

TASMANIA

REPORT

OF THE

DIRECTOR OF MINES

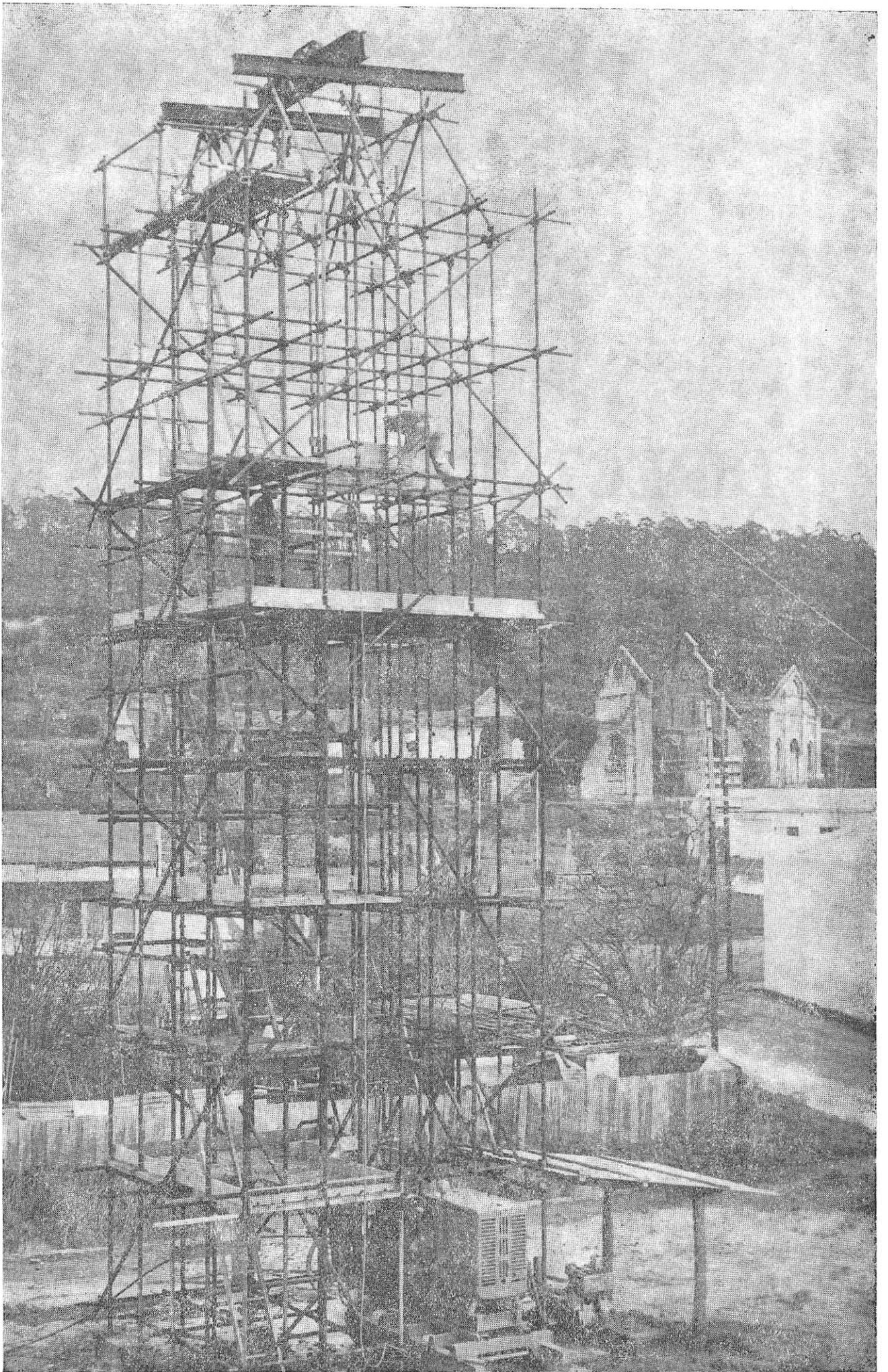
FOR THE

YEAR ENDED 31st DECEMBER,

1963



TASMANIA:
D. E. WILKINSON, GOVERNMENT PRINTER, HOBART
1964.



Department of Mines Diamond Drill Rig at Beaconsfield.

[Photo by courtesy: "Mercury"]

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5 cm

TIN PRICES

MONTHLY AVERAGES

1952 - 1963

£ STG. "SPOT" PER TON LONDON METAL EXCHANGE.
UNIT RATE PER TON PAYABLE SYDNEY. ----
£ AUST. PER TON ———



REPORT OF THE DIRECTOR OF MINES

Department of Mines,
Hobart,
30th April, 1964.

THE HONOURABLE THE MINISTER FOR MINES.

I have the honour to present my report on the mining industry for the year ended 31st December, 1963.

The mining industry produced metals and minerals valued at £A40,081,933 for 1963 consisting of metals and minerals produced from Tasmanian ores valued at £A16,103,136 and pigment oxides and metals valued at £23,978,797 from imported ores.

There were increases in the production of copper, gold, lead, zinc and scheelite but the output of tin, wolfram and silver declined. There were increases in the value of copper, gold, lead and zinc but because of the low market price offering the value of scheelite declined substantially.

The recorded production of non-metallic minerals and construction materials increased and contributed to the overall value of the mining industry.

Coal production continued to decline and sixty men were displaced from the industry and were absorbed in forestry work in the Fingal Valley.

The average number of men employed increased by 128 to 8836, mainly from expansion of productive capacity by the aluminium industry operated by Comalco Aluminium (Bell Bay) Ltd.

MINES

No new mines were opened during 1963. As indicated in my previous statement the continued higher price for tin has stimulated interest in exploration activities. Exploratory work continued at the old Mt. Cleveland Mine near Waratah and progress has been made with design of the milling plant. It is expected that development operations will be commenced in early 1964.

As a result of research work carried out in the Laboratories of the Department, a deposit of clay in the north-east has proven suitable for use in the paper making industry at Burnie. Steps have been taken to prepare for productive work and deliveries should commence during 1964.

I regret to record that as a result of the loss of markets for coal to oil three coal mines were obliged to close during the year.

METAL PRICES

Copper.—The average Australian price of copper for 1963 was £305 per ton which was unchanged from last year. Approximately 92% of the production of the Mt. Lyell Company was disposed of on the Australian market and all sales qualified for the bounty provided under the Copper Bounty Act, 1958, the average price received being £334 per ton. The Act expired in December, 1963, and the matter of continuation of the assistance is being examined by the Tariff Board.

Lead and Zinc.—The Australian price of zinc remained constant at £100 per ton for the first nine months of the year but an increase was recorded during the last quarter, the highest price being £122 17s. 6d. f.o.b. Risdon. The Australian price varies with movements on the London Metal Exchange and because of the gap between world production and consumption it is expected that the zinc price will remain firm.

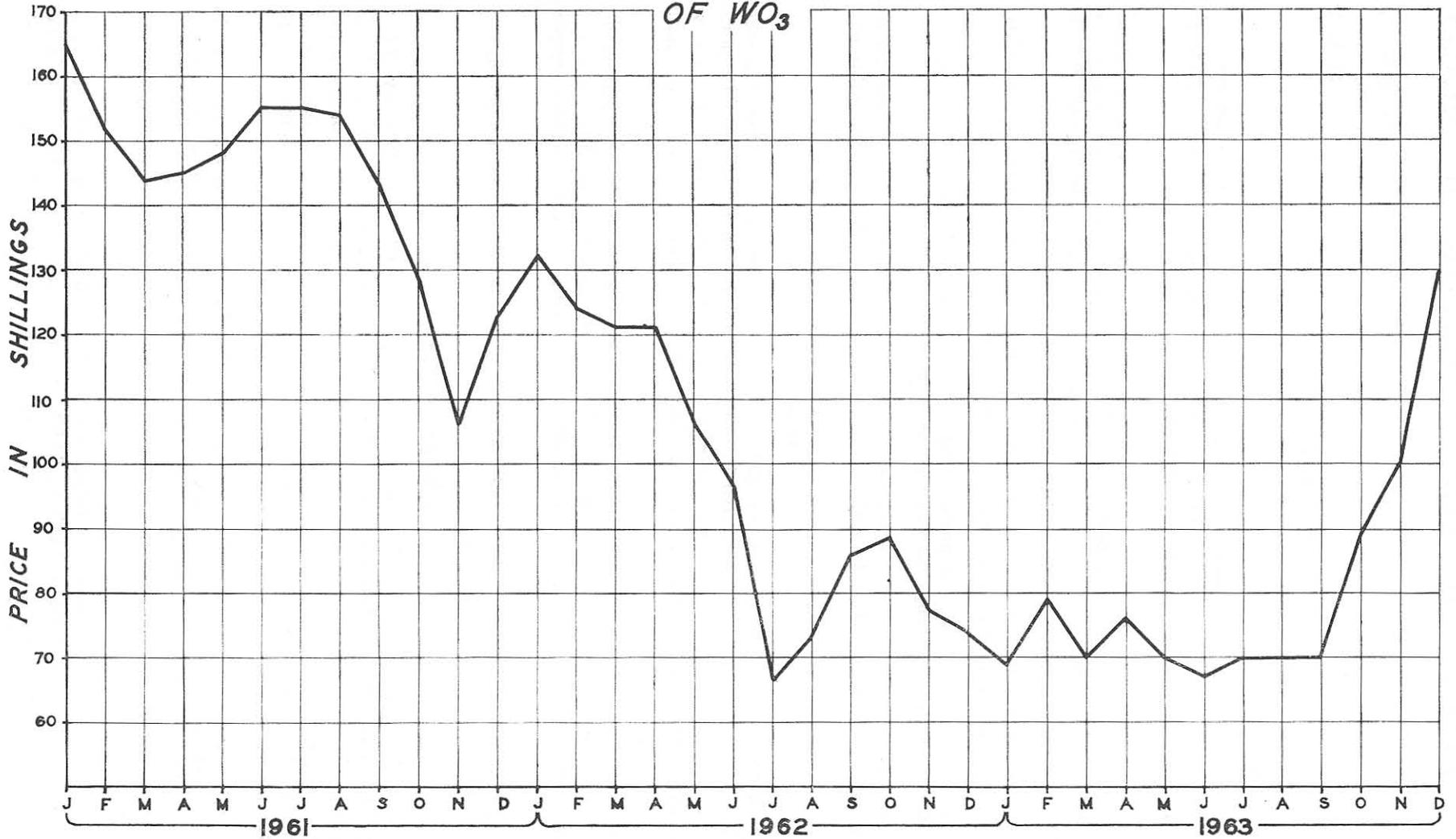
The Australian price of lead has reflected the improvement in price on the London Metal Exchange and it increased from £A80 to £A90 per ton during the year. World consumption of lead continues to increase and at the meeting of the International Lead and Zinc Study Group it was indicated that world stocks of this metal are being reduced. The effect is difficult to assess because of import quotas in the United States and policies affecting stockpiles.

Tin.—The average Australian price of tin for 1963 was £A1,188 per ton as compared with £A1,178 per ton for 1962. The price was £A1,110 per ton early in 1963 and showed a progressive increase throughout the year which closed with the quoted price of £A1,333 per ton in December.

5 cm

WOLFRAM PRICES 1961-63 (LONG TON UNITS)

OF WO_3



Prices quoted on the London Metal Exchange have shown a similar trend and have ranged from a low of £E851 per ton in January to a high of £E1038 per ton in December. The market for tin has reflected the growing shortage of supplies and the latest estimates indicate a consumption of 162,000 tons as against production of 136,000 tons. The U.S. stockpile has continued as a major controlling factor in dampening the normal rise flowing from the operation of the forces of supply and demand. There has been a meeting between representatives of the International Tin Council and the U.S. General Services Administration with the object of negotiating a long term policy for stockpile releases. A decision would enable the price of tin to remain firm and encourage production from deposits previously unworked. Early in December the price ranges under the Tin Agreement were fixed at a higher level in accordance with the higher market price offering. Under the new arrangement the Buffer Stock Manager must buy when the price is under £E850; he may buy in the range £E850-£E900; he may sell when the range is £E950-£E1,000 and he is required to sell when the price is above £E1,000. This device is effective in stabilizing the price when tin stocks are available to the Manager, but at the end of the year his stocks were exhausted and only the controlling factor to run-away prices was the U.S. stockpile.

The statistical position is such that high prices are likely to remain for some time and the effect has been to stimulate exploration of potential tin bearing areas and the development of other deposits previously uneconomic for working. No actual production has accrued from work being undertaken in this State, but during the current year the Dorset Tin Dredge which has been moved to another area will be in full operation and the Cleveland Mine is expected to be nearing actual production.

Tasmanian producers have benefited from the higher price and the unit price payable for concentrates sold has ranged between 184s. 11d. per unit and 227s. 11d. per unit, equivalent to from £A648 to £A798 per ton of 70% concentrate. This compares with £A639-£A750 for 1962.

Tungsten.—The price of tungstic oxide determines the price obtained for wolfram and scheelite concentrates.

A decline commenced early in 1961 and at the end of 1962 the price on the London Metal Exchange was 65s. per unit. The fall continued to July 1963 when the price was 57s. 6d. per unit. It then commenced to improve and rose to 105s. per unit at the end of the year, the overall average being 66s. 5d. per unit Sterling. Market reports indicate that low price tungsten being marketed from Communist Bloc countries has been responsible for the decline in price and the current improvement is dependent on the availability of metal from China and Russia. A United Nations Committee on Tungsten was formed to examine the position but no decision was taken on means by which the market outlook could be improved.

The position is of serious consequence to the producers of wolfram and scheelite in this State. The Storeys Creek Tin Mining Company No Liability, the principal producer of wolfram in the State has been obliged to curtail production and depends on its tin production for economic operation. The King Island Scheelite Company which produces scheelite only has been unable to continue profitable mining and representations were made to the Government for a subsidy to preserve the mine as a working unit in the interests of employment and the mining industry in anticipation of a price rise. A subsidy of £125,000 was made available, but as market conditions did not improve sufficiently to permit economic production a further subsidy of £124,000 was provided to cover production until 31st May, 1964. It does not appear from current market reports that a significant increase in price is possible under existing conditions and it could mean that the operations of the company will cease.

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

Mineral	1960			1961			1962			1963		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
Copper per ton	323	6	8	306	13	4	305	0	0	305	0	0
Lead per ton	100	0	0	99	3	4	81	13	4	85	0	0
Zinc per ton	112	8	6	101	19	1	100	0	0	104	13	4
Tin per ton	1,039	13	4	1,177	13	4	1,160	13	4	1,187	13	4
Silver per oz.	0	8	6	0	8	7	0	9	8	0	11	6
Osmiridium per oz.	20	0	0	.....	.....	.....	.....	.....	.....	.....	.....	.....
Gold per fine oz.	15	12	6	15	12	6	15	12	6	18	12	6
Wolfram per unit (WO ₃)	182/5			143/2			97/5			79/11		

EXPLORATION

Major mining companies have continued to be interested in the exploration and investigation of the mineral resources of the State. Aberfoyle Tin N.L. and its subsidiaries are undertaking active programmes of investigation of known and potential tin bearing areas in eastern

and western parts of the State; the Mt. Lyell Co. and the Electrolytic Zinc Co. are concentrating activities on specific areas on the West Coast where geophysical surveys have indicated anomalies; the Broken Hill Pty. Co. Ltd., through its subsidiary, Haematite Exploration Pty. Ltd., has followed an air-borne geophysical survey of Bass Strait by sea-borne seismic survey and interpretations are being made to determine whether conditions favour the occurrence of oil in the area; Industrial and Mining Investigations Pty. Ltd., the holder of a licence covering the Savage River Iron Ore deposits, has continued drilling operations to determine volume and grades of available ore, and market investigations and harbour transport surveys were also under constant attention; Mt. Costigan Mines Ltd., a Canadian company, has commenced preliminary investigations on an area on the West Coast; the Broken Hill Pty. Co. Ltd. is investigating a silica deposit as a source of raw material in the manufacture of ferro-silicon at Bell Bay and is also examining three separate areas for possible tin production; Clutha Development is investigating mineral possibilities in the Zeehan area; Storeys Creek Tin Mining Co. is examining potential kaolin deposits in the north-east; and Utah Development Co. has been granted an Exploration Licence to examine the tin potential of an area in the north-east.

The policy of granting licences for the exploration and investigation of the mineral potential of large areas of the State has operated for several years and has resulted in examinations being made in the north, north-east, north-west, west and south-west by companies having the necessary equipment and staff to undertake such work and to employ the most modern techniques. In accordance with the conditions of licences the holders are required to furnish the Department of Mines with detailed reports of all investigations and as a consequence there are a number of reports on record containing information which forms a valuable contribution to knowledge of the mineral resources of the State. It has been estimated that expenditure on exploration of large areas over the past ten years has exceeded £1,750,000. During 1963 the expenditure amounted to £430,000.

The Department's boring plants have been in constant operation. One plant has been fully engaged in testing potential tin bearing areas at St. Helens, two other plants are occupied in foundation testing and water boring, and three diamond drills have been employed in drilling a gold reef on a former gold field in the north-east, testing geophysical anomalies on the West Coast and coal measures near operating mines in the Fingal Valley. A new diamond drilling plant capable of boring deep holes has been purchased and it is planned to commence boring at the old Tasmania Gold Mine near Beaconsfield within a few months.

The geological staff of the Department has continued with regional mapping, examination of mineral occurrences and selecting sites for water boring.

Surveys were also undertaken on various aspects of engineering geology mainly related to foundations and problems associated with landslips. This aspect of the geological work of the Department is being extended and a Senior Geologist has been placed in charge of engineering geology. Services are in demand by other Government Departments and instrumentalities engaged in engineering and also by Consulting Engineers. Advice on geological conditions associated with landslip areas has been given to municipal councils as a guide to authorizing building and to inform the public interested in building in the areas concerned.

Geological maps with explanatory notes and Technical Reports are published as the work on separate areas is completed.

The publication of the one mile to one inch series of geological maps has continued and an average of two maps per year is being maintained. Geological maps at this scale are particularly useful in outlining favourable areas for mineral search and are assisting the mineral exploration programme very substantially.

COAL

Production has continued to fall and the output of 206,922 tons represented a fall of 65,420 tons for the year. The number of men employed declined from 227 in 1962 to 167 in 1963. Three coal mines have closed during the year and when one of the principal consumers, namely, Associated Pulp and Paper Mills Ltd. at Burnie, completes conversion to oil fuel, there will be a further curtailment in production and employment. The Committee set up by the Government last year to investigate the economics of thermal power production in the Fingal Valley recommended against the project. Representations were made to the Commonwealth Government to support the proposal, but without success.

The Coal Utilisation Research Advisory Committee was appointed by the Commonwealth Government to make a survey of research and investigation into the uses of coal in progress overseas, as well as in Australia, and to make recommendations on lines of research which should be either further encouraged or initiated. The Committee has recommended considerably increased expenditure on research and development. There has been a preliminary meeting

between representatives of the Commonwealth Government, the Department of Mines, coal producers and coal consumers at which the recommendations of the Advisory Committee were discussed together with a basis for contribution to the cost of operation of research investigations. The Government is prepared to make finance available to further the proposed research, but the extent of the contribution required has not yet been fixed.

SAVAGE RIVER IRON ORE

The exploration of the iron ore deposits at Savage River entered a new phase during 1963. Diamond drilling of the orebody continued during the year, and a further nine holes totalling 2,796 feet were drilled. In June the licence holder, Industrial and Mining Investigation Pty. Ltd., signed an agreement with Pickand Mather & Co. of Cleveland, U.S.A., and a joint programme to develop the Savage River iron deposits was commenced.

The programme was to establish the economics of producing a high grade iron ore pellet suitable for blast furnace feed. Metallurgical test work was completed and established that a suitable pellet, high in grade and low in impurities and with high strength, could be made from the magnetite iron ore at Savage River.

Further research was done to establish the possibilities of direct reduction of this pellet material as a second stage in the programme, but this aspect was still in progress at the close of the year.

The proposed operation is to concentrate the ore at the mine site, and to transport the high grade finely ground concentrate as a pulp by pumping in a pipeline to the shipping port.

Satisfactory investigational work on this aspect has been completed. A company specializing in harbour and port construction was employed to assess the feasibility and cost of constructing a port, capable of handling large ships to load pellets, the export of pellets being regarded as a means of developing the orebody to large scale production. This investigational work has now been completed satisfactorily. Marketing details have not yet been completed and the result of the investigation will depend upon a satisfactory price agreement being finalized.

The increasing world demand for pellet furnace feed and the superior qualities of the magnetic minerals in the Savage River orebodies have given this deposit a substantial advantage in comparison with other iron deposits in Australia.

LEGISLATION

The Explosives Act 1916

The Department has frequent requests for advice and assistance in all kinds of blasting as distinct from mining and many requests are received from the general public for protection from blasting for excavations in built-up areas. The Mines and Works Regulation Act relates only to mines, quarries and certain proclaimed works and does not cover the various miscellaneous jobs involving the use of explosives. An amendment has been made to the Explosives Act, 1916, to extend the application of the Act to the use of explosives in addition to storage. A set of Regulations is in process of being proclaimed under which a safe code of blasting practice is being prescribed similar to the requirements of the Mines and Works Regulation Act. Shot firers will be required to hold a permit issued by an Inspector of Explosives who must be satisfied as to the ability of the holder to load and fire shots safely. The permit holder must also have some knowledge of explosives. Provision is being made for exemptions to be granted in country areas.

Under the existing provisions of the Act the Chief Inspector of Explosives may destroy explosives immediately upon importation if they are deemed to be unsafe. It is also provided that importation and distribution of explosives may be prohibited by Regulation. An amendment has been made to empower the Chief Inspector to prohibit the landing of explosives deemed unsafe.

Provision has also been made to clarify the conditions under which small quantities of explosives may be kept without a licence.

Several cases of improper storage and use of explosives have been investigated and consideration is being given to practical measures to ensure the observance of better practices by users.

The Inflammable Liquids Act 1929

The Inflammable Liquids Act which regulates the keeping, conveyance and sale of inflammable liquids also applies to dangerous commodities which are declared from time to time by proclamation. The Act is used by Marine Boards to control handling of dangerous goods, but it is virtually impossible to proclaim separately each such commodity. The Australian Port Authorities Association has accepted the new Model Code for the handling of dangerous goods

contained in the Classified List of Dangerous Goods issued under the Commonwealth Navigation Act and an amendment has been made to the Inflammable Liquids Act to enable this Classified List to be proclaimed by name rather than by specifying over 1,000 particular substances listed. The amendment will enable commodities specified under any Commonwealth Act, the Standards Association, the Board of Trade or other like authority to be proclaimed as a whole. The proposal has the advantage that the commodities proclaimed are accepted as an Australia wide standard and in some cases as a world standard.

The amendment was proclaimed to commence on 1st August, 1963, and was followed by a Regulation declaring as dangerous goods the Classified List of Dangerous Goods issued by a proclamation under the Navigation Act. Any inflammable corrosive or poisonous gas and any substance which by reason of its properties constitutes a fire or explosive hazard or is poisonous or corrosive were also declared to be dangerous commodities subject to the provisions of the Inflammable Liquids Act.

REVENUE

Return showing the Revenue Collected during the Year ending 31st December, 1963.

Head of Revenue	Amount £
Public Works and Services—Mines Department	15,585
Rent and Fees of Auriferous and Mineral Lands	25,271
Survey Fees	1,458
Fees under the Explosives and Inflammable Liquids Act	14,722
Total	£57,036

Comparative Statement of Revenue from Mines, being Rents, Fees, Storage of Explosives, &c., Paid to the Treasury during the Years 1956 to 1963.

Year	Amount £
1956	24,260
1957	23,827
1958	22,187
1959	32,288
1960	41,726
1961	47,598
1962	44,121
1963	57,036

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

LEASES AND LICENSES

Return showing Number and Area of New Leases and Licences Issued during the Year ended 31st December, 1963.

Leases and Licences	Number	Area (Acres)	Sluiceways
Beryllium	1	10	....
Clay and Sand	3	93	....
Coal	1	1,377	....
Copper	1	10	....
Gold and Copper	13	236	....
Granite	1	5	....
Limestone	1	100	....
Minerals	4	100	....
Ochre	1	4	....
Stone	8	557	....
Tin	20	2,308	....
Water Licences	5	....	17
Total	59	4,800	17

Return showing the Total Number of Leases and Licences in Force on 31st December, 1963.

Leases and Licences	Number	Sluiceways	Area (Acres)
Bauxite	5	....	454
Beryllium	1	....	10
Clay	17	....	593
Coal	28	....	7,953
Copper	4	....	6,689
Copper-Nickel	3	....	120
Dolomite	4	....	309
Easement Licences	58	....	863
Feldspar	2	....	15
Gold	26	....	656
Granite	5	....	32
Iron Ore	4	....	190
Limestone	20	....	1,573
Mica	1	....	20
Minerals	39	....	8,763
Ochre	2	....	8
Osmiridium and Chromite	7	....	110
Sand and Gravel	13	....	907
Scheelite	4	....	921
Silica	6	....	107
Silver-Lead	9	....	269
Stone	40	....	4,072
Tin	212	....	5,968
Tin-Wolfram	3	....	54
Uranium	1	....	50
Water Licences	111	613	879
Wolfram	4	....	1,332
Total	629	613	42,917

Return showing Number and Area of Leases and Licences Applied for during the Year ended 31st December, 1963.

Leases and Licences	Number	Area (Acres)	Sluiceways
Beryllium	1	10	....
Clay	1	5	....
Copper	2	3,953	....
Gold	5	75	....
Granite	1	5	....
Gravel	4	190	....
Iron	3	49	....
Minerals	5	358	....
Ochre	1	3	....
Osmiridium and Chromite	5	60	....
Silica	2	8	....
Stone	17	1,233	....
Tin	30	4,284	....
Tin and Gold	2	769	....
Water Licences	13	22	50
Total	92	11,024	50

Return showing particulars of Exploration Licences and Special Prospector's Licences in force at 31st December, 1963.

Licence No.	Holder	Area	Situation	Mineral
EL3/59	Mt. Lyell Mining and Railway Co. Ltd.	12 square miles	West Coast	Minerals except coal and oil
EL1/60	Haematite Explorations Pty. Ltd.	35,325 square miles	Bass Strait	Oil and gas
EL4/61	Industrial and Mining Investigations Pty. Ltd.	147 square miles	Savage River	Minerals
EL5/61	Industrial and Mining Investigations Pty. Ltd.	450 square miles	East Coast	Coal and limestone
EL1/62	Electrolytic Zinc Co. of Australasia Ltd.	49 square miles	Rosebery	Minerals except coal and oil
EL2/62	Electrolytic Zinc Co. of Australasia Ltd.	8 square miles	Dundas	Minerals except coal and oil
EL1/63	Aberfoyle Tin N.L.	14.75 square miles	Waratah	Tin
EL2/63	Aberfoyle Tin N.L.	87.4 square miles	Mt. Lindsay	Minerals
EL3/63	Aberfoyle Tin N.L.	35 square miles	Blue Tier	Tin
EL4/63	Storeys Creek Tin Mining Co. Ltd.	144 square miles	Moorina	Kaolin
EL5/63	Mt. Costigan Mines Ltd.	1910 square miles	West Coast	Minerals
EL6/63	R. D. Ellett	300 square miles	North-East	Tin and gold
SPL 389	C. Loftus Hills	1,440 acres	Zeehan	Minerals
SPL 390	D. G. Clark	16 square miles	Moina	Minerals
SPL 391	A. E. Gazzard	4 square miles	Zeehan	Minerals
SPL 392	G. C. Kingston	25 square miles	Balfour	Minerals
SPL 393	F. C. Hudson	25 square miles	Balfour	Minerals
SPL 394	M. E. Burns	600 acres	Weldborough	Tin
SPL 395	Broken Hill Pty. Co. Ltd.	5 square miles	St. Helens	Minerals
SPL 397	Broken Hill Pty. Co. Ltd.	502 acres	Beaconsfield	Quartzite
SPL 398	L. Price	2 square miles	Scamander	Tin
SPL 399	V. Wood	17.5 square miles	Mt. Cameron	Tin
SPL 400	W. C. Burrows	4 square miles	Branxholm	Tin

Return showing the Total Number and Areas of Authorities to Prospect held during the year ended 31st December, 1963.

Type of Authority	Number	Area
Permits to enter on private land including owner's consents	7	2,788 acres
Exploration licences	12	38,482 sq. miles
Special Prospector's Licences	11	65,582 acres
Prospector's Licences	123	6,150 acres
Miner's Rights	46	23 acres
Authorities to prospect under the Aid to Mining Act 1927	4	21,300 acres

WARDEN'S COURT

E. L. Clapp v. F. H. Graham and T. L. Bean—Application for forfeiture of lease 39M/48 of 20 ac. at Mangana.

This application was listed for hearing by the Warden of Mines, Launceston, on 30th July, 1963, but was withdrawn after a mutual settlement between the parties.

H. K. Turner v. M. D. Garett—Application for forfeiture of leases 24M/43 and 25M/43 at Stanley River.

This action was heard by the Warden of Mines at Devonport on 1st and 2nd July, 1963. The Warden declared the leases forfeited.

EXEMPTIONS

The following exemptions were granted:—

Comalco Aluminium (Bell Bay) Ltd.—Leases 569P/M, 570P/M, 571P/M, 572P/M, 591P/M.

Eagle Metal and Industrial Products Pty. Ltd.—Leases 45M/52, 46M/52, 47M/52.

MINE MANAGER'S CERTIFICATES

During the year the Board of Examiners granted Metalliferous Mine Manager's Certificates of Competency to:—

James Francis Alexander Taylor and Garrett Michael Sainsbury.

A certificate was also issued to:—

Kenneth Francis Patterson,
upon presentation of a certificate issued by a recognized authority in another state.

PUBLICATIONS

The following publications were issued during the year:—

Geological Maps—Devonport Sheet (No. 29 of Geological atlas).

St. Clair Sheet (No. 59 of Geological atlas).

Technical Report—No. 7.

Explanatory Notes—Middlesex Geological Sheet.

Geological Survey Bulletin—No. 47—Structure and Petrology of the Raglan Range by R. D. Gee (B.Sc. Hons.).

RETURN SHOWING VALUE OF TASMANIAN MINERALS IN RECENT YEARS WITH AUSTRALIAN METAL PRICES

	Value £A		Value £A
1955	11,069,444	1960	13,387,260
1956	14,374,621	1961	13,379,477
1957	12,591,687	1962	15,437,068
1958	11,838,054	1963	16,103,136
1959	12,766,261		

MINERAL PRODUCTION SINCE 1880

Quantity and Value of Mineral Production as at 31st December, 1963

<i>Mineral</i>	<i>Total Quantity</i>	<i>Value £A</i>
METALLIC MINERALS—		
Antimony	(tons) 3	1,017
Bismuth	(tons) 84	29,644
Cadmium	(tons) 1,379	1,632,142
Cobalt Oxide	(tons) 14	12,510
Copper (Blister) to 1918 (now shown under Silver and 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) 421,060	66,195,851
Crocoite	(specimens only)	533
Gold	(fine oz.) 2,600,494	15,286,816
Ilmenite	(tons) 550	1,256
Iron Oxide (including Hematite, Limonite and Magnetite)	(tons) 101,159	105,968
Lead (from 1919)	(tons) 341,378	20,018,122
Manganese	(tons) 1	3
Manganese Dioxide (from 1957)	(tons) 1,359	18,295
Monazite	(tons) 33	607
Nickel	(tons) 233	40,518
Osmiridium	(oz.) 31,088	708,531
Pyrites	(tons) 1,511,571	3,271,014
Rutile	(tons) 1	18
Scheelite	(tons) 18,746	17,923,253
Silver Lead Ore to 1918 (now under Silver and Lead)	(tons) 1,083,898	6,429,219
Silver from 1919	(fine oz.) 42,896,157	11,046,485
Sulphur as Sulphuric Acid (from 1957) (mono tons)	220,423	1,034,823
Tin	(tons) 148,000	35,890,580
Wolfram	(tons) 14,566	8,886,747
Zinc	(tons) 717,380	45,904,986
Zinc Sulphate (from 1957)	(tons) 1,465	63,098
NON-METALLIC MINERALS—		
Asbestos	(tons) 3,980	17,142
Barytes	(tons) 2,205	8,239
Clay—(from 1958)		
Brick	(cubic yd.) 598,705	552,659
Tile	(cubic yd.) 22,376	6,448
Other	(cubic yd.) 87,864	77,432
Dolomite	(tons) 24,772	72,574
Graphite	(tons) 40	107
Kaolin	(tons) 111,086	441,509
Limestone—		
Agricultural and other	(tons) 539,132	647,120
Chemical and Metallurgical	(tons) 4,095,911	2,331,934
Carbide	(tons) 631,685	810,245
Cement	(tons) 4,150,272	2,615,218
Ochre	(tons) 2,285	7,132
Pebbles (from 1957)	(tons) 3,848	28,507
Silica	(tons) 165,792	114,486
Talc	(tons) 333	1,077
FUEL MINERALS—		
Coal	(tons) 9,073,176	11,427,248
Shale	(tons) 41,572	31,231
CONSTRUCTION MATERIALS—		
Building Stones—		
Granite	(cubic yd.) 2,038	37,544
Freestone	(cubic yd.) 2,413	14,936
Other	(cubic yd.) 940	1,198
Gravel (from 1958)	(cubic yd.) 5,318,118	2,593,372
Sand (from 1958)	(cubic yd.) 277,895	209,527
Crushed and Broken Stone—(from 1958)		
Basalt	(cubic yd.) 264,845	220,662
Dolerite	(cubic yd.) 2,722,376	4,144,079
Limestone	(cubic yd.) 162,714	202,986
Sandstone	(cubic yd.) 5,459	2,191
Other	(cubic yd.) 588,486	491,582
Other Road Materials	(cubic yd.) 129,220	123,876
		<u>£276,234,433</u>

STATISTICS RELATING TO THE MINERAL INDUSTRY

Mineral	Year Ended 31st December 1962		Year Ended 31st December 1963	
	Total Quantity	Value £A	Total Quantity	Value £A
<i>Metallic Minerals:</i>				
Cadmium (tons)	72	128,173	73	182,737
Cobalt Oxide (tons)	1.48	1,652	1.59	1,748
Copper (tons)	13,949	4,254,592	15,602	4,758,613
Gold (fine oz.)	28,673	448,017	31,989	499,837
Iron Oxide (tons)	4,082	5,870	4,221	6,004
Lead (tons)	11,605	947,714	11,889	1,011,543
Manganese Dioxide (tons)	276	4,708	325	6,337
Pyrites (tons)	54,629	163,887	56,402	169,206
*Scheelite (tons)	984	328,734	1,010	279,103
Silver (fine oz.)	1,441,447	696,855	1,438,858	828,991
Sulphur as Sulphuric Acid (mono ton)	43,798	208,596	46,355	231,775
*Tin (tons)	1,211	1,403,736	1,005	1,192,513
*Wolfram (tons)	929	400,192	382	111,651
Zinc (tons)	38,168	3,816,812	38,589	4,018,785
Zinc Sulphate (tons)	268	12,089	355	19,515
Value of Metallic Minerals	....	£12,821,627	....	£13,318,358
<i>Non-Metallic Minerals:</i>				
<i>Clay:</i>				
Brick (cubic yds.)	93,691	3,150	98,949	94,075
Tile (cubic yds.)	3,150	94,956	1,250	1,250
Other (cubic yds.)	16,828	23,680	16,153	18,653
Dolomite (tons)	2,217	6,734	2,623	8,139
Kaolin (tons)	606	3,282	Nil	Nil
<i>Limestone:</i>				
Agricultural (tons)	20,875	26,196	22,627	37,284
Carbide (tons)	28,374	46,743	26,782	50,630
Cement (tons)	233,142	228,286	272,117	266,447
Chemical and Metallurgical (tons)	35,695	64,933	32,463	49,238
Other (tons)	452	4,735	476	5,135
Ochre (tons)	60	390	51	328
Pebbles (tons)	375	2,561	518	3,793
Silica (tons)	514	3,054	2,641	2,965
Value of Non-Metallic Minerals	....	£508,700	....	£537,937
<i>Fuel Minerals:</i>				
Coal (tons)	272,342	£647,574	206,922	£429,422
<i>Construction Materials:</i>				
<i>Crushed and Broken Stone:</i>				
Basalt (cubic yds.)	36,667	34,882	104,095	94,540
Dolerite (cubic yds.)	534,005	654,613	597,537	749,373
Limestone (cubic yds.)	27,174	33,758	28,676	34,563
Sandstone (cubic yds.)	Nil	Nil	693	520
Other (cubic yds.)	71,862	89,608	108,964	116,499
<i>Building Stone:</i>				
Freestone (cubic yds.)	677	4,060	1,079	6,673
Granite (cubic yds.)	Nil	Nil	34	4,030
Other (cubic yds.)	653	1,073	232	109
Gravel (cubic yds.)	1,087,364	574,300	1,173,982	634,312
Sand (cubic yds.)	90,959	66,605	105,523	73,148
Other Road Materials (cubic yds.)	537	268	100,625	103,652
Value of Construction Materials	....	£1,459,167	....	£1,817,419
Total Value with Australian Metal Prices	....	£15,437,068	....	£16,103,136
<i>Metallurgical Production from other than Tasmanian Ores:</i>				
Alumina	....	17,431,610	....	23,978,797
Aluminium	....		
Cadmium	....		
Cobalt Oxide	....		
Ferro-Manganese	....		
Titanium Dioxide	....		
Zinc	....		
Total Value of Mining and Metallurgical Production	....	£32,868,678	....	£40,081,933
<i>Manufactured Products:</i>				
Product—	Total Quantity (tons)	Total Quantity (tons)		
Acetylene Black	195	221		
Ammonium Sulphate	39,390	30,226		
Carbide	13,989	13,259		
Cement	167,641	201,355		
Superphosphate	87,863	84,075		
Average number of men employed	8,708	8,836		

* Includes adjustment.

AID TO MINING

The principal item of expenditure was an advance of £84,323 to the Storeys Creek Tin Mining Co., representing portion of a total loan of £110,000 made to the company to reconstruct and move the Dorset Tin Dredge to a new site. In addition advances were made to one party for the purchase of equipment for alluvial tin mining; another party was assisted to drive a tunnel and a small tin producer on the West Coast was financed to purchase an engine. Total expenditure on assistance and in maintenance of plant and equipment available for hire was £85,143. Funds totalling £126,000 to meet this expenditure were available from the Mining Trust Fund constituted under the Aid to Mining Act, 1927. An amount of £110,000 was transferred from Loan Funds for the advance to Storeys Creek Tin Mining Company N.L., £12,095 was received in repayment of loans previously made to various operators and £876 was received in interest, hire of mining equipment and royalties from tributors at the old Mt. Bischoff mine, Waratah. An amount of £3,038 was carried forward from 1962 and the balance being brought forward to 1964 is £40,865 of which £25,677 is payable to the Storeys Creek Tin Mining Company N.L. as the balance of the loan of £110,000. An amount of £15,200 is, therefore, available for other aid to mining projects, and several applications are under consideration. A detailed financial statement is appended.

Loan to Storeys Creek Tin Mining Company N.L. Representations were made to the Government in January, 1963, by Aberfoyle Holdings Limited for assistance to maintain various projects in the State. The company through subsidiaries operates the Aberfoyle Mine, the Storeys Creek Mine and the Dorset Tin Dredge, and is actively pursuing programmes of exploration at Mt. Cleveland near Waratah, an area near the old Bischoff Mine, the Mt. Lindsay Tinfield, and the Blue Tier Tinfield. In addition it is developing a clay industry in the North-East to supply Associated Pulp and Paper Mills at Burnie.

The Dorset Tin Dredge, operated by the subsidiary Storeys Creek Tin Mining Company N.L., closed down in April, 1963, due to exhaustion of tin reserves and plans were made for extensive alterations and improvements to the dredge and to transfer it to a new area some ten miles downstream from its previous location. The Company's various activities throughout the State limited available funds to finance the Dorset Tin project and application was made for loan of £110,000. After consideration of the potential of the new area for the production of tin and also of the fact that a continuation of operations was of economic value to the State and the source of employment of 45 men the loan was approved. At the end of the year £84,323 had been advanced. It is expected that reconstruction will be completed and the dredge placed in commission early in 1964.

King Island Scheelite (1947) Ltd. As a result of the decline in the price of scheelite, the King Island Scheelite Company was unable to continue profitable mining and representations were made to the Government for a subsidy to maintain operations whilst the price as quoted in the London Metal Bulletin remained below 124s. 3d. per unit. In accordance with the provisions of the King Island Scheelite Agreement Act, 1963, a sum of £125,000 was made available by way of subsidy covering the period 1st January, 1963, to 31st August, 1963, whereby the company agreed to maintain production at the rate of 5,800 long ton units per month in consideration of a subsidy payment equivalent to 0.93 of the difference between 124s. 3d. per unit and the monthly average unit price as published by the London Metal Bulletin with a maximum payment of 48s. per unit.

The price of tungsten had not improved by 31st August, 1963, and because the operations of the company at King Island constitute an important element in the economic conditions at King Island and the closure of the mine would have a serious effect on employment and the Island's economy it was considered desirable to make available a further subsidy of up to £100,000.

The King Island Scheelite Agreement Act (No. 2) 1963 was passed by Parliament in December, 1963, to enable the further subsidy to be paid. The Act provides for the payment of the subsidy on the same formula as the first subsidy and for the payment of a minimum in certain circumstances. The payment of the subsidy is to cease after 31st May, 1964.

Both the Acts referred to contained detailed provisions for repayment of the subsidy according to the London Metal Bulletin quotation for scheelite. Special provision was made to cover responsibility for repayment in the event of the company ceasing operations in any period of four consecutive months commencing 1st October, 1964, and ending 31st March, 1967. The company ceases to be liable to make any repayments after 30th June, 1972.

The company has received a monthly subsidy since 1st January, 1963. The price of scheelite during 1963 averaged 66s. 5d. per unit as quoted by the London Metal Bulletin but showed an upward trend towards the end of the year when the quoted price was 105s. per unit.

Mt. Bischoff Mine, Waratah. The reservation covering a radius of three miles from Waratah was maintained and tributes were granted to small parties for tin production on a limited scale. Royalty received from tributors was £120 and this together with other funds provided by the Department, amounting in all to £197 was expended in maintaining plant for the use of the tributors.

As indicated in my last report an amendment was made to the Aid to Mining Act, 1927, to enable prospecting to be undertaken on reservations made under the Act. This has enabled investigation of the mineral potential of the old Mt. Bischoff Mine and surrounding area within the reservation which was beyond the capacity of tributors. Such operations have, however, been arranged so as not to interfere with the working of tribute parties and the granting of new tributes as existing areas are worked out.

The holders of authorities to prospect have carried out active programmes of investigation and exploration which if successful could lead to the re-establishment of large scale productive mining in the Waratah district.

Particulars of authorities held are as follows:—

No.	Holder	Area
1AP/AM	N. F. Fooks	80 acres
3AP/AM	G. van der Geer	320 acres
4AP/AM	M. Solomon	28 square miles
5AP/AM	Aberfoyle Tin N.L.	2,980 acres

Mining Plant. The value of this equipment was again demonstrated although it was not in constant use. One party hired the small portable compressor and mining equipment to sink a shaft and drive a tunnel on a gold prospect in the North East and one of the major exploration companies operating in the State made use of the large portable compressor to enable test work to be undertaken both in the North East and on the West Coast.

STATEMENT OF RECEIPTS AND PAYMENTS OF THE MINING TRUST FUND FOR THE YEAR ENDED
31st DECEMBER, 1963.

<i>Receipt.</i>			<i>Payments.</i>		
	£	s. d.		£	s. d.
Balance 31st December, 1962	3,038	15 2	Assistance	84,804	8 11
Loan Appropriation Act 1963-64	110,000	0 0	Maintenance tribute plant Mt. Bischoff		
Repayment of loans	12,095	5 11	Mine, Waratah	196	17 3
Interest on loans	496	13 2	Mining plant maintenance	135	19 6
Hire of mining plant	219	19 8	Miscellaneous	6	4 0
Tribute royalty	120	13 7			
Authorities to prospect	32	16 3		85,143	9 8
Miscellaneous	5	0 0	Balance to next Account	40,865	14 1
	£126,009	3 9		£126,009	3 9

STAFF

The following were the staff movements during the year:—

Name	Position	Remarks
Miss E. J. Cooley	Stenographer	Resigned
Miss M. K. Foster	Typist	Appointed
J. C. Goodrick	Caretaker—Magazine	Appointed
D. I. Groves	Geologist	Appointed
A. E. Hemsley	Inspector of Explosives	Retired
J. F. Liddy	Senior Metallurgical Engineer	Resigned
Brian Marshall	Geologist	Appointed
Miss C. L. McKillop	Typist	Resigned
S. M. Rowe	Geologist	Retired on account of ill health
C. P. Smith	Clerk	Appointed
W. R. Tindal	Mining Engineer and Inspector of Mines and Explosives	Appointed
Glen Urquhart	Geologist	Appointed
R. J. Voss	Draughtsman	Appointed
E. Williams	Senior Geologist	Appointed
K. Burns	Geologist	Resigned
R. C. Vivian	Mining Engineer and Inspector of Mines and Explosives	Resigned
E. Domoney	Draughtsman	Resigned
Miss K. L. Wileman	Office Assistant	Appointed

SCHOLARSHIPS

The holder of the geology scholarship, Mr. D. E. Leaman, completed the second year of a science course at the University of Tasmania. The Chemistry Scholarship holder, Mr. R. Skabo, obtained his Bachelor of Science degree but decided not to accept an appointment on the staff of the Department as required by the Scholarship Agreement.

No geology scholarship was awarded in 1963 but Mr. J. G. Pitcher was granted the Chemistry Scholarship to undertake studies at the University of Tasmania for a Science degree with chemistry as the major subject. On graduation he will be appointed to the staff of the Department's Chemical and Metallurgical Research Laboratories at Launceston.

MINES DRAUGHTING SECTION

Number of Working Plans in use and kept up-to-date	244
Working Plans renewed and additional plans brought into use	2
Manuscripts brought up-to-date for preparation	6
Lithographs entered to date for sale	142
Miscellaneous Plans and Tracings prepared	30
Mineral Survey Diagrams drawn	27
Mineral leases drawn	26
Mineral leases drawn subject to Survey	36
Copies of reduced charts prepared for the Launceston Office	11

CONCLUSION

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.

A detailed review of operations and production follows, and the reports of the Geological Survey Branch, the Chemical and Metallurgical Branch, the Mines and Explosives Branch, the Mount Cameron Water Race Board and the Ringarooma and Cascade Water Board are attached.

J. G. SYMONS, Director of Mines.

OPERATIONS AND PRODUCTION

1.—METALLIC MINERALS

CADMIUM

Quantity produced:—

	Tons.	Value.
1924-59	1,120	1,139,448
1960	52	83,498
1961	62	98,286
1962	72	128,173
1963	73	182,737
Total	1,379	£1,632,142

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 1.59 ton of cobalt oxide of value £1,748 was the same as that of cadmium above.

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	£
1919-1959	272	103,794	7,472	1,871,346	360,447	47,969,869	404	10,581	368,595	49,955,590
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
1962	33	10,103	1,014	309,379	12,902	3,935,110			13,949	4,254,592
1963			1,157	352,888	14,445	4,405,725			15,602	4,758,613
Total	339	£124,291	11,021	£2,966,783	409,297	£63,094,196	404	£10,581	421,061	£66,195,851

The Mount Lyell Mining and Railway Company, Limited, Queenstown

Mining—

	Tons
Overburden removed	2,206,097
Ore mined (West Lyell)	2,143,509
Ore mined (Crown Lyell)	22,859
Limestone delivered to works	9,621
Silica	Nil

Reduction—

	Tons
Concentrates smelted	54,028
Crown Lyell ore smelted	9,622
Precipitate smelted (North Lyell and Comstock)	22
Blister copper produced	14,547
Containing—	
Copper (tons)	14,445
Gold (fine oz.)	9,129
Silver (fine oz.)	62,771
Pyrite concentrate shipped	56,402
Total value of production	£5,003,185

Average number of men employed—

	No.
Mining:	
Open cut	244
Underground	82
Other	1,240
Total	1,566

Production from the inception to 31st December, 1963—

Copper (tons)	567,890
Gold (fine oz.)	594,525
Silver (fine oz.)	16,018,635

Mr. J. B. Braithwaite, Mining Engineer, reports that the increase of 1,543 tons in blister copper production was due mainly to the improved grade of ore delivered to the treatment plant, but the mill recovery also improved from 87.4% to 89.4% due to the increased use of mechanical flotation cells, more suitable xanthates and improvements in operating techniques. Coupled with the increased recovery there was also an increase in the grade of concentrate produced.

In the West Lyell open cut the use of A.N.-molasses explosive was discontinued as it had proved unsatisfactory. A trial was made with hydromex in wet holes and as this was satisfactory further testing will follow.

Underground mining continued in the Crown Lyell No. 2 mine but was limited to the production of copper bearing siliceous flux for the smelter. The exploration of a low grade quartzite orebody adjacent to the Crown Lyell No. 2 was continued by driving and diamond drilling. Development of the Razorback orebody commenced with a tunnel from the West Lyell open cut. The ore will be mined by shrinkage and sub-level methods and delivered by diesel truck to the West Lyell crushing plant. Underground development work consisted of:—

	Level	Driving Feet	Rising Feet
Crown Lyell No. 2	1,930	432	....
	No. 1	1,028	....
	No. 3	91	....
	No. 4	453	28
	No. 5 Sub	104	57
		<hr/>	<hr/>
		2,108	85
		<hr/>	<hr/>
Royal Tharis		547	71
Razorback		1,260	155
		<hr/>	<hr/>
Totals		3,915	311
		<hr/>	<hr/>

Diamond drilling consisted of 99 holes totalling 20,112 feet and was carried out at Lyell Comstock, North Lyell, Crown Lyell and Lyell Blocks.

During the year a change was made from rail to road transport between Queenstown and Strahan and this is expected to result in an appreciable reduction in operating costs. Government assisted in the change-over by carrying out major improvements to the road, which will be sealed. The labour force previously engaged in operating and maintaining the railway was all absorbed in the new road transport and other sections of the plant. Except for coke and explosives which are still landed at Regatta Point and pyrite which is shipped from the Pyrite Wharf, goods are landed or shipped at the Strahan wharf where a large enclosed yard has been built. An explosives magazine of 150,000 lb. capacity has also been built near Strahan and a 20-ton weighbridge and a transport control office have been built at Queenstown. The following vehicles have been brought into use:—

- 11 Side-tipping trucks.
- 2 Flat-top trucks.
- 1 Front-end loader.
- 2 Fork-lift trucks

The ore reserves as published at 30th June, 1963, were:—

	Tons.
West Lyell	18,030,000
North Lyell	2,500,000
Lyell Tharsis	800,000
Crown Lyell No. 2	60,000
Razorback	190,000
	<hr/>
	21,580,000
	<hr/>

Electrolytic Zinc Company of Australasia Limited, Rosebery

This company, reviewed under Zinc, produced 9,309 tons of copper concentrate containing 1,157 tons of copper valued at £352,888.

GOLD

Quantity produced—

	Fine oz.	Value £
Prior to 1959	2,472,029	13,279,514
1959	20,260	316,567
1960	23,015	359,613
1961	24,528	383,268
1962	28,673	448,017
1963	31,989	499,837
Total	<u>2,600,494</u>	<u>£15,286,816</u>

The Mount Lyell Mining and Railway Company Limited, Queenstown

This Company recovered 9,129 fine oz., valued at £142,642, from sludge in the electrolytic copper refinery.

Electrolytic Zinc Company of Australasia Limited, Rosebery

Concentrates produced by this Company contained 22,695 fine oz., valued at £354,606.

Storeys Creek Tin Mining Co. N.L. (Dorset Tin Division) South Mount Cameron

From the tin concentrates of this dredge (reviewed under Tin) 137 fine oz. of gold valued at £2,147, was recovered.

Savage River

A parcel of bullion mined and smelted at the Savage River in 1914 and containing 20.8 fine oz. was sold for £325.

Alberton

Mr. G. Watson sold 3.6 fine oz. obtained from the treatment of sulphide concentrates at Alberton. The value was £47.

Daylight Mine, Fingal

Mr. E. L. Clapp has taken over the Daylight Mine, Fingal, and has done a considerable amount of prospecting for no worthwhile result. His first work was an adit crosscutting the bedding opposite the adit driven by Messrs. Graham and Bean. Thirty feet of approach for the adit portal was removed and the adit driven 30 feet. This work was abandoned, and a move made up hill 250 feet where a shaft was sunk 48 feet and a crosscut driven west, 16 feet back towards the tunnel, and thence a winze sunk 11 feet. A move was then made north 500 feet where a shaft was sunk to 70 feet, and a crosscut driven west for 91 feet. The first shaft was sunk using the Department's compressor and rock drill plant. There was no production for the year but two men were employed.

IRON OXIDE

Quantity produced—

	Tons	Value £
Prior to 1960	87,040	84,764
1960	3,497	5,503
1961	2,309	3,827
1962	4,082	5,870
1963	4,221	6,004
Total	<u>101,159</u>	<u>£105,968</u>

Iron Cliffs Mine, Penguin

Mr. A. Pearson continued to work the secondary ore at the Iron Cliffs Mine and supplied a cement works with 4,161 tons of hematite valued at £5,731. Employment averaged two men. In addition 60 tons of limonite valued at £273 was supplied for use as a catalyst in coal gas generation.

LEAD

Quantity produced—

	Tons	Value £
1919-59	295,423	15,813,575
1960	12,183	1,218,381
1961	10,278	1,026,909
1962	11,605	947,714
1963	11,889	1,011,543
Total	341,378	£20,018,122

Electrolytic Zinc Company of Australasia Limited, Rosebery

This company, reviewed under Zinc, produced 15,513 tons of lead concentrates and the total content of the lead in the lead, zinc and copper concentrates was 11,368 tons valued at £967,603.

Farrell Mining Co. Ltd., Tullah

Ore mined and milled was 5,009 tons giving 808 tons of lead concentrates containing 520 tons of lead of value £43,980. The silver content is shown under that heading. The average number of men employed was 22 on the surface and 15 underground.

MANGANESE DIOXIDE

This is recovered as a sludge in the electrolysis of zinc sulphate at the Risdon works of the Electrolytic Zinc Company of Australasia Limited, the original source being the ore in its West Coast mines. The production of 325 tons was valued at £6337.

OSMIRIDIUM

Quantity produced—

	oz.	Value £
1910-59	31,088	708,531
1960 .....	.....	.....
1961 .....	.....	.....
1962 .....	.....	.....
1963 .....	.....	.....
Total	31,088	£708,531

PYRITE

Quantity produced—

	Tons	Value £
1915-59	1,275,534	2,562,903
1960	53,919	161,757
1961	71,087	213,261
1962	54,629	163,887
1963	56,402	169,206
Total	1,511,571	£3,271,014

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

SILVER

Quantity and value of production:—

Year	From Tin and other Ores		From Silver-Lead Ore		From Copper Ore		From Lead-Zinc Ore		Total	
	Fine Oz.	£	Fine Oz.	£	Fine Oz.	£	Fine Oz.	£	Fine Oz.	£
1919-59	88,148	36,189	17,303,361	2,691,087	3,411,475	571,431	16,571,544	5,094,362	37,374,528	8,393,069
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
1962	17,266	7,735	70,689	34,084	67,618	32,546	1,285,874	622,490	1,441,447	696,855
1963 .....	.....	.....	54,674	31,419	62,771	36,242	1,321,413	761,330	1,438,858	828,991
Total ..	121,787	£50,882	17,648,937	£2,850,467	3,635,311	£680,181	21,490,122	£7,464,955	42,896,157	£11,046,485

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

Producer	Source	Quantity oz.	Value £
E.Z. Co. of A/asia Ltd.	Copper & Lead Concentrate	1,321,413	761,330
Farrell Mining Co. Ltd.	Lead Concentrate	54,674	31,419
Mt. Lyell M. & R. Co. Ltd.	Refinery Sludge	62,771	36,242

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 46,355 mono tons, valued at £231,775.

TIN

Quantity produced—

	Tons	Value £
1873-59	144,021	31,352,197
1960	884	920,040
1961	879	1,022,094
1962	1,211	1,403,736
1963	1,005	1,192,513
Total	148,000	£35,890,580

Aberfoyle Tin N.L., Rossarden

Mr. L. W. Morris, Mining Engineer, Launceston, reports that the quantity of ore milled was 75,045 tons, a decrease of 4,165 tons under the preceding year.

In addition 39,150 tons of accumulated tailings were retreated.

Actual production was:—

	Concentrate Tons	Metal Tons	Value £
Tin	673	480	515,187
Wolfram	146	103	.....

Of the wolfram produced only £13,000 worth was sold, the greater part being stockpiled.

Capital works completed during the year comprised:—

Mine

- Two storage tanks for hydraulic fill for underground workings were erected at the south end of the mine together with necessary pumping and pipeline equipment. Total storage capacity for stope fill is now 400 tons.
- Completion of sand distribution pipelines to all levels of the mine where stoping is in progress.
- One 10' x 6' rod mill to provide sand from heavy media tailings for underground fill.
- Eight 15 h.p. and three 5 h.p. double drum scraper hoists underground.

Mill

- Erection of a heavy media separation plant for treatment of ore and stored tailings completed.
- Two tanks each of 100 tons capacity for storage of jig tailings when the gravity section of the mill is not working.
- Minor circuit modifications to improve mill efficiency.

Underground development comprised:—

	Feet
Driving	1,195
Crosscutting	111
Rising	575
Winzing	223
Total	2,104
Diamond drilling	360

Development and diamond drilling on the various levels was as follows:—

No. 3 Level.—Four hundred and fifty two feet of driving on parallel and branch orebodies; 29 feet of crosscutting between these drives, and 52 feet of rising for stope preparation.

No. 4 Level.—Two hundred and eleven feet of driving on parallel and branch orebodies, and 96 feet of rising for stope preparation.

No. 5 Level.—One hundred and three feet of driving on parallel and branch orebodies, 9 feet of crosscutting between these orebodies, 12 feet rising for stope preparation, and 28 feet of diamond drilling checking for parallel ore occurrences.

No. 6 Level.—Thirty feet of crosscutting following a diamond drill intersection of an 11 inch wide vein, 9 feet of rising for stope preparation and 66 feet of diamond drilling seeking parallel ore occurrences.

No. 7 Level.—Seventy feet of driving on a lateral extension south and 23 feet of prospecting rising at the end of the drive; 140 feet of winzing on a promising new western orebody; 126 feet of diamond drilling for possible parallel ore occurrences.

No. 8 Level.—Three hundred feet of driving of which 100 feet was on a lateral extension and the balance on parallel orebodies; 15 feet of crosscutting between orebodies; 178 feet of rising for stope preparation; and 140 feet of diamond drilling seeking possible parallel orebodies.

No. 9 Level.—Sixty-five feet of rising for stope preparation.

No. 10 Level.—One hundred and fourteen feet of rising for stope preparation, and 7 feet of winzing.

No. 11 Level.—Fifty-eight feet of driving on a lateral extension, 28 feet of crosscutting as part of a haulage drift, 26 feet of stope preparation rising and 76 feet of winzing on the western vein.

Total ore reserves as at the end of the year were 496,259 tons.

Average number of men employed was:—

Surface: 106.

Underground: 161.

Endurance Tin Mining Co. N.L., South Mount Cameron

This company treated 441,750 cubic yards from the Clifton Workings for the production of 101 tons concentrate, containing 76 tons of tin, valued at £89,905.

The average number of men employed was 25 in the open cut and 12 others, total 37.

Storeys Creek Tin Mining Co. N.L., Dorset Tin Division, South Mount Cameron

The dredge treated 453,000 cubic yards for the production of 67 tons of concentrate, containing 49 tons of tin valued at £56,475 and 137 fine oz. of gold, valued at £2,147.

Average employment was 42 men. The Dorset Extended area was worked out during the second quarter of the year and a start was made to move the dredge to the Black Duck-McGregor area north of Gladstone. At the close of the year this work was well advanced. The new pontoon was afloat and all frame work and main components of the treatment plant complete. Workshop, store and office accommodation was built on the new site and three houses were built at Gladstone.

Prospecting for both tin and kaolin was continued during the year. On Exploration Licence 3/61 fourteen 16" holes were completed by the Conrad machine for a total footage of 621', and fourteen 6" holes were drilled by a smaller machine for a total footage of 593'.

Storeys Creek Tin Mining Co. N.L., Storeys Creek

This company, reviewed under Tungsten, produced 131 tons of concentrates containing 97 tons of tin.

Renison Associated Tin Mines N.L., Renison Bell

This company mined 27,398 tons of ore from the Battery Workings and produced 352 tons of concentrates containing 227 tons of tin valued at £269,606. Development was mainly in the Battery area where 969 feet of rising and 1,750 feet of driving were completed, but there were also 67 feet of rising and 324 feet of driving in the Federal area to obtain further information on ore indicated by diamond drilling. In the mill a D.S.M. screen is undergoing a plant test following laboratory tests by the Department of Mines.

The average labour employed in the mine during the year was 25 men underground and 42 on the surface. Ore reserves indicated by diamond drilling are 4,000,000 tons of grade 0.7 per cent tin.

Star Hill Syndicate, Gladstone

This syndicate has continued to work two faces, one using an 8 in. gravel pump driven by a diesel engine, the nozzle water being delivered by a pump driven by an electric motor. The other face is worked by a nozzle, water pressure for which is delivered by a pump driven by an electric motor. Tailings disposal is by gravity through a tail race.

Production for the year was 25 tons of concentrate containing 18 tons of tin valued at £22,028 from 106,000 cubic yards of gravel handled. Average employment was five men.

Mussel Roe Mine, Pioneer

From his two working places near the Mussel Roe River Mr. V. Wood treated 55,500 cubic yards of gravel for the production of 28 tons of concentrate containing 20 tons of tin valued at £24,055. Average employment was four men.

Razorback Mine, Dundas

This mine operated by Messrs. Hodge and Bye produced 9 tons of concentrates containing 4 tons of tin valued at £5,063. A portion of these concentrates was produced during bulk sampling when the mine was under option to Aberfoyle Tin Development Partnership. The ore mined during sampling was from adits but later mining by the operators was in the open cut. Two men worked the mine throughout the year.

Mount Cleveland Mine, Luina

The Aberfoyle Tin Development Partnership continued drilling at Mount Cleveland until July when borehole No. 46 was completed, making a total of 5,347 feet of drilling. It was decided to drive an adit 300 feet below the outcrop in order to investigate the ore bodies indicated by diamond drilling. The route for an access road to the portal of the adit was surveyed and preliminary work was commenced in November. An average of three men was employed for the whole of the year, nine being employed in the last quarter.

Production by Small Workers

Many miners and prospectors throughout the State produced small quantities of concentrates by reason of either small-scale or part-time working. Hereunder their work is described under the headings of various districts.

MOUNT BISCHOFF

M. G. Glozier and Partner, Thompsons Lode: Operations by these two men were of a desultory nature. The rise between Nos. 4 and 3 levels was not completed during the year but a parcel of ore was stripped from the east wall of the rise and treated for a return of 0.332 ton of tin valued at £404.

W. Hankey, Websters Gully: In a determined bid to treat the Websters Gully alluvial hydraulically, Mr. Hankey installed a 51 h.p. engine and a 4 inch pump. His operations yielded 0.425 ton of tin valued at £527. Some promising values were disclosed in the mining.

B. Housego, North Lode: Working single handed and lacking equipment Mr. Housego mined a small high grade parcel of ore for the recovery of 0.295 ton of tin valued at £370. The ore had to be carried by hand in bags for 300 yards. Towards the end of the year lode mining was abandoned and construction of sluice boxes commenced on the lower side of the road for ground sluicing when the rain water is sufficient.

Jack Housego, Waratah Creek: Operating his tailings retreatment plant in Waratah Creek Mr. Housego recovered 0.952 ton of tin valued at £1,139.

E. Kelly, Don Hill: In partnership with another, Mr. Kelly sluiced a small paddock of alluvial ground for the recovery of 0.158 ton of tin valued at £190. A 3 inch pump was used, motive power being supplied by a 26 h.p. tractor.

D. Kenworthy, Pig Flat Dyke: Mr. Kenworthy experimented on and worked his tin dressing plant at weekends with disappointing results. The tin was of a very fine nature and the overall recovery was 0.066 ton of tin valued at £81.

G. Machen, Don Hill: Operating a 4 inch pump by means of a 26 h.p. diesel, Mr. Machen treated detritus hydraulically for the recovery of 1.612 tons of tin valued at £1,863. Employment averaged two men.

C. J. Neighbour, Don Hill: Work of a desultory nature on a small tribute area adjoining Mr. Machen's returned 0.153 ton of tin valued at £181.

F. Prouse: Spare time fossicking on Mt. Bischoff yielded 0.018 ton of tin valued at £20.

L. W. Wills, Black Tank: Part-time work on a lode on this tribute returned 0.039 ton of tin valued at £45.

DERBY

L. M. Barnett, Weld River: Between Moorina and Weldborough, Mr. Barnett produced 0.076 ton of tin valued at £98.

G. A. Cotton: Above the Cascade Dam, Mr. Cotton produced 0.075 ton of tin valued at £97.

C. Gibbons: From the Cascade River, Mr. Gibbons produced 0.146 ton of tin valued at £169.

R. Kerrison, Ringarooma River: Mr. Kerrison mined the beaches below Derby for 0.359 ton of tin valued at £476.

T. Merritt, Ringarooma River: Mr. Merritt mined the beaches for 0.695 ton of tin valued at £848.

W. Kerrison: Mr. Kerrison cradled various patches of wash to produce 0.193 ton of tin valued at £249.

A. G. Machen, Derby: Mr. Machen produced 0.900 ton of tin valued at £1,067 on a tribute from Briseis Tin N.L. situated in the Ringarooma River below the Derby bridge.

P. A. Richardson: Mostly from the upper Cascade River reaches, Mr. Richardson produced 0.782 ton of tin valued at £318.

A. R. Smith: Mostly from the Arba Mine, Branhholm, Mr. Smith produced 0.671 ton of tin valued at £822.

R. L. Rainbow, Banca Mine: Mr. Rainbow and Son continued to work the Banca Mine on a full time basis, using a diesel-driven pump for monitor water. Production was 3.004 tons of tin of value £3,506.

GLADSTONE

J. Bartels, Gladstone: Mr. Bartels and Son produced 1.583 tons of tin of value £1,894 from Cameron Creek. Lack of water limited operations.

Dunstan and King, Amber Hill: Messrs. M. J. Dunstan and W. King joined forces during the year and worked a deposit near Amber Hill, from which was produced 1.875 tons of tin valued at £2,255. This deposit was of limited extent and was almost exhausted at the end of the year. A move is being made to a deposit east of Gladstone. This party used a nozzle fed by gravity and an 8 inch gravel pump driven by a tractor.

S. R. Fletcher, Lark Creek: Mr. Fletcher produced 0.121 ton of tin valued at £138 from some shallow ground but has ceased mining.

Miscellaneous: Messrs. H. A. Fenton, A. G. Floyd, B. G. R. Groves, R. C. Lawry, C. W. and L. M. Moore, M. J. Moore, V. H. Moore, A. Richardson, F. D. Richardson, K. Richardson and V. B. Moore produced individually small quantities totalling 0.571 ton valued at £704, mostly by cleaning up old workings on a part-time basis. Mr. J. J. Wigram, who has left the district, received £30 from the sale of 0.027 ton of tin which he had mined sometime earlier.

MOUNT CAMERON-PIONEER

G. Cox, White Rocks: Mr. Cox worked full time on his prospect producing 0.941 ton of tin of value £1,129.

Messrs. Kerrison, Pioneer: Messrs. J., M. J. and B. Kerrison worked their claim near the Wyniford River using two monitors supplied with water from the tail race of the Frome Power Station. Production was 5.289 tons of tin valued at £6,350.

Messrs. E. Kerrison, G. L. Pitchford and B. L. Summers between them produced a total of 0.097 ton valued at £118 from cleaning up around old workings.

ST. HELENS

M. G. Bevan: Mr. Bevan produced 0.251 ton, valued at £295, by cleaning up around old dumps in the Argonaut area.

A. B. Counsel: Mr. Counsel produced 0.095 ton, valued at £112, from some very poor shallow ground near the Rosebud Mine. He is now working full time in the Argonaut area.

H. Moses: Mr. Moses produced 0.637 ton, valued at £737, from his mine in the Transit area.

J. P. Reynolds: Mr. Reynolds is working shallow ground in the Saxelby Creek area, but is hampered by lack of water. His production was 0.219 ton, valued at £271.

D. Bailey: Mr. Bailey produced 0.073 ton, valued at £86, by cradling on a part-time basis.

MATHINNA

Messrs. A. and G. J. Miller worked a small very rocky deposit on Ding Dong Plains for the production of 0.317 ton, valued at £366. They have now ceased production.

MOORINA-WELDBOROUGH

W. L. Boon: Mr. Boon works his claim near the Weld River continuously, and produced 0.688 ton, valued at £830.

Messrs. J. and M. Lambert produced from the old school ground and vicinity at Weldborough. Their production was 1.249 tons, valued at £1,469.

Miscellaneous: Messrs. E. W. Amos, A. J. Mullins, E. M. Mullins, F. J. Mullins, H. J. Mullins, A. Richards, E. Russell and H. W. Terry produced individually small quantities from old mine tailings in the district. Their total production was 1.244 tons, valued at £1,425.

GIPPS CREEK

Messrs. Hayes and Sutcliffe operated a small mine and mill at Gipps Creek at week-ends. They produced 0.223 ton, valued at £275 during the year. At the close of the year, a parcel of 100 tons was being mined for treatment at the mill of the Storeys Creek Company.

WEST COAST

C. D. King, Port Davey: The only ore mined in the south-west was tin ore, by Mr. King at the Melaleuca Mine. The deposit being worked is detrital and only two to three feet deep under a button grass swamp. The mining and treatment consist of stripping the button grass and mud from a small area with a bulldozer and then dozing the wash to the head of a sluice box. Low pressure water for the box is obtained direct from a wide race cut through the swamp while a portable pump delivers enough high pressure water from the race to break up the wash and force it through a screen into the box. Production was 1.59 tons of tin valued at £1,937.

P. Towndrow, Exe River: This lode mine was closed down during the year after a production of 0.013 ton of tin valued at £15. The plant was dismantled.

A. S. Smith, North Heemskirk: Mr. Smith produced 0.606 ton of tin valued at £691 from his alluvial workings.

MISCELLANEOUS

There are many small producers, some of whom produce tin as a week-end pastime. In a number of these cases, the locality from which production takes place is difficult to fix, as a few pounds are often produced from several places. Among such producers are:—

- Mr. D. Dicker, Gordon.
- Mr. E. J. Holmes, Branhholm.
- Mr. F. Coombe, Derby.
- Mr. R. Saunders, Derby.
- Mr. R. J. Wolfe, Derby.
- Mr. K. Banks, who lives in Launceston.
- Mr. T. Fitzallen, Avoca.
- Mr. H. N. Haas, Scamander.
- Mr. W. F. Marshall, who lives in Launceston.
- Mr. E. W. Amos, Moorina.
- Mr. M. B. Whittaker, Scottsdale.
- Mr. T. Longley.
- Mr. A. Hartnett.

Total production from these gentlemen was 0.816 tons, valued at £1,002.

TUNGSTEN (SCHEELITE)

Quantity produced:—

	Tons (Concentrates)	Value £
1917-59	15,310	16,544,276
1960	420	265,382
1961	1,022	505,758
1962	984	328,734
1963	1,010	279,103
Total	<u>18,746</u>	<u>£17,923,253</u>

King Island Scheelite (1947) Ltd., Grassy

Mr. L. F. Egan, Mining Engineer, Burnie, reports as follows:—

Mining.—A total of 411,071 tons of material was removed from the open-cut. Of this total, 197,525 tons was ore, and the remainder overburden and low-grade material. On the 70 foot level, the footwall bench was completed to design limits and the 40 foot level was well advanced. Ore was mined on the 10 foot, 20 foot and 50 foot levels.

Ore Reserves.—Ore reserves to the 110 foot horizon at 31st October, were 1,672,900 tons of an average tungstic acid content of 0.517%.

Equipment.—A Gardner-Denver "Air Trac" drill and compressor was purchased and commissioned in April and an "Air Viva" resuscitator installed in the first aid room.

Blasting.—The use of Ammonium Nitrate-Fuel Oil mixture in primary blasting was increased to 59% by charging wet holes inside a polythene tube. The loading density resulting from a smaller effective diameter was rather low, and required closer spacing of blast holes. A blast hole loader was purchased for charging dry horizontal holes with the mixture.

Milling.—Production was 1,010 tons of concentrate valued at £279,103. The concentrate grade was 69% tungstic oxide and the recovery was 72%.

Employment.—An average of 120 men were employed.

TUNGSTEN (WOLFRAM)

Quantity produced:—

	Tons (Concentrates)	Value £
1899-1959	11,337	7,227,067
1960	1,106	731,653
1961	812	416,184
1962	929	400,192
1963	382	111,651
Total	<u>14,566</u>	<u>£8,886,747</u>

Aberfoyle Tin N.L., Rossarden

Wolfram concentrates produced contained 103 tons of WO_3 valued at £41,105. This company is reviewed under Tin.

Storeys Creek Tin Mining Co. N.L., Storeys Creek

Tonnage of ore delivered to the mill was 25,515 tons, 1,699 tons less than the previous year. Sales of wolfram have again been very slow and a total of only £26,309 was realized from this source, the balance of production being unsold at the close of the year.

Production from the ore treated was:—

	Concentrates Tons	Metal Tons	Value £
Wolfram	237	173	.....
Tin	131	97	104,090

Of the wolfram produced only £26,309 worth was sold, the greater part being stockpiled.

Underground development comprised:—

	Feet
Driving	1,315
Crosscutting	21
Rising	172
Total	1,508

Development and diamond drilling on the various levels was:—

No. 2 Adit.—One hundred and seventy eight feet driving north on the lateral extension of No. 1 vein and 10 feet driving south on the lateral extension of No. 1 vein, east branch.

No. 1A Level.—Twenty-seven feet driving north on the lateral extension of north hanging wall vein.

No. 3 Level.—One hundred and thirty-four feet driving north on the lateral extension of the foot wall tin vein; 147 feet driving south on the lateral extension of No. 1 vein; 100 feet driving south at 26-245 on the extension of No. 1 vein.

No. 4 Level.—Thirty-seven feet driving north on the lateral extension of the foot wall tin vein; 27 feet driving north from 34-252 on the lateral extension of the foot wall tin vein; 48 feet driving north from 34-263 on the lateral extension of the footwall tin vein; 38 feet driving south from 34-260 on the lateral extension of the footwall tin vein; 20 feet driving south from 34-263 on the lateral extension of the footwall tin vein; 131 feet driving south from 34-254 on the lateral extension of the footwall tin vein; 150 feet driving south from 26-243 on the lateral extension of No. 1 vein; 35 feet raising an ore pass.

No. 5 Level.—Sixty-two feet driving south on the lateral extension of No. 1 vein (South).

No. 6 Level.—Fifty-six feet driving south on the lateral extension of No. 1 vein (South); 21 feet of crosscutting to No. 1 vein at 2,740 north; 22 feet raising an ore pass at 2,500 north-east; 22 feet raising an ore pass at 2,650 north-east; 17 feet rising to intersect No. 1 vein at 2,700 north; 20 feet raising an ore pass at 3,250 north.

No. 9 Level.—Twenty-nine feet driving south on the lateral extension of the hanging wall vein; 56 feet rising at 3,010 north to explore S.C. 5 vein.

A total of 600 feet of diamond drilling was completed in exploration for parallel or branch orebodies.

No surface capital works of any magnitude were completed during the year. Underground a small electric trammig locomotive was purchased and installed on No. 6 Level during the year. The average number of men employed was 25 on the surface and 43 underground. The ore reserves at the close of the year were 286,595 tons.

ZINC

Quantity produced:—

	Tons	Value £
1919-59	581,638	31,776,812
1960	27,191	3,054,714
1961	31,794	3,237,863
1962	38,168	3,816,812
1963	38,589	4,018,785
Total	717,380	£45,904,986

Electrolytic Zinc Company of Australasia Limited

EXTRACTION FROM CONCENTRATES: RISDON

From other than Tasmanian Ores—

	Tons
Zinc	94,893
Cadmium	232
Cobalt Oxide	23
Superphosphate	84,075

<i>From Tasmanian Ore—</i>	
Zinc	40,888
Cadmium	80
Cobalt Oxide	1.58
<i>Manufactured product—</i>	
Ammonium Sulphate	30,226
<i>Men employed—</i>	
The average number of men employed: 2,756.	

WEST COAST DIVISION

<i>Ore Mined—</i>	
	Tons
From Hercules Mine	28,451
From Rosebery Mine	265,444
Total	<u>293,895</u>

<i>Concentrates Produced—</i>	
	Tons
Zinc Concentrates	81,168
Lead Concentrates	15,513
Copper Concentrates	9,309
Total	<u>105,990</u>

<i>Recoverable Quantity in Ore Mined—</i>	
Zinc	38,589 tons
Lead	11,368 tons
Copper	1,157 tons
Cadmium	73 tons
Silver	1,321,413 oz. (fine)
Gold	22,694 oz. (fine)
Cobalt Oxide	1.58 tons
Manganese Dioxide	325 tons
Zinc Sulphate	355 tons
Sulphate and Sulphuric Acid	46,355 mono-tons

Total Value of Production—£6,784,933.

Average Number of Men Employed—

Hercules Mine	40
Rosebery Mine	675
Total	<u>715</u>

ROSEBERY AND HERCULES MINES

Excluding driving and rising work in connection with sub-levels and ore passes from main to sub-levels, development at the Rosebery mine consisted of:—

<i>Driving on—</i>		Feet
No. 15 Level		19
No. 14 Level		738
No. 13 Level		643
No. 12 Level		145
No. 11 Level		148
Total driving		<u>1,693</u>
<i>Rising from—</i>		Feet
No. 14 Level		280
No. 13 Level		795
No. 11 Level		166
Total rising		<u>1,241</u>

In connection with the deepening of the main shaft a winze was sunk 354 feet and it is intended to continue this to No. 17 Level before commencing to rise to connect with the bottom of the shaft below No. 14 Level. The drive on No. 15 Level is from this winze to the site of the proposed No. 15 Level Plat.

Development at the Hercules mine consisted of:—

	Feet
Winzing from 3A Level	41
Rising from 6 Level	57
Rising from 5A Level	47
Rising from 3A Level	52
Total rising	156

Diamond drilling during the year consisted of 3,043 feet of development holes and 4,542 feet of exploration holes at Rosebery and 364 feet of development and 1,194 feet of exploration at Hercules. The development drilling at Rosebery included 1,180 feet of pilot and ventilation holes.

Both mines operated satisfactorily during the year at much the same rate as in 1962 and there were no major changes in methods in either the mines or the mill. The new pumping and transformer station on the No. 14 Level was completed and is working successfully.

RISDON WORKS

Additions to the plant at Risdon during the year included:—

The completion of No. 5 Cell Unit and the associated spent solution cooling towers in the Electrolytic Division.

The completion of the Aluminium Sulphate Plant.

Two new rectifiers, Nos. Z3 and Z4, were installed and brought into service and the new Power Control Centre building was completed.

A 17-ton reverberatory furnace was installed in the Zinc Products Division.

A new crib room was built in the Casting Division and a new change house constructed adjacent to No. 3 Change House.

In the Assay Office a new polychromator was installed and extensive improvements were made to the building.

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 355 tons and value £19,515.

2.—NON-METALLIC MINERALS

CLAY

Quantity produced—

	Cubic Yards	Value £
1958-59	247,026	174,796
1960	116,038	113,607
1961	115,860	112,372
1962	113,669	121,786
1963	116,352	113,978
Total	708,945	£636,539

Company	Clay cu. yd.	Value £	No. of Men	Product
Agripipe Pottery Pty. Ltd., Relbia	740	370	4	Pipes
Burnie Brick Co., Cooe	8,000	2,955	13	Bricks
John Campbell Pty. Ltd., Launceston ..	2,130	624	9	Pipes
Crisp & Gunn Co.-op. Ltd., West Hobart	— 17,234	21,543	46	Bricks
Goliath P. C. Co. Ltd., Railton	8,391	11,473	3	Cement
Hobart Brick Co., New Town	— 10,201	12,750	29	Bricks
Huttons Bricks Pty. Ltd., Prospect	10,320	5,502	17	Bricks
King's Bay Contractors, Kingston	— 7,078	2,832	1	Bricks
Luck Brick & Pipe Pty. Ltd., Dulverton	9,606	8,983	19	Bricks
Machens Bricks, Kings Meadows	17,380	17,380	20	Bricks
McHugh Bros. Bricks Pty. Ltd., Granton	— 12,000	15,000	28	Bricks
McHugh Bros. Pty. Ltd., Hamilton	1,948	3,242	4	Bricks
McHugh Bros. Pty. Ltd. Launceston ..	7,130	7,130	11	Bricks
Wunderlich Pty. Ltd., Loira & Launces- ton	1,250	1,250	23	Tiles

DOLOMITE

Quantity produced—

	Tons	Value £
Prior to 1960	16,146	47,599
1960	2,678	6,947
1961	1,108	3,155
1962	2,217	6,734
1963	2,623	8,139
Total	24,772	£72,574

Circular Head Dolomite and Trading Co. Pty. Ltd., Smithton

This company, the sole producer, employed an average of two men and increased production by 406 tons. The stone is milled for top-dressing in agriculture.

KAOLIN

Quantity produced—

	Tons	Value £
1940 to 1959	108,284	426,782
1960	964	5,062
1961	1,232	6,383
1962	606	3,282
1963 .....	.....	.....
Total	111,086	£441,509

Storeys Creek Tin Mining Co. N.L. (Dorset Tin Division), South Mount Cameron

This company drilled 109 holes of total footage 3,629 in testing clay deposits in the Scott's Area. Research in treatment methods was continued preparatory to the construction of a plant to produce high quality clay for use in papermaking.

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	£
1919-59	3,359,713	1,882,679	525,606	624,480	3,978,041	2,123,425	462,087	527,678	8,325,447	5,158,262
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
1962	233,142	228,286	28,374	46,743	35,695	64,933	21,327	30,931	318,538	370,893
1963	272,117	266,447	26,782	50,630	32,463	49,238	23,103	42,289	354,465	408,604
Totals ..	4,150,272	2,615,218	631,685	810,245	4,095,911	2,331,934	539,132	646,990	9,417,000	6,404,387

Australian Commonwealth Carbide Company Ltd., Ida Bay and Electrona

This company quarried 26,782 tons of limestone valued at £50,630 at Ida Bay and employed 26 men. The limestone was transported by sea to Electrona and used in the manufacture of calcium carbide. Production amounted to 13,259 tons and 162 men were employed. Production of acetylene black was 221 tons and eight men were employed in this section of the plant.

Goliath Portland Cement Co. Ltd., Railton

Limestone quarried and processed in the manufacture of cement weighed 272,117 tons and was valued at £266,447. Employment averaged 20 men in the quarry. Overall cement production totalled 201,355 tons valued at £1,158,468. Of this, 127,267 tons valued at £837,252 was fine cement and 74,088 tons valued at £321,216 was clinker cement. An interesting development was the construction of a new access road to the works to allow the mining of the old road into the quarry. Average employment at the works excluding quarry personnel was 258.

Wright Stephenson Pty. Ltd., Pulbeena

In addition to the production of 6,628 tons of limesand sold for £8,285, development work consisting of stripping of light surface overburden, trenching, blocking out and draining was a major phase of operations.

Melrose Agricultural Lime Quarries, Eugenana

Ground limestone production for agricultural purposes was 3,521 tons valued at £6,552, affording employment to an average of eight men. This is approximately 700 tons less than the previous year, the employment being two less.

Railton Limeworks, Railton

This company ceased quarrying its own limestone at the end of June and thereafter derived its supplies of limestone from the Goliath Portland Cement Company. Limestone crushed and milled was 11,210 tons altogether valued at £19,156. Average employment as a result of the closure of the quarry dropped from nine men in the first half of the year to two men in the second half of the year.

Mineral Supplies, Ulverstone

Sales of stocks on hand by this company amounted to 10 tons valued at £74.

Australian Newsprint Mills Ltd., Junee

This company quarried 5,516 tons of limestone valued at £12,187 at Junee to be burnt at Boyer for use as a chemical reagent. The average number of men employed was six.

The Mount Lyell Mining and Railway Co. Ltd., Halls Creek

This company, reviewed under Copper, mined 9,621 tons of limestone for metallurgical purposes. The value was £15,844 and three men were employed. During the year the quarry was connected to Queenstown by road and rail transport ceased.

A. R. Beams, Flowery Gully

From his quarry, crushing plant and lime kiln, Mr. Beams produced:—

		£
747	tons agricultural limestone, valued at	2,241
16,681	tons limestone for chemical and metallurgical purposes, valued at	20,017
410	tons burnt lime for various purposes, valued at	5,005
<u>17,838</u>	tons Total Value	<u>£27,263</u>

Fourteen men were employed.

R. K. Sulzberger, Launceston and Flowery Gully

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

		£
513	tons agricultural limestone, valued at	985
645	tons limestone for chemical and metallurgical purposes, valued at	1,190
<u>1,158</u>	tons Total Value	<u>£2,175</u>

Two men were employed.

OCHRE

Quantity produced—	Tons	Value £
1918 to 1959	2,068	5,686
1960	31	219
1961	75	509
1962	60	390
1963	51	328
Total	2,285	£7,132

A. Pearson, Spalford

Production of ochre from this pit was 51 tons valued at £328.

PEBBLES**A. Pearson, Ulverstone**

The collection of pebbles for grinding was continued on the beaches around Ulverstone. The output was 518 tons, valued at £3,793.

SILICA

Quantity produced—	Tons	Value £
1936-59	155,991	99,540
1960	5,231	6,885
1961	1,415	2,042
1962	514	3,054
1963	2,641	2,965
Total	165,792	£114,486

Mineral Supplies, Ulverstone

This firm supplied 248 tons of silica valued at £692. Of this, 221 tons were extracted from the Leven River pit for use in cement manufacture and 27 tons were mined at the Forth quarry for use as a metallurgical flux.

Australian Glass Manufactures Ltd., South Arm

This company obtained 2,393 tons of silica sand valued at £2,273 for the manufacture of glass.

3.—CONSTRUCTION MATERIALS

BUILDING STONE

Quantities produced—	Cubic Yards	Value £
Freestone	1,079	6,673
Granite	34	4,030
Other	232	109
	1,345	£10,812

Freestone was quarried and dressed in two quarries near Hobart for walls, fireplaces and paving. A quartz schist was put to similar usage at Burnie. Interest in the granite at Coles Bay continued and a small production resulted.

CRUSHED AND BROKEN STONE

The largest producers were Government and semi- and local government authorities, accounting for 373,613 cubic yards of crushed and broken stone valued at £492,248. Dolerite, being both suitable and widespread, was quarried most extensively for road and concrete making.

Basalt			
Quarry	Men	Cu. yd.	Value £
A.F.H., Surrey Hills	6	14,720	14,720
A.N.M., Maydena	3	16,534	13,783
Bonney, Mooreville	5	10,600	7,950
Brighton Council	2	8,470	6,352
George Town Council	.....	300	300
Haines, Dove River	1	8,500	6,375
H.E.C., Meadowbank	12	18,341	22,206
Weily, Bridgewater	9	23,248	17,436
Wynyard Council	6	3,382	5,418
Total	44	104,095	£94,540

Hydro-Electric Commission, Meadowbank

The Commission opened a basalt quarry at Meadowbank and erected a fully mechanized crushing and screening plant producing all sizes of material required for concrete aggregate for the dam. The various sizes of material are stockpiled over chutes feeding a conveyor belt installed in a tunnel.

Dolerite			
Quarry	Men	Cu. yd.	Value £
Bain, Dynnyrne	10	17,850	17,850
Cygnat Council	9	15,000	11,250
Flagstaff Gully	2	6,392	4,794
Gordon, Glenorchy	2	6,100	5,100
Grubb, Moonah	8	22,030	25,698
H.E.C., Poatina and Arthurs Creek	21	155,698	202,083
Hobart, New Town	28	150,268	162,665
Kingborough Commission	5	11,500	14,000
Launceston, Mowbray	17	44,914	54,796
McHugh, Waverley	8	6,979	9,421
Rouse, St. Leonards	5	12,091	15,362
Others	144	148,715	226,354
Total	259	597,537	£749,373

Hobart Quarries Pty. Ltd., New Town

This company increased its output by 10% on last year's and made many improvements in plant and layout. There are now three benches on each side of the access road and it is intended that the only high face remaining will be divided into two as soon as possible. Most of the drilling is now done with a Gardner Denver "Air Trac" machine drilling 3" holes to 60 feet if necessary. The holes are column loaded with ANFO and fired with milli-second delay detonators and noise and vibration are negligible. New magazines and an ANFO mixing shed have also been constructed and are in use.

Limestone			
Quarry	Men	Cu. yd.	Value £
Devonport Council	.....	540	404
Melrose, Eugenana	4	2,454	2,640
Weily, Glenorchy	15	24,017	30,021
Walter, Claremont	1	1,665	1,498
Total	20	28,676	£34,563

Other Stones			
Quarry	Men	Cu. yd.	Value £
A.N.M., Maydena	1	1,318	4,936
Burnie Council	1	4,410	3,307
Devon Metal Supplies, Devonport	10	15,330	14,275
Devonport Council	1	4,872	2,972
Flagstaff Gully	1	3,362	3,026
Electrolytic Zinc, Rosebery	2	1,106	2,212
Gordon, Glenorchy	3	9,800	8,800
Mt. Lyell Co., West Lyell	4	33,032	48,824
Sorell Council	3	24,606	18,454
Others	7	11,821	10,213
Total	33	109,657	£117,019

The Mount Lyell Mining and Railway Co. Ltd., Queenstown

This company operated a crushing plant at West Lyell and produced 33,032 cu. yd. of material screened to various sizes and valued at £48,824. The rock treated in the plant consisted entirely of hard waste from the copper mining operations. It was mostly required for their own use on quarry roads but some was supplied to the Public Works Department and to the Queenstown Council. Four men were employed.

GRAVEL				
	Pit	Men	Cu. yd.	Value £
ME	Beaconsfield Council	2	25,958	12,979
ME	Deloraine Council	2	21,032	10,516
S	Esperance Council	2	12,277	6,139
ME	Fingal Council	5	15,281	8,141
S	New Norfolk Council	2	13,252	6,626
ME	George Town Council	3	39,410	32,359
ME	Ringarooma Council	2	20,825	10,412
ME	Scottsdale Council	1	16,310	8,155
ME	Westbury Council	1	19,534	9,767
ME	Woodfield and French, Launceston	12	50,136	50,136
	Government Departments	41	502,408	253,638
	Others	20	437,559	225,444
	Total	93	1,173,982	£634,312

SAND				
	Pit	Men	Cu. yd.	Value £
S	Clarke, Huonville	1	3,777	5,644
	H.E.C., Poatina		12,384	18,592
	H.E.C., Meadowbank		2,831	2,831
ME	Bonney Bros., Calder		4,080	2,040
S	Grubb & Sons, South Arm	1	6,612	3,306
S	Harrison, South Arm	1	3,830	1,915
S	Long, South Arm	4	40,350	20,175
S	Males, South Arm	1	3,400	1,700
ME	Woodfield & French, Launceston	1	3,846	3,434
	Others	2	24,413	13,511
	Total	11	105,523	£73,148

OTHER ROADMAKING MATERIALS

	Pit	Men	Cu. yd.	Value £
	H.E.C., Arthurs Lake	24	59,162	76,292
	Woodfield & French, Launceston		22,576	17,266
ME	Circular Head Council	2	5,959	2,980
	Others		12,928	7,114
	Total	26	100,625	£103,652

4.—FUEL MATERIALS**COAL**

Quantity produced—

	Tons	Value £
Prior to 1959	7,741,046	8,444,075
1959	299,368	621,494
1960	297,670	673,543
1961	255,828	611,140
1962	272,342	647,574
1963	206,922	429,422
Total	9,073,176	£11,427,248

Mr. W. R. Tindal, Mining Engineer, reports that there was a drop in production of 65,420 tons of coal, equivalent to 32%. The number of employees decreased from 227 to 167, of whom 92 were employed underground. The production per man year increased from 1,878 to 2,249 tons for underground employees and from 1,200 to 1,299 overall.

The fall in production has been caused by loss of markets due to increased use of fuel oil.

Cornwall Coal Mine, Cornwall

The production from this colliery operated by the Cornwall Coal Company N.L. has been obtained from areas called the Gully and Eastern Sections.

Gully Section

In this area the production has been confined to the 4' 9" or Hitit Seam. Entry to this section has been by Blair's Tunnel through worked out areas, and workings have been confined to a section between the Mt. Nicholas Fault and the Gully Fault. Headings off Blair's Tunnel have been driven to within 239 feet of the outcrop and it is the intention of the company to drive to surface. In addition panels have been driven further inbye of the headings.

This section is fully mechanized using a continuous miner loading into shuttle cars which discharge into skips on the endless rope haulage. The height of the workings is approximately eight feet and there is a good coal roof and a reasonable floor. The workings are just damp enough for good working conditions.

Eastern Section

Production from this section has been on both the Hitit and Blue Seams using mechanized equipment, namely loaders, cutters, borers and shuttle cars. The coal is loaded into 3-ton bottom dumping skips which are transported to the surface by battery locomotives. These skips are then taken to the pit top at Blair's Tunnel by a diesel locomotive. Production in the early part of the year was wholly from the Hitit Seam. A drift was driven from the Hitit Seam to the Blue Seam and when the necessary connections, bins and conveyors had been made and installed, work in the Hitit Seam was stopped and the production for the remainder of the year was from the Blue Seam, the thickness of the coal being between seven and eight feet.

The total production from this colliery was taken by rail to Fingal to the company's washery. Annual production for this colliery was 72,506 tons, a fall of 32,762 tons compared to the previous year. The number of employees fell from 105 to 65, but there was an increase in overall production per man year from 1,003 to 1,115 tons. Future operation of this colliery is dependent on availability of markets.

Duncan Coal Mine, Fingal

The workings of this colliery, operated by the Cornwall Coal Co. N.L., have been confined to one seam, the seam which is being working in the Fingal Colliery. The seam is between eight and 10 feet high with a very good roof and a soft mudstone floor which, if water is present, has a tendency to break up.

Contract miners have been employed in making the necessary connections and advancing the main headings for future panels.

Conventional mechanical units are used in the panels operating to the right of the main headings towards the Fingal Coal Mine, namely, loaders, cutters, borers and shuttle cars. The shuttle cars load onto trunk conveyor belts which discharge into skips on the endless rope haulage. The coal is then conveyed by motor lorry to the company's washery.

Production from this colliery was 71,748 tons, an increase of 1,899 with the same number of employees, namely 45. This gives an increase of overall production per man year from 1,552 to 1,594 tons.

Fingal Coal Mine, Fingal

In the Fingal Colliery, the Fingal Coal Co. Pty. Ltd. has been extracting pillars to the left of the main headings along the Duncan Colliery boundary, working a virgin area on the left hand side in the re-entrant block into the Duncan Colliery area, and developing a new section on the right hand side of the main headings for future extraction.

The seam in the pillars and the virgin area has an approximate height of eight feet but decreases to about six feet in the development area. The roof is weak and requires much support but the floor is good.

At the close of the period all work was being concentrated in the new development headings being driven in the form of a panel to open up a virgin area below the old workings of the Tasmania Colliery.

Hand mining, using power borers, is carried out on a contract basis. The skips are drawn by horses to the main-and-tail haulage which hauls the skips to the surface. The coal is crushed and sold without further treatment, being taken by motor lorry to rail.

Production from this colliery was 21,747 tons, a decrease of 395 tons with the same number of employees, namely 17. There was a decrease of overall production per man year from 1,303 to 1,279 tons.

Tasmania Coal Mine

This colliery was operated by the Fingal Coal Co. Pty. Ltd. for the first four months of the year and was closed down because it did not comply with safety and ventilation requirements. The same seam was worked as in the Fingal Colliery, the workings being steep and disturbed by faulting. The height of the seam was six feet and the roof and floor are reasonably good. The coal produced was sold without any treatment and transported to rail by motor lorry. The production up to the time of closure was 695 tons produced by two men.

Valley No. 2 Coal Mine, Fingal

The Valley Coal Co. Pty. Ltd. commenced production from this colliery at the beginning of 1963 and two main headings have been developed for approximately 200 yards. Workings to the right and left have been made off the main headings. The workings to the left have been in very poor roof conditions requiring the use of heavy timber supports. These workings were worked early in the year, and since then all work has been concentrated in the right hand side towards the abandoned Valley No. 1 Coal Mine. Roof conditions are better on this side with the height of coal being five feet.

The coal is cut by a coal cutter and after being shot is loaded out by hand on contract. Horses are used inbye to bring the skips out to the main bye and thence a main-and-tail haulage takes the skips to the surface. There they are dumped into a bin and the coal transported to rail by motor lorries.

Production was 11,643 tons, 12 men being employed with an overall production per man year of 970 tons.

Seymour Coal Mine, Seymour

Messrs. Yates and Haas carried on work at this colliery with a small number of men.

The seam is 3' 6" high with a very good roof and floor. The method of mining has been by hand using a battery-operated power borer. The coal was hauled to the surface by a winch driven by a petrol engine. The coal is sold as mined and carted by motor lorry to rail at St. Marys.

Production from this colliery was 4,362 tons, an increase of 572 tons, with the same number of employees, namely three. The overall production per man year increased from 1,263 to 1,454 tons.

New Stanhope Coal Mine, Avoca

The whole of the production from this colliery was obtained in completing the first working of the virgin area remaining on the left hand side of No. 1 Tunnel.

Preparations were being made to enable part of the production in 1964 to be obtained from pillar extraction in the area worked during 1963.

The new No. 2 Tunnel was driven for a distance of 25 yards to work the virgin area to the right of the workings of No. 1 Tunnel. This tunnel is angled so that the belts and conveyors to be installed will discharge direct into the pit top bins at No. 1 Tunnel.

The seam worked is seven feet high with a good roof, disturbed in places by faulting, and a very good floor. Coal is won by means of grunching and loaded onto scraper conveyors by a calfdozor driven by an electric motor. The scraper conveyors discharge into skips which are taken to the surface by a main-and-tail haulage.

The coal after crushing to minus 6" was screened and the minus 6" plus 1½" sold uncrushed. The minus 1½" was washed on a Deister table.

Motor lorries are used to transport the coal to rail at Avoca.

Production from this colliery was 17,986 tons, an increase of 2,714 tons with the same number of men, namely 13. Overall production per man year increased from 1,172 to 1,384 tons.

Mount Christie Coal Mine, Avoca

Mr. R. C. Fenton worked a very small area of coal near a major fault with consequent very steep grades. The seam is eight feet high with a stone band, 9" thick, in the middle. The top ply is grunched in for 10 feet, the full width of the bord, and loaded out. The stone is then lifted and stowed and the bottom ply shot up and loaded. Transport to the surface is by direct haulage and the coal is dumped into a bin without further treatment and transported to rail at Avoca by lorry.

Production was 1,801 tons, an increase of 38 tons for the year with the same number of men, namely two. There was an increase in the overall production per man year from 881 to 900 tons.

Merrywood Coal Mine, Avoca

Due to loss of orders the mine closed down at the end of 1962 but 1,362 tons of coal was recovered from stockpiles. The plant and machinery have been sold and very little now remains at the site.

Langloh Coal Mine, Hamilton

The Hamilton Coal Co. ceased operations at this colliery during the year owing to loss of markets, which was primarily due to the high cost of production. The seam was in two plies with a stone band in the centre. The band increased in thickness and reached a stage where for every skip of coal a skip of stone had to be hauled. A cutter was used to cut a kerf in the stone and the face then fired. Due to bad roof conditions and the stone band it was necessary to use heavy timbers and lagging on the roof and sides. Up to the time of closure 991 tons of coal were produced by four employees.

Sandfly Coal Mine, Kaoota

Mr. O. L. Roberts produced a semi-anthracitic coal for use in hop kilns.

The seam is very low, being only 3' 6" high. After a false roof of six to nine inches is taken down the roof is very good and the floor is good also. The coal being produced is from a small area between the workings off the present tunnel and the old adjoining mine.

Production from this colliery was 2,081 tons, an increase of 332 tons, from four employees, giving an overall production per man year of 520 tons compared with 471 in the previous year.

5.—FOREIGN ORES

The total value of the metallurgical products of four large works treating foreign ores imported into Tasmania was approximately £23,978,797.

ALUMINIUM

Comalco Aluminium (Bell Bay) Limited expanded its productive capacity at Bell Bay to 52,000 tons of aluminium per year, but actual production was hampered by an electrical failure and a deficiency of electric power. The quantity of bauxite treated was 88,717 tons and 30,650 tons of aluminium ingot was smelted. In addition 101 tons of alumina was exported. The average number of persons employed was 1,011.

The following capital works were completed during the year:—

1. Extra furnace room consisting of 84 furnaces.
2. Extension of the carbon block baking furnace.
3. Extension of the electrical control centre.
4. Extension of the green carbon plant.
5. Extensions and modifications to the alumina plant equipment.
6. Installation of bulk fuel and caustic tanks and landing and pipeline equipment.
7. Erection of an alumina storage warehouse.

Work in progress at the close of the year consisted of the erection of additional metal casting space and associated equipment.

FERRO-MANGANESE

The Tasmanian Electro-Metallurgical Company Pty. Ltd., Bell Bay, during the year smelted 68,237 tons of imported manganese ore for the production of 34,433 tons of ferro-manganese. No major capital works were carried out. The average employment was 86 men.

TITANIUM DIOXIDE

Australian Titan Products Pty. Ltd. completed the extension of its works at Heybridge to a capacity of 22,000 tons of pigments per year. The approximate cost of the extension, planning for which commenced in 1958, was over £3 million.

The range of pigments manufactured was extended and six new grades of pigment were placed on the market during 1963. Markets in South-East Asia and New Zealand were explored with a view to building up export business in these areas. The quality of the pigments was maintained at a high level, the premium grade in the range being the most durable of the high opacity pigments produced anywhere in the world.

The total quantity of pigments produced was 16,130 tons, an increase of 28% over the previous year. The average employment was 465 persons. A noteworthy feature of the operations was a very low accident frequency of 18 per million man hours.

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.

GEOLOGICAL SURVEY BRANCH

Report of the Chief Geologist, Terence D. Hughes, B.Sc., M.Aust.I.M.M.

The division of the Geological Survey into three principal sections, Regional, Economic and Engineering-Water Supply is now complete and staff has been engaged to fill all vacant positions. Three additional geologists are due to arrive in Australia from overseas early in the New Year to fill these positions. In particular, greater emphasis is being placed on the staffing of the Engineering Section to bring it up to the strength of the other two Divisions.

Emphasis was placed on regional mapping during the summer field season and geologists from other divisions assisted in the mapping of areas of rough terrain and difficult accessibility in the Mackintosh and St. Clair Quadrangles. It was found that much of the terrain was too rugged and forested for helicopter landings and greater use was made of drops by light aircraft. A tracked vehicle, known as a 'bombardier', was purchased and has proved a reliable transport asset, particularly over boggy ground. This is a rubber tracked vehicle enclosing six inflatable rubber tyres driven by a front wheel cog. It is of approximately 2 ton capacity and powered by a 112 h.p. Chrysler 6 cylinder engine. This vehicle can be used for transporting personnel or baggage and larger loads can be hauled using a tracked trailer.

On the economic side, most investigations concerned tin deposits, although iron ore, particularly at Savage River and Hampshire, occupied the attention of several geologists. A Jalander magnetometer was purchased and several surveys have already been carried out.

The work of the engineering section has increased in volume greatly during the past year. Unstable slopes, endangering houses and roads in the Burnie Municipality, resulted in requests for detailed geological investigations and this led to further requests for advice by other town councils and others along the north coast. Increased geological information is also being sought by the Public Works Department.

There have been several staff changes during the year. Dr. E. Williams was appointed Senior Geologist in charge of Regional Mapping. Resignations were received from K. L. Burns and S. M. Rowe. At the end of the year, the effective staff were:—

Chief Geologist: T. D. Hughes.

Regional Geology: Senior Geologist E. Williams. Geologists M. J. Longman, A. B. Gulline, B. Marshall, R. D. Gee, I. H. Naqvi (temporary), C. M. Barton*.

Economic Geology: Senior Geologist A. J. Noldart. Geologists V. M. Threader, R. Jack, G. Urquhart, D. I. Groves.

Engineering and Water Supply Geology: Senior Geologist I. B. Jennings. Geologists W. L. Matthews, W. R. Moore*, D. J. Jennings*.

Mineralogist and Petrologist: G. Everard.

Publications Officer and Librarian: E. M. Smith.

Drafting Office: Chief Draftsman K. T. Kendall. Draftsmen P. B. Nankivell, J. S. Pepper, R. J. Voss.

Field Assistants: A. V. Jackson, B. E. Cox, B. Knox, W. Pitulej (temporary).

Cadet: D. E. Leaman.

* Appointed but not yet in office.

REGIONAL GEOLOGY

Senior Geologist E. Williams reports:—

During the year regional geological mapping was continued on a number of 1 mile sheets. Progress was as follows:—

(1) *Devonport 1 mile sheet*

This sheet was published during the year and an explanatory account, by Geologist K. L. Burns, is with the Publications Officer prior to publication.

(2) *Lake St. Clair 1 mile sheet*

Geologist A. B. Gulline completed the mapping and the sheet has been published. Explanatory notes are with the Publications Officer prior to publication.

(3) *Launceston 1 mile sheet*

Geologist M. J. Longman completed the mapping of this sheet which is now in the process of being published. Explanatory notes are with the Publications Officer prior to publication.

(4) *Burnie 1 mile sheet*

Geologist R. D. Gee is nearing completion of the mapping of this sheet.

(5) *Table Cape 1 mile sheet*

Geologist R. D. Gee has completed the mapping and the sheet is being prepared for the drafting section.

(6) *Mackintosh 1 mile sheet*

During the summer field parties led by Geologists K. L. Burns, R. D. Gee and B. Marshall continued the mapping from the previous summer field season. Some 40% of the mapping of this difficult terrain was completed, which included all areas surrounding Cradle Mountain.

(7) *Pipers River 1 mile sheet*

Geologist B. Marshall and Temporary Geologist I. H. Naqvi completed some 20% of the mapping of this sheet during the winter.

ECONOMIC GEOLOGY

Senior Geologist A. J. Noldart reports:—

METALLIC MINERALS

Tin

Emphasis was again placed on the investigation and testing of tin deposits in Tasmania.

In the North-East, percussion drill testing of Thureau's Deep Lead, St. Helens, was completed but no significant deposits were located. An investigation into tin occurrences at the Pyramid Mine, Upper Scamander, was also completed and reports on these two projects were completed by R. Jack.

A percussion drilling programme was commenced on the Great Frazer Deep Lead in the latter part of the period.

In other localities, examinations were made on Laffer's Prospect and the Peripatetic Mine, North Heemskirk; Fooks Prospect and Thompson's Lode, Waratah; and the X-Proprietary Mine, X River.

A regional economic appraisal of the Meredith Range-Yellow Band Creek-Mt. Frazer tin province was commenced in the latter part of the period.

Gold

Geologist V. M. Threader completed field work on the Mathinna-Alberton gold deposits and a final report is in course of preparation. An investigation of the Una Mine in this district is the subject of a separate report.

The gold deposits of Beaconsfield and the occurrence of alluvial gold in the Arthur River were reported on by A. J. Noldart and R. Jack respectively.

Iron

Geologist G. Urquhart carried out a geological survey of the Savage River iron ore deposits and environs. Microscopic work and map compilation on this project are at present under way.

A geological examination of the Hampshire iron ore deposits was carried out by R. Jack in conjunction with a magnetometer survey of the deposits.

Silver Lead

The exploratory diamond drilling programme on Balstrup's Mine, Manganese Hill, Zeehan, was completed and a report prepared by R. Jack. No significant mineralization was found.

An appraisal of the lead deposits in the Tullah District was carried out by A. J. Noldart and D. I. Groves and an exploratory diamond drilling programme outlined.

Copper

A copper prospect on the Lyons River was examined by the Chief Geologist T. D. Hughes and a report prepared.

NON METALLICS

Barite

An exploratory diamond drilling programme was completed on the barite deposits at Madam Howard Plains, Queenstown, and a report compiled by D. I. Groves. No significant mineralization was found.

A report on the barite deposits at Lower Beulah, Sheffield District, was prepared by A. J. Noldart.

Some prospecting was carried out on small occurrences at The Hummocks and St. Valentine's Peak.

Clay

A further examination of potential brick making clay in the Wynyard district was made by R. Jack.

Some prospecting for bentonitic type clay deposits was carried out on the Tasman Peninsula.

Sand and Gravel

Several sand and gravel deposits on the Tasman Peninsula and in the New Norfolk District were examined for construction materials.

ENGINEERING GEOLOGY AND WATER SUPPLY

Senior Geologist I. B. Jennings reports:—

WATER SUPPLY

Due to the dry conditions prevailing during the year a large number of enquiries were received regarding the possibility of obtaining underground water.

Geologists W. L. Matthews and R. Jack furnished advice to enquirers in most cases. They also inspected boring progress and provided technical advice as required.

ENGINEERING GEOLOGY

A feature of the year's work was the increased emphasis given to mapping unstable areas in towns in the North and along the North-West Coast. In addition to this, studies were made and advice tendered on foundation conditions at various damsites, bridges, highways and building sites.

Details are given below:—

Landslip Studies

Geologist W. L. Matthews made a detailed study of the surface geology and morphology of unstable areas in the Burnie district. As a result of this a zone map was prepared indicating the relative stability of areas within the Burnie municipality. In addition to this several inspections were made of the small landslip at Parklands.

At the request of the Penguin Council a study was made of unstable areas at Penguin and Preservation Bay. By the end of the year Geologist W. L. Matthews had completed the field work and compilation of zone maps and a report was in course of preparation.

A small landslide affecting Housing Department property at Ulverstone was examined and a report outlining the probable cause and corrective measures was prepared. A further detailed study of the whole town area is programmed for the coming year.

As a result of a study of a small landslip affecting the West Tamar Highway at Beauty Point an appraisal was made of the stability of the slopes around Beauty Point township. A zone map and a report on these problems was furnished for the guidance of the council officers.

In additions to the above, inspections were made of individual allotments at Burnie, Penguin and Beauty Point.

Foundation Studies

Following the failure of the Flagstaff Gully Dam numerous inspections were made of the foundation rocks and leakage paths and reports and technical assistance provided to the consulting engineers.

Geologist R. D. Gee prepared a geological map and report concerning probable foundation conditions at the site of a proposed dam near the mouth of the Blythe River. Geologist D. I. Groves carried out a detailed geological mapping programme over an area surrounding a proposed dam and storage reservoir at Risdon Brook. A report was furnished on this work and a diamond drilling programme initiated.

Geological advice was tendered concerning the foundation conditions likely to be encountered in siting a bridge on the Derwent River upstream of the Tasman Bridge. Boring was carried out along a line between Dowsing Point and Courtoy's Point and a geological section and report prepared.

Geological investigations and a diamond drilling programme were carried out to investigate the foundation conditions for a proposed bridge across the Forth River near its mouth.

Reports were also prepared concerning foundation conditions and slope stability in the vicinity of a reservoir for the Huon Hospital and for extensions to the wharf area at Inspection Head.

Highway Studies

The route of the proposed deviation of the Bass Highway between the Don and Forth rivers was examined. The stability of cuttings and slopes was studied and a boring programme carried out to determine excavation conditions in cuttings along the proposed route. Geological advice was also given concerning the site of a proposed railway underpass on the Don River.

General

Geologist D. I. Groves made a study of the materials likely to be encountered in the excavation of a trench to carry a coaxial cable between Burnie and Launceston. A report and plans covering the whole route were forwarded to the authority concerned.

Geological mapping was carried out in a sewerage tunnel being constructed for the Glenorchy Council at Berriedale.

W. Pitulej spent a few weeks prospecting for deposits of coarse sand in the vicinity of Hobart, Huonville, New Norfolk and South Arm.

PETROLOGY AND MINERALOGY

Petrologist and Mineralogist G. B. Everard reports:—

Early in the year an examination of D.D.H. core from the Mount Cleveland Mine was completed. This involved mineragraphic investigations, and further equipment has been obtained for this kind of work.

In connection with the field mapping of the Launceston and Mackintosh quadrangles petrological examinations were required and suites of specimens collected by Field Geologists from Granite Tor, Fury River, Back Peak, Mt. Inglis and other localities, were described.

Further suites of specimens were examined from Pyramid Mine, Upper Scamander, and Manganese Hill, Zeehan, and also core from Dowsing Point boreholes.

Single specimens and groups of specimens were examined from various localities in the State, including Loddon Range, Mount Hartnell, Penguin, Bruny Island, Kingston, Forth River, &c.

Twenty-five rock and mineral specimens and samples of concentrates were examined for mining companies and private prospectors.

Several small collections of rocks and minerals were supplied for educational and scientific purposes.

Two hundred and ninety specimens were added to the Departmental rock and mineral collection during the year.

MAPPING AND ENGINEERING DRAUGHTING SECTION

Senior Draughtsman K. T. Kendall reports:—

Continued progress is reported on the Geological Atlas one mile series where a publication rate of two sheets per year has been maintained.

Devonport Sheet No. 29: Fair drawings completed, printed in fifteen colours.

St. Clair Sheet No. 59: Compiled, fair drawn and printed in fourteen colours.

Launceston Sheet No. 39: Geological compilation completed, fair drawings commenced.

Other published material includes:—

One five-colour geological map plus seventeen monocolour maps, sections, diagrams and photographs prepared for inclusion in Geological Survey Bulletin No. 47, Structure and Petrology of the Raglan Range, which was published during the year.

Thirty monocolour maps, sections and diagrams prepared and printed in the publication, Technical Reports No. 7 (1962).

Thirty-four monocolour maps, sections, diagrams and photographs prepared and published in the Explanatory Report one mile Geological Map series K/55-6-45 Middlesex.

Safety posters and notices were designed and prepared for the use of the inspectorial staff.

Cartographic work was also undertaken on behalf of the Regional Establishment at Wynyard.

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

PUBLICATIONS

Publications Officer E. M. Smith reports:—

The following papers were published during 1963:—

Technical Reports No. 7.

Explanatory Report, 1-mile Geological Map Series, K/55-6-45, Middlesex: by I. B. Jennings.

Bulletin No. 47: Structure and Petrology of the Raglan Range: by R. D. Gee.

The following reports were prepared for inclusion in Technical Reports No. 8:—

Notes on Auriferous Deposits, Beaconsfield Goldfield: A. J. Noldart.

Blue Peak Gold Mines, Prospecting Area and Lease, Arthur River: R. Jack.

Copper Prospect, Lyons River: T. D. Hughes.

Great Pyramid Tin Mine, Upper Scamander: R. Jack.

Investigations for Road Metal:—

(a) Basalt at Kingston: W. L. Matthews.

(b) Quarry Site, Lenah Valley: R. Jack.

(c) Quarry Site, Bridgewater: R. Jack.

Proposed Drilling at Una Mine: V. M. Threader.

Early Upper Cambrian Fossils from the Comet Slate at Dundas, Tasmania: C. G. Gatehouse.

Magnetometer Survey, Hampshire Iron Ore Deposit: R. Jack.

Notes on Barite Deposits, Lower Beulah, Sheffield District: A. J. Noldart.

Permian Rocks of the Mt. Inglis Area: R. D. Gee.

Thureau's Deep Lead, St. Helens: R. Jack.

Madam Howard Plains Barytes Deposit: D. I. Groves.

Manganese Hill, Zeehan: R. Jack.
Interim Report on Site Conditions at Cosgrove Park, Launceston: I. Jennings.
Foundations for Ainslie House, Cosgrove Park, Launceston: I. Jennings.
Slope Stability at Beauty Point: I. Jennings.
Proposed Extensions, Inspection Head Wharf: I. Jennings.
Geology of the Proposed Damsite, Blythe River Estuary: R. D. Gee.
The Geology of the Burnie Area: W. L. Matthews.
Landslides in the Burnie Area: I. Jennings.
Further Report on the Parklands Landslip: I. Jennings.
Landslip at William Street, Ulverstone: I. Jennings.
Foundation Conditions at Flagstaff Gully Dam: I. Jennings.
Further Explorations at Flagstaff Gully Dam: I. Jennings.
Investigations on Site of Proposed Bridge from Dowsing Point to Courtoys Point: I. Jennings.
Geological Report on Drilling in the Forth River: I. Jennings.
Mt. Cleveland Mine Prospect; G. Everard.
Petrological Examination of Specimens from the Pyramid Mine, Upper Scamander: G. Everard.
Petrological Notes on Specimens from the Mackintosh Quadrangle, South East Quarter: G. Everard.
Underground Water at Seven Mile Beach Golf Course: W. L. Matthews.
Examination for Underground Water at Natone Area School: W. L. Matthews.
Artesian Water at Spreyton: W. L. Matthews.
Results of Drilling for Water in Northern and Southern Tasmania: W. L. Matthews.
Results of Drilling for Water in North Western Tasmania: W. L. Matthews.

CHEMICAL AND METALLURGICAL BRANCH

Report of the Chief Chemist and Metallurgist, Mr. W. St. C. Manson, M.Aust.I.M.M.

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

Ore dressing research and associated milling problems continue to be a major activity.

Extensions have been made to ore dressing equipment by installation of a continuous pilot plant of larger capacity than the previously existing plant. The major units are ore bin and feeder, 30 inches x 36 inches ball mill, D.S.M. and Hammer screens, hydro-cyclones, flotation cells, Stokes 3 spigot hydrosizer, half size Holman sand and slime tables, 6 feet Vanner, Buckman tilting deck, Denver jig and ancillary gear. Special attention has been given to the automatic sampling of all major mill products, and two single samplers and a sampler to sample six products has been provided for. An electric hoist is installed for assembly of treatment units, and also for servicing. The installations have been designed to treat ores by flotation or gravity concentration. Treatment rate is variable with a general maximum of one ton per hour.

An 18 inch Stearns wet magnetic separator has been commissioned, and can be used either for batch or continuous operation. A high intensity Jones wet magnetic separator has also been installed, and will be used initially for varying treatments of tin ores.

Determinations made during the year amounted to 6,332 and were as follow:—

Types	Number
Aluminium	28
Antimony	14
Arsenic	25
Barium	4
Bismuth	15
Boron	2
Cadmium	1
Calcium	55
Carbon and Carbon Dioxide	46
Chlorine	3
Chromium	18
Cobalt	7
Copper	62
Fluorine	3
Gold	79
Iron	754
Lead	82
Magnesium	33
Manganese	29
Molybdenum	31
Monazite	1
Nickel	12
Phosphorus	154
Potassium	9
Qualitative tests	36
Silicon	46
Silver	75
Sodium	11
Sulphur	253
Tantalum and Niobium	6
Tin	3,561
Titanium	213
Tungsten	366
Water Analyses	17
Vanadium	38
Zinc	33
Coal Analyses	48
pH Tests	12

Types	Number
Ignition Loss	24
Sodium Cyanide	22
Rochelle Salt	20
Sodium Carbonate	20
Sieve Analyses	27
Water	23
Fusibility Tests	14
Total	6,332

Research investigations undertaken during the year were reported as follows:—

Types	Number
Tin	11
Iron	1
Coal	1
Kaolin	1
Ceramics	17
Dutch State Mines Screening Tests	1
Total	32

Tin—Hayes and Sabjen's Prospect, Near Gipps Creek

R.424

A sample of tailings from current operations on a prospect near Gipps Creek was examined for the presence of recoverable cassiterite.

The sample tested contained 2.13 per cent of tin of which 83.5 per cent was recoverable by tabling after sizing to plus and minus 100 mesh.

It was arranged to check milling operations at the prospect at a later date.

Tin—Renison Associated Tin Mines N.L.: Mill Vanner Feed

R.426

A series of hydrocyclone tests were performed on a sample of mill vanner feed with the object of producing a cyclone underflow product suitable for tabling.

A sizing analysis of the sample showed that 47 per cent of the tin was coarser than 20 microns, but tests indicated that with single stage cycloning over 70 per cent of the total tin reported in the underflow. Single stage cycloning is therefore of little use for the application under consideration.

However, this type of operation would be an effective means of desliming the vanner feed as the overflow contains an almost negligible amount of recoverable tin. Since the slime overflow amounts to 39.6 per cent by weight, the amount of vanner feed would be materially reduced.

Recycloning of primary underflows improves the rejection of fines from the final underflow, and, in lieu of the installation of a more suitable sizing device, it was recommended that the two stage aspect of cyclone classification be further studied.

Tin—Ore from Great Pyramid Mine, Upper Scamander: Concentration Tests

R.427, R.428 and R.429

The investigation was performed to determine the recovery of tin attainable by tabling. The samples were initially ground to minus 40 mesh, and the coarse table tailings were later reground and retabled to determine the additional recovery of tin obtainable with finer grinding.

The test results may be summarized thus:—

	R.427 Per Cent		R.428 Per Cent		R.429 Per Cent	
	Tin	Recovery	Tin	Recovery	Tin	Recovery
Combined Concentrates From Initial Grind	61.6	79.26	50.5	73.81	46.9	60.59
From Initial Grind Plus Regrinding plus 60 Mesh Tail- ing	59.7	84.55	48.9	77.25	43.8	66.61
From Initial Grind Plus Regrinding plus 60 Mesh Tail- ings, plus Regrind- ing plus 100 Mesh Tailings	59.0	87.05	46.9	79.76	41.3	71.37

Tin—Mt Costigan Mines, Canada: Greisen Ore from Mt Bischoff

R.431

The sample was tested to determine the maximum recovery of tin obtainable in a low grade cassiterite-sulphide concentrate by gravity means for possible use for chemical extraction of the tin in the concentrate.

Procedure adopted was closed circuit grinding to minus 60 mesh and table concentration with progressive grinding of tailings to minus 200 mesh, with retabling between each grinding stage.

Results were as follows:—

	Per Cent
Weight of concentrate	7.3
Tin content of concentrate	5.2
Tin recovery in concentrate	66.0
Tin content of tailings	0.2
Tin content of ore	0.5 (approx.)

Tin—Renison Associated Tin Mines, N.L.: Dutch State Mines Screening Tests of Mill Ball Mill Discharge

R.437

The object of the investigation was to compare the classification efficiency of a D.S.M. 60 degree wedge wire screen with that of the currently operated Dorr Classifier installation in the Renison Bell Mill.

Several D.S.M. screen tests at various feed rates and densities were performed, and sizing analyses were made of samples of overflow and underflow products for comparison with sizings of classifier sands and overflow.

Results of these tests indicated that the D.S.M. screen was much superior to the classifier for the sizing operation. Also it eliminates the return of freed cassiterite in the minus 60 mesh sizes and thus avoids over-grinding of the freed cassiterite.

Comparative efficiencies of classifier and typical D.S.M. screen tests with respect to both weight and tin are shown below:—

Test Type	Separation Efficiency		
	Minus 100 Mesh	Minus 150 Mesh	Minus 200 Mesh
Mill Classifier—			
Weight	40.3	48.8	52.3
Tin	26.8	32.9	35.9
D.S.M. Screen Test 2—			
Weight	72.4	83.9	86.7
Tin	70.6	78.2	82.2
D.S.M. Screen Test 5—			
Weight	83.5	88.9	89.7
Tin	81.4	86.8	88.6

*Tin—Renison Associated Tin Mines: Tilting Deck Concentration of Mill Vanner Feed***R.449**

Gravity concentration tests using tilting decks were carried out on mill vanner feed to determine grades of concentrate and tin recoveries obtainable with this type of equipment.

The effect of the following variables was tested: dispersion of the feed pulp, desliming of the feed, feed pulp density, deck slope, and time cycle. The sample contained 2.64% tin.

Indications were that concentration by tilting deck would result in very high recoveries as low grade concentrates in sizes down to 10 microns.

Typical test results:—

Test No.	Deck Concentrate Per Cent			Deck Tailing Per Cent		Slope Inch/Ft.	Time	
	Wght.	Tin	Recovery	Wght.	Tin		Min.	Deslimed
3/1	8.1	21.9	66.8	59.9	1.0	1.9	6	Yes
3/2	15.7	12.7	77.1	52.3	0.6	1.9	5	Yes
7	20.3	10.9	77.8	79.7	0.79	1.9	5	No

*Tin—Ore, Pinnacle Mine, Upper Scamander: Assay and Concentration Tests***R.451**

The sample submitted contained 8.7 % tin, and concentration tests were deferred pending the submission of a representative sample.

*Tin—Concentrate, Stormsdown Mine, Zeehan: Sizing of Cassiterite***R.455**

This sample was obtained for determination of its minus 5 micron cassiterite content in connection with the industrial disease, stannosis. Sizing by sedimentation showed the presence of 0.4% minus 5 micron cassiterite.

*Tin—North Valley, Mt Bischoff: Dressing Box Discard from Sluicing Operations by Mr. W. Hankey***R.456**

A sample of reject material from sluicing operations was obtained for investigation into the nature of tin losses and suggestions for improving recovery. The sample contained 6.8% tin which was present in various forms from partly water worn to angular grains.

Experimental work involved sizing, sink-float separations, and jig and table concentration tests.

Sizing and sink-float tests showed a high proportion of relatively coarse cassiterite, 81.2% of the total tin reporting in the plus 36 mesh fraction.

Results of concentration tests after crushing to minus $\frac{1}{8}$ " size are as follow:—

Product	Per Cent		Per Cent Tin Distribution
	Wght.	Tin	
Jig concentrate plus 60 mesh	16.57	40.0	84.4
Table concentrate minus 60 mesh	1.45	52.6	9.7
Total concentrate	18.02	41.0	94.1
Total tailing	81.98	0.57	5.9
Composite head	100.0	7.86	100.0

Recovery can be improved by using jigs for concentration, either direct or for clean-up operations after removal of oversize rock.

Moderate grinding would improve both recovery and grade of concentrate.

*Tin—Renison Associated Tin Mines, N.L.: Examination of Cassiterite Grain Size in Diamond Drill Core Samples***R.457**

Samples from Federal area were examined to determine cassiterite grain sizes and quantities recoverable by vaning assay.

Grain size determinations involved digestion of the samples by aqua regia, followed by treatment with hydrofluoric acid. Cassiterite is unattacked and practically all associated minerals are decomposed. The acid insoluble portion containing the cassiterite was then sized by elutriation, and the fractions assayed for tin content.

Test results:—

Lab. Reg. No.	R.B. Sample No.	Per Cent Tin		Sizing Cumulative Per Cent Tin Distribution		
		Total	Vanning	Plus 200 (76 Micron)	EF 2 (28 Micron)	EF 3 (20 Micron)
1845	2,040	1.29	0.77	19.3	60.3	70.7
1846	2,405	1.23	0.58	9.7	38.0	56.5
1847	2,406	0.81	0.47	22.0	57.0	67.7
1848	2,407	1.07	0.88	23.8	70.9	80.3

From the above figures the indicated recoveries to be expected from table and vanner concentration range from approximately 55 to 72%.

Ferromanganese: Separation of Ferromanganese Metal from Slag by Gravity Concentration

R.436

The samples submitted by Tasmanian Electro-Metallurgical Co. Pty. Ltd. contained some 30 to 40% by weight of slag, the remainder being ferromanganese metal. The following information was supplied:—

Slag: Iron content 0.26 per cent. Sp. Gravity 4.3.

Ferromanganese: Iron content 21.6%. Sp. Gravity 7.1.

Treatment consisted of sizing to plus and minus 60 mesh B.S.S., followed by jigging of the coarser fraction and tabling of the minus 60 mesh product, with retreatment of tailings as necessary.

This type of treatment resulted in the production of high grade ferromanganese concentrate in all sizes tested with overall recoveries of approximately 90%.

Test Results:—

Product	Weight	Per Cent	Iron
Plus $\frac{1}{8}$ " untreated	29.0		19.8
Minus $\frac{1}{8}$ " gravity concentrate	43.8		22.2
Minus $\frac{1}{8}$ " tailing	27.2		6.0

Iron Ore: Analysis and Wet Magnetic Separation of Hampshire Iron Ore

R.452

The sample was ground to minus 350 mesh B.S.S. and wet magnetically separated with several cleaning stages. The magnetic concentrate amounted to 86% by weight and contained 90% of the total iron. Analyses of sample and concentrate follow:—

Per Cent	Sample	Magnetic Concentrate
Iron	65.9	69.1
Sulphur	0.08	0.03
Silica	1.94	0.44
Phosphorus	0.02	0.01
Titanium	0.08	0.09
Manganese	0.94	0.87
Aluminium	0.91	0.54
Vanadium	Nil	Nil

Coal: Stanhope Colliery: Sink-float Testing and Examination of Product

R.439

The sample was submitted to sink-float separation at specific gravity 1.60 with the following results:—

Float at Sp. G. 1.6: 78.0%.

Sink at Sp. G. 1.6: 22.0%.

Further examination of the products is pending the supply by the company of a suitable apparatus.

*Coal: Cornwall Coal Co.: Sink-float Beneficiation of Crushed Washery Feed ex Duncan Colliery***R.458**

The object of the test was to compare the results obtained with those from a bulk sample submitted in 1958.

The test procedure was to size the sample to 4", 2", 1", $\frac{3}{4}$ ", $\frac{3}{8}$ ", $\frac{1}{4}$ ", $\frac{1}{8}$ " and plus and minus 30 mesh B.S.S. fractions, followed by sink-float separations of all fractions except minus 30 mesh material at specific gravities of 1.3, 1.4, 1.5 and 1.6.

Summation of results:—

Product	Individual Per Cent		Cumulative Per Cent	
	Weight	Ash	Weight	Ash
Float 1.3	4.0	7.4	4.0	7.4
Float 1.4	40.0	12.6	44.4	12.1
Float 1.5	29.0	20.4	73.4	15.4
Float 1.6	10.3	28.6	83.7	17.0
Sink 1.6	12.4	63.9	96.1	23.1
Minus 30 mesh untreated	3.9	27.0	100.0	23.2
Composite float 1.6 plus minus 30 mesh untreated	87.6	17.5	....	....

The test results are similar to those obtained from the 1958 sample.

*Ceramics: Clay Samples from Wynyard***R.430**

Six samples were obtained by Departmental Geologist D. Gee, from an area adjacent to the old brick pit, Wynyard. The six samples and a blend of equal weights of each were tested for brick manufacture by de-aired extrusion; stiff-plastic and semi-dry pressing tests were conducted on the blend.

While moderate quality bricks can be produced by de-aired extrusion, results indicated that the preferred method of manufacture would be by semi-dry pressing which produces bricks of more regular conformation and dimensions than either of the other methods.

Test pieces were satisfactorily fired at 1000°C and 1050°C.

*Ceramics: Campbell's Pottery Works, Launceston: Clays from Glen Dhu***R.432, R.433, R.434 and R.435.**

The four samples submitted were tested for ceramic pipe manufacture by de-aired extrusion. Extruded columns from all samples exhibited good green strength. Firing temperatures investigated were 1050°C and 1100°C, and test pieces were well fired at these temperatures with minor firing contractions.

All samples were found to be suitable for the manufacture of pipes by the above method.

*Ceramics: Clays from Wynyard: Brick Manufacturing Tests***R.440 to R.448**

Nine samples were received and submitted to pressed brick manufacturing tests by semi-dry and stiff plastic methods. Good quality bricks were made from numbers R.443-4 to R.448-9 inclusive at a firing temperature of 1050°C. Samples R.440-1 to R.442-3 were found to be unsuitable for the manufacture of bricks.

In general, bricks made by semi-dry pressing methods are of better appearance and conformation than those from stiff-plastic pressing.

Further work was performed on samples R.443-4 and R.444-5 by blending equal weight mixtures of those two samples with various proportions of quartz sand Reg. No. 2416/63, also obtained from Wynyard, and testing the blends for brick manufacture. The following blends were tested:—

- Blend A—Clay 5 parts. Sand 1 part.
- Blend B—Clay 4 parts. Sand 1 part.
- Blend C—Clay 3 parts. Sand 1 part.
- Blend D—Clay 2 parts. Sand 1 part.

Satisfactory bricks fired at 1050°C were made from all blends except D, bricks from which almost failed to meet the strength specification.

Ceramics: Machen's Brick Works, Launceston: Brick Manufacture by Stiff Plastic Pressing

R.453 and R.454

Five samples of "Relbia Clay", R.453 and one sample of "West Tamar" clay, R.454, were tested for brick manufacture by stiff plastic pressing methods.

Test pieces were fired at 1050°C. Sample R.453-4 showed high drying and firing contractions and considerable distortion of the fired test pieces. Satisfactory quality bricks were made from the other samples which are considered suitable for brick manufacture.

Clays: Recovery of Paper Filler Clay from Weathered Granite from South Mount Cameron

R.438

A bulk sample of weathered granite from South Mount Cameron was obtained, and the clay content recovered by previously established methods, i.e., slurring the crude sample, spiral classification to remove gravel, hydrocycloning to produce fine clay pulp, and filtration.

The wet filter cake was despatched to U.S.A. for drying tests related to the installation of commercial plant at South Mount Cameron.

MINES AND EXPLOSIVES BRANCH

Report of the Deputy State Mining Engineer and Deputy Chief Inspector of Mines and Explosives, Mr. P. M. Johnstone, B.E., M.Aus.I.M.M.

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 8,836. This represents an increase of 124 although there was a reduction of 60 men in the coal mining section of the industry. This section became more depressed as more users turned to oil fuel. The numbers of persons in metal mining remained steady and the increase in employment took place wholly in metallurgical works.

ACCIDENTS

The number of registered accidents was 86 in which 83 men were injured and four killed. In calculation of the rates per thousand, 168 employees in the total of 8,836 were disregarded because their employers do not submit accident reports. The rate of ten per thousand was satisfactory although the number of fatalities appeared unnecessarily high. Rates in the various groups remained relatively steady but for an unwelcome increase in silver-lead-zinc mining. Mention has been made in recent years of the comparatively high incidence of accidents in the tin mining group, and a further rise amongst the underground workers is noted.

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	92	....	4	4.3	75	....	1	1.3	167	....	5	3.0
Copper	82	....	2	2.4	1,484	....	3	0.2	1,566	....	5	0.3
Silver-lead-zinc	346	....	17	4.4	406	....	8	2.0	752	....	25	3.3
Tin and Tungsten	231	2	25	10.0	425	....	8	1.9	656	2	33	5.3
Quarries, Works, &c.	....	....	....	....	5,527	2	15	0.3	5,527	2	15	0.3
Total	751	2	48	6.7	7,917	2	35	0.5	8,668	4	83	1.0
Not reported	....	....	....	....	168	....	....	....	168	....	....	....
					8,085				8,836			

DESCRIPTION OF FATAL AND SERIOUS ACCIDENTS

Fatal

R. J. Quinn, Comalco: Running out falls on travelling crane when jib struck live overhead cable; electrocuted.

S. Polles, Aberfoyle Tin: Struck by fall of ground.

J. Stasevicius, E.Z. Co., Risdon: Driving fork lift truck when it ran off wharf into river.

K. R. Johns, Storeys Creek: Struck by fall of ground.

Serious

A. J. Voss, Mt. Lyell Co.: Contacted circular saw; lost finger.

H. Presch, Mt. Lyell Co.: Driver of locomotive which was dragged over dump by derailed truck; broken shoulder blades and lacerated scalp.

C. Johns, E.Z. Co., Rosebery: Bumped against stack of timber; injured knee.

C. L. Elliot, E.Z. Co., Rosebery: Slipped and fell off set timber; injured elbow and shock.

E. A. Gibbons, E.Z. Co., Rosebery: Struck by piece of timber; broken foot.

S. Tripp, E.Z. Co., Rosebery: Struck by stone whilst drilling; broken leg and shock.

D. Dillon, E.Z. Co., Rosebery: Struck by sheave when anchor pin pulled out; broken leg.

J. Maxwell, E.Z. Co., Rosebery: Jammed between timber on winch rope and timber set; broken head.

S. A. J. Smith, Aberfoyle Tin: Caught hand between truck and chute; broken finger.

G. de Paoli, Aberfoyle Tin: Struck by stone whilst barring down; broken wrist.

E. Baxter, Aberfoyle Tin: Knee jammed between two trucks; broken knee cap.

J. Hampton, Aberfoyle Tin: Struck by stone whilst timbering rise; severe contusion and laceration of elbow.

V. G. Pilgrim, Cornwall Colliery: Struck by fall of coal; broken leg.

K. Butler and J. Petraitis, E.Z. Co., Risdon: Molten metal tipped into water causing explosion and spray of metal; severe burns to face and body.

- A. Molinaro, E.Z. Co., Risdon: Finger jammed in grill over intake valve; broken.
 A. Jurka, E.Z. Co., Risdon: Caught in conveyor belt; lost arm.
 S. V. Abel, King Island Scheelite: Caught in Vee belt; lost first joint of thumb.
 G. L. Crack, King Island Scheelite: Fingers drawn into grinding wheel whilst sharpening tool; severe lacerations.
 J. T. Parker, Tasmania Colliery: Struck by fall of top coal; injured head.
 G. Izard, Comalco: Foot slipped and entered furnace; severe burns.
 D. Denby, Comalco: Struck by bucket carried by overhead crane; broken arm and injured head.
 L. G. Byrne, Comalco: Whilst driving fork lift truck extended leg against a stack of aluminium billets to stop truck; dislocated hip.
 W. H. Brown, Goliath Cement: Lost balance on platform and fell to ground; broken arm.

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
1962	8708	68	2	66	68	0.234	7.726	7.961
1963	8836	86	4	83	87	0.461	9.575	10.037

* See Report of Director of Mines—1954.

‡ See Report of Director of Mines—1956.

† See Report of Director of Mines—1960.

INCIDENTS OF ACCIDENTS

Place and Cause of Accident	Number of Persons Killed	Number of Persons Injured (Incapacitated for over 14 days)
<i>Section A.—Metalliferous Mines—</i>		
1. Below Ground:		
(a) Explosions		
(b) Falls of Ground	2	8
(c) Falling down Shafts, &c.		1
(d) Other Causes		33
2. Above Ground:		
(a) Machinery in Motion		2
(b) Other Causes		13
3. Accidents in Batteries, Ore-dressing, Smelting and other Metallurgical Works, &c.	2	21
Total Metalliferous Mines (A)	4	78
<i>Section B.—Coal Mines—</i>		
4. Below Ground:		
(a) Mine Explosions (fire damp, &c.)		
(b) Explosives (dynamite, &c.)		
(c) Falls of Earth		3
(d) Other Causes		1
5. Above Ground:		
(a) Machinery in Motion		1
(b) Other Causes		
Total Coal Mines (B)		5
Total All Mines (A and B)	4	83

INSPECTION

In May, Mr. R. C. Vivian resigned as Mining Engineer and Inspector of Mines and Explosives, Queenstown, and the post remained vacant during the remainder of the year. On the appointment of Mr. W. R. Tindal as Mining Engineer and Inspector of Mines and Explosives on the coalfields in April, Mr. D. Besford's temporary tenure of the position ended.

PROSECUTION

A prosecution was made successfully against a mine owner and his agent for not supplying annual plans and for not reporting an accident.

EXPLOSIVES ACT, 1916

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

	Burnie	Currie	Hobart	Launceston	Strahan	Ulverstone	Total
Nitro-compounds (lb.)	437,375	34,500	318,710	309,800	1,505,750	....	2,606,135
Detonators, &c.	....	9,000	80,500	294,350	50,000	531,000	964,850
Ammonium Nitrate (lb.)	....	....	40,950	136,150	....	....	177,100
Explosives shipments (No.)	6	3	6	8	11	1	35

The use of ammonium nitrate-fuel oil explosive continued to increase, but much less so than expected. The use of ammonium nitrate-molasses has ceased due to its poor loading characteristics in wet holes. The underground usage at two mines passed through the trial stages without difficulty but the application is far from general. The number of permits issued for the manufacture of this explosive increased from 13 to 19, a very small increase considering the much lower cost of A.N.F.O. compared to gelignite. The quantity of nitro-compounds imported was of the same order as in the previous year. A great reduction in the number of detonators was compensated by a decrease in stocks.

ACCIDENTS AND OUTRAGES

No accidents with explosives occurred during the year but two outrages were committed by unknown persons. In a burglary the door was blown off a large steel safe, and in the other case machinery at a quarry was destroyed.

PROSECUTIONS

Complaints against two men for improperly keeping detonators were successful, each being fined £20 plus costs. The detonators had not been safely stored and came into the hands of children. Another prosecution, against a man for leaving loose explosives on a public thoroughfare, failed for want of evidence.

INSPECTION

Fireworks imports were mostly satisfactory but two pyrotechnic types were prohibited for containing an excessive weight of composition. An alarming number of failures of anti-hail rockets led to extensive proof firing before the root cause was discovered and overcome. All rockets were impounded pending reconstruction in certain details. Fibreboard boxes for detonators and polythene liners for gelignite proved satisfactory.

Lectures were given by inspectors at schools and to police cadets on the recognition and safe handling of explosives. A considerable quantity was handed in for destruction during the year. The exhibitions at the major country shows were repeated with gratifying attendances.

The number of licensed magazines was 127 and 531 persons held licences to sell, convey or import explosives.

Mr. A. E. Hemsley, Inspector of Explosives, Burnie, retired in October and his place was filled by the transfer of Mr. H. R. Powell from Hobart. Mr. G. Jobson, Magazine Keeper, was promoted to Inspector of Explosives, Hobart, and Mr. G. C. Goodrick succeeded him at the Hobart Magazine.

LEGISLATION

The Act was amended to enable the making of regulations for the safe usage of explosives in miscellaneous blasting not controlled under the Mines and Works Regulation Act. These are in course of preparation.

INFLAMMABLE LIQUIDS ACT, 1929

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

	Bell Bay	Burnie	Devonport	Hobart	Naracoopa	Total
Aviation Gasoline	571	....	....	2,378	....	2,949
Benzol	....	....	....	480	....	480
L.P. Gas	126	....	....	....	....	126
Kerosene, Aviation	....	....	....	4,385	....	4,385
Kerosene, Lighting	....	....	862	3,291	....	4,153
Kerosene, Power	....	....	1,575	1,530	....	3,105
Motor Spirit, Premium	25,147	7,641	18,016	44,474	....	95,278
Motor Spirit, Regular	13,004	4,106	13,467	26,843	800	58,220
Total	38,848	11,747	33,920	83,381	800	168,696
Tankships (No.)	11	5	11	32	1	60

There were six more tank ships than in the previous year and the quantity landed was 1,394 tons greater.

INSPECTION

At the 30th June the number of licensed premises was 2,052, an increase of 120 in 12 months. During the year 436 applications for approval to construct or alter premises were dealt with, mainly minor bulk storage depots which account for most of the increase. The first bulk installation for L.P. Gas was constructed at Bell Bay, for the discharge of tank ships and the filling of cylinders. The initial cargo of gas liquefied by pressure was received without incident. The plans for the first petroleum distillery were approved and construction commenced. The product will be bitumen with distillate as a by-product.

No prosecutions were made during the year.

DRILLING

DIAMOND DRILLING			CHURN DRILLING		
Number of Holes	Total Footage	Object	Number of Holes	Total Footage	Object
5	1217	Mineral Exploration—Zeehan	6	369	Water Boring—Northwest
1	81	Mineral Exploration—Mathinna	6	159	Water Boring—North
1	395	Water Boring—Spreyton	19	1730	Water Boring—Midlands
4	316	Engineering Investigations	17	1722	Water Boring—Southeast
38	1522	Foundation Testing	11	691	Outlining Limestone Deposit
			14	2196	Testing Alluvials for Tin—St. Helens
			17	623	Testing Alluvials for Tin—Great Fraser
			3	132	Engineering Investigations
			30	1250	Foundation Testing
49	3531		123	9172	

DIAMOND DRILLING

Three crews were engaged on a great variety of projects, an unusual one of which was a water bore in an artesian basin at Spreyton. A relatively small hole 395 feet deep overflowed at 2,500 gallons per hour. In mineral exploration one hole was completed and another drilled at Zeehan in a possible silver-lead zone. Three holes were drilled into a barytes deposit near Queens-town. In the coal fields one hole near Fingal was advanced 81 feet and suspended in favour of more urgent work.

In civil engineering works nine projects were undertaken on the testing of foundations, including those for bridges over the Derwent (2), Don, Forth and South Esk rivers, the Denison Canal and the railway at Leith. The others were for a wharf and a building.

Engineering investigations were made by drilling into a landslip area at Beauty Point and into the Tamar banks at Launceston. These 42 holes varied in depth from 16 to 267 feet and encompassed a great variety of ground conditions, in all of which good core recovery was required. On the Derwent and Forth rivers the drilling was done from barges on tidal water in conjunction with a churn drill.

Two new drills were acquired, and one of these, rated to 1,500 feet, was placed in service. The other machine, of 3,000 feet capacity, was held in reserve.

CHURN DRILLING

Three crews were engaged, one full time on testing for alluvial tin, and the others on water boring and foundation testing. In the Northwest five bores of average depth 60 feet produced from 100 to 400 gallons per hour for watering stock, and similar results were obtained in boring six wells in the North. Of the 19 wells sunk in the Midlands eight were abandoned dry in dolerite. The others ranged in depths from 70 to 182 feet and in outputs from 180 to 300 gallons per hour. In the Southeast there were six dry holes in the 17 bored, and one was lost. Outputs varied between 50 and 350 gallons per hour and depths between 40 and 150 feet. The number of dry bores in the Midlands and Southeast was unusually high. The seven civil engineering projects included testing for foundations for four bridges (Derwent (2), Forth and North Esk rivers), and one building. The others were required to obtain information for road cuttings at Don and flood protection works at Launceston.

All this drilling, except the alluvial testing, was done with three Goldfields G33 machines which have reached the end of their economic life. Consideration is being given to the purchase of various types of drills as replacements. The Ruston Bucyrus drill completed testing at St. Helens and moved on to an area on the Great Fraser River.

Mr. L. F. Egan, A.Mus.Aus.I.M.M., Burnie, reports:—

EMPLOYMENT

The average number of persons employed in the district was 1,045 as against 1,008 in the previous year.

ACCIDENTS

Of the four accidents reported as having caused 14 days or more lost time, three resulted in finger injuries and one in a fractured arm. Of the finger injuries one was caused when a workman grasped the frame of a fork lift truck with his left hand and had his left little finger crushed by the moving elevator chain. Amputation of a joint of a thumb was necessary when a workman, who had fitted new belts to a pump, started the motor and stepped backwards into a drain. In attempting to regain his balance he fell forward and caught his thumb between the belt and the pulley. Lacerations to fingers were sustained by a workman when he was sharpening a punch on a grinding wheel. A chip off the wheel caused the work and his fingers to be drawn in between the wheel and the work platform. When a man loading steel balls into the ball mill overbalanced and fell, he struck his left arm on the concrete, fracturing one of the bones of the forearm.

In each case an investigation was made into the cause of the accident and the surrounding circumstances. Recommendations were then made with a view to preventing repetitions.

HEALTH AND SAFETY

Constant attention has been directed in all inspections to the maintenance of hygienic and safe working conditions. The constant effort to eliminate the dangerous fraction of dust in the atmosphere at crushing stations and other work places has been a major phase of inspection work. In addition, through the medium of the operation of the Workers' Occupational Diseases Relief Fund Act, it has been possible to keep a check on the incidence, or more correctly the absence, of pneumoconiosis among the workers listed under the Act. Records were kept and medical examinations were arranged as required. No evidence of silicosis among current employees was detected during the year.

PROSPECTING

Exploration by geological, geophysical and diamond drilling methods was continued by five companies at Balfour, Mt. Bischoff, Mt. Cleveland, Savage River, and Mt. Lindsay. Average employment for the year was 29.

INFLAMMABLE LIQUIDS AND EXPLOSIVES

Supervision of the landing of inflammable liquids and explosives was continued by Mr. A. E. Hemsley, Inspector of Explosives, until the date of his retirement in October. Thereafter, these duties were undertaken by Mr. H. R. Powell, Inspector of Explosives. As necessity arose surveillance was exercised by the Inspector of Mines and Explosives. In addition a number of men were examined and issued with Shot Firer's Permits. Inflammable liquid installations and explosive magazines in the North West district were kept under observation.

Mr. 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 in this district was 1,811, of whom 205 were employed underground. This is an increase of 167 on the previous year, with a decrease of eight employed underground.

ACCIDENTS

Twenty-eight accidents were reported as having caused 14 days or more lost time. Of these three were fatal, two could be classed as serious, and the balance minor. One fatal accident was caused by the jib of a mobile crane coming in contact with one phase of overhead transmission lines carrying 33,000 volts, while the deceased was pulling out the hauling rope; both the others were caused by falls of rock underground. One of the serious accidents was caused by a man climbing onto a furnace and being struck by a travelling crane. He suffered head injuries and a broken arm. The other serious accident occurred when a man slipped while on top of a furnace, and his foot entered molten slag. The man was wearing special protective footwear which prevented more serious consequences.

HEALTH AND SANITATION

Amenities, sanitation and ventilation in the mines continues to be satisfactory. In works, amenities and sanitation are of a higher order, and it is pleasing to report that in many cases this high standard is provided without request.

EXPLOSIVES AND INFLAMMABLE LIQUIDS

Storages and means of conveyance have been kept under review and generally have conformed to required standards.

Eight shipments of explosives were landed under the supervision of the Inspector of Explosives (Mr. D. R. Bonham), and the landing facilities at Hillwood have been found to function well.

Inflammable liquids are landed at Bell Bay Terminal of Mobil Oil Pty. Ltd., and black oil is now landed at the Comalco installation and stored in Comalco tanks at the plant. Eleven shipments of inflammable liquids were landed at the Mobil installation without untoward incident.

During the year a bulk storage for L.P. Gas was completed at the Mobil Depot, Bell Bay. The first shipment of 126 tons was unloaded in November.

Mr. J. B. Braithwaite, B.C.E., B.M.E., M.Aus.I.M.M., A.M.I.E.Aust., Hobart, reports:—

EMPLOYMENT

The average number of men employed in the industry was 3,185 which is an apparent increase of 180, but this is mainly accounted for by the inclusion of the Australian Commonwealth Carbide works at Electrona, where there are 170 men, in the area covered by this report. There was a further decrease of 20 in the number employed by the Electrolytic Zinc Coy. of Australasia Ltd., and a large increase in the number employed in the production of construction materials. Approximately half of this increase is of a temporary nature due to the start of construction of the Meadowbank Dam by the Hydro-Electric Commission,

ACCIDENTS

One fatal accident occurred when a fork-lift truck went over the edge of the wharf at Risdon and the driver was drowned. No satisfactory account of how the accident happened was arrived at in spite of exhaustive enquiry. Two men were seriously injured by an explosion which occurred when molten zinc was spilt into a trough of water and only the safety spectacles they were wearing saved them from still more serious injuries. One man lost an arm when it was caught between a moving conveyor belt and the pulley. He was cleaning the moving belt with his hand, a practice that is strictly forbidden. Of the five minor accidents three involved crushed fingers.

HEALTH AND SAFETY

All works and quarries were visited regularly during the year and the provisions of the Mines and Works Regulation Act were extended to cover the construction of a 1700 feet sewerage tunnel at Austin's Ferry. A number of complaints were received of fly-rock from blasting, both in quarries and on construction work. In many cases it was found that there had been fly-rock but no serious damage was caused and advice was given on how to prevent a recurrence of the trouble. Complaints were also received of damage caused by vibration from blasting but these were all found to be without foundation. Although blasting at two brick-pits was not causing damage, recommendations were made and adopted to use milli-second delay methods and this resulted not only in reduction in the nuisance caused to neighbours, but in improved results. At the request of the Hobart Museum, advice was given which resulted in blasting being carried out close to the existing building with no damage to the contents or structure.

One complaint of excessive dust from a zinc concentrate stock pile was received and the company agreed to the installation of high pressure water nozzles for spraying. These appear to be working satisfactorily.

West Coast District

EMPLOYMENT

The average number of persons employed in the industry was:—

Quarry or Open-Cut	.....	253
Other Surface	.....	1,678
Underground	.....	472
Total	.....	<u>2,403</u>

This is a slight decrease on previous years, the main cause being the change over from rail to road transport between Queenstown and Strahan. No men were thrown out of work, however, as employees from the railway were absorbed in other jobs which would normally have been filled by new employees replacing natural wastage.

ACCIDENTS

There were no fatal accidents during the year but there were eight serious and 23 minor ones. Of these, five of the serious and 14 of the minor occurred underground. As usual a large proportion of the injuries were to hands or fingers, in this case two serious and eight minor. Two of the serious accidents occurred when timber was being hauled up into a stope and could have been avoided. In one a miner was holding the timber on the slipping clutch on the back rope of a scraper winch while his mate moved the other rope, when the clutch grabbed, moving the timber and jamming the man's head. In the other the block had been attached to the roof above the manway by a single pin and wedge which came loose under load and one man was struck on the head. One man suffered a broken leg and another a broken arm when they were struck by falling pieces of rock while drilling. In the other underground accident a man had a bone broken in his foot when it was struck by a piece of edging that was being hauled into the stope. On the surface one man lost a finger in a docking saw, one had his fingers jammed under a tank and the third was pulled over a waste dump on an electric locomotive and had both shoulder blades broken when a truck overbalanced and fell on him.

Mr. W. R. Tindal, A.W.A.S.M., M.Aus.I.M.M., Hobart, reports:—

EMPLOYMENT

In the coal mining industry, due to a decrease in the demand for coal, the total number of employees on surface and underground fell from 227 to 167, a decrease of 60. The decrease occurred mainly underground where the number of men fell by 53. The number of employees underground was 92 and on surface 75.

ACCIDENTS

Three serious accidents were reported for the year.

Two of these accidents occurred underground. One, resulting in a broken leg, was due to coal sliding off the rib whilst cuttings were being cleared from a coal cutting machine, and the other, resulting in facial injuries, was due to a fall of roof stone at the face. The third accident occurred on surface where an employee jammed his finger in a coal elevator.

PROSECUTIONS

During the period under review the owner and agent of the Fingal Coal Co. was prosecuted under the Mines and Works Regulation Act and convicted for not carrying out quarterly surveys, not submitting yearly plans and not reporting an accident.

SAFETY

Attention has been directed to the safe working of all mines and quarries by regular inspections. Hygrometer readings were taken in all working faces and found to be within the requirements of the Act and all mines were found to be free of inflammable gas. At one colliery men were ordered out until accumulations of black damp, due to a breakthrough to workings of an abandoned colliery, were cleared and the breakthrough sealed off.

Particular attention has been paid to the electrical installations in the coal mines and in a number of instances considerable alterations have been required and so installations have been brought to a reasonable standard.

EXPLOSIVES AND INFLAMMABLE LIQUIDS

Magazines and inflammable liquid installations, new and old, have been regularly inspected and where they did not comply with the regulations, orders were issued for the requirements of the appropriate Act to be fulfilled.

REPORT OF THE MOUNT CAMERON WATER RACE BOARD FOR THE YEAR ENDED 31st DECEMBER, 1963

SIR,

We have the honour to submit the report of the Mount Cameron Water Race Board for the year ended 31st December, 1963.

Production of tin concentrates was 51.75 tons as compared with 42.5 tons for 1962. One party was supplied with water on the royalty scale based on the proceeds of tin concentrates produced and two parties obtained water on the Cash or Fixed Scale under which cash payment is made for each sluichead of water supplied. Revenue received from water under the royalty scale amounted to £39 and £2,527 was paid for cash scale water. The number of sluicheads delivered under the royalty scale was 108 and under the cash or fixed scale 2,138.

Expenditure totalled £2,928 and as receipts amounted to £2,688 there was a deficit of £240 for the year.

The Chum flume required replacement and a tender of £285 was received and a contract approved. The work was undertaken during the Christmas-New Year period 1963-64 when it was necessary to turn off water supplies for a short period. The balance of the race system was maintained in good order by the permanent staff.

The Storeys Creek Tin Mining Co. N.L. which operates the Dorset Tin Dredge has indicated that when the dredge commences operations at the new location in the McGregor-Black Duck area consideration will be given to purchasing surplus water from the race after permanent users have been supplied. It is not possible to indicate likely supplies as operations on the new site will not commence until April, 1964, but this will provide the Board with an additional source of revenue and could prevent an anticipated operational loss.

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

We have the honour to be Sir,

Your obedient servants,

J. G. SYMONS, Chairman.

H. K. TURNER, Member.

H. C. LAWRY, Member.

The Hon. the Minister for Mines.

MOUNT CAMERON WATER RACE SUSPENSE ACCOUNT. *Statement of Receipts and Payments for the year ended 31st December, 1963.*

Receipts.	£	s.	d.	Payments.	£	s.	d.
Sale of Water—				Salaries and wages	2,651	19	6
Fixed or Cash Scale	£2,527	10	0	Pay-roll tax	66	5	10
Royalty Scale	39	4	9	Car allowance—Manager	50	7	6
Domestic Use	91	10	0	Insurance	78	3	0
			2,658	Tools, general requisites	74	16	0
Hire of pipes			30	Freight and Cartage	6	12	9
			2,688				
Balance—Loss			239				
			£2,928		£2,928	4	7

MOUNT CAMERON WATER RACE *Statistics for the year ended 31st December, 1963*

Registered Rainfall			Production				
Great Mussel Roe	37 inches	3 points	Tin Oxide produced—	ton	cwt.	qr.	lb.
Little Mussel Roe	36 inches	48 points	Royalty Scale	5	—	1	6
			Fixed Scale	51	9	2	22
			Total	51	15	3	28
Water Services			Employment				
Average number of claims supplied per week		2	Average per week—				
Greatest number of claims supplied in any one week		3	Royalty Scale				1
Sluicheads supplied:—			Fixed Scale				9
Royalty Scale		108	Total				10
Fixed Scale		2,138					
Total		2,246					

REPORT OF THE RINGAROOMA AND CASCADE WATER BOARD FOR THE YEAR ENDED 31st DECEMBER, 1963

SIR,

We have the honour to submit the report of the Ringarooma and Cascade Water Board for the year ended 31st December, 1963.

Since the closure of the race system the Board has continued to function for the purpose of maintaining the two principal dams and to meet fixed charges on the capital cost of the system. An amount of £169 14s. was received from one user of water who was in arrears with payment for water supplied, and £186 was received from the Municipality of Ringarooma representing the final payment for water supplied to the town of Derby. Interest was the principal item of expenditure which totalled £627. The deficit for the year was £271 12s. 3d.

During the year £120 was received from the sale of buildings and the amount will be off-set against the original capital cost of the system amounting to £10,000.

The Board will continue to function as provided by the Ringarooma and Cascade Water (Agreement) Act, 1947.

We have the honour to be, Sir,

Your obedient servants,

J. G. SYMONS, Chairman.

H. K. TURNER, Member.

N. P. EDWARDS, Member.

The Hon. the Minister for Mines, Hobart.

RINGAROOMA AND CASCADE (WATER) SUSPENSE ACCOUNT *Statement of Receipts and Payments for the year ended 31st December, 1963*

<i>Receipts.</i>	£	s.	d.	<i>Payments.</i>	£	s.	d.
Revenue from Sale of Water—				Ringarooma Race—			
Town supplies	186	0	0	Wages	95	0	0
Mining purposes	169	14	0	Rent private land	9	6	8
Total revenue	355	14	0	Legal expenses	3	7	6
Balance (Loss)	271	12	3	Cascade System—			
				Maintenance on race	80	10	0
				Interest on capital cost of Ringarooma and Cascade Water System	439	2	1
	£627	6	3		£627	6	3