survey is part of a larger scheme which includes Victorian and South Australian waters and it represents a further stage in the investigation of Bass Strait as a potential oil bearing area.

The Department has continued its policy of drilling for supplies of underground water and to test mineral areas recommended by Departmental geologists. At present two Churn plants are engaged in boring for water and three diamond drills are in constant operation. One plant is testing coal measures in the Fingal Valley, another is boring on a tin lode series on the West Coast and a third has bored a nickel deposit at Beaconsfield and is now testing a tin lode at Ruby Flat near Branhholm.

Towards the end of the year one water boring plant was temporarily closed down and the crew transferred to a new Churn drill which has commenced a programme of drilling in the St. Helens district to explore the possibilities of locating deposits of alluvial tin capable of economic working. It is planned to use this plant constantly on investigating alluvial tin deposits in the east and north-east and when the boring at St. Helens has been completed operations will be transferred to the Gladstone district. There has been a delay in re-commissioning the second water boring plant because of the difficulty in obtaining the services of an experienced driller but it is proposed to commence further water boring as soon as an appointment can be made.

The Department has maintained close liaison with geological, drilling and metallurgical investigations being undertaken by the holder of the licence covering the Savage River deposits and has carried out beneficiation work in the ore-dressing laboratories on iron ore from Blythe River.

Geologists of the Department have been engaged on an active field programme and surveys have been undertaken in the West, North-West, East and North-East of the State. Maps are published as field work is completed. A new geological map of the State was issued and to date six new regional maps in the Geological Atlas series have been distributed. Work is proceeding on new additional maps for which field work has been completed. One volume of explanatory notes on the maps is in press and another is in course of preparation.

COAL

Coal produced amounted to 255,828 tons as compared with 297,670 tons for 1960 representing a decline of 41,847 tons. Men employed in the collieries in 1960 averaged 297 men but the average for 1961 was 258 men. Actually 289

men were in employment at the beginning of 1961 but this figure had fallen to 227 men at the end of December, a decline of 62 men.

As indicated in my last report a downward trend in demand for coal was then becoming evident. This assumed serious proportions when the full effect was felt of the economic measures to control inflation instituted by the Commonwealth Government. There was a large drop in the demand for coal and this resulted in a decline in employment particularly in the Fingal Valley where most of the coal mines are concentrated. Action was taken by the Government through the Forestry Commission to absorb those displaced by accelerating development of State Forests. Following various representations the Government appointed a Board of Inquiry in September, 1961, to inquire into the question of generation of electricity in Tasmania with particular reference to the Fingal Valley. The findings of the Board were not available at the end of the year under review.

The prosperity of the coal industry is dependent upon retaining existing markets and finding alternative outlets in place of consumers who have converted to the use of oil. It is probable that release of the "credit squeeze" will result in some improvement as consumer industries which have been affected are able to resume normal trading but the replacement of customers lost to oil is necessary for a rehabilitation of the industry.

Producers have met the position by improvement of their product through coal washeries and increased efficiency in operation resulting in lower production costs and no market price increases, but in some cases it has been necessary to reduce the size of activities. All mines have been obliged to reduce the labour force, but to date there has not been a complete suspension of operations at any of the mines.

LEGISLATION

THE EXPLOSIVES ACT—1916

An amendment was made to the Explosives Regulations (Statutory Rule 1961, No. 200) to include igniter cord in the ammunition class of explosives. The import and export of ammunition is being allowed without a licence or a permit. Further provision has also been made for the safe use of explosives.

MINES AND WORKS REGULATION ACT—1915

Preparation of new Rules has been completed to conform with modern practices and in accordance with agreed standards formulated at conference of the Chief Inspector of Mines of all the States. The Rules will be published in January, 1962.

OPERATIONS AND PRODUCTION

1.—METALLICS

CADMIUM

Quantity produced:—		
	Tons	Value £
1924-57	1,011	969,708
1958	56	84,663
1959	53	85,077
1960	52	83,498
1961	62	98,286
Total	1,234	£1,321,232

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 0.55 ton of cobalt oxide of value £621 was the same as that of cadmium above.

COPPER

THE MOUNT LYELL MINING AND RAILWAY COMPANY, LIMITED, QUEENSTOWN RETURN FOR 1961.

	Tons
Mining—	
Overburden removed	2,659,992
Ore mined (West Lyell)	1,959,195
Ore mined (Crown Lyell)	13,355
Limestone delivered to works	6,360
Silica	1,394

Reduction—	Tons
Concentrates smelted	48,581
Crown Lyell ore	7,200
Precipitate smelted (North Lyell and Comstock)	16
Bliester copper produced	10,903
Containing Copper 10,821 tons	
Gold .. 6,874 ozs.	
Silver 48,290 ozs.	
Pyrite concentrate shipped	71,087
Total Value of Production	£3,746,967
Average Number of Men Employed—	
Mining—Open cut	569
Underground	60
Other	976
Total	1,605

Production from the inception to 31st December, 1961—

Copper	540,543 tons
Gold	578,112 ozs.
Silver	15,888,234 ozs.

Inspector Braithwaite reports that the stripping of overburden by a contractor continued throughout the year but the contract is expected to finish in May, 1962.

A new truck fleet was brought into operation at West Lyell when the 20 trucks of nominal capacity 20 tons were replaced with 18 of nominal capacity 27 tons.

A major economy was also introduced by the changeover to an Ammonium Nitrate-Molasses mixture for a large portion of the primary blasting. The nine inch churn drill holes are lined with plastic tube before loading, and as the A.N.-Molasses mixture is heavier than water, wet holes are of no consequence. A 120-ton Ammonium Nitrate store was built in the railway yard and a 40-ton store at West Lyell.

The West Lyell ore bin was covered with a galvanized iron roof supported on two 174 feet box girders to minimize the effect of rain on the stored ore. Wet ore tends to hang up in the pass.

In the Crown Lyell Mine, three stopes were developed for shrinkage mining and 1073 feet of driving and 54 feet of rising were carried out. Twenty-two diamond drill holes, of total footage, 2222 feet were drilled from various levels.

On the surface four diamond drill holes, of total footage, 877 feet, were drilled to intersect the Razorback orebody and four holes of total footage, 1972 feet, to intersect the Great Lyell anomaly.

ELECTROLYTIC ZINC COMPANY OF AUSTRALASIA LIMITED, ROSEBERY

This company, reviewed under Zinc, produced 8057 tons of copper concentrate containing 769 tons of copper valued at £236,174.

ABERFOYLE TIN NO LIABILITY—ROSSARDEN

This company, reviewed under Tin, sold accumulated copper-silver residues containing 34 tons of copper, valued at £10,394.

GOLD

Quantity produced—

	oz.	Value £
Prior to 1958	2,451,053	12,951,765
1958	20,976	327,749
1959	20,260	316,567
1960	23,015	359,613
1961	24,528	383,268
Total	2,539,832	£14,338,962

THE MOUNT LYELL MINING AND RAILWAY COMPANY LIMITED, QUEENSTOWN

This Company recovered 6874 oz., valued at £107,407, from sludge in the electrolytic copper refinery.

ELECTROLYTIC ZINC COMPANY OF AUSTRALASIA LIMITED, ROSEBERY

Concentrates produced by this Company contained 17,209 oz., valued at £268,889.

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

From the tin concentrates of this dredge (reviewed under Tin) 431 oz., of gold valued at £6728, were recovered.

MISCELLANEOUS

The Endurance Tin Mining Co. N.L., recovered 10 oz., valued at £163 from tin concentrate produced at the Clifton workings.

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	£
1919-1957	272	103,794	6,295	1,506,008	339,675	41,504,039	404	10,581	346,646	43,124,422
1958 .....	...	...	669	205,465	10,187	3,124,569	...	...	10,856	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
1961	34	10,394	769	236,174	10,821	3,322,646	...	...	11,624	3,569,214
Total	306	£114,188	8,850	£2,304,516	381,950	£54,753,361	404	£10,581	391,510	£57,182,646

IRON OXIDE

Quantity produced—	Tons	Value £
Prior to 1957	77,722	71,951
1958	4,266	5,418
1959	5,062	7,395
1960	3,497	5,503
1961	2,309	3,827
Total	92,856	£94,094

A. PEARSON, PENGUIN

Operations at the Iron Cliffs Mine, the sole producer, were carried out by three men with a front-end loader. The hematite produced (2118 tons of value £2968) was used in cement manufacture and the limonite (191 tons of value £859) in coal gas generation.

LEAD

Quantity produced—	Tons	Value £
1919-57	269,298	13,366,293
1958	12,902	1,124,977
1959	13,223	1,322,305
1960	12,183	1,218,381
1961	10,278	1,026,909
Total	317,884	£18,058,865

ELECTROLYTIC ZINC COMPANY OF AUSTRALASIA LIMITED, ROSEBERY

This Company, reviewed under Zinc, produced 11,450 tons of lead concentrates and the total content of the lead, zinc and copper concentrates was 9696 tons valued at £968,963.

FARRELL MINING CO. LTD., TULLAH

The quantity of ore mined was much the same as last year, but the production of concentrates fell to 895 tons which contained 581 tons of lead valued at £58,046. The silver content is shown under that heading. Average employment was 42 men (27 surface and 15 underground).

Development was carried out on a footwall deposit on No. 7 level but no payable ore was proved. Twenty-four diamond drill holes, of total footage 2781 feet, were driven into the footwall on No. 6 level but no ore was intersected.

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 182 tons was valued at £2059.

OSMIRIDIUM

Quantity produced—	oz.	Value £
1910-57	31,043	705,047
1958	42	3,424
1959	3	60
1960 .....	.....	.....
1961 .....	.....	.....
Total	31,088	£708,531

PYRITE

Quantity produced—	Tons	Value £
1915-57	1,134,423	2,139,573
1958	68,110	204,330
1959	73,000	219,000
1960	53,919	161,757
1961	71,087	213,261
Total	1,400,540	£2,937,921

This is produced and exported by the Mount Lyell Mining and Railway Company Limited for sulphuric acid manufacture. Production was temporarily suspended at the end of the year and stockpiles were drawn upon.

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 £
Aberfoyle Tin N.L.	Copper Concentrate	16,373	6,958
E.Z. Co. of A/asia Ltd.	Copper & Lead Concentrate	1,165,529	499,825
Farrell Mining Co. Ltd.	Lead Concentrate	62,576	26,880
Mt. Lyell M. & R. Co. Ltd.	Refinery Sludge	48,290	20,770

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 33,564 mono tons, valued at £158,850.

TIN

Quantity produced—	Tons	Value £
1873-1957	142,248	29,526,388
1958	883	883,111
1959	890	942,698
1960	884	920,040
1961	879	1,022,094
Total	145,784	£33,294,331

ABERFOYLE TIN N.L., ROSSARDEN

Inspector Morris reports that the ore treated in the mill was 76,151 tons, an increase of 10,601 tons compared to the previous year. Tin concentrate production was 633 tons containing 457 tons of tin valued at £534,222. Details of the wolfram production are given under Tungsten. The average number of employees was 278 (94 surface, 184 underground).

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.	£
1919-57	88,148	36,189	16,939,681	2,543,661	3,345,750	544,868	14,335,331	4,191,487	34,708,910	7,316,205
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	66,997	45,157	19,192	1,145,762	486,948	1,348,556	573,137
1961	16,373	6,958	62,576	26,880	48,290	20,770	1,165,529	499,825	1,292,768	554,433
Total	104,521	£43,147	17,523,574	£2,784,964	3,504,922	£611,393	18,882,335	£6,081,135	40,015,852	£9,520,639

During the year winze-rise connections were completed from the southern end of the western lode system on the bottom level to the No. 4 level. This work is preparatory to installing an exhaust fan to discharge up Brandon Shaft. Similar work is in progress at the north end of the mine. All mill discharge, except water, free from solids, is now either stored in a surface dump or used as stope filling.

Underground development comprised:—

Driving	1,874 feet
Crosscutting	509 feet
Rising	683 feet

Total 3,066 feet

In addition 18 diamond drill holes were completed for a total footage of 6115 feet.

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

This Company, reviewed under Tungsten, produced tin concentrates from the mine at Storeys Creek containing 10 tons of tin valued at £11,055.

**DORSET TIN DREDGE, SOUTH MOUNT
CAMERON**

The Dorset Tin Division of the Storeys Creek Tin Mining Co., N.L. at South Mount Cameron dredged 1,554,000 cubic yards of gravel for the production of concentrates containing 98 tons of tin valued at £116,242.

In April prospecting of the Black Duck-McGregor area, covered by Exploration Licence 3/61, was commenced. The higher ground of the Beltz and McGregor workings were explored during the winter, when 16 scout bores of 6 inch diameter were bored for a total footage of 215 feet and 25 Conrad holes of 16 inch diameter for a footage of 580 feet. The Black Duck-McGregor river flats have, to the close of the year, been explored by 30 holes of 16 inch diameter for a total footage of 1117 feet. The exploration programme is continuing. The average number of men employed was 46.

**RENISON ASSOCIATED TIN MINES N.L.,
RENISON BELL**

Production at 171 tons valued at £205,473 from 21,604 tons of ore was 87 tons more than last year, when 84 tons was won from 133 tons of concentrates from 11,788 tons of ore treated. Some production continued to come from development but a large proportion was from stoping.

Development in the Battery Workings consisted of 950 feet of rising and sinking and 1721 feet of driving. A new underlay haulage shaft was equipped with a single drum electric winch and brought into operation. In the Black Face section 70 feet of development was carried out. Diamond drilling comprised 10 surface holes of 534 feet total depth. The re-organization of the mill continued and more vanners were installed. The average number of men employed was 58 of whom 22 were underground.

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

This Company treated 411,500 cubic yards of gravel from the Clifton workings for the production of 64 tons of tin concentrate, containing

48 tons of tin valued at £57,039. In addition, 10 oz. of fine gold valued at £163 was recovered.

From adjacent workings, 1232 tons of kaolin was produced and sold to paper manufacturers for a return of £6383. The average employment was 43 men, of whom two men were employed in the clay pits.

BRISEIS TIN N.L., DERBY

During the year the company commenced operations at the Valley Mine. At the close of the year it appeared that operations were likely to prove uneconomic.

Production from 38,900 cubic yards of gravel was seven tons of concentrate, containing five tons of tin valued at £5808. The average number of men employed was 13.

STAR HILL SYNDICATE, GLADSTONE

This syndicate sluiced 80,000 cubic yards of gravel for 22 tons of concentrate, containing 17 tons of tin valued at £19,332. The average number of men employed was five.

MUSSELROE MINE, PIONEER

From his two working places, Mr. V. Wood mined 52,500 cubic yards of gravel which yielded 23 tons of concentrate, containing 17 tons of tin valued at £19,999. Average employment was four men.

RAZORBACK MINE, DUNDAS

In the middle of the year Mr. W. Hodge was joined by Mr. C. C. Bye and production amounted to two tons of tin valued at £2939.

Towards the end of the year the Tin Development Partnership of Aberfoyle Tin N.L. took an option on the Razorback and Grand Prize Mines. The first stage of the prospecting, consisting of the mining of bulk samples from the existing adits in the Razorback area, and their treatment in the existing mill, started late in December with a total of five men engaged.

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 £
BRANXHOLM				
Bolch, R.	Branxholm	.....	0.036	42
Holmes, J.	Ruby Flat	.....	0.037	46
Rogers, L. C.	Branxholm	.....	0.013	15
Seymour, R. R.	Branxholm	.....	0.081	101
Stevens, W. G.	Ruby Flat	2	0.074	93
Symons, R.	Branxholm	.....	0.093	115
DERBY				
Barnett, L. M.	Ringarooma	.....	0.078	95
Burr, C. W.	Ringarooma	.....	0.040	49
Cotton, G. A.	Derby	.....	0.016	17
Cunningham, G.	Derby	.....	0.002	2
Davey, G. B.	Derby	.....	0.038	44
Gibbons, C.	Derby	1	0.258	296
Hyde, R. G.	Derby	1	0.777	892
Kerrison, R.	Derby	1	0.604	689
Machen, A. G.	Main Creek	.....	0.135	168
Merritt, L.	Ringarooma River	.....	0.072	76
Merritt, T.	Ringarooma River	1	0.791	938
Mundy, L.	Derby	.....	0.115	138
McWatters, W. J.	Derby	.....	0.064	80
Rainbow, R. L.	Winnaleah (Banca Mine)	1	2.299	2,771
Richardson, P. A.	Ringarooma River	.....	0.634	705
Singline, K. H.	Ringarooma	.....	0.034	42
Smith, A. R.	Ringarooma	.....	0.181	224
Smith, F. G.	Ringarooma	1	0.754	533
GLADSTONE				
Bartels, J.	Gladstone	1	0.357	440
Elizabeth Syndicate	Gladstone	.....	0.402	.....
Fletcher, S.	Edina Mine	1	0.385	459
King, E. K.	Amber Creek	.....	0.687	841
Kirton, K. S.	Gladstone	.....	0.035	44
Lawry, L. A.	Gladstone	.....	0.037	46
Lawry R. & Richardson, D.	Gladstone	1	0.299	364
Moore, B. S.	Gladstone	.....	0.073	91
Moore, James	Gladstone	.....	0.059	73
Ponting, J.	Gladstone	.....	0.095	119
Richardson, A.	Gladstone	.....	0.030	35
Richardson, D.	Gladstone	.....	0.031	39
Richardson, K.	Gladstone	.....	0.052	62
Richardson, E. M.	Gladstone	.....	0.042	52
Standage, H.	Gladstone	3	1.934	2,414

SMALLER PRODUCERS—Continued.

Name	Locality and Description	Men	Tons	Value £
MISCELLANEOUS				
Aitken, R.	Flinders Island		0.097	122
Banks, K.	.....		0.061	76
Dicker, D.	.....		0.032	40
Fitzallen, T.	Royal George		0.057	71
Freeman, J.	.....		0.155	193
Freeman, G. A.	Avoca		0.017	20
Grubb, G.	.....		0.009	11
Hayes, E. J.	Upper Natone		0.116	145
King, C. D.	Melaleuca Inlet		1.571	1,765
Lambert, Mrs. D.	.....		0.024	29
Marshall, W. F.	.....		0.073	84
Sajben, J. & Hayes D.	Storeys Creek	1	0.389	478
Woolley, Alan	.....		0.143	178
MOORINA-WELDBOROUGH				
Boon, W. L.	Frome River	1	0.417	513
Lambert, D.	Weldborough		0.116	122
Lambert, Jim	Weldborough	1	0.641	721
Lambert, M.	Weldborough		0.198	247
Lambert, K. J.	Weldborough		0.117	124
Mullins, F. J.	Moorina	1	0.583	693
Mullins, H. J.	Moorina		0.102	108
Richards, A.	Weldborough		0.032	40
Weldborough Tin Mines	W.X.X. Mine, Moorina	3	2.602	3,251
MT. CAMERON-PIONEER				
Kerrison, E.	Pioneer		0.112	125
Kerrison, J. & M. J.	Pioneer	2	4.262	4,999
Torby, L. L.	Herrick		0.031	38
ST. HELENS				
Berwick, J. C.	St. Helens		0.009	11
Beven, M. G.	St. Helens	1	0.858	1,038
Counsel, A. B.	St. Helens	1	0.375	441
Goshen Tin Mines	Groom River	5	7.541	8,953
Kerrison, W.	Pyengana		0.263	329
Kirwan, M.	St. Helens		0.200	225
Lawry, E. V.	St. Helens		0.021	26
Moses, H.	Constable Creek	1	0.348	434
Pursell, R. G.	Blue Tier, Pyengana		0.130	162
Reynolds, J. P.	St. Helens	1	0.347	399
Wingfield, J. K.	St. Helens		0.075	82
WARATAH				
Brooke, H. T.	Shovel Lode	2	1.447	1,738
Housego, C.	Kayser Lode	1	0.497	590
Housego, J.	Waratah Creek	1	0.359	433
Kelly, E.	Mt. Bischoff	2	1.131	1,344
Kelly, J.	Mt. Bischoff		0.017	21
Kelly, G. & Glozier, M.	Thompson's Lode	2	1.494	1,755
Kenworthy, D.	Pig Flat		0.204	254
Machin, G.	Don Hill		0.738	920
Neighbour, C. & Glozier	North Valley		0.086	107
Prouse, H.	Black Tank	1	0.634	693
Prouse, J.	40 Mill	1	0.377	442
Stokes, N. G. & Others	Mt. Bischoff		0.131	163
Wills, L. W. & G. H.	Mt. Bischoff		0.195	244
WEST COAST				
Bye, C. C.	Dundas (Grand Prize)	1	0.614	668
Coleman, E.	Near Remine		0.011	13
Towndrow, P.	Exe River	1	0.280	338

TUNGSTEN (SCHEELITE)

Quantity produced—	Tons (Concentrates)	Value £
1917-57	14,579	16,105,911
1958	731	438,365
1959	Nil	Nil
1960	420	265,382
1961	1,022	505,758
Total	16,752	£17,315,416

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

Inspector Egan reports that this Company steadily increased production and last year's output was more than doubled. The number of persons employed increased from 71 to 131. Production was 1022 tons of concentrates containing 712 tons of WO₃ valued at £505,758 from the treatment of 202,673 tons of ore. The use of the blasting agent A.N.-F.O. was successfully introduced in the open cut.

TUNGSTEN (WOLFRAM)

Quantity produced—	Tons (Concentrates)	Value £
1899-1957	9,951	6,612,249
1958	495	188,639
1959	891	426,179
1960	1,106	731,653
1961	812	416,184
Total	13,255	£8,374,904

ABERFOYLE TIN N.L., ROSSARDEN

Wolfram concentrates produced contained 132 tons of WO₃ valued at £91,822. This Company is reviewed under Tin.

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

Tonnage milled increased by 3893 tons to 48,622 tons. Production of concentrate at 626 tons containing 455 tons of WO₃ valued at £324,362 showed a significant decline owing to a fall in the unit price. The average number of persons employed was 121 (51 surface and 70 underground). Details of tin production at this mine and at Dorset are given under Tin.

Tailings are now stored in a dam, on the opposite side of the creek to the mill, pending completion of equipment to take this material underground as stope fill.

Underground development comprised:—

Driving	2,906 feet
Crosscutting	835 feet
Rising	1,232 feet
Total	4,973 feet

In addition 16 diamond drill holes were driven for a total footage of 5437.

ZINC

Quantity produced—	Tons	Value £
1919-57	524,732	26,145,844
1958	29,023	2,650,370
1959	27,928	2,980,598
1960	27,191	3,054,714
1961	31,794	3,237,863
Total	640,623	£38,069,389

**ELECTROLYTIC ZINC COMPANY OF
AUSTRALASIA LIMITED****RETURN FOR 1961****EXTRACTION FROM CONCENTRATES: RISDON***From other than Tasmanian Ores—*

Zinc	97,925	tons
Cadmium	188	tons
Cobalt Oxide	24	tons
Superphosphate	89,932	tons

From Tasmanian Ore—

Zinc	31,843	tons
Cadmium	51	tons
Cobalt Oxide	0.5	tons

Manufactured product—

Ammonium Sulphate	46,255	tons
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Men employed—

The average number of men employed: 2860.

WEST COAST DIVISION*Ore Mined—*

	Tons
From Hercules Mine	17,530
From Rosebery Mine	216,534
Total	234,064

Concentrates Produced—

	Tons
Zinc Concentrates	68,177
Lead Concentrates	11,450
Copper Concentrates	8,057
Total	87,684

Recoverable Quantity in Ore Mined—

Zinc	31,794	tons
Lead	9,697	tons
Copper	770	tons
Cadmium	62	tons
Silver	1,165,529	oz.
Gold	17,209	oz. (fine)
Cobalt Oxide	0.5	tons
Manganese Dioxide	182	tons
Zinc Sulphate	187	tons
Sulphur as Sulphuric Acid	33,564	mono-tons

Total Value of Production—£5,318,599

Average Number of Men Employed—

Hercules Mine	29
Rosebery Mine	697
Total	726

ROSEBERY AND HERCULES MINES

Development at Rosebery consisted of 2531 feet of driving and crosscutting and 821 feet of rising, not including sub-levels and ore passes between levels and sub-levels. Diamond drilling underground consisted of 3835 feet of exploration holes and 8585 feet of development holes which included 3004 feet of pilot and blast holes.

Following complaints of possible pollution of the Pieman River the tailings settling area was brought into use again and all tailings now either go underground as stope filling, or are pumped to this area, and retained. Work proceeded on the construction of the main pumping station at No. 14 Level and the new Stitt River pumping scheme for mine and mill supply. In the concentration plant the 6 feet ball mill was replaced by an 8 feet one and 6 new copper flotation cells and 18 new lead flotation cells replaced old units. At Primrose, ten new houses were erected for Company employees.

Development at Hercules consisted of 141 feet of rising and 197 feet of diamond drilling. A further 2590 feet of prospecting diamond drilling was completed. The jeep road to the mine office and upper levels, which was constructed to aid the re-opening of the mine, is being maintained, and provides a very useful alternative route to the mine.

Re-construction after the fire was completed and ore production resumed in April.

RISDON WORKS

In the Electrolytic Section construction of the fifth unit proceeded towards the full complement of 144 cells, of which the first 36 were put into service last year. The bulk handling depot and bagging section for superphosphate despatch was placed in operation early in the year. An oil-fired and an electric melting furnace were completed in the zinc casting section. An electrostatic precipitator was installed for cleaning waste gases and is in operation.

Tasmanian and imported concentrates were roasted and the calcine, 246,993 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 £15,819,619.

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 187 tons and the value £7154.

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
1961	115,860	112,372
Total	478,924	£400,775

DOLOMITE

Quantity produced—	Tons	Value £
Prior to 1957	10,654	32,023
1958	2,585	7,437
1959	2,907	8,119
1960	2,678	6,947
1961	1,108	3,155
Total	19,932	£57,701

Company	Clay, cu. yd.	Value £	No. of Men	Product
Agripipe Pottery Pty. Ltd., Relbia	552	154	5	Pipes
Burnie Brick Co., Cooe	8,250	2,930	13	Bricks
John Campbell Pty. Ltd., Launceston	831	322	15	Bricks
Clays Pty Ltd., and McHugh Bros. Pty. Ltd., Launceston	2,520	2,520	22	Pipes
Crisp & Gunn Co-op Ltd., West Hobart	18,765	23,456	46	Bricks
Goliath P. C. Co. Ltd., Railton	6,453	10,701	3	Cement
Granton Brick Ltd., Granton	14,800	18,500	28	Bricks
Hobart Brick Co., New Town	19,495	19,495	39	Bricks
Huttons Bricks Pty. Ltd., Prospect	10,360	4,105	18	Bricks
Luck Brick & Pipe Pty. Ltd., Dulverton	6,386	6,386	19	Bricks
Machens Bricks, Kings Meadows	16,928	16,928	27	Bricks
McHugh Bros. Bricks Pty. Ltd., Launceston	6,470	6,470	9	Bricks
Wunderlich Pty Ltd., Loira & Launceston	4,050	405	24	Tiles

CIRCULAR HEAD DOLOMITE AND TRADING CO. PTY. LTD., SMITHTON

This Company, the sole producer, employed an average of 2 men.

KAOLIN

Quantity produced—	Tons	Value £
1940 to 1957	103,742	401,580
1958	3,302	20,469
1959	1,195	5,733
1960	964	5,062
1961	1,232	6,383
Total	110,480	£438,227

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

This Company, reviewed under Tin, produced 1232 tons of kaolin, valued at £6,383 from deposits on its leases. Two men were employed.

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	£
1919-57	3,009,612	1,584,553	482,428	540,362	3,930,762	2,053,092	437,697	481,222	7,860,199	4,659,229
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
1961 ..	132,580	121,288	26,632	45,501	24,816	46,663	19,314	23,308	203,342	236,760
Totals	3,645,013	2,120,485	576,529	712,872	4,027,753	2,217,763	494,702	573,770	8,743,997	5,624,890

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

This Company produced 13,129 tons of Calcium Carbide and employed an average of 160 persons at the works. Production was 1898 tons higher than last year when an average of 158 persons were employed. In addition 170 tons of Acetylene Black was produced, 8 of the men being employed on this.

From the Ida Bay quarry 26,632 tons of limestone valued at £45,501 were shipped to the works at Electrona, the average number of employees being 24.

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

In the production of 106,417 tons of cement, 132,580 tons of limestone valued at £121,288 were used, an average of 20 men being employed in the quarry. Total employment (including asbestos-cement manufacture) was 256.

The most important event of the year was the bringing into commission of the new 1500 horsepower cement mill.

Other points of interest were:—

1. The completion of the craneway extension.
2. The installation of a second overhead crane.
3. The successful testing and adoption of A.N.-F.O. blasting agent in the quarry.

**WRIGHT STEPHENSON PTY. LTD.,
PULBEENA**

Operations have now been extended to the western side of the railway line and a new cut opened up. A loading station and conveyor belt were installed and a front-end loader acquired. The pump shed was shifted to the western side of the bins. Production amounted to 4526 tons of lime sands valued at £5658 for use in agriculture. Two men were employed continuously.

**MELROSE AGRICULTURAL LIME
QUARRIES, EUGENANA**

The company produced 2744 tons of ground limestone valued at £5488 for use in agriculture, an average of 6 men being employed.

RAILTON LIMEWORKS, RAILTON

A development at these works was the installation of a new steel storage bin. Production of ground and burnt limestone amounted to 10,684 tons valued at £6895, an average of 5 men being employed.

**MINERAL SUPPLIES PTY. LTD., ULVER-
STONE**

Sales by this company totalled 17 tons valued at £87.

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

This Company, reviewed under Copper, quarried 6360 tons of limestone valued at £9950. This was either used in the smelter as a flux, or burnt to lime for use in the reduction works.

A second face was opened in the quarry and production increased by 946 tons.

A. R. BEAMS, FLOWERY GULLY

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

	£
316 tons Agricultural Limestone, valued at	831
3082 tons Limestone for Chemical and Metallurgical purposes, valued at	3,698
270 tons Burnt Lime for various purposes, valued at	2,835
<u>3668 tons Total Value</u>	<u>£7,364</u>

Five men were employed.

**R. K. SULZBERGER, LAUNCESTON AND
FLOWERY GULLY**

From his quarry at Flowery Gully and crushing plant at Launceston, Mr. Sulzberger produced:—

	£
757 tons Agricultural Limestone, valued at	1,514
11,277 tons Limestone for Chemi- cal and Metallurgical purposes, valued at	23,554
<u>12,034 tons Total Value</u>	<u>£24,068</u>

Eight men were employed.

OCHRE

Quantity produced—	Tons	Value £
1918 to 1957	1,943	4,605
1958	66	645
1959	59	436
1960	31	219
1961	75	509
Total	2,174	£6,414

A. PEARSON, SPALFORD

Production of ochre from this pit was 75 tons, valued at £509.

PEBBLES

A. PEARSON, ULVERSTONE

The collection of pebbles for grinding was continued on the beaches around Ulverstone. The output was 453 tons, valued at £3199.

SILICA

Quantity produced—	Tons	Value £
1936 to 1957	142,822	85,815
1958	6,639	6,068
1959	6,519	7,657
1960	5,231	6,885
1961	1,415	2,042
Total	162,637	108,467

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

This company, reviewed under Copper, quarried 1394 tons of silica, valued at £1772 for use in the smelter.

3.—CONSTRUCTION MATERIALS

Quantities produced—

	Cubic Yards	Value £
Building stone:		
Freestone	139	794
Granite	38	40
Other	50	6
	227	£840
Crushed and Broken Stone:		
Basalt	84,242	47,945
Dolerite	378,387	597,813
Limestone	30,933	37,034
Sandstone	480	160
Other	77,672	62,400
	571,714	£745,352
Gravel	924,660	417,226
Sand	24,627	23,987
Other Road Materials	18,958	16,731

The largest producers were Government and Local Government authorities, accounting for 171,446 cubic yards of crushed and broken stone valued at £340,178, and 774,590 cubic yards of gravel, valued at £357,958.

BASALT

Quarry	Men	Cu.yds.	Value £
A. F. H., Surrey Hills	3	4,587	4,689
Bonney's, Mooreville	2	7,800	570
Weily's, Bridgewater	13	6,500	8,125
Utah, Burnie	15	52,904	17,979
Wynyard Council	5	3,279	5,117

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.yds.	Value £
Bain's, Dynnyrne	7	11,868	11,680
Gordon's, Glenorchy	6	3,000	2,700
Grubb's, Moonah	9	25,103	29,836
Evandale Council		450	900
Hobart, New Town	27	109,148	130,264
Launceston, Ravenswood	17	37,928	46,734
Nelson's, Dynnyrne	6	7,881	11,840
Rouse's, St. Leonards	7	16,102	21,068
McHugh's, Waverley	6	3,049	4,192

LIMESTONE

G. J. Weilly and Sons Pty. Ltd., quarried 23,873 cubic yards of limestone, of value £29,841, at Glenorchy for construction purposes. Twelve men were engaged. From the Melrose Agricultural Lime Quarries, Eugenana, 2935 cubic yards, valued at £3188, were produced in addition to that for agriculture.

OTHER CRUSHED AND BROKEN STONE

Quarry	Men	Cu.yds.	Value £
Devon, Devonport	7	9,528	9,905
Devon, Wivenhoe	5	3,716	5,725
Devonport Council	1	6,686	838
E.Z., Rosebery	2	3,454	6,908
Howard's, Zeehan	1	707	729
Mt. Lyell, West Lyell	4	30,597	25,739
Queenstown Council	2	600	550
Sundry, North West	5	9,000	.....
Utah, Wivenhoe	1	5,662	1,415

The Mount Lyell Mining and Railway Company Limited completed the construction of a modern crushing and screening plant at West Lyell and now maintains stockpiles of various sizes of stone for supply to the Public Works Department and the Queenstown Council, and for use on the mine roads. The stone crushed has been selected hard schist from West Lyell which would otherwise have been dumped as waste.

GRAVEL AND SAND

Clean sand and gravel are obtained from many small pits, principally in the South Arm, Flowerdale and Beaconsfield districts. From the last named 19,367 cubic yards were obtained on royalty payments. Prepared Concrete Limited of Launceston obtained 28,575 cubic yards valued at £28,988.

4.—FUEL MATERIALS

COAL

Quantity produced—	Tons.	Value £
Prior to 1958	7,464,778	7,895,216
1958	276,268	550,859
1959	299,368	621,494
1960	297,670	673,543
1961	255,828	611,140
Total	8,593,912	£10,350,252

Inspector Mason reports a fall in production of 13 per cent or 41,842 tons. The number of employees decreased correspondingly from 297 to 258, of whom 170 were underground. The production per man-year increased from 1452 tons to 1505 tons for underground employees but decreased slightly to 992 overall.

CORNWALL COLLIERY, ST. MARYS

This colliery produced 91,046 tons valued at £221,478 at the mine and employed an average of 123 persons, a production well below the record year of 1960.

DUNCAN COLLIERY, FINGAL

The Cornwall Coal Company produced 81,785 tons from this mine valued at £198,175 and employed an average of 58 persons. This was 20,789 tons more than last year as the direct result of the mechanization plan adopted here.

Washed coal sold from this and the Cornwall Colliery amounted to 156,177 tons valued at £381,614.

FINGAL COLLIERY, FINGAL

This mine produced 22,519 tons valued at £51,074 and an average of 20 men were employed.

BARBER'S COLLIERY, FINGAL

This colliery produced 6968 tons valued at £13,841 and employed an average of 6 persons. It is proposed to drive two new adits and make an entirely new mine in this area with some form of mechanization.

SEYMOUR COLLIERY, SEYMOUR

Messrs. Yates and Haas produced 3969 tons valued at £8921 and employed 3 persons. This was less production than was obtained last year.

NEW STANHOPE COLLIERY, AVOCA

The Stanhope Coal Company produced 9915 tons valued at £24,787 and employed an average of 12 persons. These figures are lower than last year, but should be sound economically as all coal won is by mechanical means.

MOUNT CHRISTIE COLLIERY, AVOCA

Mr. R. C. Fenton produced 1870 tons valued at £3751 and employed 2 men. This was 140 tons more than last year.

MERRYWOOD COLLIERY, AVOCA

Production from this colliery was 32,397 tons valued at £70,739 and an average of 19 persons were employed. This was a decrease of 9400 tons and 5 persons. All coal underground is won with chain conveyors by the bord and pillar method and transported to the surface by a belt conveyor which was installed towards the end of the year. This belt will be extended as the main heading is driven.

LANGLOH COLLIERY, HAMILTON

The Hamilton Coal Company produced 3217 tons valued at £11,590 and employed an average of 10 persons. This was 2158 tons less than last year with 3 less persons. A drive has been continued for some months now to make connection with the main aircourse for the second means of egress. This will be completed soon. The intrusion of a thick band of stone in the middle of the seam makes the working very difficult and the sides fret away considerably.

SANDFLY COLLIERY, KAOOTA

Mr. O. L. Roberts produced 2142 tons valued at £6784 and employed 4 persons. Difficulty is experienced in selling the slack coal from this mine and it is left below ground.

5.—FOREIGN ORES

The total value of the products of three large works treating foreign ores imported into Tasmania was approximately £19,192,100.

ALUMINIUM

The Aluminium Production Corporation Ltd. acquired from the Australian Aluminium Production Commission the Bell Bay Works for the extraction of alumina and aluminium from imported bauxite. Local products such as coal and limestone were consumed in the process. Construction of furnaces and ancillary works were commenced to increase production to 48,000 tons per year.

FERRO ALLOYS

The Tasmanian Electro Metallurgical Company Pty. Ltd. continued construction of a plant at Bell Bay and production of ferro alloys is scheduled to begin early in 1962.

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 11,603 tons of titanium dioxide from 24,572 tons of Western Australian ilmenite concentrates, an average of 393 people being employed. The output was 121 tons greater than in 1960.

Installation of the No. 2 Process plant continued and a significant rise in output is expected towards the end of 1962. A pipeline was extended 600 yards out to sea to carry the effluent waters into suspected offshore currents. Up to now inshore currents have carried the effluent some distances along the coast which has been stained by the contained copperas.

REVENUE

Return showing the Revenue Collected during the Year ending 31st December, 1961.

Head of Revenue	Amount £
Public Works and Services—Mines Department	11,000
Rent and Fees of Auriferous and Mineral Lands	19,517
Survey Fees	1,659
Fees under the Explosives and Inflammable Liquids Act	14,421
Rent and Sale of Government Property	1,001
Total	£47,598

Comparative Statement of Revenue from Mines, being Rents, Fees, Storage of Explosives, &c., Paid to the Treasury during the Years 1955 to 1961.

Year	Amount £
1955	22,858
1956	24,260
1957	23,827
1958	22,187
1959	32,288
1960	41,726
1961	47,598

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, 1961.

Leases and Licences	Number	Number of Sluiceways	Area (Acres)
Bauxite	5	....	454
Clay	16	....	438
Coal	27	....	9,415
Copper	2	....	113
Copper-Nickel	3	....	120
Dolomite	4	....	309
Easement Licences	53	....	652
Feldspar	2	....	15
Granite	4	....	27
Gold	25	....	604
Iron Ore	1	....	9
Limestone	25	....	1,992
Minerals	28	....	10,909
Mica	1	....	20
Osmiridium	5	....	90
Ochre	2	....	28
Scheelite	13	....	897
Silica	2	....	14
Silver-Lead	9	....	1,230
Stone	24	....	3,352
Sand and Gravel	8	....	749
Tin	165	....	10,538
Tin-Wolfram	4	....	69
Uranium	1	....	50
Wolfram	7	....	1,377
Water Licences	121	757	1,043
Total	557	757	44,514

Return showing Number and Area of New Leases and Licences Issued during the year ended 31st December, 1961.

Leases and Licences	Number	Area (Acres)	Sluiceways of Water
Bauxite	3	1,843	.....
Clay and sand	1	23	.....
Coal	3	1,843	.....
Copper	1	80	.....
Gold	1	5	.....
Lead	1	10	.....
Limestone	4	224	.....
Minerals	2	80	.....
Osmiridium and chrome	2	50	.....
Scheelite	5	349	.....
Stone	7	241	.....
Tin	39	2,980	.....
Tin-Wolfram	8	977	.....
Wolfram	1	20	.....
Water licences	29	56	54
Total	107	8,781	54

Return showing Number and Area of Leases and Licences Applied for during the Year ended 31st December, 1961.

Leases and Licences	Number	Area (Acres)	Sluiceways
Coal	1	60	.....
Gold	1	80	.....
Gold-Copper	3	180	.....
Tin	45	3,578	.....
Tin-Wolfram	20	3,368	.....
Minerals	2	80	.....
Water Licences	17	16	29
Total	89	7,362	29

Return Showing Particulars of Exploration Licences and Special Prospector's Licences in Force at 31st December, 1961.

Licence No.	Holder	Area	Situation	Mineral
EL2/59	Electrolytic Zinc Co. of Australasia Ltd.	4 square miles	Scamander	Minerals except coal and oil
EL3/59	Mt. Lyell Mining and Railway Co. Ltd.	2,878 square miles	West Coast	Minerals except coal and oil
EL4/59	Rio Tinto Southern Pty. Ltd.	316 square miles	West Coast	Minerals except coal and oil
EL7/59	Electrolytic Zinc Co. of Australasia Ltd.	35 square miles	Blue Tier	Minerals except coal and oil
EL1/60	Haematite Explorations Pty. Ltd.	28,975 square miles	Bass Strait	Petroleum oil and gas
EL2/60	Storeys Creek Tin Mining Co. N.L.	144 square miles	Moorina	Kaolin
EL3/61	H. K. Turner	26 square miles	Gladstone	Minerals except coal and oil
EL4/61	E. R. Hudson	147 square miles	Savage River	Minerals
EL5/61	E. R. Hudson	450 square miles	East Coast	Coal and limestone
EL6/61	H. K. Turner	20 square miles	Royal George	Minerals except coal and oil
S.P.L. 366	Rio Tinto Southern Pty. Ltd.	220 acres	Tullah	Minerals
S.P.L. 367	D. W. Chisholm	3,000 acres	Arthur River	Minerals
S.P.L. 369	M. Penney	4 square miles	Algonkian Rivulet	Gold
S.P.L. 370	G. A. John	25 square miles	Balfour	Tin, Copper and Wolfram
S.P.L. 371	C. C. Hurst	2.25 sq. miles	Back Creek	Gold
S.P.L. 373	Blue Peak Gold Mines N.L.	4200 acres	Arthur River	Minerals
S.P.L. 374	A. Miller	1,000 acres	Mt. Saddle-back	Gold and Tin
S.P.L. 375	E. B. McDougall	6 square miles	Tomahawk River	Tin
S.P.L. 376	Aberfoyle Tin N.L.	3 square miles	Whyte River	Tin
Total		33,048 square miles		

Return showing the Total Number and Areas of Authorities to Prospect held during the year ended 31st December, 1961.

Type of Authority	Number	Area
Permits to enter on private land including owners' consents	7	7,387 acres
Exploration licences	10	32,995 sq. miles
Special prospectors' licences	9	34,340 acres
Prospectors' licences	83	4,150 acres
Miners' rights	125	62 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	1958			1959			1960			1961		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
Copper per ton	307	13	5	314	10	0	323	6	8	306	13	4
Lead per ton	87	5	8	100	0	0	100	0	0	99	3	4
Zinc per ton	91	7	11	106	6	5	112	8	6	101	19	1
Tin per ton	997	6	7	1,058	1	5	1,039	13	4	1,177	13	4
Silver per oz.	0	7	11	0	8	3	0	8	6	0	8	7
Osmiridium per oz.	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 ₃)	91/11			128/2			182/5			143/2		
Scheelite per unit (WO ₃)	91/11			128/2			182/2			143/2		

MINERAL PRODUCTION SINCE 1880

Quantity and Value of Mineral Production as at 31st December, 1961

Mineral	Total Quantity	Value £A
METALLIC MINERALS—		
Antimony (tons)	3	1,017
Bismuth (tons)	84	29,644
Cadmium (tons)	1,234	1,321,232
Cobalt Oxide (tons)	11	9,110
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)	391,509	57,182,646
Crocoite (specimens only)	..	533
Gold (fine oz.)	2,539,832	14,338,962
Ilmenite (tons)	550	1,256
Iron Oxide (including Hematite, Limonite and Magnetite) (tons)	92,856	94,094
Lead (from 1919) (tons)	317,884	18,058,865
Manganese (tons)	1	3
Manganese Dioxide (from 1957) (tons)	758	7,250
Monazite (tons)	33	607
Nickel (tons)	233	40,518
Osmiridium (oz.)	31,088	708,531
Pyrites (tons)	1,400,540	2,937,921
Rutile (tons)	1	18
Scheelite (tons)	16,752	17,315,416
Silver Lead Ore to 1918 (now under Silver and Lead) (tons)	1,083,898	6,429,219
Silver from 1919 (fine oz.)	40,015,852	9,520,639
Sulphur as Sulphuric Acid (from 1957) (mono tons)	130,270	594,452
Tin (tons)	145,784	33,294,331
Wolfram (tons)	13,255	8,374,904
Zinc (tons)	640,623	38,069,389
Zinc Sulphate (from 1957) (tons)	842	31,494
NON-METALLIC MINERALS—		
Asbestos (tons)	3,980	17,142
Barytes (tons)	2,205	8,239
Clay—(from 1958)		
Brick (cubic yds.)	406,065	363,628
Tile (cubic yds.)	17,976	2,048
Other (cubic yds.)	54,883	35,099
Dolomite (tons)	19,932	57,701
Graphite (tons)	40	107
Kaolin (tons)	110,480	438,227
Limestone—		
Agricultural and other (tons)	494,702	573,770

MINERAL PRODUCTION—Continued.

Mineral	Total Quantity	Value £A
Chemical and Metallurgical (tons)	4,027,753	2,217,763
Carbide (tons)	576,529	712,872
Cement (tons)	3,645,013	2,120,485
Ochre (tons)	2,174	6,414
Pebbles (from 1957) (tons)	2,955	22,153
Silica (tons)	162,637	108,467
Talc (tons)	333	1,077
FUEL MINERALS—		
Coal (tons)	8,593,912	10,350,252
Shale (tons)	41,572	31,231
CONSTRUCTION MATERIALS		
Building Stones—		
Granite (cubic yds.)	2,004	33,514
Freestone (cubic yds.)	657	4,203
Other (cubic yds.)	55	16
Gravel (from 1958) (cubic yds.)	3,056,772	1,384,760
Sand (from 1958) (cubic yds.)	81,413	69,774
Crushed and Broken Stone—(from 1958)		
Basalt (cubic yds.)	124,083	91,240
Dolerite (cubic yds.)	1,590,834	2,740,093
Limestone (cubic yds.)	106,864	134,665
Sandstone (cubic yds.)	4,766	1,671
Other (cubic yds.)	407,660	285,475
Other Road Materials (cubic yds.)	28,058	19,956
		<u>£244,694,229</u>

**STATISTICS RELATING TO THE MINERAL INDUSTRY FOR THE YEAR
ENDED 31st DECEMBER, 1961.**

Mineral	Total Quantity	Value £A.
<i>Metallic Minerals:</i>		
Cadmium (tons)	62	98,286
Cobalt Oxide (tons)	0.55	621
Copper (tons)	11,624	3,569,214
Gold (fine oz.)	24,528	383,268
Iron Oxide (tons)	2,309	3,827
Lead (tons)	10,278	1,026,909
Manganese Dioxide (tons)	182	2,059
Pyrites (tons)	71,087	213,261
Scheelite (tons)	1,022	505,758
Silver (fine oz.)	1,292,768	554,433
Sulphur as Sulphuric Acid (mono tons)	33,564	158,850
Tin (tons)	879	1,022,094
Wolfram (tons)	812	416,184
Zinc (tons)	31,794	3,237,863
Zinc Sulphate (tons)	187	7,154
Value of Metallic Minerals		<u>£11,199,781</u>
<i>Non-Metallic Minerals:</i>		
Barytes (tons)	Nil	Nil
Clay:		
Brick (cubic yds.)	102,104	98,490
Tile (cubic yds.)	4,050	405
Other (cubic yds.)	9,702	13,477
Dolomite (tons)	1,108	3,155
Kaolin (tons)	1,232	6,383
Limestone:		
Agricultural (tons)	19,044	20,473
Carbide (tons)	26,632	45,501
Cement (tons)	132,580	121,288
Chemical and Metallurgical (tons)	24,816	46,663
Other (tons)	270	2,835
Ochre (tons)	75	509
Pebbles (tons)	453	3,199
Silica (tons)	1,415	2,042
Value of Non-Metallic Minerals		<u>£364,420</u>

<i>Mineral</i>	<i>Total Quantity</i>	<i>Value £A</i>
<i>Fuel Minerals:</i>		
Coal (tons)	255,828	£611,140
<i>Construction Materials:</i>		
Crushed and Broken Stone:		
Basalt (cubic yds.)	84,242	47,945
Dolerite (cubic yds.)	378,387	597,813
Limestone (cubic yds.)	30,933	37,034
Sandstone (cubic yds.)	480	160
Other (cubic yds.)	77,672	62,400
Building Stone:		
Freestone (cubic yds.)	139	794
Granite (cubic yds.)	38	40
Other (cubic yds.)	50	6
Gravels (cubic yds.)	924,660	417,226
Sand (cubic yds.)	24,627	23,987
Other Road Materials (cubic yds.)	18,958	16,731
Value of Construction Materials .....	.....	£1,204,136
Total Value with Australian Metal Prices .....	.....	£13,379,477

<i>Manufactured Products:</i>	<i>Total Quantity</i>
Product—	(tons)
Acetylene Black	170
Ammonium Sulphate	46,255
Carbide	13,129
Cement	106,417
Superphosphate	89,932
<i>Production from other than Tasmanian Ores:</i>	
Product—	Value £A
Aluminium	} £16,933,417
Cadmium	
Cobalt Oxide	
Titanium Dioxide	
Zinc	

Average number of men employed—8493.

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	1961	13,379,477

DEPARTMENTAL ACTIVITIES

AID TO MINING

Expenditure was £5921 as compared with £11,944 for 1960. The principal item of expenditure was in the form of financial assistance and £5244 was expended in this connection. Ten separate applications were approved and advances were made for purchase of plant at North Heemskirk, Zeehan, Waratah, Mt. Stronach, Winnaleah and Gladstone and one operator was assisted to become established in alluvial tin mining operations in the Derby district.

The increased price of tin has resulted in efforts being directed to working ground previously uneconomic either because of its low grade or because capital expenditure on plant and equipment was required. In cases where technical officers of the Department were satisfied that reasonable prospects exist and economic operations were possible financial assistance for purchase of plant was provided. In such cases advances are secured by a registered Mortgage Deed covering the plant at the mine.

The coal washing plant for which assistance was provided during 1959 and 1960 commenced operations early in 1961 and regular repayments by royalty on coal produced have been received.

Mt. Bischoff Mine, Waratah.—The area embracing and surrounding the old Mt. Bischoff Tin Mine has continued to be reserved for tribute purposes under the Aid to Mining Act, 1927. Tin concentrates produced by several small parties amounted to 10 tons and royalty of £179 was received by the Department. Three parties were assisted in the provision of plant, and the Department expended £563 in further repairs to the calciner plant and in maintenance work on the compressor and associated equipment. The level of productive activities does not justify large expenditure on plant but some further expenditure is planned during 1962 on maintenance and improvement to the building, housing calciner plant. This will complete a programme of plant re-conditioning extending over a period of three years, and should enable tributors to remain in productive mining operations.

Mining Plant—The equipment remained with a tribute party at Waratah until the end of the year when it was transferred to enable a company engaged in prospecting on the West Coast to obtain bulk samples from a tin prospect for testing. Arrangements were made to enable the party at Waratah to be provided with air supplies from a large stationary compressor, and rock drills have been hired.

As a result of cessation of operations at a mine where financial assistance had been provided the Department secured possession of a large portable compressor which has been reconditioned and is available for hire to parties to test mineral occurrences. As mentioned in my previous report there has been little demand for hire of the mining equipment by prospectors, who for the most part are directing activities to small alluvial areas where mining plant is not required for prospecting.

STATEMENT OF RECEIPTS AND PAYMENTS OF THE MINING TRUST FUND FOR THE YEAR ENDED
31st DECEMBER, 1961.

<i>Receipts.</i>	£	s.	d.	<i>Payments.</i>	£	s.	d.
Balance 31st December, 1960	7,294	10	1	Assistance	5,244	9	5
Repayments of loans	2,759	15	4	Maintenance tribute plant Mt. Bischoff			
Interest on loans	365	8	3	Mine, Waratah	563	1	9
Tribute royalty	179	12	11	Maintenance mining plant	113	10	4
Hire of mining plant	66	5	0				
Appropriation Act, 1961-62	1,000	0	0	Total	5,921	1	6
				Balance to next Account	5,744	10	1
	£11,665	11	7		£11,665	11	7

DRILLING

DIAMOND DRILLING

Three crews were engaged continuously by the Department in drilling on Departmental projects and for hirers. Details are as follows:—

LONGYEAR JUNIOR STRAITLINE DRILL

This machine was used to test the coal measures near the Fingal mines. Hole No. 2 was completed at 632 feet and No. 3 was advanced to 200 feet in dolerite, the total footage being 656. The extremely bad conditions previously reported in the dolerite capping were repeated and extended in depth to 200 feet.

GOLDFIELDS No. 10 DRILL

Following the discovery of anomalies by geophysical prospecting in the Dundas tinfields, a crew was engaged to operate this drill. The first set up was made in the Grand Prize area and thereafter 3 holes were drilled there and 2 in the Razorback area. The total footage was 1399.

MINDRILL F 20 C DRILL

One hole of 159 feet was drilled on a nickel deposit near Holwell and thence the crew moved to Ruby Flat, near Bransholm. Here 3 holes of total footage 504 feet were put down to test outcropping veins bearing cassiterite.

In testing the footings of Tasman Bridge piles the machine drilled 18 holes of total footage 107 feet. The drilling was done through the unfilled pile casing at considerable depth from a pontoon. This machine thus drilled in all 770 feet.

MINDRILL E1000 DRILL

As in 1958-59 drilling from a barge was undertaken in combination with a churn drill. This was in testing Tasman Bridge pile foundations and 12 churn drill holes were extended a total distance of 125 feet.

CHURN DRILLING

Goldfields G33 Drills

Two of these were used on water boring and foundation testing, but one was temporarily shut down at the end of the year when the crew

was changed over to alluvial testing. Details of the drilling are shown below:—

Number of bores	Total Footage	Object
17	1856	Tasman Bridge—pile foundation testing.
6	187	Lyell Highway, Granton—testing for excavation.
17	1056	Smithton district—boring for water.
22	2171	Sorell district—boring for water.
1	30	Bellerive—foundation testing.
	4300	

In the Smithton district depths varied between 16 and 90 feet and the supply between 100 and 500 gallons per hour, except in one bore in which it was inadequate.

Of the 22 bores in the Sorell district 6 were dry and in 5 others the water was salty. Supplies in the wet holes varied between 60 and 250 gallons per hour.

RUSTON BUCYRUS 22RW DRILL

This new machine was obtained specifically for alluvial testing and towards the end of the year commenced work on Thureau's Lead, St. Helens. Three holes were drilled to test for tin, the total footage being 170.

WARDEN'S COURT

R. C. Sulzberger v. R. M. Clarke and H. S. Barnett—Application for forfeiture of lease 491P/M, Flowery Gully.

The case was heard by the Warden of Mines at Launceston who dismissed the application with costs.

M. J. Dunstan v. T. N. Burrell—Application for forfeiture of water licence 6W/60, Gladstone.

Upon the non-appearance of the applicant at the hearing set down for the 18th July, 1961, at the Warden's Court at Launceston the application was dismissed and all fees forfeited to the Crown.

R. A. Trickett v. F. G. Smith and L. M. Barnett—Application for forfeiture of water licence 8W/59, vicinity of Branxholm.

This application which was submitted to the Warden of Mines, Launceston, for hearing was withdrawn.

V. J. Davis v. G. A. John and E. J. Bailey v. G. A. John—Objection to the grant of a Special Prospector's Licence of 25 square miles at Mt. Balfour.

The Warden of Mines, Devonport, to whom the objections were referred, advised that the objectors claimed no estate or interest under the Mining Act, 1929, to the subject land and that there was consequently no objection to determine as provided by Section 15C (4) of the Mining Act, 1929. The objections were considered by the Director of Mines on an administrative basis and were not regarded as containing sufficient grounds to prevent a recommendation to the Minister that a Special Prospector's Licence should be granted. The licence was issued.

H. J. Clune v. H. K. Fielding—Objection to application for lease 590/M, vicinity of Don.

This application which was heard by the Warden of Mines, Devonport, concerned an application by H. K. Fielding for a stone lease to mine quartz on the objectors land which the objector's son had previously marked out as a lease to mine gravel. The Warden ruled that the marking out was of no effect because gravel cannot be included in a stone lease of private land (Section 70 (1) and 82E). The objection was dismissed with costs against the objector.

H. K. Fielding v. H. J. Clune—Plaint for determination of compensation: Application for lease 590P/M.

Following the decision in the case of H. J. Clune v. H. K. Fielding reported above and with the consent of all parties the Warden fixed the amount of compensation, as required by Section 74, to enable the issue of the lease in respect of application 590P/M.

EXEMPTIONS

The following exemptions were granted:—

- A. D. Smith—Prospecting Claim, Lyons River. Eagle Metal and Industrial Products Pty. Ltd.—Lease 45M/52, Zeehan.
- D. Lathey—16M/53, 17M/53, 18M/53, 19M/53 and 7W/56, Bells Hill.
- G. A. John, B. King and L. C. Gunther—3M/60—Balfour.
- Rio Tinto Australian Exploration Pty. Ltd.—11M/58, Red Hills.

MINE MANAGER'S CERTIFICATES

During the year the Board of Examiners granted, on the results of an examination, the following certificates:—

Metalliferous Mine Certificate—Clive Henry Annear, John Kenneth Allister McLeod.

The following certificate was issued by the Board without examination on presentation of a Mine Manager's Certificate issued by the recognized authority in another State:—

Metalliferous Mine Certificate—Herbert Keith Turner.

STAFF

The following were the staff movements during the year:—

Officer & Position	Remarks
King, R., Clerical Assistant	—Resigned.
Forster, J., Clerical Assistant	—Appointed.
Johnson, T., Clerical Assistant	—Resigned.
Wicks, G., Clerical Assistant	—Appointed.
Tetlow, P., Chemist	—Appointed.
Blacklow, C. C. J., Cadet Chemist	—Resigned.
Austin, K., Cadet Chemist	—Appointed.
Brumby, P. M., Cadet Chemist	—Appointed.
Fyfe, R. W., Cadet Chemist	—Resigned.
Pepper, J., Draughtsman	—Appointed.
Besford, D., Inspector of Mines and Explosives	—Retired.
Mason, J. S., Inspector of Mines and Explosives	—Appointed.
Longman, Mrs. N., Publications Officer	—Resigned.
Smith, Miss E., Publications Officer	—Appointed.
MacLeod, W. N., Senior Geologist	—Resigned.

RETIREMENT

I desire to place on record appreciation of the services of Mr. D. Besford, Inspector of Mines and Explosives, who reached the retiring age at the end of the year.

SCHOLARSHIPS

The Department continued its policy of awarding one scholarship every two years to an approved student to graduate in science at the University of Tasmania with Geology as the major subject. The 1961 scholarship was awarded to Mr. T. J. Kennedy. The first geology scholarship holder Mr. Dennis Gee who has graduated with honours will join the staff of the Department at the beginning of 1962 as a Geologist. Mr. David Groves the second student to be awarded a scholarship has completed his B.Sc. degree and will undertake an honours course during 1962. The establishment of the system of scholarships will ensure a regular intake of Tasmanian trained geologists to the staff of the Department which is the principal avenue of employment in this State for geology graduates.

Difficulty was experienced in filling a position as Chemist at the Department's laboratories at Launceston, and in order to provide for future staff requirements a chemistry scholarship tenable at the University of Tasmania was granted to Mr. H. Skabo.

PUBLICATIONS

The following publications were issued during the year:—

- Geological Map of Tasmania (8 M= 1").
- Geological Map—Du Cane Sheet (No. 52 of Geological Atlas).
- Technical Reports No. 5.

MINES DRAUGHTING SECTION

Number of working plans in use and kept up-to-date	242
Workings plans renewed and additional plans brought into use	4
Manuscripts brought up-to-date for reproduction	7
Manuscripts traced for reproduction	3
Lithographs printed	25
Lithographs entered to date for sale	105
Miscellaneous plans and tracings prepared	25
Mineral diagrams drawn	37
Mineral leases drawn in duplicate	83
Mineral leases drawn and described subject to survey	63

Photostats of diagrams forwarded to Launceston Office	64
Mining Charts brought up-to-date for Launceston	3
Copies of Reduced Charts prepared for Launceston	66

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, 1961.

The Chief Geologist, Terence D. Hughes, reports:—

Most attention was focussed during 1961 on Regional Mapping, both for the preparation of the 8-mile geological map of Tasmania and the continued compilation of the 1-mile series. Most geologists spent some period, particularly during the summer months when a helicopter was available, in regional mapping.

Staff changes in 1961 were slight. Senior Geologist W. N. MacLeod, who had been in charge of the economic section, resigned as also did Temporary Geologist M. Z. Stefanski. Miss E. Smith replaced Mrs. N. Longman as Publications Officer. J. Pepper was appointed Draughtsman.

As at the end of 1961 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.
- 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.
- Miss E. Emith, B.Sc., Publications Officer and Librarian.
- R. D. Gee, Geological Scholarship.
- D. I. Groves, Geological Scholarship.
- T. J. Kennedy, Geological Scholarship.
- A. Jackson, Senior Field Assistant.
- B. Cox, Field Assistant.
- K. T. Kendall, Senior Draughtsman.
- P. B. Nankivell, Draughtsman.
- J. Pepper, Draughtsman.
- E. E. Domeney, Junior Draughtsman.

REGIONAL MAPPING

Senior Geologist I. B. Jennings reports:—

(1) North-West Centre

The centre at Wynyard was re-occupied by Geologist K. L. Burns on 5th May upon his resumption of full time duties after a year's absence as holder of a General Motors scholarship.

After taking up duties at Wynyard K. L. Burns began recording and compiling a great mass of field data on West Coast Areas made available by Rio Tinto Ltd. This work was completed by the latter half of the year and will be of considerable benefit to future regional mapping in those areas.

Upon completion of this, K. L. Burns was occupied in completing the geological field work on the Devonport sheet. By the end of the year field work and compilation of this sheet was advanced as far as possible pending the preparation of a suitable base map by the Lands and Surveys Department.

A start was made in mapping the south-east quarter sheet of the Mackintosh Quadrangle. By the end of the year a detailed study of several Precambrian sequences in the vicinity of Cradle Mountain had been completed and the general planning and reconnaissance for the forthcoming summer field programme was in hand.

(2) Zeehan Centre

The final fieldwork necessary for the completion of the Zeehan 1-mile Map Sheet was carried out during the summer. Field camps were set up on Godkin Ridge, near the Huskisson River, along Dunkley's Tram and in the vicinity of Mount Dundas and by the end of the summer the field mapping was completed. On the 15th April Senior Geologist A. H. Blissett and Geologist A. B. Gulline, who had carried out this mapping, returned to Hobart to complete the geological map. Both of these officers were fully engaged on this until the latter half of the year when A. B. Gulline was diverted to other duties and A. H. Blissett commenced the preparation of a publication to accompany the geological map.

By the end of the year draughting of the map and the preparation of the text of the publication were well advanced.

(3) Port Davey Centre

Senior Geologist M. Z. Stefanski continued mapping in this area during the summer. Following a reassessment of the problems involved here it was decided to re-examine portions of the area in more detail. Consequently several field traverses on the South-West Cape Range, and in the vicinity of Cox's Bight, New Harbour and Louisa Bay were carried out. In addition to this some detailed mapping in the vicinity of Hannant Inlet and Melaleuca Inlet was also carried out. The difficulties of the terrain were overcome to some extent by the use of helicopters where possible.

This fieldwork was completed by April and from this time until the date of his resignation on 31/8/61, M. Z. Stefanski was engaged in plotting and recording all information which has been gathered so far from this base.

For the time being geological mapping has been suspended from this base pending a further study of the difficult problems associated with the rocks in this area.

(4) Hobart

Several geologists based at Hobart were engaged on regional mapping in various parts of the State. Details of these projects are set out below.

(a) Du Cane 1-mile Map Sheet—

Senior Geologist W. N. MacLeod and Geologists R. Jack and V. M. Threader were engaged for most of the summer on geological mapping in the Du Cane area. As a result of this work the 1-mile sheet was completed and a publication explaining the geology of this area was prepared. The geological mapping was assisted by use of a helicopter and detailed traverses of all the accessible creeks and rivers were made. W. N. MacLeod carried out most of the mapping in the south-west corner of the sheet whilst R. Jack and V. M. Threader co-operated in mapping the northern section. The preparation of the explanatory note was done mainly by W. N. MacLeod assisted by field notes prepared by the other workers.

By the end of the year the geological map was completed and issued and its accompanying publication was in the hands of the printer.

(b) Mackintosh

During the latter part of the year Geologist V. M. Threader commenced mapping in the north-east portion of the Mackintosh Quadrangle. The early field work was carried out from a semi-permanent field camp established in the Vale of Belvoir.

(c) Lake St. Clair

Geologists A. B. Gulline and W. L. Matthews commenced regional mapping of the Lake St. Clair 1-mile sheet toward the end of the year. Up till the end of the year about half of the southern and eastern part of the sheet had been examined. A. B. Gulline carried out traverses of the eastern part of the sheet from Bronte as well as mapping along the Lyell Highway whilst W. L. Matthews spent several weeks mapping a wide area between the Lyell Highway and Lake King William.

The work so far done on this sheet has contributed considerably toward the regional mapping programme and it is anticipated that the geological fieldwork will be completed during the coming year.

(d) Launceston

Geologist M. J. Longman has commenced mapping the Launceston Quadrangle. Although mapping was not commenced until the second half of the year considerable progress has already been made and it is anticipated that the fieldwork will be completed in the coming year. So far, efforts have been directed towards mapping Permian and Triassic sequences in the eastern part of the sheet.

(e) Arthur River Area

Further geological mapping, in co-operation with the Forestry Commission was carried out by Geologists W. L. Matthews and M. J. Longman. From helicopter camps in the vicinity of the Arthur and Frankland Rivers these officers completed the reconnaissance mapping of the remainder of the Trowutta Quadrangle and the Bluff Point Quadrangle. W. L. Matthews completed the western portion of the Trowutta Quadrangle by means of stream traverses of all available watercourses whilst M. J. Longman mapped the major streams and available outcrop.

As a result of this work and mapping carried out in the previous year, together with a study of the photogeology of the area, a reconnaissance geological map has been prepared of the Trowutta and Bluff Point area embodying all the available information.

(f) General

Final checking and compilation of the 8-mile Geological Map of Tasmania was undertaken and the map was completed and issued during the early part of the year. A start was made with the preparation of explanatory notes on the geology of the Middlesex Quadrangle. This work was well advanced by the end of the year.

ECONOMIC GEOLOGY

(W. N. MacLeod, Senior Geologist)

Tin

Most interest was focussed on tin deposits and the Department was responsible for several independent investigations as well as the examination of prospects for outside interests.

At Dundas, a start was made on drilling targets located by the Geophysical Section of the Bureau of Mineral Resources between the Razorback and Grand Prize Tin Mines. Five holes, averaging 280 feet in depth, were drilled but no significant tin zone was intersected. Drilling is continuing.

Near Branxholm a series of greisen zones in granite were investigated by means of three diamond drill holes. Although some tin values were obtained at depth, the results were not encouraging enough to continue drilling. The geological work in connection with this investigation was done by Geologist R. Jack. Towards the end of the year, a new percussion drilling plant was brought into operation in the St. Helens District to test alluvial tin in a Tertiary river deposit known as Thureau's Deep Lead. An extensive drilling programme extending over several miles of country has been planned here.

Interest has been aroused in the old Mt. Balfour Tin and Copper Field by prospecting operations, principally for tin, by a Smithton syndicate. On behalf of this syndicate, an examination of the field was made by W. N. MacLeod and R. Jack.

W. N. MacLeod carried out an investigation at the old Anchor Mine, near St. Helens and prepared a drilling plan to test the tin granite there. R. Jack reported on a tin prospect at Gipps Creek in the Avoca District, on a possible dredging area in the Lower Ringarooma River Area, and on an alleged tin discovery near the old Shepherd and Murphy Mine, Moina.

Iron

Although the Savage River Area has been taken up under licence, the Department is still showing an active interest and several geologists visited the area, to give advice on bore sites, access roads, &c. Drilling continues to add corroboration to predicted patterns and quantities of ore reserves. Geophysical work continued during the summer months.

A report on iron deposits at Penguin Creek was prepared by M. J. Longman.

Gold

In his systematic appraisal of Tasmanian Goldfields V. M. Threader concentrated on the gold belt between Mathinna and Alberton.

Silver-Lead

W. N. MacLeod prepared a short report and drilling plan on the Comet-Maestries Lode, Dundas, in preparation for a drilling campaign there.

Nickel

A short drill hole was put down in serpentine near Beaconsfield to test the nickel and chrome content of a section of that rock. No economic grade of either of these two metals was apparent.

Non-Metallics

A report on a wollastonite deposit at Hampshire was prepared by M. J. Longman, while he and W. L. Matthews investigated a limestone deposit near Redpa. Brick making materials at Bowenwood, Kingston were the subject of a report by M. J. Longman.

Coal

A thin seam of Permian coal of excellent quality was examined by T. D. Hughes in the Takone area.

ENGINEERING GEOLOGY AND WATER SUPPLY

A senior geologist has not yet been appointed.

Dam Sites

Geological features influencing several proposed dam sites were reported on by W. N. MacLeod, including those at Kingston, Allens Rivulet, Baden and Oatlands. T. D. Hughes furnished geological information on the site of a water storage tank being constructed near Huonville.

Bridge Site

A geological report on alternative bridge sites over the South Esk River at Fingal was prepared by R. Jack.

Quarry Site

A quarry site at Flagstaff Gully in the Municipality of Clarence, was reported on by W. N. MacLeod.

Miscellaneous

Core and chip samples from drilling at the Hobart Bridge Site and two locations on the Hobart-New Norfolk Road were examined by R. Jack. Also examined were a gravel deposit at Berriedale by W. L. Matthews and the site of a television tower on Mt. Barrow by T. D. Hughes.

Underground Water

Possibilities in all parts of the State were assessed, principally by W. L. Matthews, who also prepared a report on Underground Water on a Land Settlement Division in the North-East and summarized the results of drilling in North-Western and Southern Tasmania.

PETROLOGY AND MINERALOGY

Petrological investigations included the examination of suites of rocks collected by various members of the geological staff at—

Confidence Saddle and Natone Creek,
Trowutta district,
Wallace and Mersey Rivers,
Lorinna district.

Individual specimens were examined from geologists and other members of the Department, collected at Mt. Read, Bond Plains, Mt. Barrow, Blythe River, Tin Spur, Devon Mine, Wivenhoe, Cradle Mountain, Lindisfarne and other localities.

Mineral concentrates were examined from Shepherd and Murphy Mine and the Vale of Belvoir.

Bore core from Beaconsfield and Savage River was examined in thin section.

Specimens and samples of rocks, minerals and concentrates to the number of about fifty were identified for members of the general public, and various inquiries in connection with mineral collections and general geological information were attended to.

GEOPHYSICAL SURVEYS

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

Savage River

The magnetometer survey of this large magnetite deposit was continued for nearly two miles to the south of the previous surveys and revealed

interesting anomalies including some without surface expression. Towards the end of the year, a commencement was made on a survey of a still larger area, the district between the Savage River and Long Plains deposits.

North-Eastern Tasmania

A commencement was made on a combined seismic and gravity survey to ascertain the position of Deep Leads in the following areas:—

St. Helens,
Boobyalla,
Mussel Roe,
Great Fraser.

MAPPING AND ENGINEERING DRAUGHTING SECTION

K. T. Kendal, Senior Draughtsman, reports:—

Staff Movements during the year were as follows:—

Mr. G. J. Dowl, Junior Mapping and Engineering Draughtsman—resigned.
Mr. J. S. Pepper was appointed as a Draughtsman.

Operations

Preparation and printing of two multi-coloured geological maps were highlights of this year's activities. The Geological Map of Tasmania was published at a scale of eight miles to one inch, and the Du Cane Sheet No. 52 of the Geological Atlas at a scale of one mile to one inch. Successful applications of new fair drawing and printing techniques were features of these productions.

Compilation of the Zeehan Sheet No. 50 at a scale of one inch to one mile was completed toward the end of the year and fair drawings of this sheet were commenced. Printing of the sheet will be effected early next year. Further progress is also reported on the Devonport Sheet No. 29.

Fifty-five monocolour geological maps and diagrams were prepared as line blocks for inclusion in the publication Technical Reports No. 5 (1960) which was printed during the year. Six monocolour geological maps, sections and photographs were prepared for inclusion in a new series publication, Explanatory Report One Mile Geological Map Series K/55-11-52-Du Cane which was prepared for printing during the year.

Cartographic work was undertaken on behalf of the Regional Establishments at Zeehan, Wynyard, and Port Davey.

Also arranged and supervised were the Mines Department Exhibits at the Scientific Industrial and Cultural Exhibition held in Launceston (28th August-2nd September) and the International Exhibition held at Claremont (4th November).

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

PUBLICATIONS

The following reports were prepared for publication in Technical Reports No. 6:—

SECTION 1—ECONOMIC AND GENERAL GEOLOGY
Wallastonite at Limestone Creek, near Hampshire: M. J. Longman.
Limestone at Redpa: M. J. Longman and W. L. Matthews.
Iron Ore at Penguin Creek: M. J. Longman.
Sajben's Prospect: "This is It", Gipps Creek: R. Jack.
Tin Deposits, Branxholm: R. Jack.
The Balfour Tin Field: W. N. MacLeod.

The Comet-Maestries Lode, Dundas—Proposed Drilling Programme: W. N. MacLeod.
 Nickel in Serpentine near Beaconsfield: T. D. Hughes.
 Brickmaking Materials at "Bowenwood", Kingston: M. J. Longman.
 Proposed Drilling Programme at the Anchor Mine, Blue Tier: W. N. MacLeod.
 Possible Dredging Area, Lower Ringarooma River: R. Jack.
 Geology of the Bluff Point and Trowutta Quadrangles: M. J. Longman and W. L. Matthews.

SECTION 2—COAL

Coal at West Takone.

SECTION 3—ENGINEERING

Geology of the Present and Former Bridge Sites at Fingal: R. Jack.
 Proposed Dam Site, Whitewater Creek, Kingston: W. N. MacLeod.
 Proposed Dam Site, Allens Rivulet, Municipality of Kingborough: W. N. MacLeod.
 Water Storage Area for Huon Municipal Water Supply: T. D. Hughes.
 Investigation of an Irrigation Dam Site on the Coal River near Baden: W. N. MacLeod.

Quarry Site at Flagstaff Hill, Municipality of Clarence: W. N. MacLeod.
 A Proposed Reservoir Site on Dulverton Rivulet near Oatlands: W. N. MacLeod.

SECTION 4—UNDERGROUND WATER

Underground Water on Land Settlement Division Property between Tomahawk and Boobyalla Rivers: W. L. Matthews.
 Results of Drilling for Water in North-Western Tasmania: W. L. Matthews.
 Results of Drilling for Water in Southern Tasmania: W. L. Matthews.

SECTION 5—PETROLOGY

Petrological Notes on Specimens from Various Localities: ranges: M. J. Longman.

Petrological Notes on Specimens from Various Localities: G. Everard.

- (a) Trowutta Area.
- (b) Blythe River.
- (c) Mt. Barrow.
- (d) Bond Plains.
- (e) Beaconsfield.
- (f) Flagstaff Hill, Lindisfarne.
- (g) Savage River.

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 section tested 36 samples of clay during the year.

Determinations made during the year were as follows:—

Types	Number
Aluminium	82
Antimony	21
Arsenic	30
Barium	10
Beryllium	4
Bismuth	4
Calcium	76
Carbon	153
Chlorine	1
Chromium	63
Copper	27
Fluorine	1
Gold	76
Iron	573
Lead	21
Magnesium	47
Manganese	186
Mercury	1
Molybdenum	14
Nickel	59
Phosphorus	166
Potassium	42

Types	Number
Qualitative Tests	56
Radio-Activity Tests	2
Silicon	91
Silver	72
Sodium	42
Sulphur	212
Tantalum and Niobium	14
Tin	1,721
Titanium	121
Tungsten	192
Vanadium	15
Zinc	26
Moisture and combined water	80
Coal Analyses	58
Water Analyses	39
Miscellaneous	52
Total	4,450

Research Investigations undertaken during the year were as follows:—

Types	Number
Tin	10
Tungstic Oxide	2
Chromite	2
Coal	3
Iron	3
Cyclone Tests	1
Total	21

RESEARCH INVESTIGATIONS, 1959-61.

*Clay—South Mount Cameron***R.362, R.364, R.365, R.366 and R.368**

Five samples of decomposed granite from D. Brown's leases, South Mount Cameron, were tested for their suitability to produce high quality clays for use in paper manufacture as filler and coating clays. The investigations were undertaken for the Dorset Tin Division of the Storeys Creek Tin Mining Co.

Consumption of filler clay in Tasmania is currently of the order of 10,000 tons per annum, and the sole consumer is the Associated Pulp & Paper Mills at Burnie. A major proportion of this company's requirements are imported from England, Africa and United States of America.

The desired quality of filler clay is as follows:—

Sizing.—All minus 200 mesh size. Not more than two per cent plus 30 microns.

Brightness.—A.S.T.M. Directional reflectance method designation E.97-55. Not less than 77.

Grit.—Less than three per cent, reference to the sulphuric acid digestion method, Treadwell & Hall, pages 421 and 422, 29th Edition.

Various samples of imported filler clay contained from 10 to 40 per cent of minus one micron clay, and the clays produced from the raw material from South Mount Cameron ranged from 25 to 40 per cent of this sizing, which is considered to be satisfactory.

Examinations showed only small quantities of very fine non-clay minerals such as mica and quartz, which would be difficult to separate from the minus 30 micron clay by hydraulic methods. Clays of high quality, to meet the specifications above, were produced as follows. The raw material was dispersed by agitation with 10 lbs. per ton of sodium silicate, classified and screened to remove plus 72 mesh impurities, and the finest quartz was removed from the clay by separation in a 30 mm. diameter cyclone at 40 p.s.i. Treatment is effective with a cyclone feed of 30 per cent solids. Larger cyclones require a more dilute pulp than the above, and with a 3 inch cyclone the desired size separation could be obtained with a feed density of not more than 20 per cent solids. For subsequent drying operations the dispersed clay was flocculated with aluminium sulphate at the rate of 20 to 40 lbs. per ton of refined clay and filtered on a rotary filter, fitted with strings for cake discharge.

Filter cakes ranged from 3 to 10 lbs. per sq. ft. per hour dependent upon the nature of the sample, temperature and density of the pulp. Filter cakes contained up to 47 per cent of moisture. When clay samples were below specification in brightness, due to the presence of organic matter, they could usually be bleached to the requisite brightness with small quantities of sodium hypochlorite, or chlorine gas. This treatment was applied after final degrading by cyclone.

Investigations were also undertaken with a centrifuge and useful applications by this means were (a) thickening of portion of the clay pulp to approximately 55 per cent solids. The quantity thickened depended upon feed rate, and ranged from 28 to 62 per cent of the clays fed to the centrifuge. The economics for this application are dependent upon the quantity thickened and the filtration rate of the dilute centrifuge effluent after flocculation, for comparison with the cost of flocculation and filtration of the total refined clay. (b) For separation of the finest clay to attain the requirements for coating clays, the minus one micron content was raised from a feed of 35 per cent to 70 per cent in the clay in the effluent, with 9 per cent minus one micron size in the thickened product, thus showing a major separation of the finest clay.

Tin—Aberfoyle Tin Mining Co. Mill Jig Tailings
R.362

Examinations were made of the three jig tailings to assess losses.

$\frac{3}{8}$ Inch Jig Tailings contained 0.22 per cent of tin, 7.7 tin units were present as free cassiterite, and 12.5 units were present as composites having an Sp.G. in excess of 2.95. Regrinding of these heavy composites and concentration of same, plus the free cassiterite, resulted in a recovery of 0.14 per cent of tin, and reduced the tailing assay from 0.22 to 0.08 per cent.

$\frac{1}{4}$ Inch Jig Tailings.—Examination showed 4.9 tin units of free cassiterite, and 13.6 units in composites of over 2.95 Sp.G. Regrinding and reconcentration, together with the free cassiterite, reduced the tailing value from 0.2 per cent to 0.08 per cent of tin.

$\frac{1}{8}$ Inch Jig Tailings.—The sample contained 17.6 tin units as heavy composites. Regrinding of these composites and concentration reduced the tailings value from 0.19 per cent to under 0.1 per cent.

Results:—

R.369, Hole No. 4

Product	Wght.	Per Cent			Per Cent Distribution		
		Fe	S	P ₂ O ₅	Fe	S	P ₂ O ₅
Cl/O Magnetics	22.0	64.5	0.3	0.05	30.6	1.2	3.4
Cl/O 2nd Cl. Tails	0.6	15.0	8.7	0.78	0.2	0.9	1.5
Cl/O 1st Cl. Tails	3.3	5.7	8.6	1.06	0.4	5.1	10.7
Cl/O Ro. Tails	16.9	4.4	10.1	1.10	1.6	30.5	56.7
Sp. Magnetics	47.2	65.0	0.6	0.05	66.2	5.1	7.3
Sp. 2nd Cl. Tails	0.4	26.1	11.1	0.36	0.2	0.8	0.3
Sp. 1st Cl. Tails	0.8	12.8	16.5	0.63	0.2	2.3	1.5
Sp. Ro. Tails	8.8	3.1	34.4	0.69	0.6	54.1	18.6
Comp. Ore	100.0	46.4	5.6	0.33	....	....	....
Total Concentrates:							
Rougher	74.3	61.0	1.2	0.11	97.8	15.4	24.7
Cleaner	70.2	64.2	0.6	0.06	97.2	8.0	12.5
Recleaner	69.2	64.8	0.5	0.05	96.8	6.3	10.7
Non-Magnetics from re-cleaner separation	30.8	4.9	17.0	0.95	3.2	93.7	89.3

Magnetite—Savage River

R.367

Two bulk samples from Adits C and D were submitted by the Director of Mines for analyses and if necessary, beneficiation tests. Beneficiation tests were not proceeded with.

Analyses	"C" Adit		"D" Adit	
	%		%	
Iron (HCl. Sol.)	66.8		59.8	
Sulphur	0.27		3.87	
Phosphorus pentoxide	0.01		0.07	
Silica	2.07		3.23	
Alumina	0.88		0.88	
Titania	0.32		0.29	
Manganese	0.13		0.17	

R.369

Diamond drill cores from No. 4 hole from 100 feet to 839 feet 9 inches were submitted to a beneficiation test by wet magnetic separation.

R.370

Diamond drill cores from No. 5 and No. 6 holes were combined for a beneficiation test by wet magnetic separation.

The footage covered in this composite sample was hole No. 5, 36 feet to 871 feet 2 inches, and hole No. 6, 52 feet to 559 feet 3 inches.

Beneficiation was limited to minus 60 mesh wet ground ore by ball milling and wet screening, and magnetic separation was performed in a 4 inch Dings belt separator.

The tests included two stages of cleaning.

The minus 60 mesh ore samples were separated into two sizes by hydraulic classification at a rising velocity of 20 mm. per second, and the classifier overflow and spigot products were subjected individually to magnetic separation.

R.370, Holes 5 and 6

Cl/O Magnetics	13.6	64.3	0.3	0.06	28.7	1.1	2.4
Cl/O 2nd Cl. Tails	1.3	6.6	4.0	0.70	0.3	1.4	2.7
Cl/O 1st Cl. Tails	5.4	2.7	2.4	0.66	0.5	3.6	10.5
Cl/O Ro. Tails	30.5	1.9	3.6	0.63	1.9	30.4	56.6
Sp. Magnetics	31.6	64.4	0.6	0.04	66.9	5.3	3.7
Sp. 2nd Cl. Tails	0.3	13.0	8.1	0.43	0.1	0.7	0.4
Sp. 1st Cl. Tails	0.8	8.8	8.3	0.41	0.2	1.8	1.0
Sp. Ro. Tails	16.5	2.6	12.2	0.47	1.4	55.7	22.7
Comp. Ore	100.0	30.4	3.6	0.34	....	....	....
Total Concentrates:							
Rougher	53.0	55.5	0.9	0.13	96.7	13.9	20.7
Cleaner	46.8	62.4	0.7	0.07	96.0	8.5	9.2
Recleaner	45.2	64.4	0.5	0.05	95.6	6.4	6.1
Non-Magnetics from re-cleaner separation	54.8	2.5	6.2	0.58	4.4	93.6	93.9

Additional determinations were made as follows:—

R.369

	Per Cent			
	Al ₂ O ₃	SiO ₂	Mn	TiO ₂
Total recleaner magnetics	0.64	3.3	0.11	0.62
Total recleaner non-magnetics	3.23	26.7	0.11	0.62
Ore	1.44	10.5	0.11	0.62

R.370

Total recleaner magnetics	0.91	3.6	0.07	0.61
Total recleaner non-magnetics	7.64	37.8	0.11	0.94
Ore	4.60	22.4	0.09	0.79

Sluice Concentrates

R.371

A sample of sluice concentrates from the Hampshire-Valentine Peak area containing ilmenite, monazite and cassiterite was examined for concentration of the cassiterite. Electro-magnetic separation to remove the ilmenite and monazite, and concentration of the cassiterite in the non-magnetics presented no difficulties. The concentrate sizing was all minus 6 mesh, and all plus 200 mesh.

Mica—Gladstone

R.363 & R.372

Extensive deposits of weathered greisenized granite occur at Gladstone, and consist essentially of muscovite mica, quartz, and a minor quantity of feldspar. The material contains some relatively coarse quartz. Examinations show that quartz predominates in the coarser sizes, and start to show marked increases in mica content from 44 mesh sizes and finer. Consequently there is some prospect of sale for material screened to this size. Minus 36 plus 44 mesh size contained 14 per cent of mica, and evenly increased to plus 70 per cent at approximately 100 mesh size. The mica content of screen undersize would vary with the screen size, and it can be anticipated that the mica content would range from 40 to 70 per cent for separations from 30 to 80 mesh. Screen undersize contains some mica bearing slimes, and minus 30 micron fractions on samples tested showed 20 per cent of this fraction.

Investigations were undertaken to produce a high grade quality product by flotation. Flotation with cathionic reagents at low pH values produced mica concentrates of high quality, containing approximately 98 per cent of mica. Desliming is necessary prior to flotation, and three stages of cleaning of the rougher flotation

concentrates were necessary to produce best quality concentrate. Several cathionic reagents were tested and Armac C, Arquads 12/50 and S 50 gave similar results.

The following table shows the reagent consumption for treatment of a deslimed feed to produce a mica concentrate amounting to 23 per cent of the feed.

Reagent Stage	Consumption	Sulphuric Acid lbs./ton	Armac C lbs./ton	Aerofroth ⁷³ lbs./ton
Rougher	0.8	0.65	0.08
1st Cleaner	0.3	0.20	0.04
2nd Cleaner	0.3	0.20	0.04
3rd Cleaner	0.3	0.20	0.04
Total	1.7	1.25	0.20

pH value of pulps ranged from 2.5 to 2.9. Reagent costs per ton of concentrate amounted to 56s., and probably this rate of usage would be reduced in a commercial plant.

Sizing of the Concentrate

Mesh	% Weight
+ 60	1.2
+ 85	5.1
+ 100	3.0
+ 150	10.8
+ 200	8.1
—200+30 microns	71.8

Coal—Stanhope Washery

R.373

A sample of washery reject was obtained from the dump and was examined by sink-float method at various sizes and densities, and 3.6 per cent of the sample was found to be useful coal, with an ash content of 22 per cent. Previous investigations of seam samples showed a reject of 15 to 20 per cent, and assuming that the reject amounts

to 25 to 30 per cent of the mined coal, the useful coal in the reject amounts to about 1 per cent of the coal as mined. If this is representative of the single table washery plant operation is most satisfactory.

Mill Surveys

A survey of the concentration plant of the Storey's Creek Tin Mining Co. N.L. was carried out in September, 1959, and a survey of the concentration plant of the Aberfoyle Tin Mining Co. N.L. was undertaken in April, 1960.

The objects of these investigations were to assess the performance of the concentrating plants, determine the nature of avoidable losses, and recommend amendments to treatment to improve recoveries.

Tin—Aberfoyle Tin N.L. Slime Table Tailings

R.374

A sample of plant slime table tailings was examined by sizing and elutriation, followed by assay of the fractions. The sample assayed 0.84 per cent tin. About 32 per cent of the tin was coarser than 20 microns, and should be recoverable if in the free state.

Tin—Renison Associated Tin Mines N.L.

R.377

A pulp sample of gravity section mill feed (desulphidized flotation tailing) was sized and elutriated, and the sulphur content of each fraction was determined.

Tin—Aberfoyle Tin N.L. Slime Table Tailings

R.379

Six pulp samples of slime table tailings, each representing one week's production, were submitted for investigation into the nature of the tin losses in these tailings.

The tailings received assayed about 1.2-1.3 per cent tin, and about 0.65 per cent WO_3 . Between 20 and 40 per cent of the tin and about 20 per cent of the WO_3 in these tailings is recoverable by gravity concentration in a comparatively high grade concentrate. The pulp can be deslimed by cycloning without loss of recoverable tin and wolfram. It was suggested that consideration be given to desliming and desulphidizing the feed to the slime tables.

Tin—Renison Associated Tin Mines N.L.

R.380

Samples of products of tin ore were washed on a fluidized bed under oxidizing conditions by the chemical engineering section of the C.S.I.R.O., Melbourne, and the products from this treatment and magnetic separation were submitted for concentration of the cassiterite.

Concentration tests gave recoveries of 64-66 per cent of the tin in concentrates of 63-67 per cent tin, or alternatively a recovery of 74 per cent of the tin in a concentrate of 56 per cent tin from the "non-magnetic" sample.

Improved concentration results were obtained by solution of some of the gangue minerals by aqua regia or sulphuric acid before concentration, resulting in recoveries of up to 78 to 87 per cent of the tin in concentrates assaying 68 to 73 per cent tin.

Tin—Aberfoyle Tin N.L. Slime Table Concentrate

R.382

A sample of plant slime table concentrates was infrasized, and the tin and wolfram content of each fraction determined. The sizing showed that little material below the 20-30 micron size range was recovered in the slime table concentrates.

Tin—Aberfoyle Tin N.L. Slime Table Feed

R.391

A pilot plant test was carried out on a sample of slime table feed from the company's plant. Treatment involved desliming by cycloning, desulphidizing by flotation, and tabling of the deslimed and desulphidized tailing.

The test showed:—

- (1) The feed may be deslimed by cycloning with negligible loss of recoverable tin.
- (2) The deslimed feed is readily desulphidized by flotation, with negligible loss of recoverable tin.
- (3) The overall pilot plant test tailing was considerably lower than normal practice, but it is difficult to compare the results of the pilot plant test with plant performance due to lack of data.
- (4) The sulphides contained 8.05 per cent copper and 25.4 ounces of silver per ton. This is possibly a saleable product.

Tin—Aberfoyle Tin N.L. (Tin Development Partnership)

R.390, R.392, R.394 and R.395

Concentration tests were carried out on reject samples of diamond drill core from Ardlethan, N.S.W., to obtain data relating to the recovery of tin by gravity concentration. Depth of most drill holes was 250 feet, and composite samples were made up to represent each 50 feet of drill core.

- Investigation R.390: Hole DP1
 Investigation R.392: Hole DP2.
 Investigation R.394: Hole NC1.
 Investigation R.395: Hole DP3.

The composite samples were roll crushed and ball mill ground to minus 44 mesh. Sulphides were removed by flotation. The minus 44 mesh product was screened at 60, 100 and 200 mesh, and the four sized products tabled separately. Middlings from table concentration were reground and returned to the next stage of concentration.

Vanning concentration tests were also carried out on each 50 feet composite sample.

A heavy liquid separation was carried out on a minus 5 mesh composite sample representing each hole.

Table concentration tests can be summarized as—

Sample No.	Composite Head % Sn	Combined Concentrate % Sn	Combined Tailings % Sn	% Recovery of Sn in Concentrate
R.390A ..	0.36	9.2	0.17	52.6
R.390B ..	0.46	10.1	0.19	59.0
R.390C ..	0.44	12.3	0.23	48.9
R.390D ..	0.34	7.6	0.13	62.7
R.390E ..	0.41	9.6	0.16	62.6
Average	0.40	9.8	0.18	57.2

Sample No.	Composite Head % Sn	Combined Concentrate % Sn	Combined Tailings % Sn	% Recovery of Sn in Concentrate
R.392A	0.21	5.1	0.08	64.0
R.392B	0.34	9.7	0.12	66.8
R.392C	0.27	7.9	0.09	67.5
R.392D	0.41	12.0	0.16	63.4
R.392E	0.48	14.9	0.18	62.9
Average	0.34	9.9	0.13	64.9
R.394A	0.40	24.5	0.14	63.8
R.394B	0.40	22.7	0.13	68.9
R.394C	0.73	29.9	0.23	69.6
Average	0.51	25.7	0.17	67.4
R.395A	0.28	19.9	0.07	74.6
R.395B	0.66	31.3	0.19	67.4
R.395C	0.74	31.2	0.22	70.5
R.395D	0.61	25.7	0.19	69.1
R.395E	0.63	25.8	0.20	68.1
Average	0.58	26.8	0.17	69.9

Composite samples to represent each hole were crushed minus 5 mesh. Heavy liquid separations were carried out on the plus 10 and plus 60 mesh fractions.

Results may be summarized as—

Minus 5 mesh plus 10 mesh fractions: float products

Sample	Weight	% Sn	% Proportion of Sn in Head
R.390	31.5	0.25	20.3
R.392	22.1	0.21	14.0
R.394	39.8	0.22	16.9
R.395	36.7	0.26	17.3

Minus 10 mesh plus 30 mesh fractions: float products

Sample	Weight	% Sn	% Proportion of Sn in Head
R.390	38.5	0.15	14.8
R.392	39.7	0.10	12.0
R.394	32.7	0.13	8.2
R.395	29.9	0.10	5.5

Wolfram—Aberfoyle Tin N.L. Wolfram Concentrate

R.375

A pulp sample of "wolfram seconds ex acid vat and flotation" was tested to determine the causes of the material nodulizing on drying. The nodulizing appears to be due to presence of salts and was largely eliminated by water washing. The wolfram content of the non-magnetic fraction was markedly reduced during subsequent magnetic separation.

Wolfram—Storeys Creek Tin Mining Co. Thickener Slimes

R.393

The three inch Warman cyclone unit was installed for a short period at the Storeys Creek mill to handle slime thickener underflow. A tabling test was carried out on a sample of the cyclone underflow to determine the quantity of recoverable wolfram in the sample. Some 31.4 per cent of the tungstic oxide was recovered in a concentrate assaying 17.5 per cent tungstic oxide. The concentrate contained appreciable sulphides. The tungstic oxide content of the table tailings was 1.83 per cent of which about 9.4 per cent is finer than 20 microns, and would not be economically recoverable by gravity concentration.

Chromite—Ben Lomond Mining Co.

R.376

A sample of nickeliferous clay from the Beaconsfield area was submitted for chromite concentration tests. Low grade chromite concentrates, containing up to 24 per cent Cr_2O_3 were produced.

Chromite—Ben Lomond Mining Co.

R.384

Three samples from Beaconsfield area were tested for chromite and magnetite beneficiation. Treatment consisted of desliming and removal of the 10 mesh oversize by screening, gravity concentration of the undersize, and separation of the magnetite and chromite by magnetic separation.

	Weight	Cr_2O_3 %	Ni	Fe
Sample R.384/1:				
Magnetite concentrate	6.5	1.71	0.41	57.8
Chromite concentrate	2.0	55.4	Nil	26.5
Sample R.384/3:				
Magnetite concentrate	10.8	1.4	0.22	59.8
Chromite concentrate	4.2	54.9	Nil	27.5

No sensible concentration was obtained for sample R.384/2.

The chromite is almost entirely minus 30 mesh size. The magnetite is mostly plus 20 mesh.

Coal—Cornwall Coal Mining Co. Washery Products

R.378

Two specimens of washery middling coal were broken to minus one inch size and tested in heavy liquids to determine the possibility of recovering saleable coal by crushing and re-jigging the coarse jig middlings which currently go to waste. Tests indicated that saleable coal could be recovered by retreating the middlings.

Coal—Cornwall Coal Co. Washery Products

R.385

A sample of coarse washery rejects which had been crushed to minus $1\frac{1}{4}$ inch size was tested in heavy liquids to determine the possibility of recovering useful coal from the crushed product. The tests indicate that about 40 per cent by weight of the crushed reject could be recovered as useful coal, with an ash content of 25.7 per cent. The ash contents of the fractions with specific gravities less than 1.6 increase with increase in size from 22.2 per cent from the plus $\frac{1}{8}$ inch to 30.3 per cent for the plus $\frac{3}{4}$ inch size.

Coal—Cornwall Coal Co. Washery Products.

R.388

A sample of fine coal slurry from the overflow of the settling cone at the washery at Fingal was received. The product is a waste product, and is deposited in dams for settlement and natural drying. The company requested preliminary tests directed at reducing the quantity of solids sent to the dams. The slurry contained 18 per cent by weight of solids. The solids were 73 per cent minus 350 mesh.

The fineness of the feed and the low specific gravity of the solids makes cycloning, filtration or settlement difficult. A reasonably thick cyclone underflow can be obtained, but the underflow contains less than one fifth of the solids. Filtration rates are very slow, probably due to the presence of appreciable clay-like slimes. Flotation gives a product that should be saleable.

Magnetite—Savage River

R.383

Beneficiation tests were performed on a bulk sample representing selected sections of diamond drill core from holes numbered 7, 9 and 10 of the Savage River iron ore deposits.

Sections of ore specified were:—

Bore hole No. 7	477' to 782'
Bore hole No. 9	178' to 231'
Bore hole No. 9	268' to 497'
Bore hole No. 10	95' to 114'
Bore hole No. 10	124' to 276'
Bore hole No. 10	318' to 331'
Bore hole No. 10	359' to 438'

The sample was composed from jaw crushed residues from laboratory assay samples. A small number of samples was not available for the make up of the composite, but the weight of these is not significant, and the sample may be regarded as typical of the section of core specified.

A head sample was taken from the composite, and assayed with the following results:—

Iron	47.6 per cent
Sulphur	5.84 per cent
Phosphorus	0.12 per cent
Silicon	4.18 per cent
Alumina	2.04 per cent
Titanium	0.42 per cent
Manganese	0.10 per cent
Vanadium	0.30 per cent

The sample contained 47.6 per cent of iron, 0.12 per cent of phosphorus, and 5.84 per cent of sulphur.

Weight yields of magnetic concentrate ranged from 88.5 per cent of minus $\frac{3}{8}$ inch size to 67.5 per cent at minus 200 mesh. Iron recoveries were high, the lowest recovery being 96.3 per cent from separation at minus 200 mesh.

Beneficiation at minus $\frac{1}{8}$ inch was not appreciably better than at minus $\frac{3}{8}$ inch. Figures shown in the test flow-sheet indicate the reason for this, only small amounts of non-magnetic material being released by crushing of $\frac{3}{8}$ inch magnetics A. Any gain in quality from this operation is nearly counter-balanced by the inclusion of small amounts of low grade magnetic material released by the crushings of $\frac{3}{8}$ non-magnetics B.

Beneficiation at minus 18 mesh showed a sharp increase in concentrate quality over minus $\frac{1}{8}$ inch operations. This trend continues with finer grinding of the feed and is clearly indicated in the following summary of the magnetic concentrates.

Magnetic Products

Size of Separation	Wght.	Fe	Fe Dist.	S	Per Cent P	Al ₂ O ₃	Si	Mn	Ti	V
$\frac{3}{8}$ inch	88.5	53.4	99.3	4.59	0.09	1.49	3.00	0.10	0.40	0.34
$\frac{1}{4}$ inch	87.8	53.8	99.2	4.59	0.09	1.47	2.91	0.10	0.40	0.34
$\frac{1}{8}$ inch	86.6	54.6	99.1	4.26	0.08	1.49	2.96	0.10	0.40	0.34
18 mesh	74.9	61.8	97.4	1.63	0.03	1.09	1.78	0.10	0.40	0.35
60 mesh	70.7	65.1	97.0	0.75	0.02	0.91	1.22	0.10	0.40	0.38
100 mesh	68.5	66.7	96.4	0.32	0.02	0.91	0.94	0.09	0.31	0.37
200 mesh	67.5	67.9	96.3	0.33	0.02	0.88	0.80	0.09	0.31	0.37
No Beneficiation	100.0	47.6	100.0	5.84	0.12	2.04	4.18	0.10	0.42	0.30

Rejection of impurities generally increases with fine grinding of separator feed, and the pattern is similar to that shown in most previous investigations. A full tabulation of percentages rejection of impurities appears below.

Size of Separation	S	P	Per Cent Al ₂ O ₃	Rejection of Si	Mn	Ti
$\frac{3}{8}$ inch	26.9	33.1	40.7	36.6	12.9	16.6
$\frac{1}{4}$ inch	27.4	34.6	42.1	38.6	13.9	17.3
$\frac{1}{8}$ inch	33.7	39.3	42.3	38.7	13.9	17.1
18 mesh	78.4	79.2	60.0	68.1	25.7	28.7
60 mesh	91.0	88.0	68.5	79.4	29.7	32.8
100 mesh	96.1	88.9	69.5	84.6	38.6	49.6
200 mesh	96.1	89.7	70.9	87.1	39.6	50.4

Sizing

Size	Sizing of Separator Feeds		
	Per Cent $\frac{3}{8}$ inch feed	Per Cent $\frac{1}{4}$ inch feed	Per Cent $\frac{1}{8}$ inch feed
— $\frac{3}{8}$ " + $\frac{1}{4}$ "	14.3	...	...
— $\frac{1}{4}$ " + $\frac{3}{8}$ "	31.4	38.0	...
— $\frac{1}{8}$ " + 44 mesh	36.4	42.4	75.2
— 44 mesh	17.9	19.6	24.8

Size B.S.S.	Sizing of Separator Feeds			
	Per Cent 18 mesh	Per Cent 60 mesh	Per Cent 100 mesh	Per Cent 200 mesh (nominal)
— 18+ 60 mesh	50.3	Trace	...	...
— 60+100 mesh	17.5	39.3	Trace	...
— 100+150 mesh	10.6	21.4	27.0	Trace
— 150+200 mesh	2.6	10.9	18.0	15.5
— 200 mesh	19.0	28.4	55.0	84.5

Iron Ore—Industrial and Mining Investigations Pty. Ltd., Blythe River

R.386

Two samples of ore from the Blythe River deposits were submitted by Industrial and Mining Investigations Pty. Ltd. for beneficiation tests to produce a concentrate containing over 60 per cent iron suitable for export to Japan.

Each sample weighed approximately nine cwt.

Sample R.386A, marked Bly-N, was stated to be from the Northern Adit. Sample R.386B, marked Bly-S, was stated to be from an ore deposit dump on the left bank of the Blythe River, and is believed to have come out of the Southern Adit.

The ore consists of massive hematite with irregular broken veins of quartz, in places coloured red by contained hematite and limonite.

Sizing Specification.—A tentative sizing specification for the upgraded concentrate was supplied by Industrial and Mining Investigations Pty. Ltd. for our guidance, as follows:—

- Eighty-five per cent minus 3 mm.
- Less than 15 per cent minus 150 mesh.

Summary

Two samples, R.386A and R.386B, tested from the Blythe River deposits, were comparatively high grade, assaying 55.9 and 52.4 per cent iron respectively.

By gravity concentration, it is possible to obtain concentrates in excess of 60 per cent iron, and containing about 92 per cent and 85 per cent of the iron respectively.

Due to the fine grained nature of the ore, it is not possible to reject significant quantities of clean tailings coarser than about 150 mesh. Regrinding of the tailings from concentration of the coarser sizes allows further recovery of iron in good grade concentrates.

The logical concentration procedure appears to involve:—

- (1) Initial grinding to approximately minus 5 mesh, followed by close sizing of the ground material;
- (2) Concentration of plus 20 or 40 mesh material by jigging;
- (3) Concentration of minus 20 or 40 mesh plus 150 mesh material by Humphreys Spirals;
- (4) Concentration of minus 150 mesh material by tabling.

The concentrate will approximately meet the tentative sizing specification supplied by Industrial and Mining Investigations Pty. Ltd.

Impurities in Iron Concentrates.—Composite samples were made from the concentrates from the jigging and tabling tests on samples R.386A and R.386B. These concentrates had the following compositions:—

	Per Cent	
	R.386A	R.386B
Phosphorus (P)	0.04	0.01
Sulphur (S)	0.02	0.02
Silica (SiO ₂)	10.8	13.5
Titania (TiO ₂)	0.02	0.01
Manganese (Mn)	0.10	0.02
Vanadium (V)	Trace	Trace

These concentrates are particularly free of the common contaminants of iron ores.

Cyclone Tests—Electrolytic Zinc Co. of Australasia Ltd. Cycloning Lead Cleaner Tailings

R.389

Cyclone tests were carried out on two samples of lead cleaner tailings from current plant production. Test work was conducted on the 3 inch

diameter Warman cyclone test unit, and recommendations were made for the installation of 6 inch cyclones in the plant.

The following ceramic tests were conducted during the year.

Reg. No.	Received from	Locality
188	McHugh Bros.	Company's Works
368	W. C. Hodgman	Kingston
369	W. C. Hodgman	Kingston
372	Director of Mines (H. A. Dobson)	Lileah
461	Director of Mines (H. A. Dobson)	Lileah
528-538	Departmental	Gladstone
899	C. C. Hurst	Back Creek, Lefroy
900	H. C. Lawry	St. Helens
1404-1412	McHugh Bros.	Company's Works
1483	McHugh Bros.	Granton Brick Works
1641-1646	McHugh Bros.	Company's Works
1991	McHugh Bros.	Granton
1992	McHugh Bros.	Hamilton

PUBLICATIONS

The following reports were prepared for inclusion in Technical Reports No. 6:—

- R.361, R.364, R.365, R.366, R.368—Clay, South Mount Cameron.
- R.369, R.370, R.383—Magnetite, Savage River.
- R.371—Heavy Minerals, Hampshire-Valentine Peak area.
- R.372, R.372A—Mica, Gladstone.
- R.373—Stanhope Coal Company.
- R.374, R.379, R.382, R.391—Slime Table Tailings, Concentrate and Feed, Aberfoyle Tin Mining Company, N.L.
- R.375—Wolfram, Aberfoyle Tin Mining Company, N.L.
- R.376, R.384—Chromite from Nickeliferous Clay, Beaconsfield.
- R.377—Sulphur Content of Mill Gravity Section Feed, Renison Associated Tin Mines, N.L.
- R.378, R.385, R.388—Cornwall Coal Company, Coal Washery.
- R.380—Tin Ore, Renison Associated Tin Mines, N.L.
- R.386—Blythe River Iron Ore Beneficiation.
- R.389—Cycloning Lead Cleaner Tailings.
- R.390, R.392, R.394—Concentration Tests on Diamond Drill Cores from Holes D.P. 1, 2 and 3, Ardlethan, N.S.W.

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 8493. This represents an increase of 194, which was evenly spread over the whole industry, with the exception of coal mining where a decrease was recorded. Coal mining is passing through a difficult period, owing to competition, but other sections appear healthy although the low price for tungsten is a cause of concern.

ACCIDENTS

The number of registered accidents was 108 in which 107 persons were injured, an increase of 15, and one killed. In calculating the rates per thousand, 81 employees in the total of 8493 were disregarded because their employers do not submit accident reports.

DESCRIPTION OF FATAL AND SERIOUS ACCIDENTS

Fatal

M. G. O'Dea, E.Z. Co., Rosebery: Fell through hatchway in mill building.

Serious

A. Reynolds, Cornwall Colliery: Caught against machine by moving trolley; crushed legs.
 R. Smedley, E.Z. Co., Risdon: Fell from scaffold when suspension rope came adrift; broken head.

- J. Morrison, Australian Titan Products: Lost footing on construction steelwork and fell; broken pelvis.
- F. E. Dolbey, Merrywood Colliery: Struck by falling prop which he was placing; broken foot.
- M. L. J. Berry, Mt. Lyell Co.: Tripped and fell over machine under repairs; broken ribs.
- R. Hartshorn, E.Z. Co. Risdon: Struck by lead ingot dislodged from stack; broken foot.
- M. D. Heywood, Barber's Colliery: Struck by falling bar which he was setting; broken leg.
- B. Hedley, Merrywood Colliery: Caught foot in chain conveyor; broken and dislocated.
- G. T. Roberts, Sandfly Colliery: Struck by fall of roof; broken pelvis.
- B. Neal, E.Z. Co., Rosebery: Struck by stone rolling down hill; broken leg.
- J. Crnagoj, E.Z. Co., Rosebery: Struck by scat whilst spalling; lost eye.
- A. J. Matthews, Mt. Lyell Co.: Lorry he was driving went over dump when edge gave way; broken ribs and collapsed lung.
- J. F. Galvin, Mt. Lyell Co.: Slipped and fell in doorway; broken shoulder.
- L. Potter, Mt. Lyell Co.: Caught between railway waggon and post; broken arm.
- Z. Novack, Mt. Lyell Co.: Pile of concentrates collapsed whilst being picked down; broken leg.
- G. G. Willisroft, Mt. Lyell Co.: Caught hand in brake wheel of railway truck whilst operating; broken arm.
- J. Wegerbaner, Mt. Lyell Co.: Involved in explosion of partially slaked lime in drum; broken arm.
- J. Batik, Mt. Lyell Co.: Jammed between bogger and wall of drive whilst re-railing; broken arm.
- J. Stekar, Aberfoyle Tin: Struck by fall of ground; broken leg.
- J. Lockwood, A.P. Corp.: Struck by dislodged load whilst riding on trailer tow-bar; broken rib and epicondyle.
- A. Henry, A.P. Corp.: Foot slipped on safety mat into furnace bath; burnt leg.
- F. Nerreth, Aberfoyle Tin: Struck by fall of ground; broken back and pelvis.

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	170	....	11	6.5	88	....	3	3.4	258	....	14	5.4
Copper	60	....	3	5.0	1,545	....	15	1.0	1,605	....	18	1.1
Silver-lead-zinc	322	....	16	5.0	446	1	8	2.0	768	1	24	3.1
Tin and Tungsten	282	....	27	9.6	463	....	4	0.9	745	....	31	4.2
Quarries, Works, &c.	....	....	....	....	5,036	....	21	0.4	5,036	....	21	0.4
Total	834	....	57	6.8	7,578	1	51	0.7	8,412	1	108	1.3
Not reported	....	....	....	....	81	....	....	....	81	....	....	....
					7,659				8,493			

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†								
1941-1950‡								
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
1961	8493	108	1	107	108	0.119	12.720	12.839

* See Report of Director of Mines—1954.

† See Report of Director of Mines—1956.

‡ See Report of Director of Mines—1960.

INCIDENCE OF ACCIDENTS

Place and Cause of Accident	Number of Persons Killed	Number of Persons Injured (Incapacitated for over 14 days).	Place and Cause of Accident	Number of Persons Killed	Number of Persons Injured (Incapacitated for over 14 days).
<i>Section A.—Metalliferous Mines—</i>			5. Above Ground:		
1. Below Ground:			(a) Machinery in Motion	.....	.....
(a) Explosions	.....	.....	(b) Other Causes	.....	3
(b) Falls of Ground	.....	7	Total Coal Mines (B)	.....	14
(c) Falling down Shafts, &c.	.....	3	Total All Mines (A and B)	1	107
(d) Other Causes	.....	35			
2. Above Ground:					
(a) Machinery in Motion	.....	9			
(b) Other Causes	1	20			
3. Accidents in Batteries, Ore-dressing, Smelting and other Metallurgical Works, &c.	.....	19			
Total Metalliferous Mines (A)	1	93			
<i>Section B.—Coal Mines—</i>					
4. Below Ground:					
(a) Mine Explosions (fire damp, &c.)	.....	.....	
(b) Explosives (dynamite, &c.)	.....	.....	
(c) Falls of Earth	.....	1			
(d) Other Causes	.....	10			

INSPECTION

Mr. D. Besford, Inspector of Mines and Explosives on the coal fields retired at the end of the year and his place was taken by Mr. J. S. Mason. Mr. H. L. Olds, Inspector of Mines and Explosives, Hobart, resigned in January and his post remained vacant throughout the year.

SHOTFIRERS' PERMITS

Permits to act as shotfirers at particular quarries were issued to 28 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 and blasting agents were imported during the year at the ports shown:—

	Currie	Hobart	Launceston	Burnie	Strahan	Ulverstone	Total
Nitro-compounds (lb.)	33,100	266,400	703,300	425,450	561,450	.....	1,989,700
Detonators, &c.	20,000	125	2,800	180	.....	1,605,700	1,628,805
Ammonium Nitrate (lb.)	.....	.....	.....	.....	.....	.....	670,808

There were 29 shipments landed, a decrease of 10, and each was inspected on arrival. The reduction in imports of more than 1.5 million pounds of nitro-compounds occurred mainly through the ports of Strahan and Launceston. In the first port it is a reflection of the increased use of ammonium nitrate as a blasting agent, and in the latter reduced consumption on major works. The vastly increased number of detonators imported shows how blasting has increased.

The on-site mixing of ammonium nitrate (Class II Nitrate Mixture) has expanded very much and is applied on the open cut mines and larger quarries. The mixtures used by special authority are A.N.-Fuel Oil, and A.N.-Molasses-Water; A.N.-Sugar-Water has been tried as well. All have been successful in performance and

cost-saving and each has its special applications. No applications for trials underground have been received.

ACCIDENTS

Two accidents occurred through misuse of explosives. A boy was severely injured when he threw a tin of gunpowder into a fire. He had found the powder abandoned in the bush. In the other case a man fiddled with a detonator in such a way as to fire it. His hand was badly injured.

INSPECTION

Approval was given to the packing of nitro compounds in outer fibre-board boxes and of plain detonators in inner cardboard boxes. Hail rockets were introduced for the first time and given close attention. The firing has been satisfactory, there having been only three failures.

INFLAMMABLE LIQUIDS ACT, 1929

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

	Hobart	Devonport	Bell Bay	Narracoopa	Total
Aviation Gasoline	1,315	.....	1,257	.....	2,572
Benzol	500	.....	.....	.....	500
Kerosene, Aviation	6,281	.....	.....	.....	6,281
Kerosene, Lighting	2,879	475	.....	.....	3,354
Kerosene, Power	1,200	1,951	.....	.....	3,151
Motor Spirit, Premium	36,325	19,941	17,452	.....	73,718
Motor Spirit, Regular	25,754	13,455	12,823	551	52,583
Total	74,254	35,822	31,532	551	142,159
Tank Ships (No.)	26	12	8	1	47

There were two less tank ships than in the previous year and the quantity landed was 12,670 tons less.

ACCIDENTS

One accident occurred when a vapour train from vats of highly inflammable liquid was ignited. The liquid was heated for the dissolution of paraffin wax, and in the resulting explosion 7 persons were injured, one fatally.

INSPECTIONS

At the 30th June the number of licensed premises was 1923, an increase of 208 in 12 months.

During the year the port installation at Burnie for the discharge of petrol was completed ready for the first tankship. Preliminary approval was given for the use of dracones for the carriage of inflammable liquid between Hobart and Flinders Island. The dracones (flexible sausage-like containers of 12,000 gallons capacity) are to be towed behind regular trading vessels. A large bulk storage depot was transferred to a new site at Launceston.

REPORTS OF THE INSPECTORS OF MINES AND EXPLOSIVES

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

EMPLOYMENT

The average number of persons employed in the industry was 1494 of whom 254 were engaged underground. These figures do not include employees of the Hydro-Electric Commission at Poatina, or employees engaged on the construction of the ferro-manganese plant at Bell Bay for the Tasmanian Electro Metallurgical Company Pty. Ltd.

ACCIDENTS

There were 33 accidents reported as having caused 14 or more days lost time; of these, three could be classed as serious, the balance minor. Of the serious accidents, two were caused by falls of rock underground, one man suffering fractures to the base of the spine and pelvis, the other a broken leg. The other serious accident occurred when a man's foot slipped into the bath of a furnace. His foot was badly burnt, and more serious damage would have been suffered, but for the use of special footwear. The accident figures do not include accidents at the Hydro-Electric Commission, Poatina, which are not reported.

HEALTH AND SANITATION

Inspections have been directed to maintenance of adequate ventilation, sanitation and safety practice in mines. Ventilation in the two underground operating mines is greatly improved, and installation of exhaust fans is expected to further improve conditions. Equipment for feeding hydraulic fill to both mines is being installed. Generally crib rooms, change houses and other facilities are satisfactory.

EXPLOSIVES AND INFLAMMABLE LIQUIDS

Explosives and inflammable liquid storages have been inspected periodically and kept to the required standards. During the year the new Government Magazine at Dilston was completed and the first explosives stored there from a shipment landed on the 26th October, 1961. Shifting equipment and explosives from the Launceston Magazine was in progress at the close of the year. A number of new magazines were constructed in the district during the year and were found, before licensing, to conform to the plans approved. A number of liquid fuel storages were also approved and licensed.

Nine shipments of explosives and eight shipments of inflammable liquid were landed under the supervision of Inspector Bonham.

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

PROSPECTING

A departmental diamond drill commenced operating in the Dundas district in February. Two holes were drilled on anomalies between the Grand Prize and the Razorback and one to intersect the possible extension of the Grand Prize Lode. The drill then moved to the Razorback

area and was on the second hole prospecting anomalies on the possible extension of Razorback mineralization at the end of the year. Prospecting by the E.Z. Company in conjunction with the Mt. Lyell Company and Rio Tinto Australian Exploration Company continued on a small scale.

EMPLOYMENT

The average number of men employed in the industry was distributed as follows:—

Quarry or Opencut	261
Other Surface	1,784
Underground	407
Total	2,452

The decrease of approximately 285 in the "Quarry or Opencut" figure and the corresponding increase in the "Other Surface" is due to an alteration in the method of classification, but there is an increase of over 100 in the total.

ACCIDENTS

The total number of accidents reported during the year was 39, and of these one was fatal, and 14 were serious. The fatal accident occurred in a mill when a rigger slipped while opening a trap-door and fell 20 feet to the concrete floor below.

Of the serious accidents, eight occurred on the surface. Two railway workers suffered broken arms, one during shunting operations, and one when releasing the brake of a stationary truck. The driver of a Euclid that slipped over a tip sustained broken ribs, a smelter worker had a leg broken when a falling lump of concentrate jammed him against a post, a mill worker had his arm broken when a bucket of incompletely slaked lime exploded, an electrician who tried to right a passing truck lost part of his thumb, a janitor fell in the office and broke his shoulder, and a fitter sustained a disc lesion while using a crowbar.

Underground two men each lost the sight of an eye, one from a scot while spalling, and the other from a spanner thrown from the chuck of a diamond drill. One man had a leg broken and another a thumb, by being struck with a bar. A man had his arm broken while re-railing a bogger and another lost portions of two fingers when he slipped and grasped a scraper rope.

Nine of the minor accidents and one serious one involved injuries to hands, or fingers, and seven minor ones were strains. No accidents were due to breaches of the Rules, nor to negligence on the part of the employers, or other employees.

HEALTH AND SAFETY

All mines and works in the area were visited regularly with particular reference to safety and hygiene. Dust sampling was carried out both underground and in crushing plants to ensure that the Rules regarding ventilation and dust suppression were being carried out.

AID TO MINING

Financial assistance to three parties mining tin ore was continued.

EXPLOSIVES AND INFLAMMABLE LIQUIDS

The landing of five shipments of explosives totalling 11,229 cases at Regatta Point was supervised. The use of the Ammonium Nitrate-Molasses mixture for major blasting in the West Lyell quarry has greatly reduced the quantity of normal explosive required on the West Coast. The ammonium nitrate is imported in steel bulk containers specially designed to hold two short tons in 80 lb. plastic bags. Explosive magazines were inspected and a check was kept on the transport of explosives within the district. New and altered facilities for the storage of inflammable liquids were inspected and recommendations made regarding the issue of licences.

PROSECUTIONS

One prosecution under Section 74 of the Mines and Works Regulation Act followed a complaint regarding an assault on a mine. The verdict was "Charge proved but dismissed under the Probation of Offenders Act".

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

EMPLOYMENT

The average number of persons employed was 974, an increase of 42 men on the previous year.

ACCIDENTS

There were nine accidents involving more than 14 days' lost time but all were of a minor nature such as strains, dislocations and minor fractures. An unrecorded fatal accident occurred when a bystander was struck by a piece of flying stone during blasting at a quarry. All precautions and firing warnings had been put into effect. From the position of the victim and other evidence it was deduced that he had come out from cover to watch the actual blast. Fly rock from deep face shots such as this was most unusual and in this case unexpected. It is thought that it resulted from the presence in the face of a horizontal band of weakened weathered basalt.

HEALTH, SANITATION AND SAFETY

Inspections have been directed to the maintenance of safe, clean, dust free conditions on all mines, quarries and works. In the interests of safety close attention was given to ensuring that safe practices were employed in the storage, distribution and use of explosives. Initial tests of Ammonium Nitrate-Fuel Oil explosives were attended to ensure that safe practices were adopted. Crushing units on metallurgical works and road and construction material plants were under constant surveillance in the endeavour to bring about cleaner atmospheric conditions. Measures required included the installation of mist sprays and additional branches to existing exhaust ventilating systems.

AID TO MINING

Aid in one instance to enable a Mt. Bischoff tributor to erect a small washing and concentrating plant and in other cases the granting of loans to enable tributors to purchase equipment, afforded assistance to three parties. The small concentrating plant was brought into operation during the year. It consisted of a 4 inch multi-stage centrifugal pump which was used to deliver water under pressure to a soft finely divided dyke formation, thereby breaking the formation down and carrying it by means of launder to a bin from which it was pumped by a diaphragm pump to a hydrosizer.

EXPLOSIVES AND INFLAMMABLE LIQUIDS

Discharge of tank-ships and explosives at Devonport and Burnie was in the main under the supervision of Mr. A. E. Hemsley, Inspector of Explosives. Discharge of tank-ships at Naracoopa is now made bi-yearly. At Currie, the Harbourmaster continued to exercise control over all landings of explosives. Private magazines on all mines and works were kept under surveillance and safe storage practices were required throughout.

**Inspector J. S. Mason, A.M.Aus.I.M.M.,
Hobart, reports:—**

EMPLOYMENT

The average number of persons employed at mines and works operating under the Mines and Works Regulation Act was 427, a decrease of 35 compared with the previous year. The decrease occurred in the coal mining industry where the average number of employees fell by 39.

ACCIDENTS

The number of accidents reported was 14, of which four were serious. In two instances miners were struck by the timber they were engaged in erecting and sustained a broken leg and a broken foot respectively. A fall of ground at the face broke the pelvis of another. In the fourth serious affair a miner's legs were crushed between a moving trolley and a coal cutter.

SAFETY

Attention has been directed to the safe working of all places, regular inspections have been made of all places and all mines have been found to be free of gas. Hygrometer readings were taken in all working places and found to be within the requirements of the Act.

EXPLOSIVES AND INFLAMMABLE LIQUIDS

Magazines and inflammable installations were regularly inspected and were generally found to comply with the requirements of the Act.

STATISTICS FOR THE YEAR ENDED 31st DECEMBER, 1961.

<i>Registered Rainfall.</i>		<i>Production</i>				
Great Mussel Roe	35 inches 15 points	Tin oxide produced—				
Little Mussel Roe	34 inches 50 points		tons	cwt.	qrs.	lbs.
<i>Water Services</i>		Royalty scale	14	1	18	
Average number of claims supplied per week	3	Fixed scale	39	15	1	18
Greatest number supplied in any one week	4	Total	40	9	2	18
Sluiceways supplied:—		<i>Employment</i>				
Royalty Scale	142	Average per week—				
Fixed Scale	2,390	Royalty scale				1
		Fixed Scale				10
Total	2,532	Total				11

Statement of Receipts and Payments of the Mt. Cameron Water Race Dispersance Account for the Year Ended 31st December, 1961.

<i>Receipts.</i>				<i>Payments.</i>		
	£	s.	d.	£	s.	d.
Sale of water—				Salaries and wages	2,556	13 0
Fixed scale	2,620	0	0	Pay-roll Tax	63	18 5
Royalty scale	97	12	7	Insurance	58	10 9
Domestic use	94	10	0	Car allowance—Manager	22	12 2
				Tools and general requisites	16	0 0
				Electrical work—Manager's residence		
Hire of pipes			30 0 0	Total	2,773	10 0
Contribution from users			99 0 0	Balance—profit	167	12 7
			£2,941 2 7		£2,941	2 7