

TASMANIA

(No. 9.)

REPORT

OF THE

DIRECTOR OF MINES

FOR

YEAR ENDING DECEMBER 31

1927

INCLUDING REPORTS OF THE INSPECTORS OF MINES, GOVERNMENT
GEOLOGIST, CHIEF GOVERNMENT CHEMIST AND ASSAYER,
MANAGER OF THE MOUNT CAMERON WATER-RACE, &c.

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



Tasmania

JOHN VAIL, GOVERNMENT PRINTER, HOBART

1928

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REPORT OF THE DIRECTOR OF MINES.

Mines Department,
Hobart, 17th April, 1928.

SIR,

I HAVE the honour to submit herewith a report dealing with the work of the Mines Department during the year 1926-1927.

You will note that a departure has been made from the ordinary mode of presentation. That course has been deemed advisable in order to have the information presented in greater detail. Changes in the methods of compiling statistics of production, as forecasted last year, have not yet been brought into operation, but preparations have been made for the collection of the necessary data for that purpose.

It is hoped that a perusal of the following pages will convey an idea of the great scope of the work and of its value in connection with the industrial development of the State.

I have the honour to be,

Sir,

Your obedient Servant,

A. McINTOSH REID,
Director of Mines.

THE WORK OF THE MINES DEPARTMENT DURING 1926-27.

The following report outlines the activities of the Department of Mines during the past year. The research work of the Department, which is devoted largely to surveys fundamental to the continued development of the natural resources, is divided, in accordance with the recent reorganisation, into the following branches:—

- (1) Geological Surveying.
- (2) Mining Engineering.
- (3) Chemical and Metallurgical.

It should be understood that the work of the Geological Survey is not restricted to mining, but relates also to surveys of underground water-supply; the investigation of soils; of stone for building purposes; of clays, sands, and limestones for various uses; of dam sites for the Hydro-Electric Department; of foundations for large structures; of harbour works and obstructions to shipping; and to many other fundamental investigations connected with all branches of industry.

PERSONNEL.

In no branch of the Public Service is the staff in numbers so disproportionate to the work. All of the responsible officers are impelled, by force of circumstance, to give of their leisure to the service of the public. That is not conducive to efficiency, and results, in some cases, in the impairment of the health of officers and consequent ultimate loss of time. Not only is the staff undermanned, but five vacancies, now occupied by temporary officers, still remain to be filled, despite the fact that the necessary provision for such was made in 1926 and urgent applications made from time to time during the year.

It is desirable to so co-ordinate the officers of the clerical branch that one may understudy another and

be able to act in the dual role in time of illness or emergency. The necessity for such a system has long been felt, and the matter has been fully discussed with the Public Service Commissioner. The first move towards that consummation would be the appointment of an officer to the position of deputy-accountant. Such rearrangement of duties would not necessarily entail an addition to the staff.

Important changes have been made in the personnel during the year. At my request provision was made for the appointment of two junior officers to the staff of the Geological Survey, which had been reduced to one member. Subsequently F. Blake was appointed to the position of Assistant Government Geologist and Draftsman and Q. J. Henderson to that of Cadet Geologist. The object in having these new offices created was to train local men for this branch of the Public Service.

The retirement of Inspector Curtain, who reached the age limit, led to the transfer of Inspector Williams from Queenstown to Launceston and to the appointment of J. J. Andrew to the vacant position at Queenstown.

This opportunity may be taken to place on record the faithful and able service rendered to the State by the late Inspector C. H. Curtain, who had been in the employ of the Department since 1901.

Owing to the extraordinary demand for the services of the field staff, the position of State Mining Engineer was recreated, and J. B. Scott, who had previously been acting in that capacity, received the appointment.

The Registrars of Mines at Launceston and St. Helens, A. G. Smith and V. A. Haley respectively, resigned, and Thomas Haley was appointed to the St. Helens office. J. T. Herrick was appointed to the position of junior clerk, Mines Office, Launceston. A sampler, in the person of E. W. Coleman, was appointed to the laboratory staff, Launceston.

The permanent staff now consists of:—

1. *Administration:*—
A. McIntosh Reid, Director of Mines.
W. A. Pretymann, Secretary for Mines.
2. *Geological Survey:*—
P. B. Nye, Government Geologist.
F. Blake, Assistant Government Geologist.
Q. J. Henderson, Cadet Geologist.
3. *Mining Engineering:*—
J. B. Scott, State Mining Engineer.
4. *Inspection of Mines:*—
J. O. Hudson, Chief Inspector of Mines, Magazines, and Explosives.
H. Vaudeau, Inspector of Mines.
W. Williams, Inspector of Mines.
J. J. Andrew, Inspector of Mines.
E. Rider, Inspector of Explosives and Magazine-keeper, Hobart.
5. *Chemistry and Metallurgy:*—
W. D. Reid, Chief Government Chemist and Assayer.
L. H. Bath, Senior Chemist.
C. St. C. Manson, Chemist.
E. W. Coleman, Sampler.

6. *Accountancy and Registration.*—

A. B. Bryan, Chief Clerk and Accountant.
H. W. Park, Engrossing Clerk.
W. A. Smith, Registrar of Mines.
Miss N. Priest, Clerk and Typiste.
J. T. Herrick, Junior Clerk, Launceston office.

In addition to the permanent staff, the following is a list of temporary officers in the employment of the Department:—

Hedley Barrett, Librarian.
C. A. H. Woods, Clerk.
S. Brue, Clerk.
Miss N. J. Gumley, Typiste.
T. Garrard, Registrar of Mines, Launceston.
V. A. Haley, Registrar of Mines, St. Helens.
H. E. Spottswood, Registrar of Mines, Derby.
W. Laughlin, Drill Foreman.
W. B. Pybus, Acting-Registrar of Mines, Zeehan.
D. Soutar, Registrar of Mines, Devonport.

SUGGESTED COMMONWEALTH ASSISTANCE.

The scheme, originally suggested to Sir Nicholas Lockyer, when investigating the industrial affairs of the State, for the acceleration of the Geological Survey of Tasmania, has been submitted to the Development and Migration Commissioners for consideration. The proposals have been well received by the Commissioners, and I am advised that the Commonwealth Geologist, Dr. Woolnough, will be sent to investigate and report thereon.

The following are the alternative schemes:—

- (1) The appointment of three parties of field geologists; each party to consist of a leader, an assistant geologist, and a field assistant: or
- (2) The appointment of a geologist to each topographic survey party, or four in all.

If such assistance is granted the parties will work under the supervision of the Department, but be paid by the Commonwealth Government.

CO-OPERATION.

This Department has always endeavoured to co-operate in the interests of the State with other departments, and also with Federal departments, but the need for a closer co-operation has been apparent a long time. With that idea in view Boards have been set up by the Government to deal with all those problems touching the various activities of departments, in order to prevent an overlapping of work and a clashing of interests. For instance, the dedication of areas for forestry, the reservation of areas for mining and water conservation, and the opening of new lands for grazing and agriculture present problems that can be satisfactorily determined only by a conference of heads of departments. For that purpose the Crown Lands Examination Board was brought into being, and is functioning satisfactorily. The Department also is represented on the Advisory Council, which deals with matters pertaining to the introduction and establishment of new industries; on the Australian Standards Association, for which a fuel survey of the State has just been completed; and on the local Council for Scientific and Industrial Research. The Department is co-operating with the Development and Migration Commission in connection with the investigation of methods of geophysical prospecting, the preparation of plans for the topographical survey of Tasmania, and the investigation into the possibilities of working the extensive bodies of tin-bearing granite in North-Eastern District.

The Department has undertaken the work of lecturing in geology at the University of Tasmania.

Assistance is given to the Victoria Museum Committee in furnishing material for the museum and arranging

the mineral and palæontological collections; and to the Local Industries Committee in maintaining a mineral exhibit at the annual exhibition.

Co-operation with municipal councils in connection with water-supply and other matters has been maintained during the period.

These co-operative efforts have added to the usefulness of this Department and greatly facilitated the work of the several departments, and have resulted in considerable progress.

PUBLICATIONS.

The results of the field investigations of the Geological Survey are published in bulletins and maps describing the geology and mineral deposits; as mineral resources giving information in detail relating to the occurrence, nature, extent, and value of deposits of particular minerals; as reports describing mines and prospects and mineral areas; as water-supply papers dealing with the underground water resources; as records of natural substances of purely scientific interest; as papers or monographs of general interest on particular minerals; and as pamphlets giving in brief a statement of the resources of minerals and statistics of production.

These reports and maps are in constant local demand, and copies are sent to all civilised countries. Copies may be obtained in England from the Agent-General for Tasmania, Australia House, Strand, London; and may be seen in the libraries of many institutes. Enquiries are received for these official publications from all quarters, more especially from Great Britain and the British Dominions and Dependencies, and from the United States of America. So great has been the demand that many of the publications are now out of print.

During the year the following publications have been issued:—

- (1) A revised edition of the State geological map; and
- (2) An illustrated pamphlet giving a brief account of the mineral production of the State and statistics relating thereto.

Owing to financial stress, some reports prepared for publication have not been issued. Such reports lose in value to those particularly interested if not issued directly after preparation. They will be published early next year.

SPECIAL APPROPRIATIONS REQUESTED.

In order that the Mines Department may be enabled to continue, and even enlarge upon, the present progressive policy, the special appropriations given in detail, hereunder are requested. The only material increase is for drilling, which has now become an important arm of the Department, and a special request is made in connection with geophysical prospecting.

It is proposed to thoroughly explore, next year, the tin ore resources of Blue Tier and of Avoca by means of the diamond drill; and also the iron ore deposits of Hampshire; the oil shale seam beyond Latrobe, at Cheshunt, and at Osmaston; and the underground water-supplies of Oatlands. To perform these very important works the extra amount for drilling is required. The tin-granite drilling investigation at Blue Tier will require a considerable sum.

In addition to the ordinary appropriation for mining and geology, which includes administration, inspection, of mines, travelling expenses, printing, geological field work, and equipment, funds are requested for the following works:—

	£
Clearing of old and cutting of new tracks	500
Drilling	6,000
Aid to mining	5,000
Total	£11,500

SPECIAL INVESTIGATIONS.

So great was the demand for special investigations during the year that only one areal survey could be undertaken. All field officers have been actively engaged in attempting to cope with the very numerous applications for their services in the examination of prospects and mines and in advising on the mineral possibilities of many areas. Many of the applications come from prospectors and mining companies, and many from mining firms and investors. While this work may be regarded as very important in providing reliable information and giving helpful advice, too much time is lost by the senior officers in investigating areas that do not warrant attention. Altogether 75 special investigations were made during the year.

In connection with some of these investigations drilling machines have been used to great advantage in testing the average value of deposits. The more extended use of such plants is desirable in order that the Department may check the results obtained by interested parties.

In almost all instances the services of officers are made available free of any charge. A nominal fee only is charged for the reports prepared by them. It is intended, owing to extreme pressure of work, to delegate the State Mining Engineer for attention to special investigations, as far as possible.

CHEMICAL ANALYSIS.

The laboratory staff, stationed at Launceston, has been fully engaged during the year in dealing with a record number of samples of metallic ores, drill cuttings, mineral waters, cement materials, clays, coal, and oil shale, &c.

In addition to the samples received from all parts of the State, many complete analyses and determinations of minerals have been made for the geological survey staff.

A charge of 1s. is made for each metal in the assaying of a sample, and 5s. is charged for a coal analysis. Advantage is taken by mining men in particular of the facilities thus provided for cheap and rapid determinations, and appreciation of such service has been freely expressed by them. The work of this important branch is on the increase.

The annual report of the Chief Chemist is appended.

FUTURE WORK OF THE DEPARTMENT.

It should be understood in the first instance that the work of the Department is fundamental to the development of all basic industries. That fact is not apparent to one in a hundred of the people, nor is it fully realised by the few; yet the work is carried on, and the people receive the benefits that accrue without being aware of it. In some few cases the results are immediate, and the Department is credited therewith, but, in the great majority of cases, the results are not direct and are only slowly cumulative.

The chief works of the Department, aside from the general administration of the Mining Acts and regulations, are:—

- (1) The investigation of the natural resources, and a stocktaking thereof;
- (2) The lending of assistance to prospectors, mining engineers, and investors in the development of the mining industry;
- (3) The development of all other industries using natural raw products of the earth;
- (4) The marketing of the less common mineral products.

(1) It is proposed during the coming year to continue the work of area surveys, particularly of the North-Eastern tin districts. More attention is being directed to the investigation of tin than to any other base metal,

because of a world shortage, and the consequent interest being displayed at present by English investors. In anticipation of such enquiries as to Tasmanian sources of supply, an investigation has been made of the Blue Tier area. That work is to be continued shortly to include Weldborough, Moorina, and Bransholme, and eastward from Blue Tier to St. Helens.

Other important large tin ore-bodies to receive careful attention are those in the neighbourhood of Avoca. Of those the Royal George, Brookstead, Foster's Freehold, and Roy's Hill are of particular interest.

With the present field staff those works will occupy the winter months. During summer it is intended to confine attention to the Western Division.

In addition to geological investigations it is proposed to carry out diamond drilling campaigns of the tin-granites, of Blue Tier, of the oil-shale seams beyond Latrobe, and water-supply at Oatlands.

(2) It is intended to continue, under the provisions of the Aid to Mining Act, 1927, assisting those interested in mining. Such assistance is provided to meet the requirements of all those engaged in active development work. The services of technical officers will be available to investigate and report upon mines and prospects and to give advice on all matters pertaining to mining.

Drilling at cost price is about to be undertaken at—

- (a) Mathinna and neighbourhood;
- (b) Blue Tier tin-mining area;
- (c) Latrobe shale area;
- (d) Hampshire iron ore field.

It is proposed, with the aid of the Development and Migration Commission, to undertake geophysical surveys of Zeehan, Rosebery, and other Western mining fields.

(3) Of all industries those using raw materials of low gross value are the more stable, and often are of greater economic importance. Such industries are those based upon coal, oil shale, limestone, clay, sand and gravel, iron ore, stone, &c.

The Department is endeavouring to assist in the establishment of or extension of the following industries:—

- (a) The distillation of oils from shale;
- (b) The manufacture of Portland and aluminous cements;
- (c) The manufacture of clay products of many kinds;
- (d) The manufacture of glass, cleansing materials, &c.;
- (e) Iron ore products;
- (f) The manufacture of paints from barytes, ilmenite, and ochres; and
- (g) The cutting of stone for buildings, sharpening implements, &c.

(4) Owing to the comparatively low market rates of lead, zinc, copper, and silver, more attention is being drawn to other minerals and mineral products, such as magnesite, talc, silica, mica, zircon, ochre, barytes, ilmenite, monazite, and antimony. Endeavours are being made to find markets for these minerals. As a direct result of Departmental activity, negotiations are now under way for the marketing on the mainland of some of the minerals mentioned above.

As regards the outlook for mining next year, it may be stated that the statistical position of the more common metals, such as tin, zinc, lead, and copper, is sound, despite the fact that prices of all but the last are at present lower than the average of recent years. The world consumption of tin during 1927 exceeded production, and supplies are to-day insufficient to meet the demand, the recent fall in price being accountable to speculative manipulators. The outlook for a rise in the prices of the other metals is not so promising.

However, given industrial peace and average prices for metals, it is anticipated that the value of production in 1927 will be exceeded in 1928.

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	6,000
	5,000
Total	£11,500

EXPLORATION.

The proposed expedition to Port Davey by the Geological Survey in co-operation with Mr. M. Freney has been postponed, for various reasons, until the beginning of next year.

State-assisted prospectors have been engaged in every quarter of the Island. Reports of their work are regarded, in a few cases, as valuable additions to the records. Two of the discoveries made by them are likely to lead to important results.

Particular attention has been directed to the country south of Arthur River, where an important tin ore development is reported; to the neighbourhood of Port Davey, where tin ore is likely to be found; to the Boyes River serpentine belt, at the northern end of which osmiridium has been discovered in richer, though smaller, concentrations than at the southern end; and to the outlying fields of the Western Division, where developments are regarded as promising.

TRACKS.

Every year applications are received from prospectors for assistance in cutting new tracks and reopening old ones. For this purpose a sum is placed upon the estimates.

The following is a list of the works performed during 1927:—

	£
(1) Staking the line of and clearing the track from Gordon River to Boyes River, osmiridium field	56
(2) Clearing track from Princess Gold Mine to Collingwood River	30
(3) Cutting and clearing track from Boco Siding to Ross Creek, lead-zinc prospect	100

Tracks are suitable for preliminary investigations, but roads are essential to the successful development of many mining areas, those of the Western Division in particular. The cost of transport is the greatest hindrance to the progress of the mineral industry in that division. For instance in some areas freight charges are £1 per ton per mile; a tax too great to be borne. It may be affirmed that the lack of road communication is the greatest obstacle to advancement. All other problems can be overcome.

DRILLING AND BORING.

Late in the year the Department took delivery of the new diamond-drilling plant. This is a Sullivan "C" type, capable of drilling to 2000 feet, the latest of that class. It has been used to some extent and has given entire satisfaction.

Cost of plant:—	£	s.	d.
Drill, accessories and duty	1,174	1	1
Carbons	302	3	6
Equipment	619	7	0
Transport	25	6	0
Miscellaneous	0	19	6
	£2,121	17	1

The first work undertaken was that of drilling the limestone beds at Railton for the Tasmanian Cement Proprietary Limited. In the aggregate the drilling of the several holes measured 526 feet. In addition to that work the Department, by means of hand-boring plants, drilled many holes through the overburden of clay and gravel to the limestone, the total amounting to 3280 feet.

Small hand-drilling plants were let on hire to prospectors and engineers to test the value of alluvial deposits, chiefly of tin ore.

The Victoria calyx drill has been let on hire, at £2 per week, to the Amalgamated Tin No Liability, who are testing the value of the tin ore-bodies of Renison Bell. Six applications have already been received for the use of the diamond-drill.

It is the opinion of the Department that more effective exploratory work can be performed by means of drilling machines than by any other appliances. In consequence it is proposed to make the fullest use of these plants as aids to mining development. The conditions under which the plants are made available are outlined hereunder:—

HIRE OF HAND-BORING PLANTS.

- (1) The plant to be taken from the place of storage, Launceston or Hobart, and returned, if so required, to the same place when boring operations cease, at the cost of the hirer.
- (2) The rent for the use of the plant to be 10s. per week from the date it leaves the stores until it is returned to the stores, if so required, payable four weeks in advance.
- (3) An inventory will be given to the hirer, who shall sign it and post it to the State Mining Engineer. On the return of the plant intact, the hirer will be given a discharge of further responsibility.
- (4) All damages, losses, and breakages to be made good by the hirer, and the plant to be returned in good order and condition, ordinary wear and tear excepted.
- (5) Applications for the use of the drill to be made to the Secretary for Mines.

HIRE OF POWER DRILLS.

Calyx or Victoria Plant Type.

- (1) Applications for the use of the drill to be made to the Secretary for Mines, Hobart.
- (2) The rent for the use of the plant to be £2 per week from the date it leaves the place of storage until it is returned there, if so required, payable four weeks in advance (and the rent in four weekly payments thereafter) from time to time.
- (3) An inventory of the plant will be given to the hirer, who shall be required to sign it and post it to the State Mining Engineer, Hobart. On the return of the plant intact, the hirer will be given a discharge of further responsibility.
- (4) All damages, losses, and breakages to be made good by the hirer, and the plant to be returned in good order and condition, ordinary wear and tear excepted.
- (5) The hirer shall pay the cost of transport of the drill from the place of storage and, if so required, to the same place, when boring operations cease.
- (6) Before taking delivery of the drill the person or company hiring it will be required to enter into a formal agreement relating thereto.

DIAMOND AND CALYX DRILL.

(Conditions when Operated by the Department.)

- (1) Applications for drilling shall be made to the Secretary for Mines.
- (2) Boring operations will be conducted under the supervision of the State Mining Engineer upon terms to be arranged with him.
- (3) The terms will vary according to the nature of the country and strata to be passed through, the locality, difficulty of access, &c. Arrangements may be made for—
 - (a) Rate per foot to be determined in each particular case;
 - (b) A definite contract to bore at a fixed cost; or
 - (c) Boring to be performed at cost, plus a sum to cover cost of transport to and from, wear and tear, breakages, losses, and depreciation.
- (4) Before boring operations are commenced, the person or company on whose behalf such works are to be undertaken will be required to enter into a formal agreement relating thereto.

GEOPHYSICAL PROSPECTING.

This record of the work performed during the year would not be complete without reference to the investigations made by the Department into the latest developments in geophysical prospecting processes. During the past four years this Department has been searching the records of geophysical surveys, collecting all

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available information on this new application of science, and has been at the same time endeavouring to enlist the aid of the Council for Scientific and Industrial Research in the work, with the ultimate object of trying out the two most important electro-magnetic processes. Two conferences were held in Melbourne with the Council for Scientific and Industrial Research, not, however, with definite result. The matter was subsequently brought under the notice of Mr. H. W. Gepp, Chairman of the Development and Migration Commission, who was then about to leave for England. Mr. Gepp suggested that the British and Australian Governments should co-operate in respect to the financing of geophysical exploration in Australia. The matter was subsequently referred to the Empire Marketing Board, who, after obtaining favourable reports from their Research Committee, agreed to co-operate with Australia in an exhaustive trial of geophysical methods of exploring for minerals, water, &c. The Board agreed to provide £10,000 for the first year and £6000 for the second year, on the condition that the Commonwealth should contribute a like sum. The Board made the offer on the understanding that the work would be directed by Mr. A. Broughton Edge. This offer has been accepted by the Commonwealth Government.

Mr. Broughton Edge is expected to leave for Australia early next year.

A special offer has been made by K. Burggraf, on behalf of the Elbof Company, to Tasmania, because of the particular interest taken by this Department in geophysical prospecting. Although the offer is an attractive one, advantage cannot be taken of it, because no funds are available for the purpose of geophysical prospecting.

It is not considered likely that trials of the direct electric process—the one of particular application to Tasmania will be undertaken for a long time by the Commonwealth Advisory Committee, because other processes are to be used first. The gravimetric and sonic methods are not applicable to our western districts, therefore the direct electric process is desired.

The inference is that Tasmania is not likely to receive immediate attention, despite the fact that this State was first in the field. It may be advisable to work independently.

THE MOUNT CAMERON WATER-RACE.

The Mount Cameron Water-race was purchased by the Government from the Mount Cameron Hydraulic Tin Mining Company in 1887, to provide a water-supply for the tin-ore miners of Gladstone. Supplies are drawn from two major streams (Great Mussel Roe and Little Mussel Roe Rivers) and from several small streams *en route*. The race (15 miles in length) is capable of carrying and delivering 35 sluice-heads of water.

The control of the race is now vested in the Minister for Mines.

The gradual depletion of the reserve of tin ore in the alluvial gravels of Gladstone led to a closer investigation of neighbouring areas, with the result that requests were made for supplies of water from leaseholders on the north side of Ringarooma River and from those interested in Native Lass Plain area. In compliance with these requests surveys were made by the State Mining Engineer, estimates formed, and tenders called for the construction of a line of pipes (18 in inches in diameter and 4122 feet in aggregate length) from the race across Ringarooma River and for the extension of the race to Native Lass Plain reservoir. The tenders of the Hume Pipe Company for the construction and laying of cement pipes, at a cost of £2301 9s., was accepted; additions brought the total cost to £2518, or £18 in excess of the estimate. That work was completed during the year, and is regarded as the best of the kind in Tasmania. No tender was accepted for the extension of the water-race. Attention will be directed again to this work next year.

In order to safeguard local miners the whole of Native Lass Plain area has been reserved for sluicing in 5-acre (or less) lots only.

Water is sold under:—

- (1) Fixed scale; or
- (2) Royalty scale.

In order to lend assistance to the miners who are now working lower grade deposits, reductions have been made under both scales of prices. Despite these reductions the profit for the year amounted to £1060, as compared with £801 for 1926. Further details are given in the following statement:—

Revenue.—The revenue for the year amounted to £1983 0s. 6d., an increase of £368 0s. 3d. on the previous year.

Expenditure.—The expenditure amounted to £922 3s. 11d., being an increase of £108 3s. 4d. on that of the previous year.

Statistics.—The statistics for the year are as follows:—

Average number of claims supplied per week, 10.

Greatest number of claims supplied in any one week, 13.

Total number of sluiceheads supplied—

Under royalty scale	920
Under fixed or cash scale	1,805
	2,725

Tin ore raised:—

	tons.	cwt.	qr.	lb.
Under fixed scale	31	18	—	—
Under royalty scale	12	9	1	23
Total	44	7	1	23

Average number of men employed per week, 25.

Receipts:—

	£	s.	d.
Water sold under fixed scale	1,423	11	8
Water sold under royalty scale	548	7	10
Water sold for sanitary and domestic purposes	11	0	0
Sale of regulations	0	1	0
	£1,983	0	6

Expenditure:—

	£	s.	d.
Salaries and wages	704	17	8
Gauge-boxes	16	10	0
Insurance	6	15	11
Building and repairs to cottages	123	10	0
Stationery and stores	18	8	2
Repairs to race	43	8	9
Refund	7	18	5
Advertising	0	15	0
	£922	3	11

Rainfall.—The registered rainfall for the year was as follows:—

	In.	Pts.
Great Mussel Roe intake	24	17
Little Mussel Roe intake	23	55

The manager's report for the working of the race for the year is attached.

MOUNT CAMERON WATER-RACE.

Manager's Office,
Gladstone, 29th March, 1928.

SIR,

I BEG to submit my annual report relative to the working of the Race for the year ending the 31st December, 1927.

Race.—Cleaning and scrubbing race to Higgs' and Kerrison's dam; widening race from dam to Higgs' and Kerrison's claim; cost, £29 1s. Building new culvert across race on the Cape Portland-road; cost, £9. Other repairs to race; cost, £5 7s. 9d. Total cost of repairs, £43 8s. 9d. The race will need a thorough cleaning out early in the coming year. Two new gauge boxes, at a cost of £16 10s., were put in for the Garfield Tin Mine.

Syphon.—All the syphons will need to be tarred during the coming year. The boards on the No. 1 syphon, and the

boards, cross-pieces, and hand-rails on the iron fluming will have to be replaced with new timber. The new concrete syphon which was put down early in the year is a great success.

A portion of the wooden syphon has decayed, and is only a thin shell in many places; it would be advisable to have some of the stays on hand to replace same when needed.

An additional two new rooms and repairs to Channel-keeper Moore's cottage have been carried out at a cost of £120. Also new chimney top to Channel-keeper Keegan's cottage, and new top on chimney of kitchen of manager's residence; cost, £2 10s.

Yours obediently,

D. SHIELDS, Manager.

A. McINTOSH REID, Esq.,
Director of Mines,
Hobart.

STATISTICS.

It was hoped last year to inaugurate a more comprehensive scheme for the setting out of statistical information, the idea being to present results obtained from two methods of compiling the production of metals, metalliferous ores, and other raw products of the earth. The old method, based on the ultimate value of the refined metals, is to be adhered to; but another method, based on the actual values of the ores, metals, &c., produced or transported from the mines or quarries, is to be adopted in addition.

Non-metallic products are compiled similarly in both methods, viz., on their values as used or marketed.

The objects to be attained in the presentation of mineral statistics are:—

- (1) A record of the quantity and value of each product shipped from the mine.
- (2) The amount of each product consumed at home.
- (3) The amount of each product exported.
- (4) The place of marketing of each product.
- (5) The importation of raw materials.
- (6) A record of the ultimate value of the refined metals for purposes of reference and comparison with the production of other countries.

Neither of the methods mentioned give complete and strictly accurate results, but, by the use of two methods, can be given a fair statement of production suitable for purposes of comparison.

The detailed comparative statements here presented show the production of each mineral, metal, or other material during the past five or more years, the proportion which each contributes to the total, and the increase or decrease, as the case may be, in the output and value of each product.

MINERAL PRODUCTION.

During the period 1921 to 1926 the mineral industry experienced a rapid recovery, and that rate of increase might have been maintained in 1927 had not progress been arrested by strikes of engineers at Mount Lyell and miners at Catamaran and the suspension of work at the National Portland Cement Company's plant at Maria Island. It was anticipated last year that the production would reach the £2,000,000 mark if metal prices remained stable and work continued without interruption. The reduction in the output of the Mount Lyell Mining and Railway Company accounts for half the loss.

The total value of mineral production for the year, as based upon the values of the metals after refining, is £1,621,027, a decrease of £187,817 as compared with that in 1926. The decrease is not as serious as it appears when it is realised that the market rates of almost all metals and many mineral products fell gradually until the close of the year.

RETURN showing the Quantity and Value of Minerals Produced in the State of Tasmania during the Year 1927.

Mineral.	Quantity.	Value.
		£
Cadmium	19·2712 tons	3233
Carbide	2072 "	34,896
Copper	5811 "	362,988
Coal	112,056 "	99,802
Cement	38,690 "	176,779
Gold	4860·7 ozs. f.	20,646
Lead	5583·12 tons	135,403
Limestone	169,522 "	167,373
Nickel	86·2 "	14,656
Ochre .....	...	...
Osmiridium	632·687 ozs.	7456
Silver	741,782 ozs. f.	87,024
Shale	3150 tons	2050
Tin	1105·74 "	317,593
Tungsten	148·57 "	9886
Zinc	6326·2 "	181,242
Total .....	...	£1,621,027

The Electrolytic Zinc Company recovered 43,239 tons of Zinc, valued at £1,230,525, and 135·538 tons of Cadmium, valued at £22,770, from other than Tasmanian ores, and employed an average of 945 men.

Metallic products were valued at £1,140,127, or 70·3 per cent. of the total. Non-metallic products, excluding structural materials, were valued at £101,852, or 6·2 per cent. of the total, and structural materials such as cement, limestone, &c., at £379,048, or 23·5 per cent. Compared with 1926, the metallic products showed a decrease of 14·2 per cent., non-metallic products an increase of 9·9 per cent., and structural materials a decrease of 2·3 per cent. The metallic products increases are recorded in tungsten, nickel, cadmium, gold, and zinc, and slight decreases in lead, tin, and silver, and great decreases in copper and osmiridium. Amongst non-metallic products, increases are recorded in both coal and shale. Structural materials showed a decrease in carbide and increases in cement and limestone. No records have been kept of clay products.

Copper still continues as the most important mineral product of Tasmania, despite the reduction in output, due to the labour strike at the Mount Lyell Mining and Railway Company's works. Tin retains its position as second on the list of mineral products, the greater part coming from the North-Eastern District, where developments indicate an early increase in production. Zinc is third on the list, and is likely to occupy a more prominent position in the near future. Within three years it is expected that the output of the Read-Rosebery Mines will show a marked increase.

A falling-off is recorded of lead and silver, due, in large measure, to the falling-off in the prices of those metals.

Perhaps the most noteworthy reduction is that of osmiridium. The output of that natural alloy is dependent upon the market price. At the low rates ruling in 1927 the richest deposits only could be worked at a profit. Tungsten and gold remain low on the scale, the former because of the lower post-war prices. Nickel appears on the list of products, but is a record of sales of ore held in stock since 1914. There is a likelihood, since a market has been found for this ore, that the old mines in the neighbourhood of North Dundas will be reopened.

Coal shows an increase both in point of tonnage and value, and the output would have been much greater had not the Catamaran Company failed in their operations. It is likely that mining will be resumed early in the new year.

Cement and limestone production show appreciable results.

Value of Minerals during the Year 1927.

Quantity.	Value.
	£
19·2712	3233
2072	34,896
5811	362,988
2,056	99,802
8,690	176,779
4860·7	20,646
5583·12	135,403
9,522	167,373
86·2	14,656
...	...
632·687	7456
11,782	87,024
3150	2050
1105·74	317,593
148·57	9886
6326·2	181,242
...	£1,621,027

recovered 43,239 tons of 538 tons of Cadmium, Tasmanian ores, and

t £1,140,127, or 70·3 illic products, exclud- lued at £101,852, or ctural materials such ,048, or 23·5 per cent. ic products showed a etallic products an structural materials a illic products increases cadmium, gold, and tin, and silver, and smiridium. Amongst recorded in both coal showed a decrease in and limestone. No ducts.

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reduction is that of atural alloy is depen- he low rates ruling in ould be worked at a low on the scale, the t-war prices. Nickel ut is a record of sales There is a likelihood, for this ore, that the of North Dundas will

point of tonnage and ve been much greater failed in their opera- will be resumed early ion show appreciable

All the metals, except copper and gold, showed a serious falling-off in average price, and this is reflected in the value of the output. There appears now a slight upward trend, which augurs well for the coming year.

ANTIMONY.

Free antimony ore has been found in small bodies only in Tasmania, but associated with lead in the mineral jamesonite it is fairly abundant. Deposits of jamesonite are known at the Spray Mine, Zeehan; at Wallace Prospect, North-East Dundas; and at Ring Valley.

A market for lead-antimony ores was arranged by the Department, but advantage was not taken of the opportunity by would-be producers.

ASBESTOS.

The most important variety of asbestos is chrysotile, a fibrous form of serpentine. For some years the chrysotile deposits of Anderson's Creek, near Beaconsfield, were worked by the Wunderlich Company and treated on the spot. Chrysotile is found in irregular deposits in some other parts of the island, but not in long fibre nor in closely associated bands. Chrysotile provides silky flexible fibres of spinning grade, and is marketable down to $\frac{1}{8}$ -inch in length of fibre.

Anthophyllite or amphibole asbestos is found also at Anderson's Creek. The fibres are up to 8 inches in length, but are weak and brittle and not suitable for spinning. The market price seems to be in a steady upward trend with a good demand, particularly for the short fibres. The price is about £100 per ton for good quality material.

RETURN showing the Quantity and Value of Asbestos produced from 1899 to 1920-27 inclusive.

Year.	Quantity.	Value.
	Tons.	£
1899.....	200	363
1900.....	128	113
1901.....	46·5	45
1902-1915	—	—
1916.....	15	30
1917.....	271	271
1918.....	2854	5008
1919.....	51	1275
1920-1927	—	—
	3565·5	£7105

BISMUTH.

No bismuth ore has been produced since the closing of the Shepherd and Murphy Mine at Moina in 1921. Bismuth ores are found with tin ore and wolfram at that mine, the separation being effected by chemical means.

The discovery of a bismuth ore deposit about three miles west of Moina a short time ago by R. Magee led to considerable activity during the year. An Adelaide syndicate is now engaged on the systematic development of the body, which is a large one. The bismuth ores are found as disseminations in garnetised limestone, and are associated with magnetite.

Practically all the world's supply of bismuth comes from two sources. Until 1919 Bolivia produced the bulk of the bismuth ores. Their output was refined and marketed in England by the Bismuth Association under the direction of Johnson, Matthey & Co. Ltd., of Hatton Garden, London. That association was in absolute control of the market, and by regulating the supply to the demand virtually dictated prices. Since 1916 the

two companies in the United States operating electrolytic lead refineries produce sufficient for American requirements. The price of the metal is, however, still regulated from London. The world's production in 1924 was:—

	Metric Tons. Ore.	Metric Tons. Metal.
Bolivia	399	170
Spain	125	—
United States	—	136
Australia	15·5	—
	539·5 tons	306 tons

RETURN showing the Quantity and Value of Bismuth produced from 1904 to 1927 inclusive.

Year.	Quantity.	Value.
	Tons.	£
1904	·3	15
1905	3·5	800
1906	·3	24
1907	·175	27
1908	3·75	462
1909	2·9	980
1910	10·70	4249
1911	14·395	5758
1912	7·59	2646
1913	5·08	1627
1914	5·619	1666
1915	5·5	1203
1916	3·51	1059
1917	4·212	895
1918	4·608	1038
1919	1·77	573
1920	·10	9
1921	·05	21
1922	—	—
1923	—	—
1924	—	—
1925	—	—
1926	—	—
1927	—	—
	74·059	£23,052

CADMIUM.

The increase in the world's production of cadmium from 90 tons in 1920 has been attributed to two plants, the Electrolytic Zinc Company, in Tasmania, and the Annaconda Copper Company, Montana, both of which produce the cadmium as a by-product from their electrolytic zinc refineries. Cadmium is contained in some Tasmanian zinc blende ores in the proportion of 2 per cent.

On the authority of C. P. Linville, the war-time use of cadmium as a substitute for tin in solders has brought about a direct price-relation between the two metals, the price of cadmium fluctuating with that of tin.

The production of cadmium by the Electrolytic Zinc Company from Tasmanian ores this year amounted to 19·2712 tons, valued at £3233, as compared with 10·3014 tons, valued at £1827 in 1926. From other than Tasmanian ores the production was 135·538 tons, valued at £22,270.

Cadmium metal is used chiefly with other metals to form alloys for fusible metals in connection with fire-protection plants, safety plugs for boilers, and for alloys in dentistry. Cadmium-bearing copper is being used for transmission lines. Cadmium sulphide is used as a paint material for colouring rubber goods and soaps and in the electroplating industry. There are two varieties of

cadmium sulphide, one a lemon yellow, the other deep red. The latter can be changed to the former by heating.

RETURN showing the Quantity and Value of Cadmium produced during the Years 1924, 1925, 1926, and 1927.

Year.	Quantity.	Value.
	Tons.	£
1924.....	5·247	1175
1925.....	5·2454	1178
1926.....	10·4014	1827
1927.....	19·2712	3233
Total.....	40·165	£7413

COPPER.

The productions of copper in 1927 was 5811 tons, valued at £362,988, as compared with 6915 tons, valued at £454,854, in 1926. The only producer was the Mount Lyell Mining and Railway Company, the falling-off in quantity being due to a strike of engineers and consequent suspension of operations.

That is the value of the blister copper shipped to the refining works at Port Kembla. No deduction has been made for the cost of refining.

Works are now being erected at Queenstown for the purpose of refining the bullion on the spot.

Statistics showing the annual production of copper since 1920 are given in the following table, which shows the quantity and value:—

RETURN showing the Quantity and Value of Copper in Blister Copper and Copper Ore during the Years 1919 to 1927 inclusive.

Year.	In Blister Copper.		In Copper Ore.		Total	
	Q'ty.	Value.	Q'ty.	Value.	Q'ty.	Value.
	Tons.	£	Tons.	£	Tons.	£
1919...	5014	503,977	13	984	5027	504,961
1920...	4791	528,177	·75	60	4791·75	528,237
1921...	6171	462,876	9·843	287	6180·843	463,163
1922...	5616	391,535	—	—	5616	391,535
1923...	6063	435,282	1·7	131	6064·7	435,413
1924...	6698	457,386	—	—	6698	457,386
1925...	6539	436,661	—	—	6539	436,661
1926...	6915	454,854	—	—	6915	454,854
1927...	5811	362,988	—	—	5811	362,988

GOLD.

The production of gold was 4860·7 ounces, valued at £20,646, as compared with 4222·7 ounces, valued at £17,936, in 1926. The increase in production, though small, is encouraging.

The production is made up of gold obtained from copper and lead ores, from gold-bearing quartz veins, and from alluvial workings. A very small portion only of the output from alluvial workings is placed on record,

because the digger does not regard himself as in duty bound to furnish returns. To-day licences are not required of buyers of gold.

Statistics of production during the past decade are given in the subjoined table:—

RETURN showing the Quantity and Value of Gold won from 1880 to 1927 inclusive.

Year.	Quantity.	Value.
	Ozs.	£
1880 to 1903 inclusive	1,265,836·95	4,905,706
1904	65,921	280,015
1905	73,540·5	312,380
1906	60,023·4	254,963
1907	65,354·25	277,607
1908	57,085·1	242,482
1909	44,777·366	190,201
1910	37,048·053	157,370
1911	31,100·873	132,108
1912	37,973·252	161,300
1913	33,400·457	141,876
1914	26,243·453	111,475
1915	18,547·338	78,784
1916	15,790·096	67,072
1917	14,496·464	61,577
1918	10,528·930	44,724
1919	7,686·470	32,650
1920	6,246·192	29,796
1921	5,340·094	28,395
1922	3,431·486	15,998
1923	3,684·124	16,639
1924	4,625·600	21,563
1925	3,523·870	15,041
1926	4,222·748	17,936
1927	4860·7	20,646
Total	1,901,288·766	£7,618,304

IRON ORE.

No iron ore has been shipped from Tasmania since 1908, and no active mining of ore has been recorded for the year.

Two companies are holding leases at present, namely:

G. and C. Hoskins Ltd.—

511 acres at Heemskirk,
35 acres at Manganes Hill, and
154 acres at Rio Tinto, near Savage River,
and

R. E. and L. J. Smith and Party—

90 acres at Hampshire.

All these leases are of magnetite deposits, which are richer and purer than the hematite.

The magnetite ores are composed of 68 to 70 per cent. iron, are almost free of silica, and contain traces only of phosphorus.

Messrs. G. and C. Hoskins Ltd., of Lithgow and Sydney, have performed a great amount of development work during the year, but no information is given in their report as to when the breaking of ore will be undertaken. A commencement was to have been made directly after the completion of the Moss Vale Railway and the erection of new furnaces at Port Kembla. It is understood that both works are now complete, yet no intimation is given as to the intention of the company with respect to their Tasmanian interests. It is reported that the company has acquired deposits in Queensland until recent time held in reserve by the Government of that State.

The Hampshire iron ore deposits have been placed under option of purchase to Signor Tanfani on behalf of European investors. Signor Tanfani has applied for the use of the diamond drill in the work of testing their extent and value at depth.

RETURN showing the Quantity and Value of Iron Pyrites produced during the Years 1915 to 1927 inclusive.

Year.	Quantity.	Value.
	Tons.	£
1915.....	12,835.59	8945
1916.....	14,005.084	13,597
1917.....	7,685.549	7137
1918.....	5,105.600	4667
1919.....	3,456.95	4288
1920.....	4,440	7346
1921.....	606.5	2579
1922.....	8,276	18,620
1923.....	11,882	26,737
1924.....	—	—
1925.....	—	—
1926.....	—	—
1927.....	—	—
Total.....	68,293.273	£93,916

RETURN showing the Quantity and Value of Iron Ore produced from 1897 to 1927 inclusive.

Year.	Quantity.	Value.
	Tons.	£
1897 to 1903 inclusive	20,442	16,276
1904.....	6840	2975
1905.....	6300	2600
1906.....	2600	1100
1907.....	3000	1150
1908.....	3600	1600
1909-1927	—	—
Total.....	42,762	£25,701

LEAD.

Production of lead ore decreased from 5892.58 tons, valued at £183,167, in 1926, to 5583.12 tons, valued at £135,403. The decrease of 309.46 tons is due largely to the closing of the Round Hill Mine and to a reduction in the output of North Farrell Mine during the last quarter.

Zeehan field, once a considerable producer, has of late been of small account. It is proposed to have an electro-magnetic survey made of that field and to drill where ore-bodies are located. Electro-magnetic surveys and drilling campaigns might be conducted with advantage in the northern and southern quarters, also of Zeehan especially, where the mineral-bearing rocks are covered with detritus or with gravels and sands.

Attention is directed to the Heazlewood line of lead-zinc ore and to the Ross Creek bodies, both of which are of low average grade but of large size and extent. Drilling could be undertaken at those places without further geological investigation in order to get data for the estimation of the probable ore. The Heazlewood body lies along the line of contact between Devonian syenite and Silurian sandstone and limestone; the Ross Creek body of disseminated lead and zinc sulphides is contained in an igneous member of the porphyroid group of rocks.

RETURN showing the Quantity and Value of Lead included in Silver Lead during the Years 1919 to 1927 inclusive.

Year.	Quantity.	Value
	Tons.	£
1919.....	2357.142	64,403
1920.....	3855.639	142,268
1921.....	1434.794	32,241
1922.....	4925.880	118,257
1923.....	4784.057	127,542
1924.....	4559.110	154,881
1925.....	5525.99	197,452
1926.....	5892.58	183,167
1927.....	5583.12	135,403

NICKEL.

No nickel ore has been mined in Tasmania since 1914, when the opening of the war with Germany closed the market in that country. At the time about 800 tons of copper-nickel ore was in stock, for which a market could not be found until this year.

The amount of nickel in the ore was 86.2 tons, valued at £14,656. The actual value to the State was not one-tenth of that sum.

The ore is in the form of pentlandite and is associated with chalcopyrite and pyrrhotite. It is found in association with dykes of gabbro and norite and other basic intrusives.

A company is about to be formed for the purpose of reopening the mines on these narrow (1 to 4 feet) lodes.

In addition to the nickel and copper, which will probably average 6 per cent. nickel and 3 per cent. copper, these ores contain a little gold, platinum, and palladium. Ore can be raised to 11 per cent. nickel and 6 per cent. copper by careful selection, but in so doing a large quantity of low-grade material is discarded.

The first shipments of ore caused much anxiety because of spontaneous combustion due to rapid oxidation of the sulphides. To-day the ores are roasted in open heaps to remove part of the sulphur. It is proposed to smelt the ores in water-jacketed blast furnaces in order to concentrate the metals in the form of matte and thereby reduce the cost of freight and prevent fire.

OSMIRIDIUM.

Production in 1927 was only 632.687 ounces, valued at £7456, compared with 3172.5 ounces, valued at £61,908, in 1926. The falling-off in output was due, in the first place, to the low average price (£11 per ounce) for the alloy, the richest of the natural concentrations only being workable at that price. Adamsfield is still the chief source of supply, and is receiving more attention of late owing to a considerable rise in the market value.

Osmiridium is now sold by private negotiation to agents of metal dealers and not through a pool. The present method of marketing is much better for the following reasons:—

- (1) Competitive buying results in higher prices.
- (2) The highest price can be given for the best material.
- (3) Full payment is made immediately.
- (4) Definite contracts can be arranged with individual producers.

It is remarkable that a considerable rise in price coincided with the abandonment of the pooling system of marketing.

The attention of prospectors is directed to the Boyes River area north of Adamsfield, where the serpentine belt is found to extend six to seven miles beyond the outcrops near the confluence with Gordon River. Coarse metal has been found in the far northern part, to which a track has been cut by the Department from the crossing of Florentine River. A track has been opened down Weld River valley from the South Gordon track to provide a way of success to serpentine belts in that direction. Prospectors are exploring the country between the south coast and upper Huon River. Osmiridium has been reported between Mount Stewart and Mount Ramsay in the western division.

RETURN showing the Quantity and Value of Osmiridium produced during the Years 1910 to 1927 inclusive.

Year.	Quantity.	Value.
	Ozs.	£
1910.....	120	530
1911.....	271.88	1888
1912.....	778.77	5742
1913.....	1261.65	12,016
1914.....	1018.83	10,076
1915.....	247.048	1581
1916.....	222.150	1899
1917.....	332.079	4898
1918.....	1606.743	44,833
1919.....	1669.715	39,614
1920.....	2009.196	77,114
1921.....	1750.655	42,935
1922.....	1173.924	35,512
1923.....	673.423	19,642
1924.....	364.805	10,617
1925.....	3365.543	103,570
1926.....	3172.5	61,908
1927.....	632.687	7456
Total.....	20,671.598	£481,831

SILVER.

In 1927 the total productions of silver, including that produced as bullion in the smelting of copper and the metal contained in lead and zinc ores sent to smelters or otherwise treated, was 741,782 fine ounces, valued at £87,024, compared with a production of 766,653 ounces in 1926, a decrease of 24,871 ounces. The decrease is proportionate to the decrease in the production of copper and lead.

The average price of silver was 2s. 2.045d., as compared with 2s. 6.75d. in 1926.

RETURN showing the Quantity and Value of Silver-Lead Ore produced from 1888 to 1927 inclusive.

Year.	Quantity.	Value.
	Tons.	£
1888 to 1903 inclusive.....	300,977.5	2,571,771
1904.....	51,138	203,702
1905.....	75,270.5	246,888
1906.....	87,117.75	462,443
1907.....	89,762.5	572,560
1908.....	63,116.9	322,007
1909.....	80,378.35	298,880
1910.....	51,226.91	247,576
1911.....	61,501.195	253,361
1912.....	90,123.868	309,098
1913.....	83,289.268	319,997
1914.....	11,565.54	96,225
1915.....	10,382.95	91,689
1916.....	11,229.410	153,796
1917.....	9575.780	152,122
1918.....	7241.400	127,176
1919.....	—	136,234
1920.....	—	261,166
1921.....	—	59,422
1922.....	—	223,183
1923.....	—	201,284
1924.....	—	220,279
1925.....	—	283,735
1926.....	—	263,764
1927.....	—	210,538
Total.....	—	£8,298,796

* "Quantity" discontinued, as it has been found previous figures are misleading concentrates, hand-picked ore, and crude ore having all been added and included under the one head.

RETURN showing the Quantity and Value of Silver contained in Silver-Lead and Blister Copper during the Years 1919, 1920, 1921, 1922, 1923, 1924, 1925, 1926, and 1927.

Year.	In Silver Lead.		In Blister Copper.		Total.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Ozs.	£	Ozs.	£	Ozs.	£
1919	296,719.27	71,831	228,624	53,733	525,343.27	125,564
1920	453,411	118,898	169,948	47,869	623,359	166,767
1921	165,637	27,181	183,021	30,395	348,658	57,576
1922	674,886	104,926	119,699	18,511	794,585	123,437
1923	516,073.61	73,742	122,528	17,597	638,601.61	91,339
1924	494,782	75,398	147,376	22,439	642,158	97,837
1925	597,012.67	86,283	133,181	19,226	730,193.67	105,509
1926	...	80,597	...	17,391	766,653	97,988
1927	640,575	75,135	101,207	11,889	741,782	87,024

TIN.

The output of tin for the year was 1105.74 tons, valued at £317,593, compared with 1096.16 tons, valued at £322,526, in 1926, an increase of 9.58 tons, but a decrease in value of £4933. The average market price was £289 ls. 4d., compared with £291 3s. in 1926. The steady decline in the market price of tin is attributable to the operations of speculative manipulators, the price not being governed or regulated by the process of supply and demand. To-day the market is as sound as it has been in years, yet the price is low and still declining. Greater interest is being displayed in the search for and development of tin ore deposits than for any other mineral. As a result of that activity a number of discoveries have been reported. The depletion of the known reserve of alluvial tin ore is not reflected in the statistics, yet a gradual decline is inevitable if new sources of supply are not found soon to stem the downward trend. One important lead remains to be explored, namely, the old bed of Ringarooma River passing through Herrick. It is estimated that the bed-rock lies at depths between 150 and 200 feet. No attempt has been made to explore this long lead, of which the Briseis is but a tributary. The difficulties of working to that depth presented such formidable engineering problems that the investigators one by one gave up the enterprise before any actual work had been performed.

Chief of the alluvial tin mines to-day are the Briseis, Pioneer, Endurance, and Mount Bischoff. Some others are coming into prominence, and a few of these may prove of importance.

The time is fast approaching when attention will be focussed upon the tin-bearing granites of Tasmania. Such are those of Blue Tier, Weldborough, Avoca, and Heemskirk. Those bodies are of low grade, but of large size and great extent. They will provide a not inconsiderable portion of the tin requirements of the future. The history of all companies, with one noteworthy exception, who attempted to work these large rock deposits on a small scale has been written down as an unbroken record of failures. In the light of our present knowledge no other result could have been possible. The works of those companies, although commercially disastrous, are of very great value in providing essential information as to the nature, extent, and metal content of the stone. The investigation of these deposits is proceeding, and bulletins are to be issued dealing therewith.

Value of Silver con-
centrated during the Years
1926, and 1927.

Total.	
Quantity.	Value.
Ozs.	£
525,343.27	125,564
623,359	166,767
348,658	57,576
794,585	123,437
638,601.61	91,339
642,158	97,837
730,193.67	105,509
766,653	97,988
741,782	87,024

Alluvial tin ore in black sands (ilmenite) is found in considerable abundance at Fraser River, King Island. This deposit has received attention of late, and an endeavour has been made to market the mixed product in Sydney. The State Mining Engineer has recently performed experiments for the separation and concentration of these ores. He found that on ordinary concentrating tables a first product tin ore concentrate up to 67 per cent. could be obtained by direct treatment, and that after grinding to 100-mesh the ilmenite could be separated without difficulty.

As regards the metallurgy of tin, no great advance has been made in recent years. In the operation of milling, engineers now rely more on rolls and tube-mills and ball-mills than on the stamper battery. Metallurgists are attempting to apply flotation methods to the concentration of tin ore, but with no marked success. Further research in that work may lead to important results.

RETURN showing the Quantity and Value of Tin exported from Tasmania from 1880 to 1904 (compiled from Customs Returns only), Tin Ore produced during the Years 1905 to 1918 inclusive, and Metallic Tin produced during the Years 1919 to 1927 inclusive.

Year.	Quantity.	Value.
	Tons.	£
1880 to 1904 inclusive	76,708.4	7,167,564
1905	3891.5	362,670
1906	4472.75	557,266
1907	4342.75	501,681
1908	4520.8	421,580
1909	4511.2	418,165
1910	3701.01	399,393
1911	3953.05	513,500
1912	3713.825	543,103
1913	4010.41	531,983
1914	2572.713	259,300
1915	2599.234	292,306
1916	2854.636	350,852
1917	2637.337	427,917
1918	2256.203	488,798
1919	1580.22*	395,794
1920	1310.411*	369,362
1921	790.395*	130,257
1922	679.440*	112,407
1923	1160.390*	236,955
1924	1108.450*	275,014
1925	1129.662*	297,515
1926	1096.16	322,526
1927	1105.74	317,593
Total.....	15,806.686	£15,693,301

* Metallic Tin.

TUNGSTEN.

Tungsten ore, in the form of wolfram, is found in close association with tin ore in Tasmania. Two mining companies, one operating at Story's Creek, near Avoca, the other at Moina, produce the whole output. Production this year amounted to 148.57 tons, valued at £9886, compared with 83.15 tons, valued at £5265, last year, an increase in tonnage of 65.42 and in value of £4621.

The market rates fluctuate daily within definite limits, the average rate remaining so low that veins only rich in tin ore also can be worked at a profit.

RETURN showing the Quantity and Value of Wolfram produced from 1899 to 1927 inclusive.

Year.	Quantity.	Value.
	Tons.	£
1899 to 1903 inclusive	57.25	2157
1904	15.5	1147
1905	32.25	2371
1906	19.75	1465
1907	40.75	4411
1908	4.5	338
1909	28.35	2494
1910	67.35	7280
1911	69.96	7769
1912	66.49	6601
1913	68.07	7040
1914	46.873	4327
1915	94.685	11,115
1916	106.265	16,910
1917	172.190	28,714
1918	155.362	27,239
1919	120.907	26,613
1920	70.89	13,626
1921	10.34	676
1922	19.26	1024
1923	96.86	6150
1924	54	2785
1925	174.170	14,658
1926	83.15	5265
1927	148.57	9886
Total	1823.742	£212,061

RETURN showing the Quantity and Value of Scheelite produced during the Years 1917 to 1927 inclusive.

Year.	Quantity.	Value.
	Tons.	£
1917	69	12,130
1918	216	39,252
1919	198.98	43,181
1920	105.09	17,905
1921-1927	—	—
Total	589.07	£112,468

ZINC.

The output of zinc for the year was 6326.2 tons, valued at £181,242, compared with 5377.75 tons, valued at £183,362 last year, an increase of 948.5 tons and a decrease in value of £2120. The difference in value shows clearly the results of the serious fall in the market rates for this metal.

The principal producer was the Electrolytic Zinc Company from their Hercules and Rosebery Mines. Exploration at the Hercules Mine has resulted in the proving of the eastern ore-body, which is 51 feet in width and is composed largely of zinc ore of high grade.

Another important development is reported from the Tasman and Crown Lyell Zinc-lead Mine, where the owners are putting into operation the scheme recommended by the Government Geologist, P. B. Nye.

RETURN showing the Quantity and Value of Zinc produced during the Years 1917 to 1927 inclusive.

Year.	Quantity.	Value.
	Tons.	£
1917	48	1968
1918	3822	152,880
1919	285	13,110
1920	9.3	334
1921-1923	—	—
1924	2748.75	90,485
1925	3112.69	110,691
1926	5377.75	183,362
1927	6326.2	181,242
Total	21,729.69	£794,072

SMELTER PRODUCTION.

The active smelting companies in 1927 were as follows:—

- (1) The Mount Lyell Mining and Railway Company, Queenstown.
- (2) The Electrolytic Zinc Company, Risdon, Hobart.
- (3) The Mount Bischoff Tin Mining Company Registered, Launceston.

(1) Ore reduction operations at Mount Lyell Mining and Railway Company's works proceeded on usual routine lines throughout the year. One of the two additional ball mills referred to in the previous report was completed and is in operation, and the second unit is nearing completion.

During the year the concentrating plant treated 106,592 tons of North Lyell ore, producing 31,062 tons of concentrates. The metal-bearing material smelted totalled 34,227 tons, including 844 tons of Mount Lyell pyrites, 2394 tons of North Lyell high-grade ore, and 30,989 tons of concentrated ore produced from North Lyell ore, these figures showing a slight reduction on those of the preceding term, due mainly to the smaller quantity of Mount Lyell pyrites dealt with. The blister copper output for the period totalled 5893 tons, as compared with 6980 tons for the previous year.

The construction of the electrolytic copper refinery mentioned in the previous report was commenced early in the year, and excellent progress has been made to date. It is expected that construction work will be completed and the plant put into operation during the first half of 1928. The installation will be on the high density multiple system, using blister copper anodes, and the heating of the solution, as well as electrolytic deposition, will be accomplished by means of hydro-electric power from the company's Lake Margaret plant.

*The Mount Lyell Mining and Railway Company Limited:
Return for the Calendar Year 1927.*

Ore and metal-bearing material smelted—	Tons
Ore:	(Dry).
From the Company's Mount Lyell Mine ...	844
From the Company's North Lyell Mine ...	2,394
Concentrates:	
From the Company's North Lyell Mine	
Ore	30,989
Total	34,227

Blister copper produced—5863 tons; containing copper, 5811 tons; silver, 101,207 oz.; gold, 2138 oz.; approximate value, £383,809.

Average number of men employed—

Mining Department:	
At the Company's Mount Lyell Mine ...	119
At the Company's North Lyell Mine ...	372
At the Company's Lyell Comstock Mine	3
Reduction Works Department (including Lake Margaret)	494
Railway Department—	
Mount Lyell Railway	77
North Lyell Railway	8
Total	85
Total	1,012

Dividends paid during year, £145,034 8s. 9d. (2s. 3d. per share).

Dividends paid from the inception of the Company to the 31st December, 1927, £4,587,411.

Copper produced from the inception of the Company to the 31st December, 1927, 212,178 tons (fine).

Silver produced from the inception of the Company to the 31st December, 1927, 13,722,813 oz. (fine).

Gold produced from the inception of the Company to the 31st December, 1927, 389,222 oz. (fine).

(2) There has been a steady combination of production at the Risdon works of the Electrolytic Zinc Company.

The figures relating both to zinc and cadmium and the various by-products show an all-round improvement, and although the increases are necessarily not large they are an indication that the steady application of research work to the improvement of the process is quite justifying itself.

The work has now reached a stage when a small improvement in extraction can only be looked for after much intensive study in technique and economics, and, in the light of this fact, the additional production of metal is encouraging.

There was a gratifying increase in the consumption of fertilisers in Tasmania during the year, despite the abnormally dry autumn, and the company's plant showed itself well able to take care of all demands made on it for superphosphate production.

The board of directors of the company is anticipating a further growth in the use of artificial manures by putting in hand additional plant for the making of sulphuric acid. The extra capacity now available gives definite assurance that all demands likely to arise for some time to come will be readily met.

The average number of men employed during the year at Risdon was 943.

(3) The figures relating to the smelting of tin ore at the smelting works of the Mount Bischoff Tin Mining Company Registered, at Launceston, are not available for publication. It may be stated, however, that the bulk of the tin ore produced in Tasmania is sent to these works for treatment. The average tin content of the ore sent to the smelters was 67.54 per cent., and the tin bullion obtained was up to the high standard set by this company many years ago.

There is not any information to record regarding modifications in the smelting processes.

COAL.

Coal production in 1927 advanced slightly to 112,056 tons, valued at £99,802. The higher rate was due to the opening of Catamaran Colliery, the output from which it was hoped would ultimately place Tasmania in a position almost independent of Newcastle. The failure of the company to continue development was due, in the first place, to lack of capital, then to unsettled labour conditions. Operations were suspended just when the company was getting a firm hold on the local market. On the resumption of operations no trouble need be anticipated in that regard, because the coal is particularly desired for household and steam-raising purposes.

The greater part of the output came from the Mount Nicholas, Cornwall, and Jubilee collieries.

During the year mining development was continued at the Seymour Colliery in preparation for active production early next year. The East Coast Development Company has discontinued work on the railway line, which was designed to serve the Dalmaine Collieries.

RETURN showing the Quantity and Value of Coal raised from 1880 to 1927 inclusive.

Year.	Quantity.	Value.
	Tons.	£
1880 to 1903 inclusive	767,261.5	659,010
1904.....	61,109	51,942
1905.....	51,993	44,194
1906.....	52,895.75	44,962
1907.....	58,891	50,057
1908.....	61,067.75	51,907
1909.....	66,161.75	56,237
1910.....	82,445	48,609*
1911.....	57,067	26,214*
1912.....	53,560	24,568*
1913.....	55,043	25,367*
1914.....	60,794	27,853*
1915.....	64,536.25	30,418*
1916.....	55,575	27,736*
1917.....	63,412	38,673*
1918.....	60,163	37,676*
1919.....	66,253	47,004*
1920.....	75,429	64,005*
1921.....	66,476	63,446*
1922.....	69,238	61,016*
1923.....	80,718	70,797*
1924.....	75,988	66,555*
1925.....	81,698	70,424*
1926.....	102,358	90,401*
1927.....	112,056	99,802*
Total.....	2,402,189	£1,878,873

* Value at pit's mouth.

MAGNESITE.

Inquiries have been received by this Department for the mineral magnesite (natural carbonate of magnesia), which is used largely for lining furnaces operating under basic processes. In that application iron oxide is added as a binder, and the mixture is "dead burned" or calcined at 1400° to 1700° C., pressed into bricks, or used in the form of clinker. The next most important use of magnesite is for outside and inside stucco, in the form of "plastic magnesia," i.e., light burned between 600° and 800° C. Handsome monolithic floors and bathroom fixtures are made of plastic magnesia. The carbonate, after converting wholly or partially to the basic carbonate or to the hydroxide, is used for heat insulation, fire-proofing, cosmetics, sugar refining, dry cleaning, boiler-scale prevention, varnish dryers, refractory crucibles, for a filler in rubber and paper manufacture, and for the manufacture of magnesium salts.

The most important of the known deposits of magnesite is that of the Victory Mine, Arthur River. This mine is accessible by way of Wynyard through Yolla and Takone.

The magnesite is found in association with dolomite, both having been derived from a basic igneous rock. Grab samples taken to determine the general composition of the large deposit were of the following composition:—

	No. 1.	No. 2.	No. 3.
Silica	3.40	0.16	0.36
Ferric oxide	1.57	trace	1.43
Alumina	0.43	2.28	1.37
Lime	0.90	1.25	0.88
Magnesia	45.48	47.58	46.30
Carbonic acid	49.00	48.60	50.40

The difficulty of transport is the chief obstacle to commercial exploitation.

MICA.

Inquiries have been received during the year for mica. Several varieties are known here, and are widely distributed, but not one in flakes large enough to be of commercial value.

One of the most striking of the deposits of mica is that opened in an adit close to the Orient Tin Mine, Heemskirk. This is a large body of phlogopite, built up of quarter-inch flakes with interstitial analcite. It is reported that the average tin content of this body is 0.25 per cent. If the report is correct it may be possible to work this body and market the mica, in addition to the tin ore.

MONAZITE.

Monazite is a compound of the phosphates of thorium, cerium, didymium, and other rare earth metals. In the past its value depended upon the proportion of thorium, which is used in the manufacture of incandescent gas-mantles. The demand for monazite has been declining since electric illumination began to displace gas light. After the extraction of thorium the residue from the monazite is treated for cerium, which is used as an alloying agent in special steels. The market for cerium alloys is not a large one.

Samples of monazite have been sent to dealers in England in an endeavour to find a market there. Tasmanian monazite contains up to 15 per cent. thorium, the average being about 8 per cent. Large deposits are known at Gladstone, Yellow Band Plain, and at Stanley River.

OIL SHALE.

There is as yet no oil shale industry in Tasmania. Since the nineties a considerable amount of work has been performed on oil shale, and although it cannot be said that oil has been produced on a commercial scale the pioneers of this industry have, as a result of their works, given us a great amount of valuable information relating to the peculiarities of these shales and the nature of their products. It has been found that the

problem is not merely the producing of oil; it is the producing of a uniformly good oil as a continuous operation. The establishment of the industry has been delayed because of a lack of appreciation of the problems confronting investigators, a tendency to make light of difficulties, and not make provision for overcoming them. As a result we have two idle retorting plants.

However, it now appears that as a result of recent researches and experiments the chief difficulties have been overcome. It has been found—

- (1) That emulsification of crude oil and water can be prevented by preliminary drying of the shale.
- (2) That the drawing of dust into the condensers can be reduced to a minimum by the use of two or more outlets below the surface of the charge.
- (3) That carbonisation of the walls of the retort can be prevented by the introduction of inert gases, such as carbon monoxide and carbon dioxide, into the retort.
- (4) That greater efficiency is obtainable by the use of a large number of small retorts than by the use of a few large retorts.

Those were the main causes of the early failures.

During the year the Australian Shale Oil Company opened their mine and continued the erection of works, but ran out of capital. Two trials of the retort were made with, it is claimed, satisfactory results, and about 60,000 gallons of oil was produced. The power kerosene obtained therefrom found a ready market in nearby centres. A local market is available for each of the products.

The Southern Cross Motor Fuels Ltd. continued their researches and experiments, and as a result have designed a retort which they claim is superior to any other. Large scale trials give credence to their statements. The Department is assisting the company in the preparation of their plans for a start early next year.

The output of shale was 3150 tons, valued at £2050.

RETURN showing the Quantity and Value of Shale produced during the Years 1910 to 1927 inclusive.

Year.	Quantity.	Value.
	Tons.	£
1910.....	364	214
1911.....	500	250
1912.....	—	—
1913.....	130	130
1914.....	75	75
1915.....	—	—
1916.....	1286	1286
1917.....	—	—
1918.....	—	—
1919.....	600	900
1920.....	140	172
1921.....	868	1506
1922.....	40	100
1923.....	1101	1094
1924.....	1576	1526
1925.....	820	559
1926.....	2127	1475
1927.....	3150	2050
	12,777	£11,337

PAINT MATERIALS.

Enquiries have been received from Melbourne and Sydney and from England with respect to such paint materials as ilmenite, barytes, and ochre.

From information received it appears likely that a trade in these products will be built up next year. An English market, however, cannot be opened because of high freights.

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64,005*

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99,802*

£1,878,873

Ilmenite.—Ilmenite, an oxide of titanium and iron, is coming into more extended use in the manufacture of paints and of cements. Titanium oxide is produced from ilmenite or rutile by the following process:—The ore is pulverised to 200-mesh, mixed in equal proportion with sulphuric acid, and heated to a temperature between 120° and 250° C. During the heating a violent reaction occurs, and basic sulphates of titanium and iron are formed. On cooling the mass sets to a hard cake, which is crushed and treated with water. The iron in the resulting solution is reduced to the ferrous state and the titanium oxide precipitated by hydrolysis. The oxide is then washed and calcined. Before the solution is hydrolysed it is customary to add an extender, which usually consists of very finely divided barium sulphate, and is added as a wet pulp. The titanium oxide precipitates on to the barium sulphate and becomes intimately mixed with the grains. On heating and dehydrating the mixture is found to be uniform, and it is suggested that the pigments so produced consist of intercrystallised TiO_2 and $BaSO_4$, or that titanate and other components have been formed.

The ilmenite deposits of Tasmania are derived mainly from diabase, of which it is a prominent accessory component. It is found in large quantity associated with alluvial tin ore near Fraser River, King Island, at Arthur Lake, and at many other places. Rutile is an abundant component of the gravels of Clayton Rivulet, near Hamilton-on-Forth.

Ochres.—Ochres are clayey oxides of iron ranging in colour from buff through brown and brick red to deep red. The largest deposits are decomposition products of basalt, diabase, and magnetite-rich serpentines. In some places the decay of hematite leads to the formation of ochres; in others rich red ochres are derivatives of pyrite, which, altering to iron sulphate, is ultimately converted into hydrous oxide of iron. Ochres are sold at £3 to £4 per ton delivered into trucks at the nearest railway station. They are excavated in open-cuttings as a rule.

At A. Pearson's farm, Spalford, ochres derived from basalt are mined intermittently and on a small scale. Near that spot is some hematite ochre of deep brick colour. Ochres from diabase are obtainable at Mowbray and from magnetite at Ilfracombe, near Beaconsfield. At Mount Bischoff and at Renison Bell ochres derived from pyrites by oxidation are found in small quantity, but of excellent quality.

RETURN showing the Quantity and Value of Ochre produce during the Years 1918 to 1927 inclusive.

Year.	Quantity.	Value.
	Tons.	£
1918.....	100	200
1919.....	—	—
1920.....	—	—
1921.....	14	56
1922.....	—	—
1923.....	—	—
1924.....	20	50
1925.....	—	—
1926.....	38	69
1927.....	—	—
Total.....	172	£375

Barytes.—No barytes has been produced in Tasmania since 1922, the main reason being the high cost of transport to mainland markets. Inquiries, however, have been received of late from paint manufacturers in Sydney and Melbourne.

Its principal use is in lithopone, a mixture of 70 per cent. barium sulphate and 30 per cent. zinc sulphide, which is used extensively as an inside paint, as a filler in rubber goods, linoleum, oil cloths, window shades, and paper. Pure barytes is put to similar uses. Barytes

has recently come into use in the manufacture of titanox, an intimate mixture of barium and titanium compounds, which has uses similar to those of lithopone.

The old method of refining barytes was by roasting it with charcoal, thereby reducing the sulphate to the sulphide condition, then dissolving in hydrochloric acid and precipitating with sulphuric acid.

A new process, described in the "Engineering and Mining Journal," December, 1927, has of late been evolved, which, it is claimed, is superior to the old method, and is, therefore, thought to be worthy of record. It depends on the property of molten sodium chloride (common salt) of dissolving and holding barium sulphate in solution to the exclusion of other minerals. The barium sulphate is then separated from the salt by the simple operation of dissolving out the salt in water, which leaves a pure and, incidentally, white precipitate, and in the finest desired physical condition. This results in the most desired product.

All of the tests made with various grades of ore, including those contaminated with galena and sphalerite, yield uniformly good results and a product better than that obtained by any other process. Incidentally no grinding, acid treatment, nor any other operations are required on the product after precipitation, washing in clean water, and drying. Estimates on the cost of production indicate a considerable saving over other methods of producing finished barytes from ores of inferior grades. This process has an additional value in effecting a separation of lead ores from barytes, thereby getting two products.

It is expected that this process, applied to commercial production on a large scale, will have a far-reaching effect on the trade, as it will practically equalise the values of all barytes ores of equal barium sulphate content regardless of the character of impurities. The form of the particles, which are globular, is more to be desired than the sharp particles resulting from crushing and grinding, particularly when used as a filler for rubber and other goods.

All of the barytes deposits of Tasmania are contained in the so-called porphyroid intrusives of Ordovician age. The most important of the known deposits are those of:—

- (1) Mount Block, east of Guildford Junction;
- (2) Alma, near Wilmot River;
- (3) Paradise Road, near Mount Roland;
- (4) Linda Valley;
- (5) Frankford;
- (6) Francombe's property, near Beulah;
- (7) Pinnacles Hills;
- (8) Higgins' Creek, near Huskisson River;
- (9) Riana.

The proportions of lead, copper, and zinc impurities are insignificant.

RETURN showing the Quantity and Value of Barytes produced during the Years 1916 to 1927 inclusive.

Year.	Quantity.	Value.
	Tons.	£
1916.....	83	359
1917.....	52	234
1918.....	217	977
1919.....	399	1160
1920.....	1048	4163
1921-1924.....	—	—
1925.....	3.5	16
1926.....	—	—
1927.....	—	—
Total.....	1802.5	£6909

STRUCTURAL MATERIALS AND CLAY PRODUCTS.

Few products of quarries and mines are used more extensively than the materials that come under this heading. They comprise:—Cement; clay products, such as tiles, pottery, brick, sewerpipe, and drainpipe; lime; sands and gravels; slate and stone for building purposes, including sandstones, limestones, granite, diabase; stone for road-making; sandstone for sharpening implements; &c.

Statistics relating to the production of cement and of limestone only are collected and recorded, but an attempt is about to be made to extend the scope of the collection to include the other products mentioned. The value of such statistics may not be apparent at present, but data relating to production for purposes of comparison, if for no other purpose, would repay the cost of compilation many times. Carefully compiled statistics also present a true reflection of industrial conditions at the time, and are records for future reference.

CALCIUM CARBIDE.

The production of carbide by Electro Products Company last year was 2072 tons, valued at £34,896, as compared with 3420 tons, valued at £68,400 in 1926. The comparison is not a true representation of the condition of the industry, because Carbide Electro Products, who recently acquired the plant at Electrona, were not in continuous operation during 1927.

The company draw their supplies of high grade limestone from Ida Bay district. Last year 7676 tons of limestone, valued at £5583, was quarried and transported to the works at Electrona.

Investigations are now being made into the production of lampblack, for which a large market is available in Australia.

RETURN showing the Quantity and Value of Carbide produced during the Years 1922 to 1927 inclusive.

Year.	Quantity.	Value.
	Tons.	£
1922.....	4512	135,509
1923.....	3236	64,720
1924.....	3305	65,660
1925.....	2934	60,047
1926.....	3420	68,400
1927.....	2072	34,896
Total.....	19,479	£429,232

CEMENT.

The total quantity of cement made in 1927, according to returns received from the manufacturers, was 38,690 tons, valued at £176,779, as compared with 33,611 tons, valued at £166,447, in 1926. The production was smaller than estimated owing to the suspension of operations at Maria Island and the delay in getting the full plant in continuous operation at Railton.

Two plants are in operation, viz., the National Portland Cement Company, at Maria Island, and the Tasmanian Portland Cement Company, at Railton.

The former is operating on Permo-Carboniferous limestone and the latter on Ordovician limestone. Both produce cement of high quality. Domestic consumption is not large, the bulk finding a ready market in Victoria.

Cement has not been used much in road-building in Australia, mainly because aluminous cement is not manufactured here and a heavy duty is imposed on its importation. A plan is now being drawn up for the purpose of erecting large aluminous cement plants in Tasmania. It is proposed to use local limestone and draw supplies of bauxite from foreign countries. No commercial ores of aluminium have as yet been found in Tasmania, and mainland deposits are not of high

even grade. Moreover, the costs of production and transport are much greater from Victoria, New South Wales, or Western Australia than from Europe. It is proposed to use the electric process.

Titanium cement, developed during 1924, has many highly desirable properties. Like aluminous cement, it is quick in hardening, has a high strength, and a lime base, but, unlike aluminous and Portland cements, titanic oxide is the chief acid constituent instead of alumina or silica. It is claimed that titanium cement is more dense and chemically more resistant than any cement heretofore produced. When a mixture of titaniferous iron or lime and coke are fused in an electric furnace or a block-furnace, the iron is converted into pig iron, and the slag, when finally ground, gives the titanium cement.

RETURN showing the Quantity and Value of Cement produced during the Years 1924, 1925, 1926, and 1927.

Year.	Quantity.	Value.
	Tons.	£
1924.....	21,026	105,130
1925.....	32,574	162,870
1926.....	33,611	166,447
1927.....	38,690	176,779
Total.....	125,901	£611,226

CLAY AND CLAY PRODUCTS.

No statistics have been kept of the production and value of clay heretofore. The chief products are bricks, tiles, pottery, drain pipes, and sewer pipes. Manufacturers of those articles have works at all important centres, the production being limited to domestic requirements.

It is desirable that a thorough investigation of the more important beds of china and other clays be performed at the earliest opportunity. That work has been under consideration for some time.

Some of the most important beds of clay are members of the Tertiary formation; others, like the peculiar black clays of Cape Barren Island, are of recent age, and valuable fireclays are interbedded with Trias-Jura coal seams. Crookery has been made of kaolin or china clay from the Tertiary beds of St. Helens. Similar clays are known in the Upper Derwent Valley and other localities. The black carbonaceous clays of Cape Barren Island are worthy of careful investigation. On heating the carbonaceous matter disappears, leaving an almost pure white clay of very high fusion point.

Some of the fire-clays are of excellent quality.

LIME.

No record is kept of the production of lime, which is used in the building trade and other construction works and in agriculture. The market is local, and is affected by the financial condition of the time.

Almost the whole of the lime produced in the southern district is burnt from Permo-Carboniferous limestone. Kilns are situated at Granton and neighbourhood and near Hobart.

In the northern district lime is burnt from Silurian and Ordovician limestones. Kilns are in active operation at Railton, Melrose, Winkleigh, Beaconsfield, and other centres.

The Tertiary limestones of Marrawah produce lime of the highest quality.

SAND AND GRAVEL.

Up to the present no attempt has been made by the Department to obtain statistics relating to the production of sand and gravel. The total amount used in building and in other construction works is large, and last year a few hundred tons of sand was shipped to

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Value.
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16
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—
£6909

Melbourne from Beauty Point. Sand is used here for mixing with cement in the manufacture of pipes for drainage purposes, in addition to its many other applications. Some years ago a glass factory was erected in Hobart, but the plant was not put into operation owing to industrial troubles.

Glass sands are distributed throughout all quarters of the island, the better known deposits being at Kingston, Derwent Valley, Deviot, Beaconsfield, Beauty Point, and Blythe. Reports were prepared during the year on four of those deposits. A company (Cementoid Construction Company) has been formed for the manufacture of cleansing materials from the Beaconsfield sands, and at Kingston such articles have been manufactured by Scown and Son for many years, and considerable exports have been made to New Zealand.

A sand of extraordinary nature is found in the neighbourhood of Wynyard. This consists almost wholly of silica, and is so fine in grain that the greater part will pass through a 200-mesh sieve.

No record is kept of the sand and gravel used for railway ballasting.

STONE.

Under the heading "Stone" are included all classes of stone used for building, monumental, and ornamental purposes, stone for paving, curbstone, flagstone, manufactured grindstone, and scythestone, rubble, crushed stone, limestone for furnace, flux, &c., but limestone for cement and calcium carbide and for burning lime is not included.

The records given hereunder are confined to the amounts of limestone trained and shipped by the Broken Hill Proprietary Company from Melrose quarries to their steel works at Newcastle, and that quarried by Electro-Products Ltd. and sold to the Electrolytic Zinc Company. No account is taken of that used for fluxing by the Mount Lyell Mining and Railway Company. The following is the record of production:—

Shipped by the—			
Broken Hill Pty. Co....	159,015 tons, value	£159,015	
Quarried for the—			
Electrolytic Zinc Co.....	2831 " "	£2775	
	161,846 " "	£161,790	

RETURN showing the Quantity and Value of Limestone produced during the Years 1923 to 1927 inclusive.

Year.	Quantity.	Value.
	Tons.	£
1923.....	100,113	122,428
1924.....	146,140	146,140
1925.....	124,670	124,670
1926.....	153,707	153,219
1927.....	169,522	167,373
Total.....	694,152	£713,830

The kinds of stone quarried are:—

- (1) Sandstones for building, monumental, and ornamental purposes, for cutting into grindstones, and scythestones, for paving, curbstone, and flagstone.
 - (2) Granites, porphyries, gabbro, serpentine, and diabase for building, monumental, and ornamental purposes.
 - (3) Diabase, basalt, and limestone for road materials.
 - (4) Limestone for the manufacture of cements, calcium carbide, lime, &c.
- (1) The sandstones used belong to the basal member of the Trias-Jura formation and to an upper member of the Permo-Carboniferous. Quarries are open in many parts of the Island, some of the more important being

at Ross, Tunbridge, Patersonia, Orford, Glazier's Bay, New Norfolk, Bellerive, and Hobart. The wonderful properties of these sandstones are given expression in the older public buildings, churches, and homesteads, and in monuments and ornamental works. Some of the finest public buildings in Melbourne are built of sandstone shipped from quarries at Orford and Glazier's Bay. Ross grindstones and scythestones are shipped to all States of Australia, and many years ago, when there was a direct shipping service between Hobart and New Zealand ports, a large export trade was maintained with New Zealand, for which supplies are now drawn from England.

All cutting is at present performed by hand, but a company is about to be formed for the purpose of providing the necessary capital to operate on a large scale with the use of machinery.

(2) The granites of the State have a deservedly good reputation for beauty, strength, and power of resisting the action of the elements of erosion, but they are not extensively used because the local demand is small. The best are those of Devonian age, which vary in colour from light grey to a reddish hue. Some of the porphyritic varieties are particularly beautiful in design and colouring.

An attempt was made recently to develop a trade in gabbro and serpentine, but without success. The gabbro of Nineteen-Mile Creek is a beautiful black and white rock.

Diabase is used largely for building foundations. Polished, it is a rock of considerable value.

(3) Diabase, with basalt, finds a more ready use for road construction.

(4) The Silurian and Ordovician limestones of Tasmania are of high quality, and are used extensively in the manufacture of cements and carbide. Deposits are distributed throughout the island, many being close to ports.

SLATE.

Many years ago slate for roofing was quarried at Bangor and other parts of the Lefroy district.

Slate of better quality, and in larger unwarped sheets, is exposed in the cliff faces of Arthur River Gorge south of Preolenna.

The market is too low at present to induce interest in this material.

RETURN showing Value of Minerals and Metal raised in Tasmania from 1880 to 1927 inclusive.

Mineral or Metal.	Value.
	£
Asbestos	7105
Barytes	6909
Bismuth	23,052
Cadmium.....	7413
Carbide	429,232
Cement.....	611,226
Coal	1,878,873
*Copper (Blister).....	18,039,424
Copper Matte	133,736
Copper Ore.....	579,335
Gold	7,618,304
Iron Ore	25,701
Iron Pyrites	93,916
Limestone.....	713,830
Nickel	14,656
Ochre	375
Osmiridium	481,831
Scheelite	112,468
Shale.....	11,337
*Silver-lead	8,310,785
Tin	15,693,501
Wolfram	212,061
Zinc	734,072
Unenumerated prior to 1894	31,988
Total	£55,771,130

* Metallic contents and values are shown in Tables.

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481,831
112,468
11,337
8,310,785
15,693,501
212,061
734,072
31,988
£55,771,130

in Tables.

RETURN showing the Amounts paid in Dividends by Mining Companies during the Year ending 31st December, 1927.

Mines.	Dividends.
	£ s. d.
Copper .....	...
Gold .....	...
Tin	15,918 5 0
Silver .....	...
Coal	6560 0 0
Total	£22,478 5 0

RETURN showing the Average Number of Persons engaged in Mining during the Years 1880 to 1927 inclusive.

Year.	Number.	Year.	Number.
1880.....	1653	1904.....	6194
1881.....	3156	1905.....	6581
1882.....	4098	1906.....	7005
1883.....	3818	1907.....	7516
1884.....	2972	1908.....	6466
1885.....	2783	1909.....	6054
1886.....	2681	1910.....	5770
1887.....	3361	1911.....	5247
1888.....	2989	1912.....	5566
1889.....	3141	1913.....	6107
1890.....	2868	1914.....	4741
1891.....	3219	1915.....	3908
1892.....	3295	1916.....	3864
1893.....	3403	1917.....	4050
1894.....	3433	1918.....	4278
1895.....	4062	1919.....	4413
1896.....	4350	1920.....	5364
1897.....	4510	1921.....	4011
1898.....	6052	1922.....	3835
1899.....	6622	1923.....	4785
1900.....	7023	1924.....	5264
1901.....	6923	1925.....	5110
1902.....	5934	1926.....	5309
1903.....	6017	1927.....	5044

RETURN showing the Mining Companies registered during the Year ending 31st December, 1927.

Number of Companies.	Capital.
10	£98,200

In addition to the above, 5 Agents for Foreign Companies were registered.

REVENUE.

The revenue of the Department as compared with the expenditure, as shown by the Treasury statements, is not a true comparison, as, owing to the method adopted, items which really constitute part of the Department's receipts are paid into General Revenue, and, likewise, payments for which rebates are received are still charged to the full amount as expenditure. For instance, the Department, from time to time, receives fairly large amounts for the sale of mining plant held under mortgage, &c., but these amounts are not included in the Department's revenue. In the second instance, the salary of the chemist at Maria Island may be mentioned. This is shown as a disbursement by the Department, although the amount is refunded by the National Portland Cement Company. The rebate is not credited to the Department's receipts, but is paid into General Revenue.

RETURN showing the Total Amount of Rents, Fees, &c., received by the Mines Department during the Year ended 31st December, 1927.

Head of Revenue.	Amount.
	£ s. d.
Rent of Auriferous and Mineral Lands	11,946 12 2
Fees, Auriferous and Mineral Lands	1281 2 11
Survey Fees	2781 6 11
Fees under the Explosives and Inflammable Liquid Act	878 7 0
Total	£16,887 9 0

RETURN showing the Average Number of Miners employed during the Year ending 31st December, 1927.

Division.	Number.
Northern and Southern	1853
North-Eastern	497
Eastern	596
North-Western	402
Western	1696
Total	5044

RETURN showing the Total Area of Land and Number of Sluice-heads of Water applied for during the Year ending 31st December, 1927.

Mineral.	Number.	Sluiceheads.	Area.
			Acres.
Bismuth	2	...	60
Clay .....	...	...	...
Coal	9	...	6507
Copper	1	...	80
Gold	15	...	155
Iron	3	...	200
Lead	1	...	80
Minerals	57	...	2195
Molybdenite	1	...	80
Nickel	1	...	80
Oil	1	...	588
Silver	3	...	90
Stone	1	...	40
Tin	232	...	6550
Wolfram	2	...	11
Machinery Sites	5	...	18
Mining Easements	15	...	289
Dredging Claims	30	511	423
Water Rights and Dam Sites	77	...	170
Licences to search for Coal or Oil	2	...	890
Total	458	511	18,506

RETURN showing Total Number and Area of Leases and Licences issued during the Year ending 31st December, 1927.

Mineral.	Leases.	Sluiceheads.	Area.
			Acres.
Arsenic .....	...	...	...
Clay	1	...	2
Copper	1	...	10
Coal	3	...	905
Dredging Claims	13	...	338
Gold	21	...	276
Iron .....	...	...	...
Limestone	2	...	240
Minerals	38	...	1635
Machinery Sites	5	...	46
Mining Easements	11	...	76
Osmiridium	1	...	10
Phosphate Rock .....	...	...	...
Silver Lead	4	...	118
Stone	1	...	14
Shale Oil	3	...	117
Tin	188	...	6263
Wolfram	2	...	11
Zinc Lead	4	...	200
Water Rights and Dam Sites	63	227	128
Licences to search for Coal and Oil	4	...	5090
Total	365	227	15,479

RETURN showing the Total Number of Leases and Licences in force on 31st December, 1927.

Mineral.	No. of Leases.	No. of Sluiceways.	Area.
			Acres.
Asbestos.....	1	...	1
Coal	24	...	8180
Copper	3	...	58
Clay	4	...	29
Dredging Claims.....	41	...	502
Gold	38	...	749
Gems	1	...	80
Iron	16	...	744
Kaolin.....	1	...	5
Limestone	10	...	1191
Mining Easements	77	...	484
Machinery Sites	21	...	110
Minerals.....	123	...	8683
Nickel.....	1	...	80
Osmiridium	4	...	78
Ochre	1	...	20
Phosphate Rock	1	...	7
Serpentine	1	...	80
Shale	5	...	1706
Silver-lead	21	...	401
Stone	1	...	14
Tin.....	455	...	15,147
Water-rights and Dam Sites	394	1748	2246
Wolfram.....	5	...	57
Zinc Lead	3	...	120
Licences to search for Coal or Oil.....	4	...	5090
	1256	1748	45,862

RETURN showing the Annual Value of Mineral Products for the State of Tasmania from 1880 to 1927 inclusive.

Year	Value.	Year.	Value.
	£		£
1880	554,031	1904	1,379,204
1881	602,723	1905.....	1,729,129
1882	556,306	1906.....	2,257,147
1883	560,873	1907.....	2,277,159
1884	468,302	1908.....	1,650,027
1885	518,885	1909.....	1,574,995
1886	489,966	1910.....	1,432,193
1887	593,256	1911.....	1,349,497
1888	616,733	1912.....	1,493,502
1889	504,718	1913.....	1,415,700
1890	444,210	1914.....	1,007,038
1891	528,388	1915.....	1,225,575
1892	526,909	1916.....	1,521,050
1893	627,909	1917.....	1,584,290
1894	732,764	1918.....	1,750,574
1895	575,692	1919.....	1,301,090
1896	662,058	1920.....	1,421,104
1897	1,006,140	1921.....	822,851
1898	1,071,084	1922.....	1,013,415
1899	1,660,622	1923.....	1,219,456
1900	1,888,695	1924.....	1,496,804
1901	1,763,896	1925.....	1,700,861
1902	1,378,406	1926.....	1,808,844
1903	1,354,044	1927.....	1,621,027
		Unenumerated prior to 1894	31,988
			£55,771,130

RETURN showing the Number and Area of Leases held under the Mining Act, in force on 31st December, 1919 to 1927 inclusive.

Nature of Lease.	In force on 31st Dec., 1919.		In force on 31st Dec., 1920.		In force on 31st Dec., 1921.		In force on 31st Dec., 1922.		In force on 31st Dec., 1923.		In force on 31st Dec., 1924.		In force on 31st Dec., 1925.		In force on 31st Dec., 1926.		In force on 31st Dec., 1927.	
	No.	Area.	No.	Area.	No.	Area.	No.	Area.	No.	Area.	No.	Area.	No.	Area.	No.	Area.	No.	Area.
		Acres.		Acres.		Acres.		Acres.		Acres.		Acres.		Acres.		Acres.		Acres.
For Minerals, Silver, Tin, &c.	823	31,006	795	30,043	901	31,719	716	26,459	614	21,880	460	23,308	532	23,588	541	22,129	642	25,604
For Coal, Slate, Shale, &c.	45	11,562	50	11,667	66	15,430	73	16,809	66	16,053	27	8901	35	9922	49	13,136	39	11,077
For Gold	32	537	65	1403	92	1894	127	2424	108	1687	91	1829	70	1340	42	870	38	749
Dredging Claims	31	482	30	410	29	413	36	399	33	369	20	289	20	195	42	363	41	502
Mining Easements	113	608	104	616	97	621	87	607	81	606	77	592	77	570	68	494	77	484
Machinery Sites	38	180	33	147	34	152	31	123	30	124	26	115	27	112	25	150	21	110
Licences to search for Coal or Oil	—	—	—	—	51	117,031	73	137,692	36	34,761	21	38,528	19	14,130	8	10,669	4	5090
Water-rights Mineral and Gold	551	2116 & 1975 sluice-heads	559	2094 & 1982 sluice-heads	543	2247 & 2060 sluice-heads	493	3002 & 1814 sluice-heads	435	2147 & 1612 sluice-heads	338	1990 & 1520 sluice-heads	371	2167 & 1604 sluice-heads	360	2190 & 1591 sluice-heads	394	2246 & 1748 sluice-heads

Copper—Spot
Lead—Soft
per ton
Spelter : per ton
Tin—Standard
Silver—Standard
Spot

Mineral Products for
1927 inclusive.

Value.
£
1,379,204
1,729,129
2,257,147
2,277,159
1,650,027
1,574,995
1,432,193
1,349,497
1,493,502
1,415,700
1,007,038
1,225,575
1,521,050
1,584,290
1,750,574
1,301,090
1,421,104
822,851
1,013,415
1,219,456
1,496,804
1,700,861
1,808,844
1,621,027
erated o 1894
31,988
£55,771,130

COMPARATIVE Statement of Revenue from Mines, being Rents, Fees, Storage of Explosives, &c. (exclusive of Survey Fees), paid to the Treasury for the Years ending 30th June, from 1882 to 1903, and for Six months ending 31st December, 1903, and for the Years ending 31st December, 1904 to 1926, inclusive.

Year.	Amount.	Year.	Amount.
	£ s. d.		£ s. d.
1882.....	23,077 1 9	1905, Jan. to Dec.	20,208 17 0
1883.....	15,439 14 5	1906.....	24,136 12 5
1884.....	6981 11 10	1907.....	24,794 7 7
1885.....	11,070 5 7	1908.....	20,311 3 0
1886.....	12,523 10 4	1909.....	22,804 1 5
1887.....	14,611 11 5	1910.....	22,221 18 0
1888.....	23,502 8 4	1911.....	20,556 15 10
1889.....	17,254 9 0	1912.....	17,639 19 11
1890.....	26,955 4 9	1913.....	19,410 17 8
1891.....	37,829 16 5	1914.....	14,087 0 6
1892.....	17,568 18 4	1915.....	17,679 3 6
1893.....	16,971 9 2	1916.....	14,678 19 10
1894.....	16,732 7 7	1917.....	14,669 7 2
1895.....	15,323 1 9	1918.....	17,833 14 9
1896.....	20,901 13 2	1919.....	15,388 7 7
1897.....	25,631 0 3	1920.....	16,767 11 6
1898.....	33,661 13 9	1921.....	11,248 14 11
1899.....	24,696 10 5	1922.....	14,184 7 3
1900.....	28,380 11 10	1923.....	13,224 11 9
1901.....	21,569 5 2	1924.....	14,678 13 11
1902.....	19,471 0 1	1925.....	14,229 8 7
1903.....	17,776 14 3	1926.....	15,163 15 7
1903, 1 July to 31 Dec.	14,758 17 1	1927.....	16,887 9 9
1904.....	16,631 8 2		

The above Statement does not include Stamp Duties upon Transfer of Leases and Tax payable upon Dividends, from which sources large sums are derived.

RETURN Showing the Average Annual Prices for Minerals during recent years.

st December,

Force on st Dec., 1926.	In force on 31st Dec., 1927.
No.	Area.
Acres.	Acres.
11	22,129
642	25,604
19	13,136
39	11,077
42	870
41	363
38	494
25	150
8	10,669
4	5090
394	2246 & 1748
1591	sluice-heads
sluice-heads	

	Average for 1917.	Average for 1918.	Average for 1919.	Average for 1920.	Average for 1921.	Average for 1922.	Average for 1923.	Average for 1924.	Average for 1925.	Average for 1926.	Average for 1927.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Copper—Standard, Spot : per ton	125 2 5	115 11 6	90 19 4	97 12 5	69 8 8	62 3 6	66 7 4	63 4 3	61 9 7	58 1 0	55 13 10·642
Lead—Soft Foreign : per ton	30 0 0	30 2 8	28 3 11	38 4 7	22 14 6	23 14 10	25 19 4	33 13 11	35 17 3	36 2 3	24 8 2·140
Spelter : per ton.....	52 3 6	52 3 11	42 5 3	45 4 6	26 4 1	29 14 2	32 18 4	33 12 0	36 5 0	34 3 0	28 9 10·905
Tin—Standard, Spot : per ton	237 13 1	329 11 2	257 9 8	296 1 7	165 8 2	159 10 9	191 7 5	248 17 4	261 1 8	291 3 0	289 1 4·879
Silver—Standard, Spot : per oz	3 4·88	3 11·57	4 9·06	5 1·56	3 0·875	2 10·41	2 8·37	2 9·97	2 8	2 6½	2 2·045

FIELD INVESTIGATION.

A statement of the field work performed by me is listed hereunder:—

- (1) Examination of the Cygnet Gold Mine.
- (2) Investigation of the Beds of Sand on the properties of R. D. Room, Deviot, and J. W. H. T. Davies, Beauty Point.
- (3) Examination of Cascade Tin Mine, near Derby.
- (4) Visit to Round Hill Silver-Lead Mine.
- (5) Investigation of the Ore Deposits of Royal George Mine, Avoca.
- (6) Visit of inspection to Kingston Sand Beds.
- (7) Visit of inspection to Mount Rattler Tin Mine.
- (8) Investigation of Williamsford Tin Mine.
- (9) Inspection of Davies and Ryan's Prospect, near Aberfoyle, Avoca.
- (10) Examination of Sterling Valley and other mines at Tullah.
- (11) Examination of Oceana Zinc-Lead Deposits near Zeehan.
- (12) Examination of Perry Mine, near Zeehan.
- (13) Investigation of Queensbury Ore Deposits.
- (14) Inspection of Smallhorn's Tin Ore Prospect, near Gladstone.
- (15) Inspection of Railton Cement Works.
- (16) Investigation of Mount Lindsay Tin Mine, Stanley River.
- (17) Examination of Gold-bearing Tertiary Gravels, near Elliott.
- (18) Examination of Gold-bearing Tertiary Gravels, near Wynyard.
- (19) Examination of Birthday Tin Mine, Heemskirk.
- (20) Visit of inspection to Washington Brown Prospect, near Mount Housatop.

- (21) Examination of Connell Tin Ore-body, Exe River.
- (22) Examination of Ahern Tin Ore-body, Exe River.
- (23) Examination of South Renison Bell Tin Mine.
- (24) Investigation of Groom River Alluvial Tin Ore Deposits.
- (25) Inspection of Garfield Tin Mine, Gladstone.
- (26) Inspection of Blue Tier Weld Mine.
- (27) Investigation of the Alluvial Tin Ore Deposits of Lower George River.
- (28) Investigation of Coal Prospects in the neighbourhood of Berriedale.
- (29) Visits to Oil Shale Works at Latrobe.
- (30) Examination of Bismuth Ores, west of Moira.
- (31) Investigation of North Zeehan Lead Mining Area.

In addition to that work I completed a geological survey of the Blue Tier District, an area of 105 square miles.

ACKNOWLEDGEMENTS.

It would not be fitting to bring this report to an end without making reference to the loyal service rendered by every officer of the Department. Co-operative effort is essential to the efficient performance of any works of a varied character and of the expanding activities of a live Department in particular. It is therefore very pleasing to place on record my appreciation of the manner and the spirit of co-operation in which each officer entered upon and performed his duties.

A. McINTOSH REID, Director of Mines.

28th May, 1928.

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REPORT OF THE GOVERNMENT GEOLOGIST FOR THE YEAR 1927.

Hobart, 4th April, 1928.

SIR,

I HAVE the honour to submit my report for the year ended 31st December, 1927.

Field Investigations.

The field work during the year consisted entirely of special examinations of short duration in connection with individual mines, deposits, &c. These examinations were carried out in response to applications by individuals, syndicates, companies, &c. The time occupied by these examinations and other work did not permit of the carrying out of any extended field trip, with the object of areal mapping.

The following list contains a complete statement of the field work performed:—

- (1) Preliminary Geological Examination of the Cox Bight and Port Davey District.
- (2) Examination of Gold Prospect at Adamsfield.
- (3) Examination of Water Seepage at Hobart Gaol.
- (4) Examination of Strathblane Coal Mine.
- (5) Examination of Bell's Plains Mine.
- (6) Visit to Shannon Tier.
- (7) Examination of the Coalfields in the vicinity of Bicheno and St. Albyn.
- (8) Examination of the Tin Field south of Bicheno.
- (9) Examination of Water Seepage at the Blind Institution.
- (10) Visit to North-Eastern Districts with Mr. J. T. Moate.
- (11) Inspection of Roma Mine, Branzholm, and Lone Brother Mine, Derby.
- (12) Inspection of Spring at Bagdad.
- (13) Examination of Greisen Lodes at Rattler Hill, Weldborough.
- (14) Examination of Miss Campbell's property, Boobyalla.
- (15) Examination of the Sheffield District in connection with Underground Water Supplies.
- (16) Examination of Lowe's Show, Odd Boys', and other Mines, Mathinna District.

The following reports were prepared in connection with the above and other field trips:—

- (1) Geological Report on the Cox Bight Tin Field.
- (2) Report on the Fly-by-Night Mine at Gladstone.
- (3) Report on Haley's Lease Mine, Poimena.
- (4) Report on the Rex Hill Tin Mine.
- (5) Report on A. C. Nichol's Mine, Frome River.
- (6) Water Seepages at the Gaol.
- (7) Report on Properties of Messrs. W. A. and O. J. Walsh, Branzholm.
- (8) Supplementary Report on the Seepages at the Hobart Gaol.
- (9) Report on Gold Prospect at Adamsfield.
- (10) Report on the Strathblane Coal Mine.
- (11) Supplementary Report on the Strathblane Coal Mine.
- (12) The Mineral Resources and the Mining Industry of the North-Eastern Districts in relation to the possible provision of Hydro-Electric Power.
- (13) Report on the Bakhap Lode, Branzholm.
- (14) Report on the Bell's Plains District.
- (15) Coal in the Bicheno and St. Albyn District.
- (16) Report on Water at the Blind Institution.
- (17) Report on the Alluvial Tin Deposits at Bicheno.
- (18) Report on Spring at Bagdad.
- (19) Report on Property of Miss Campbell at Boobyalla.
- (20) Report on Roma and Lone Brother Mines.
- (21) Report on Greisen Lodes of Rattler Hill.
- (22) Report on Amber Creek Mine.
- (23) Report on selection of Bore Sites for Brock Bros., Mathinna District.
- (24) Report on possibilities of obtaining Underground Water at Sheffield.

Preparation and Publication of Bulletins, &c.

The bulletin on the Low Rocky district was completed and became available for publication. Ministerial authority was not, however, given for its publication.

The greater part of the Adamsfield bulletin was also prepared. The completion of this, however, has been delayed on numerous occasions by the extraordinary field trips which had to be made. It will be completed, and be available for printing, during 1928.

Assistant Geologist.

Mr. F. Blake was appointed as Assistant-Geologist on 1st March. Mr. Blake accompanied me on most of the

field trips during the year, and carried out several independent ones, viz.:—

Geological Examination and Boring Campaign at Kingston.

Geological Examination and Boring Campaign at Bicheno.

In the office he has assisted me generally, and, amongst other matters, has performed the following:—

- (1) Reorganised the fossil, mineral, and rock collections.
- (2) Reorganised the store collections of rocks, minerals, and fossils.
- (3) Carried out all the work in the compilation of a new geological map of Tasmania.
- (4) Assisted with the mineral arch.
- (5) Assisted in the compilation of report on coal and oil shale for the Australian Commonwealth Engineering Standards Association.
- (6) Supervised the compilation of a complete set of geological plans.

During the year Mr. Blake attended lectures in Geology II. and passed with high distinction.

Cadet Geologist.

Mr. Q. J. Henderson was appointed as Cadet Geologist on 1st March. He has been engaged chiefly upon the drafting work connected with the geological surveys and examinations. He has also, during any available time, proceeded with the preparation of a complete set of the geological maps of the different parts of the State.

His field work has consisted of:—

- (1) Assisting the Assistant-Geologist in the survey and boring of the Kingston district.
- (2) Assisting the Director of Mines in the areal survey of the Blue Tier district.

In addition he has assisted in many other matters, such as the erection of the mineral arch, the removal into the new rooms, &c.

During the year Mr. Henderson attended lectures in Geology I. and passed the examination therein.

Routine and Other Duties.

During the year a considerable amount of extraordinary work was performed. This included:—

- (1) Erection of the mineral arch.
- (2) Bringing up-to-date of the pamphlet issued in connection therewith.
- (3) Removal of the offices, library, stores, collections, &c., into the new rooms.
- (4) Much attention to drilling matters during the absence of the officers connected therewith.
- (5) Weighing and certifying to the osmiridium of Tasmanian Osmiridium Producers' Co-operative Association.

And the preparation of extraordinary reports, such as:—

- (1) Report on Economies which would result in the Geological Survey of Tasmania if an accurate topographical map was provided.
- (2) Report on Permo-Carboniferous Rocks in Tasmania.
- (3) Report on Metamorphic Rocks in Tasmania.
- (4) Compilation of Statistics, &c., in connection with the Power Survey of the State.
- (5) Report on Coal Resources in connection with the Power Survey of the State.

A considerable amount of correspondence had to be attended to, and numerous interviews held with visitors desiring information about mineral deposits, mines, &c.

University Lectures.

Some few years ago arrangements were made between the Hon. the Minister for Mines, and the Hon. the Minister for Education, and the University for the Geological Survey to give lectures in geology for the University.

In accordance with this agreement, which was agreed to by the present Hon. Minister for Mines, and acting under instructions from yourself, I acted as lecturer in Geology II. during 1927.

Apart from the value of these lectures to the University and the State, I must point out the great importance of them to the Department at the present time, as they provide the only means of instruction for the Assistant Geologist and the Cadet Geologist who are at present members of the Geological Staff.

Yours faithfully,

P. B. NYE, M.Sc., B.M.E.,

Government Geologist.

A. MCINTOSH REID, Esq.,

Director of Mines, Hobart.

REPORT OF THE CHIEF GOVERNMENT CHEMIST AND ASSAYER, LAUNCESTON, FOR THE YEAR 1927.

Mines Department Laboratory,
Launceston, 28th March, 1928.

SIR,

I BEG to submit my annual report for the year ending 31st December, 1927.

During the year the work consisted largely of making metallurgical tests and analyses of ores, rocks, coal, and minerals.

The total number of assays and analytical tests made for the public and the Department amounted to 4800.

Assays have been made for gold, silver, lead, tin, zinc, copper, bismuth, tungstic acid, molybdenum, barium, iron, manganese, sulphur, nickel, cobalt, osmium, iridium, ruthenium, rhodium, platinum, chromium, antimony, arsenic, titanium, phosphorus, magnesium, potassium, sodium, vanadium, mercury, fluorine, and aluminium. Complete analyses have been made of rocks, ores, clay, shale, coal, and alloys. Distillation tests of shale, &c., have been carried out.

Personal Interviews.

In addition to the large number of inquiries by post, over 1700 personal interviews have been attended to. The

large amount of technical information supplied has involved considerable work after office hours.

In order to cope with the increased amount of work Mr. E. W. Colman was appointed to the position of sampler, in the laboratory.

Correspondence.

A large amount of correspondence has been dealt with during the year, the number of letters in and out totalling 1350.

I desire to place on record my appreciation of the splendid services rendered by the officers of the staff—Messrs. L. H. Bath, W. St. C. Manson, and E. L. Colman.

I have the honour to be,

Sir,

Your obedient Servant,

W. D. REID,

Chief Government Chemist and Assayer.

The Director of Mines, Hobart.

REPORT OF THE STATE MINING ENGINEER.

Mines Department,
Hobart, 1st May, 1928.

SIR,

I HAVE the honour to submit my report for the year ended 31st December, 1927.

Field Investigations.

This work consisted of special examinations of properties in various parts of the State, including Cape Barren and King Islands.

The following is a list of reports prepared during a period of five months in which the writer was engaged as an officer of the Department:—

- (1) Report on Section 9679-M, Mount Claude District.
- (2) Report on the Washington Silver-Lead Mine, Moirina, Middlesex District.
- (3) Report on Hard Luck Alluvial Tin Deposit, Cape Barren Island.
- (4) Report on Battery Bay Alluvial Tin Deposit, Cape Barren Island.
- (5) Report on Fraser River Black Sand Deposit, King Island.
- (6) Report on Cygnet Gold Mine, Cygnet.
- (7) Report on Wallace and Kitto's Prospecting Claims at North Dundas.
- (8) Report on Section No. 1771, Razorback Mine, North Dundas.
- (9) Report on Old Grand Prize Mine, North Dundas.
- (10) Report on Mount Bischoff Extended Mine, Warratah.
- (11) Report on Moorina Tin Mine, Moorina.
- (12) Report on Sections 10,142-M and 10,159-M, Storey's Creek District.
- (13) Report on Section 10,183-M, Storey's Creek District.
- (14) Report on Flaherty and McKenzie's Lease, Storey's Creek District.
- (15) Report on the Bell Hill Mine, Bransholme.
- (16) Report on E. L. Andrews' Leases, Central Cascades, Derby.
- (17) Report on Extended Prospecting Area, Renison Bell Hill, South Heemskirk.
- (18) Report on The Renison Bell Mining Field, North Dundas.
- (19) Report on Section 9925-M, Avoca.

In a number of cases compass surveys were made of the areas examined and plans prepared of the workings and general features.

Aid to Mining.

A number of visits were paid to the Zeehan district for the purpose of inspecting and reporting upon tribute areas.

Activities under the Aid to Mining Act, 1921, show a further decline, due primarily to the fall in the market price of silver and lead. Operations under the Act being confined to the Zeehan field, as the ore raised in that district is chiefly silver-lead, the drop in metal prices to a figure considerably below that ruling for a number of years past had a very depressing effect on the normal output of the district.

The number of Government tributors actively engaged in development and productive work is now very small. Assistance to those, in the development of their areas, has been granted in several instances, aggregating in all 245 feet of sinking and driving.

No new discoveries or important developments have been recorded.

With a return of lead to a price equivalent to the average of the past few years renewed activity on the field would ensue.

During the year the Swansea Mine has been equipped with additional hoisting and pumping machinery. A new main shaft has been sunk, and all preparations made for active productive work, pending an improvement in the market price of lead. Operations for the time being have been suspended.

Aid to Mining Trust Fund.

Expenditure.

	£	s.	d.
Salary and wages	10	11	4
Miscellaneous expenses	3	3	7
Assistance to prospectors	133	17	6
Sustenance allowance to prospectors	1,543	0	0
Cost of removal of pump from No. 2 Argent Mine	15	0	0
Storage of No. 6 Argent plant	15	0	0
	£1,721	2	5

Receipts.

	£	s.	d.
Royalty paid by tributors	46	14	2
Sale of plant, No. 6 Argent Mine	28	0	0
Sale of plant, Z.L. Prospecting Syndicate	25	0	0
Sale of Plant, Dreadnought-Boulder Mine	25	0	0
Refund of premium	353	8	1
Compensation for loss of water-wheel by fire	0	3	3
Interest on loans	100	0	0
Commonwealth grant	16	5	0
	500	0	0
	£1,094	10	6

The amount received which was distributed as

Paid to tributors ...
Royalty paid to State

Mount Claude

The new 18-inch diameter in length, completed to satisfaction. In cost,

PRIMARILY, the duties explosives are concerned Mines and Works Regulation the Inflammable Liquids those Acts does not limit he is periodically engaged ters under the Mining Act in matters otherwise connected exploitation of the mine

The simple application not express the function by an examination of the being administered that

Under the Mines and an incurred duty to ensure whether surface or underground upon an inspection ledge of all modes of connecting details of a discrimination necessarily vailing conditions to the stratigraphical condition. In instances in this State both coal and metalliferous have a comprehensive knowledge function efficiently.

The health conditions are within the essential He must necessarily provide of atmospheric dust other recognised methods purity, quantity, and ensurance of the standard of hygrometry, psychrometry of deleterious and theory and practice of the prevalence of any atmospheric condition, dependant, it is a duty of cation of corrective measures be a full knowledge of a of mine conditions. The fumes in and about metall crushing stations fall within an obligation of an inspector the prevailing condition in the interests of health

Sanitation and general the general principles of applied in the preservation

To ensure against the scribe and see that adequate any outbreak of fire, against fire are duties liery work, and in certain fire control is of much importance to mine fires must be of safety.

In addition to being mines and works, an inspector all machinery engines and boilers. Mention of machinery is of performance of that imposed of machinery under the vested in an inspector. It is a duty of an inspector and treatment of horse mine or works.

ASSAYER,

Ore Sales.

The amount received from ore sales was £587 15s. 4d., which was distributed as follows:—

	£	s.	d.
Paid to tributors	541	1	2
Royalty paid to State	46	14	2
	£587	15	4

Mount Cameron Water-Race.

The new 18-inch diameter concrete pipe syphon, 61 chains in length, completed early in the year, has given every satisfaction. In cost, durability, and other essential

features, concrete pipes are particularly suitable for the construction of a syphon when superstructures are not necessary to support it.

General.

A good deal of usual routine work was attended to, and information supplied, verbally and by correspondence, to enquirers.

Yours obediently,

J. B. SCOTT,
State Mining Engineer.

A. McINTOSH REID, Esq.,
Director of Mines,
Hobart.

INSPECTION OF MINES AND EXPLOSIVES

By J. O. HUDSON, Chief Inspector of Mines.

PRIMARILY, the duties of an inspector of mines and explosives are concerned with the administration of the Mines and Works Regulation Act, the Explosives Act, and the Inflammable Liquid Act, but the administration of those Acts does not limit the functions of an inspector, as he is periodically engaged in technical and general matters under the Mining Act and the Aid to Mining Act, and in matters otherwise correlated with the exploration and exploitation of the mineral resources of the State.

The simple application of the provisions of an Act does not express the functions of an inspector, and it is only by an examination of the general machinery of the Acts being administered that the duties can be revealed.

Under the Mines and Works Regulation Act there is an incurred duty to ensure the safety of mine workings, whether surface or underground, for which purpose it is incumbent upon an inspector to be possessed of a knowledge of all modes of mining and timbering, and the connecting details of mining practices, as his powers of discrimination necessarily extend from the immediate prevailing conditions to the suitability of any practice to the stratigraphical conditions in the interests of safe working. In instances in this State the duties being performed cover both coal and metalliferous mining, and an inspector must have a comprehensive knowledge of the dual practices to function efficiently.

The health conditions and general sanitation of mines are within the essential duties of an inspector of mines. He must necessarily practice in the technical determinations of atmospheric dust by konimetry, microscopy, and other recognised methods. The Act specifies standards of purity, quantity, and circulation of mine air and the ensurance of the standards involves a technical application of hygrometry, psychrometry, anemometry, the detection of deleterious and inflammable gases, and the general theory and practice of ventilation. Having determined the prevalence of any injurious, dangerous, or inadequate atmospheric condition, upon which health or safety is dependant, it is a duty of an inspector to enforce the application of corrective measures, for which purpose there must be a full knowledge of all practices relating to those phases of mine conditions. The general conditions of dust and fumes in and about metallurgical plants, works, and stone-crushing stations fall within a similar category, and it is an obligation of an inspector to examine and determine the prevailing conditions and institute corrective measures in the interests of health.

Sanitation and general cleanliness are of moment, and the general principles of hygiene must be understood and applied in the preservation of the health of mine workers.

To ensure against the occurrence of mine fires, to prescribe and see that adequate precautions are taken against any outbreak of fire, and to approve of all provisions against fire are duties of an inspector. In general, colliery work, and in certain classes, of metalliferous mining, fire control is of much importance, and all matters relating to mine fires must be given careful study in the interests of safety.

In addition to being required to visit and inspect all mines and works, an inspector is under an obligation to inspect all machinery used therein, other than steam engines and boilers. Mechanical knowledge for the inspection of machinery is essential, and for the effectual performance of that imposed duty the powers of an inspector of machinery under the Inspection of Machinery Act are vested in an inspector of mines.

It is a duty of an inspector to ensure the proper care and treatment of horses and other animals used in any mine or works.

In general practice it become a duty of an inspector to initiate and conduct prosecutions against persons contravening the requirements of the Act, and to appear at all court inquiries respecting mining accidents.

The functions of an inspector, consequently, extend beyond an application of the general interpretation of the Mines and Works Regulation Act to duties of a technical and skilled nature in ensuring that the prescribed standards are maintained, and that all details of mining practices are conducted in the interests of safety and well-being of the persons employed in or about any mine or works or mine contiguous thereto.

The compilation of statistics relating to the nature, quantity, and value of the mineral production, and the number of men engaged in the mining industry within the State is a specific duty of an inspector of mines.

The Explosives Act and that section of the Mines and Works Regulation Act relating to explosives operate collaterally, and these statutes impose responsibilities and duties regarding the manufacture, importation, sale, conveyance, safe handling, general storage, and use of all classes of explosives. In addition to those duties and the general application of the formal provisions of the Acts, an inspector is required to make careful examinations and tests of explosives to ensure that such are in a fit state for safe use. There must be a comprehensive knowledge of the chemical and physical properties of explosives, and of the general behaviour of different explosives under different and varying conditions of use and storage. A responsibility exists for the determination of the suitability of different classes of explosives for use under similar or dissimilar conditions and in the blasting of materials of different characters. The variation in the chemical and physical properties of explosives that must often ensue in the blasting of barren rock, light sulphides, dense sulphuric masses, and coal creates an important duty of an inspector, as different classes of explosives are not safely applicable to the same materials or conditions of blasting.

The Inflammable Liquid Act makes provision for the keeping, conveyance, selling, and exposing of inflammable liquids and carbide of calcium, and it is the duty of an inspector to ensure that the requirements of the Act are observed. Storage is of several classes, and the actual requirements of the keeping of liquids depend largely upon conditions, situation, and environment, consequently an inspector must be technically versed in the properties of petroleum products and the conditions under which such may be suitably kept in the interests of safety and the avoidance of fire risk. It is a duty of an inspector to visit and inspect storage premises, and do such other acts as will ensure that the requirements of the Act are observed.

As inferred, the duties of an inspector of mines and explosives are not limited by the engagement in technical and general matters under the Mines and Works Regulation Act, the Explosives Act, the Inflammable Liquid Act, the Mining Act, the Aid to Mining Act, and, where necessary, the Machinery Act, but he has been required to report upon mineral discoveries, assess the condition and value of plants and machinery, exercise competency in surveying, and in all matters relating to the mineral resources, mining, and mining operations. There is no definite limit to the work of an inspector, and, therefore, no concise definition of his duties can be given.

It is the duty of an inspector to perform all clerical duties connected with the working of his office.

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amount of work Mr.
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staff—Messrs. L. H.
Colman.

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Servant,

REID,
Chemist and Assayer.

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improvement in the
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Fund.

	£	s.	d.
...	10	11	4
...	3	3	7
...	133	17	6
...	1,543	0	0
No. 2	15	0	0
...	15	0	0
	£1,721	2	5

	£	s.	d.
...	46	14	2
...	28	0	0
...	25	0	0
...	25	0	0
...	353	8	1
...	0	3	3
...	100	0	0
...	16	5	0
...	500	0	0
	£1,094	10	6

REPORT OF THE CHIEF INSPECTOR OF MINES.

Hobart, 1st June, 1928.

SIR,

I HAVE the honour to submit my annual report for the year 1927 on the inspection of mines and the administration of the Mines and Works Regulation Act, 1915.

Tables showing (1) the number of persons killed and injured in and about the mines of Tasmania, (2) the rate per 1000 killed and injured in the different divisions, (3) analysis of statistics of accidents for the Western Division, are attached, also a comparative table of statistics in and about the mines of Tasmania from 1st July, 1892, to 31st of December, 1927; also a graph showing the number of persons employed, the number of persons killed, and the ratio of persons killed per 1000 persons employed.

The field staff was altered on account of Inspector Curtain having reached the retiring age. Inspector Williams was transferred from Queenstown to Launceston, and Mr. J. J. Andrew was appointed to the vacant position of Inspector of Mines, and is stationed at Queenstown.

Accidents.—The total number of accidents reported for the year was 70, as against 54 for the year 1926. The 70 accidents caused injury to 70 persons, 5 of which were fatal, and 65 caused injury which necessitated absence from work for more than 14 days. The rate per 1000 employed (injured and killed) was 13.877, compared with 10.736 for the year 1926.

The rate per 1000 persons employed in regard to fatal accidents was 0.991, compared with 0.941 for the year 1926.

The rate per 1000 persons employed who received serious injury was 12.886, compared with 9.794 for the year 1926.

The five fatal accidents were caused as follows:—

- (1) A round of holes were fired, and all the holes were reported to have exploded. The following morning the ground was worked down, and later the rock-drilling machine was placed in position and boring started. After boring a short distance an explosion occurred, due to boring into a portion of an unexploded charge of gelignite, which exploded, causing injuries of such a nature that death was instantaneous. The accident was apparently due to a cut-out hole, which examination, on working down the face, failed to disclose. The explosives were found in good condition.
- (2) In a limestone quarry a man was assisting to fire a round of holes. After igniting two fuses he was walking to the sheltering-shed; when crossing the tramlines to the bottom bench he tripped and struck the back of his head on a steel rail. The other men employed igniting charges, on reaching the shelter-shed, noticed the man lying on the rails, and carried him to the shelter-shed before the holes exploded. The injuries to the head were such as to cause death without the man regaining consciousness.
- (3) Two persons were employed battering back the wall of a deep tailrace at a sluicing mine. One man was away temporarily, and on returning found that a fall of ground had taken place, which pinned his mate in such a position that the water, which was blocked by the fall, covered the man, who was drowned.
- (4) A person employed in a quarry connected with a brickworks was levering a rock. The rock on which he was standing overturned, and the man jumped to save himself, but unfortunately, he fell, and the stone on which he was standing struck him, causing such injury that later caused death.
- (5) Two persons were employed in a shallow sluicing mine. After hydraulicking a fall of face ground, it was found necessary to remove two large granite boulders. While removing one of the boulders it was noticed that the other boulder was moving towards them; they attempted to get clear, but one of them tripped and was struck by the boulder, causing fatal injury.

Of the 65 serious accidents which occurred 16 were such as to cause fracture, and the remaining 49 were minor injuries which necessitated absence from employment for more than 14 days.

One fatal and 19 serious accidents occurred underground, and 4 fatal and 46 serious accidents occurred on the surface.

Prosecutions.—There were 9 prosecutions for breaches of the Act and Regulations. Convictions were obtained in 8 cases, and the other was dismissed. Six of the cases were in connection with failure to use appliances for the prevention of dust.

Prospecting.—A vigorous policy of assisting prospectors was continued during the year. Seventy parties, consist-

ing of 138 men, received sustenance allowance to assist them to prospect in various parts of the State. No discovery of special value was located, but the reports from several areas indicate good possibilities for further exploration.

Electrolytic Zinc Co., Risdon.—This company produced for the year 43,239 tons of zinc, valued at £1,230,525, and 135,538 tons of cadmium, valued at £22,770, from calcines produced in other States.

There has been no material additions to the plant, and the superphosphate works have produced a regular output.

The West Coast mines produced 661 fine ounces of gold, 256,318 ounces of silver, 2054 tons of lead, 5916 tons of zinc, and 19,241 tons of cadmium, the value of which was £256,729.

At the Zeehan Experimental Mill research work has been continuously carried out during the year, and improvements in treatment methods have been evolved as the result thereof. The company proposed shortly to commence the erection of a concentrating mill at Rosebery, the design work of which is at present receiving attention. This mill is being designed at the outset to treat 2000 tons of crude ore per week.

The company's administrative offices at Rosebery are approaching completion, and the erection of workshops, &c., commenced.

Underground development in both the Rosebery and the Hercules Mines has been carried forward according to plan, and the mines will be in a position to produce the requisite tonnage for the mill when same is completed.

Electric current, generated at the power station of the Mount Lyell Mining and Railway Company at Lake Margaret, has been brought to the mines from Zeehan under arrangements with the Hydro-Electric Department, and power has been available for some time for mining, ventilation, and underground lighting.

Considerable development has taken place at Rosebery and Williamsford in connection with the provision of homes for the miners and of recreational facilities for them and their families. Approximately 50 homes will have been provided by the 1st of September next, and construction will be continued as necessary.

Under arrangements made by the company with the Hydro-Electric Department, the villages of Rosebery and Williamsford have been reticulated and electric current is available for all domestic purposes.

The average number of men employed by the company in its West Coast operations during the year was 314.

Catamaran Coal Mine produced 18,271 tons of coal, valued at £23,458. At the latter end of the year the mine ceased operations owing to the want of capital. At the end of the year arrangements were being entered into to work the mine on a co-operative basis, the company paying the men a price per ton for the coal delivered in the bins. The stoppage of this mine would be of great loss to the State owing to the coal being of a good steam variety.

This is another case of a company erecting a costly surface plant before developing the mine sufficiently, and, when a small unforeseen trouble is encountered, find that they have not sufficient funds to carry them over their difficulties.

The **Esperance Coal Mining Company** are carrying out development work on the Strathblane area, about one and a half miles north of the mine which was previously worked. They have located a seam of coal, which gives every promise of developing. The seam of coal is 8 feet, and is of a hard nature, which will prove an advantage in connection with the small amount of slack which will be made in transport. There is every possibility of a large coal area existing in this vicinity.

National Portland Cement Company.—The output for the year was 21,274 tons, valued at £106,370, which was a considerable decrease on the output for the previous year.

The difficulty in disposing of the product and lack of shipping facilities were responsible for the company considering the removal of the works to the mainland. The latest information is that there is every probability of the works continuing operations at the present site.

The **Stone Quarries**, which are under the provisions of the Act, have been operated in a satisfactory manner, except in the case of one, where the dust conditions are most unsatisfactory. Steps are being taken to have the conditions rectified.

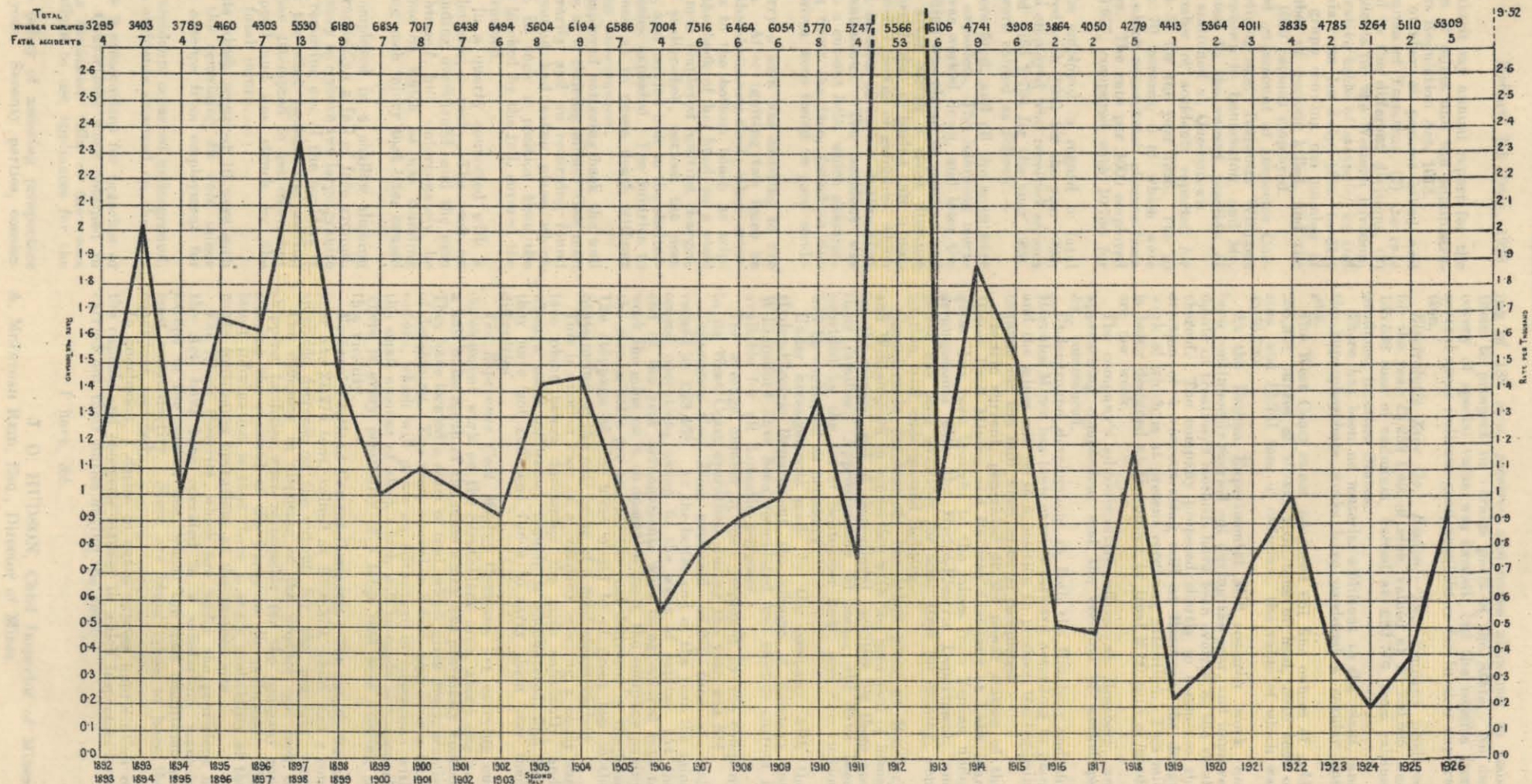
In conclusion, I desire to again express appreciation of the capable and energetic manner in which inspectors have carried out their duties during the year.

I have, &c.,

J. O. HUDSON, Chief Inspector of Mines.
A. McINTOSH REID, Esq., Director of Mines.

5 cm

DIAGRAM SHOWING THE RATIO OF FATAL ACCIDENTS IN MINES IN TASMANIA RATE PER 1000 MEN EMPLOYED



TAB

Northern a
North-East
Eastern...
North-West
Western...

Mt. Lyell
Zeelany, &c.

COMP

1 July, 18

1 Jan, 18

TABLE showing Rate per Thousand Killed and Injured in different Divisions for the Year 1927.

Division.	Average Number of Men Employed.	Number of Accidents.	Number of Persons		Total Number Killed & Injured.	Average per 1000 Killed and Injured.	Average per 1000	
			Killed.	Injured.			Killed.	Injured.
Northern and Southern	1853	18	2	16	18	9.713	1.079	8.634
North-Eastern	497	4	2	2	4	8.048	4.024	4.024
Eastern	596	2	...	2	2	3.355	...	3.355
North-Western	402	10	1	9	10	24.875	2.487	22.388
Western	1696	36	...	36	36	21.226	...	21.226
Total	5044	70	5	65	70	13.877	0.991	12.886

ANALYSIS of Statistics of Accidents for Western Division.

Division.	Number of Miners Employed.	Number of Accidents.	Number of Persons		Total Number Killed & Injured.	Average per 1000 Killed and Injured.	Average per 1000	
			Killed.	Injured.			Killed.	Injured.
Mt. Lyell	1011	17	...	16	17	16.815	...	16.815
Zeehan, &c.	685	19	...	20	19	27.737	...	27.737
Total	1696	36	...	36	36	21.225	...	21.225

COMPARATIVE Table of Statistics of Accidents in and about the Mines of Tasmania from 1st July, 1892, to 31st December, 1927.

Period.	Number of Miners Employed.	Number of Accidents.	Number of Persons.		Total Killed and Injured.	Average per 1000 Killed and Injured.	Average per 1000.	
			Killed.	Injured.			Killed.	Injured.
1 July, 1892, to 30 June 1893	3295	28	4	25	29	8.8001	1.214	7.586
" 1893 " 1894	3403	25	7	20	27	7.934	2.057	5.877
" 1894 " 1895	3789	26	4	24	28	7.390	1.058	6.332
" 1895 " 1896	4160	22	7	16	23	5.529	1.682	3.847
" 1896 " 1897	4303	36	7	31	38	8.831	1.627	7.204
" 1897 " 1898	5530	36	13	33	46	8.318	2.351	5.967
" 1898 " 1899	6180	35	9	34	43	6.957	1.456	5.501
" 1899 " 1900	6834	19	7	16	23	3.365	1.024	2.341
" 1900 " 1901	7017	29	8	23	31	4.417	1.140	3.278
" 1901 " 1902	6438	38	7	35	42	6.524	1.088	5.437
" 1902 " 1903	6484	44	6	43	49	7.557	0.925	6.632
" 1903, to 31 Dec., 1903	5604	27	8	20	28	4.977	1.428	3.569
1 Jan. 1904 " 1904	6192	73	9	65	74	11.951	1.454	10.497
" 1905 " 1905	6586	34	7	30	37	5.618	1.063	4.555
" 1906 " 1906	7004	65	4	61	65	9.280	0.571	8.709
" 1907 " 1907	7516	68	6	64	70	9.314	0.798	8.515
" 1908 " 1908	6464	60	6	58	64	9.900	0.928	8.972
" 1909 " 1909	6054	54	6	49	55	9.085	0.991	8.093
" 1910 " 1910	5770	63	8	57	65	11.265	1.386	9.878
" 1911 " 1911	5247	80	4	77	81	15.437	0.762	14.675
" 1912 " 1912	5566	60	53*	53	106	19.044	9.522	9.522
" 1913 " 1913	6106	64	6	60	66	10.809	0.982	9.826
" 1914 " 1914	4741	69	9	62	71	14.977	1.896	13.081
" 1915 " 1915	3908	71	6	67	73	18.679	1.535	17.144
" 1916 " 1916	3864	53	2	51	53	13.716	0.517	13.198
" 1917 " 1917	4050	50	2	48	50	12.345	0.493	11.852
" 1918 " 1918	4279	50	5	45	50	11.684	1.168	10.516
" 1919 " 1919	4413	58	1	57	58	13.143	0.226	12.917
" 1920 " 1920	5364	52	2	50	52	9.694	0.372	9.322
" 1921 " 1921	4011	40	3	37	40	9.972	0.748	9.224
" 1922 " 1922	3835	31	4	27	31	8.083	1.043	7.040
" 1923 " 1923	4785	64	2	63	65	13.584	0.417	13.166
" 1924 " 1924	5264	72	1	73	74	14.057	0.189	13.867
" 1925 " 1925	5110	62	2	61	63	12.328	0.301	11.937
" 1926 " 1926	5369	54	5	52	57	10.736	0.941	9.794
" 1927 " 1927	5044	70	5	65	70	13.877	0.991	12.886

* Mt. Lyell disaster.

TABLE showing the Number of Persons Killed and Injured in and about the Mines of Tasmania during the Year 1927.

PLACE OR CAUSE OF ACCIDENT.	INSPECTION DISTRICTS.													
	Northern and Southern Division.		North- Eastern Division.		Eastern Division.		North- Western Division.		Western Division.				TOTAL.	
									Zeehan and other Districts.		Lyell District.			
	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.
UNDERGROUND—														
Falls of ground .....	...	1	...	...	...	...	1	...	1	...	...	...	...	3
Shaft Accidents—														
Falling down passes and shafts.....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total .....	...	1	...	...	...	...	1	...	1	...	...	...	...	3
Miscellaneous (underground).														
Haulage.....	...	1	...	...	...	...	...	...	...	...	...	...	...	1
Trams, &c. ....	...	...	...	...	...	1	...	...	...	...	...	...	...	1
Sundry accidents.....	...	...	...	...	...	...	4	...	1	...	5	...	10	
Explosives .....	...	...	...	...	...	...	1	...	4	...	...	1	4	
Total .....	...	1	...	...	...	1	4	...	5	...	5	1	16	
Total Underground ....	...	2	...	...	...	1	5	...	6	...	5	1	19	
ON SURFACE—														
Smelting-works.....	...	1	...	...	...	...	...	...	1	...	2	...	3	
Machinery .....	...	...	...	...	...	1	1	...	1	...	4	...	7	
Tramways .....	...	3	...	...	...	...	...	...	2	...	2	...	4	
Falls of persons	2	4	...	...	...	...	...	...	...	...	3	2	7	
Explosives .....	...	2	...	...	...	...	1	...	1	...	...	...	4	
Miscellaneous .....	...	8	...	1	...	...	2	...	8	...	1	...	20	
Sluicing .....	...	...	2	1	...	...	...	...	...	...	...	2	1	
Total Surface.....	2	14	2	2	...	1	4	...	13	...	12	4	46	
Gross Total, 1927	2	16	2	2	...	2	9	..	19	...	17	5	65	

REPORT OF THE CHIEF INSPECTOR OF MAGAZINES AND EXPLOSIVES.

Hobart, 1st June, 1928.

SIR,
I HAVE the honour to submit my annual report in connection with the administration of the Explosives and Inflammable Liquid Acts for the year 1927.

The imports of explosives were:—

	lb.
Monobel	17,750
Gelignite	421,700
Blasting gelatine	38,720
Ligdyn	45,000
Gelatine dynamite	14,000
Powder	8,700
Detonators	420,000

The quality of the explosives, generally, was good, but there was a tendency to freeze on the part of one class, which gave considerable concern. The matter has received very close investigation, and it is hoped that the steps taken will remove any risk to the persons using the explosive. Small quantities of explosives have been condemned and destroyed, chiefly due to the absorption of moisture. The quality of fuse, in some cases, was found not to be to the usual standard, and was restricted from use.

There were eight accidents due to explosion during the year, one being fatal and seven seriously injured. In no case could the occurrences be traced as due to any defect in explosives.

The bulk installation mentioned in the last report has been completed, and the first bulk ship discharged in Tas-

mania. The pumping was carried out without any difficulty, and the pipe lines, tanks, and connections were all that could be desired, there not being the slightest leakage. The ship was discharged by pumping three hundred tons per hour.

The introduction of bulk distribution of inflammable liquid and the new methods render it necessary to provide a new Act and regulations. The present Act and regulations were made for case storage only, and, with the new conditions, are now obsolete.

There were no prosecutions during the year.

Revenue.—

	£	s.	d.
Magazine licences (116)	110	10	0
Licences to store (312)	307	10	3
Registered premises (352)	91	17	6
Permits to sell explosives (526)	124	8	9
Permits to sell fireworks only (90)	11	1	0
Permits to convey (89)	21	15	0
Permits to import (27)	51	5	0

Magazine rents

£718 7 6
243 14 11

£962 2 5

I have, &c.,

J. O. HUDSON, Chief Inspector of Explosives,
A. McINTOSH REID, Esq., Director of Mines.

MR. INSP

I have year 1927 of the va of the wo The ave was 1030½ Acciden arisen, ha by Section 1915. Th year, and ground. and 3 at visions of One per results of minutes a remainder, one 18 da 22 days, i days, three one 117 d Two suff skull, two to eyes, tw from cuts, these have In conne occurred d inspecting of Inspect H. Curtain attend the gained sub rence, whic Mine, War holes were all shots. was reporte machine ar dently bor holes, whic to explode, his chest. The verdict dentially an the man ha the acciden rect, the r one of the The grou off's" coul contained o it difficult The othe the Broke Devonport. after doing he evident a manner of a tram regained c had also b turned bac alarm. Th before the gelignite. was purely to anyone On 12th they had drilling m explosion also cutti 21 days' v was not o afterwards was found in the bo off the ac serious. between t explosives In this occurred. as having men, and did not r day shift

REPORTS OF INSPECTORS OF MINES.

Mr. INSPECTOR H. A. VAUDEAU reports:—

I have the honour to submit my annual report for the year 1927 in connection with the work and administration of the various Acts delegated to this office and a resume of the work carried out in the district.

The average number of persons engaged in the district was 1030½ men.

Accidents.—Report concerning these, as they have arisen, have been sent forward to head office as required by Section 26 of the Mines and Works Regulation Act, 1915. Thirty-two accidents were registered during the year, and of these 21 occurred on the surface and 11 underground. Seven of these accidents happened at a quarry, and 3 at works which have been brought under the provisions of the Act.

One person was killed underground, and one died as the results of injuries received on the surface some twenty minutes afterwards, not regaining consciousness. Of the remainder, one lost 14 days, one 16 days, three 17 days, one 18 days, one 19 days, three 20 days, two 21 days, one 22 days, two 24 days, one 25 days, one 27 days, one 32 days, three 34 days, two 35 days, two 38 days, one 90 days, one 117 days, and two almost six months.

Two suffered broken legs, one broken ribs, one fractured skull, two lost tops of little fingers, four suffered injuries to eyes, two from jars, ten from crushes and bruises, nine from cuts, one from sprain, and one from burns. All of these have since returned to work.

In connection with the fatal accident underground, this occurred during my absence from my district, while I was inspecting in the Mount Lyell district, owing to the absence of Inspector W. H. Williams on sick leave, Inspector C. H. Curtin being sent forward by the Director of Mines to attend the inquest. From his report, and information I gained subsequently, the following particulars of the occurrence, which happened at the Mount Bischoff Extended Tin Mine, Waratah, are:—On the previous day a round of holes were fired; the men stated that they heard reports of all shots. The place was worked down next morning and was reported safe, and the man rigged up a rock-drilling machine and started to bore. Shortly afterwards he evidently bored into an unexploded portion of one of the holes, which had been cut off, this causing the gelignite to explode, projecting its burden with such force against his chest, face, and arms that death followed instantly. The verdict of the jury was "that he met his death accidentally and not otherwise." A report was circulated that the man had bored into "gas," and this was the cause of the accident. I am positive that this was absolutely incorrect, the mine itself being one almost free from gas and one of the best ventilated in my district.

The ground was heady and of such a nature that "cut-offs" could occur, and the hole in which the gelignite was contained could be obliterated in such a manner as to make it difficult to discern when cleaning down.

The other accident which resulted fatally occurred at the Broken Hill Proprietary Limestone Quarry, Melrose, Devonport. The man had been lighting "pops," and, after doing so, had started to walk to the shelter-shed when he evidently looked back, stumbled, and fell, falling in such a manner as to strike the back of his head on the end of a tram line. No one actually saw him fall, and he never regained consciousness after the accident. His mates, who had also been lighting fuses, were all ahead of him. One turned back and saw him on the ground and gave the alarm. They rushed back and got him to the shelter-shed before the fuses he was lighting reached the charge of gelignite. The coroner's verdict was "that the accident was purely accidental, and that no blame was attachable to anyone."

On 12th May two men were working in a main drive; they had cleaned down and started to bore with rock-drilling machine. The drill ran into an old hole, when an explosion occurred, causing an injury to the eye of one, also cutting the left arm of the person concerned. He lost 21 days' work. The other person suffered from shock, but was not otherwise affected. On the place being inspected afterwards, and the drill being withdrawn, some gelignite was found in the hollow of the drill and more was observed in the bottom of the hole. If all the explosives had gone off the accident, no doubt, would have been much more serious. Evidently there must have been an "air-gap" between the explosives, which saved the position. All the explosives I tested at the time were of good quality.

In this same drive, on 19th July, another serious accident occurred. On the afternoon of the 18th the man mentioned as having suffered from shock was on shift with two other men, and they hit seven holes in the face of drive and did not report any misholes. He returned to work on the day shift with his usual mates, and, after cleaning down,

started to bore again, as was supposed under the previous "cut and easier holes." From inquiries made and what I saw I am satisfied that one of the easers had not gone off. The material from the cut-holes, &c., had covered the collar of this, so that when men went into work it was not noticed and tested in the usual manner. The other butts evidently were tested, but on the ground being cleaned away no one tested the bottom "easer." This man with his machine bored into this hole and an explosion occurred. In a statement to me he said he was boring in a direction that would be, when completed, one foot from this hole. His judgment was bad, as the holes met.

One mate was attending to him and another boring from the other side of drive, and he received the worst of the explosion, receiving a terrible "peppering." It was thought he could not possibly recover from injuries received, viz., penetration of both eyes, puncture wounds in both legs, abdomen, and head, but, thanks to the doctor's skill and the wonderful pluck of the man, he is quite recovered. He returned to work on the 18th January, 1928.

The other man who bored into the explosives received penetration of the right eye and wounds in right leg and face, and lost 35 days from work. The other man received no injuries.

It might have been expected that after the first occurrence more care would have been taken, but it looked to me as if even reasonable care had not been taken, particularly so when it was stated by one of the afternoon shift men that there was a doubt as to the explosion of all the seven charges.

At a works a man was engaged welding an outlet nipple on a 90-gallon drum, which had previously contained methylated spirit, when an explosion occurred. A ring on the drum struck him on the forehead, causing fracture of the skull. When I examined the drum I found the bung (screw-plug) was still in place (one end of the drum was thrown over 40 feet away).

There would have been a big risk of explosion if this plug had been taken out, but it was a foolish act to use the "torch" without doing so. He lost 38 days from work.

At a mine a man was riding on a full truck of tailings going to the dump. This was supposed to strike some unseen obstacle and overturn, throwing him off the truck on to his side and against the tram rails, causing the fracture of his ribs and contusions to muscles. He lost 34 days from work.

At the same mine a miner was rigging a rock-drilling machine when a piece of mullock came away from the foot-wall of stope and fell on his right leg, crushing and fracturing the foot and ankle. He stated he had tested all the ground and considered it safe. He lost about six months from work.

A man at a works, in turning around, tripped against a concrete abutment and fell on the concrete floor and broke his right leg.

Three men received injuries to eyes, as mentioned above, in premature explosives; another received an injury to his right eye by a chip of limestone flying up from a piece he was spalling. He lost 14 days, but is alright again.

Two men lost portion of their little fingers on left hand. One was standing on a log felling scrub; his both feet slipped, and, in falling, he placed his left hand on log, the axe in his right hand, and fell and severed the little finger below second joint. He lost 35 days work. The other, whilst pitching a rock-drill machine hole, got his finger in the way of the drill, which slipped and caught his finger, taking the top off. He lost 21 days from work.

One man was picking down ore in open-cut face about ten feet from floor; a piece of porphyry, approximately two tons in weight, alongside of him gave way, and, in falling, struck him on the hip, bruising it badly. He lost 90 days work. He told me he had tested this lump just before the accident and considered it safe.

Another person was loading mullock on to a trolley. He had picked up a big lump to place it thereon when it broke, portion of it falling on his foot and bruising it. He lost 17 days from work.

Several of the accidents appeared to have happened through carelessness or want of thought. For instance, some shots were being fired in connection with the forming of a water-race; warning had been given for men to get under cover, but one man took up a position which he considered safe, though he was told to get further away, and was struck by a flying stone. There were plenty of trees in the vicinity where adequate shelter could have been obtained, but he stood out in the open. He lost 34 days from work.

Another person was boring down some ground from the roof of a stope when a piece came away and slipped along

Tasmania during

Injured.	Killed.	Injured.	TOTAL.
...	...	...	3
...	...	...	3
...	...	...	1
...	...	...	1
5	...	10	
...	1	4	
5	1	16	
5	1	19	
2	...	3	
4	...	7	
2	...	4	
3	2	7	
...	...	4	
1	...	20	
...	2	1	
12	4	46	
17	5	65	

EXPLOSIVES.

without any difficulty connections were all the slightest leakage. g three hundred tons

tion of inflammable necessary to provide present Act and regulation, and, with the new

the year.

	£	s.	d.
...	110	10	0
...	307	10	3
...	91	17	6
...	124	8	9
(90)	11	1	0
...	21	15	0
...	51	5	0
£718	7	6	
...	243	14	11
£962	2	5	

Inspector of Explosives, Mines.

the bar on to his leg. I have had to speak to this man several times about his foolish method of barring down. He will persist in standing in the very worst positions imaginable, and I am afraid, from what I was told, he was doing so on this occasion. He lost 32 days work.

Two men were shovelling dirt, one on the surface, the other underground, and undermined the heap to such an extent that stones came away from above and rolled on them. At one quarry men are spoken to repeatedly, both by the foreman and myself, about the folly of doing this.

The rest of the accidents were mostly those which are incidental to the industry and which an inspector is ever endeavouring to keep down. Owing to the increase in the number of the accidents occurring, much care, time, and patience were given to try and eliminate risks, &c.

Two fatal accidents were reported to me by the Superintendent of Police which occurred at quarries where stone was being obtained for road work. One of these was unsafe. Neither of these places had been brought under the provisions of the Mines and Works Regulation Act, 1915, so I could not deal with them. I think the time is ripe when all quarries and rock-crushing plants in the State should be registered and brought under the Act. The conditions existing at some of these are deplorable.

Works and quarries can be brought under the Act by recommendation from an inspector, &c., according to Section 6 of the Act, but it might be thought one had not sufficient work to do if one did so, and this is far from the state of things with me. Recently I saw a rock-crusher working that if I saw the same conditions existing at a mine I would have stopped the plant at once until something had been done for the protection of the health of the men.

Ventilation.—There is still room for much improvement at one mine. I find I have to continually keep at the manager of the mine to induce him to endeavour to make things better.

In most instances I have been met with a ready response to requests made. At one place improvements were delayed for a time, but this was owing to difficulty in obtaining a suitable motor; at another through lack of funds, but these were eventually put right.

Settlement of Ground.—Apart from a few places where ground moved owing to structural weaknesses, and which gave plenty of warning, nothing of a serious nature has occurred. These are being mined with the usual precautions, and, as far as I am aware, no accidents have happened while doing so.

Change-houses.—These, on the whole, have been satisfactory. At one works the manager requested that this matter be left to stand for the time being owing to monetary difficulties. The men themselves being agreeable to this, it was granted for the time being.

Shelter-sheds and Crib-places.—I am still endeavouring to get improvements in this connection. In most instances one gets a ready response, but one has to continually insist on them being kept clean.

Health and Sanitation.—The man mentioned in my last annual report as an old West Coaster has passed away. I have not heard of any fresh cases of miners' complaint since. Regret has been expressed to me by several managers that the Miners' (Occupational Diseases) Relief Fund Bill, 1927, did not pass and come into force.

At one works, where it was found necessary to insist on the wearing of respirators, one man failed to do so. He was brought before the Warden of Mines and fined heavily. It was hoped this would be a warning to all men concerned, but, on going through the works on 1st November, five men were found failing to use them, though they had them handy. The men took the matter up with their representatives, who interviewed the Chief Inspector, who agreed, on their undertaking to see the requirements of the Act carried out, to postpone the cases *sine die*. This was done. As the informations were laid against them within the six months, as required by Section 73 of the Act, the cases can be called on at any time. It is hoped this will not be necessary.

I am pleased to state the last time I was at the works I found the men all using the respirators when required. At these works it is proposed to put in what is known as the "wet process," and when this is done the dust nuisance will be ameliorated. I shall be pleased to see it done. If one insisted on proper precautions being taken to remove the dust by way of exhaust, fans, &c., at this works under existing conditions I believe it would be impossible to carry on operations. I am trying to get the next best possible.

Underground improvements have been obtained in many instances, but I am sorry to report that I still find signs where men are not using sufficient water to allay dust, but it is difficult to obtain sufficient evidence to get convictions if legal action were taken.

Explosives and Magazines.—Considerable attention has been given to the safe handling and storage of explosives

at the mines and quarries. The handling and forwarding of these as they arrive from the mainland has been supervised as occasion demanded.

At one mine 57 cases of gelignite showed exudation to such an extent that it was deemed necessary to have this re-wrapped, the explosives company sending a man over from the mainland to do so.

There was slight exudation noticed at a few other places, but not sufficient to stop its use.

Only a very small quantity of sodium-nitrate gelignite had to be destroyed. A new magazine has been erected at one mine as required, and an improvement is expected thereat in handling, &c., as a consequence.

Three reports have reached me in connection with faulty fuse. In one instance it was reported that a person was lighting four fuses. He lit these, and, looking to see if they were burning satisfactorily, he noticed the first bit had burnt to the collar of the hole, a distance of three feet. The holes were tamped with clay, and he just had time to step into safety when this hole exploded. I tested several pieces of fuse, as did the superintendent of the quarry, and could not find any faulty. At the other places quick burning was reported, but the pieces complained of were all of a similar nature. I have tested fuse again and again, and have always found the burning rate to be satisfactory.

I have had no complaints *re* detonators.

Careless handling of explosives was noticed at one big mine, and the matter was taken up with the superintendent, who promptly took the matter up with the staff, and I do not expect any further trouble in this connection.

Incline Haulages, Machinery, Ropes, &c.—One accident occurring on an incline haulage was reported to this office. The gripman left the "gate" open, and he pushed the full truck of ore over the brow; not having the "grips" fast, the truck got away, and resulted in damage being done to three ore trucks. Fortunately, the ropes were undamaged and no one injured.

Ropes have been inspected and requests made for cutting and reshoeing when necessary, as required by the Act. One rope was condemned at a mine, but men had been previously instructed by the manager not to ride on the cage which it was attached to. The mine has since closed down.

Several cases of, in my opinion, unsafe electrical wiring have been recorded against and sent on to the Machinery Department for attention, but though safe conditions have been requested by that Department, in most instances nothing has been done. Apart from the above, taken on the whole, conditions have been reasonably safe.

Inflammable Liquid Act, 1920.—Considerable attention has been given to the safe storage of motor spirit under this Act as time has permitted, but there is still plenty to do in this connection. Every encouragement has been given to persons concerned to try and obtain the greatest safety possible. One still finds persons who are very lax in their methods of handling, and good advice was given regarding safety.

During the term under review it was not found necessary to recommend legal action being taken, though it was found necessary to threaten it on a few occasions to get safety.

General.—The various mines, works, and quarries in my district which are under the provisions of the Mines and Works Regulation Act, 1915, have been regularly inspected as time permitted and as the importance of the operations called for. One still finds much loose and affected ground, both at quarries and underground. There is always a certain amount of satisfaction when one is able to have this brought down and places made safe for men to work in.

In most instances my recommendations and suggestions have been heartily appreciated and acted on. I would again like to express my appreciation to the various managers, officers, and workmen who have given me, at any time, their hearty assistance in my endeavours to get a reasonable degree of safety and decent working conditions.

There is no need for any bitterness to exist, as any inspector who has interest in his job must occasionally deal with faulty conditions, and it is his desire to help to get these remedied as quickly as possible, and any sane manager must know that it pays to have the very best conditions regarding safety and hygiene for commercial purposes.

Herewith I submit a summary of the mines and works also quarries, in my district:—

TIN.

Mount Bischoff Tin Mine, Waratah.—During the year an average of 214 men have been employed. There were 60,398 tons treated at the concentrating mill for a return of 336 tons of concentrates, containing 220.25 tons of metallic tin, an average of 3679 per cent. per ton. Underground.—The development of the "cross-lode" has been

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continued, and a few other places looked at. At the Stanhope adit level most of the work on this lode has been done in the westerly direction, and values have continued favourable. In the easterly direction the formation is rather broken up, and values have been low. Work on what is known as the "flat make" starts from this "cross-lode" at the main tunnel level, and there has been a nice make of ore here, and a considerable tonnage has been mined. Recently, in driving on this in a northerly direction, another formation came in from the bottom, being of a "dirty" nature, carrying zinc and lead, and disturbed the flat make considerably, and, as values declined at once, work was soon stopped thereon. In my opinion it is well worth driving on, as values may make again at any point. The ground here, and at the Stanhope level, is on the hard side, and, considering that plenty of electrical power is available, it is a pity that plant has not been installed so that rock-drills could be used. Work in connection with the excavation of ore at the surface has continued on the usual lines. The "Brown face" is very nearly finished. Some wonderfully good ore has been mined lying on the contact. There are a couple of places going off from this make into the "walls" that, in my opinion, are well worth following.

Work in connection with the treatment of the alluvial ground of the Waratah River has steadily progressed. The race has been cut, pipe-line laid, pontoon erected, and machinery is now being put into position thereon, and in two months' time should be a going concern. It is to be hoped that the plant will successfully treat the material available, and that a more progressive policy of exploration will be adopted in connection with the underground workings.

Mount Bischoff Extended Tin Mine, Waratah.—Some 12,348 tons have been treated at the concentrating mill, producing 56½ tons of concentrates, containing 38½ tons of metallic tin. An average of 54½ men were employed. All the available ore above No. 5 level at the old Wheel workings has been worked out. Misfortune seems to have dogged the company's operations: several breakages at the battery, shortage of water, fall in the price of tin, and disturbance of the lode (making it more costly to mine) in blocks G, G1, and G2. The directors finally decided to stop operations on the usual scale, and at present only a few men (5) are engaged driving on the lode at the lowest main adit No. 9 level.

There are at least five places in this mine that I would like to see developed: To drive both ends at No. 9 level (this is now being done), both ends at No. 6 level, and a rise put up on what is known as the "haulage lode." If this is done it may be the making of a new mine; if not, the company will be able to say they have done all that could be done to give the mine a chance to make good.

Pryde, Palmer, and Others, South Bischoff.—A few men have been working here during the first three-quarters of the year, and obtained a ton and a half of metallic tin.

Luina Tin Mine.—No work has been carried out during the year. It is stated that an English company is making inquiries into the property.

Renison Bell.—A. Victor Leggo & Company had the time of their options extended in connection with the Renison Bell Tin Mine, the Dreadnought-Boulder, and the Montana Tin Mines. They carried out enough developmental work on the leases to comply with the lease covenants. Some drilling was carried out towards the end of the year, and is being continued at present with an oil-driven percussion drill.

Tributers are still working at the Renison Bell Tin Mine, 4 men being employed most of the time. There were 572 tons crushed for 2351 tons metallic tin, and a small area in the creek was ground-slucied for '059 tons of tin. Some 59 bags of ore on hand at end of year were not sold, hoping for an increase in price.

A few others have been working off, and are in the district, and obtaining a little tin.

Stanley River District.—Two men were prospecting and working some tin ground for about six months at the old Reward Tin Mine, and have sold ore containing 35491 ton of metallic tin. For six months these two men have been out prospecting on the slopes of Parson's Hood, and they consider they have opened up payable values in tin lodes and alluvial.

Mount Lindsay Tin Mine.—During the year one man has been tributing, and has crushed 48 tons through the small battery for 50071 ton of metallic tin. He has also obtained 22025 ton from tailings. I have been informed that a prospecting association has taken a working option over the mine.

Some wonderfully good tin ground has been worked in this district at different times, and it would not surprise me that in days to come there will be some big mines opened up here.

Williamsford Tin Mine.—The plant on this mine has been dismantled and most of it sent to the Federation Tin

Mine. This is another of those cases of putting up a concentrating mill with very little ore exposed, thinking that if a mill were erected the mine would pay for the opening up of itself, &c. It usually ends in failure. It is a wise procedure to open up the mine first, to a reasonable extent, before incurring the expenditure of a mill.

Merton's Prospect (now Henshaw's), Wilson River.—An option over this property was given to Melbourne investors, but they have not started operations yet. A little work in the way of cleaning out old drives and sampling were carried out by the persons holding the claim. Prospects are reported to be good.

New Shepherd and Murphy Mine.—A little hydraulic sluicing work was carried out towards the end of the year, no cleaning having been made. The magnetic separation plant has been erected and given a trial run, treating some tin-wolfram ore from Kitto's and Kemp's Rainbow Mines.

The manager considers market values for tin and wolfram are not high enough to warrant opening up the mine underground.

Kemp's Rainbow Tin Mine, Moina.—This has been worked for about three-quarters of the year when water has been available. A clean-up was made towards the end of the year and ore sent to the new Shepherd and Murphy mill for separation of wolfram and tin contents. This has not been sold yet. The previous year's clean-up gave 30238 tons metallic tin and 55858 tons of wolfram.

Balfour District.—A few men have been prospecting in the district and forwarding small lots of tin and copper precipitates to market.

King Island.—No work has been done on the Sea Elephant Mine. The acting manager reports that he expects work to be resumed early in January, and that the building of dams and putting in machinery on the alluvial property will be the first work to be put in hand.

House Top District.—A little prospecting has been done in this locality, and ore sent away containing 799 tons of metallic tin.

Bluff River Tin Mine.—Some work has been done here by two men, and a few bags of tin sent forward to smelters.

ZINC-LEAD SILVER MINES.

The Electrolytic Zinc Company of Australasia Ltd. have continued their extensive developmental policy both at the Mount Read and Rosebery group of mines. At the Hercules Mine a very nice body of ore, known as "G" lode, has been penetrated at No. 4 level and driven on, and is opening up well. Other ore bodies at both mines are turning out up to expectation. At this mine an average of 51 men were employed, and 10,508 tons of ore mined and sent to their works at Zeehan. At their Rosebery Mine 123 men have been employed, and 25,164 tons sent forward to their works at Zeehan.

A good many houses and huts have been erected, and many more are in the course of erection, and it is expected that there will be a much larger number of men employed in the near future erecting the main concentrating plant at Rosebery. Everything has the look of progress about it.

SILVER-LEAD MINES.

Waratah District.

Magnet Silver Mine.—An average of 96 men have been employed; 2011 tons of ore were sent away, containing 140,851 ounces of silver and 943 tons of lead. The work at this mine continues on the usual lines, and present prices of metals do not help to improve matters.

Mount Jasper Copper Mining Company.—Work has been suspended here and the plant removed.

Mount Farrell District.

North Mount Farrell Company.—An average of 130 men have been employed; 21,803 tons of crudes have been treated, producing 3098.8 tons of ore, containing 194,313.92 ounces of silver and 188.6 tons of lead. As stated in my last annual report, it was decided to sink a new main shaft from the surface. To provide the necessary power required for this and the new flotation plant, &c., a new crude oil engine had been ordered and was expected to have arrived at the mine towards the end of last year. However, it was not delivered until 6th May, when it was found that the bed-plate was cracked (due to an accident on the s.s. "Port Hunter"). Considerable delay over this extended the time of getting it into commission, and when at last it did start trouble was experienced, but the last report received was that the engine was running satisfactorily.

Owing to having insufficient power it has hindered the work seriously in every department underground during the year. Good progress has been made with the erection of the flotation plant, and this should soon be put into commission.

The main shaft is down 300 feet. It has been a much wetter proposition than was expected. A crosscut was started from No. 8 level of old main shaft to get out under the new shaft. It should serve several purposes, to drain the new shaft, prospect the intervening ground, improve ventilation of mine, and make first connection for hoisting purposes to save present expensive method of handling.

Under the circumstances a fair amount of developmental work has been carried out, and some nice ore has been opened up in the south end of No. 9 level. It is too soon yet to say what the north end is going to be at this level. Some good ore has been worked in the stopes above No. 8 level, and it is improving as the stopes go up.

South Mount Farrell Mine.—A little prospecting work has been carried out here, also on the old Murchison River Mine, but no ore has been sent away.

Mount Claude and Moina District.

Round Hill Silver-Lead Mine, Cethana.—Early in the new year the manager left the company to join the Government, and the directors decided to close down the mine. The men at the mine offered to work it on tribute, and this was agreed to. At first it appeared as if they were going to make a success of things, but the sudden collapse in the metal market made it otherwise, and towards the end of the year they gave in. The mine is now shut down, with a caretaker in charge. For the first three-quarters an average of 23 men were employed, and ore produced carrying the following values:—86.8 ounces gold, 13,022 ounces silver, and 139.68 tons of lead. The tributers undertook to do a certain amount of developmental work, which they carried out. Some small patches of galena were cut in the crosscut at the main adit level. If followed it may lead on to something. I took a sample of some of this off the side and it gave 36.6 ounces silver, 18.5 per cent. lead, and 7 per cent. zinc per ton. There are several places in the mine that, in my opinion, are well worth testing, and which would probably put a different complexion on things altogether.

Washington Silver-Lead Mine, Moina.—An average of four men have been employed, principally in connection with getting ready for erection of concentrating mill.

BISMUTH.

The Stormont Prospecting Syndicate have been developing a prospect near Lea's River, Moina, and prospects are reported to be very encouraging. It is too soon yet to form much of an opinion, but if there is a ready market for the product the show is well worth developing.

OSMIRIDIUM.

Caudry's Osmiridium Mine, Waratah District.—A little work has been carried out during the term. One small patch of good ground was met with, but, on the whole, the ground was too poor for anything, and at last the company decided to stop work and sell the plant.

Savage and Castra River, 19-Mile Creek, &c.—An average of 18 men have been at work. A considerable amount of the metal obtained has not been sold, and most of what has been was sent to the mainland buyers. One man told me he had not sold any metal for 12 months and was doing well.

Wilson River District.—An average of 8 men were engaged, but the field is about done and, as far as I know, only two men are there at present.

COAL.

Meunna Coal Mine (now known as The Torbanhill Colliery).—During the last quarter ten tons of coal was broken from the "crop" and sold. It is expected that an extensive development policy will be undertaken in the near future.

Ulamatha Colliery, Spreyton.—An average of 8½ men were at work, and 1328 tons were sent to market. The seam averages from 16 to 22 inches in thickness.

SHALE.

The Tasmanian Cement Proprietary Limited Shale Mine, Latrobe.—Some 5000 tons was sent to the company's cement works at Railton, some of it being taken from the dumps at surface, the remainder being mined from 88-yard bords from No. 2 tunnel.

An average of 9½ men were employed. The shale is used in the manufacturing of cement.

Australian Shale Oil Corporation.—An average of 23½ men were employed. During the third quarter some 500 odd tons were retorted and most of the crude oil on hand distilled. It is stated that there is a ready sale for the products. Towards the close of the year the work underground was stopped, and the main work on surface suspended owing to monetary troubles.

It is to be hoped that work will be resumed and that a thorough success may be achieved.

New Southern Cross Motor Fuel Proprietary, Latrobe.—No work underground has been attempted during the year. Mr. Long has been extending work on the retort designed by the late manager, Mr. McPherson, altering the feed and making various adjustments, and two trial tests were made on the property, which were reported to be satisfactory. A new company is being formed to take over the whole concern, and big things are expected.

IRON ORES.

No work, that I know of, has been done in my district in connection with the opening up of the enormous deposits therein. An option has been granted to some investors over the deposits at Smith and Doyle's show at Housetop.

CEMENT.

The Tasmanian Cement Proprietary, Railton.—An average of 107 men have been employed here, and 17,416 tons of cement have been sold. It is reported that there is a ready sale of the product, and everyone that I have spoken to who have tried their cement give it a good name, saying it is the best they have ever used.

There is a considerable amount of overburden at their limestone quarry, and this tends to increase costs, particularly so as the process is a "dry one." Once the overburden is removed there will be plenty of stone under foot, it going deeper than the company are ever likely to want to follow it. There is talk of a "wet process" being installed.

LIMESTONE.

The Broken Hill Proprietary Company, at their Melrose quarry, have broken and dispatched 159,375 tons to their works at Newcastle, the average number of men being 74.

PROSPECTING.

Several men have been granted sustenance allowance under Part III. of the Aid to Mining Act, 1921, during the term in my district, and have been prospecting in various places, viz., Frankland and Wedge River, Rocky River, St. Valentine's Peak, and Black Bluff Mountain, Whyte River, vicinity of Mount Sunday and Norfolk Range, between Trowutta and Waratah, Housetop, eastern slope of Parson's Hood Range, eastern slopes of Mount Cleveland, Heazlewood, and Mount Stewart, Mount Sunday, and Donaldson River.

As far as I know nothing of any importance has been found.

GENERAL.

Owing to the fall in the prices of metals it has hit the mines in my district very hard, and it is to be hoped there may soon be an improvement.

MR. INSPECTOR W. H. WILLIAMS (Launceston) reports:—

I have the honour to furnish the following report upon the work of inspection and administration of the provisions of the Mines and Works Regulation Act, 1915, the Explosives Act, 1916, and the Inflammable Liquid Act, 1920, within the Northern and North-Eastern inspection division for the year ended on the 31st December, 1927:—

Consequent upon my transfer from Queenstown I took over the duties of this office from Inspector Curtain who, having attained the statutory age limit, retired from office as from the 16th August last.

The first visit of inspection to the various mines and works revealed many irregularities in the conditions and arrangements. Failure in keeping at angles of repose "dead" walls and walls of races at tin-slucing mines. Carelessness in the handling and storage of explosives at both coal and metalliferous mines. Weaknesses in the timbering and in the mode of securing a roof-cloth in a colliery. The prevalence of atmospheric dust at a rock-crusher station, and defective ventilating conditions necessitated corrective measures.

The system of coal-mining in operation at one of the collieries was unsatisfactory, and although immediate measures were instituted to alter the mode of working, the opportunity presented for dealing with the matter came too late to avert the extensive roof movement that ensued. That was the only settlement of ground recorded during the period under review.

Five accidents, involving injuries to a like number of persons, were registered under the provisions of Section 26 of the Mines and Works Regulation Act, as against 15 of the former and 17 of the latter numbers recorded during the previous year. Four of the accidents occurred on the surface, and two of those were attended with fatal results. The fifth accident happened in a colliery, and was

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of a minor nature, the injured person sustaining a bruised foot as the result of being jammed between a skip and a lump of coal in a hewing-place. The two fatal, and one serious, surface accidents were associated with tin-sluicing operations, while the fourth surface accident was in connection with aerial ropeway operations at a coal mine.

The first fatal accident occurred in the shallow lead of tin drift at Tin Pot Creek. After hydraulicking away fallen ground it was found necessary to move two large granite boulders, which had been brought down with the fall. One of the boulders was being worked into a suitable position when the miners noticed the other boulder move towards them, whereupon they attempted to get clear, but one tripped and fell into the ground-race, and the moving boulder rolled on to him, inflicting fatal injuries.

Two persons were engaged battering back one wall of a deep tail-race at a tin-sluicing mine when one had occasion to absent himself temporarily. Upon returning to the working-place it was found that a fall of wall-ground had taken place, had knocked and pinned his mate into the race, and had blocked the flow of water, which, as a consequence, rapidly collected in the race and suffocated him.

A miner, attempting to obtain a sample of tin wash from a wall of compacted drift, dislodged a large body, which carried him into open-cut workings below and crushed him. The circumstances suggested that proper and necessary measures had not been taken to determine the condition of the place prior to the accident.

A bucket and carrier had become displaced from the carrier rope of an aerial ropeway at a coal mine, and while three persons were removing the bucket to enable the carrier to be released from the tail rope, the carrier, which was in a vertical position, fell over, struck one of the persons, and fractured his right leg. Had consideration been given to the probability of an accident the injured person would not have ventured at the side of the carrier, as the carrier was intended to fall in one of only two directions, and measures were not taken to control its fall in either of the directions.

Comprehensive surveys were made of the ventilating conditions at the principal collieries, and revealed many irregularities, although in no instance were the thermometrical requirements of the Act being exceeded.

At one coal mine, with furnace-controlled ventilation, a reversal of the air currents ensued at the furnace shaft because of adverse surface conditions. Inadequate provision for the circulation of air to the working faces, the presence of stationary and fogged atmospheres, high temperatures, and the absence of sufficient air in hewing places, required my attention. The application of shift-end shot-firing and the absence of inflammable gases favoured colliery conditions, but the condition of ventilation generally was defective. An innovation at one of the collieries was the replacement of the furnace by a suitable displacement fan, but, for operating reasons, the manager favoured a larger furnace, and it was agreed that if sufficient volume and velocity of air could be produced by the new furnace arrangements the difficulties might be overcome. The necessary work was commenced and well advanced at the close of the year.

At a second colliery the conditions were worse than those already depicted, and ventilation was found to be in a deplorable state. The ventilation is fan-controlled, but, owing to short-circuiting, not more than 20 per cent. of the effective air was passing through to ventilate the coal-producing sections of the pit. In one district, the western workings, an unbalanced condition and partial stagnation were encountered, with the result that lingering atmospheres, laden with the products from short-firing, prevailed in hewing-places and roadways, a condition which is detrimental to the health of miners and a contravention of the Mines and Works Regulation Act. The ventilation of this mine had been allowed to pass into such a bad state that extensive alterations were necessary, and although consideration had been given by the management to remedial measures no material result had been accomplished at the close of the period under review.

At a third colliery no bad conditions were encountered except in a small coal-producing area served by one roadway, where the conditions were deemed objectionable owing to saturated atmospheres and slight deficiencies in the quality of the air as determined by flame-extinction tests. Corrective measures were instituted, but desirable results had not been attained at the close of the year.

At one metalliferous mine lingering atmospheres, laden with the products from blasting operations, has caused discomfort, and the management has endeavoured to overcome the difficulty by restricting blasting to crib-periods and not permitting any person to re-enter any place until clear of smoke and fumes.

The economic advantages of good ventilation do not appear to have been realised. Although the object aimed at is the preservation of the health of employees, it is

recognised that good ventilation tends to contentment amongst the employed and results in an economic advantage to the employer.

Attention has been given to the dust nuisance at rock-crusher stations. In this connection an effort is about to be made to allay the nuisance by the use of water, but as this mode of settling dust is not very effective in open places other methods will be used in addition.

Legal proceedings were instituted against one person for failing to use, when required, an appliance for the prevention of dust during rock-drilling operations in a metalliferous mine. Defendant was convicted, fined £1, and ordered to pay costs amounting to 7s. 6d.

As occasion arises managers are being encouraged, when obtaining new underground drilling equipment or when replacing discarded machines, to instal water-feed machines only.

Changing and bathing accommodation is provided at the principal collieries, and also at the metalliferous mines. In some cases modern appointments are lacking, the general arrangements being of a mean order, and improvements should be made for the convenience and comfort of employees.

The protection and general safety of the machinery in use at the various mines and works received attention. One rope, in use at an underlie shaft, was ordered to be replaced owing to a number of broken wires.

A fatal accident occurred at a crushing and concentrating plant connected with a tin mine, but as such was deemed to be a "machinery accident" it was not registered under the provisions of Section 26 of the Mines and Works Regulation Act.

Due regard was given to the administration of the Explosives Act and the provisions of the Mines and Works Regulation Act relating to explosives.

Initial visits of inspection to the various mines revealed irregularities in the handling and storage of explosives. The worst condition obtained at a colliery, where it was usual to find exposed detonators, generally affixed to fuses, on the timbers or carelessly placed on the "gobbing" at the roadsides. The placing of explosives in the "gobbing" was a common practice. The action of the Miners' Federation in lending assistance is worthy of record.

Several magazines were erected, and instructions were issued for the provision of suitable charging boxes. It is intended that the handling and storage of explosives shall be performed strictly according to regulation.

Several small parcels of nitro-compounds were condemned and ordered to be destroyed owing to deterioration, principally as an after-effect of "freezing." The 50 per cent. gelignite exhibited an inherent tendency to "freeze" at temperatures under which other grades of nitro-compounds remained unaffected. Departmental attention was directed to this matter.

No explosive mishaps were reported, and no complaint was made to this office regarding the quality of the fuse in use, although it is understood that an irregularity was encountered with the fuse used at one mine and that the cause of the objection was overcome.

The administration of the provisions of the Inflammable Liquid Act has demanded greater attention than this office could allot it. A serious complaint was made regarding general laxity in the storage of petrol, and acquaintance with the general distribution of mineral spirit showed the complaint to be justified. During the latter half of the year a vigorous effort was made to contend with contraventions of the Act regarding storage. The result is now reflected in the increase in number of applications for licences. The bulk handling of petrol is adding to the work of this office, as many consumers have been, and are, under the impression that mineral spirit may be stored in the ordinary 40-gallon container drums irrespective of distance and locality. A miniature system for the bulk storage of petrol, at distances of not less than 30 feet from buildings and other fire risk, was approved and was put into operation towards the close of the year. Several plants of this type have already been erected and have proved satisfactory. A miniature system for bulk storage, irrespective of distance, is under consideration, and, if approved, this system will further facilitate the storage of petrol, and will enable this office to satisfy all inquiries regarding storage. The provisions of the Act will be strictly enforced during the coming year, and it is anticipated that the storage of inflammable liquids will be under better control than hitherto.

Gold mining retrogressed slightly during the year, but tin and coal mining were appreciably active.

The depletion of previously developed blocks of stone and the failure of the company to develop new bodies of importance resulted in reduced activity at the Golden Gate Consolidated Mine at Mathinna, and, in consequence, operations by the company were restricted to prospecting by way of a crosscut from the North Gate shaft and along

the course of an old bore-hole to intersect the eastern reef at No. 14 level. It is alleged that the bore revealed rich stone. The exploration of the eastern reef in this locality is the immediate objective of the company. Appreciable recoveries of gold were made from the cyanidation of accumulated tailing.

At the Old Boys' Gold Mine prospecting was continued, with two men on each shift, at the 300-foot level. The main crosscut was extended to and through the western reef without important result. An exploration drive was then commenced in a south-westerly direction from the crosscut. A short shoot of quartz, carrying visible gold, was passed through, but the objective had not been attained at the close of the year. At this mine there is an interesting zone of faulting. Although nothing of a permanent nature has yet been established, there are occurrences of auriferous quartz which lend encouragement to further exploration.

Several prospectors received assistance under the Aid to Mining Act in the Mathinna and Lefroy districts, but no discovery of moment was reported as a result of their works.

A small party hydraulicked an area of alluvial drifts at New River, and recovered 29 ounces of gold.

The importance and extent of tin mining in the north-eastern part of the State can only be realised by a visit to the areas being exploited, and, although operations in certain localities passed from active to quiescent stages compensating developments ensued in other localities, and it is anticipated, given a reasonable recovery of market prices, that the coming year will witness greater activity in tin mining.

Whilst hydraulic mining continued to predominate increased interest has been displayed in the development of lode mining, and in the latter respect the exploration and development of the lode zones in the Aberfoyle slates at Storey's Creek may be followed with interest. Comprehensive examinations have been, and are, being made of the Blue Tier ore-bodies within the Lottah-Weldborough area to determine their commercial possibilities.

The Storey's Creek Tin Mining Syndicate operated continuously throughout the period, and produced fairly large quantities of tin oxide and wolfram. The opening up of the No. 3 level has been attended with encouraging lode developments, and has enhanced the value of the mine.

At the Aberfoyle Tin Mine the small vertical shaft was sunk to a depth of 60 feet and connected by a crosscut with a prospecting underlie shaft. Within a distance of 51 feet seven veins of tin-bearing ore of varying widths have been revealed as a result of exploration at surface. A new underlie shaft is to be sunk, additional mining equipment is to be obtained, and the erection of a crushing and concentrating plant is about to be undertaken.

In the same locality a syndicate has been formed to drive a crosscut tunnel from the foot of the western slope of the Aberfoyle gorge in order to prospect the silicified slates, which, on the surface, show small veins of tin-bearing quartz. For this purpose a small portable compressor plant and a water-feed rock-drilling equipment are to be used.

Ground-sluicing was pursued by several small parties at Storey's Creek and Gipp's Creek, and the Riverside and Henbury mines entered the lists of active alluvial tin producers during the year.

Aulich and party have erected a five-head stamper battery and a concentrator at Upper Scamander, and expect to be producing tin oxide from the old Pyramid Mine during the coming year.

The Argonaut and George Bay Tin Mines carried on operations continuously with good results, and the output of tin from the St. Helens district has been added to by several small parties operating in different localities.

Operations on the tin aplites at the Michael Mine at Lottah have been suspended. Official returns show the value of the ore to be '324 to '36 per cent. of tin oxide, equal to '23 to '26 per cent. tin. A comprehensive examination is to be made of the deposits to determine the economic possibilities.

At the old Anchor Mine, Lottah, attention has been given to lode tin ore, and a small quantity of ore has been put through the 10-head stamper battery.

Hydraulic mining at the Blue-Tier-Weld, Weldborough, Laffer, and Moorina Tin Mines was active, and numerous small parties of sluicers added appreciably to the output of tin from the Weldborough-Moorina areas.

Much interest was centred in developments at the Garfield and Monarch Tin Mines, and operations in several

other places added to the importance of mining in the Gladstone district.

Operations by the Monarch Tin Mining Company in the Shallamar drifts have been attended with good results. Consequent upon the opening of a sluicing basin, about half-a-mile southward from the old sluicing area and nearer Mount Cameron, the steam plant was lowered to the basin floor and sluicing was continued in drifts about 35 feet deep and reported to be payable. Lately a ground race has been cut from the elevator sump to the southern face, where an older and coarser tin wash has been revealed below the original sluicing floor.

After a long delay in preparatory work sluicing was commenced at the Garfield Mine, but results were not up to expectations.

The Endurance Company carried on operations with two plants on different drifts. Sluicing operations were resumed at the Eastern Lead Tin Mine. The New Clifton Company was added to the lists of active producers. Although operating periods were interrupted by barge difficulties, shallow sluicing was actively pursued on Harmon's section. Mining generally showed added activity in the South Mount Cameron area.

The Pioneer Tin Mining Company continued to be an important producer of tin ore from the deep lead at Bradshaw's Creek, and the output from this area was augmented by operations at the Rajah and Waugh mines, on the Wyniford River alluvial grounds.

At the Briseis Tin Mine the immense undertaking of hydraulicking the basaltic overburden was in continuous operation, and was proceeded with in such manner as to allow of sluicing of the underlying drifts. Additions were made to the plant for handling and dumping the overburden. Developments at the Lone Brother Tin Mine were satisfactory, and the output has been more than sufficient to cover the expenditure incurred in placing the property on a producing basis. An increase in production is anticipated during the next period.

Preliminary arrangements have been made to form a company to work the old Mutual Hill Mine.

Several small parties operating on the alluvial ground at Main Creek and Cascade River have added to the production of tin ore from the Derby district.

Interest in mining in the Bransholm area has largely centred in operations at the Ruby Flat, Royal Gordon, Baker's Discovery, Arba, Ormuz, and Roma Tin Mines.

At the Roma Mine attention has been given to the run of drift passing into private property and to the western extremity of the Bransholm Creek lead worked, in part, by the Arba Company. A small steam plant has been put in place, and using that plant good results have been attained. A considerable amount of tin ore has been saved by two tribute parties in the work of resluicing the Arba tailing dump. At the Ormuz Mine the deep drifts forming the marginal faces of the Arba Company's old workings have been attacked, and the yields have been regarded as payable. Good results have been obtained from shallow sluicing at Ruby Flat; and the prospects at the Royal Gordon Mine are considered by those interested to be favourable.

Coal mining was fairly active, but, as hitherto, the Jubilee, Cornwall, and Mount Nicholas Mines continued to be the principal producers. Lesser activities at the Fingal, Excelsior, Mount Christie, and York Plains collieries slightly augmented the total output of coal from this division.

The Seymour Colliery was reopened and preliminary work undertaken. A commencement was made with the driving of a 1 in 5 dip tunnel, and this work was fairly well advanced at the close of the year. The objective is the 5-foot seam, and if the producing and marketing stages are attained, an accession to coal mining in the State will result, as those interested are principally concerned in export trading.

MR. INSPECTOR J. J. ANDREW (Queenstown) reports:—

I have the honour to submit the following report upon the work of inspection and administration of the provisions of the Mines and Works Regulation Act, 1915, the Explosives Act, 1916, and the Inflammable Liquid Act, 1920, within the Queenstown and Zeehan inspection division for the year ended 31st December, 1927.

Accidents.—During the year 26 accidents were registered in this division, there being no fatalities. The following table shows the particulars:—

Casualties:		Queenstown:	
Surface	20	Surface	10
Underground ...	6	Underground ...	6
Fatal	Nil	Zeehan:	
		Surface	10
		Underground ...	—
Total	26	Total	26
Average number of men employed, Queens-			
town			1,015
Average number of men employed, Zeehan			
			324
Total number of men employed			
			1,339

Twenty accidents occurred on the surface and 6 underground. In regard to the former, a young man was twisting a fuse in a detonator, which exploded, causing the loss of thumb and finger on right hand. A second serious accident was caused through a man falling off a platform, a distance of 16 feet, at the flotation works, his ribs being fractured; while another man engaged cutting a beam in the ore bins slipped and fell a distance of 10 feet, also fracturing his ribs. A painful accident befel a man through getting struck in the jaw by a bar, which got caught in a cog-wheel, while he was clearing a chute. The bar swung round, and, striking his jaw, fractured it. The remaining surface accidents were of a miscellaneous character, such as jammed fingers, injuries to toes, &c., which necessitated more than 14 days absence from work. Of the underground accidents, in one case a platman was stepping off the cage before it came to rest at the plat, and not stepping out far enough the cage came down on his foot, causing a painful and badly lacerated heel. In another case a trucker pushing a loaded truck bumped into another trucker, who was standing at the end of a stationary truck, causing broken radius of right arm, and in a third case, while helping to place in position a pit-head pulley the pulley fell on his right leg badly bruising the leg. The remaining three accidents were not of a serious nature, although causing more than 14 days absence from work. In connection with the serious accidents investigations were made, and certain recommendations were suggested to the management to prevent similar occurrences. A tabulated list of accidents has been forwarded to the Chief Inspector of Mines.

QUEENSTOWN DISTRICT.

During the year increased mining activity has been shown by the Mount Lyell Mining and Railway Company, and that remark is applicable also to the important undertaking of connecting the 1100 feet level with a tunnel from the smelters end. The length of this tunnel will be 7000 feet when complete, and it will be on a down grade from the mine of 1 in 200. The sectional area is 9 feet by 9 feet. The tunnel is being driven from both ends, and was started in the latter part of February. During the period ended 31st December a total distance of 4370 feet has been driven. Ventilation has been an important factor in this work, and has been given considerable attention. Two suction fans, electrically driven, one at smelters end and the other at the mine end, with a capacity of approximately 2000 cubic feet of air per minute, have been successfully operated in this connection, and I am pleased to report that the ventilation has been satisfactory throughout. Boarded travelling ways to the face, and the provision made for the men changing at the smelters end with up-to-date changing-house fitted with electrically-heated lockers, have helped considerably in making conditions generally satisfactory. It is anticipated that the tunnel will be completed and equipped and placed in service during the latter part of the current year. Incidentally, this tunnel will provide means of testing the low grade ore at a deep level in the old "Tharsis" Mine.

Productive Operations.—The whole of the productive operations have been carried out at the North Lyell Mine, from which a total of 108,029 tons of ore have been sent to the smelters for treatment. No. 12 level has been opened up from the "Blocks" shaft, and is being driven to connect with a crosscut from the North Lyell workings. A rich lense of bornite ore was intersected in this drive, which is regarded as an important development. In the stopping operations much time has been given to the maintenance of safe working conditions, but at times not enough attention has been given to barring-down affected ground, covering ore passes, and other matters ensuring safety. However, these matters have been promptly brought under the notice of the officer in charge, and the requests of this office have been generally complied with. In cases of struc-

tional weakness and affected roof bulks have been built where necessary. There has been no serious or unobserved settlements of ground, and no accidents due to falls of ground during the period under review. The filling of the stopes have been carried out regularly and with success. The filling consists of crushed schist mixed with conglomerate gravel and broken boulders of conglomerate. The material is mined from a quarry at surface and trucked to a main mullock-pass and dumped. Aided by a little running water it flows through a branch pass or mullock-way leading into the stope being filled, where it quickly sets like concrete. The method is unique and efficient.

During the year an overwind occurred at the "Blocks" shaft, North Lyell Mine. Four men were in the cage at the time. Fortunately the safety appliances on the cage acted perfectly, and no material damage was done. The overwind was through an error of the enginedriver in raising instead of lowering the cage. A full investigation was made and the matter brought under the notice of the inspector of machinery.

Lyell Comstock Mine.—Development work has been commenced at this mine by the Mount Lyell Mining and Railway Company. No. 5 tunnel is being extended, and a rise has been connected with a winze from No. 4 tunnel. Ventilation and conditions generally have been satisfactory.

Horseshoe Syndicate Mine.—This property (the old Tasman and Crown Mine) adjoins the Lyell Comstock Mine, and during the period under review a little prospecting work has been carried out in conjunction with productive work on a small scale on a zinc-lead lode. Conditions have generally been reasonably safe, the value of the ore mined being as follows:—

		Gross Value.
		£
Silver (oz.)	1,289.6	150.55
Lead (tons)	31.64	808.75
Zinc (tons)	31.34	291.85
Total value		£1,251.16

Pioneer Prospecting Syndicate.—This property is situated on the eastern slopes of Mount Huxley, about 7 miles from Queenstown. A quartz lode, carrying gold up to an ounce per ton, was discovered by prospector J. Elliott. A syndicate was formed, and the lode is now being developed. Very encouraging results have, so far, been obtained.

ZEEHAN AREA.

Increased activities have been shown during the year at the South Comet Lead-Zinc Mine and the Federation Tin Mine. Activities in the Zeehan area for silver-lead ore have declined during the latter half of the year owing to the low prices ruling for lead.

At the Federation Tin Mine considerable constructional work has been carried out, especially in connection with the erection of an hydro-electric plant. The water from the old Cumberland dam will be utilised in this respect. Foundations for the generator have been completed and the mill site cut out ready for the erection of an up-to-date crushing and treatment plant. A little mining development work was carried out on the Federation sections, but was suspended until the completion of the power plant. A five-head battery is being erected on a lease taken over from Messrs. Riley and Grey. Rich tin ore is exposed in these workings. Three tons of tin ore sent away at the end of the year gave an assay value of 71 per cent. tin. It is anticipated that during the latter part of the ensuing year the power plant will be in operation and mining development resumed on the Federation leases. Acceptable response has been made to any recommendations for safety from this office.

At the South Comet Lead-Zinc Mine the flotation plant was completed during the year, and the treatment of the zinc-lead sulphides undertaken with satisfactory results. The mine is being worked from two tunnels. At the bottom tunnel development work has been retarded owing to bad ventilation. This has since been adjusted and development work is again in hand; otherwise conditions at the mine were generally satisfactory. The unfortunate fall in prices for lead and zinc is, no doubt, seriously affecting the working of this mine, together with other mines in the Zeehan area. The following table show the values ore or raised from this mine during the year.

Mineral.	Quantity.	Gross Value.
		£
Silver (oz.)	10,906	1,271.69
Lead (tons)	121	2,748.00
Zinc (tons)	378	10,152.05
Total value		£14,171.74

Comstock Zinc-Lead Mine.—During the final quarter of the year work on the zinc-lead lodes at Comstock was commenced by shaft-sinking. Fifteen men are engaged mining the ore, which is being railed to the South Comet mill for treatment. The lode is turning out fairly well. The regulations in accordance with the Act have been observed, and any requests from this office carried out.

A tribute on a galena lode being worked by J. Dunkley and party at Comstock is producing some high grade galena ore. Visits of inspection to this property have resulted in the observance of the regulations.

West Coast Silver-Lead Company.—The mine, situated at North Zeehan in the area known as "The Big Ben," gave promise of opening up well. A main shaft was sunk to test the lodes at depth. Owing to the low prices of lead operations were suspended with the hope of the metal market improving. Assay results of samples of ore from this area, also from the Gem Mine adjacent to this property, have shown very high lead and silver contents.

Razorback Tin Mine, Dundas.—Four men have been working this property and treating the lode matter in a small stamper battery and concentrating plant. Fair returns have been obtained, and the lode is regarded as worthy of systematic prospecting. Requests for safer working conditions have been carried out.

Tribute Parties.—The Swansea, Sunshine, and other small mines have been visited as opportunity occurred, and recommendations made where necessary for safe working and compliance with the mining regulations generally.

Electrolytic Zinc Works, Zeehan.—These works were inspected periodically, and recommendations for allaying dust carried out. Notices posted pointing out the necessity of keeping water-sprays continually running have had a good effect, and any suggestions from this office for improved conditions have been carried out. Improvements are in hand for the dispersing of fumes from the furnaces.

Health and Sanitation.—Conditions pertaining to health and sanitation have received attention, and improvements requested where necessary. Ventilations generally has been satisfactory in the Queenstown area. In one mine at Zeehan operations were suspended until forced ventilation enabled work to be resumed.

The changing-house accommodation has been looked into, and increased accommodation asked for and obtained where required.

Dust.—Konimeter estimation of dust has been carried out when opportunity occurred, with interesting and helpful results.

Crib Houses.—Crib houses in the larger mines and reduction works have been generally found in good order. In the latrine accommodation any irregularities discovered have, upon request, been corrected.

Prosecutions.

During the year legal proceedings were taken against eight persons for contravention of the provisions of the Mines and Works Regulation Act. Four of these were for failing to use water when boring; in each of these cases the maximum penalty of £5 was inflicted, with costs. In this respect I am strongly of the opinion that no dry boring machines should be permitted to work in any Tasmanian mine. Two cases of men riding down the Mount Lyell Company's haulage contrary to regulations were upheld and penalties inflicted in each case, while in the remaining two cases for failing to have an ore-pass securely covered, one man was convicted and fined, and the case against the other man was dismissed. It is hoped by the Mines Department that the above prosecutions will have the desired effect for the observance and carrying out of the mining regulations.

Ropes, Cages, &c.

Inspection of ropes, cages, and appliances were periodically made. In one case a new winding rope was requested, which was promptly attended to, and another case

a new windlass rope asked for, which request was complied with. The cages and appliances have been tested and proved to be in good order.

Explosives.

A thorough examination has been made of a shipment of 1700 cases of 50 per cent. gelignite recently delivered at Queenstown, and frozen plugs have been found among them. Thermometer tests showed that most of the stuff was chilled and some frozen. The Chief Inspector of Explosives visited the field in connection with the matter, and after completing his examination and testing he consulted with the Mount Lyell management, and it was agreed to thaw the gelignite in the cases by raising the temperature of a special magazine by non-glowing electrical heaters controlled by switches some distance from the magazine. This has so far been very satisfactorily carried out, and at time of writing 1400 cases have been reconditioned and used with satisfactory results. To ensure safety considerable attention has been given to this matter, and it is anticipated that the whole of this gelignite will be used before the winter sets in. Attention has been given to magazines generally and the storage of explosives. Several requests were made for more care in conveying explosives for use, and for canisters, in accordance with the regulations, the requests, in all cases, being complied with. The testing of fuse has been regularly carried out, and no faulty fuse has been discovered.

During the year 2640 cases of gelignite and 16 cases containing 80,000 detonators have been landed at Regatta Point, the unloading being supervised from this office, and the work was carried out in a safe manner.

Inflammable Liquids.

Two new depots for the storage of mineral spirit have been erected during the year, one at Strahan and one at Heemskirk, in compliance with the provisions of the Inflammable Liquid Act.

General.

In the Queenstown area considerable diamond drilling has been carried out, and also some geophysical prospecting work. A new refinery for refining the Mount Lyell Company's blister copper is well under way, and is expected to be completed during the ensuing year and put in operation. This, together with the important development work in hand, points to much increased activity at Queenstown in the near future.

At Zeehan the Federation Tin Mining Company are showing much enterprise, and production should be on a firm basis during the latter part of 1928. In regard to the lead and zinc mines, it is hoped that better prices will be obtainable for these metals during the current year, which would mean an increased output and a larger number of men employed. The copper-nickel lodes at the 5-Mile, Zeehan, are receiving attention, and it is reported that work will soon be resumed at these mines.

Value of Output from the Queenstown-Zeehan Division.

The estimated production and gross value of the output of metallics, based on average quarterly prices of metals, for the year under review is as follows:—

		Value. £
Copper (tons)	5,855	365,706
Gold (oz.)	2,137	9,034
Silver (oz.)	134,436	15,798
Lead (tons)	457	10,422
Zinc (tons)	412	11,143
Tin (tons)	14	3,874
Nickel (tons)	88	15,060

Total gross value of output £431,029