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TASMANIA

REPORT

OF THE

DIRECTOR OF MINES

YEAR ENDED 31ST DECEMBER

1965

TASMANIA.
D. E. WILKINSON, Government Printer, Tasmania.
1966.

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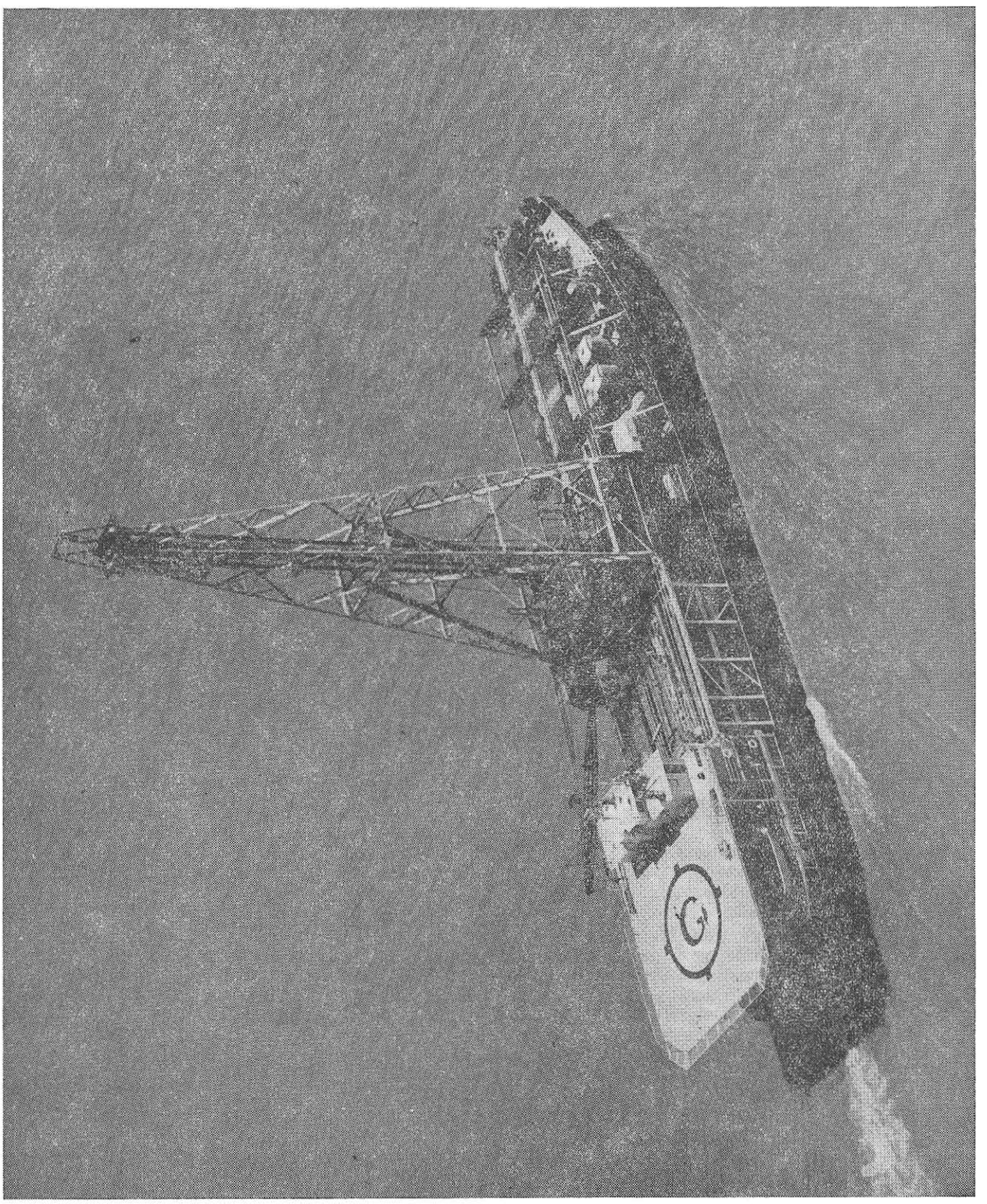


Glomar III, drilling rig, Bass Strait.

REPORT OF THE DIRECTOR OF MINES

Department of Mines,
Hobart,
30th June, 1966.

THE HONOURABLE THE MINISTER FOR MINES.

I have the honour to present my report on the mining industry for the year ended 31st December, 1965.

The mining industry produced metals and minerals valued at £A57.26 ($A114.52) million consisting of production from Tasmanian ores to the value of £A21.88 ($A43.76) million, and from imported ores £A35.38 ($A70.76) million. This is an increase of approximately £A4½ ($9) million over last year.

Favourable market prices have been responsible for increased activities by established producers and for the extensive interest in exploration activities. There have been increases in the production of tin, wolfram and scheelite but a slight decline was recorded in the output of copper, gold, lead, silver and zinc as a result of the shortage of skilled labour.

The average number of men employed was 9,038.

The mining industry in Tasmania is enjoying an unprecedented volume of activity both by established mines and by companies engaged in exploring the potential mineral value of large areas of the State.

NEW MINES

No new mines were opened during the year.

Investigational and developmental work at the Cleveland Mines, Waratah, by the Aberfoyle Tin Development Partnership was further advanced and a project consultant is studying capital requirements preparatory to commencing productive mining.

Work in re-establishment of productive mining at the old Pioneer Tin Mine at Pioneer was advanced to the final stages.

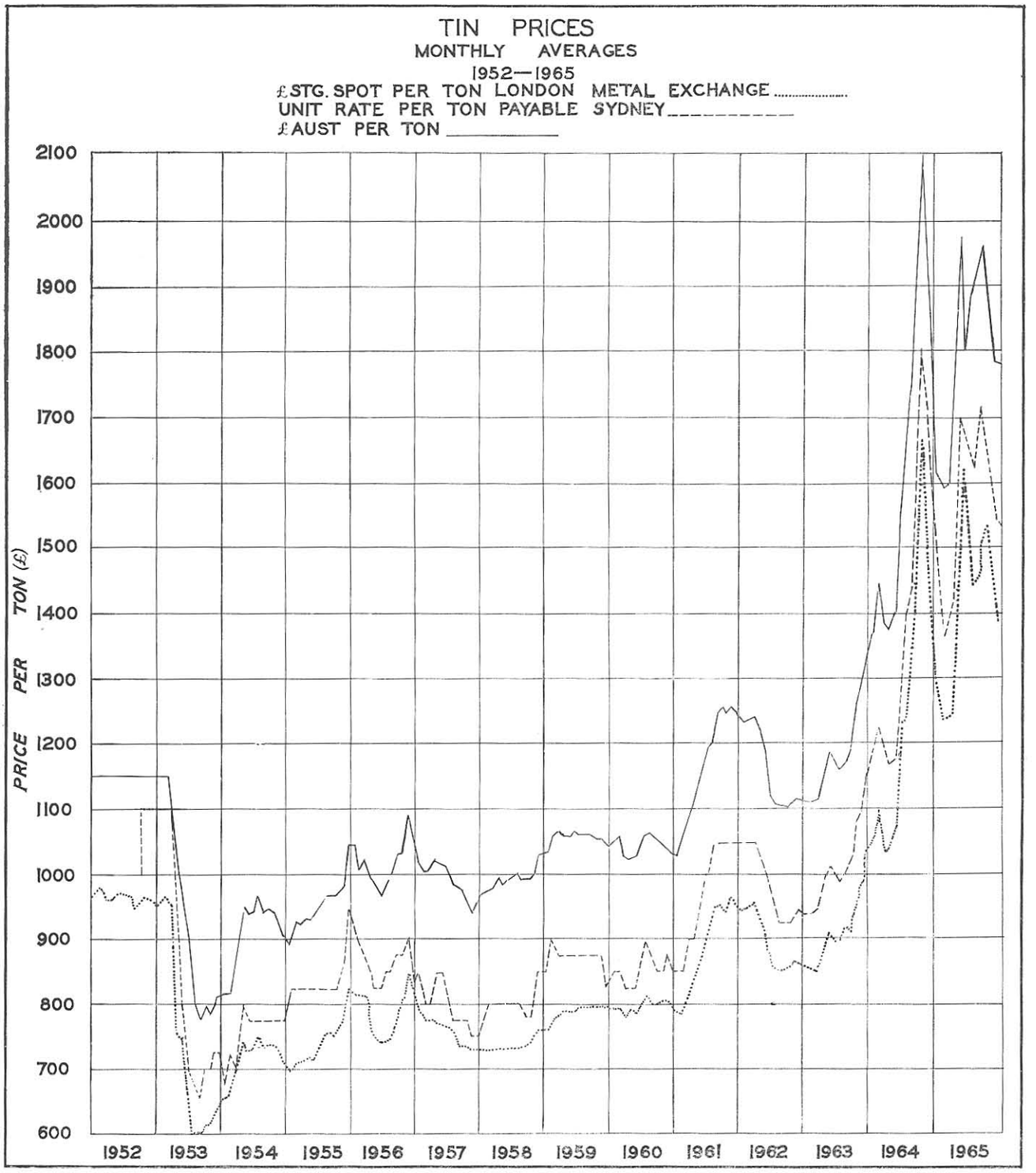
Investigational work in connection with the establishment of an iron ore pellet export industry based on the Savage River iron ore deposits was completed and a decision made to proceed with the project. Construction was in progress at the end of the year.

METAL PRICES

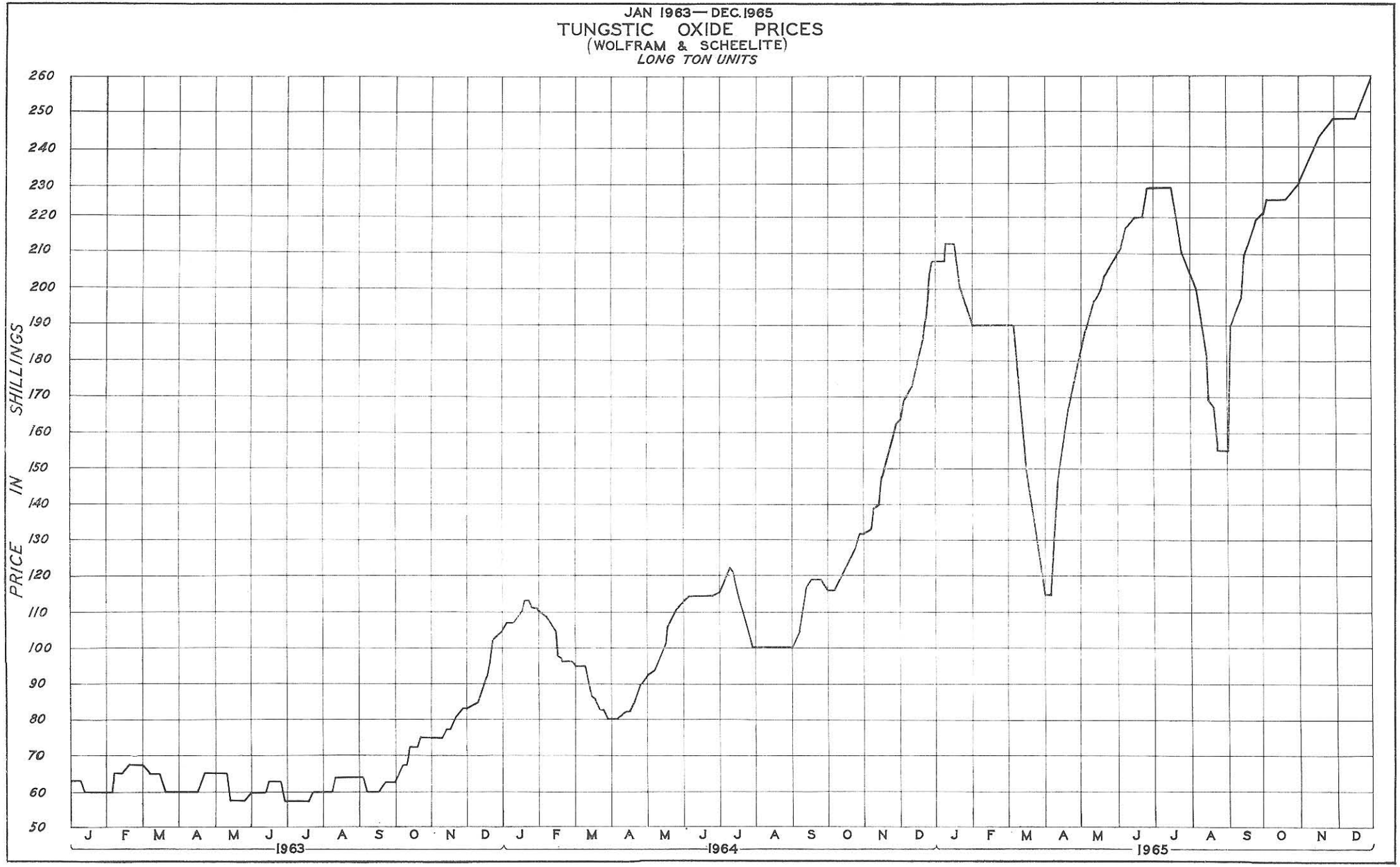
Copper.—The Australian Copper Producers price at which copper is sold for domestic consumption, which was £A340 ($A680) per ton at the end of 1964, continued at this price until 3rd May, 1965, when it was increased to £A375 ($A750) per ton. A further rise to £A395 ($A790) per ton became effective in October. The Copper Bounty Act 1958, was extended until the end of 1966. This guarantees a minimum price of £A340 ($A680) by means of payment of a bounty and provides in effect that the price of copper in Australia shall not fall below £A305 ($A610) per ton. Where the prices does not exceed this figure the maximum bounty is £A35 ($A70) per ton with a profit limitation of 10%.

Lead.—The domestic price of lead varied between a maximum of £A175 ($A350) per ton in February to a minimum of £A125 ($A250) per ton for the September quarter. The average for the year was £A140 ($A280) per ton.

Tin.—The average Australian price of tin for 1965 was £A1,819 ($A3,638) per ton as compared with £A1,615 ($A3,230) for 1964. This reflects the continued gap between production and consumption. Prices showed considerable fluctuations throughout the year and this has been attributed to political instability in the major producing countries and also to the possibility of tin plate, which is a major consumer of tin, being replaced by aluminium or coated steel for the manufacture of containers. Market observers report, however, that tin plate is preferred for food containers and the demand for tin will continue to be maintained. The situation of potential areas of increased production in politically and socially unstable countries has offered little inducement to bigger investments necessary to development of higher production. In Australia where stable conditions obtain there has been considerable exploration and developmental activities and production has increased considerably but some imports are still necessary.


TIN PRICES
MONTHLY AVERAGES
1952—1965
£STG. SPOT PER TON LONDON METAL EXCHANGE
UNIT RATE PER TON PAYABLE SYDNEY
£AUST PER TON
PRICE PER TON (£)
2100
2000
1900
1800
1700
1600
1500
1400
1300
1200
1100
1000
900
800
700
600
1952
1953
1954
1955
1956
1957
1958
1959
1960
1961
1962
1963
1964
1965

5 cm


JAN 1963— DEC. 1965
TUNGSTIC OXIDE PRICES
(WOLFRAM & SCHEELITE)
LONG TON UNITS
PRICE IN SHILLINGS
260
250
240
230
220
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D
1963
1964
1965
5 cm

The International Tin Council continued to meet but its Buffer Stock scheme to control prices was unable to operate because of unavailability of stocks. The only balancing factor was the release of tin from the United States Government Stockpile. This is expected to be sufficient to exercise control on run-away prices for the next three years. Political conditions in producer areas which affect a higher rate of production and the possibility of substitutes are the main factors which may affect future tin prices but it seems certain that they will remain at a high level for a long time.

The price has stimulated intense exploration activity in Tasmania, notably by the Aberfoyle group, Utah Development Co., Placer Prospecting and Comstaff Pty. Ltd., and has led to expansion of productive activities by Renison Ltd. to exploit deposits of tin ore located by drilling. Work is continuing at the Cleveland Tin Mine preparatory to the establishment of productive activities.

Tasmanian producers are paid for tin concentrates at a unit rate based on the percentage of tin contained in concentrates. Payments ranged from 269/7 ($A26.98) per unit to 359/8 ($A35.99) per unit equivalent to £A994 ($A1,988) to £A1,260 ($A2,520) per ton of 70% concentrates. During 1964 the equivalent prices ranged from £A803 ($A1,606) to £A1,298 ($A2,596).

Tungsten.—The price of tungstic oxide determines the price obtained for wolfram concentrates from the Storeys Creek and Aberfoyle Mines and for scheelite concentrates from the King Island Scheelite Mine.

In my last Annual Report it was indicated that the price at the end of 1964 was 207/6 ($A20.75) per unit. This declined slowly until towards the end of March when the quoted price was 115/- ($A11.50) per unit. A rapid increase then occurred which, apart from a recession to an average of 177/9 ($A17.78) in August, maintained an average of over 224/- ($A22.40) per unit with a peak of 261/- ($A26.10) per unit in December.

Operations by the King Island Scheelite Mine which were subsidized by the Government during 1963 to the extent of £A198,955 ($A397,910) continued on a profitable basis and repayments were made in accordance with the provisions of the King Island Scheelite Agreement Act of 1963. The total amount repaid to 31st December, 1965 was £A163,700 ($A327,400).

According to market observers the price of tungsten now offering is the best offering since the Korean war and the primary reason has been due to limited supplies of clean wolfram and scheelite. It is expected that there will be the usual price fluctuations during 1966, and the position can be influenced by releases from the U.S. stockpile for the domestic market which is currently undersupplied.

Zinc.—The Producers Price has been adopted as the basis for sale of zinc although trading in zinc continued on the London Metal Exchange. The Producers Price of £A143 ($A286) at September, 1964, continued during 1965.

EXPLORATION

A total of 58 exploration and special prospector's licences are in force covering an area of 89,350 square miles for the purpose of investigation and exploration of the mineral and oil resources of the State. The whole of the land area with the exception of portions of northern, eastern and central Tasmania is being actively investigated.

A total of 13,000 square miles of sea covered land mainly in the north-eastern part of the State and surrounding King Island and Flinders Island is in occupation for the search for minerals, and the whole of Bass Strait and the continental shelf surrounding Tasmania as well as the estuary of the Derwent River is held for oil exploration purposes.

Established mining companies have been actively engaged in exploration activities within their mining leases in order to increase ore reserves.

The Mt. Lyell Mining and Railway Co. Ltd., at Queenstown in which Consolidated Goldfields (Aust.) Pty. Ltd. has a controlling interest has increased the area held under lease and has ore reserves assessed at 23 million tons of 0.93% copper.

The Electrolytic Zinc Company at Rosebery has increased its ore reserves to 5.5 million tons and is investigating potential mineral resources on a total of 80 square miles outside its leases. In addition the Company has purchased the Mt. Farrell Mine at Tullah and production and exploration at this mine have continued.

Renison Ltd. at Renison Bell is proceeding with a large programme of expansion to develop and produce from the Federal and Bassett tin lodes investigated during previous exploration activities. The work of building and equipping a new mill of 1,000 tons per day capacity is well advanced and progress has been made with the development of a major housing scheme at Zeehan. The Government passed special legislation to enable the Company to obtain a clear title to the land allotments required. The Company estimates ore reserves at 12 million tons averaging 0.95% tin.

Renison Limited is a subsidiary of Consolidated Goldfields (Aust.) Pty. Ltd.

The Aberfoyle Group of Companies is very active in the State. It operates the Aberfoyle Tin Mine at Rossarden, the Storeys Creek Tin Mine at Storeys Creek and the Dorset Tin Dredge at Gladstone. In addition it is engaged in exploration activities for tin on the Blue Tier on the East Coast; at Mt. Lindsay on the West Coast; Mt. Bischoff at Waratah on the West Coast and Mt. Cleveland near Waratah on the West Coast. At Mt. Cleveland, ore reserves are estimated at two million tons of 1% ore and the Company has appointed a project consultant and is studying capital requirements preparatory to commencing productive mining. The Government has co-operated with the Company by arranging metallurgical research into treatment methods through the laboratories of the Department of Mines.

In addition to exploratory activities by established producers within the State to which reference has been made, other companies are engaged in geological and geophysical surveys, diamond drilling and other prospecting activities.

The Broken Hill Pty. Co. Ltd. is engaged in assessing the mineral potential in the whole of the south-western part of the State comprising almost one-quarter of the land area. Comstaff Pty. Ltd. has a licence over 925 square miles on the West Coast and also occupies a substantial part of the old Mount Bischoff Mine at Waratah; Placer Prospecting Pty. Ltd. has been investigating parts of the old Zeehan field and is currently testing the Razorback Tin Mine. Industrial and Mining Investigations Pty. Ltd. continues to occupy the Savage River iron ore deposits apart from the area which will be mined by Pickands Mather & Co. International for the requirements of the iron ore pellet export industry. Diamond drilling is continuing to assess the volume and grade of iron ore in the Long Plains and Rocky River areas adjoining the deposits at Savage River. Pickands Mather & Co. have extended their interests to other mineral deposits and have been granted an Exploration Licence over an area of 4,000 square miles of the north-western part of Tasmania. On the North-West Coast, The Broken Hill Pty. Co. Ltd. and the Mt. Lyell Mining and Railway Co. Ltd. are engaged in exploration activities.

In the north-east in addition to exploratory work by the Aberfoyle Companies, Utah Development Company is maintaining its search for deposits of tin and gold and the Endurance Tin Mining Co. N.L., which has been one of the principal tin producers in the State for many years, is investigating further alluvial areas as possible extensions for its activities. On King Island a local syndicate has interested the Aberfoyle Group and Mt. Costigan Mines Limited in the possibilities of developing alluvial tin and beach sand deposits. Utah Development Company are the holders of an Exploration Licence of the Furneaux Group and are currently investigating the tin deposits on Cape Barren Island.

The interest being displayed in the exploration and investigation of off-shore mineral deposits opens up a new phase in the development of the mining industry in the State. The areas mainly concerned are off the North-East Coast and the east coast of King Island where it is thought that alluvial tin deposits will have been conveyed from the land to off-shore areas by stream action.

Ocean Mining A.G. are particularly active in this field of exploration and have arranged a joint venture with Ocean Science & Engineering Inc., Bethlehem Steel Corporation, Charter Consolidated, Anglo American Corporation and The Electrolytic Zinc Company of Australasia Ltd. for a comprehensive programme of work on all areas held by Ocean Mining A.G.

The Broken Hill Pty. Co. Ltd. and Utah Development Co. also hold off-shore areas under Exploration Licences.

The Broken Hill Pty. Co. Ltd through Haematite Explorations Pty. Ltd., a wholly owned subsidiary, has held an Exploration Licence to search for oil and gas in Bass Strait since 1960. In association with Esso Exploration Australia Inc. one oil well was drilled in the Bass Basin to a depth of 7,717 feet but no oil or gas was encountered.

Further drilling was deferred whilst the drilling vessel " Glomar III " undertook boring in the Gippsland Basin in Victorian waters. Four bores have been drilled in this basin and gas was

obtained in one hole and gas and oil in another. The drilling plant is now being returned to Tasmanian waters to continue boring in the Bass Basin. The discovery of oil would have an enormous impact on the economy of Tasmania and the outcome of the boring is of major importance.

Esso Exploration Australia Inc. has also been granted a licence to search for oil on the continental shelf surrounding Tasmania and the Electrolytic Zinc Co. has a licence in south-eastern Tasmania including the estuary of the Derwent River and portion of the East Coast for oil exploration purposes.

Expenditure on exploration outside existing mining leases was as follows—

	£	$
1953-63	2,180,000	4,360,000
1964	555,000	1,110,000
1965	1,450,620	2,901,240
	£4,185,620	$8,371,240

The Government, through the Department of Mines, has continued its policy of investigation and exploration of the mineral resources. The geological staff maintained a full programme of field work covering regional and economic surveys. Technical reports and maps are published regularly and these are in constant demand by exploration companies. Departmental drilling plants were employed in testing coal measures in the Fingal Valley; boring a gold reefing series at Mathinna and at the old Tasmania Mine, Beaconsfield; testing small iron deposits on the North-West Coast; investigating alluvial tin deposits in the north-east and in boring underground water resources. Ore-dressing, metallurgical and assay laboratories operated by the Department of Mines maintained full services to the industry and undertook metallurgical investigations including pilot plant testing of ores for operating and exploration companies.

COAL

Production declined from 151,161 tons in 1964 to 102,457 tons this year and the number of men employed was 70 which was 38 less than in 1964. Virtually the only large industrial consumer of coal is the Australian Newsprint Mills at Boyer the remaining production being used by brick kilns. The only mines now in operation are the Duncan Mine, Fingal; the Stanhope Mine at Avoca; Sandfly Mine, Kaoota; and the Cardiff Mine at St. Marys.

The Coal Utilization Research Advisory Committee referred to in my previous report met on several occasions and the State was represented by the Director of Mines. Several research projects were undertaken by the National Coal Industry Research Laboratories and universities, and financial contributions were made from funds provided by private industry and by the Commonwealth and State Governments represented on the Advisory Committee. The contribution by Tasmania was £A2,500 ($A5,000) for 1965-66 and further amounts are to be provided in subsequent years to assist with scientific and technological aspects of research into the uses of all types of Australian coal.

Any developments which may represent possibilities of alternative uses of Tasmanian coal will be included in reports to the Coal Utilization Research Advisory Committee and the Director of Mines as the State representative will arrange for investigation of all aspects of application for commercial purposes.

IRON ORE

Interest in the potential of the Savage River deposits was renewed in 1955 and following a geophysical survey undertaken by the Bureau of Mineral Resources at the request of the Department of Mines a diamond drilling programme was carried out by the Department. The results were encouraging and, following representations, an Exploration Licence was issued to Mr. E. R. Hudson of Industrial and Mining Investigations Pty. Ltd. Further geophysical surveys were made and a vigorous drilling campaign was undertaken which proved the existence of large deposits of iron ore capable of commercial exploitation. Mr. Hudson endeavoured to interest Australian investors in the deposits but without success and after approaching English and American companies made an arrangement for Pickands Mather & Co. of Cleveland, Ohio to investigate the commercial potential of the deposits in 1963.

After further drilling and other investigations the Company submitted a proposal for the establishment of an industry for the export of iron ore pellets to Japan from an area of approximately 2,000 acres at Savage River. The proposal received the approval of the Government and after lengthy negotiations it was agreed to submit special legislation for the granting of leases and to approve of an agreement to enable the industry to be established.

The crude ore will be mined by open-cut methods and concentrated by crushing, grinding and magnetic separation near the mine site at Savage River. The concentrated ore will be pumped in a slurry form to a pellet plant at Brickmakers Bay situated on the North-West Coast near Wynyard, a distance of 56 miles. At Brickmakers Bay the water will be removed and the concentrated ore will be formed into pellets ready for shipment. From the pellet plant the pellets will be transported by conveyor over a ship loading facility extending into Bass Strait for approximately one mile to a delivery point where ships of 40,000 to 60,000 tons capacity will be loaded. The pellets will then be transported to Japan for use as blast furnace feed.

The project will be a joint venture of Northwest Iron Co. Ltd. and Dahlia Mining Co. Ltd. each of which will have a half interest and will take one-half of the output and pay one-half of the costs. Management will be by Pickands Mather & Co. International a subsidiary of the American Company, Pickands Mather & Co. The capital of Northwest Iron Co. Ltd. will be subscribed by Pickands Mather & Co. International and certain American and Australian interests and the capital of Dahlia Mining Co. Ltd. will be subscribed by Mitsubishi Shoji Kaishi Ltd. and Simitomo Shoji Kaisha Ltd. The proposal is that Northwest Iron Ltd. will sell its share to Dahlia Mining Co. Ltd. which in turn will sell the whole output to Japanese steel companies who will be contractually bound to accept and pay for it. The capital cost of the industry will be approximately £A31m ($A62m) or $US88m. It is proposed that the Companies referred to will provide $US24m, lenders in the United States $US59.5m. and the Tasmanian Government by way of loan $US4.5m or $A2m.

Briefly, the agreement and lease which have been ratified under the Iron Ore (Savage River) Agreement Act 1965, provides for the granting of a mining lease covering the mine and plant site at Savage River (2,530 acres) ; the pipe line to Brickmakers Bay (area approximately 956 acres) ; the pellet plant at Brickmakers Bay (120 acres) and wharf and loading facilities at Brickmakers Bay (2,110 acres). The lease will be for a term of 30 years and in addition to an annual rental of £A2,898 ($A5,796) a royalty of 15 cents per ton will be payable on the first 60 million tons of pellets shipped. The State has reserved the right to fix a royalty of not more than double this rate on shipments in excess of 60 million tons. When shipments commence towards the end of 1967 the expected rate of shipment will be two to three million tons per annum and this will return revenue to the State of £A150,000 ($A300,000) to £A225,000 ($A450,000) per year or a total of £A4.5m ($A9m) on the 60 million tons of pellets referred to in the lease.

It is proposed to sell the Companies 655 acres of Crown land near Savage River for the construction of a township for approximately 375 men. The town will be constructed by the Companies but the State will provide public services and will also construct access roads to serve the mine. Housing for the 135 men expected to be employed at the plant at Brickmakers Bay will be provided by the Government at a reasonable distance thereto and the State will also contribute to a re-alignment of the Bass Highway which is necessary because of plant location. A loan of £A2m ($A4m) is being made for construction of port facilities and this will be repayable over a term of 20 years.

The lease relates to portion only of the area at Savage River held under Exploration Licence by Industrial and Mining Investigations Pty. Ltd. and the licence holder will continue to investigate the balance of the area of 140 square miles with the stated object of determining the potential for the establishment of an integrated steel industry.

LEGISLATION

The Iron Ore (Savage River) Agreement Act 1965

The Iron Ore (Savage River) Agreement Act 1965, was passed to authorize the granting of a lease covering the land required in connection with the establishment of the iron ore pellet export industry based on the Savage River iron ore deposits. The lease will be for a term of 30 years and in addition to an annual rental of £A2,898 ($A5,796) a royalty of 1/6 (15c) will be payable on the first 60 million tons of pellets shipped. The State has reserved the right to fix a royalty of not more than double this rate on shipments in excess of 60 million tons.

The Inflammable Liquids Act 1929

An amendment was made to this Act to assist the functioning of the Navigation and Survey Authority constituted under the Marine Act 1963. This Authority is charged under the Marine Act with the regulation of the carriage and storage on vessels of dangerous or hazardous substances. In order to enable the Authority to use the uniform code for handling and storage of inflammable liquids and dangerous commodities laid down by the Inflammable Liquids Act and Regulations and to exercise certain of the powers of an Inspector of Explosives it was necessary to amend the Inflammable Liquids Act.

REVENUE

Return showing the Revenue collected during the year ended 31st December, 1965.

Head of Revenue	Amount	
	£A	$A
Public Works and Services—Mines Department	17,013	34,026
Rent and Fees of Auriferous and Mineral Loans	29,455	58,910
Survey Fees	1,013	2,026
Fees under the Explosives and Inflammable Liquids Act	15,322	30,644
Total	£62,803	$125,606

Comparative Statement of Revenue from Mines, being Rents, Fees, Storage of Explosives, &c., Paid to the Treasury during the years 1958 *to* 1965.

Year	Amount	
	£A	$A
1958	22,187	44,374
1959	32,288	64,576
1960	41,726	83,452
1961	47,598	95,196
1962	44,121	88,242
1963	57,036	114,072
1964	59,699	119,398
1965	62,803	125,606

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

LEASES AND LICENCES

Return showing number and area of New Leases and Licences issued during the year ended 31st December, 1965.

Leases and Licences	Number	Area (Acres)	Sluiceheads
Clay and Sand	4	289	....
Coal	2	188	....
Copper	1	4,343	....
Easements	1	10	....
Gold	2	22	....
Gravel	4	106	....
Iron	2	20	....
Minerals	1	20	....
Osmiridium	2	20	....
Silica	4	170	....
Stone	10	413	....
Tin	30	566	....
Water Licences	9	7	88
Total	72	6,174	88

Return showing the Total Number of Leases and Licences in Force on 31st December, 1965.

Leases and Licences	Number	Area (Acres)	Sluiceheads
Bauxite	5	454	....
Clay	16	695	....
Coal	16	5,057	....
Copper	3	7,446	....
Copper-Nickel	3	120	....
Dolomite	4	369	....
Easement Licences	57	839	....
Feldspar	2	15	....
Gold	27	615	....
Granite	3	25	....
Iron Ore	6	241	....
Limestone	25	1,958	....
Mica	1	20	....
Minerals	51	8,749	....
Ochre	2	8	....
Osmiridium and Chromite	9	130	....
Sand and Gravel	19	1,047	....
Scheelite	5	1,000	....
Silica	15	1,396	....
Silver-Lead	10	1,270	....
Stone	42	4,109	....
Tin	203	5,825	....
Tin-Wolfram	9	2,253	....
Uranium	1	50	....
Water Licences	118	915	858
Total	652	44,606	858

Return showing Number and Area of Leases and Licences Applied for during the year ended 31st December, 1965.

Leases and Licences	Number	Area (Acres)	Sluiceheads
Clay	2	181	....
Coal	1	80	....
Copper	1	40	....
Gold	1	5	....
Gravel	1	2,078	....
Iron Ore	2	61	....
Minerals	5	247	....
Osmiridium	2	20	....
Peat	1	178	....
Scheelite	2	119	....
Silica	11	1,467	....
Stone and Sand	6	662	....
Tin	37	754	....
Water	9	5	48
Total	81	5,897	48

Return showing particulars of Exploration Licences and Special Prospectors Licences in force at 31st December, 1965.

Licence No.	Holder	Area	Situation	Mineral
EL 1/60	Haematite Exploration Pty. Ltd.	35,325 square miles	Bass Strait	Petroleum Oil and Gas
EL 4/61	Industrial and Mining Investigations Pty. Ltd.	147 square miles	Savage River	Minerals
EL 5/61	Industrial and Mining Investigations Pty. Ltd.	450 square miles	East Coast	Coal and Limestone
EL 1/62	Electrolytic Zinc Co. of Australasia Ltd.	49 square miles	Rosebery	Minerals
EL 2/62	Electrolytic Zinc Co. of Australasia Ltd.	8 square miles	Dundas	Minerals
EL 1/63	Aberfoyle Tin N.L.	14.75 square miles	Mt. Cleveland	Tin

Licence No.	Holder	Area		Situation	Mineral
EL 2/63	Aberfoyle Tin N.L.	87.4	square miles	Mt. Lindsay	Minerals
EL 3/63	Aberfoyle Tin N.L.	35	square miles	Blue Tier	Tin
EL 4/63	Storeys Creek Tin Mining Co. Ltd.	144	square miles	Moorina	Kaolin
EL 5/63	Comstaff Pty. Ltd.	925	square miles	West Coast	Minerals
EL 6/63	Utah Development Co.	140	square miles	Dorset	Tin and Gold
EL 1/65	Aberfoyle Tin N.L.	100	square miles	Rossarden	Minerals
EL 2/65	Utah Development Co.	3,300	square miles	Furneaux Group Islands	Minerals
EL 3/65	Broken Hill Pty. Co. Ltd.	57	square miles	Holwell	Minerals
EL 4/65	J. K. Rogers	127	square miles	Beaconsfield	Chrysotile Asbestos
EL 5/65	Broken Hill Pty. Co. Ltd.	80	square miles	Dorset	Minerals
EL 6/65	Ocean Mining A.G.	900	square miles	Dorset	Minerals
EL 7/65	Ocean Mining A.G.	600	square miles	King Island	Minerals
EL 8/65	Mt. Lyell Mining and Railway Co. Ltd.	110	square miles	Devon	Minerals
EL 9/65	Storeys Creek Tin Mining Co. N.L.	75	square miles	King Island	Minerals
EL10/65	Mt. Costigan Mines Ltd.	1,343	acres	King Island	Minerals
EL11/65	Storeys Creek Tin Mining Co. N.L.	4	square miles	Gladstone	Minerals
EL13/65	Broken Hill Pty. Co. Ltd.	6,000	square miles	South-West	Minerals
EL12/65	Pickands Mather and Co. International	4,074	square miles	West Coast	Minerals
EL14/65	Broken Hill Pty. Co. Ltd.	36	square miles	Frankford	Quartzite-Silica
EL15/65	Broken Hill Pty. Co. Ltd.	1,700	square miles	Sheffield	Minerals
EL16/65	Austminex Pty. Ltd.	98	square miles	Scamander	Minerals
EL17/65	A. S. Gill	8,000	square miles	S.E. Tas.	Petroleum Oil and Gas
EL18/65	Esso Exploration (Aust.) Inc.	8,350	square miles	W. and S.W. Coast	Petroleum Oil and Gas
EL19/65	Esso Exploration (Aust.) Inc.	2,700	square miles	Offshore, E. Coast	Petroleum Oil and Gas
EL20/65	Planet Mining Co. Pty. Ltd.	2,750	square miles	Western Bass Strait	Phosphate Rock
EL21/65	Planet Mining Co. Pty. Ltd.	3,300	square miles	Furneaux Group Islands	Minerals
EL22/65	Ocean Mining A.G.	3,290	square miles	West of King Island	Minerals

Licence No.	Holder	Area		Situation	Mineral
EL23/65	Ocean Mining A.G.	1,900	square miles	Bass Strait	Minerals
EL24/65	Ocean Mining A.G.	100	square miles	Extending north into Bass Strait	Minerals
EL25/65	Ocean Mining A.G.	740	square miles	East Coast	Minerals
EL26/65	Planet Mining Co. Pty. Ltd.	2,050	square miles	North-West	Phosphate Rock
EL27/65	Pickands Mather and Co. International	13	square miles	Natone	Minerals
EL28/65	Pickands Mather and Co. International	11	square miles	Natone	Minerals
EL29/65	Aberfoyle Tin N.L.	76	square miles	Waratah	Minerals
SPL 399	V. Wood	14.5	square miles	Mt. Cameron	Tin
SPL 403	L. Price	2	square miles	Scamander	Tin
SPL 404	C. Loftus Hill	1,440	acres	Zeehan	Minerals
SPL 410	G. C. Kingston	25	square miles	Balfour	Minerals
SPL 1	Electrolytic Zinc Co. of Australasia Ltd.	15	square miles	Trial Harbour	Minerals
SPL 2	M. Gatenby	680	acres	Naracoopa	Minerals
SPL 3	Electrolytic Zinc Co. of Australasia Ltd.	10	square miles	Tullah	Minerals
SPL 6	J. G. Loftus-Hills	2,112	acres	Linda Valley	Minerals
SPL 7	J. C. Curtain	500	acres	Naracoopa	Minerals
SPL 8	Storeys Creek Tin Mining Co. N.L.	1,750	acres	Gladstone	Tin
SPL 9	M. Solomon	1.3	square miles	Cowper Point	Tin
SPL 11	R. P. J. Weedon	3,200	acres	Dundas	Minerals
SPL 12	Placer Prospecting Pty. Ltd.	2,560	acres	Zeehan	Minerals
SPL 13	Placer Prospecting Pty. Ltd.	1,440	acres	Zeehan	Minerals
SPL 14	E. R. Hudson	2,500	acres	Weldborough	Tin
SPL 15	J. Neale	18	square miles	Bell Hill	Tin
SPL 16	Endurance Tin Mining Co. N.L.	7	square miles	South Mt. Cameron	Minerals

Return showing Total Number and Areas of all Types of Authorities to Prospect Held at as 31st December, 1965

Type and Authority	Number	Area
Permits to enter and search on private land including owners' permissions	6	4,518 acres
Exploration Licences	40	89,208 sq.miles
Special Prospector's Licences	18	89,142 acres
Prospector's Licences	137	6,850 acres
Miner's Rights	115	58 acres
Authorities to prospect under Aid to Mining Act 1927	4	21,300 acres

WARDEN'S COURT

P. D. Beard v. T. H. Fitzallen and L. Foot—Application for forfeiture of lease 601P/M—*Royal George.*

This application which was listed for hearing by the Warden of Mines, Launceston, was withdrawn.

The Broken Hill Pty. Co. Ltd. v. C. A. Dally—Compensation for lease of private land at Beaconsfield.

This application was heard by the Warden of Mines, Launceston, who ruled that the landowner was entitled to compensation but did not fix the amount of such compensation. Subsequently the Company lodged an Appeal with the Supreme Court but the application for lease was withdrawn and the Appeal did not proceed.

EXEMPTIONS

The following exemptions were granted:—

Eagle Metal and Industrial Products Pty. Ltd. Leases 45M/52, 46M/52 and 47M/52, Dundas to 30th June, 1966.

L. D. McRae. Lease 5M/63 at Coles Bay to 31st December, 1965.

Aberfoyle Tin N.L. Leases 49M/61, 50M/61, 75M/63 and 76M/63 at Mt. Cleveland to 31st March, 1966.

Aberfoyle Tin N.L. Exemption Exploration Licence 1/65 at Rossarden until 6th September, 1965.

Aberfoyle Tin N.L. Exemption Exploration Licence 2/63 at Mt. Lindsay to 15th December, 1965.

MINE MANAGER'S CERTIFICATES

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

Bruce Vernon McDougall,

John Leslie Black,

Richard Melvyn Hennessy.

Certificates were also issued to:—

John Thomas Samuel,

Ian Douglas Cameron,

upon presentation of a certificate issued by a recognized authority in another State.

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

	Value £A		Value £A
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	1964	20,006,689
1960	13,387,260	1965	21,877,952

MINERAL PRODUCTION SINCE 1880

Quantity and Value of Mineral Production as at 31st December, 1965.

Mineral		*Total Quantity*	*Value £A*
METALLIC MINERALS—			
Antimony	(tons)	3	1,017
Bismuth	(tons)	84	29,644
Cadmium	(tons)	1,525	2,066,201
Cobalt Oxide	(tons)	17	15,785
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)	450,850	76,660,976
Crocoite	(specimens only)	....	533
Gold	(fine oz.)	2,662,129	16,249,859
Ilmenite	(tons)	550	1,256
Iron Oxide (including Hematite, Limonite and Magnetite)	(tons)	111,491	120,567
Lead (from 1919)	(tons)	364,327	23,009,725
Manganese	(tons)	1	3
Manganese Dioxide (from 1957)	(tons)	2,034	31,392
Monazite	(tons)	33	607
Nickel	(tons)	233	40,518
Osmiridium	(oz.)	31,088	708,531
Pyrite	(tons)	1,636,820	3,646,761
Rutile	(tons)	1	18
Scheelite	(tons)	20,994	19,523,194
Silica for Silicon Alloy Production	(tons)	15,206	56,317
Silicon as Silicon Alloys	(tons)	1,865	134,280
Silver Lead Ore to 1918 (now shown under Silver and Lead)	(tons)	1,083,898	6,429,219
Silver from 1919	(fine oz.)	45,757,432	12,716,376
Sulphur as Sulphuric Acid (from 1957)	(mono tons)	342,521	1,645,313
Tin	(tons)	150,017	39,390,102
Wolfram	(tons)	15,422	9,533,834
Zinc	(tons)	795,548	58,242,920
Zinc Sulphate (from 1957)	(tons)	2,312	113,030
NON-METALLIC MINERALS—			
Asbestos	(tons)	3,980	17,142
Barytes	(tons)	2,205	8,239
Clay—(from 1958)			
Brick	(cubic yards)	836,118	766,481
Tile	(cubic yards)	27,726	13,933
Other	(cubic yards)	129,153	134,012
Dolomite	(tons)	26,840	78,606
Graphite	(tons)	40	107
Kaolin	(tons)	111,086	441,509
Limestone—			
Agricultural and other	(tons)	599,322	722,131
Carbide	(tons)	689,219	922,660
Cement	(tons)	4,660,409	3,114,695
Chemical and Metallurgical	(tons)	4,157,982	2,427,555
Ochre	(tons)	2,394	7,866
Pebbles (from 1957)	(tons)	5,495	40,568
Silica	(tons)	174,585	123,943
Talc	(tons)	333	1,077
FUEL MINERALS—			
Coal	(tons)	9,326,794	11,948,736
Shale	(tons)	41,572	31,231
CONSTRUCTION MATERIALS—			
Building Stones—			
Freestone	(cubic yards)	4,117	26,031
Granite	(cubic yards)	5,627	41,236
Other	(cubic yards)	1,340	1,657
Crushed and Broken Stone—(from 1958)			
Basalt	(cubic yards)	688,778	640,257
Dolerite	(cubic yards)	4,060,942	5,832,687
Limestone	(cubic yards)	205,759	251,688
Sandstone	(cubic yards)	30,808	23,332
Other	(cubic yards)	923,938	830,431
Gravel (from 1958)	(cubic yards)	8,205,597	4,148,212
Sand (from 1958)	(cubic yards)	538,123	372,348
Other Road Materials	(cubic yards)	411,691	282,590
			£318,119,074

STATISTICS RELATING TO THE MINERAL INDUSTRY

Mineral.	Year ended 31st December, 1964.		Year ended 31st December, 1965.	
	Total Quantity.	Value £A.	Total Quantity.	Value £A.
Metallic Minerals:				
Cadmium (tons)	76	255,501	70	178,558
Cobalt Oxide (tons)	1.46	1,601	1.52	1,674
Copper (tons)	15,217	5,036,689	14,573	5,428,436
Gold (fine oz.)	31,551	492,980	30,084	470,063
Iron Oxide (tons)	6,808	9,681	3,524	4,918
Lead (tons)	11,823	1,439,803	11,126	1,551,800
Manganese Dioxide (tons)	304	5,947	371	7,150
Pyrite (tons)	66,381	199,143	58,868	176,604
Scheelite (tons)	1,063	554,641	1,185	1,045,300
Silica for Silicon Alloy Production (tons)	9,375	27,162	5,381	29,155
Silicon as Silicon Alloys (tons)	1,865	134,280	Nil	Nil
Silver (fine oz.)	1,477,416	863,533	1,383,859	806,358
Sulphur as Sulphuric Acid (mono tons)	57,926	289,630	64,172	320,860
Tin (tons)	990	1,618,643	1,027	1,880,879
Wolfram (tons)	364	195,567	492	451,520
Zinc (tons)	40,072	6,128,213	38,096	6,209,721
Zinc Sulphate (tons)	507	30,725	340	19,207
Value of Metallic Minerals	....	£17,283,739	....	£18,582,203
Non-Metallic Minerals:				
Clay:				
Brick (cubic yards)	113,664	104,173	123,749	109,649
Tile (cubic yards)	1,600	3,360	3,750	4,125
Other (cubic yards)	20,992	28,852	20,297	27,728
Dolomite (tons)	923	2,640	1,145	3,392
Kaolin (tons)	Nil	Nil	Nil	Nil
Limestone:				
Agricultural (tons)	29,961	34,502	29,685	34,845
Carbide (tons)	27,219	53,199	30,315	59,216
Cement (tons)	261,030	255,568	249,107	243,909
Chemical and Metallurgical (tons)	32,996	50,184	29,075	45,437
Other (tons)	312	3,268	232	2,396
Ochre (tons)	69	462	40	272
Pebbles (tons)	727	5,060	920	7,001
Silica (tons)	4,231	4,193	4,562	5,264
Value of Non-Metallic Minerals	....	£545,461	....	£543,234
Fuel Minerals:				
Coal (tons)	151,161	£311,315	102,457	£210,173
Construction Materials:				
Crushed and Broken Stone:				
Basalt (cubic yards)	196,860	190,085	227,073	229,510
Dolerite (cubic yards)	557,981	677,690	780,585	1,010,918
Limestone (cubic yards)	24,292	26,668	18,753	22,034
Sandstone (cubic yards)	659	327	24,690	20,814
Other (cubic yards)	136,525	134,436	198,927	204,413
Building Stone:				
Freestone (cubic yards)	755	4,760	949	6,335
Grey Granite (cubic yards)	....	....	20	20
Red Granite (cubic yards)	3,569	3,672	Nil	Nil
Other (cubic yards)	195	287	205	172
Gravel (cubic yards)	1,286,348	694,220	1,601,131	860,620
Sand (cubic yards)	113,255	65,146	146,973	97,675
Other Road Material (cubic yards)	106,498	68,883	175,973	89,831
Value of Construction Materials	....	£1,866,174	....	£2,542,342
Total Value with Australian Metal Prices	....	£20,006,689	....	£21,877,952
Metallurgical Production from other than Tasmanian Ores: Alumina, Aluminium, Aluminium Sulphate, Cadmium, Cobalt Oxide, Ferro-Manganese, Titanium Dioxide, Zinc	....	32,499,359	....	35,380,916
Value of Mining and Metallurgical Production	....	£52,506,048	....	£57,258,868

Manufactured Products: Product.	Total Quantity (tons)	Total Quantity (tons)
Acetylene Black	221	127
Ammonium Sulphate	30,226	40,809
Carbide	13,259	14,051
Cement	201,355	175,927
Superphosphate	84,075	99,558
Average Number of men employed	8,815	9,038

AID TO MINING

Financial assistance was provided under the Aid to Mining Act 1927 to four projects. An advance was made to the Stanhope Coal Mine towards the cost of purchase and installation of a belt conveyor system; Briseis Tin N.L. were assisted to meet the cost of drilling by the Department to establish the existence of a deep tin lead, and two small parties were given aid to purchase plant and to enable productive mining to be established. Total expenditure was £4,378.

The Stanhope Coal Mine is one of the few coal mines which has remained in production and the belt conveyor system of handling coal at the mine will increase efficiency and lower production costs. Interest and repayments of principal at the agreed rate have been received.

The drilling at the Briseis Mine, if successful, will enable the mine to re-open although mining problems and high costs associated with the high rates of overburden to be handled will be important factors in determining the economics of mining. Difficult drilling conditions have been encountered which have retarded progress and results so far have not been encouraging.

The Endurance Tin Mining Company which was granted assistance last year for the purchase of new plant has made substantial repayments and it is expected that improved tin recoveries from the use of the cyclones and jigs purchased from the loan will result in the amount granted being almost repaid during the coming year.

The party which was assisted last year for test drilling of iron ore deposits at Hampshire and Highclere was unable to secure a market for the grade of ore available and the proposal to develop the deposits for export of iron ore lapsed.

King Island Scheelite (1947) *Ltd.*—The price of scheelite continued to be favourable during 1965 and repayments of the subsidies in accordance with the provisions of the King Island Scheelite Agreement Acts of 1963 were made. At the end of the year total repayments of £163,700 had been received by the Treasury in respect of advances amounting to £198,950. Early repayment of the balance of the amount advanced can be expected.

Mt. Bischoff Mine.—Portions of the old Mt. Bischoff Tin Mine, Waratah, have continued to be held as tributes under the Aid to Mining Act 1927, but production has been confined mainly to one tribute party which has utilized hydraulic sluicing methods successfully.

Investigational work at the mine and research directed to improving recoveries of tin through new metallurgical treatment processes have occupied the attention of holders of Authorities to Prospect on the area within three miles radius of Waratah which has been reserved for the purpose of the Aid to Mining Act 1927.

Authorities to Prospect currently held consist of:—

No.	Holder	Area
3AP/AM	E.S. & A. Nominees	320 acres
4AP/AM	E.S. & A. Nominees	18,218 acres
5AP/AM	Aberfoyle Tin N.L.	2,682 acres

The Department has commenced diamond drilling on the reservation with the object of locating extensions of orebodies which might be capable of economic development. At the end of the year the first bore had been drilled to 102 feet. No results can be assessed at this stage.

Mining Plant.—Mining equipment which is available for hire to small parties to test prospects has not been fully employed. The small compressor and rock drill was used for short periods on a gold prospect and to test a tin-wolfram occurrence and a larger mobile compressor was used intermittently by one of the tribute parties at Waratah.

STATEMENT OF RECEIPTS AND PAYMENTS OF THE MINING TRUST FUND FOR THE YEAR ENDED 31ST DECEMBER, 1965.

Receipts.	£	s.	d.
Balance, 1st January, 1965	5,895	18	8
Repayment of loans	4,415	10	2
Hire of mining plant	523	19	9
Tribute royalty	420	4	2
Interest on loans	631	19	8
Authorities to Prospect	31	6	0
	£11,918	18	5

Payments.	£	s.	d.
Assistance	4,378	17	8
Boring—Waratah	228	9	10
Maintenance, mining plant	82	3	0
Maintenance, tribute plant, Mt. Bischoff Mine—Waratah	14	15	3
	4,704	5	9
Balance to next Account	7,214	12	8
	£11,918	18	5

STAFF

The following were the staff movements during the year:—

Name	Position	Remarks	
Creek, R. D.	Clerk	Resigned	21.1.65
Blizzard, K. M.	Typist	Appointed	2.2.65
Valentine, M. A.	Clerk	Appointed	4.2.65
Manchester, P. S.	Cadet Chemist	Appointed	5.3.65
Davies, C.	Typist	Resigned	31.3.65
Shorthouse, P.	Typist	Appointed	1.4.65
Coulston, J.	Chemist	Appointed	21.4.65
Eaves, B. D.	Field Assistant	Resigned	21.4.65
Pelham, M. V.	Typist	Resigned	28.4.65
Black, J. L.	Mining Engineer	Appointed	14.6.65
Probin, B. J.	Typist	Appointed	15.6.65
Hughes, T. D.	Chief Geologist	Resigned	18.6.65
Wicks, G. V.	Clerical Assistant	Transferred	22.7.65
Flounders, J. L.	Senior Chemist	Appointed	26.7.65
Barton, C. M.	Geologist	Resigned	29.8.65
Clark, T. L.	Inspector of Explosives	Appointed	11.10.65
Kennaugh, A. D.	Clerk	Appointed	25.10.65

Scholarships

During the year a Chemistry Scholarship was granted to Mr. M. Wadsley and a Geology Scholarship to Mr. S. Stephens.

Retirement

Mr. C. J. Penman, Senior Chemist at the Department's Laboratories at Launceston, reached the retiring age on 21st March, 1965, after 35 years service.

MINES DRAUGHTING SECTION

Number of Working Plans in use and kept up-to-date	250
Working Plans renewed and additional plans brought into use	16
Lithographs entered to date for sale	213
Miscellaneous plans and tracings prepared	200
Mineral Survey Diagrams drawn	41
Mineral Leases drawn	20
Mineral Leases drawn subject to survey	49
Copies of mineral charts prepared for regional offices	31
New Series mineral charts produced	1
Inland and Offshore Exploratory Maps prepared for sale	137

PUBLICATIONS

The following publications were issued during the year:—

Explanatory Notes—Devonport Geological Map Sheet.

Explanatory Notes—St. Clair Geological Map Sheet.

Geological Map Sheets—Pipers River Sheet (No. 31 of Geological Atlas).

OBITUARY

I regret to record the death of Mr. Kenneth D. Sear, Senior Inspector of Explosives, on 10th April, 1965.

CONCLUSION

Appreciation is recorded of the services rendered by officers of the Department, including officers of the Mines Draughting Section, Wardens of Mines and Registrars 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 and 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 £
1924–61	1,234	1,321,232
1962	72	128,173
1963	73	182,737
1964	76	255,501
1965	70	178,558
Total	1,525	£2,066,201

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 1.52 ton of cobalt oxide of value £1,674 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	£
1919–1961	306	114,188	8,850	2,304,516	381,949	54,753,361	404	10,581	391,509	57,182,646
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
1964	....	....	1,075	356,023	14,142	4,680,666	....	....	15,217	5,036,689
1965	....	....	1,078	401,181	13,495	5,027,255	....	....	14,573	5,428,436
Total	339	£124,291	13,174	£3,723,987	436,933	£72,802,117	404	£10,581	450,850	£76,660,976

The Mount Lyell Mining and Railway Company Limited, Queenstown

	Tons
Mining—	
Overburden removed	2,296,295
Ore Mined—	
West Lyell	2,009,649
Crown Lyell	24,329
Razorback	88,381
Prince Lyell	4,386
Royal Tharsis	3,306
Limestone delivered to works	9,249
Reduction—	
Concentrates smelted	49,406
Crown Lyell ore smelted	8,246
Precipitate smelted (North Lyell and Comstock)	15
Blister copper produced	13,582
Containing—	
Copper (tons)	13,495
Gold (fine oz.)	8,526
Silver (fine oz.)	52,228
Pyrite concentrate shipped	58,868
Total value of production	£5,148,016
Average number of men employed—	
Mining—	
Open cut	238
Underground	79
Other	1,185
Total	1,502

Production from the inception to 31st December, 1965—

Copper (tons)	595,527
Gold (fine oz.)	611,759
Silver (fine oz.)	16,130,660

Mr. L. W. Morris, Senior Mining Engineer, and Mr. J. L. Black, Mining Engineer, Burnie, report that development work in the underground mines was as follows:—

Mine	Driving Feet	Rising Feet	Total Feet
Crown Lyell	1,546	69	1,615
Royal Tharsis	430	94	524
Prince Lyell	502	55	557
Totals	2,478	218	2,696

A total of 45,278 feet of diamond drilling, comprising 117 holes, was drilled. This includes 19 surface holes of total footage 5,919.

Ore reserves at 1st March, 1964, were as follows:—

Mine	Tons	Copper %	Silver oz.	Gold oz.
West Lyell	13,900,000	0.78	0.50	0.008
North Lyell	2,500,000	0.80	0.35	0.010
Lyell Tharsis	800,000	1.00	0.15	0.010
Razorback	139,000	1.60	0.05	0.008
Crown Lyell No. 2	36,000	5.70	0.80	0.010
Crown Lyell No. 3	3,680,000	1.60	....	....
Total	21,055,000	0.94	....	....

During the year a 7,400-feet, 12-inch diameter pipeline was installed to pump water from the Yolande River catchment to the Queen River Dams. Capacity of the system is 4,000,000 gallons per day.

A heavy duty down-the-hole drill was purchased for use in the open cut.

Extensive alterations and re-arrangement of the crushing section were completed to improve throughput.

A new office for the Mining Department was completed.

Electrolytic Zinc Company of Australasia Limited, Rosebery

This company, reviewed under Zinc, produced 10,424 tons of copper concentrate containing 1,078 tons of copper valued at £401,181.

GOLD

Quantity produced—

	Fine oz.	Value £
Prior to 1962	2,539,832	14,338,962
1962	28,673	448,017
1963	31,989	499,837
1964	31,551	492,980
1965	30,084	470,063
Total	2,662,129	£16,249,859

The Mount Lyell Mining and Railway Company Limited, Queenstown

This company recovered 8,526 fine oz., valued at £133,218 from sludge in the electrolytic copper refinery.

Electrolytic Zinc Company of Australasia Limited, Rosebery

Concentrates produced by this company contained 21,460 fine oz., valued at £335,314.

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

From the tin concentrate of this dredge, reviewed under Tin, 89 fine oz. of gold, valued at £1,393 was recovered.

Mr. J. N. Butler sold 5 fine oz. of gold, valued at £70.

Mr. Holman sold 4 fine oz. of gold, valued at £62.

Mr. J. Bell sold ½ fine oz. of gold, valued at £6.

IRON OXIDE

Quantity produced—

	Tons	Value £
Prior to 1962	92,856	94,094
1962	4,082	5,870
1963	4,221	6,004
1964	6,808	9,681
1965	3,524	4,918
Total	111,491	£120,567

Iron Cliffs Mine, Penguin

Mr. A. Pearson continued to work the secondary ore at the Iron Cliffs Mine and supplied a cement works with 3,524 tons of hematite valued at £4,918. Employment averaged two men.

Savage River Mines, Savage River and Port Latta

Pickands Mather International and associated organizations formed Savage River Mines to bring the central orebody at Savage River to production, establish a town and reduction works at Savage River, and a pelletizing plant and loading facilities at Port Latta, with a 9-inch pipeline to transport the iron ore from the reduction plant to the pelletizing plant.

The work of clearing and grading the sites at Savage River had progressed at the end of the year and a start made on the road to connect the town with the works and mine.

At Port Latta work was well advanced in diverting the Bass Highway around the plant site and in grading, draining and levelling the site.

The Public Works Department made considerable progress in upgrading the road from Waratah and the Hydro-Electric Commission completed a survey for a power line to Savage River.

LEAD

Quantity produced—

	Tons	Value £
1919–61	317,884	18,058,865
1962	11,605	947,714
1963	11,889	1,011,543
1964	11,823	1,439,803
1965	11,126	1,551,800
Total	364,327	£23,009,725

Electrolytic Zinc Company of Australasia Limited, Rosebery

This company, reviewed under Zinc, produced 13,565 tons of lead concentrates and the total content of lead in the lead, zinc and copper concentrates was 11,126 tons valued at £1,551,800.

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 371 tons was valued at £7,150.

OSMIRIDIUM

There was no production in 1965. Total production, 1910–1965, has been 31,088 oz., valued at £708,531.

PYRITE

Quantity produced—

	Tons	Value £
1915–61	1,400,540	2,937,921
1962	54,629	163,887
1963	56,402	169,206
1964	66,381	199,143
1965	58,868	176,604
Total	1,636,820	£3,646,761

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

SILICA FOR SILICON ALLOY PRODUCTION

The Broken Hill Proprietary Company Limited, Beaconsfield

This company mined 5,831 tons of silica, valued at £29,155 for export to Newcastle for the manufacture of silicon alloys.

SILVER

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

Producer	Source	Quantity Fine oz.	Value £
E.Z. Co. of A/asia Ltd.	Copper, Lead & Zinc Concentrates	1,331,631	775,926
Mt. Lyell M. & R. Co. Ltd.	Refinery Sludge	52,228	30,432

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.	£
1919-61	104,521	43,147	17,523,574	2,784,964	3,504,922	611,393	18,882,835	6,081,135	40,015,852	9,520,639
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
1964	....	....	41,663	24,350	59,807	34,961	1,375,946	804,222	1,477,416	863,533
1965	....	....	....	....	52,228	30,432	1,331,631	775,926	1,383,859	806,358
Total	121,787	£50,882	17,690,600	£2,874,817	3,747,346	£745,574	24,197,699	£9,045,103	45,757,432	£12,716,376

SULPHUR AS SULPHURIC ACID

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

Quantity and value of production:—

	Mono Tons	Value £
1957–1961	130,270	594,452
1962	43,798	208,596
1963	46,355	231,775
1964	57,926	289,630
1965	64,172	320,860
Total	342,521	£1,645,313

TIN

Quantity produced:—

	Tons	Value £
1873–1961	145,784	33,294,331
1962	1,211	1,403,736
1963	1,005	1,192,513
1964	990	1,618,643
1965	1,027	1,880,879
Total	150,017	£39,390,102

Aberfoyle Tin N.L., Rossarden

Mr. W. R. Tindal, Mining Engineer, Hobart, reports that the tonnage of ore milled was 87,238 tons, an increase of 1,414 tons over the preceding year.

In addition 4,697 tons of accumulated tailings were re-treated.

Actual production was:—

	Concentrate Tons	Metal Tons	Value £
Tin	622	436	797,392
Wolfram	168	122	154,268

Underground development comprised:—

Driving	1,279 feet
Rising	1,937 feet
Crosscutting	284 feet
Total	3,500 feet

Underground diamond drilling consisted of 25 holes completed with a footage of 1,595 and one in progress at a footage of 995, making the footage for the year, 2,590.

Capital works comprised—

1. Commencement of rising main from the 10 level.
2. Designed and commenced construction of new 11KV pumping station on 10 level.
3. Installed 1½ ton Gemco trammer on 5 level.
4. Crosscut to Lutwyche Prospect commenced and driven 20 feet at a point 50 feet above 13 level, and ore passes to handle ore and mullock completed.
5. Recreation hall for single men's quarters comprising T.V., reading and sports rooms completed.
6. Installation of a scavenger jig in the mill to improve recovery of cassiterite and wolfram.
7. Shuttle conveyor to enable ore in bins to be fed to crusher.
8. Installation of dewatering cones to condition mill tailings for use as stope fill.
9. Standard of housing improved.

Average number of men employed—

Surface	108
Underground	152
Total	260

Cleveland Development Project, Luina

Toward the close of the year Aberfoyle Tin Development Partnership ceased activities with the completion of the diamond drilling programme, to await formation of an operating company.

Development for the year comprised:—

Main Adit RL 1300 advanced South	183 feet
Main Adit RL 1300 advanced North	125 feet
Sample crosscutting	93 feet
Crosscutting to winze positions	116 feet
Winzing	40 feet

Diamond drilling:—

15 surface holes were completed of total footage	9,188
24 underground holes were completed of total footage	2,151

Average employment was seven men.

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

This company treated 250,200 cubic yards from the Clifton Workings for the production of 49 tons of concentrate, containing 36 tons of tin, valued at £66,980.

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

Jigs and cyclones acquired to replace the sluice boxes were erected but not put into service.

Mussel Roe Mine, Pioneer

From his two working places near the Mussel Roe River, Mr. V. Wood treated 32,000 cubic yards of gravel for the production of 15 tons of concentrate containing 11 tons of tin, valued at £19,893. Average employment was four men.

Pioneer Mine, Pioneer

Mr. V. Wood employed five men on reopening this mine. The laying of the 39-inch pipeline was completed and sluicing commenced in December.

Placer Prospecting Pty. Limited, Zeehan

This company, the former Clutha Development Limited, built an office, store and assay building and a manager's house in Zeehan, and rehabilitated an old building as a mess. Prospecting comprised the following headings, in feet:—

Mine and Location	Driving Feet	Cross Cutting Feet	Rising Feet	Winzing Feet	Total Feet	Diamond Drilling Feet
Grand Prize, Dundas	1,235	394	4	....	1,633	160
Queen Hill, Zeehan	393	307	19	....	719	1,211
Razorback, Dundas	598	569	88	9	1,264	4,812
St Dizier, N Heemskirk	....	....	....	....	....	217

Renison Limited, Renison Bell

This company produced and treated 37,089 tons of ore for the production of 519 tons of concentrate containing 334 tons of metallic tin, valued at £612,135.

Development consisted of:—

	Feet
Battery Mine (new loading facilities)—	
Adit for diesel trucks	199
Driving and crosscutting	23
Rising	128
Total	350

	Feet
Federal Mine—	
Driving	101
Rising	172
Total	273
Federal and Bassett Lodes—	
Ventilation adit	44
Ventilation winze	47
Main decline adit	120
Total	211
Diamond Drilling:—	
South Montana (surface)	580
Battery Mine extensions (surface)	614
Adjacent to the Battery and Federal Mines	11,771
Total	12,965

Further rearrangement of the treatment plant took place during the year to meet research requirements.

The average labour force was: Surface, 73; Underground, 23.

Ore reserves as at 30.6.65 were as follows:—

Lode:	Battery-Boulder	Federal	Bassett	Black Face	Other	Total
Developed Tons	190,000	....	....	19,500	....	209,500
Part Developed Tons	81,000	....	....	....	....	81,000
Prospective Tons	84,500	5,040,000	6,290,000	....	127,000	11,541,500
Totals Tons	355,500	5,040,000	6,290,000	19,500	127,000	11,832,000
Grade % Sn	1.03	0.58	0.83	0.77	0.89	....

Capital Works

Earth-works for the erection of concentrating plant, workshop, and administration offices.

Workshop, store, compressor house (3 x 1,300 Cfm compressors) and administration block completed.

Temporary sub-station erected.
Twenty-nine houses completed at Zeehan.
Three houses completed at Renison Bell.
Sewerage works at Zeehan in course of construction.

Star Hill Syndicate, Gladstone

This syndicate operates one mine and several small prospecting ventures in the vicinity.

Production for the year was 21 tons of concentrate containing 15 tons of tin, valued at £28,287 from 148,500 cubic yards of gravel handled. Average employment was six men.

Storeys Creek Tin Mining Co. N.L., Dorset Tin Division, Gladstone

Mr. L. F. Egan, Mining Engineer, Launceston, reports that the dredge treated 1,756,000 cubic yards for the production of 123 tons of concentrate, containing 92 tons of tin, valued at £170,455 and 89 oz. of gold, valued at £1,393. The average number of men employed was 45. Dredging was in the Black Duck-McGregor area north of Gladstone. Check boring of the Scotia Lead was continued.

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

This company, reviewed under Tungsten, produced 89 tons of concentrates containing 65 tons of tin, valued at £117,424.

Production by Small Workers

Many miners and prospectors throughout the State produced small quantities of concentrates from either small-scale or part-time workings. Their work is described under the heading of the various districts.

WARATAH

Mr. L. W. Wills produced concentrates containing 0.090 ton of tin, valued at £148 from a small underground vein by part-time working.

Mr. G. Machen continued one sluicing operation in North Valley and commenced preparation to establish a further two sluicing operations. Production was 7.539 tons of concentrate containing 5.179 tons of tin, valued at £9,496. Average employment was three men.

Mr. C. Neighbour produced concentrates containing 0.045 ton of tin, valued at £74 by part-time work.

Mr. M. G. Glozier from his underground working on Thompson's Lode produced concentrates containing 0.318 ton of tin valued at £548 by part-time work.

Mr. J. Housego produced concentrates containing 0.697 ton of tin, valued at £1,259 working full-time.

Mr. C. Housego produced concentrates containing 0.866 ton of tin, valued at £1,619 working full-time.

Messrs. E. Kelly and C. Rist produced concentrates containing 0.065 ton of tin, valued at £123 by part-time work.

Mr. W. Housego, working part-time, produced concentrates containing 0.131 ton of tin, valued at £231.

Mr. *D. Kenworthy,* working part-time, produced concentrates containing 0.077 ton of tin, valued at £144.

Mr. T. Burrell produced concentrates containing 0.467 ton of tin, valued at £854 on behalf of the Syndicate of Packham and Kingston, Smithton, in West Valley. Two men were employed part-time.

Other small producers were:—

Name	Tin Content Tons	Value £A	Employment
Mr. G. Richardson	0.059	110	1 ....
Mr. N. Stewart	0.024	45	1 part-time
Mr. K. Prouse	0.032	59	1 part-time
Mr. W. Hankey	0.127	209	3 part-time
Mr. A. N. Duncombe	0.006	11	....
Mr. E. J. Bailey	0.047	86	1 part-time

WEST COAST

Mr. E. Coleman continued to produce small quantities from his mine and small plant at Mt Heemskirk. He produced concentrates containing 0.091 ton of tin, valued at £167, working part-time only.

Mr. R. S. Laffer, from part-time work, produced concentrates containing 0.154 ton of tin, valued at £263. Mr. Laffer's area is under option to Placer Prospecting Pty. Ltd.

Mr. *C. D. King, Port Davey,* produced from the Melaleuca Mine concentrates containing 0.965 ton of tin, valued at £1,804.

Mr. *E. Cornish* sold concentrates containing 0.032 ton of tin, valued at £61.

Mr. A. R. Smith from his holding at North Heemskirk produced concentrates containing 1.386 tons of tin, valued at £2,488. Mr. Smith was employed full-time.

Mr. D. Dunkley produced 2.029 tons of concentrates containing tin and lead from his mine at Queen Hill and treatment plant at Zeehan. Assay of the concentrate was Sn: 29.05%, Pb: 4.42%. The shipment was despatched to Capper Pass and Son Ltd., England.

Miscellaneous: Production from other sources totalled 0.326 ton of concentrates containing 0.230 ton of tin, valued at £368.

SCOTTSDALE

Messrs. H. R. Burr and W. J. Bartels, from newly acquired leases adjoining the old Mt Stronach mine, produced concentrates containing 0.163 ton of tin, valued at £305. A protracted spell of dry weather commencing early in the last quarter of the year caused an early curtailment of operations by this party.

Miscellaneous: Messrs. M. Hodgetts, L. Baros and R. Maroldo produced, individually, small parcels of concentrates containing, in all, 0.094 ton of tin, valued at £161.

BRANXHOLM-RINGAROOMA-DERBY

Mr. G. Rayner and Party, Derby.—Operating on tribute to the Briseis Company, this party, consisting of three men, produced concentrates containing 4.412 tons of tin, valued at £7,948 from the Cascade River bed.

Messrs. T and L. Merritt, Ringarooma River, continued to work beaches and recovered concentrates containing 0.473 ton of tin valued at £847 from the treatment of 1,915 cubic yards.

Mr. K. Kerrison, Derby.—Operations yielded concentrates containing 0.916 ton of tin, valued at £1,634.

Mr. A. G. Machen and Party, Ringarooma River, curtailed operations after the first quarter of the year, producing concentrates containing 0.648 ton of tin, valued at £1,108.

Miscellaneous: Messrs. E. J. Homes, A. Quinn, W. G. Stevens, Burrows and Stevens, L. G. Burr, C. Hyde, W. J. McWatters, R. Loone, R. J. Wolfe, Salter and Mott, and R. C. Cunningham produced, individually, small quantities of concentrates containing a total of 0.864 ton of tin, valued at £1,569.

GLADSTONE

The following list of small scale producers were responsible, individually, for small quantities of concentrates containing a total of 2.683 tons of metallic tin, valued at £4,827:—Messrs. E. K. King, H. Standage, A., K. and F. D. Richardson, J. W. Watt, L. T. Moore, W. J. Ponting, J. M., J., and L. Groves, A. Floyd, M. J. Moore, K. Richardson and G. S. Willis.

MT CAMERON-PIONEER

Mr. R. L. Rainbow, Banca Mine, sluiced 11,160 cubic yards to obtain concentrates containing 2.202 tons of tin, valued at £4,030. Employment averaged less than two.

Messrs. Kerrison, Pioneer, sluiced pillars left in the Garibaldi workings by former operators and also worked terraced ground immediately north of the old workings. Concentrates containing 1.031 tons of metallic tin were produced, valued at £1,930. An average of three men were employed.

Mt. Cameron Tin Syndicate: Sluicing was continued on the same pattern as the previous year and 15,200 cubic yards were treated for the recovery of concentrates containing 4.614 tons of tin, valued at £8,379. Employment averaged two men.

Miscellaneous: Messrs. E. and M. Kerrison, H. Mullins, G. Cox, M. L. Watt, M. Salter, L. Torley and H. L. Summers produced, individually, small quantities of concentrates containing a total of 1.419 tons of tin, valued at £2,521.

MOORINA-WELDBOROUGH

Mr. H. Moses, working shallow ground part-time on the plateau of the Blue Tier, treated 1,590 cubic yards for a recovery of concentrates containing 0.701 ton of tin, valued at £1,249.

Mr. M. Slater, Herrick, produced from the Ringarooma River concentrates containing 0.341 ton of tin, valued at £530.

Mr. W. L. Boon, Moorina: Production from this Frome River claim was partly in Mr. Boon's name and partly in the name of his associates. Concentrates containing 1.924 tons of tin, valued at £3,447 were won, average employment being three men.

Messrs. M. and J. Lambert, Weldborough: From their lease near the old racecourse reserve, this party produced concentrates containing 0.623 ton of tin, valued at £1,151. Employment averaged two men.

Messrs. S. Dwyer, W. Grose and P. Kidd, Weldborough, made a start on opening up the old Cambria Mine, cutting a road into the claim, building a small dam and laying a pipeline. Concentrates produced contained 0.009 ton of tin, valued at £16.

Mr. S. Adams, Weldborough: The only scale recorded for Mr. Adams was of concentrates containing 0.029 ton of tin, valued at £48.

Messrs. K. Banks and F. Coombes produced concentrates containing 0.353 ton of tin, valued at £635.

NORTHEAST COAST

Mr. W. D. Clark, Coles Bay: Sluicing an area off Saltwater Creek, a party of four recovered concentrates with a tin content of 2.511 tons, valued at £4,662.

Miscellaneous: Messrs. J. P. Reynolds (Saxelby Creek), B. Gillies, Slater and Palmer, W. Munday, H. N. Haas, Jacobson and Jamieson, and G. Robertson produced, individually, small quantities of concentrates containing a total of 0.286 ton of tin, valued at £519.

AVOCA

Cornwall Coal Co. N.L., Royal George: This company obtained leases over the Royal George Mine. Dewatering of the underground workings and rehabilitation of the inclined shaft was started. Sampling costeens were dug on the extension of the lode. A diamond drill hole was drilled to a depth of 143 feet, approximately 300 feet north of the underground workings.

Messrs. Brinkman and Dicker, Mount Rex: This partnership engaged in re-opening the Mount Rex mine. A camp was established and many items of plant obtained. Production was 0.118 ton of tin in concentrates, valued at £206.

Messrs. L. R. and D. Fenton, Mount Rex, sluiced detrital deposits for a recovery of concentrates containing 0.491 ton of tin, valued at £932.

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 Messrs. O. S. Brodie (Flinders Island), R. Holloway, A. J. Harrison, G. Holman, H. A. Richardson, D. Fitzallen, and W. Swain. The concentrates produced by all these operators together contained 0.266 ton of tin, valued at £489.

TUNGSTEN (SCHEELITE)

Quantity produced:—

	Tons (Concentrates)	Value £
1917–61	16,752	17,315,416
1962	984	328,734
1963	1,010	279,103
1964	1,063	554,641
1965	1,185	1,045,300
Total	20,994	£19,523,194

King Island Scheelite (1947) Ltd., Grassy

Ore Reserves: Ore reserves were estimated at the 31st October, 1965 to be 1,315,700 tons of average assay 0.51% tungstic oxide, down to 110 feet below sea-level.

Exploration: Diamond drilling was begun northeast of the No. 3 fault which has hitherto been regarded as cutting-off the orebody in an easterly direction. Four holes have been drilled. Each has intersected ore, and although the record is not clear, there appears to be a horizontal displacement on No. 3 fault of 500 to 600 feet. The deepest hole cut several bands of ore aggregating a core length of 100 feet, with an average assay of 0.5 % tungstic oxide in a total core length of 240 feet between vertical depths of 250 feet to 400 feet. The outcrop of this ore is obscured by sand and gravel, and by faulting (other than No. 3).

Construction: A firm of engineers was engaged to advise on certain improvements in the mill, and a start has been made on an extension to the concentrate treatment building, primarily to provide storage space for concentrate.

Equipment: In the open-cut, a down-the-hole type of percussion drill, mounted on crawler tracks, and complete with a rotary compressor, was purchased and put into operation on blast-hole drilling.

In the laboratory, a Warman cyclosizer was purchased and erected.

Production: From 238,578 tons of ore milled, 1,185 tons of concentrates were recovered. The WO_3 content of this was 844 tons, valued at £1,045,300.

Employment: An average of 149 men were employed.

TUNGSTEN (WOLFRAM)

Quantity produced—

	Tons (Concentrates)	Value £
1899–1961	13,255	8,374,904
1962	929	400,192
1963	382	111,651
1964	364	195,567
1965	492	451,520
Total	15,422	£9,533,834

Aberfoyle Tin N.L., Rossarden

Wolfram concentrates produced contained 122 tons of WO_3 valued at £154,268. This company is reviewed under Tin.

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

Tonnage of ore delivered to the mill was 30,664 tons, which is 2,205 tons more than the previous year.

Production from the ore treated was:—

	Concentrate Tons	Metal Tons	Value £
Wolfram	324	238	297,252
Tin	89	65	117,424

Underground development comprised:—

Driving	1,641 feet
Cross cutting	52 feet
Rising	139 feet
Shaft sinking	49 feet
Total	1,881 feet

An additional 54 feet of diamond drilling was drilled in holes in progress at the end of 1964, a further 21 holes were completed with a footage of 1,634 and one hole was in progress at a depth of 287 feet, making a footage for the year of 1,975. Six holes were drilled from the surface with a total footage of 272.

Capital works comprised—

1. Main shaft sunk 49 feet.
2. Commenced 9A level pump station.
3. Development of the North end of mine commenced.
4. Electrical control gear at winder to increase capacity of hoisting.
5. Main pipeline for hydraulic fill lengthened and extended to northern end of mine.
6. Two auxiliary fans placed in stopes.
7. Four-inch main laid in township for firefighting purposes.
8. Standard of housing improved.

The average number of persons employed was:—

Surface	32
Underground	63
Total	95

ZINC

Quantity produced:—

	Tons	Value £
1919–61	640,623	38,069,389
1962	38,168	3,816,812
1963	38,589	4,018,785
1964	40,072	6,128,213
1965	38,096	6,209,721
Total	795,548	£58,242,920

Electrolytic Zinc Company of Australasia Limited

EXTRACTION FROM CONCENTRATES: RISDON

From other than Tasmanian Ore—

	Tons
Zinc	102,860
Cadmium	248
Cobalt Oxide	24
Superphosphate	99,558

From Tasmanian Ore—

Zinc	40,854
Cadmium	79
Cobalt Oxide	1.52

Manufactured products—

Aluminium Sulphate	2,140
Ammonium Sulphate	40,809

Men employed—

The average number of men employed: 2,753.

WEST COAST DIVISION

Ore Mined—

	Tons
From Hercules Mine	30,327
Pb: 5.9; Zn 17.9; Cu: 0.31; Ag: 6.66 oz/ton; Au: 1.87 dwt/ton.	
From Rosebery Mine	253,442
Pb: 5.1%; Zn: 17.2%; Cu: 0.55; Ag: 6.00 oz/ton; Au: 1.85 dwt/ton.	
From Farrell Mine	5,748
Pb: 13.3; Zn: 4.7; Cu: 0.18; Ag: 13.24 oz/ton; Au: Nil.	
Total	289,517

Concentrates Produced—

Zinc Concentrates	77,715
Lead Concentrates	13,565
Copper Concentrates	10,424
Total	101,704

Recoverable Quantity in Ore Mined—

Zinc	38,096	tons
Lead	11,126	tons
Copper	1,078	tons
Cadmium	70	tons
Silver	1,331,631	oz. (fine)
Gold	21,460	oz. (fine)
Cobalt Oxide	1.52	tons
Manganese Dioxide	371	tons
Zinc Sulphate	340	tons
Sulphur as Sulphuric Acid	64,172	mono tons

Total Value of Production—£9,126,291.

Average Number of Persons Employed—

	Surface	Underground	Total
Hercules Mine	8	25	33
Rosebery Mine	352	310	662
Farrell Mine	11	10	21
Total	371	345	716

ROSEBERY, HERCULES AND FARRELL 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:—

Driving and Cross Cutting—

	Feet
No. 12 Level	123
No. 13 Level	655
No. 14 Level	568
No. 15 Level	428
No. 16 Level	321
No. 17 Level	184
Total	2,279

Rising—

No. 11 Level	135
No. 12 Level	121
No. 13 Level	566
No. 14 Level	238
Total	1,060

In addition, 1,158 feet was driven on No. 14 Level to provide access to diamond drill sites to test the orebody to the horizon of No. 20 Level.

	Driving and Cross Cutting Feet	Rising Feet
Hercules Mine—		
No. 6 Level	111	48
Farrell Mine—		
No. 8 Level	87	....
No. 7 Level	....	88

Diamond Drilling

Rosebery Mine: A total of 18,291 feet which includes 1,774 feet of pilot and ventilation drilling.

Hercules Mine: A total of 1,044 feet which includes 53 feet of pilot and ventilation drilling.

Farrell Mine: A total of 4,541 feet which includes 2,127 feet of exploration drilling.

During the year the following major works were undertaken:—

Installation of 32-foot regrind thickener at Rosebery mine.
Installation of 50,000 c.f.b. ventilation fan, No. 4 Level.
Completion of ANFO storage and additions to other buildings.
Installation of new 600 c.f.m. compressor at Farrell mine.

Mr. J. B. Braithwaite, Senior Mining Engineer, Hobart, reports that during the year the construction of the pilot plant for the recovery of metals from zinc plant residue was completed and brought into operation. The first stage of another unit for sulphuric acid production and additional plan for superphosphate production were also installed.

All products showed increases in quantity and value except cadmium and zinc sulphate.

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 340 tons of value £19,207.

2.—NON - METALLIC MINERALS

CLAY

Quantity produced—

	Cubic yards	Value £
1958–61	478,924	400,775
1962	113,669	121,786
1963	116,352	113,978
1964	136,256	136,385
1965	147,796	141,502
Total	992,997	£914,426

Company	Clay Cu. yd.	Value £	No. of Men	Product
Agripipe Pottery Pty. Ltd., Relbia	1,790	695	2	Pipes
Burnie Brick Co., Cooee	7,900	2,930	12	Bricks
Campbell, John, Pty. Ltd., Launceston	1,900	665	11	Pipes
Crisp & Gunn Co-op. Ltd., West Hobart	9,446	11,808	18	Bricks
Fenton, E. V., Kingston	3,879	4,849	....	Bricks
Goliath Portland Cement Co. Ltd., Railton	11,281	19,179	4	Cement
Hazell Bros., Margate	5,757	7,196	1	Bricks
Hobart Brick Co., New Town and Granton	10,686	13,357	34	Bricks
Huttons Bricks Pty. Ltd., Prospect	12,305	12,305	11	Bricks
Kings Bay Contractors, Kingston	11,975	4,790	1	Bricks
Kings Meadows Bricks, Kings Meadows	16,011	16,011	21	Bricks
Luck Brick and Pipe Pty. Ltd., Dulverton	9,237	6,928	19	Bricks
McHugh Bros. Bricks, Pty. Ltd., Granton	12,200	15,250	17	Bricks
McHugh Bros. Pty. Ltd., Granton	2,555	4,021	17	Pipes
McHugh Bros., Pty. Ltd., Launceston	2,971	3,268	22	Pipes
McHugh Bros. Pty. Ltd., Prospect Vale	13,656	3,414	12	Bricks
Melrose Agricultural Limestone Quarries, Eugenana	150	75	....	Roadwork
Wells, D. S., Blackmans Bay	1,617	2,021	....	Bricks
Wise, G. R. & Son, Relbia	230	115	....	Bricks
Wynyard Brick, Wynyard	8,500	8,500	10	Bricks
Wunderlich Pty. Ltd., Loira and Launceston	3,750	4,125	28	Tiles

DOLOMITE

Quantity produced—

	Tons	Value £
Prior to 1962	19,932	57,701
1962	2,217	6,734
1963	2,623	8,139
1964	923	2,640
1965	1,145	3,392
Total	26,840	£78,606

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

This company, the sole producer, employed an average of one man and increased production by 222 tons. The stone is milled for top-dressing in agriculture.

KAOLIN

There has been no production since 1962. The total quantity produced, 1940-1962, was 111,086 tons, valued at £441,509.

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	£
1919-61	3,645,013	2,120,485	576,529	712,872	4,027,753	2,217,763	494,702	573,770	8,743,997	5,624,890
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	42,419	354,465	408,734
1964	261,030	255,568	27,219	53,199	32,996	50,184	30,273	37,770	351,518	396,721
1965	249,107	243,909	30,315	59,216	29,075	45,437	29,917	37,241	338,414	385,803
Totals	4,660,409	3,114,695	689,219	922,660	4,157,982	2,427,555	599,322	722,131	10,106,932	7,187,041

Australian Commonweath Carbide Company Ltd., Ida Bay and Electrona

This company quarried 30,315 tons of limestone at a cost of £59,216 at Ida Bay and used it for the production of calcium carbide at Electrona. Calcium carbide production was 14,051 tons valued at £816,139 and 127 tons of acetylene black valued at £38,336 was also produced. The average number of persons employed was 199, of whom 25 were at the quarry.

Australian Newsprint Mills Limited, Maydena

This company quarried 6,027 tons of high grade limestone at a cost of £14,819. The limestone was burnt at their Boyer Mill and used in newsprint production. Six men were employed in the quarry throughout the year.

A. R. Beams, Flowery Gully

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

		£
902	tons agricultural limestone, valued at	2,706
13,595	tons limestone for chemical and metallurgical purposes, valued at	16,315
230	tons burnt lime for various purposes, valued at	2,385
14,727	tons Total Value	£21,406

Twelve men were employed.

Goliath Portland Cement Co. Ltd., Railton

Limestone quarried and used in the manufacture of cement totalled 249,107 tons, at a cost of £243,909. Employment in this quarry for limestone for cement manufacture only, averaged 20 men.

Cement production totalled 175,927 tons valued overall at £1,419,110. This production consisted of 121,183 tons of fine cement valued at £1,090,647 and 54,744 tons of clinker cement valued at £328,463. Average employment was 254.

Although major developments are immediately pending, work carried out during the year has been mainly in the form of modification and improvement to existing installations.

Melrose Agricultural Lime Quarries, Eugenana

Production of ground limestone fell to 1,800 tons, valued at £3,980, an average of one man being employed in the quarry.

Mineral Supplies, Ulverstone

Sales of stocks on hand by this firm amounted to six tons, valued at £31.

The Mount Lyell Mining and Railway Company Limited, Halls Creek

This company quarried 9,249 tons of limestone, valued at £13,875, for delivery to the works at Queenstown from the quarry at Halls Creek. Quarrying operations were on a contract basis and the limestone was used as flux in the blast furnace or burnt to produce lime for use in the flotation plant.

Railton Lime Works, Railton

Two men were employed at this works to crush and mill 19,625 tons of limestone, valued at £18,983, supplied by the Goliath Company.

R. K. Sulzberger, Launceston and Flowery Gully

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

		£
285	tons agricultural limestone, valued at	570
204	tons limestone for chemical and metallurgical purposes, valued at	428
489	tons Total Value	£998

Two men were employed.

Wright Stephenson Pty. Ltd., Pulbeena

This company produced 6,163 tons of limesand, valued at £7,690, compared with 4,905 tons in the previous year. Average employment was two.

OCHRE

Quantity produced—

	Tons	Value £
1918–61	2,174	6,414
1962	60	390
1963	51	328
1964	69	462
1965	40	272
Total	2,394	£7,866

A. Pearson, Spalford and Deep Creek

Production of red and yellow ochre from these pits was 40 tons, valued at £272.

PEBBLES

Quantity produced—

	Tons	Value £
1957–61	2,955	22,153
1962	375	2,561
1963	518	3,793
1964	727	5,060
1965	920	7,001
Total	5,495	£40,568

A. Pearson, Ulverstone

The collection of pebbles for grinding was continued on the beaches around Ulverstone. The output was 920 tons, valued at £7,001.

SILICA

Quantity produced—

	Tons	Value £
1936–61	162,637	108,467
1962	514	3,054
1963	2,641	2,965
1964	4,231	4,193
1965	4,562	5,264
Total	174,585	£123,943

Australian Glass Manufacturers Ltd., South Arm

This company obtained 3,520 tons of silica sand, valued at £3,373, for the manufacture of glass.

Mineral Supplies, Ulverstone

This firm supplied 1,042 tons of silica, valued at £1,891. Of this, 972 tons were extracted from the Leven River pit for use in cement manufacture and 70 tons were mined at the Forth quarry for use as a metallurgical flux.

3.—CONSTRUCTION MATERIALS

BUILDING STONE

Quantities produced—

	Cubic yards	Value £
Freestone	949	6,335
Granite	20	20
Other	205	172
Total	1,174	£6,527

CRUSHED AND BROKEN STONE

Basalt

Quarry	Men	Cubic yards	Value £
A.F.H., Surrey Hills	4	15,596	15,596
A.N.M., Maydena	5	22,702	17,712
Bonney Bros., Mooreville	6	20,000	15,000
Brighton Council	2	5,685	4,264
H.E.C., Meadowbank	16	57,584	61,128
H.E.C., Miena	3	18,448	36,896
H.E.C., Repulse	8	22,993	25,006
H.E.C., Tarraleah and Butlers Gorge	4	8,996	10,305
Utah, Mooreville	2	35,096	26,322
Weily, Bridgewater	9	16,280	12,211
Wynyard Council	2	1,919	3,358
Others	....	1,774	1,712
Total	61	227,073	£229,510

Dolerite

Quarry	Men	Cubic yards	Value £
Bain, Dynnyrne	5	13,760	13,760
Clothier, Launceston	10	13,265	12,089
Eastern Shore Quarries, Flagstaff Gully	9	23,746	22,461
Gordon, Glenorchy	5	24,000	19,950
Hobart Quarries, New Town	27	176,892	202,118
H.E.C., Mersey-Forth	11	19,524	75,705
H.E.C., Repulse	11	42,781	54,609
Launceston Quarries, Mowbray	15	79,961	90,094
Public Works Department	190	204,133	306,200
Roche Bros., Miena	20	153,819	173,427
Rouse, St. Leonards	4	11,503	15,488
Others	9	17,201	25,017
Total	316	780,585	£1,010,918

Limestone

Quarry	Men	Cubic yards	Value £
Stone & Son, Devonport	2	2,370	3,555
Goliath Portland Cement, Railton	1	1,608	3,149
Melrose, Eugenana	....	100	150
Weily, Glenorchy	10	14,675	15,180
Total	13	18,753	£22,034

Other Stone

Quarry	Men	Cubic yards	Value £
Devon Metal Supplies, Devonport	5	17,531	13,148
Lewis Hobden, Rokeby	2	4,562	3,421
Hilder, Loyatea	1	3,000	2,250
Holloway, Round Hill	1	6,972	7,318
H.E.C., Mersey-Forth	....	1,700	6,800
H.E.C., Miena	....	20,049	40,098
H.E.C., Poatina	1	2,438	979
Jones, Burnie	4	3,828	2,871
Mt. Lyell Co., Queenstown	3	82,025	82,025
Palmer, Geeveston	1	3,750	2,812
Queenstown Council	3	10,518	7,888
Sorell Council	3	9,855	8,964
Spring Bay Council	....	2,469	1,851
Woodfield & French, Launceston	3	23,987	18,476
Others	3	6,243	5,512
Total	30	198,927	£204,413

Gravel

Pit	Men	Cubic yards	Value £
Associated Forest Holdings	2	82,311	41,156
Beaconsfield Council	2	34,337	17,167
Circular Head Council	2	37,042	18,520
Deloraine Council	2	32,060	16,030
Flinders Island Council	2	43,320	21,659
Hobart City Council	2	28,882	14,441
Huon Council	2	27,790	13,894
Kentish Council	9	24,856	12,427
Latrobe Council	6	25,147	12,569
Lilydale Council	3	20,738	12,618
Oatlands Council	6	24,160	12,080
Richmond Council	1	31,817	16,716
Roche Bros.	1	25,708	12,854
Scottsdale Council	4	29,235	14,617
Westbury Council	1	24,015	12,008
Woodfield and French, Launceston	11	70,467	70,467
Government Departments	252	651,220	325,610
Others	84	388,026	215,787
Total	392	1,601,131	£860,620

Sand

Pit	Men	Cubic yards	Value £
Bonney, Calder	2	7,700	4,300
Devon Metal Supplies, Devonport	1	5,081	2,541
Fielding, Calder	1	6,344	3,371
Grubb & Sons, South Arm	1	8,401	4,200
Johnson, Seven Mile Beach	1	8,593	4,296
Long, South Arm	3	23,049	11,524
Males, South Arm	1	5,100	2,550
Roche Bros., Westbury	....	28,357	14,178
Woodfield & French, Launceston	....	15,473	14,467
Others	16	38,875	36,248
Total	26	146,973	£97,675

Other Roadmaking Materials

Pit	Men	Cubic yards	Value £
Circular Head Council	1	11,434	5,717
Devonport Council	1	10,529	5,264
Holloway, Round Hill	2	12,738	6,505
Lilydale Council	....	7,135	3,567
Penguin Council	1	5,752	2,876
Ulverstone Council	2	10,711	5,350
Woodfield & French, Launceston	7	85,018	42,509
Zeehan Council	1	12,500	6,250
Others	9	20,156	11,793
Total	24	175,973	£89,831

4.—FUEL MATERIALS

COAL

Quantity produced—

	Tons	Value £
Prior to 1962	8,593,912	10,350,252
1962	272,342	647,574
1963	206,922	429,422
1964	151,161	311,315
1965	102,457	210,173
Total	9,326,794	£11,948,736

Mr. W. R. Tindal, Mining Engineer, reports that there has been a drop in production of 48,704 tons of coal, equivalent to 32%. The number of employees decreased from 108 to 70 of whom 42 were employed underground. The production per man year increased from 2,326 to 2,439 tons for underground employees and from 1,400 to 1464 overall.

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

Duncan Coal Mine, Fingal

Production from this coal mine operated by the Cornwall Coal Company N.L. is obtained from one seam, being the same as that worked in the Fingal and Tasmanian coal mines.

Two panels are being worked from the trunk belt. The one to the left-hand side of the belt is a first working and that to the right-hand side was extraction of pillars for the major part of the year. On the completion of the extraction of pillars from the panel the trunk belt panel was re-opened.

Conditions in the left-hand panel have been normal with the height of coal being from 8 to 12 feet, but towards the end of the year undulations in the roof were encountered and the seam decreased in height. Future development will show whether this is a temporary loss of thickness or the seam thins out as the panel goes South. The pillar extraction was completed without loss of any equipment and almost full recovery. Sufficient pillars were left to protect the trunk belt panel. No change occurred in the method of working or of transport. The whole of the output of this coal mine was washed at the company's jig washery at Fingal.

The production from this coal mine was 78,650 tons gross, a decrease of 9,774 tons with a complement of 51 employees. This gives a decrease in overall production per man year from 1,768 to 1,542 tons. Production for the whole of the year has been on a four-shift per week basis with the fifth shift being a maintenance shift.

Fingal Coal Mine, Fingal

Owing to Goliath Portland Cement Co. Ltd. of Railton forecasting its intention to change over to fuel oil early in 1965 the working of this coal mine became a day-to-day operation and finally ceased for lack of orders, on 15th April, 1965.

Work for the year was confined to two small areas. The one was a small block of coal between the Fingal and the Tasmanian coal mines and the other in the re-entrant area into the Duncan coal mine holdings. No pillars were permitted to be extracted. No change occurred in the method of working or in the treatment of the coal.

Production from this coal mine for the period of operation was 4,833 tons with four employees on surface and six underground, at the rate of 1,608 tons per man year.

New Stanhope Coal Mine, Avoca

Development was concentrated on No. 2 Tunnel and no work was done on No. 1 Tunnel. Minor disturbances were met as the tunnel advanced. The quality of the coal remained the same and no change occurred in the method of working.

The number of employees decreased from 14 to 9 due to a partial loss of orders from Goliath Cement works.

Production from this coal mine was 16,004 tons, a decrease of 4,540 tons, with an overall production per man year of 1,778 tons, an increase of 311 tons.

Mt Christie Coal Mine, Avoca

A start was made in the extraction of pillars which continued till the coal mine closed down on 15th April, 1965. Production for the past year was 577 tons with two employees, at the rate per man year of 987 tons.

Sandfly Coal Mine, Kaoota

Coal from this coal mine is semi-anthracitic and is used in hop-kilns and for household purposes.

The working of the virgin area in this coal mine has been completed and extraction of pillars started. The coal is obtained from the face by grunching and is then hand loaded and trammed to the main haulage incline. A small winch hauls the loaded skips to the surface where they are tipped by hand into storage chutes.

Production from this colliery was 2,145 tons, an increase of 80 tons for the year with four employees, giving an overall production per man year of 536 tons, an increase of 20 tons.

5.—FOREIGN ORES

The total value of the metallurgical products for four large works treating foreign ores imported into Tasmania was approximately £35,380,916.

ALUMINIUM

Comalco Aluminium (Bell Bay) Ltd., Bell Bay

Operations by this company showed an increase of 2,106 tons of aluminium over the previous year.

Other products were—aluminium hydrates, 4,091 tons; and alumina, 3,654 tons.

In all, 45,877 tons of aluminium were extracted from 114,122 tons of bauxite from Weipa and 50,393 tons of imported alumina. Average employment fell by 29 to 925.

FERRO-MANGANESE

The Tasmanian Electro-Metallurgical Co. Pty. Ltd., Bell Bay

This company smelted 77,827 tons of imported manganese ore for the production of 43,922 tons of ferro manganese. Average employment was 88 men.

Plant extensions, involving the construction of a larger capacity electric arc furnace, were commenced during the year.

TITANIUM DIOXIDE

Australian Titan Products Pty. Ltd., Heybridge

This company imported 46,719 tons of Wes Australian ilmenite from which was produced 22,180 tons of finished titanium dioxide pigment. Average employment was 459.

Extensions to the plant to lift capacity to 25 000 tons per year were completed during the year at an approximate cost of £500,000 ($1,000,000). Toward the end of the year the plant was tested and achieved this output.

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 Chief Geologist, I. B. Jennings, B.Sc. (Hons.), A.M.Aust.I.M.M.

The increased tempo of mineral explorations in the State throughout the year has continued to make heavy demands on the staff of the Geological Survey Branch in supplying exploration companies with basic data and in recording the results of exploration programmes. As most of the potential mineral bearing ground and much of the off-shore areas are now held under Exploration Licences the activities of the Branch in economic geology have been devoted more toward basic studies particularly in regard to the genesis and distribution of tin mineralization in Tasmania.

Diamond drilling of potential gold bearing areas at Beaconsfield and Mathinna continued during the year and it is gratifying to record that a very promising intersection was made of the Tasmania lode at Beaconsfield at a depth of about 1,700 feet.

The Regional Geology section continued the programme of one-mile to one-inch mapping and at the end of the year the Pipers River, Mackintosh and Table Cape sheets had been completed whilst a start had been made on the Burnie, Noland Bay, Quamby and Pieman Heads sheets.

The Engineering and Water Supply section continued investigations at Risdon Brook damsite and made several investigations of foundation conditions at various bridge and building sites. A start was made on a long-term detailed study of the groundwater resources of the Launceston basin and advice was given to various authorities on groundwater problems in several smaller areas.

Staff Movements

The Chief Geologist Mr Terence D. Hughes resigned during the year. Mr Hughes first joined the Department in 1929; he was appointed Senior Geologist in 1955 and Chief Geologist in 1960. During his long period of service with the Department Mr Hughes worked in all parts of the State and though mainly concerned with economic geology he also made notable contributions in the fields of regional mapping, underground water and engineering geology. His thorough knowledge of the mineral deposits and geology of Tasmania will be keenly missed.

Senior Geologist I. B. Jennings was appointed Chief Geologist in succession to Mr. Hughes.

Temporary Geologist I. H. Naqvi resigned to pursue post-graduate studies at the University of Tasmania and Field Assistant B. Eaves resigned to take up a position in industry. Surveyor B. Knox was seconded to the Lands and Surveys Department for six months during the year for training purposes.

REGIONAL GEOLOGY

Senior Geologist E. Williams reports:—

Progress during the year in regional geological mapping of 1-mile sheets:—

(1) *Launceston* 1-*mile Sheet*—

Explanatory notes of the published sheet are in press.

(2) *Pipers River* 1-*mile Sheet*—

Geologists C. M. Barton, D. J. Jennings, B. Marshall and Temporary Geologist I. H. Naqvi completed the mapping and the sheet has been published. Explanatory notes are in preparation.

(3) *Mackintosh* 1-*mile Sheet*—

Ten geologists were engaged in completing the mapping of this difficult terrain and the sheet is now in the process of being published. Explanatory notes are being compiled.

(4) *Table Cape* 1-*mile Sheet*—

Geologist R. D. Gee has completed the mapping and the sheet is now in the process of being published. Explanatory notes are being prepared.

(5) *Burnie* 1-*mile Sheet*—

Geologist R. D. Gee has done most of the mapping and the remainder is being completed by Geologist A. B. Gulline.

(6) *Noland Bay* 1-*mile Sheet*—

Geologist D. J. Jennings has mapped most of the area and little remains before the sheet can be prepared for the drafting section.

(7) *Quamby 1-mile Sheet*—

Geologists B. Marshall and W. R. Moore started mapping in this area.

(8) *Pieman Heads 1-mile Sheet*—

Geologists R. D. Gee and D. I. Groves were engaged on a reconnaissance survey of the area prior to mapping in the detail required.

Publications

Senior Geologist E. Williams published the following paper in the American Journal of Science, Vol. 263, March, 1965, pp. 229-237:—

The Deformation of Competent Granular Layers in Folding.

Senior Geologist E. Williams has the following paper in press with the Geological Magazine, Cambridge, England:—

An Analysis of the Deformation in a Fold in N.E. Tasmania.

Geologist B. Marshall has the following paper in press with Nature, London:—

Further Comments on Kink-bands and Related Structures.

ECONOMIC GEOLOGY

Senior Geologist A. J. Noldart reports:—

METALLIC MINERALS

Tin—

Geologist R. Jack carried out examinations of the "Star of Peace" mine, Weldborough district, and tin bearing alluvial deposits on Flinders Island and submitted reports. Periodic inspections were made of prospects and workings throughout the North-East.

Geologists G. Urquhart and D. I. Groves commenced a detailed examination of internal granite structures, inter-granite relationships and mineral distribution in the Blue Tier region. This forms part of an overall study of tin distribution in the North-East.

D. I. Groves also carried out field studies of the tin bearing granites at Coles Bay and compiled a report.

G. Urquhart also carried out an examination of the tin lodes at the Great Republic mine and submitted a report.

In the Waratah district a further examination was made of "Fooks" lode and a diamond drilling programme was commenced.

A percussion drilling programme was commenced on the Briseis Deep Lead at Derby as an extension to previous drilling in the area.

Gold—

Geologist V. M. Threader carried out examinations of potential auriferous quartz reefs in the Alberton Goldfield for future drilling programmes and investigated possible deep lead auriferous gravel deposits in the valleys of the Ringarooma and South Esk Rivers.

Iron—

The Cuprona section of the Blythe River iron deposits was re-examined by A. J. Noldart and a restricted diamond drilling programme was carried out on the northern portion of the ore-body.

Further field work was done in the Savage River/Rocky River iron ore deposits, the report was then revised and forwarded for printing.

Copper/Nickel—

R. Jack examined the copper/nickel mine at Heazlewood in the Mt Cleveland district and an inspection was made of the copper/nickel deposits in the Zeehan area.

Osmiridium—

A brief inspection was made at the Adams Field osmiridium workings by T. D. Hughes and A. J. Noldart.

FUEL MINERALS

Coal—

V. M. Threader carried out examinations and sampling programmes on the New Stanhope, Valley and Duncan coal mines in the Fingal Valley. Systematic geological mapping of the coal deposits in the Fingal Valley was commenced.

NON-METALLIC MINERALS

Clay—

Considerable attention was paid to the location of clay and shale deposits suitable for use in existing brick manufacturing plants on the North-West Coast and deposits were examined in the Wynyard, Cooee and Launceston districts by V. M. Threader.

Gravel—

Gravel deposits were examined in the Port Latta, Strahan, Beaconsfield and Upper Calder districts as a potential source for aggregate for construction purposes and road building, &c.

Silica—

Potential high grade silica deposits were examined in the Beaconsfield-Frankford district.

Sandstone—

Sandstone deposits at Winkleigh and Cressy in the North were investigated for possible building and decorative purposes.

GEMSTONES

A pamphlet on gemstone occurrences in Tasmania was completed by Geologist W. L. Matthews.

GEOPHYSICAL

A preliminary magnetometer survey was carried out on " Laffers " tin/sulphide lode in the North Heemskirk district on the West Coast using a portable " Jalander " magnetometer.

SURVEYING

The survey levelling programme on portion of the North-East tin fields was continued during the year by Surveyor B. Knox.

Survey levelling was also carried out on a " Proline " auger drilling programme in the Longford district by B. Knox and later by Field Assistant B. Eaves.

Underground surveys were carried out on the New Stanhope and Valley coal mines in the Fingal Valley by B. Knox.

ENGINEERING GEOLOGY AND WATER SUPPLY

The main activities for the year were centered on the detailed investigational aspects of the Risdon Brook dam and on preliminary geological studies for a geohydrological study of the Launceston Tertiary Basin. In addition to these projects numerous smaller studies were made in connection with localized groundwater problems and foundation conditions for buildings and bridges.

ENGINEERING GEOLOGY

Risdon Brook Dam—

Geologist M. J. Longman carried on the geological studies on this project. This involved the setting out and geological supervision of a detailed diamond drilling programme, detailed logging of several thousand feet of drill core and analysis of a programme of water pressure testing. As a result of this work a series of detailed geological cross sections of the site area were prepared for use by the consulting engineers.

Bridge Sites—

A geophysical survey of the proposed site of a new bridge over the South Esk River at Trevallyn was set out and the results interpreted in relation to the geology of the area.

At Judbury a drilling programme was laid out to provide geological information on the foundation conditions at a proposed new bridge site. A geological report was prepared on the results.

Building Sites—

Geological studies were made and diamond drilling programmes laid out where necessary in order to assess the geological conditions which would influence foundations at the following building sites:—

(*a*) Proposed extensions to Nurses' Home at New Town.

(*b*) Proposed new Public Buildings, Hobart.

(*c*) Proposed factory sites at George Town.

(*d*) Proposed extensions to Smithton Hospital.

(*e*) Life Science block and Medical Centre at the University of Tasmania.

Damsites—

Geologist W. L. Matthews made a geological study and prepared a report concerning the problems associated with building a dam to provide a water supply for Coles Bay.

Water Supply—

The major interest in underground water was the initiation of a long-term thorough assessment of the groundwater potential of the Launceston Tertiary Basin. Geologist W. R. Moore commenced mapping within the Basin aided by a series of Proline Auger holes to provide subsurface samples. It is anticipated that the project will take about three years to complete.

Geologist W. L. Matthews made studies of the possibility of obtaining a supply of underground water for the town of Currie on King Island. He also prepared reports on the groundwater potential of the Savage River township area and of the area surrounding the pelletizing plant at Port Latta.

MINERALOGY AND PETROLOGY

Mineralogist and Petrologist G. Everard reports:—

Mineralogy investigations were made on a wide variety of natural and metallurgical concentrates. These included:—

Samples of mill products from the Mount Cleveland Mine on which mineral identification and grain counts and measurements were made.

Alluvial tin samples, collected by Inspector L. Morris, which were examined to establish their place of origin from mineral content.

Sand concentrates from Naracoopa, which were examined for rutile content. The presence of rutile was confirmed by X-ray analysis.

Sand samples from Government Analyst.

Sand samples from the bore at Seal Elephant.

Petrographic descriptions were made of suites of rocks from Gladstone District, Boco Siding, Pencil Pine Creek, and small groups of rocks and single specimens were examined from McPartlan's Pass, Mount Block, Mount Romulus, Mount Cleveland, Mount Cameron and New Guinea.

Bass Strait bore core was also examined in thin section.

There was an increase in the number of specimens received for identification from prospectors and the general public, over 50 individual specimens were examined and reported on.

Several rock and mineral collections were supplied for scientific and educational purposes and 410 specimens were added to the general collection. Of these 380 were thin sectioned and 30 polished. A considerable number of thin sections were made of concentrates received from the Chief Chemist and Metallurgist from various mines, and several other, both thin and polished, sections were made for miscellaneous collections for rock and mineral identification. Most of these were discarded after being identified.

MAPPING AND ENGINEERING DRAUGHTING SECTION

Senior Draughtsman K. T. Kendall reports:—

The Geological Atlas one-mile series continued with the fair drawing and printing of Pipers River Sheet No. 31 (13 plates) and the production of one-mile topographic base maps of Mackintosh Sheet No. 44, Table Cape Sheet No. 22 and Noland Bay Sheet No. 23. Final geological compilations of Mackintosh and Table Cape were completed towards the end of the year and fair drawing will commence early in 1966. Base map material for field compilations of Burnie Sheet No. 28 and Pieman Heads Sheet No. 42 was supplied to the Regional Geology Section.

Other material prepared for publication included:—

One 4-colour map of Penguin Area, plus 32 monocolour maps, sections and diagrams for Technical Reports No. 9 (1964).

One 4-colour map and 41 monocolour maps, sections and diagrams for Geological Survey Bulletin No. 48, " Magnetite Deposits of the Savage River-Rocky River Region ".

One 4-colour map of Hobart, plus 58 monocolour maps, sections and diagrams for the Geological Excursions Handbook—Australian and New Zealand Association for the Advancement of Science (38th Congress, Hobart).

Two monocolour graphs for Director of Mines Annual Report (1964).

The demand by Exploration Licence holders for out of print and unpublished material increased and was fulfilled by various reproduction methods. An exhibit featuring State geological maps was prepared for display at the University of Tasmania during the A.N.Z.A.A.S. 38th Congress (16th-20th August, 1965). Safety posters were prepared for display purposes on behalf of the inspectorial staff.

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

PUBLICATIONS

Publications Officer E. M. Smith reports:—

The following volumes were published during 1965:—

Explanatory Report, 1-mile Geological Map Series, K/55/6/29, Devonport: by K. L. Burns.

Explanatory Report, 1-mile Geological Map Series, K/55/10/59, St Clair: by A. B. Gulline.

Geological Excursions for the Australian and New Zealand Association for the Advancement of Science.

The following papers were placed in the hands of the Government Printer:—

Explanatory Report, 1-mile Geological Map Series, K/55-7-39, Launceston: by M. J. Longman.

Bulletin 48, Magnetite Deposits of the Savage River-Rocky River Region: by G. Urquhart.

Technical Reports No. 9.

Pamphlet, Gemstones in Tasmania.

CHEMICAL AND METALLURGICAL BRANCH

Report of the Acting Chief Chemist and Metallurgist, Mr. H. K. Wellington, B.E., F.S.A.S.M., A.M.Aust.I.M.M.

Analyses were made of ores, minerals, rocks, ferrous and non-ferrous alloys, clays, coals, mill and research products.

Ore dressing research was a major activity, particularly continuing work on the Mt Cleveland Project.

Again this year there was a marked increase in the number of analyses made and interest in tin exploration is measured by an increase from 4,251 in 1964 to 6,188 in 1965. Determinations for the year were 10,578 compared with 9,148 in 1964.

Types	Number
Aluminium	22
Antimony	8
Arsenic	18
Bismuth	12
Cadmium	3
Calcium	65
Carbon (and Carbon Dioxide)	163
Chromium	106
Cobalt	14
Coal Analyses	27
Copper	1,115
Fluorine	14
Gold	66
Iron	169
Lead	27
Magnesium	21
Manganese	84
Molybdenum	333
Monazite	3
Nickel	138
Phosphorus	100
Platinum	10
Potassium	17
Qualitative Tests	56
Silicon	130
Silver	60
Sodium	17
Sulphur	638
Tantalum and Niobium	3
Tin	6,188
Titanium	234
Tungsten	53
Water Analyses	62
Vanadium	15
Zinc	167
Zirconium	3
pH Tests	8
Ash (Coals)	4
Insoluble	218
Water (Moisture)	39
Sizing Tests	125
Miscellaneous	23
Total	10,578

Research investigations undertaken during the year were:—

Types	Number
Tin	12
Tungsten	2
Ceramics	7
Total	21

Tin—Aberfoyle Tin Development Partnership: Mt Cleveland

R.482, R.490 and R.503

Introduction

As these three projects all concern Mt Cleveland they have been treated together. This progress report, for the work is still unfinished, covers the following:—

(*a*) concentrate cleaning,

(*b*) heavy media separation,

(*c*) sulphur elimination both by froth flotation and table flotation,

(*d*) the effect of grinding more coarsely than in previously reported work,

(*e*) miscellaneous tests.

Reference is made throughout to work published under R.482 in the 1964 Annual Report.

Large Pilot Plant

This plant has been used section by section, but not as yet as a complete plant. After quite a lot of effort the grinding and flotation circuit operates, but at present sampling is still a problem. In the concentration circuit work must still be done to obtain balanced flows, and to provide for sufficient samples to allow for a mathematical solution of the results.

R.482 *D.S.M. Screen Undersize*

Two screen sizes were employed in the large pilot plant, viz.: 0.4 mm and 0.6 mm. Undersize products from these sized:—

Screen B.S.	0.4 mm Weight %	0.4 mm Cum. Weight %	0.6 mm Weight %	0.6 mm Cum. Weight %
+ 52	1	1	2	2
+ 60	....	....	3	5
+ 72	2	3	5	10
+ 85	....	....	8	18
+ 100	8	11	7	25
+ 150	19	30	28	53
+ 200	12	42	6	59
— 200	58	100	41	100

In the small pilot plant equivalent screens are No. 76 to the 0.4 mm D.S.M., and No. 2688 to the 0.6 mm.

Concentrate Cleaning

R.482, *Test GC-1*. A weighted composite of primary table concentrates from Test GC-1 was screened and ball milled to all pass 150 mesh, then the sulphide was removed by flotation and the flotation tailing tabled.

Description	Weight %	Tin %	Tungstic Oxide %	Tin Distribution %
First Table Conc.	25.61	70.0	0.81	81.6
Second Table Conc.	4.30	52.1	0.53	10.2
Total Table Conc.	29.91	67.5	....	91.8
Table Middling	38.53	2.34	....	4.1
Table Tail	16.04	3.74	....	2.7
Flotation Sulphide	15.52	1.99	....	1.4
Composite Primary Conc.	100.00	22.0	....	100.0

Magnetic separation was practised on the products made above. Tungsten was largely removed from the first table concentrate. From the middling a 12% tin product was made, and from the tailing one assaying 8%.

R.482 (*Test* F.104, F.105, F.106 *and* F.107). During the establishment of operating conditions in the large pilot plant a quantity of table and vanner products was made. About these products there is no information regarding the corresponding tailings, nor is the tin distribution known. However, as they were available and could provide useful information, concentration tests were done on them. The products and tin assays were:—

F.104.	Rougher table middling	0.7% Tin
F.105.	Rougher sand and table conc.	20 % Tin
F.106.	Rougher slime table conc.	14 % Tin
F.107.	Rougher vanner conc.	6 % Tin

These concentration tests were similar to those done on Test GC-1, but without any regrinding. From F.105 and F.106 80% of the tin was concentrated in final products assaying 70% tin. The middlings produced from these tests were magnetically separated, F.105 giving a 15% tin product, and F.106 a 26% tin product. Siderite in these middlings precluded better grades.

In tabling the vanner concentrate (F.107) 88% of the tin was recovered in a 58% tin concentrate. A comparative test using the vanner instead of the table (F.110) recovered 94% of the tin as a 20% tin product.

In concentrating the rougher middlings (F.104) siderite presented a problem. Retabling produced a 14% tin concentrate containing 17% of the tin. Regrinding of the middling produced in this tabling allowed the further recovery of 25% of the tin as a 10% tin product.

These tests are presented as a qualitative approach to the concentration of tin from the rougher products, the relative importance of any one product being unknown because of reasons given in the opening paragraph of this section.

Heavy Media Separation

R.490. *Heavy Liquid Separation of 4 inch Material.* A 7,000 lb. sample of minus 4 inch ore, which was composed of material from crosscuts K, L, N, P, Q, R, T and V, was submitted for heavy liquid separation tests.

The sample was screened, then each fraction was separated in a liquid of specific gravity 2.8. The fractions were then sampled, being crushed where necessary. A composite made of minus 1 inch material after sampling was further separated at specific gravity 2.95.

The sink at 2.8 contained 82.61% of the weight, assayed 0.89% tin, and contained 99.52% of the tin. The float assayed 0.02% tin.

The float at 2.95 assayed 0.09% tin, and contained 31.45% of the weight.

R.503. *Heavy Media Separation of $\frac{3}{4}$ inch Material.* A parcel of ore marked OS/3 from "N" Crosscut, "A" Lens, Hall's Lode, R.L. 1,300 foot level, was supplied for heavy media separation. The ore was crushed to pass a $\frac{3}{4}$ inch screen, then the minus $\frac{1}{8}$ inch material was screened out. The plus $\frac{1}{8}$ inch material was subjected to heavy liquid and heavy media tests. Test H-1 employed mixtures of acetylene tetra bromide and carbon tetra chloride to obtain specific gravities of 2.95, 2.79 and 2.72.

Description	Cumulative Weight %	Assay Tin %	Cumulative Tin Distribution %
— $\frac{3}{4}$" + $\frac{1}{8}$"			
Float at 2.72	2.80	0.01	0.0
Float at 2.79	11.49	0.05	0.5
Float at 2.95	25.15	0.16	4.0

Description	Weight %	Assay Tin %	Individual Tin Distribution %
— $\frac{3}{4}$" + $\frac{1}{8}$"			
Sink at 2.95	59.92	1.34	79.0
Slime	0.73	0.64	0.5
— $\frac{1}{8}$" Screenings	14.2	1.18	16.5
Total Plant Feed	74.85	1.30	96.0
Head	100.00	1.02	100.0

Tests H-7 *and* H-8. These tests were done in a Cyanamid 20 inch cone separator using ferro silicon medium from the operating plant of the Aberfoyle Mine, Rossarden. After preliminary tests two runs, one at a specific gravity of 2.8 and the other at 2.9 were made.

Description	H-7 S.G. 2.8 Weight %	H-7 S.G. 2.8 Tin %	H-7 S.G. 2.8 Tin Distribution %	H-8 S.G. 2.9 Weight %	H-8 S.G. 2.9 Tin %	H-8 S.G. 2.9 Tin Distribution %
Float	22.67	0.15	3.1	25.74	0.20	4.7
Sink	62.43	1.41	79.9	59.36	1.42	78.3
— $\frac{3}{4}$" + $\frac{1}{8}$"	85.1	1.07	83.0	85.1	1.05	83.0
— $\frac{1}{8}$" Screenings	14.9	1.15	17.0	14.9	1.15	17.0
Head	100.0	1.09	100.0	100.0	1.07	100.0

R.503. *Recovery of Tin from HMS Float Material.* The float material from Test H-8 was roll crushed to pass a 10 mesh screen, then jigged. The jig concentrate was subjected to heavy liquid separation.

Product	Weight	Tin	Tin Distribution	
			Individual	Overall
	%	%	%	%
Jig Conc.	14.13	0.29	25.5	1.2
Jig Tail	85.87	0.14	74.5	3.5
Float	100.00	0.16	100.0	4.7

By heavy liquid 0.8% of the tin was obtained in a 10.7% tin product. Thus the treatment of the HMS float material produced only a small additional recovery of tin.

R.503. *Comparison Between Pre-Concentrated and Run-of-Mine Ore.* Tests were run on 10 kg lots produced by grinding to pass the 2688 Screen in the small pilot plant. After flotation rougher tin concentrates were made, and a comparison of results made at this stage.

Description	F.97 (Pre-Concentrated)				F.101 (Run-of-Mine)		
	Weight		Assay Tin	Tin Distribution	Weight	Assay Tin	Tin Distribution
	Pre-Conc. only	Overall					
	%	%	%	%	%	%	%
Tin Concs.	1.58	1.20	32.3	43.1	1.55	28.8	43.8
Cleaner Sulphide	36.44	27.62	0.51	15.6	31.55	0.59	18.3
Table Tails	61.98	46.98	0.70	36.5	66.90	0.57	37.9
	100.00	....	1.13	....	....	....	....
HMS Float	....	24.20	0.18	4.8	....	....	....
Head	....	100.00	0.90	100.0	100.00	1.02	100.0

These tests show that run-of-mine and pre-concentrated ores behave similarly in the tin concentrating processes employed.

Sulphur Elimination

The removal of sulphur was investigated with respect to the flotation of individual size fractions. Tests using table flotation were employed to eliminate coarse sulphide not removed by froth flotation. Tests were also made to recover tin from the floated sulphides.

R.482. Test SGC-1 was a 2 kg preliminary investigation of the flotation of sulphides after batch grinding.

Test SGC-2 was done in the small pilot plant using the Tyler 'Ton-Cap' 434 screen in closed circuit with the ball mill. Flotation was done in the 10 kg Agitair cell at an impeller speed of 800 r.p.m.

Flotation conditions at the rougher stage were:—

Reagents—		
Sulphuric acid (total)	1.63	lb./ton
Copper sulphate	2.33	lb./ton
Potassium ethyl xanthate	0.58	lb./ton
Potassium amyl xanthate	0.58	lb./ton
M.I.B.C.	0.093	lb./ton
Conditioning time	4	mins.
Flotation time	12	mins.
pH before flotation	4.7	
pH after flotation	5.0	

The rougher sulphide concentrate was cleaned without further reagent addition in the 2 kg Denver flotation cell, flotation lasted 10 minutes, and the pH at the end was 5.3.

Flotation results were:—

Product	Weight	Tin	Sulphur	Distribution	
				Tin	Sulphur
	%	%	%	%	%
Cleaner Sulphide Conc.	18.78	0.29	35.8	6.2	71.4
Cleaner Sulphide Tail	5.92	0.78	17.1	5.3	10.7
Rougher Sulphide Conc.	24.70	0.41	31.3	11.5	82.1
Rougher Sulphide Tail	75.30	1.02	2.24	88.5	17.9
Head	100.00	0.87	9.43	100.0	100.0

Flotation Feed Sizing with Sulphur and Tin Elimination in Each Fraction

Screen Mesh B.S.S.	Flotation Feed Weight %	Sulphur Elimination at Indicated Flotation Stage Rougher %	Sulphur Elimination at Indicated Flotation Stage Cleaner %	Tin Elimination at Indicated Flotation Stage Rougher %	Tin Elimination at Indicated Flotation Stage Cleaner %
+ 36	13.09	14.3	1.8	2.7	0.1
+ 44	6.38	33.0	8.4	8.3	0.7
+ 52	3.51	55.4	22.5	14.3	1.9
+ 62	6.08	73.1	44.2	18.3	5.0
+ 72	3.76	82.9	59.7	20.0	7.1
+ 100	9.29	90.9	72.2	21.7	10.5
+ 150	10.00	95.8	88.2	16.5	11.1
+ 200	5.17	97.3	93.1	13.7	10.3
— 200	42.72	95.4	91.8	8.6	5.8
	100.00	82.1	71.4	11.5	6.2

Conclusions

In sizes coarser than 72 mesh sulphide flotation was poor in the rougher stage. In the cleaner stage poor recovery of sulphides coarser than 120 mesh occurred.

In fractions coarser than 120 mesh the cleaner mesh stage markedly reduced the tin content. Coarse sulphides floated in the rougher stage and failed to float in the cleaner stage.

R.503. *Table Flotation of Sulphides.* Having seen table flotation practised at Storeys Creek Mine, the laboratory Wilfley table was modified to suit this process for Mt Cleveland ore.

Material used for these tests was pre-concentrated OS/3 ore, which was ground to pass the Tyler 'Ton-Cap' 2688 screen in the small pilot plant. The ground ore was deslimed in the Geco hydraulic sizer, the spigot products from which were mixed together for table flotation feed.

Test F.99. As previous work had shown that sulphides coarser than 85 mesh floated inefficiently, the feed for this test was screened on this sieve and each fraction treated separately.

The table flotation removed the sulphide from the plus 85 mesh fraction, but removed less than half of the sulphur from the minus 85 mesh fraction.

Test F.100. This test aimed at removing the fine sulphide by froth flotation, then removing the remaining sulphides by table flotation. The efficiency of froth flotation was intentionally reduced by lowering the impeller speed to 1,400 r.p.m. on the Denver D-1 flotation machine fitted with the 1 kg stainless steel tank.

Froth flotation conditions were:—

Reagents:—		
Sulphuric acid	1.3	lb./ton
Copper sulphate	2.6	lb./ton
Potassium ethyl xanthate	0.71	lb./ton
M.I.B.C.	0.05	lb./ton
Conditioning time	3	minutes
Flotation time	10	minutes

The froth flotation tailing was conditioned in a rotating earthenware jar for table flotation as under:—

Reagents:—			
Sulphuric acid	*8.6	lb./ton	Added together and conditioned for 2 minutes
Copper sulphate	0.71	lb./ton	
Potassium ethyl xanthate	1.7	lb./ton	Conditioned for a further minute
Kerosene	1.3	lb./ton	

* Calculated in terms of original froth flotation feed weight.

Description	Weight %	Assay Sulphur %	Sulphur Distribution %
Froth Flotation Sulphide Conc.	28.98	37.1	64.4
Table Flotation Sulphide Conc.	23.96	23.4	33.6
Residue	47.06	0.70	2.0
Head	100.00	16.7	100.0

Table flotation has been shown to be an effective means of removing coarse sulphide from Mt Cleveland ore. No great conditioning time ahead of table flotation appears necessary, but the use of copper sulphate appears mandatory. No attempt was made to obtain optimum operating conditions.

R.482. *Magnetic Separation.* Using the Gill machine wet magnetic separations were made on ore ground in the small pilot plant to pass the No. 2688 Screen and the No. 647 Screen, this latter screen being approximately 30 mesh.

Screen No. 2688

Product	Weight	Tin	Sulphur	Copper	Distribution Tin	Distribution Sulphur	Distribution Copper
	%	%	%	%	%	%	%
Cleaner Mags.	23.1	0.40	25.6	0.24	9.8	64.6	13.4
Cleaner Non-Mags	6.7	0.76	5.77	....	5.4	4.2	....
Rougher Non-Mags	70.2	1.14	4.07	....	84.8	31.2	....
Head	100.0	0.94	9.16	0.41	100.0	100.0	....

Screen No. 647

Product	Weight	Tin	Sulphur	Copper	Distribution Tin	Distribution Sulphur	Distribution Copper
	%	%	%	%	%	%	%
Cleaner Mags.	27.0	0.60	23.4	0.27	17.0	68.1	17.8
Cleaner Non-Mags	4.6	0.65	6.1	....	3.2	3.0	....
Rougher Non-Mags	68.4	1.11	3.92	....	79.8	28.9	....
Head	100.0	0.95	9.28	0.41	100.0	100.0	....

Magnetic separation, while it removes most of the sulphides, leaves a higher sulphur content in the non-magnetics than flotation. This sulphur would eventually have to be removed by flotation.

R.482. *Liberation of Cassiterite by Regrinding Sulphides.* In test F.88 the flotation sulphide concentrate was tabled to yield a 2.4% tin product, which contained 40% of the tin in the sulphide concentrate.

Aberfoyle Tin Development Partnership then requested that the sulphides be reground firstly to pass a 120 mesh screen, and secondly to pass a 170 mesh screen to see what release of cassiterite was possible.

Test F.103. During working up operations in the large pilot plant a sample of rougher sulphide concentrate was obtained, and used for this test. This rougher concentrate was cleaned in the 10 kg Agitair flotation cell, the cleaner concentrate being split in two. Each part was ground to pass its respective screen then floated in the Denver D-1 machine using the 1 kg stainless steel tank under the following circumstances:—

	Unit	Minus 120 Mesh	Minus 170 Mesh
Reagents:—			
Sulphuric acid	lb./ton	0.60	0.58
Copper sulphate	lb./ton	0.60	0.58
Potassium amyl xanthate	lb./ton	0.24	0.23
Potassium ethyl xanthate	lb./ton	0.24	0.23
M.I.B.C.	lb./ton	0.022	0.021
Conditioning time	mins.	3	3
Flotation time	mins.	10	10
pH before flotation	....	5.5	5.6
pH after flotation	....	4.8	5.4

Results—

Product	Weight Overall	Weight Test only	Assay Tin	Assay Pan Tin	Tin Distribution Overall	Tin Distribution Pan Tin	Tin Distribution Test only
	%	%	%	%	%	%	%
Cleaner Sul. Conc.	25.6	94.8	0.52	....	13.6	....	90.9
Cleaner Tailing	1.4	5.2	0.94	....	1.4	....	9.1
Rougher Sul. Conc.	27.0*	100.0	0.54	....	15.0*	....	100.0
— 120 Sul. Conc.	24.9	92.3	0.42	....	10.9	....	73.2
— 120 Tailing	0.7	2.5	3.76	2.59	2.7	1.8	17.7
Cleaner Sul. Conc.	25.6	94.8	0.51	....	13.6	....	90.9
— 170 Sul. Conc.	24.6	91.0	0.37	....	9.2	....	61.7
— 170 Tailing	1.0	3.8	4.19	2.01	4.4	2.1	29.2
Cleaner Sul. Conc.	25.6	94.8	0.52	....	13.6	....	90.9

* Assumed from Test F.87 where material ground to a similar degree was made. No values for these figures are available for the larger pilot plant.

While it has been shown that finer grinding releases more tin from the sulphides, the recoverable tin released as indicated by panning is only fractionally increased. In either case the extra recoverable tin is small, say an additional 2% overall.

Coarser Primary Grinding

Following Test GC-1, Aberfoyle Tin Development Partnership requested a similar test be done after grinding initially to pass No. 2688 Screen instead of No. 76 Screen. Two 10 kg tests namely Test F.70 and F.87 were made, the former being an exploratory one.

Tests F.70 *and* F.87. Rougher, cleaner and scavenger flotation conditions similar to those used in Test GC-1 were employed. In both tests the scavenger stage recovered so little that henceforth this stage was discontinued.

Sizing was done in the Geco hydraulic sizer, but sedimentation instead of cycloning was used to further size the Geco overflow.

F.70. *Hydraulically Sized Products*—

Mesh B.S.	Spigot 1 Weight %	Spigot 2 Weight %	Spigot 3 Weight %	Sediment Weight %	Slime Weight %
+ 44	7.33	....	....	....	....
+ 52	13.54	....	....	....	....
+ 60	29.22	13.52	....	....	....
+ 72	19.68	12.87	3.30	....	....
+ 85	15.92	20.39	4.08	....	....
+ 100	5.96	14.82	5.22	....	....
+ 120	....	18.66	13.13	....	....
+ 150	....	10.05	18.87	1.19	....
+ 170	....	....	17.22	2.38	....
+ 200	....	....	12.96	3.90	....
+ 240	....	....	11.22	6.82	....
+ 300	....	....	6.87	....	....
CS. 1	....	....	....	15.37	8.36
CS. 2	....	....	....	29.98	10.95
CS. 3	....	....	....	24.24	16.95
CS. 4	....	....	....	7.79	12.37
CS. 5	....	....	....	1.73	6.48
Undersize	8.35	9.69	7.13	6.60	45.35
Totals	100.00	100.00	100.00	100.00	100.00

The Geco was operated with the same water settings as in GC-1, but now a more even distribution of weight between the spigots occurred.

F.87. *Summary of Products*—

Product	Weight %	Tin %	Tin Distribution %
Concentrates:—			
Primary	5.97	7.1	53.2
Secondary	0.34	14.1	6.1
Total	6.31	7.5	59.3
Residues:—			
Gravity Tailing	66.60	0.29	24.1
Sulphide	27.09	0.49	16.6
Total	93.69	0.35	40.7
Head	100.00	0.80	100.0

In comparing the results from grinding initially to pass a No. 2688 Screen and No. 76 Screen, the main difference occurs in the sulphide concentrates where with the coarser screen a 6% greater loss of tin occurs.

Miscellaneous Tests

R.482. *Copper Flotation.* After some preliminary work, which showed that the extraction of copper would not be easy, Aberfoyle Tin Development Partnership decided to have this investigation continued in North America. Data obtained from tests here on—

(*a*) bulk sulphide flotation followed by selective flotation of copper from bulk concentrate;

(*b*) selective flotation of copper followed by a scavenging flotation of remaining sulphides; and

(*c*) the nature of the occurrence of the copper,
were sent to America.

R.482. *Flotation-Acid Usage and Conditioning time.* A series of 500 g tests (Test F.72-F.86 inclusive) showed that the optimum sulphuric acid was two lbs. per ton, and conditioning time two minutes.

R.482. *Flotation Using Local Mt Cleveland Water.* Tests F.108 and F.109 were made to compare flotation results made using Launceston tap water and water from Deep Creek. No difference was found.

R.482. *Grinding Circuits—Comparison of Screen and Classifier.* In the small pilot plant the ball mill was run in closed circuit with the sizing device shown:—

Test SGC-3 a six-inch Akins classifier.

Test SGC-4 a Hummer screen fitted with No. 76 screen cloth.

Some difficulty was experienced adapting the classifier to the low output of the ball mill, but indicative results were obtained.

The classifier produced a finer product than the screen. The efficiency of size separation was better on the screen. There is a strong indication that the sulphides are more finely ground in the classifier circuit, and by inference cassiterite is likewise excessively slimed.

R.482. *Slime Sedimentation.* Slime left after the sedimentation stage of Test F.87 and similar slime from Test F.94 was used in standard settling tests for thickener design. On the assumption that the thickener underflow was 45% solids, and the clear liquid had a specific gravity of one the thickener area was calculated at 28 square feet per short ton of solids per 24 hours.

Tin—Clutha Development: Razorback Mine

R.483

Sample

A sample of gossan was submitted by Clutha Development for preliminary concentration tests.

Assays

The sample assayed: Tin, 2.4%; Lead, 1.2%; Copper, 0.2%.

Investigation

Preliminary tests showed that no satisfactory release of tin occurred coarser than 100 mesh. All tailings were reduced to minus 200 mesh before discarding.

Summary

Tabling recovered 76% of the tin as a 25% tin concentrate, which also contained 2.1% lead and 0.2% copper. The final tailing contained 0.6% tin.

There was no significant concentration of lead or copper by tabling.

Tin—Aberfoyle Tin, N.L. Jig. Tailings

R.492

Sample

A sample of Aberfoyle mine jig tailings was submitted for concentration tests.

Investigation

The sample was screened on 10 mesh and primary concentrates made from the undersize. The oversize was roll crushed to pass 10 mesh, and then similarly treated to the original undersize to make secondary concentrates.

In both primary and secondary concentration, procedure was to screen on 30 and 60 meshes.

The products were treated as under:—

+ 30 mesh fraction—jig concentration.

+ 60 mesh fraction—jig concentration.

— 60 mesh fraction—table concentration.

The jig concentrates were separated using acetylene tetra bromide (specific gravity 2.954).

Summary

Product	Weight %	Tin %	Tin Distribution %
Primary Concs.	0.35	6.16	11.53
Secondary Concs.	1.39	5.6	41.59
Total Concs.	1.74	5.7	53.12
Primary Tail	18.13	0.086	8.21
Secondary Tail	80.13	0.090	38.67
Total Tail	98.26	0.089	46.88
Head	100.00	0.19	100.00

Concentrates recovered were of low grade and microscopically contained no free cassiterite.

No concentration of tungsten was obtained.

Crushing was necessary to liberate most of the tin obtained in the concentrates.

Tin—Renison Ltd.: Mill Vanner Feed Tilting Deck Tests

R.494

Sample

A pulp sample (about 50% solids) of mill vanner feed was received from Renison Ltd.

Assay

The sample assayed: Tin, 6.17%, Van Tin, 4.54%, recovery of Tin, 73.6%; Sulphur, 3.19%.

Investigation

A preliminary examination comprising sizing analysis and vanning assays was made.

A series of tilting deck tests was undertaken comprising variations in deck slope, concentration period, pulp feed rate, and feed pulp density.

Summary

The sample sizing analysis was:—

Fraction	Weight %	Tin %	Distribution Tin %	Distribution Cumulative Tin %
+ 200 mesh	4.94	1.01	0.8	0.8
CS. 1	9.37	15.3	23.2	24.0
CS. 2	12.20	9.64	19.1	43.1
CS. 3	16.03	8.43	21.9	65.0
CS. 4	12.55	6.48	13.2	78.2
CS. 5	6.54	5.12	5.4	83.6
CS. — 5	38.37	2.64	16.4	100.0
Head	100.00	6.17	100.0	....

The grade of concentrates ranged 7.65 to 52.5% tin, the corresponding recoveries 85.6 to 58.5%. The ratios of concentration ranged 1.58 to 8.34.

At any given deck slope reduced feed rate increased recovery, and lowered concentration ratio. This was more marked when actual feed rate of pulp was reduced, but feed rate was also reduced by diluting the pulp and maintaining the flow.

The relationship between ratio of concentration and recovery of tin in the concentrate is:—

(*a*) independent of deck slope;

(*b*) independent of time of concentration; and

(*c*) favourably influenced by feed dilution.

Tin—Renison Ltd.: Mill Vanner Tailing—Tilting Deck Tests

R.495

Sample

A pulp sample was received from Renison Ltd. for tilting deck tests.

Assay

The sample assayed: Tin, 1.27%; Van Tin, 0.1%; Tin recovery, 7.9%; Sulphur, 4.2%.

Sizing Analysis

Fraction	Weight	Tin	Distribution Tin	Distribution Cumulative Tin
	%	%	%	%
+ 200 mesh	4.60	0.16	0.6	0.6
CS. 1	4.70	0.23	0.9	1.5
CS. 2	7.25	0.13	0.8	2.3
CS. 3	9.50	0.14	1.1	3.4
CS. 4	9.80	0.83	6.6	10.0
CS. 5	7.25	2.21	13.2	23.2
CS. — 5	56.90	1.66	76.8	100.0
Head	100.00	1.23	100.0	....

Summary

Both the van tin and sizing analysis indicate that little concentration can be expected from tilting decks on this material.

Tilting deck tests confirmed this, inverse concentration being obtained in all cases.

Tin—Renison Ltd.: Magnetic Separation Tests on Mill Products

R.496-R.499

Samples

The following samples were received from Renison Ltd. for magnetic separation tests using the Gill wet magnetic separator:—

R.496. Mill Flotation Feed.

R.497. Gravity Feed.

R.498. Tub Toppings.

R.499. Final Concentrate.

Gill Magnetic Separator

A small prototype was lent to the Department by H. T. Reading Ltd. of Lismore, N.S.W., the manufacturers, for tests on Renison Bell and other ores.

This machine is of a new design developed for beach sand work, and these tests were the first application of it to comminuted material. Hence tests of an exploratory nature were mandatory, and short-comings in the machine, e.g., the fixed air gap, were found.

R.496. *Mill Flotation Feed*

Assays: Tin, 2.04%; Sulphur, 27.7%.

For comparative purposes sulphide flotation was also done on this sample.

Description	Flotation	Method Magnetic Test 7	Magnetic Test 9
	%	%	%
Sulphide Reject—			
Weight Distribution	80.95	60.1	69.6
Tin Assay	0.48	0.34	0.47
Tin Distribution	18.9	9.4	15.2
Sulphur Assay	34.0	35.1	35.0
Sulphur Distribution	97.2	78.4	86.6
Gravity Feed—			
Sulphur Assay	4.2	14.6	12.3

These tests show that flotation removes more of the sulphide than magnetic separation, but gravity concentration of higher sulphur-bearing non-magnetic material is possible. The complementary use of flotation and magnetic separation is also possible.

R.497. *Mill Gravity Feed*

Assays: Tin, 5.46%; Sulphur, 2.79%.

About half of the sulphur is removed from this product by magnetic separation. Most of the coarse (plus 100 mesh) sulphur is eliminated. Apart from this no significant benefit was gained by magnetic separation.

R.498. *Tub Topping*

Assays: Tin, 25.0%; Sulphur, 2.53%.

With maximum magnetic field strength only 46.9% of the carbonate mineral was removed. The non-magnetic fraction assayed 31.8% tin. A better separation may have been possible if the air gap could have been decreased.

R.499. *Final Concentrate*

Assays: Tin, 64.1%; Sulphur, 2.45%.

Magnetic separation removed almost all the coarse sulphide, with only a small loss of tin. However, there was no substantial upgrading of the concentrate.

Tin—Storey's Creek N.L.: Dorset Tin Division

R.502

Sample

A sample designated 'Dressing Shed Fine Middling' was supplied by the company for wet magnetic separation using the Gill magnetic separator. This material contains substantial amounts of ilmenite, the removal of which was investigated.

Assay

The sample assayed: Tin, 15.4%; TiO_2, 20.8%.

Summary

Product	Weight	Tin	TiO_2	Distribution Tin	Distribution TiO_2
	%	%	%	%	%
Magnetic Product	38.6	1.28	41.6	3.2	77.1
Non-Magnetic Product	61.4	24.3	7.78	96.8	22.9
Head	100.0	15.4	20.8	100.0	100.0

The removal of ilmenite indicated would facilitate further gravity concentration of tin.

Tin—Aberfoyle Tin, N.L.: HMS Float Material

R.509

Sample

Aberfoyle Tin, N.L., submitted their sample E.53, which was HMS Float Material, for jig concentration tests.

Investigation

The sample was jaw crushed to pass 8 mesh, deslimed, then fed to the Denver laboratory jig. The jig tailing was roll crushed to pass 16 mesh, deslimed and again jigged. The jig tailing was roll crushed to pass 25 mesh and jigged again.

As the concentrates made were low grade, they were subjected to heavy liquid (acetylene tetrabromide) separation.

Summary

The heavy liquid sink products contained 71.9% of the tin as a 3.4% tin concentrate. Included in this is the plus 8 mesh fraction 52.2% of the tin in a concentrate assaying 4.5% tin. Vanning assays indicated no loss of recoverable tin in the discard products.

Not one product contained a measurable amount of tungsten.

Tin—Messrs Brinkman and Dicker, Mt Rex

R.514

Introduction

Following an inspection of the Mt Rex property, which is being investigated by Messrs Brinkman and Dicker, the Chief Chemist and Metallurgist requested them to submit a sample from the tin lode for a preliminary metallurgical study.

Sample

The sample assayed: Tin, 4.8%; Lead, 0.15%; WO_3, Trace; Zinc, 0.92%; Copper, 0.26%; Sulphur, 14.2%.

Investigation

The sample was crushed to pass 8 mesh then wet screened on 22 and 60 mesh, the two oversize products being jigged, the undersize tabled. Jig tailings were reduced to pass 60 mesh and retabled. The jig concentrates were separated using acetylene tetra bromide (s.g. 2.954) to see how the tin occurred.

Summary

With primary grinding only 73% of the tin was recovered in 16% tin concentrates. Regrinding raised the recovery of tin to 89%. The final minus 60 mesh tailings assayed 0.74% tin.

Examination of the jig concentrates showed composite cassiterite grains, which indicate further size reduction of these is necessary in order to make a high grade tin concentrate.

Tungsten—Aberfoyle Tin, N.L.: Vanner Tailing

R.510

Sample

Aberfoyle Tin, N.L., submitted their sample E.64, of Storey's Creek Vanner Tailing for Gill wet magnetic separation tests to determine if Tungsten could be recovered from it.

Investigation

The sample was passed through the Gill using plenty of wash water. The magnetic concentrate thus obtained was panned to get a high grade tungsten product.

Summary

The magnetic concentrate contained 0.9% of the tungsten and assayed 5.4% WO_3; thus no appreciable concentration of tungsten was obtained.

Tungsten—Aberfoyle Tin, N.L., Rossarden: Wolfram-Siderite Concentrate

R.512

Sample

The Chief Chemist and Metallurgist obtained a sample of Wolfram-Siderite Concentrate for testing in the Gill wet magnetic separator. This concentrate is not amenable to the magnetic separation at present practised in this mill, and is currently leached with sulphuric acid.

Assay

The sample assayed 31.9% WO_3.

Investigation

Besides several tests using various magnetic intensities one test involved roasting at 700° C with charcoal for 10 minutes followed by magnetic separation.

Summary

No effective separation of wolfram from siderite was made in the 'as received' condition.

However, after the roasting procedure 86.7% of the tungsten was recovered in the non-magnetic fraction which assayed 60.8% WO_3.

Ceramics—Wynyard Brick Company

R.488

Samples

The company submitted samples of bricks and raw materials for examination to ascertain why early heats of bricks in the new plant were not up to standard.

Investigation

Samples of bricks submitted were refired at 800° C and 1050° C to see if firing temperatures had been adequate.

From the raw materials briquettes were made using 'low', 'medium' and 'high' pressures (these are relative terms). Specimens from each pressure were fired at 800° C and 1050° C.

Summary

Refiring bricks at 800° C made no visible difference. Refiring and soaking for three hours at 1050° C improved the bricks, but they were too open and porous in texture.

In tests made from raw materials and fired at 800° C none were satisfactory, those made with 'low' pressure resembling the bricks supplied.

Of those fired at 1050° C those from 'low' pressure forming resembled the bricks that had been reheated to 1050° C. Those from 'high' pressure forming were satisfactory.

More pressure and increased temperature are required to make satisfactory bricks from these raw materials.

Appendix

Field tests using Wynyard material were carried out at Machen's Brick Works and satisfactory bricks made. A minimum firing temperature at 950° C is recommended for Wynyard material.

Ceramics—Wynyard Brick Company

R.491

Samples

From clay taken from Diprose's property, Oldina Road, Wynyard:—

(*a*) Machen's Brick Works made bricks by stiff plastic pressing; and

(*b*) Wunderlichs made extruded tile.

Specimens of these products were then fired in the laboratory.

Investigation

The investigation was to ascertain if commercially usable bricks could be produced in an updraught kiln probably with a temperature between 800° C and 900° C.

Bricks were fired at 800, 850, 900 and 950° C.

Summary

The colour and quality of the bricks over this range of temperature was consistent, all were of good appearance, but rather soft and underfired.

Bricks fired at 850° C, although judged underfired, did not spall during immersion in boiling water for one hour.

The softening point of this material was 1350° C, total fusion occurred at 1370° C.

Ceramics—Crisp & Gunn Co-operative Ltd., Hobart

R.493

Sample

A sample of red clay was supplied by the above company for brick manufacturing tests using the stiff plastic pressing method.

Investigation

As received the clay contained 30% water, a further 4-5% water was necessary to make a workable material. After hand mixing this additional water the material was pressed through the Rawdon mill.

The green pressed bricks were dried naturally for two days, then finished in an electric oven at 110° C.

The bricks were fired at 1050° C and soaked at this temperature for two hours.

Summary

The material possessed excellent plastic and cohesive properties. There were high drying and firing contractions, cracking and some distortion. This material, used undiluted, is considered unsuitable for brick manufacture.

Ceramics—Wynyard Brick Company

R.500 and R.501

Two samples were submitted by the company, viz.:—

R.500. Red clay from the foot of the hill near the rifle range; and

R.501. Blue-brown clay from ten feet on the flat area.

Both samples contained small quartz boulders; those in R.500 were a significant quantity.

Iuvestigation

Because of the presence of the quartz, both samples were cut in half, one portion being roll crushed to minus $\frac{1}{4}$ inch, and the other to minus10 mesh.

No difficulties were encountered in pressing.

After drying, first naturally, then at 110° C, the bricks were fired at 950° C.

Summary

Bricks made from the coarsely crushed material suffered cracking and local deformation around the quartz inclusions. In sample R.500 this fault rejected the bricks made.

Bricks made from the finer material were better, and classed 'of moderate quality'.

Firing at 950° C appears adequate, the bricks are rust coloured and showed some lamination.

Ceramics—Luck Bros. Pty. Ltd., Devonport

R.504

Sample

The above company submitted a sample from the Don Road cutting for brick manufacturing tests by pressing and de-aired extrusion processes.

Investigation

The sample was roll crushed to pass a 5 mesh screen, water was added and thoroughly worked in by several passes through the Rawdon mill.

In pressing, the material adhered strongly to the die surfaces making ejection difficult.

Satisfactory extrusion was obtained.

After natural drying, followed by oven drying at 110° C, the bricks were fired at 950° C and soaked at that temperature for two hours.

Summary

During drying, core cracking developed in the extruded bricks, after firing they were extremely fragile.

The pressed bricks became porous on drying, after firing they too were fragile and easily abraded on the edges.

This material, as received, was not suitable for brick making.

Ceramics—Luck Bros. Pty. Ltd., Devonport

R.513

Samples

A departmental geologist, Mr V. Threader, obtained eight samples for brick manufacturing tests by de-aired extrusion. These samples were:—

No.

1. Luck Bros. old pit—Top 7 feet.
2. New site over railway line— 0 to 6 feet.
3. New site over railway line— 6 to 13 feet } Combined as one sample.
4. New site over railway line—13 to 20 feet }

5. Cambrian Greywacke—Lower Wilmot 6. Cambrian Greywacke—Sprent 7. Cambrian Greywacke—Beulah 8. Cambrian Greywacke—Lower Beulah	Combined as one greywacke sample

To simplify procedure after discussion with Mr Threader, some of the samples were combined as indicated above.

Investigation

All samples were roll crushed to pass a 10 mesh screen. After blending and incorporating water by hand, mixes were pugged in the Rawdon mill. De-aired extrusion was carried out at 27 inches of mercury vacuum. Test pieces were naturally dried for two days, oven dried at 110° C, then fired at 1000° C with two hours soaking at that temperature.

Blends Used

No.	Description
1B1.	1 Part No. 1 clay, 1 part greywacke No. 5-8.
1B2.	1 Part No. 1 clay, 2 parts greywacke No. 5-8.
2B1.	2 Parts No. 2 clay, 1 part greywacke No. 5-8.
¾B1.	2 Parts No. 3/4 clay, 1 part greywacke No. 5-8.

Summary

No. 1 clay was found suitable for brick manufacture. Blending with greywacke reduced plasticity and cohesiveness, with corner notching becoming a serious problem. Efforts to reduce this using sodium carbonate were restricted by lack of sample.

From No. 2 clay the extruded column was badly dog eared, with similar faults in Blend 2B1. The quantity of material restricted testing to overcome this fault.

Clay No. 3/4 showed characteristics between those of Clays Nos. 1 and 2. The Blend ¾B1 showed slightly greater tendency to dog ear than the undiluted clay.

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.Aust.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 9,038. This represents an overall increase of 223 although there was a reduction of 38 men in the coal mining section of the industry. This section became more depressed as more users turned to fuel oil. The numbers of persons in metal mining remaining steady.

ACCIDENTS

The number of registered accidents was 93 in which 89 men were injured and four killed. In calculation of the rates per thousand, 433 employees in the total of 9,038 were disregarded because their employers do not submit accident reports.

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	41	....	5	12.2	29	....	....	....	70	....	5	0.7
Copper	79	1	5	7.6	1,423	....	8	0.5	1,502	1	13	0.9
Silver-lead-zinc	344	....	10	2.9	369	....	3	0.8	713	....	13	1.8
Tin and Tungsten	242	1	29	12.3	512	....	14	2.7	754	1	43	5.8
Quarries, Works, Prospecting, &c.	6	....	....	....	5,560	2	15	0.3	5,566	2	15	0.3
Total	712	2	49	7.2	7,893	2	40	0.5	8,605	4	89	1.1
Not reported	....	....	....	....	433	....	....	....	433	....	....	....
					8,326				9,038			

DESCRIPTION OF FATAL AND SERIOUS ACCIDENTS

Fatal

G. Richards, Comalco: While disconnecting cathodes on reduction furnace, electrocuted through earth leakage.

I. Giampaoli, Aberfoyle Tin: Struck by fall of ground in stope.

H. E. Hallett, Melrose Quarry: Struck by flyrock from blast.

W. H. Smyth, Mt Lyell Co.: Struck by run of ore from draw point in scraper drift.

Serious

L. Mansfield, Weily's Quarry: While spalling stone, struck by splinter; lost eye.

M. Styles, E. Z. Co., Risdon: While repairing fork lift truck, truck rolled and crushed him against pit wall; broken pelvis.

H. Presch, Mt Lyell Co.: Slipped and fell down mill hole; broken wrists.

K. Wilson, E.Z. Co., Risdon: Struck by steel plate falling from crane when tack weld broke; fractures in both feet.

A. Kovacs, Mt Lyell Co.: Jumped into tip-truck to move stone which crushed him against side of mill hole; broken leg.

R. Van Zelm, Mt Lyell Co.: Struck by fall of ground in drive; broken collar bone, rib and shoulder blade.

G. T. Ryan, E. Z. Co., Rosebery: Struck by fall of ground while boring rock-bolt hole; lacerations and abrasions to both arms and legs.

S. Nacinoric, Storeys Creek: While driving locomotive pinned between chute and battery; injured chest.

J. McGiveron, Duncan: Struck by handle of jack which slipped under load; lacerations to both hands, one broken.

T. Donkers, Renison: Arm jammed by shovel caught in a conveyor; broken.

N. R. Conway, E.Z. Co., Rosebery: Strained while shovelling concentrate; hernia.

M. T. Barnes, Duncan: Struck by fall of roof; broken back.

R. R. Baldock, Cleveland: When delivery hose to receiver blew off pipe, back pressure swung pipe and bend onto legs; lacerated leg and broken leg.

S. J. Burke, Mt Lyell Co.: Struck by spring while dismantling cone crusher; broken hand.

E. W. Boxhall, E.Z. Co., Risdon: Charging digester which reacted prematurely; acid burns to trunk and limbs.

D. McNamara, E.Z. Co., Risdon: Run over by fork lift truck; leg amputated.

A. B. Brown, Aberfoyle: While pulling truck backwards jammed himself against a chute; broken arm.

L. L. Brown, E.Z. Co., Rosebery: Strained lifting heavy load; hernia.

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‡								
1951–1960§								
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
1964	8815	68	5	63	68	0.581	7.316	7.897
1965	9038	93	4	89	93	0.465	10.342	10.808

* See Report of Director of Mines—1954.
† See Report of Director of Mines—1956.
‡ See Report of Director of Mines—1960.
§ See Report of Director of Mines—1964.

INCIDENCE OF ACCIDENTS

Place and Cause of Accident	Number of Persons Killed	Number of Persons Injured (Incapacitated for over 14 days)
Section A.—Metalliferous Mines—		
1. Below Ground:		
(*a*) Explosions	....	....
(*b*) Falls of Ground	2	4
(*c*) Falling down Shafts, &c.	....	1
(*d*) Other Causes	....	41
2. Above Ground:		
(*a*) Machinery in Motion	....	1
(*b*) Other Causes	1	9
3. Accidents in Batteries, Ore-dressing, Smelting and other Metallurgical Works, &c.	1	28
Total Metalliferous Mines (A)	4	84
Section B.—Coal Mines—		
4. Below Ground:		
(*a*) Mine Explosions (fire damp, &c.)	....	....
(*b*) Explosives (dynamite, &c.)	....	....
(*c*) Falls of Earth	....	1
(*d*) Other Causes	....	4
5. Above Ground:		
(*a*) Machinery in Motion	....	....
(*b*) Other Causes	....	....
Total Coal Mines (B)	....	5
Total All Mines (A and B)	4	89

During the year the Western District was amalgamated with the Northwestern at Burnie. Mr L. W. Morris was promoted to Senior Mining Engineer and Senior Inspector of Mines and Explosives and placed in charge of the enlarged Northwest District. He is assisted by Mr J. L. Black, Mining Engineer and Inspector of Mines and Explosives, who was appointed in June, and Mr H. R. Powell, Inspector of Explosives. Messrs L. F. Egan and W. R. Tindal, Mining Engineers and Inspectors of Mines and Explosives, took over the Northern and Eastern Districts respectively. Mr Tindal in addition inspects all coal mines and acts as Electrical Inspector.

PROSECUTION

A coal mine owner and his agent were prosecuted on five charges in relation to the survey and protection of an abandoned mine. They were convicted and fined £20 on each charge.

DANGEROUS GOODS

The Explosives and Inflammable Liquids Acts

EXPLOSIVES IMPORTS

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

	Burnie	Hobart	Launceston	Naracoopa	Strahan	Total
Nitro-compounds (lb.) ..	523,750	560,975	1,627,300	91,050	1,482,650	4,285,725
Detonators	85,500	580,900	1,391,300	15,000	174,000	2,246,700
Explosive Shipments (No.)	6	5	9	3	10	33
Ammonium nitrate (imported for use as an explosive) (lb.)	....	....	....	....	....	656,295

NOTE:—Nitro-compounds exported from Launceston, 400,100 lbs.

The net quantity of nitro-compounds imported was 3,885,625 lb., an increase of more than 1,000,000 lb. The number of detonators imported also increased by one million. A considerable portion of the increased importation (227,000 lb.) was used in seismic operations in Bass Strait, and the remainder is accounted for by increased civil construction programmes and quarrying. In addition the quantity of ammonium nitrate imported for use in explosives manufacture increased by 440,845 lb. or 205%. Taking this and stocks of seismic explosives into account the total increase was 45%.

A new explosive, " Rollex ", was introduced during the year, superseding Gelignite by reason of a different method of cartridging.

PROSECUTIONS

Three persons were prosecuted for keeping explosives contrary to the Act, and each was fined £20.

INFLAMMABLE LIQUIDS IMPORTS

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	1,558	....	....	5,100	....	6,658
Benzol	....	....	....	1,649	....	1,649
Kerosene, Aviation	488	....	....	1,678	....	2,166
Kerosene, Lighting	901	170	344	1,666	....	3,081
Kerosene, Power	....	....	1,702	1,185	....	2,887
Motor Spirit, Premium	31,276	14,591	24,022	56,402	....	126,291
Motor Spirit, Regular	13,968	6,377	13,538	29,948	740	64,571
L.P. Gas	108	....	....	....	....	108
Total	48,299	21,138	39,606	97,628	740	207,411
Tankships (No.)	12	7	11	26	1	57

There were three tankships more than in the previous year and the quantity landed was 29,982 tons greater.

ACCIDENTS AND OUTRAGES

Bothwell—An explosion and fire in a sawmill was the outcome of improper storage of blasting powder.

Devonport—A heavy fuel oil tank exploded at a factory and caused a fire. It is thought that oil vapour was ignited by a spark caused by the fall of a steel manhole cover.

Gordon—Property was damaged by four men detonating gelignite in tree stumps, an old boiler and a steel tube.

Latrobe—A youth set fire to an empty oil tank. The contents of the tank exploded and he was charged with destroying it.

Margate—An explosion and fire destroyed a parked lorry laden with drums of petrol. Three prosecutions for breaches of the Explosives Act were made and convictions obtained.

INSPECTION

During the year Mr G. Jobson was promoted to the position of Senior Inspector of Explosives, which became vacant upon the much regretted death of Mr K. D. G. Sear. In October Mr T. L. Clark was appointed Inspector of Explosives *vice* Mr Jobson.

The Department was represented on the undermentioned committees which met during the year. The Australian Dangerous Goods Transport Committee made substantial progress in formulating a model code for the road transport of dangerous goods. The Australian Port Authorities Association Sub-committee on the Handling of Dangerous Goods in Harbours completed a revision of the model code, which was adopted by the Association. In Tasmania this is being translated into regulations under the Inflammable Liquids Act. The Explosives Code Committee of the Standards Association of Australia met three times on a complete revision of the code. The Department organized an emergency committee for oil fires on tankships and wharves.

Explosives—Magazine Licences, 114; Other Licences, 532; Shotfirer's Permits, 283 (total 758); Fireworks Banned, 1.

Inflammable Liquids—Licences to Keep, 2,134 (up 130); Plans Approved, 433; Exemptions Granted, 188 (Total 960).

DRILLING

Diamond—

Number of Holes	Total Footage	Object
1	980	Mineral Exploration—Beaconsfield
2	882	Mineral Exploration—Mathinna
3	679	Mineral Exploration—Cuprona
1	103	Mineral Exploration—Waratah
1	103	Mineral Exploration—Boobyalla
3	1,680	Coal Exploration—Fingal
38	1,620	Foundation Testing
49	6,047	

Churn—

Number of Holes	Total Footage	Object
21	1,414	Water Boring—Northwest
5	237	Water Boring—Midlands
9	669	Water Boring—Southeast
10	1,140	Water Boring—South
3	498	Testing Alluvials for Tin—Boobyalla
1	155	Testing Alluvials for Tin—Branxholm
3	284	Testing Alluvials for Tin—Derby
7	845	Testing Alluvials for Tin—Mt Cameron
19	1,026	Mineral Exploration—Beaconsfield
19	834	Foundation Testing
97	7,102	

Auger—

Number of Holes	Total Footage	Object
3	57	Foundation Testing
102	3,600	Underground Water Investigation—Longford
105	3,657	

DIAMOND DRILLING

Drilling at mineral targets was carried out in five fields. At Beaconsfield the lode below the workings in the Tasmania Gold Mine was successfully penetrated at 1,786 feet. Further drilling for gold at Mathinna was unproductive. At Cuprona and Waratah the targets were iron ore and

a tin-sulphide lode respectively. An attempt was made to penetrate swelling clay overlying a deep lead in the Boobyalla district. Testing coal seams near Fingal was advanced as crews were available. Foundation testing was undertaken for large hospital and university buildings.

The total footage drilled was 1,592 feet greater than in the previous year.

CHURN DRILLING

Two crews were variously engaged in boring for water, foundation testing and mineral exploration. In the northwest three of the 21 water bores sunk were dry. The productive wells varied between 200 and 1,000 gallons per hour from depths between 23 and 135 feet. Three bores in the Midlands in hard dolerite were dry but the others gave an average output of 200 gallons per hour. In the south and southeast six of the 19 bores were dry, but bailing tests in the others gave results between 80 and 300 gallons per hour from depths down to 195 feet. Testing for alluvials and limestone beds was carried out near Beaconsfield.

A third crew was wholly engaged in testing for alluvial tin in the northeast.

The total footage drilled was 1,759 feet greater than in the previous year.

AUGER DRILLING

The auger has proved to be a very useful tool for the determination of sub-surface strata in geological mapping, particularly in regard to underground water investigations. An alluvial tin sampling project for a hirer on King Island was also successfully carried out.

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

EMPLOYMENT

The average number of persons employed in the industry showed a slight increase to 3,192. Decreases were apparent in the brick industry but they were more than balanced by increases elsewhere.

ACCIDENTS

There were no fatal accidents in the area during the year but the number of serious accidents rose to 10, and there was one minor accident.

In one accident a man lost a leg when he was knocked down by a fork lift truck and a quarry worker lost the sight of one eye from a chip of rock while spalling. Four men lost portion of a finger or suffered broken fingers and three suffered acid burns in two separate accidents. One man suffered a broken pelvis when a fork lift truck moved during repairs and another had a foot broken by a casting falling on it due to the failure of a weld.

HEALTH AND SAFETY

Regular visits of inspection were made to all mines and works in the area to ensure that the Mines and Works Regulation Act was being complied with.

EXPLOSIVES

The usual number of complaints of fly rock and damage caused by vibrations was received and measures were taken to prevent the re-occurrence of fly rock. No case of actual damage by vibration was proved but advice was given regarding the use of milli-second delay detonators and the covering of detonating fuse to reduce nuisance.

Northwestern District

Mr. L. W. Morris, A.W.A.S.M., M.Aust.I.M.M.,
Mr J. L. Black, B.E., M.Aust.I.M.M., Burnie—

During the year the Northwestern and the West Coast inspectorial districts were combined to form a regional inspectorate with offices at Burnie. The Queenstown office was closed down and records and equipment removed to the Burnie office.

EMPLOYMENT

With the decision, late in the year, to bring a Savage River iron orebody to production and planned expansion by Renison Ltd. at Renison Bell there was increased demand for labour and an upsurge in employment took place. Increased exploration and prospecting activity accounted for portion of the increases. Total employment for the region was 3,148 persons of which 996 were employed underground. Exploration and prospecting accounted for 114 of the total and of these seven were employed underground.

ACCIDENTS

The number of accidents reported for the year was 37 in which two men were killed. Of the two killed, one was killed by a fall of rock from a hung-up ore chute whilst he was passing underneath. The other was struck on the head by a rock from a blast in a quarry.

EXPLORATION AND PROSPECTING

There were 26 exploration licences and special prospecting licences current in the region during the year. S.P.L's. 2, 7 and 9 and E.L's. 9/65 and 10/65 are on King Island. These areas were under option or controlled by either Storeys Creek Tin Mining Company N.L. or Mt Costigan Mines Ltd. Both these companies did active field work during the year.

E.L. 7/65—Ocean Mining A.G.: This area is off the east coast of King Island. Bathymetric surveys were carried out.

E.L. 2/65—Planet Mining Co. Pty. Ltd.: Evaluation of geological reconnaissance.

E.L. 12/65—Pickands Mather International: This company was active in the field, particularly during the good weather towards the year's end. Seven men were employed.

E.L. 1/63, E.L. 2/63, E.L. 9/65—Aberfoyle Tin Development Partnership: Each of these areas received attention by way of field mapping, sampling, &c., during the favourable weather and some diamond drilling was done in the Mt Bischoff locality.

S.P.L. 410—G. C. Kingston: This area was held under option by the Broken Hill Pty. Co. Ltd. who abandoned the option during the year. Since then the licensee has been negotiating with other interested parties.

E.L. 15/65—Broken Hill Pty. Co. Ltd.: Part only of this area is in this region.

E.L. 8/65—Mt Lyell Mining & Railway Co.: Surveying, geophysical work and prospecting has been carried out in this area.

E.L. 4/61—Industrial & Mining Investigations: Diamond drilling on the Long Plains and Rocky River orebodies has been done during the year. Savage River Mines continued diamond drilling until the middle of the year on the central orebody. Later development of this project was commenced.

E.L. 5/63—Comstaff Pty. Ltd.: There have been three diamond drills working on the Mt Bischoff area throughout the year, and considerable survey, prospecting and geophysical work has been done on the remainder of the area. One diamond drill hole was drilled in the Dundas area.

E.L. 1/62, E.L. 2/62, S.P.L. 1 and S.P.L. 3—Electrolytic Zinc Co.: S.P.L. 3 and E.L. 1/62 in the Tullah area have received considerable attention by way of field work. E.L. 2/62, Zeehan: No field work activity during the year. S.P.L. 1, Trial Harbour area: A diamond drill was working at the close of the year following field surveys, &c.

S.P.L. 404—C. Loftus-Hills: A little field work was done on this area early in the year by Placer Prospecting Pty. Ltd.

S.P.L. 11, S.P.L. 12, S.P.L. 13 are controlled by Placer Prospecting Pty. Ltd. who have been active in the district throughout the year.

S.P.L. 6—J. G. Loftus-Hills: Evaluation of geophysical work in progress.

E.L. 13/65: This area is only partly in this region. Exploration in the licence area is based on a depot on Birchs Inlet, Macquarie Harbour. The exploration headquarters are in Hobart.

HEALTH, SANITATION AND SAFETY

Generally the mines and works in the region are substantial organizations alive to the advantages of providing satisfactory sanitation and safety facilities. Sanitation, ablution and first aid facilities are good and active safety campaigns are current in practically all mines and works.

INFLAMMABLE LIQUIDS AND EXPLOSIVES

All shipments of explosives and inflammable liquids were landed generally without incident and in good order. However, early in the year there was considerable pollution of Devonport harbour when black oil escaped from an oil company pipeline during unloading of a tankship.

Five parcels of old gelignite, detonators, and detonating fuse were destroyed at a safe place in the Heybridge Magazine Reserve during the year.

Northeastern District

Mr L. F. Egan, A.M.Aust.I.M.M., Launceston—

ACCIDENTS

Of the two accidents liable for registration under the Mines and Works Regulation Act 1915, one was fatal and the other minor. The fatal accident resulted from a leakage of current during repairs to a furnace, the fitter in question receiving a lethal electric shock.

EXPLOSIVES AND INFLAMMABLE LIQUIDS

Explosive magazines and inflammable liquid installations have been under constant review and in general the users have co-operated very well in the efforts to maintain regularized storage. Two small magazines were broken into and some of their contents stolen, and in one instance gelignite was found strewn round the area.

As a result of representations by municipal councillors and others, lectures illustrating the danger of careless use of explosives, particularly detonators, were delivered to schools in and around Launceston and on two occasions lectures and demonstrations were given on television. Public reactions were highly favourable. A total of 95 examinations for shotfirer's permits under the Explosives Amendment Regulations 1964 were conducted in conjunction with the Inspector of Explosives, Mr D. R. Bonham, and 92 permits were granted.

Ten parcels of old and deteriorated explosives, containing 74 plugs of AN60 and 66 detonators, were handed in by the police and the general public and were subsequently destroyed. Surveillance over the discharge of 11 tankships, one L.P. gas tanker and 10 explosive shipments, and one outward explosive shipment was exercised by the Inspector of Explosives, Mr D. R. Bonham. All discharges were carried out smoothly, efficiently and in a safe manner, full compliance with the Inflammable Liquids Regulations and Explosives Regulations being required at all times.

PROSPECTING

Prospecting was continued by Utah Development Company on their northeastern exploration licence based on Winnaleah and on the Rooks River, Cape Barren Island, licence. Work is proceeding.

Ausminex Pty. Ltd. made an examination of Mr V. Wood's S.P.L. 399 which covers the Monarch Mine but did not exercise their option to purchase. Some work was carried out in the Pinnacles area, Upper Scamander.

Aberfoyle Tin continued their investigation of E.L. 7/62, drilling being confined to the Blue Tier in the vicinity of the old Anchor Mine. The total number of men employed on exploration work varied from 26 in the winter to 32 in the drier months.

Eastern District

Mr. W. R. Tindal, A.W.A.S.M., M.Aust.I.M.M., Hobart—

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 108 to 70. The quarrying industry employed 24 men. The district was increased during the year by the inclusion of metaliferous mines near Avoca.

ACCIDENTS

One fatal, four serious and 38 minor accidents were reported in this district during the year. The fatal accident occurred underground when the deceased, who had been using a scraper loader to clean up broken ore in a stope, was crushed by a fall of stone from the hanging wall.

Of the serious accidents three caused fractures of bones and the other chest injuries. The chest injuries occurred due to a chute door being left in a down position. The driver of a battery locomotive when reversing was struck on his back by the chute door and pinned against the battery box. One of the fractures was a fractured spine due to a piece of sandstone falling from the roof onto the back of the injured person due to a hidden slickenside. The roof had been thought to be adequately supported and tested. Another man had a bone broken in his wrist when he slipped on a rail and fell heavily. The other broke a bone in his hand when a lifting jack slipped from under a piece of machinery and the handle struck his hand.

ELECTRICAL

A survey of the condition of the electrical installations and equipment of mines and works throughout the State was commenced. Though this survey is incomplete some unsatisfactory installations have been inspected and minimum requirements recorded in the record books.

A fatal electrocution occurred when a reduction furnace, which had developed a leak, was being dismantled by the deceased who accidently made a circuit between the furnace and an abnormal earth, receiving a lethal current of electricity.

PROSECUTIONS

During the year the owner and agent of the Fingal Coal Mine were successfully prosecuted for not supplying the Department with annual plans for 1964, also for not supplying plans on abandonment, and not covering entrances to the Fingal and Tasmanian Coal Mines when the mines were abandoned.

SAFETY

The safe working of all mines and quarries was watched by regular inspections. Tests showed that the operating coal mines were free of inflammable and noxious gases and hygrometer readings showed that the air complied with requirements of the Act. Dust concentrations were checked by means of the Watson konimeter and where not satisfactory steps were taken to improve the conditions.

EXPLOSIVES AND INFLAMMABLE LIQUIDS

Magazines and inflammable liquid installations have been regularly inspected and where they did not conform with the regulations orders were issued for them to do so. An additional 53 shotfirer's permits were issued under the Explosives Amendment Regulations 1964. Numerous complaints concerning the use of explosives were investigated and where necessary compliance with the Explosives Act 1916 was ordered.

REPORT OF THE MOUNT CAMERON WATER RACE BOARD FOR THE YEAR ENDED 31st DECEMBER, 1965

SIR,

We have the honour to submit the report of the Mount Cameron Water Race Board for the year ended 31st December, 1965.

Production of tin concentrates was 39.395 tons as compared with 50.65 tons for 1964. No water was supplied under the Royalty Scale and three parties were supplied with 2,579 sluiceheads of water under the Fixed or Cash Scale. Revenue was also received from the sale of water for domestic purposes to the township of Gladstone.

Expenditure of £A3,220 ($A6,440) was £A120 ($A240) less than last year but Revenue increased by £A84 ($A168). Due principally to a non-recurring item for maintenance of the system which had to be met last year there was an operational profit of £A194 ($A388).

The dams and races are in good order at present.

However, it is anticipated that during the next three to five years replacement of the Little Mussel Roe Syphon will become necessary, which will involve substantial expenditure. The Board's revenue is unable to finance costly replacements and it was decided to surcharge consumers by 1/- (10c) per sluicehead of water supplied on the Cash or Fixed Scale as a contribution towards replacements involving large expenditures. The surcharge became effective in July, 1965, and provided water consumption continues at present rates the contribution by consumers will contribute significantly to the cost of replacement of the Little Mussel Roe Syphon.

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.

V. WOOD, Member.

The Hon. the Minister for Mines.

MOUNT CAMERON WATER RACE

Statistics for the year ended 31st December, 1965

Registered Rainfall.

Great Mussel Roe	37 inches 39 points
Little Mussel Roe	37 inches 16 points

Water Services.

Average number of claims supplied per week	3
Average number of claims supplied in any one week	3
Sluiceheads supplied—	
Fixed Scale	2,579
Royalty Scale	Nil
	2,579

Production.

Tin Oxide produced—

	tons	cwt.	qr.	lb.
Royalty Scale	....	....	....	....
Fixed Scale	39	7	3	16
Total	39	7	3	16

Employment.

Average per week—

Royalty Scale	Nil
Fixed Scale	11
	11

MOUNT CAMERON WATER RACE SUSPENSE ACCOUNT

Statement of Receipts and Payments for the year ended 31st December, 1965

$	*Receipts.*	£	s.	d.
	Sale of Water—			
6,357.35	Fixed or Cash Sale	3,178	13	6
....	Royalty Scale	....		
396.00	Domestic Use	198	0	0
60.00	Hire of pipes	30	0	0
14.13	Refund W.C.I.	7	1	3
$6,827.48		£3,413	14	9

$	*Payments*	£	s.	d.
5,886.59	Salaries and Wages	2,943	5	10
147.42	Pay-roll tax	73	14	3
100.94	Car allowance, Manager	50	9	5
172.40	Insurance	86	4	0
123.99	Maintenance	61	19	10
8.70	Miscellaneous	4	7	0
387.44	Balance (Profit)	193	14	5
$6,827.48		£3,413	14	9

REPORT OF THE RINGAROOMA AND CASCADE WATER BOARD FOR THE YEAR ENDED 31st DECEMBER, 1965

SIR,

We have the honour to submit the report of the Ringarooma and Cascade Water Board for the year ended 31st December, 1965.

Since the closure of the Race system in 1962 the Board has continued to maintain the Cascade Dam and the Mt Paris Dam but the main function of the Board no longer exists. It has, however, continued to exist under the provisions of the Ringarooma and Cascade Water Agreement Act 1947.

During the year £A316 10s. ($A633) was received to complete payment of outstanding water charges by a former water user. In addition a sale of assets consisting of scrap lead from the salvage of old pipes from one of the syphons realized £A397 10s. ($A795) and this was applied in reduction of the original capital cost of the System which amounted to £A10,000 (£A20,000). Expenditure consisted of maintenance of the dams, and interest on the capital cost of the System. It was agreed to meet the cost of road crossings over the Race on the Ruby Flat Road between Ringarooma and Branxholm and also on the Ringarooma Main Road at the entrance to the town. Expenditure on this work during the year amounted to £A245 7s. 2d. ($A490.72). The operational loss was £A437 5s. 8d. ($A874.57).

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.

RINGAROOMA AND CASCADE (WATER) SUSPENSE ACCOUNT

Statement of Receipts and Payments for the year ended 31 December, 1965.

$	*Receipts.*	£	s.	d.	$	*Payments*	£	s.	d.
633.00	Water charges	316	10	0		Ringarooma Race—			
874.57	Balance (Loss)	437	5	8	150.00	Wages	75	0	0
					490.72	Briseis Race Crossing	245	7	2
						Interest on Capital Cost of Ringarooma and Cascade			
					866.85	Water System	433	8	6
$1,507.57		£753	15	8	$1,507.57		£753	15	8

D. E. WILKINSON, Government Printer, Tasmania.