(No. 5.)

TASMANIA

REPORT

OF THE

DIRECTOR OF MINES

FOR

YEAR ENDED DECEMBER 31

1929

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

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

TASMANIA:
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ERRATA.

Page 8: Value of Lead.—For £133,793 substitute £138,793. (In table.)

Page 18: Value of Cadmium.—For £739,396 substitute £7839.

Page 18: Value of Copper.—For £7839 substitute £739,396.

REPORT OF THE DIRECTOR OF MINES.

Mines Department,
Hobart, 31st March, 1930.

SIR,

I HAVE the honour to submit herewith a report on the work of the Mines Department during the year 1928-1929.

Perusal of the following pages will show that the activities of the Department have been advanced another stage towards the goal aimed at, and as set out in my policy statement of 1926. In this report I have reintroduced the revenue proposal outlined in the aforementioned statement, which I regard as the only equitable and satisfactory means of providing the necessary funds for the performance of field development work.

I have the honour to be,

Sir,

Your obedient Servant,

A. McINTOSH REID,
Director of Mines.

The Hon. the Minister for Mines, Hobart.

THE WORK OF THE MINES DEPARTMENT DURING THE YEAR 1928-1929.

The following report gives in concise form an account of the more important activities of the Department during the year. Foremost among the activities are the systematic geological survey, economic geological survey, topographic survey, drilling, and aid to mining.

The results of field investigations have in some cases been issued in the forms of bulletins and reports.

The Department has endeavoured to find markets for many minerals and mineral products, in some cases with satisfactory results to producers and buyers; and has given advice on all matters relating to systems of mining and to methods of milling, separating, and concentrating, and has advised as to the best means and ways of transport in the very rugged parts of the Western and South-Western Districts.

PERSONNEL.

The plan of reorganisation recommended by the Development and Migration Commission has been adopted in part by the appointment of two senior field geologists and two field assistants. Additional appointments will be necessary when the systematic geological survey is under way. Applications have been called for the position of Junior Chemist, Mines Department Laboratories, Launceston.

The following changes in the Departmental staff were made during the year:—

Appointments—

Permanent Staff:

Miss Ida Cockayne, Typiste, 11.3.1929.
K. J. Finucane, Field Geologist, 17.4.1929.
F. Blake, Field Geologist.
T. D. Hughes, Field Assistant, 1.7.1929.
J. E. Rowland, Field Assistant, 1.7.1929.

Temporary Staff:

Miss N. J. Gumley, Typist, 2.1.1929 to 8.3.1929.
W. White, Temporary Magazine-keeper, 11.2.1929 to 26.2.1929.
Miss R. B. Reid, Clerk, Typist, and Librarian, 28.2.1929 to 4.10.1929.
Miss D. Jarvis, Typist, 4.7.1929 to 30.7.1929.
Miss E. M. Hutchinson, Typist, 10.7.1929 to 24.8.1929.
Mrs. C. Hewitt, Typist, 26.8.1929 to 31.12.1929.
H. E. Shepperd, Messenger, 27.11.1929 to 2.12.1929.
A. Lancaster, Drill Foreman, appointed 7.6.1929.
F. H. Ripper, Librarian, appointed 1.7.1929.

Transfers—

Permanent Staff:

Miss J. Dobbie, Typist, to Agriculural Bank, 3.3.1929.
J. E. A. Rowland, Field Assistant, to Public Trust Office, 29.11.1929.
F. N. Stops, Warden of Mines, Devonport, to Magisterial Department, Hobart, 31.12.1929.

Furlough—

Permanent Staff:

E. L. Hall, Warden of Mines, furlough terminated on 28.2.1929, resumed duty on 1.3.1929.

Resignations, Retirements, &c.—

Permanent Staff:

G. Crosby Gilmore, Acting-Warden of Mines, Launceston, services ceased on 28.2.1930, upon resumption of duties by Mr. E. L. Hall (after furlough).
W. D. Reid, Chief Government Chemist and Assayer, resigned, 15.8.1929.

Temporary Staff:

H. O. Tolman, Messenger, services ceased on 22.1.1929.

F. H. Barrett, Librarian, died on 27.3.1929.

GEOLOGICAL SURVEY.

The plan drawn up by Dr. Woolnough, Commonwealth Geological Advisor, and recommended by the Development and Migration Commission, was put into operation in a modified form. Their recommendation that two senior field geologists and two assistant-geologists be appointed, with other field staff, was altered, and two senior geologists and two field assistants only were appointed. Instead of appointing two assistant-geologists it was decided to engage three licensed surveyors to perform the preliminary topographic surveys, the idea in mind being the production of reliable topographic maps to serve also all other departments and the municipal councils, and to relieve the geologists of that extraneous work, and thereby save them very much time. This course, it was contended, would allow the two senior geologists to make as much headway as they would with the aid of two assistant-geologists.

Officers engaged on the systematic geological survey will at the same time examine and report upon all mineral products of economic value seen in the course of their investigations; and they will take samples of soil for the information of the Departments of Agriculture and Forestry, and explore the underground water resources.

Staff officers will attend to strictly economic investigations and to mining engineering work. In order to effect the best results, arrangements have been made so that one technical officer shall always be in office to attend to technical matters.

TOPOGRAPHICAL SURVEY.

After many delays the topographic survey has come into being. Its coming marks another and very important step along the way of national progress; and so its sponsors must be granted full recognition for the success of their efforts. This Department in its endeavours has been ably assisted by the Lands and Forestry Departments and by the Institute of Surveyors, and it must be acknowledged that the good result of their conferences could not have been achieved had not the Development and Migration Commission strongly supported the scheme. The original intention of combining the Mines and Forestry topographic surveys, in order to prevent duplication of work, was found impracticable; but those departments, although operating separately and individually, have arranged to lend every assistance one to the other. Moreover, the Mines Department has arranged to provide topographic maps to other departments and to municipalities.

In order to give the survey statutory recognition, the Mines Department has engaged authorised surveyors to perform all work except that of minor detail, which latter comes within the particular purview of the geologist.

With the institution of the topographic survey as an adjunct of the geological survey, the mapping of Tasmania enters upon another stage in cartographic history. The first may be characterised as the period of discovery and reconnaissance surveys, the second as one of exploration and settlement accompanied by public lands surveys and major triangulation, and the third, or last, as that of great economic development, necessitating the provision of accurate and detail topographic maps.

The third period naturally follows the second without any clear line of demarcation; in fact, the third is an extension of the second. All that can be added here in that respect is that the programme of topographic survey now instituted by the Mines Department has for its purpose the systematic examination of the natural resources of the State and the designing of plans for their development and exploitation. In effect, it provides the addition of detail to, and the extension of, existing surveys, and brings them into line by connecting them to a definite datum, the true meridian.

This work may be classified as one of minor triangulation with precise topographic survey. In some of the more settled districts the late James Sprent (Surveyor-General), who performed the major triangulation survey, broke down the triangulation to a second and third order, and in such places it has been possible to connect the topographic work, with the third order triangulation. In the Western and North-Western Districts, however, a major triangulation only was performed by Sprent, and therefore it has not been possible to make the connection in those districts. Furthermore, investigation has shown that many of the trigonometrical stations have been demolished, and the lost points cannot be located with certainty. No other course was open but to start third order triangulation in those districts. The work, then, from expedience resolved itself into a process of minor triangulation, supplemented by standard traverses and levels, stadia, and short compass surveys. Advantage is being taken of the network of cadastral surveys, railway and road traverses, and other works of standard character.

It is proposed, if the offer remains, to provide for the photographic survey of the north-western open country next year. Advantage could not be taken of the offer of the Air Force this year owing to lack of funds for that purpose, and because control points could not be fixed in time.

GEOPHYSICAL SURVEY.

This Department during recent years has taken a very active interest and a leading part in physical methods of investigating concealed ore-bodies and sub-surface geological structure. Partly as a result of its efforts the Development and Migration Commissioners arranged for the testing out of certain processes by the Imperial Geophysical Survey Committee and the Commonwealth Government. In order to obtain exact and reliable information regarding the applicability of some of the methods to the solution of problems under Tasmanian conditions the Director of the Geophysical Survey, Mr. Broughton Edge, sent Dr. Bieler and staff to Tasmania to work in the Renison Bell Tinfield, the Five-Mile Copper-Nickel Field, and the Zeehan Silver-lead Field.

The surveyors completed their investigations in Tasmania early in the year, and submitted plans and reports of their work to serve as guides to the findings. To obtain definite confirmations of the results the Development and Migration

Commissioners have agreed to test the findings by trenching and by diamond-drilling. These works will be undertaken directly after the Christmas vacation.

The various sites were chosen after consultation with officers of the Geological Survey, having in mind the principal object of the survey—namely, a testing of methods. Unfortunately the proposed gravitational testing of the Ringarooma Deep Lead could not be undertaken.

The development work already carried out by the Department at places marked for attention by the surveyors has proved their work correct in every detail. That augurs well for the testing of the deeply concealed bodies by means of the diamond drill as located by the surveyors.

The Geophysical Survey suffered a very serious loss in the death of the Deputy-Director, Dr. E. S. Bieler, who was originally appointed by reason of his special knowledge of the electrical methods and of his broad knowledge of geophysics in general. He died at Geraldton, Western Australia, on 25th July, after a very short illness. The death of Dr. Bieler caused the curtailment of the geophysical survey in Tasmania. It was intended to survey the Ringarooma Deep Lead. Some density tests had been carried out to that end.

RESEARCH WORK.

(*a*) Metallographic Investigations.

The Development and Migration Commission is lending assistance to this Department by investigating the mineral associations of mixed ores, with the object of providing necessary information for the perfecting of metallurgical processes. This work has been placed by the Commissioners in the hands of Dr. Stillwell, of Melbourne University, who has already rendered splendid service in presenting the results of his microscope investigations in report form. Dr. Stillwell has, in that work, investigated the mineral associations of the tin-bearing granites, pegmatites, and greisens of Blue Tier, the pyrrhotite-tin ores of Mount Lindsay and Renison Bell, and the copper-nickel ores of Five-Mile.

Such investigations reveal not only the mineral associations, but also the relative sizes of particles of each mineral and their proportions. Information of that character is far-reaching in its practical application, for it enables the metallurgist to determine the degree of fineness to which the ore must be ground before treatment, and the mineral relations affecting treatment.

(*b*) Flotation Tests.

Arrangements have been made with Mr. Norman H. Wood for the carrying out of flotation tests of the Stormont bismuth ores at the Mines Department laboratories, using the K. and K. machine. It is thought this plant will not prove quite suitable; nevertheless, the information to be obtained will doubtless prove of value in arriving at the best means of carrying out further experiments.

(*c*) Ilmenite-Cassiterite Separation and Concentration.

Arrangements have been made with the Adelaide School of Mines for the carrying out of experiments on the ilmenite-cassiterite sands of King Island, and a large sample of the material has been sent to that institution for that purpose.

(*d*) Distillation of Oils.

Samples of tasmanite and cannel coal have been collected for distillation on a laboratory scale by the Black process. It is claimed by the inventor that this is the most efficient method yet devised for the production of oils in marketable condition and for the production of residual bitumen. If the claim can be sustained by testing in the laboratory, it is intended to try out the process on a larger and a commercial scale.

Many distillation tests have been made in Hobart and in the laboratories, Launceston, on samples of oil-bearing materials found strewn along the southern coast. The origins of these materials are not known.

CO-OPERATION.

The Department co-operates closely with the Lands, Forestry, and Public Works Departments in connection with the topographic and geological surveys, with the Department of Agriculture in soil surveys and underground water-supply, with the Development and Migration Commission in metallurgical research, with the Council for Scientific and Industrial Research in geophysical surveys, and with the Hydro-Electric Department in the selection of reservoir sites.

In fact, this Department endeavours by every possible means to extend its services to any department or body engaged directly or indirectly in the development of primary and secondary industries in Tasmania.

ADVERTISING MINERAL RESOURCES.

By arrangement with the local correspondent of the "Manchester Guardian" information relating to the mining industry has been published from time to time in the columns of that paper.

A series of articles is being prepared for publication in "Progress in Australia," an illustrated paper issued by an Adelaide company.

In addition lectures have been delivered through the medium of public bodies in Launceston and Hobart, and copies of bulletins of the Geological Survey have been sent to the leading science institutions of the British Empire, the United States of America, and to other countries.

PUBLICATIONS.

During the year a large number of departmental reports have been prepared, and a few special reports on geological and metallurgical problems have been issued, also two bulletins (Nos. 39 and 40) of the Geological Survey, namely:—

Bulletin 39—The Osmiridium Deposits of Adamsfield District, by P. B. Nye.
Bulletin 40—The Avoca Mineral District, by A. McIntosh Reid and Q. J. Henderson.

SPECIAL APPROPRIATIONS.

A special appropriation of £5000 was provided under the Development and Migration Scheme by the Commonwealth Government for the systematic geological survey. An appropriation of £5000 is required for that work next year.

In addition to the ordinary appropriations, funds to the amount of £5000 are requested for aid to mining. I have to draw your attention to the fact that the Mining Trust Fund is now at a low ebb, no grant having been made for two years.

MINERAL PRODUCTION.

The year 1929 marks the time of the greatest cataclysm in the history of the State, extensive floods resulting in the loss of 14 lives and in great material damage to the country. In the North-Eastern District few mines escaped serious damage, and the Briseis, one of the biggest tin mines of the State, suffered enormous damage. Most other mines have since been put into operation again, and the effects of the flood waters are not now in striking evidence.

This year will be remembered also as the beginning of a serious mining depression, owing, in the first place, to the collapse of the markets for all base metals, except those of copper, tungsten, iron, and manganese. Yet despite that fact the total value of production this year exceeds that of 1928.

The total value of mineral production for the year, as determined on the basis of value of metals after refining, is £1,790,653—an increase of £196,825 as compared with that of 1928. The increase is due to the extraordinary increase in the value of copper produced by the Mount Lyell Mining and Railway Company.

RETURN showing the Quantity and Value of Minerals produced in the State of Tasmania during the Year 1929.

Mineral.	Quantity.	Value.
		£
Barytes ..... tons	9·5	24
Cadmium ..... „	17·498	7839
Carbide .... „	3434	53,841
Copper ... . „	8689	740,985
Coal ..... „	130,291	105.877
Cement ..... „	41,798	175,613
Nickel ..... „	85·44	14,765
Gold ..... ozs. f.	5596·88	23,772
Lead ..... tons	5983	133,793
Limestone..... „	68,176	66,597
Osmiridium ..... ozs.	1360	30,624
Silver ..... ozs. f.	864,354	94,560
Shale ..... tons	4299	2982
Tin..... „	640·36	130,014
Mica ..... „	23	45
Tungsten ..... „	151·86	18,358
Zinc ..... „	6997	185,964
Total	...	£1,790,653

The Electrolytic Zinc Company of Australasia Limited recovered 46,163 tons of Zinc valued at £1,237,361, and 181·5675 tons of Cadmium, valued at £81,343, from other than Tasmanian ores.

Metallic products were valued at £1,385,624, or 82·98 per cent. of the total. Non-metallic products, excluding structural materials, were valued at £108,928, or 6·08 per cent.

Compared with 1928 the metallic products showed an increase of £237,008, or 20·6 per cent.; non-metallic products showed an increase of £977, or 0·89 per cent.; and structural materials a decrease of £41,256, or 12·2 per cent. In metallic products extraordinary increase is recorded in copper, and slight increases in gold, lead, cadium, nickel, silver, and tungsten; considerable decreases are recorded in tin and osmiridium and a slight decrease in value of zinc production.

Amongst non-metallic products increases are recorded in shale and barytes, and decreases in coal and mica.

Structural materials showed decreases in calcium carbide and cement and a further decrease in limestone.

Copper has placed itself in an impregnable position in the list of mineral products. It constitutes over 54 per cent. of the total metal products of the State. Zinc now displaces tin as second on the list, but not because of an increase in value of production. Lead, contrary to expectation, shows a considerable increase despite the low market price. Tin, which occupied for so long an enviable position, now comes fourth on the list. Silver again occupies a prominent place, and is on the up grade.

The gradual fall in the price of osmiridium is reflected in the output. Tungsten and gold remain low in the scale, but have an upward tendency.

Metal prices of all but copper, tungsten, and cadium fell below the average of recent years.

Coal, cement, and calcium carbide declined.

ASBESTOS.

Although not appearing this year in the list of products, considerable activity has been displayed in the investigation of Anderson Creek and Birch Inlet deposits, as the result of inquiries from mainland and English firms.

Holders of asbestos lands are endeavouring to arrange for the testing of deposits. Selected samples were sent by the Birch Inlet lessees to a mainland firm for testing.

RETURN showing the Quantity and Value of Asbestos produced from 1899 *to* 1920-29 *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
1920-1929	—	—
Total.....	3565·5	£7105

BARYTES.

Barytes again comes into the list of mineral products, but in small quantity only. A departmental investigation of most of the known deposits was made because of the interest taken by a Launceston company in this mineral.

A few small parcels were shipped to Melbourne from the Riana deposits.

Barytes is used largely as an essential component of lithopone, which is rapidily displacing whitelead as a paint material because of its non-toxic properties.

Many deposits, some of commercial importance, occur in Tasmania, and most, if not all, occur as a phase of Ordovician mineralisation associated with intrusive rocks of the "porphyroid" group.

Nine and a half tons, valued at £24, was sold to a mainland firm.

RETURN showing the Quantity and Value of Barytes produced during the Years 1916 *to* 1929.

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	—	—
1928	—	—
1929	9·5	24
Total	1812	£6933

BERYL.

The mineral beryl is in great demand of late, and in consequence some samples from the Moina deposits have been analysed, and others have been sent to prospective buyers. One sample, analysed in the Mines Department laboratories, Launceston, showed the following constitution:—

Silica	61·2 per cent.
Beryllium oxide	14·9 per cent.

The BeO content is above the theoretical proportion and the silica content is lower, therefore this material should find a ready market. Buyers place the critical limit at 10 per cent. BeO.

Beryl is a silicate of the metals beryllium and aluminium, and when quite pure it is colourless like glass. Coloured varieties include the gems emerald and aquamarine.

Beryl is found at Moina associated with wolfram, cassiterite, and quartz as coarsely crystallised vein materials of pegmatites traversing granites. Its distribution therefore will be sporadic, and not a large quantity will be available from one deposit.

BISMUTH.

Developments refer particularly to the Stormont Mine, near Moina, where an Adelaide company has been actively engaged in opening two of the known deposits and equipping the mine with a milling and concentrating plant. Bismuth is found there native and in the compounds bismuthenite, bismatite, and bismite, and gold is an accessory compound. These ores are contained in fissure-veins traversing garnetised Silurian limestone, and their presence is indicated where garnet appears in crystal forms, that is where the action of mineralisation has been most intense.

Considerable difficulty was experienced at first in effecting the concentration of the ores; but the engineer, R. Magee, by an addition to the plant, and after further experiment, was able to obtain very satisfactory separation and concentration. It was though that the sulphide ore would prove easily amenable to flotation, but Metallurgist Norman Wood found it rather difficult. Later experiments by him will doubtless lead to good results.

The ore-bodies appear very promising, and it is hoped that the company will be able to carry on continuous operations next year.

The first bulk parcel consisted of—

Bismuth	66·5 per cent.
Lead	7·8 per cent. (?)
Gold	5·36 oz. per ton
Silver	7·035 oz. per ton.

Worth £371 18s. 0d. per ton.

The proportion of lead seems very high in view of the fact that other parcels showed a content of only 1·7 per cent lead.

Gold is a constant accessory, and this association indicates that many of the gold deposits of the neighbourhood are actually the remains of oxidised gold-bearing bismuth ores.

RETURN showing the Quantity and Value of Bismuth produced from 1904 *to* 1929 *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	—	—
1928	—	—
1929	—	—
Total	74·059	£23,052

CADMIUM.

The progressive increase in the output of cadmium, noted last year, was not maintained as shown in this year's record. It is obtained as a by-product by the Electrolytic Zinc Company of Australasia Limited in the smelting and refining of zinc. Cadmium is coming into favour as a substitute for tin and as an essential component of certain alloys.

Production amounted to 17·498 tons, valued at £7839, as compared with 19·7266 tons, valued at £4329, in 1928. From other than Tasmanian ores the production of that company was 181·5675 tons, valued at £81,343.

These records show a decrease in tonnage, but a great increase in value, due to the strong market demand.

RETURN showing the Quantity and Value of Cadmium produced during the Years 1924 *to* 1929.

Year.	Quantity.	Value.
	Tons.	£
1924	5·247	1175
1925	5·2454	1178
1926	10·4014	1827
1927	19·2712	3233
1928	19·7266	4329
1929	17·498	7839
Total	77·3806	£19,581

CHROMIUM.

During the year the chrome iron ore deposits of Mounts Vulcan and Scott and Barnes Hill, near Beaconsfield, were explored by means of the diamond drill. The deposits proved more extensive than expected. The proportion of chromic acid varied greatly, from 2 to 16 per cent., the average content being 6 per cent. These deposits, which have described in a mineral resources publication shortly to be issued, may prove of commercial value in the near future.

The mineral chromite is widely distributed in Tasmania, nowhere, however, in large concentrations, and generally situated far from lines of transport. At present the costs of mining and transport preclude the possibility of production and marketing at a profit.

COPPER.

The price is as stable at the end as it has been throughout the year, and the indications are that no great fluctuations will eventuate during the first half of 1930. Stocks are rather heavy, but a curtailment of production will offset the effects of lessened consumption, and tend to maintain the present satisfactory market prices.

According to the American Bureau of Metal Statistics, world production of copper for the 11 months of the current year was 1,970,996 tons, which compares with 1,737,231 tons in the similar period of 1928. Out of the total tonnage the United States produced 1,089,480 tons. Despite the increased tonnage the statistical position remains firm.

The production of copper in 1929 from the Mount Lyell Mining and Railway Company's works was 8689 tons, valued at £740,985, as compared with 6421 tons, valued at £444,802, in 1928, an increase of 2268 tons and £296,183 in value. This extraordinary increase is attributable largely to an enhanced price and to uninterrupted operation.

RETURN showing the Quantity and Value of Copper in Blister Copper and Copper Ore during the Years 1919 *to* 1929 *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
1928..	6421	444,802	—	—	6421	444,802
1929...	8689	740,985	—	—	8689	740,985

GOLD.

The production of gold for the year was 5596·88 oz., valued at £23,772, as compared with 3603·43 oz., valued at £15,306, in 1928.

The output was supplied largely from gold-bearing copper and zinc-lead ores. Mining solely for gold of late years has not proved satisfactory. The Golden Gate Mine, at one time a prolific producer, has been abandoned after a long struggle by the late company. The Messrs. Brock, at Mathinna, are exploring the 400-foot level of the Old Boys' Mine, and the Argyle Syndicate is engaged at the Golden Entrance Mine, at Mangana. Exploratory works at Blessington and Lefroy seem encouraging.

During the year the Department granted assistance to many parties of miners to enable them to explore known gold-bearing areas, but not with any good result.

RETURN showing the Quantity and Value of Gold won from 1880 *to* 1929.

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
1928	3603·43	15,306
1929	5596·88	23,772
Total	1,910,489·076	£7,657,388

IRON.

The development of the iron ore industry is proceeding very slowly, work having been confined to the proving of deposits by the successors to G. and C. Hoskins Limited of Lithgow and Sydney.

Production or iron ore in Tasmania ceased in 1928.

RETURN showing the Quantity and Value of Iron Ore produced from 1897 *to* 1929.

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
1909–1929	—	—
Total	42,762	£25,701

IRON PYRITES.

RETURN showing the Quantity and Value of Iron Pyrites produced during the Years 1915 *to* 1929.

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	—	—
1928	—	—
1929	—	—
Total	68,293·273	£93,916

LEAD.

The lead market remains dull, but the statistical position is expected to show a slight improvement following curtailment of production by large mining companies. No striking change for the better, however, can be expected for a long time.

Production of lead ore increased from 4786·78 tons, valued at £101,616, in 1928, to 5983 tons, valued at £138,793, in 1929.

The immediate future of lead-mining would not appear bright but for the fact that the Electrolytic Zinc Company of Australasia Limited will soon be ready for active production from its Read-Rosebery and Hercules Mines.

RETURN showing the Quantity and Value of Lead included in Silver Lead during the Years 1919 *to* 1929.

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
1928	4786·78	101,616
1929	5983	138,793

NICKEL.

The reopening of a copper-nickel mine near Zeehan brings nickel again into the list of products. The work of the company, however, was not productive of very good results.

The ouput was 85·44 tons, valued at £14,765.

It will be of interest to note here that the Imperial Geophysical Survey carried out experimental work in this field with satisfactory results, as proved by the Department in exploratory pits and trenches at marked points. The Department will shortly undertake drilling work in that field to further test deposits located by the use of geophysical instruments.

OSMIRIDIUM.

Production in 1929 reached the total of 1360 oz., valued at £30,624, as compared with 1627·186 oz., valued at £42,458, in 1928.

The decrease in output is due largely to a declining price. At the end of the year the local price had fallen to £16 10s. an ounce.

In an endeavour to stabilise the industry an effort is being made to arrange for a better marketing scheme.

State-assisted prospectors report the discovery of a large belt of enstatite serpentine in Weld River Valley and neighbourhood. The osmiridium obtained is of good quality, but is not found yet in commercial concentrations.

RETURN showing the Quantity and Value of Osmiridium produced during the Years 1910 *to* 1929 *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
1928	1627·186	42,458
1929	1360	30,624
Total	23,658·784	£554,543

SILVER.

The rapid decline in the prices of most metals is no more pronounced than the fall in silver, which at the end of the year fell to ⅛d. of the lowest price ever recorded in the London market. One authority attributes the collapse as largely due to the failure of the Chinese pool and the decline in China exchanges.

In 1929 the total production of silver from copper, lead, and zinc ores amounted to 864,354 oz., valued at £94,560, an increase of 195,028 oz., as compared with that of 1928. The increase is largely attributable to the increase in production of silver-bearing copper ores by the Mount Lyell Mining and Railway Company.

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, 1927, 1928, *and* 1929.

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
1928	564,156	66,386	105,270	12,515	669,326	78,901
1929	714,930	78,252	149,424	16,308	864,354	94,560

TIN.

This metal shows a fairly progressive fall in price since the beginning of the year, latest advices being anything but reassuring. Outstanding developments, in an endeavour to stabilise the industry, are a provisional agreement to effect a merger of four of the larger tin-smelting companies and the action of the Tin Producers' Association in calling for restriction in the production of Straits Settlements and other Eastern tinfields.

No immediate improvement in the market can be expected until a definite change for the better appears in the general industrial situation.

The output of tin for the year was 640·36 tons, valued at £130,014, a reduction of 500 tons as compared with that for 1928. This great reduction is due largely to the closing of those mines in the North-Eastern District affected by the extraordinary floods that caused much damage early in the year, and to the closing of the Mount Bischoff and other mines owing to the collapse of the tin market.

It is expected that tin-mining will revive in accordance with the increase in the price of the metal.

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* 1929.

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
1928	1140·14	258,676
1929	640·36	130,014
Total	17,587·186	£16,081,991

* Metallic Tin.

TUNGSTEN.

An exception to the general downward trend is the market price of tungsten. It is difficult to arrive at an idea of the true statistical position of tungsten, the price of which during the last quarter of the year remained firm at a considerable increment. No apprehension need be felt regarding the market for some time, because the demand is quite equal to production.

Production fell from 176·15 tons, valued at £12,094, in 1928, to 151·86 tons, valued at £18,358, a decrease in tonnage due to suspension of operations at the Story Creek Mine, and an increase in value due to enhanced market prices.

Enquiries have been received from England and the mainland for both wolfram and scheelite. The present market conditions should encourage miners to engage in tungsten-mining.

WOLFRAM.

RETURN showing the Quantity and Value of Wolfram produced from 1899 *to* 1929 *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
1928	176·15	12,094
1929	151·86	18,358
Total	2151·662	£242,513

SCHEELITE.

RETURN showing the Quantity and Value of Scheelite produced during the Years 1917 *to* 1929.

Year.	Quantity.	Value.
	Tons.	£
1917	69	12,130
1918	216	39,252
1919	198·98	43,181
1920	105·09	17,905
1921–1929	—	—
Total	589·07	£112,468

ZINC.

The output of zinc for the year was 6997 tons, valued at £185,964, compared with 7112 tons, valued at £188,691, in 1928.

Almost the whole output came from the mines operated by the Electrolytic Zinc Company of Australasia Limited. This company has erected large works at Rosebery, and will soon be in the position to operate on a large scale.

Zinc remains in good demand, yet the price at the close of the year is low. The gradual decline in price during the past four years has been offset largely by increased efficiency of all centres of the company's activities, resulting in higher output and lower costs.

The company is perhaps more favourably placed than many producers owing to the satisfactory and gradual development of its Western District mines during the past 10 years, and to the stocks of purchased concentrate now on hand.

RETURN showing the Quantity and Value of Zinc produced during the Years 1917 *to* 1929 *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
1928	7112	188,691
1929	6997	185,964
Total	35,838·69	£1,113,727

COAL.

Coal-production advanced to 130,291 tons, valued at £105,877. Limited to local markets, expansion of the trade in coal depends upon the growth of secondary industries. This will be noticeable next year when the Goliath Cement Company puts into operation additional kiln units, which, it is stated, will require 40,000 tons of coal. The best that can be looked for in the immediate future, therefore, is the gradual displacement of imported coals.

Interest in new developments is drawn particularly to the Seymour Mine. The company has carried on a scheme of gradual development, and has at the same time constructed at great expense a long jetty, with complete equipment for cheap handling. Seymour coal is now coming into the market, and is held in high favour by those in the trade.

Mining at Catamaran has been of a desultory character owing to the difficulty in finding markets for the slack, which constitutes 30 per cent. of the mined coal.

At Meunna, near Preolenna, Messrs. Carson and Barr have pushed on with their explorations, and have made preparations for the reopening of their mine, which suffered damage from phenomenal floods.

Interest has been directed again to the Silkstone, Fingal, and Mount Elephant fields, where exploratory works have of late been performed.

RETURN showing the Quantity and Value of Coal raised from 1880 *to* 1929.

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*
1928	128,500	106,558*
1929	130,291	105,877
Total	2,660,980	£2,091,308

* Value at pit's mouth.

MAGNESITE.

Large bodies of magnesite and dolomite, derivatives of pyroxenites by natural secondary processes, lie on the south bank of Arthur River, six to seven miles beyond the terminus of Preolenna railway.

It is understood that an offer of £1 a ton, delivered at Burnie, for 15,000 tons a year has been received by those interested for the highest grade material.

Difficulties in the way of progress are due to the cost of tramway connection and the necessity for a thorough preliminary testing of the bodies. If the bodies prove to be very large and of a uniformly high grade, and a market such as that mentioned be available, tramway connection would be justifiable. Silica and lime with the magnesite may prove to be in greater proportion than anticipated.

MICA.

Mica in the form sericite is being mined on a small scale at Templer's farm, Gawler. It appears there as veins, one to three feet wide, in Pre-Cambrian schists.

This year production amounted to 23 tons, valued at £45.

MONAZITE.

The market for monazite is so low and so uncertain that successful mining of this mineral is not possible.

OIL SHALE.

The year records slow progress in this industry. Set-backs in two works, due in one case to defects in the system of retorting, has created a dispiriting effect in the minds of some who have given of their time and money in endeavours to place the industry on a sound commercial footing. Unfortunately, the Long Retort, with which the Tasmanite Shale Oil Company Limited hoped to

solve the problems of retorting, did not come up to expectation. The company, undismayed by the results of the preliminary test, however, is carrying on experiments still and hopes to get over the difficulty that beset them in their trial run.

L. and N. (Tas.) Limited delivered one retort and very much accessory plant at their works, but after placing the retort in position suspended operations.

Mineral Oils Extraction Limited, in conjunction with the Goliath Cement Company operating at Railton, has erected a Crozier type retort near Latrobe. The report of a few weeks run seemed satisfactory, but a break-down in the plant caused a temporary stoppage. The further trial of this retort will be followed with the greatest interest.

RETURN showing the Quantity and Value of Shale produced during the Years 1910 *to* 1929.

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
1928	2595	1297
1929	4299	2982
Total	19,671	£15,616

RETURN showing the Quantity and Value of Oil distilled from Shale.

Year.	Name of Company.	Gallons.	Value.
			£
Up till 1926	Several Companies	22,000	550
Up till 1928	Australian Shale Oil Corporation	65,000	1,625
Up till 1930	Tasmanite Shale Oil Company	7,800	195
1929	Goliath Cement Company (Crozier Retort)	2,200	55
	Total	97,000	£2,425

The quantity produced by the several companies operating prior to 1926 is a rough estimate only. The value as given is based on a market price of 6d. per gallon.

PAINT MATERIALS.

Paint materials, such as barytes, rutile, and ilmenite, and ochres are again attracting attention. As regards barytes the reserve in Tasmania is high and the quality good, but the market is very weak, because the mineral can be imported at a figure below the cost of production and transport in Tasmania.

Very little interest has been displayed in ilmenite and ochre this year.

OCHRE.

RETURN showing the Quantity and Value of Ochre produced during the Years 1918 *to* 1929.

Year.	Quantity.	Value.
	Tons.	£
1918	100	200
1919	—	—
1920	—	—
1921	14	56
1922	—	—
1923	—	—
1924	20	50
1925	—	—
1926	38	69
1927	—	—
1928	—	—
1929	—	—
Total	172	£375

CLAY AND CLAY PRODUCTS.

No statistics have been kept of the tonnage and value of clay produced for bricks, tiles, pottery, and drainage and sewerage pipes. Production of these articles is limited to domestic requirements.

LIME.

No record is kept of the production of lime used in the building trade and other construction works.

LIMESTONE.

The records given hereunder relate only to limestone trained and shipped by the Broken Hill Proprietary Company from Melrose to Newcastle, and that quarried by Australian Commonwealth Carbide Company Limited, and sold to the Electrolytic Zinc Company of Australasia Limited at Risdon.

The following is the record of production this year:—Shipped to Newcastle and Risdon, 68,176 tons.

A company is being formed at Launceston for the production of agricultural lime (pulverised limestone), and a group in the southern part of the country are contemplating the formation of

a company with that particular objective in view. No doubt the greater use of agricultural lime would materially increase the productive properties of Tasmanian soils.

Investigations are about to be undertaken at Karoola to ascertain whether that deposit of limestone is suitable for agriculture.

SAND AND GRAVELS.

No record is kept of the production of sand and gravel for domestic use.

Cementoid Silica Limited thoroughly explored its grounds near Beauty Point, and has proved a very extensive and valuable deposit. Cost of transport is the all-important problem.

Another company has explored an extension of these deposits, which have opened up very well.

STONE.

Under this heading are included all classes of stone used for building, monumental, and ornamental purposes, stone for paving and curbs, grindstone, scythestone, rubble and crushed stone, &c. No record has been kept up till the present time.

RETURN showing the Quantity and Value of Limestone produced during the Years 1923 *to* 1929.

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
1928	98,654	79,050
1929	68,176	66,597
Total	860,984	£859,477

CALCIUM CARBIDE.

Mining and Smelting Operations of the Australian Commonwealth Carbide Company Limited at Electrona.

The following report of operations is furnished by the works manager:—

"*Limestone Quarries.*—During the year 12,476 tons of high-grade limestone was quarried at Ida Bay and shipped to Electrona. The average number of men engaged in quarrying and transporting the limestone amounted to 18. In order to provide better conditions of operation the tramway was extended 1 mile 46 chains to the old quarry.

"*Smelting Works.*—The factory at Electrona produced 3435 tons of carbide, valued at £53,645, of a quality better than the English standard requirements. It is interesting to note that the local product has proved at least equal in quality to the best imported brands, and has become very popular with consumers for both welding and lighting purposes.

"The most up-to-date process (Soderberg Electrode system) is used. It has proved quite satisfactory in operation, and shows a considerable saving compared with the old type (baked electrode) previously used.

"The average number of men employed at Electrona was 91."

RETURN showing the Quantity and Value of Carbide produced during the Years 1922 *to* 1929.

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
1928	3829	68,877
1929	3434	53,841
Total	26,742	£551,950

CEMENT.

The total quantity (41,798 tons) of cement made in 1929 fell short of last year's production by 3001 tons and £13,767 in value.

During the year the National Portland Cement Company at Maria Island suspended operations indefinitely. The closing of these works will be offset by additional units to the Goliath Cement Company's plant at Railton, which will be in full operation next year.

RETURN showing the Quantity and Value of Cement produced during the Years 1924, 1925, 1926, 1927, 1928, *and* 1929.

Year.	Quantity.	Value.
	Tons.	£
1924	21,026	105,130
1925	32,574	162,870
1926	33,611	166,447
1927	38,690	176,779
1928	44,799	189,380
1929	41,798	175,613
Total	212,498	£976,219

STATISTICS OF PRODUCTION.

RETURN showing the Annual Value of Mineral Products for the State of Tasmania from 1880 *to* 1929.

Year	Value.	Year.	Value.
	£		£
1880	554,031	1905	1,729,129
1881	602,723	1906	2,257,147
1882	556,306	1907	2,277,159
1883	560,873	1908	1,650,027
1884	468,302	1909	1,574,995
1885	518,885	1910	1,432,193
1886	489,966	1911	1,349,497
1887	593,256	1912	1,493,502
1888	616,733	1913	1,415,700
1889	504,718	1914	1,007,038
1890	444,210	1915	1,225,575
1891	528,388	1916	1,521,050
1892	526,909	1917	1,584,290
1893	627,909	1918	1,750,574
1894	732,764	1919	1,301,090
1895	575,692	1920	1,421,104
1896	662,058	1921	822,851
1897	1,006,140	1922	1,013,415
1898	1,071,084	1923	1,219,456
1899	1,660,622	1924	1,496,804
1900	1,888,695	1925	1,700,861
1901	1,763,896	1926	1,808,844
1902	1,378,406	1927	1,621,027
1903	1,354,044	1928	1,593,828
1904	1,379,204	1929	1,790,653
		Unenumerated prior to 1894	31,988
			£59,155,611

QUANTITY and Value of Minerals Reported to the Mines Department during Year 1929.

Mineral.	Locality.	Registered Name of Company or Lease.	Quantity Treated.	Output (Metallic).	Value.	Remarks.
			Tons.	Ounces.	£	
GOLD	Lisle	Sundry claims	....	252·00	1070	Obtained from sluicing
	Beaconsfield	R. V. Jillett	1400 tons, tailings	316·00	1342	Treatment of battery sands
	Beaconsfield	Sundry claims	....	55·16	234	
	Mathinna	Golden Gate Consolidated	1230 tons, tailings; 124 tons ore	384·19	1631	Battery and treatment by cyanide
	North-Eastern Division	Sundry claims	....	81·37	346	Obtained from mint return
	Rosebery	Electrolytic Zinc Co.	....	1525·00	6478	Obtained from silver-lead ore
	Queenstown	Mt. Lyell Mining and Railway Co.	....	2844·00	12,080	Obtained from copper ore
	Western Division	Sundry claims	....	135·18	574	Mint return
	North-Western Division	Sundry claims	....	1·02	4	Mint return
SILVER	North-Western Division	Magnet S. & L. Company	21,836 tons	199,145·00	21,602	
	Zeehan	Dunkley's S. & L. Mine	....	4725·00	505	
	Zeehan	Big Ben S. & L. Mine	....	3127·09	334	
	Zeehan	Lucknow Syndicate	....	133·00	16	
	Zeehan	Zeehan Queen Mine	....	384·00	43	
	Zeehan	Swansea Mine	....	330·00	34	
	Zeehan	Montana Mine	....	2361·00	241	
	Zeehan	Sundry claims	....	1831·00	191	
	Queenstown	Mt. Lyell Mining and Railway Co.	....	149,424·00	16,308	Obtained from copper ore
	Tullah	North Mt. Farrell Silver-lead Co.	65,522 tons, crude ore and tailings	290,538·00	31,935	Obtained from silver-lead ore
	Rosebery	Electrolytic Zinc Co.	43,797 tons	209,349·00	23,016	Obtained from silver-lead ore
	Dundas	Adelong Syndicate	633 tons	2892·00	312	
				Tons.		
LEAD	Magnet	Magnet S. & L. Co.	....	1255·00	28,976	
	Zeehan	Big Ben Mine	....	25·00	571	
	Zeehan	Zeehan Queen Mine	....	6·00	170	
	Zeehan	Lucknow Syndicate	....	3·00	77	
	Zeehan	Dunkley's Mine	....	54·00	1227	
	Zeehan	Montana Mine	....	16·00	358	
	Zeehan	Swansea S. & L. Mine	....	12·00	265	
	Zeehan	Sundry claims	....	10·00	234	
	Tullah	North Mt. Farrell	65,522 tons crude ore and tailings	2279·00	52,845	
	Rosebery	Electrolytic Zinc Co.	43,797 tons	2247·00	52,328	
	Dundas	Adelong Syndicate	633 tons	74·00	1742	
TIN	Bradshaw's Creek	Pioneer Tin Mining Co.	....	9·36	1900	
	Bradshaw's Creek	Rajah Tin Mining Co.	18,550 yds.	7·10	1365	
	Bradshaw's Creek	Waugh Tin Mining Co.	12,258 yds.	2·77	563	
	Bradshaw's Creek	Eastern Lead Mining Co.	122,050 yds.	10·09	2056	
	South Mount Cameron	Endurance Tin Mine	63,000 yds.	22·90	4934	
	South Mount Cameron	Harmon's Lease	13,196 yds.	6·97	1397	
	South Mount Cameron	Sundry leases	....	13·05	2716	
	Derby	Briseis Tin Mining Co.	....	88·56	18,415	
	Derby	Lone Bros.	....	7·45	1551	
	Derby	Ringarooma Tin Mine	2400 yds.	4·13	820	
	Derby	Alluvial Ltd.	....	2·02	417	
	Derby	Sundry claims	....	1·51	291	

	Straits Islands	Sundry claims	...	2·90	538
	Branxholm	Arba Tin Mining Co.	78,750 yds.	29·09	5950
	Branxholm	Roma Tin Mining Co.	....	12·42	2733
	Branxholm	Montrose and Wood Mine	....	16·25	3063
	Branxholm	Ormuz Tin Mine	....	7·44	1525
	Branxholm	Ruby Flat Tin Mine	3200 yds.	3·88	794
	Branxholm	Sundry claims	....	24·64	4873
	Ringarooma	Sundry claims	....	2·99	627
	Gladstone	Monarch Tin Mining Co.	16,000 yds.	8·72	1771
	Gladstone	New Mussel Roe Mine	38,000 yds.	6·38	1278
	Gladstone	Sundry claims	....	33·22	6543
	North-Eastern Division	Sundry claims	...	5·71	1269
	Lottah	Wyniford Tin Mine	....	2·30	450
	Lottah	Blue Tier Tin Mine	....	0·14	31
	Weldborough	Laffer Tin Mine	13,000 yds.	2·38	481
	Weldborough	Weldborough Tin Mine	....	3·81	750
	Moorina	Weld Tin Mine	17,960 yds.	8·30	1730
	Moorina	New Moorina Tin Mine	93,500 yds.	17·02	3427
	Moorina	Sundry claims	....	17·53	3503
	St. Helens	Georges Bay Tin Mine	43,880 yds.	11·08	2259
	St. Helens	Argonaut Tin Mine	66,500 yds.	19·18	3717
	St. Helens	Hunt Tin Mine	....	6·82	1375
	St. Helens	Carter's Marsh Tin Mine	....	0·25	56
	St. Helens	Sundry claims	....	13·43	2683
	Storey's Creek	Storey's Creek Tin Mine	4987 tons	14·50	2928
	Storey's Creek	Beames & Scott	2400 yds.	0·69	145
	Storey's Creek	Sundry claims	....	4·92	966
	Waratah	Mt. Bischoff Tin Mine	9858 tons; 87,300 yds.	120·81	24,704
	Waratah	Bischoff Extended Tin Mine	700 tons	9·46	1871
	Waratah	L. & R. Smith	....	1·94	392
	Waratah	R. W. Pryde	....	2·44	473
	Waratah	Sundry claims	....	1·87	395
	Balfour	Sundry claims	....	1·22	242
	Mount Lindsay	Mt. Lindsay Tin Mine	....	2·35	473
	Stanley River	Stanley River Tin Mine	....	0·79	158
	Renison Bell	Renison Bell M. &. P. Association	....	0·17	31
	Renison Bell	Boulder Tin Mine	....	2·59	511
	Renison Bell	Montana Tin Mine	....	0·49	66
	Renison Bell	Hart's Tin Mine	5650 yds.	0·37	75
	Renison Bell	Sundry claims	....	1·92	366
	South Heemskirk	Federation Tin Mine	....	33·85	6537
	South Heemskirk	Sundry claims	....	2·95	716
COAL					
	York Plains	York Plains Coal Mine	...	890·00	1111
	Preolenna	Torbanhill Coal Mine	....	22·00	33
	Spreyton	Illamatha Coal Mine	....	1817·00	2339
	Strathblane	Esperance Coal Mine	....	88·00	136
	Catamaran	Catamaran Coal Mine	....	8378·00	7446
	Avoca	Excelsior Coal Mine	....	62·00	37
	Mount Nicholas	Mt. Nicholas Coal Mine	....	38,002·00	30,481
	Cornwall	Cornwall Coal Mine	....	62,753·00	48,656
	St. Marys	Jubilee Coal Mine	....	18,382·00	15,298
	Seymour	Seymour Coal Mine	....	348·00	340
SHALE					
	Latrobe	Goliath Portland Cement Co.	....	3659·00	2510
	Latrobe	L. & N. Company	....	286·00	160
	Latrobe	Tasmanite Shale Company	....	381·00	312

QUANTITY and Value of Minerals Reported to the Mines Department during Year 1929.—continued.

Mineral.	Locality.	Registered Name of Company or Lease.	Quantity Treated.	Output (Metallic).	Value.	Remarks.
				Tons.	£	
WOLFRAM	Storey's Creek	Storey's Creek Tin Mine	....	151·35	18,281	
	Moina	Rainbow Tin Mine	....	0·51	77	
ZINC*..	Rosebery	Electrolytic Zinc Co., West Coast Division	....	5709·00	154,221	
	Tullah	North Mt. Farrell	....	1140·00	28,462	
	Tullah	Sundry claims	....	128·00	3,281	
	*Note.—The Electrolytic Zinc Co. of Australia produced 46,163 tons valued at £1,237,361 from other than Tasmanian ores.					
				Ounces.		
OSMIRIDIUM . ..	Southern District	Sundry claims	....	1036·16	23,944	
	Western and North-Western Districts	Sundry claims	....	287·84	6680	
				Tons.		
CARBIDE	Electrona	Australian Commonwealth Carbide Co.	....	3434·00	53,841	
LIMESTONE	Electrona	Australian Commonwealth Carbide Co.	....	6502·00	4923	
	Melrose	Broken Hill Prop. Co.	....	61,674·00	61,674	
BARYTES	Riana	Pearson's Lease	....	9·50	24	
CEMENT	Maria Island	National Portland Co.	....	19,568·00	97,840	
	Railton	Goliath Portland Co.	....	22,221·00	77,773	
CADMIUM†	Rosebery	Electrolytic Zinc Co., West Coast Division	....	17·498	739,396	
† Note.—The Electrolytic Zinc Co. of Australia produced 181·5675 tons of Cadium, valued at £81,343 from other than ore produced in Tasmania.						
COPPER	Queenstown	Mt. Lyell Mining & Railway Co.	....	8668·00	7839	
	Zeehan	Copper Nickel	....	20·00	1433	
	Zeehan	Sundry claims	....	2·00	156	
NICKEL	Zeehan	Copper Nickel Company	....	85·44	14,765	
TALC	Gawler	Templar's Mine	....	23·00	45	

SMELTER PRODUCTION.

The active smelting companies in 1929 were as named hereunder:—

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

THE MOUNT LYELL MINING AND RAILWAY COMPANY LIMITED.

Report by the General Manager on work done during the year ended 31st December, 1929:—

"*Mining*—

"General mining operations were practically limited to the North Lyell and Lyell Comstock Mines, these producing the whole of the ore treated, with the exception of a small tonnage of low-grade material recovered from the Royal and South Tharsis properties in the course of exploratory work. Extensive prospecting by means of diamond-drilling was carried out in the North Lyell and Royal Tharsis properties, and general exploration and development work was undertaken in the North Lyell and Lyell Comstock Mines.

"*Mount Lyell Mine.*—No work was done on this property during the year under review.

"*North Mount Lyell Mine.*—Development and exploratory work and ore-breaking operations were carried out without intermission during the year, the ore extraction totalling 167,937 tons, and 192 tons of copper precipitates were recovered from the mine water. The tunnel connecting the 1100-feet level of the North Lyell Mine with the Reduction Works was in commission throughout the year, and has duly demonstrated its efficiency, the improved facilities resulting from this work constituting an important factor in enabling the output of ore to be greatly increased.

"*Lyell Comstock Mine.*—Ore extraction from this mine was resumed during the year on an increasing scale, the output totalling 28,640 tons, inclusive of that won from developmental work In order to permit of this mine being worked under the best conditions, a well-appointed change-house, water-storage dam, and other necessary surface adjuncts have been provided, and the mine itself has been equipped with all requisite appliances for safe and economical working. With the object of facilitating ore-transport from the mine to the Reduction Works, a deviation from the main tram was commenced early in the year, and, when completed, will permit of ore being delivered to the Reduction Works by a more direct and convenient route.

"*Royal and South Tharsis Mines.*—A considerable amount of exploratory work was undertaken in this property from the North Lyell tunnel by means of driving and diamond-drilling, the carrying out of the former resulting in 1084 tons of copper-bearing material being recovered.

"*Reduction Works.*

"Ore-reduction operations were actively carried on throughout the period on usual lines.

"The concentration plant treated 192,157 tons of ore from the North Lyell and Lyell Comstock Mines, producing 40,201 tons of concentrates. The metal-bearing material direct-smelted totalled 46,836 tons, comprising 1310 tons pyritic flux, 5840 tons North Lyell ore, and 39,686 tons concentrates produced from North Lyell and Lyell Comstock ores, these figures representing a very favourable advance on those for the preceding year. The blister copper output for the year totalled 8788 tons, as compared with 6481 tons for the previous term.

"Electrolytic Copper Refinery was in commission throughout the year, and satisfactorily treated the whole of the company's blister copper production, the resulting cathode copper being shipped in that form.

"The ore-reduction plant was kept up to the usual standard of efficiency, the extension of the fine grinding section resulting in a considerable increase in the capacity of the concentrator. The average assay value of the ore feed was lower than during the preceding year, owing to the inclusion of the appreciable ore-production from the Lyell Comstock Mine. The separation of a pyritic concentrate from the tailings was successfully undertaken, the product being used as a substitute for Mount Lyell pyrites in the smelting process. General structural and other improvements were made throughout the mill, and arrangements are being made to instal a bowl-classifier and further flotation-boxes.

"*Hydro-Electric Plant.*

"The company's hydro-electric plant at Lake Margaret was operated continuously throughout the year, the whole of the company's power and lighting requirements being supplied from this source, which has also provided the requirements of the Electrolytic Zinc Company's works in the Zeehan and Rosebery districts, as well as those of the Queenstown and Gormanston Municipalities. This plant is being augmented by the addition of a further turbo-generator set, and, in order to provide for the extra power which will be required by the State Hydro-Electric Department under its contract with the company, the installation of the lower power-station on the Yolande River, about a mile below the existing station, has been decided upon. The additional water-rights required for this extension have been granted by the Mines Department.

Return for the Calendar Year, 1929.

Ore and metal-bearing material smelted—

Source of Material.	Tons (Dry).
Ore: From the Company's North Lyell Mine	5,840
Concentrates: From the Company's North Lyell Mine and Lyell Comstock Mine ore....	39,686
Pyritic flux: From the Company's Mount Lyell Mine ore and North Lyell Mine concentrates	1,310
Total	46,836

Blister copper produced—8788 tons, containing: copper, 8718 tons; silver, 149,424 oz.; gold, 2843 oz.; approximate value, £708,101.

Average number of men employed—

Mining Department:		
At the Company's Mount Lyell Mine....	—	
At the Company's North Lyell Mine....	466	
At the Company's Lyell Comstock Mine	75	
Miscellaneous	69	
		610
Reduction Works Department (including Lake Margaret)	....	497
Railway Department:		
Mount Lyell Railway	90	
North Lyell Railway	6	96
Total	....	1,203

Dividends paid during year, £257,839: 4s. per share.

Dividends paid from the inception of the Company to the 31st December, 1929, £5,006,400.

Copper produced from the inception of the Company to the 31st December, 1929, 227,317 tons (fine).

Silver produced from the inception of the Company to the 31st December, 1929, 13,977,509 oz. (fine).

Gold produced from the inception of the Company to the 31st December, 1929, 394,091 oz. (fine).

Electrolytic Zinc Company of Australasia Limited.

The following account of the operations of this company has been furnished by the general superintendent:—

"Plant operations at Risdon were uninterrupted throughout 1929.

"The output of slab zinc for the year was 51,872 tons, an increase of 1639 tons, or 3·26 per cent., over the figures for the calendar year 1928. This was primarily due to improvements and refinements in practice, and was accomplished without extensions to plant.

"Recovery of cadium also increased by 27 tons. The increased tonnage of raw material treated in the zinc plant partly accounts for this, but it is also due to the fact that some cadium-bearing residues were handled on behalf of the Broken Hill Association Smelters Proprietary Limited. Our output has continued to find a ready market at satisfactory prices.

"In view of the further development of our West Coast operations, and the establishment there of our mining and milling programme on a full production basis, a decision was arrived at to make the necessary extensions to the Risdon plant, so as to provide additional capacity equal to approximately 30 per cent. of that of the present equipment. It is expected that this programme of work will be completed during the first half of 1931, and construction work is already well in hand.

"We are now regularly absorbing 36,000 horsepower of electrical energy, drawn from the Hydro-Electric Department, and have agreed with the Government for the supply of another 10,000 horsepower to be available when the zinc plant extensions are complete. To this end the Department has put in hand the completion of the Shannon River scheme.

"Consumption of fertilisers was again influenced by weather conditions adverse to the farming and orcharding community. Nevertheless sales figures for 1929 show an increase, despite the fact that the northern part of the State was devasted by disastrous floods during April. The advantages of modern farming methods, and more particularly of the top-dressing of pastures, are gradually becoming apparent, and as time goes on the use of artificial fertilisers will doubtless expand.

Metals Extracted During Year Ended 31st December, 1929.

	Tons.	Gross Value.	Less Realisation Charges.	Net Value.
		£	£	£
Slab zinc	51,872	1,391,582	64,839	1,326,743
Metallic cadmium	199·0668	89,182	5,574	83,608

"Included in the above figures is the following production from 13,297 tons calcines received from the West Coast of Tasmania:—

	Tons.	Gross Value.	Less Realisation Charges.	Net Value.
		£	£	£
Slab zinc	5,709	154,221	7,136	147,085
Metallic cadmium	17·4989	7,839	490	7,349
Lead	798	17,449	13,635	13,439
Silver (oz.)	88,983	9,625		

"West Coast Department also produced 2898 tons lead concentrates, containing—

	Quantity.	Gross Value.	Less Realisation Charges.	Net Value.
		£	£	£
Lead	1,449 tons	51,120	21,835	29,825
Silver	120,366 oz.			
Gold	1,525 oz.			

"Average Number of Men Employed.

At Risdon, 934. West Coast, surface, 346; underground, 101; total, 447."

"West Coast Division.

"*Zeehan.*—The mill ran throughout the year on experimental work only. It will be closed down early in the new year, in order to admit of transfer of equipment to Rosebery.

"The roasting section also worked continuously, producing calcine for despatch to Risdon. It will continue operations even when milling is transferred to Rosebery.

"*Rosebery and Williamsford.*—Development work in the Rosebery, Hercules, and Mount Read Mines was steadily pushed forward, and satisfactory progress made. Comparatively little work was done outside the limits of known orebodies, but further tonnage has been revealed, mainly in the Hercules section.

"The village at Rosebery has grown considerably, and there are now 110 houses and 28 huts provided for employees there. At Williamsford eight houses and seven huts are now available and occupied, and construction is still going on at both centres.

"The co-operation council has developed the co-operative store activities until this service is now covering an important section of the needs of the employees.

"The aerial ropeway connecting Williamsford with Rosebery is very nearly completed, and the bin systems at either end of it are well advanced.

"The average number of men employed on the West Coast was 447, of which 101 men were underground and 346 surface men."

THE MOUNT BISCHOFF TIN MINING COMPANY REGISTERED.

The following is a report prepared by the mine superintendent on the operations of the company for the year 1929:—

"At the beginning of the year the low price of tin and high mining costs compelled a restriction of operations to the richer faces and stopes. Then the continued fall in tin value made the position more difficult, the ore reserves being used up without benefit to the company. Hence after serious consideration it was decided to cease all work at the end of October until the metal market permitted a resumption at a profit. A few men have been retained on repairs and as caretakers. Some sixteen tributers are engaged in sluicing the small gullies and creeks, and are all doing well.

"*Developmental Work.*—To open good ore in the south-west corner of the Brown Face 222 feet of driving has been done. A connection has been made between the 75-feet level from the north side of the mount and the Flat Make stopes by 40 feet of driving. To stope the top portion of the Happy Valley lode a tunnel has been driven for 30 feet.

"*Metallurgical.*—The mill crushed 10,017 tons of ore, of which 1570 tons came from the underground workings. Total output, 89 tons of concentrates, assaying 68·6 per cent. tin. Recovery per ton of ore, 0·67 per cent. tin.

"*The North Valley.*

"As with the mine, the continuous fall in the price of tin was the dominating factor in the policy of the North Valley operations. To conserve the reserves of wash it was deemed prudent to suspend sluicing when the mine closed. At that time the pontoon had been floated forward into a new paddock, the machinery had been rearranged and a better balance obtained. A big "grizzly" and an electric winding winch had been installed to handle the boulders, and a different system of working evolved. In the next campaign a smaller gang of men will be required. The return of tin per cubic yard was below expectations, and was occasioned by shallow and poor wash being unexpectedly found between two rows of testing shafts, which are 10 chains apart. The top of the new paddock again shows deep and rich wash. The number of cubic yards sluiced was 87,500, and 81 tons 17 cwts. of concentrates were obtained. The concentrates assayed 62·1 per cent. tin, and gave an average of 2·1 lb. of concentrates to the cubic yard.

"Up to the time of the stoppages the average number of men employed at the mine was 43, and at the North Valley 42.

"Smelting of tin ore at the Launceston works has been suspended, owing to the lack of sufficient tin ore to keep the furnaces in operation."

AID TO MINING.

The subject of aid to mining as applied in Tasmania is one that is open to controversy. Aid is generally regarded as desirable and even necessary; the form of aid is questioned. In another part of this report I have expressed myself as not in full accord with the present system, but to devise a better is a difficult matter when all the circumstances are taken into consideration. I suggest, however, that the most effective forms of aid are—

(1) The construction of narrow roads through the richer mineral belts to serve as feeders for the railways; and

(2) The drilling of ore-deposits, coal and shale seams, rock formations, and water-bearing rocks.

Those two forms of aid will give immediate results, and will, more than any other means, assist in the development and the growth of the industry.

The provision of funds for aid to mining calls for attention, and I would suggest that consideration be given to the scheme submitted to the late Government in 1926; that is, the impost of a royalty on the net value of products sufficient to provide a revenue of £7000 to £7500 per annum. The industry could well support the burden of such a low impost, the funds from which would furnish power to aid in the development of mines under any of the measures provided for that purpose.

Advantages to be derived from such scheme:

(1) The Department would be able to make plans for the work of the following year;

(2) A fairly close estimate of cost could be made of the forthcoming revenue;

(3) Delays incident to the provision of funds, as at present, would not occur; and

(4) The Government would be relieved of this provision.

No discovery of great economic importance resulted from the work of State-aided prospectors; but geological discoveries of considerable importance have been reported. One of the most promising is that reported by C. King, of Judbury, who found a large body of serpentinised enstatite in Weld River valley, and he reports nearby a dyke of alaskite granite and felspar porphyry.

Espie and party discovered a silver-lead and arsenical pyrites ore-body on the flank of Raglan Range. This promises to become of value when the Gormanston-road extension is joined to that near Lake St. Clair.

Silver-lead is reported from Surprise River, and a crystalline dolomite from the same area.

Perhaps the most important discovery is that reported by Pryde and Keegan, of Waratah. This relates to the occurrence of a large area of tin-bearing ground along the eastern side of Meredith Range.

All these deposits lie far from ways of transport—so far that development becomes a slow and costly work in each case. The subject of track and road construction is one that calls for immediate attention. Progress demands it.

The amount of assistance to prospectors, syndicates, and companies is given in the subjoined table:—

Expenditure.

	£ s. d.	£ s. d.
Part II. of the Aid to Mining Act, 1921—		
Drilling and boring carried out at Beaconsfield, Barnes Hill, and Preolenna		
Freight and cartage, drill plant	135 15 5	
Travelling expenses	25 11 10	
Petty expenses	15 13 9	
Salary and wages	1,453 19 6	
Fuel	68 6 0	
Repairs, drilling plant		17 3 6
Stores and material		87 15 10
Diamonds	573 16 1	
		2,378 1 11
Sustenance allowance to prospectors		1,596 8 1
Miscellaneous expenditure—		
Insurance premium		2 15 5
Grants under Part III. of the Aid to Mining Act, 1921—		
Messrs. Barr & Carson	25 0 0	
New Henbury Alluvial Mining Co. No Liability	170 13 3	
Lucknow Prospecting Syndicate No Liability	303 9 9	
J. L. Frizoni	92 11 5	
		591 14 5
Assistance to prospectors—C. Ledger (cutting drive)		50 0 0
Grants under Part IV. of the Aid to Mining Act, 1921—		
Federation Tin Mines Limited (assistance to construct tram)	299 16 0	
Federation Tin Mines Limited (advance)	2,500 0 0	
Swansea Silver-Lead Mining Company No Liability (advance by way of loan)	200 0 0	
		2,999 16 0
		£7,618 15 10

Receipts.

	£ s. d.	£ s. d.
Royalty paid by tributers		8 9 10
Sale of plant from—		
Miner's Dream Mine	60 0 0	
No. 6 Argent Mine	2 5 0	
Golden Gate Consolidated No Liability	5 0 0	
Miscellaneous	1 10 0	
		68 15 0
Commonwealth Treasury—Grant for precious metals prospecting		376 18 4
Refund—Lucknow Prospecting Syndicate No Liability		3 10 0
		£457 13 2

Ore Sales.

The amount received from ore sales was £109 16s. 5d. which was distributed as follows:—

	£ s. d.
Paid to tributers	101 6 7
Royalty paid to State	8 9 10
	£109 16 5

SPECIAL FIELD INVESTIGATIONS.

In addition to work on district surveys, a number of special investigations have been made for Departmental information, some for the purpose of selecting sites for drilling, others for arranging schemes of development, and a few for the purpose of reporting upon methods of mining, milling, and concentrating.

This year, with a bigger field staff, I have been able to devote more time to administration duties, therefore comparatively little field work has been required of me. Moreover, the initiation of the topographical and geological surveys tied me to office, and made compulsory the delegation of the less important field work.

FUTURE WORK OF THE DEPARTMENT.

During the coming year one party of field geologists will remain at Smithton, and continue the survey of the northern coastal strip; the other party will be transferred to Rosebery to initiate the geological survey of the western strip. Three parties of licensed surveyors will be engaged to perform the framework topographic surveys for the geologists.

In addition economic surveys will be made of the Lefroy and Beaconsfield districts, the Mount Ramsay-Meredith Range country, and any others of importance for which demands may be made.

Plans have been drawn for the drilling of—

1. Meunna Coalfield.
2. Renison Bell Tinfield.
3. Five-mile Copper-Nickel Field.
4. Dundas Field.
5. Zeehan Field.
6. Beaconsfield Alluvial (?) Deposits.
7. Moorina Deep Lead.
8. Gladstone Alluvial Deposits.
9. George Town Coalfield.
10. Lefroy Goldfield.
11. Preolenna Coalfield.
12. Underground Water-supplies.

The drilling work performed during the year had proved of very great value, and this arm will be used to the fullest extent.

STATISTICS OF MINING COMPANIES.

RETURN showing the Amounts paid in Dividends by Mining Companies during the Year ending 31st December, 1929.

Mines.	Dividends.
	£ s. d.
Copper	129,238 0 0
Gold	...
Tin	244 0 0
Silver	...
Coal	7,258 0 0
Total	£136,740 0 0

RETURN showing the Mining Companies registered during the Year ending 31st December, 1929.

Number of Companies.	Capital.
5	£20,800

In addition to the above, 6 Agents for Foreign Companies and 3 Syndicates under Part VA of the Mining Companies Amendment Act, 4 Geo. V. No. 44, were registered.

RETURN showing the Average Number of Persons engaged in Mining during the Years 1880 *to* 1929.

Year.	Number.	Year.	Number.
1880	1653	1905	6581
1881	3156	1906	7005
1882	4098	1907	7516
1883	3818	1908	6466
1884	2972	1909	6054
1885	2783	1910	5770
1886	2681	1911	5247
1887	3361	1912	5566
1888	2989	1913	6107
1889	3141	1914	4741
1890	2868	1915	3908
1891	3219	1916	3864
1892	3295	1917	4050
1893	3403	1918	4278
1894	3433	1919	4413
1895	4062	1920	5364
1896	4350	1921	4011
1897	4510	1922	3835
1898	6052	1923	4785
1899	6622	1924	5264
1900	7023	1925	5110
1901	6923	1926	5309
1902	5934	1927	5044
1903	6017	1928	5170
1904	6194	1929	4986

RETURN showing the Average Number of Miners employed during the Year ending 31*st December*, 1929.

Division.	Number.
Northern and Southern	1691
North-Eastern	390
Eastern	490
North-Western	442
Western	1973
	4986

RETURN showing the Total Amount of Rents, Fees, &c., received by the Mines Department during the Year ended 31*st December*, 1929.

Head of Revenue.	Value.
	£ s. d.
Rent of Auriferous and Mineral Lands	12,547 13 2
Fees, Auriferous and Mineral Lands	1,242 4 3
Survey Fees	2,035 19 4
Fees under the Explosives and Inflammable Liquid Act	875 14 2
Total	£16,701 10 11

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 30*th June, from* 1882 *to* 1903, *and for Six months ending* 31*st December*, 1903. *and for the Years ending* 31*st December*, 1904 *to* 1929, *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	1928	14,313 12 0
		1929	14,665 10 7

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 Total Number and Area of Leases and Licences issued during the Year ending 31st December, 1929.

Mineral.	Leases.	Sluiceheads.	Area.
			Acres.
Arsenic	...	...	...
Clay	1	...	20
Copper	...	...	...
Coal	2	...	1039
Dredging Claims	22	...	328
Gold	16	...	303
Iron	...	...	...
Limestone	...	...	...
Minerals	18	...	972
Machinery Sites	4	...	18
Mining Easements	8	...	53
Nickel	1	...	80
Osmiridium	...	...	...
Phosphate Rock	...	...	...
Silver Lead	1	...	10
Sand and Gravel	1	...	25
Shale Oil	...	...	...
Tin	93	...	4969
Wolfram	1	...	54
Zinc Lead	...	...	...
Water Rights and Dam Sites	53	343	153
Licences to search for Coal and Oil	5	...	5744
Total	226	343	13,168

RETURN showing the Total Area of Land and Number of Sluice-heads of Water applied for during the Year ending 31st December, 1929.

Mineral.	Number.	Sluiceheads	Area.
			Acres.
Asbestos	1	...	80
Barytes	5	...	190
Clay	2	...	25
Coal	4	...	1245
Copper	2	...	120
Gold	21	...	311
Iron	...	...	...
Minerals	37	...	1777
Nickel	...	...	...
Osmiridium	7	...	40
Silver	2	...	114
Silica	1	...	40
Sand and Gravel	...	...	...
Tin	114	...	4695
Wolfram	...	...	...
Machinery Sites	...	...	...
Mining Easements	12	...	77
Dredging Claims	30	..	716
Water Rights and Dam Sites	58	485	177
Licences to search for Coal or Oil	5	...	5744
Total	301	485	15,351

RETURN showing the Number and Area of Leases held under the Mining Act, in force on 31st December, 1920 to 1929 inclusive.

Nature of Lease.	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.		In force on 31st Dec., 1928.		In force on 31st Dec., 1929.	
	No.	Area.	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.		Acres.
For Minerals, Silver, Tin, &c.	795	30,043	901	31,719	716	26,459	614	21,880	460	23,308	532	23,588	541	22,129	642	25,604	728	28,103	652	27,052
For Coal, Slate, Shale, &c.	50	11,667	66	15,430	73	16,809	66	16,053	27	8901	35	9922	49	13,136	39	11,077	52	15,407	36	11,022
For Gold	65	1403	92	1894	127	2424	108	1687	91	1829	70	1340	42	870	38	749	40	830	36	746
Dredging Claims	30	410	29	413	36	399	33	369	20	289	20	195	42	363	41	502	52	626	60	756
Mining Easements	104	616	97	621	87	607	81	606	77	592	77	570	68	494	77	484	77	475	55	409
Machinery Sites	33	147	34	152	31	123	30	124	26	115	27	112	25	150	21	110	29	169	25	171
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	7	7200	9	10,844
Water-rights Mineral and Gold	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	371	1552 & 1581 sluice-heads	486	2359 & 2053 sluice-heads

CONDITIONS AFFECTING THE DEVELOPMENT OF MINING.

The successful development of the mining industry does not wholly depend upon the excavation of ores from mines, their separation and concentration; it depends largely upon the efficient collaboration of all parties, from the producer to the consumer. A system of large-scale low-cost production is essential, but that is of no avail if a thoroughly efficient system of transportation, fabrication, and marketing is not provided for in addition. The market values of minerals vary with the industrial development of the State and the Commonwealth, and also with their trading relations with, and the industrial development of, other countries. A very small portion, for instance, of the mineral production of Tas-

mania is fabricated here, consequently the price of any product is determined by the value placed upon it in the country of market. Many products, such as ores of bismuth, osmiridium, and chromium, are controlled by small groups of metal-dealers in England and America, who fix the prices on the basis of supply and demand, and hold in hand at times considerable stocks. Fluctuations in prices of metals have been so rapid, and have covered such wide ranges, of recent years as to seriously hamper the progress of existing mining companies and prevent the formation of others. Measures are being taken in other countries to regulate the supply of some metals to the demand, in order to ensure stability, and at the same time conserve resources. The general slump in metal prices has resulted in the closing of many mines, and has greatly restricted the output of others. No alleviation can be expected until the return to normal trading relations between the highly-industrialised countries.

I do not look for the discovery of new districts only to maintain, and perhaps improve, the position of mining in the industrial scale; but also to the application of advanced methods of mining and metallurgy to known large low-grade deposits, and to improved conditions of transport. In the past, pioneer miners had little difficulty in locating rich outcropping ore-bodies in new country, and in their explorations discovered many low-grade deposits of minerals. The marketable grade of ore in those days, as in these, was conditioned by the cost of transport and by the ease of preparation for market. Most of the outcroping lodes in settled districts containing rich concentrations of minerals have already been found, and have been, or are being, worked. Few, however, of the enormous bodies of low-grade ores, upon which the future of the industry depends, have received much attention.

The large complex deposits of Read-Rosebery, the ores of which have so long baffled metallurgists, have now succumbed to the ingenuity of the Electrolytic Zinc Company. Again, at Mount Lyell advances made in the metallurgy of copper have allowed the general manager to remodel the whole process of treatment in such manner as to be productive of the very best results. In like manner, the Blue Tier Tin Committee has carried out the preliminary investigations of tin-ore deposits at Lottah, with the object of submitting a scheme for the mining and treating of the material on a very large scale.

Another and very important condition is that relating to transport. Upon that the success of mining largely depends.

In the course of a year considerable sums are allocated for sustenance allowance to prospectors, with very little good result; and sums are also granted for the development of known deposits, not often with satisfactory results. It seems to me that the work of the Department would prove more effective it much of the money so allocated could be used in improving the conditions of transport, in order to provide ways to known mineral belts, particularly those of the Western District. The greatest tax on the mineral producer in the undeveloped areas is the cost of transport, and to this must be attributed the slow development of western mineral fields. For instance, not one discovery of note has been made since the construction of the railways through the Western District, which were directed to tap existing mining centres. Prospectors now search particularly for gold and osmiridium, because the cost of transport in those cases applies only to supplies of provisions. It seems to me that a series of conferences with representatives of residents of the Western District and the Mines, Forestry, and Public Works Departments, for the purpose of investigating the most effective road routes and reporting their findings to the Government, would be a good first step on the way. The prospector could, and would, explore undeveloped mineral areas without assistance if such be made easily accessible; the investor would develop ore-bodies discovered by the prospector; and companies would mine, concentrate, and market the ores if the cost of transport allowed of successful operation. The prospector of to-day is quite the equal of his forebears, and would gladly welcome the opportunity of entering unexplored mineral areas if ways of access were provided for him.

The lack of transport facilities, therefore, is one of the main reasons for the slow growth of mining, especially in the Western District. As regards development in other districts, the slump is due to the depletion of the richest deposits and to the very low market prices of metals.

It must be remembered also that the large mines of Tasmania can be counted on the fingers of the hand; that the richer veins and lodes are very narrow, and, as a rule, the ore lenses are short and sporadic; and that Tasmania, although containing a large variety of mineral, cannot be regarded as a country of vast mineral resources.

CONCLUDING REMARKS.

In concluding this report I have to express regret that among certain staff officers there appears at times a lack of harmony; a suspicion that all are not working in accord; and that selfish motives sometimes outweigh an officer's good judgment. Agreement and contentment are two factors essential to success. I have always encouraged a willing spirit of co-operation between the various units. To be technically efficient is not enough. In order that this Department may function efficiently it is essential that every officer realise his obligations and act accordingly, and that he have one objective—the good of the State—only in mind. As a whole, the staff has given very good service.

Important changes in, and additions to, the work of the Department have led to much criticism. Divergence from old standards, the application of new ideas, and the initiation of great undertakings, must lead to opposition, for the majority are averse to change. However, I have not been influenced by group opinion, and have in consequence been able to set in motion more important works than any of my predecessors. The time will soon arrive when the true value of the new systematic topographical and geological surveys will come up for recognition and general approval.

A. McINTOSH REID, Director of Mines.

7th April, 1930.

REPORT OF THE GOVERNMENT GEOLOGIST FOR YEAR 1929.

Hobart, 15th April, 1930.

SIR,

I HAVE the honour to submit my report for the year ended 31st December, 1929.

Field Investigations.

The most important field investigation carried out during the year was the systematic geological survey of the Smithton district. This survey represents the first one to be carried out in connection with the Development and Migration Commission scheme for the systematic geological survey of certain parts of the State. The details of this scheme and the survey will be described later in this report.

The remaining field investigations consisted of special examinations of short duration in connection with individual mines, mineral deposits, underground water, selection of bore-sites, &c. The following list represents a complete statement of such field investigations:—

(1) Geological examination of the Packer's Creek (formerly Cliff) Tin Mine.
(2) Tour of the Zeehan, Copper-nickel, Renison Bell, Rosebery and Ringarooma Valley districts to conduct Dr. Bieler, of the Imperial Geophysical Experimental Survey, over same.
(3) Geological examination of the alluvial flats, Arthur River, north of its junction with the Waratah River.
(4) Geological examination of the Magnet Mine.
(5) Geological examination of the Conara district for selection of bore-site for water.
(6) Geological examination of Geeveston district.
(7) Geological examination of the Swansea Mine, Zeehan.
(8) Geological examination of the Big Ben Mine, Zeehan.
(9) Geological examination of a gas prospect, Henty River.
(10) Geological examination of Ballochmyle, Tunbridge.
(11) Geological examination of Harland Rise, Evandale.
(12) Geological examination of F. Walker's property, Lalla.
(13) Geological examination of asbestos deposit at Asbestos Point, Macquarie Harbour.
(14) Geological examination of Mount Leslie, near Launceston.
(15) Geological examination of oil prospect at Mengha.

Short Reports.

The following reports were prepared in connection with the above and other field trips. It is to be noted that, in accordance with the instructions of the Hon. the Minister for Mines, some of the later reports were prepared for departmental purposes only, and not for issue to the public.

(1) Report on the Cream Creek Tin Mine.
(2) Report on the Packer's Creek (formerly Cliff) Tin Mine.
(3) Report on the alluvial flats, Arthur River, north of its junction with Waratah River.
(4) Departmental report on the Magnet Mine.
(5) Report on site for proposed bore-hole at Conara.
(6) Brief preliminary report on underground water at Geeveston.
(7) Brief preliminary report on the Swansea Mine.
(8) Report on gas prospect at Henty River.
(9) Geological report (Departmental) on the Big Ben Mine.
(10) Report on possibilities of obtaining underground water-supply on Ballochmyle, Tunbridge.
(11) Report on possibilities of obtaining underground water-supply on property of F. Walker, Lalla.
(12) Report on possibilities of obtaining underground water-supply in the Geeveston district.
(13) Notes on button-grass areas.
(14) Departmental report on the asbestos deposit at Asbestos Point, Macquarie Harbour.
(15) Departmental report on coal at Harland Rise, Evandale.
(16) Notes on the Tower Hill Mine.
(17) Summary report on reserves of iron, oil, coal, and sulphur in Tasmania.

Underground Water.

During the year interest in underground water-supplies was renewed, and several applications for sinking of bore-holes were made. Altogether, six localities were examined geologically, and recommendations made.

Five bore-holes (two at Conara; two on Ballochmyle, Tunbridge; and one on Salt Pan, Tunbridge) were sunk as a result of these recommendations, and all were successful.

The two bore-holes at Conara were put down in the station-yard for the Railway Department. Both proved supplies to exist greater in quantity than could be tested by the bailing apparatus, while the quality was good. The importance of such supplies at an important junction like Conara cannot readily be estimated.

The two bore-holes on the Ballochmyle property, Tunbridge, were also successful. Both provide ample quantities for watering all the stock. The provision of such watering points is of great advantage, in that the property can be (and has been) divided into smaller paddocks, thus enabling it to be conducted on more efficient and satisfactory methods, which were hitherto impossible owing to lack of water supplies for the stock.

The bore-hole on the Salt Pan property, at Tunbridge, was also successful, both as regards quantity and quality. This bore-hole will enable subdivision of the larger paddocks to be made, and thus permit of more efficient and economical practice.

Geological Survey Staff.

Field Geologists.—The successful applicants for the two positions were K. J. Finucane and F. Blake. K. J. Finucane is a graduate of the University of Western Australia, and holds the degree of Bachelor of Science. He has had considerable experience in various kinds of surveying in Western Australia. Prior to his appointment he had been on the staff of the Geological Survey of Western Australia for two years, and was engaged in the survey of the Kalgoorlie Goldfield.

F. Blake was transferred from the position of Assistant Geologist, which position he had occupied for three years. Prior to that he had been performing the drafting work of the Geological Survey for two years in the Mines Drafting Branch, with which he had been associated for many years. During recent years he has taken and passed in the Geology I. and II. courses at the University, and also gained much field experience.

Field Assistants.—T. D. Hughes and J. Rowland were appointed to the positions, and worked with the Survey at Smithton.

J. Rowland was transferred to the Public Trust Office in December.

Assistant-Geologist.—F. Blake occupied this position until April, when he was appointed to the position of Field Geologist. While still occupying the above position, he accompanied me on several field trips, and carried out the following investigations:—

(1) Geological examination and boring campaign of the alluvial deposits of Fraser Beach, King Island.
(2) Geological examination of occurrence of asphaltum at King Island.

The following reports were prepared in connection with the above:—

(1) Report on examination and boring campaign of alluvial deposits at Fraser Beach Terrace, King Island.
(2) Report on occurrence of asphaltum at King Island.

The position is not filled at the present time.

Cadet Geologist.—Q. J. Henderson continued to carry out the greater part of the drafting work of the Geological Survey. One of the most important items of drafting performed was the design and drawing of the rock-slicing machine for the Geological Survey. On the transfer of the Assistant-Geologist it was found necessary to withdraw Mr. Henderson from the drafting room for general work in the Geological Survey. It was also necessary to withdraw him from the drafting work in order that he should enter another phase of his training, viz., the handling of rocks, minerals, fossils, and all other geological specimens. In this connection he

has organised the various collections sent away by request from other institutions, persons, &c., in numerous parts of the world, and has also been engaged in enlarging, altering, and otherwise improving the Survey type and store collections.

Two field trips were made, viz.:—

(1) Geological survey of the Geeveston district.
(2) Smithton district, where for two months he was engaged in connection with the systematic survey.

One report was prepared by him, viz., report on investigation of the underground water resources of the Geeveston area.

Librarian.—Mr. F. H. Barrett continued to fill the temporary position of Librarian until the end of March, when, owing to his death, the position became vacant.

Mr. F. H. Ripper was appointed to the temporary position on 1st July. He continued the work of preparing a subject index of the library, and kept the other card systems up to date. He has also largely assisted the Department generally in the matters of looking up references, preparing extracts, preparing statistics, &c.

Towards the end of the year, as a result of recommendations by the Director of Mines and reports by the Public Service Commissioner, it was decided to instal a filing system in the Technical Branch of the Department. The work of the recording and filing is being carried out by the Librarian, and occupies a considerable portion of his time.

Typist.—Miss J. Dobbie was transferred to the Agricultural Bank early in March, and Miss I. Cockayne was appointed in her place. The typing of letters, reports, &c., for the Director of Mines, Government Geologist, and State Mining Engineer has kept her fully occupied.

Initiation of Systematic Geological Survey.

As a result of the investigations of the Development and Migration Commission, a report was submitted on the mineral industries of the State. This report included important recommendations in connection with the geological survey of Tasmania, with the object of establishing a systematic survey of the State. The report was received in July, 1928, and the financial arrangements recommended in connection therewith were included in the estimates submitted to Parliament for 1928-29. The arrangements were approved of, and the estimates were passed in December, 1928.

Steps were at once taken to initiate the survey by calling for applications for the appointment of the necessary staff, and the ordering of the necessary equipment.

The two field geologists (K. J. Finucane and F. Blake) were appointed in April, 1929, but considerable delay occurred before the ordered equipment was received. During April and May the field geologists were employed, amongst other things, in making themselves acquainted with typical Tasmanian rock systems in Southern Tasmania. During June a trip was made to Western Tasmania, to become familiar with the older rock-formations of the mineral fields. July was occupied in obtaining plans and all necessary data, &c., for the first field trip.

The first area recommended for survey by the Development and Migration report was a strip along the north coast. For geological and other reasons the Smithton district was selected as the locality to be surveyed first, and was approved of by the Director of Mines. The field geologists, with two field assistants, accordingly left Hobart for Smithton on 23rd July, and commenced operations. I joined them a week later, and survey operations were carried out continuously until the end of the year.

Systematic Geological Survey.

A full report dealing with the scope of geological investigations, the necessity for a detailed or systematic geological survey, and the results to be obtained from same, was incorporated in the report for 1928, and need not be repeated here.

The main objectives of the present systematic geological survey are:—

(1) The elucidating of the stratigraphy of the Proterozoic and Lower Palæozoic rock systems. It is in these rocks that the mineral deposits of the State occur, and thus it is highly important that such knowledge should be available for use in connection with the economic geology of the mining districts. The information obtained in the past with regard to these older rocks has proved to be most valuable, but it cannot be claimed to be either complete or detailed. This complete and detailed knowledge is absolutely essential for the satisfactory study of the mineral deposits, and it can only be obtained by a systematic survey of certain selected districts.
(2) The production of detailed geological maps. Such maps will be one of the most immediate results of the surveys. Such maps are produced by practically every sovereign State throughout the world and are invaluable for many purposes, including particularly the search for mineral deposits of all types.
(3) The investigation of all deposits of economic minerals, &c., in the districts surveyed. The economic geology surveys are thus being carried out at the same time as the systematic survey.

In the present survey the selected areas are—

(1) An east-west strip along the north coast. The selection of this strip was due to the excellent exposures of the older rocks along the coasts, which would greatly facilitate the study of the older rocks.
(2) An east-west strip through the west coast. This would include some of the more important mineral fields, and would yield further sections of the older rocks.
(3) A north-south strip connecting the above two strips, and including the areas of older rocks.

One party has been working at Smithton in the first area, and one will shortly be started at Rosebery in the second area.

For the purposes of the survey the State has been divided into districts, bounded approximately by meridians and parallels which will represent rectangles with sides one-sixth of a degree in length (about 11 miles by 9 miles). These are divided into four parts, and the maps of these will be issued as geological quarter-sheets.

Every road, railway, stream, water divide, &c., will be traversed and examined, while full advantage will be taken of every exposure, whether natural (cliffs, waterfalls. &c.) or artificial (cuttings, quarries, &c.). The result will be a very complete and accurate map, from which, with the other information available, the geological structure of the district will be worked out.

Topographical Survey.

At the time of the preparation of the Development and Migration Commission report it was anticipated that a topographical survey of Tasmania would also be carried out, in which case the Geological Survey would have used these maps as a basis for the geological ones. In the event, however, of the topographical survey not being formed, the following recommendation was made:—

> "It strongly urges, however, that the work done by the Geological Survey parties be carried out in such a way as to be available to the geodetic and topographical survey parties when this work is undertaken."

It was in accordance with this recommendation that the Geological Survey undertook the work of carrying out topographical as well as geological surveys. This was rendered necessary because, in the absence of topographical maps, it was essential to prepare same as a basis for the geological maps.

During the latter half of 1929 many attempts were made to form a topographical survey, but none were successful. The final arrangement was that this should be carried out under the control of the Geological Survey, with the assistance of a number of authorised surveyors, and this scheme is being followed at present. Pending these arrangements, the Geological Survey had completed the survey of the Smithton N.E. quarter-sheet.

The scheme being followed is, that authorised surveyors are engaged, and carry out framework surveys (triangulation, standard traverses, and levels) for each quarter sheet. The topographic details (streams, hills, and other natural and artificial features) are filled in by the field geologists as a result of careful chain and compass surveys, during which the geology and geological features are also examined and surveyed.

The triangulation is purely a topographic one, the aim being to fix trigonometrical stations at distances of approximately 1 mile apart. All such stations are permanently marked. The accuracy aimed at in the triangulation is that the maximum closure of triangles shall

not exceed 12 seconds, and the average not exceed 6 seconds. (This in accordance with the standards of the United States topographical and geological surveys.) Where possible, this triangulation will be connected with the major triangulation survey of the State.

The permanent marking of all trigonometrical stations will enable the topographic triangulation to be incorporated in a general major (should this be repeated at any time), or second order (should this be attempted) and third order, triangulation scheme at any future time.

The remainder of the framework surveys will be standard theodolite traverses. This will be carried along all main roads and other important features, and also approximately around the boundaries of the quarter-sheets. They are arranged so that they provide a regular and well-spaced framework on which to tie the compass traverses. These traverses will all close on trigonometrical stations, and under such circumstances an accuracy of 1 in 5000 is aimed at. In districts which do not lend themselves to triangulation, and standard traverses have to be relied upon, a higher accuracy (1 in 10,000) will be sought. Arrangements are being made to permanently mark all theodolite stations with piping, so that the accurate surveys can be used at any future time for any purpose.

Lines of standard levels will be carried along the main roads to provide a framework for the contouring. The datum used will be that of the railway levels which have been worked out by the Public Works Department, which represent the only continuous line of levels throughout the State. Bench-marks will be left at convenient points, and the levelling will be arranged so as to be capable of use by the Public Works Department if required.

The details of the topography will be filled in by careful chain and compass surveys by the field geologists. With the framework of trigonometrical stations and theodolite traverses these will be well controlled, and will give an accuracy well within the limits of plotting.

In addition to the above, use will be made of all surveys (railways, &c.) of a continuous nature. These will be connected to the remainder of the surveys by the theodolite traverses.

Results of the Surveys and Co-operation With Other Departments, &c.

One of the main results of the surveys will be the production of geological and of topographical maps. The importance and use of the former have already been partly dealt with. The latter will be of great advantage and use to the Lands and Surveys Department, Forestry Department, Public Works Department, and all others which require accurate and detailed maps, and the importance of the maps to them cannot readily be estimated. They will also be extremely useful to other public institutions, private persons, &c.

The geological maps will be invalubale to geologists, mining engineers, mine managers, prospectors, and the mining industry generally. They should also be useful to the Agricultural and Forestry Departments.

In the actual surveying, active co-operation with the Agricultural and Forestry Departments is being practised. It has been arranged that the field geologists take samples of soil in accordance with the requirements of the Agricultural Department, and make such other field observations as are required. Similar arrangements with the Forestry Department, and close co-operation between the two departments, is being aimed at.

Drafting and Printing.

While arrangements have been completed for field staffs, and surveying operations were proceeding, no arrangements had been made for the drafting work connected therewith.

Although no draftsman had been appointed up till the end of 1929, one has since been appointed, and this work is now proceeding satisfactorily. The question of printing will have to be considered in the near future.

Yours faithfully,

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

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

REPORT OF THE STATE MINING ENGINEER.

State Mining Engineer's Office,
Hobart, 8th April, 1930.

SIR,

I HAVE the honour to submit my report for the year ended 31st December, 1929.

A summary of the work performed is appended herewith, and included—

(1) Special investigations and reports.
(2) Feature and contour surveys; and underground surveys, including structural features of orebodies and country rocks.
(3) Supervision of boring operations; location and survey of bore sites—(*a*) Diamond drill, (*b*) Victoria drill, (*c*) hand-boring.
(4) Aid to mining—Investigations and reports in connection with applications for assistance.
(5) Mount Cameron Water-race.

Special Investigations.

These included examinations and reports on—

(1) Dam-sites, Main Creek, Derby.
(2) Mammoth Tin area, Avoca district.
(3) Tin-bearing lode outcrops, Mount Murchison district.
(4) Mount Lindsay Mine, Parson Hood (on account of D. and M. Commission).
(5) Mount Stormont Mine, Moina.
(6) Laffer Mine, Weldborough.
(7) Tailing discharge, Main Creek, Adamsfield.
(8) New tin area, Mount Ramsay district.
(9) Asbestos deposit, Anderson Creek, Beaconsfield.

Surveying work was carried out on the following:—

(1) Mammoth Tin area (feature and contour survey).
(2) Old Boys' Mine, Mathinna (underground and surface workings, including geological features).
(3) New Golden Gate Mine (portion of underground workings).
(4) New Stirling Valley Mine (underground and feature survey, including investigation of waterpower scheme).
(5) Argyle Syndicate's gold-mining lease, Mangana.
(6) Chrome iron deposits, Beaconsfield (contour and feature survey, including bore-sites).
(7) Razor Back Mine, Dundas (survey of lower tunnel and open-cut workings).
(8) Mount Paris Mine, Branxholm (contour and feature survey).

Record of Boring Operations.

Diamond Drill.

This plant has been in constant operation throughout the year.

Anderson Creek Area, Beaconsfield.

Boring operations commenced on 22nd January on the chromiferous iron deposit at Anderson Creek, near Beaconsfield. On the Mount Vulcan area 13 holes were bored, aggregating 861 feet. The average depth of the ironstone on this area, covering approximately 50 acres, proved to be 32 feet, ranging in depth from 10 feet to 61 feet 6 inches.

On an adjacent area, known as Mount Scott, two holes were put down, one to a depth of 53 feet and the other to 60 feet, the depth of ironstone averaging 32 feet.

On Barnes Hill, situated about a mile to the south of Mount Vulcan, six holes were drilled, aggregating 351 feet, the average depth of chromiferous iron covering the area bored being 47 feet, ranging from 19 to 66 feet. The holes, being in the nature of scout bores, embraced approximately 20 acres, which, however, did not include the ultimate boundaries of the deposit. The analyses of all samples from the areas tested are not completed.

South Lode, Tasmania Mine, Beaconsfield.

A vertical bore was put down to a depth of 550 feet, with the object of locating what is known as the South Lode of the Tasmania Mine. The country rock throughout consisted of a crushed zone of sandstone, making it very difficult to bore. Grouting with cement, and reboring considerable sections of the bore, was found necessary in order to reach the required depth.

The bore failed to locate anything of value or a lode-formation of any kind.

Towards the end of the year the drill was removed to the Preolenna coal areas for scout-boring purposes. The first bore was put down at Meunna, on a site a short distance west of the Pruana railway-station. Boring work here was found to be more difficult to carry out than was anticipated, owing to the depth and loose nature of much of the basalt covering of the coal measures. The following is a tabulated record of the above:—

Sectional Depth. Feet.	Strata.	Core Obtainedn. Ft.	In.
Surface to 16	Clay and loose basalt boulders	Nil	
16 to 52	Clay and loose basalt boulders	4	6
52 to 76	Solid basalt	24	0
76 to 84	Broken basalt	3	0
84 to 183	Solid basalt	83	6
183 to 194	Dark mudstone intermixed with fragmental basalt	4	4
194 to 210	Mudstone	5	0
210 to 215	Sandstone	Nil	
215 to 260	Coarse sand, pebbles, and quartz boulders	Nil	
260 to 291	Light-grey pebbly mudstone	21	0
291 to 315	Light-grey sandy mudstone	20	0
315 to 328	Pebbly mudstone	13	0
328 to 334	Mudstone with embedded pebbles	5	0
334 to 348	Pebbly sandstone	12	0
348 to 390	Mudstone	37	0
390 to 402	Grey sandstone	8	0
402 to 412	Dark-grey banded sandstone	8	0
412 to 413½	Carboniferous shale	0	10
413½ to 416¾	Coal (thickness of seam, 3¼ feet)	0	6
416¾ to 419	Light-coloured sandstone	2	2
419 to 428	Banded sandstone	2	6
428 to 431	Light-grey stone	6	0

An analysis of the sample of coal obtained was conducted at the Mines Department Laboratory, Launceston, and resulted as follows:—

	Per Cent
Moisture	0·36
Volatile carbonaceous matter	40·00
Fixed carbon	54·64
Ash	5·00
Sulphur	3·30

This bore, and any subsequent ones of the present series decided upon, are merely scout bores, intended for the purpose of determining the nature and conditions of the strata likely to be met with—to serve as a guide for more intensive boring work intended to be undertaken in the future.

Victoria Drill.

This plant, which is operated by a 10-h.p. internal combustion engine, using kerosene as fuel, is adapted for boring by four different methods: (1) with an auger-bit, (2) calyx-bit, (3) shot-drilling, (4) percussion-drilling. The various appliances are used according to the nature of the ground to be bored.

The plant was on hire during the previous year, and for several months of the present term, to a Victorian syndicate for the purpose of boring the pyritic tin-ore deposits at Renison Bell.

Early in June last boring for water by the Department was undertaken on the railway reserve at Conara Junction, on account of the Railway Department.

No. 1 bore was put down to a depth of 130 feet.

The upper section, to 48 feet, consisted of surface soil and decomposed basalt; from that depth to 66 feet hard basalt was passed through; then a band, 8 feet thick, of hard white sandstone; below this, fine, sandy grit was met with, which continued to a depth of 123 feet. The bore was continued to a depth of 130 feet, the last section being in mudstone.

The unconsolidated strata between 100 and 110 feet of the surface proved to be water-bearing, and tests made proved a flow of at least 200 gallons per hour.

A short distance from No. 1 a second hole was drilled to a depth of 120 feet, with similar results to that obtained in the former.

An analysis of a sample of water conducted at the Mines Department Laboratory, Launceston, gave the following results:—

	Parts per Million.
Total dissolved solids	884·12
SiO_2	67·88
Fe_2O_3 and Al_2O_3	9·98
Na	229·30
Ca	18·42
Mg	30·23
Cl	391·52
SO_4	20·53
CO_3	77·57
Organic and volatile matter	37·36
Suspended matter	33·93

The Government Geologist (P. B. Nye, B.M.E., M.Sc.), reporting on the quality of the water, states:

"For drinking and culinary use: Fairly good and suitable for both.
Laundry and toilet: Fairly soft.
Boiler use: Would produce foaming, but little scale."

Tunbridge.

On the Ballochmyle estate, Tunbridge, two bores were put down on account of Mr. A. B. Cumming, to a depth of 141 feet and 250 feet respectively, the strata passed through being felspathic sandstone, with alternating beds of mudstone at the junction of the latter with the sandstone. At a depth of 125 feet a flow of water was met with, which proved on analysis to be heavy in dissolved mineral matter. A sample analysed at the Mines Department Laboratory, Launceston, resulted as follows:—

	Parts per Million,
Total suspended matter	39·93
Total dissolved solids	5438·19
Chlorine	2817·49
Sodium	1293·09
Calcium	182·67
Magnesium	272·93
Silica	35·94
Iron and alumina	39·93
Carbonates	380·88
Sulphates	152·58
Organic and volatile matter	262·68

The second bore at Ballochmyle was put down on the higher ground, some distance easterly of the first site. In the second bore similar conditions to those of the first were met with. A flow of water, estimated at not less than 200 gallons per hour, was struck at a depth of 220 feet.

An analysis of a sample of water from this bore made at the Mines Department Laboratory resulted as follows:—

	Parts per Million.
Total solids	1260·3
Sodium	244·13
Calcium	59·46
Magnesium	64·31
Silica	7·98
Iron and alumina	Nil
Chlorine	534·73
Sulphates	35·50
Carbonates	76·40
Organic and volatile matter	226·87

On the Gaffs Hills estate, Tunbridge district, a bore was put down on account of Mr. G. M. Burbury to a depth of 236 feet, the strata consisting of horizontally-bedded felspathic sandstones, mudstones, and shales; the bore entered diabase rock at a depth of 218 feet. As a source of water-supply this bore was unsuccessful.

The last bore of this series, prior to removing the drilling plant from this district, was put down on Glen Morey estate for Mr. S. Burbury, the strata passed through being felspathic sandstones, mudstones, and shales of similar formation to the other bores put down in the district. This bore was sunk to a depth of 110 feet. A good flow of water was tapped at 88 feet.

A sample analysed at the Mines Department Laboratory, Launceston, gave the following result:—

Total solids	1707·00
Chlorine	715·29
Sodium	317·85
Calcium	108·37
Magnesium	102·29
CO_3	167·13
SO_4	24·61
Silica	27·95
Fe_2O_3 and Al_2O_3	15·97
Organic and volatile matter	226·90

On a general classification basis, the analysis brings it within the category of "medium quality for drinking and culinary purposes."

The full rate of flow that the respective bores in which water was encountered could not be ascertained with the appliances at hand, which were limited to a rate of approximately 200 gallons per hour.

Hand-Boring.

A number of test bores by a hand-drilling plant were put down on the New Henbury mining property, Avoca, aggregating in depth 156 feet, with an average depth of 17 feet 4 inches. In addition to the boring work carried out, three prospecting shafts were sunk in the drift material, the depth of these being 7 feet, 16 feet, and 22 feet.

This work was carried out under the provisions of the Aid to Mining Act, 1927. The ground tested failed to give prospects of a payable character. More intensive boring is required to determine the value of the tin drifts occurring on the property. This work was in progress at the time of the disastrous floods which occurred in the early part of the year. The whole area was submerged, and further work at that time would not be proceeded with.

Several hirers made use of the Department's several light hand-boring plants through the year.

The Aid to Mining Act, 1927.

A number of investigations in connection with applications for assistance under the provisions of the Aid to Mining Act, 1927, were made, and reports furnished on the various properties situated in different parts of the State, but chiefly in the Zeehan district. These, with other duties, involved five visits to the Western Mineral Division, including an exploratory trip to Mount Block.

Mount Cameron Water-Race.

Two special visits were made to Gladstone in connection with the contract for the extension of the Mount Cameron Water-race to Native Lass dam which was satisfactorily completed in August. The heavy floods which occurred earlier in the year delayed the possible completion of this work many months later than anticipated, owing to the damage caused in other parts of the race.

General.

The duties in connection with the work of this branch of the Department, in addition to those described, entailed a considerable amount of travelling, as well as many personal interviews by persons seeking information in connection with mining properties and districts.

A lot of work of a technical character was carried out in addition to routine duties.

The special work included information supplied to mine operators on all matters in connection with design of treatment plants, erection of same, potential waterpower schemes, methods of sampling, and other general information in connection with the many branches of the mining industry.

Yours obediently,

J. B. SCOTT,
State Mining Engineer.

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

REPORT OF THE GOVERNMENT CHEMIST AND ASSAYER.

Mines Department Laboratory,
Launceston, 30th January, 1930.

SIR,

I HAVE the honour to submit my report dealing with the work of the Mines Department Laboratory for the year 1929.

During the period under review 6400 estimations have been made for the Department and the public. In addition to this large number several thousands of qualitative tests have also been made.

The work during the year included complete analyses of ores, rocks, alloys, coal, &c. Assays have been made for gold, silver, copper, lead, tin, antimony, bismuth, tungsten, nickel, cobalt, zinc, manganese, barium, strontium, calcium, iron, aluminium, chronium, osmium, iridium, rhodium, platinum, magnesium, tantalum, arsenic, carbon, molybdenum, &c.; distillation tests of shale; examination of samples for oil; analyses of water; analyses of iron chrome ores, and analyses of minerals; fusion tests of refractory clays and kaolins; examination and tests of titaniferous iron sands; examination and tests of asphaltum, &c.

Owing to the depleted staff, for a great part of the year it was found necessary to carry out some of the work after ordinary office hours.

I desire to place on record my appreciation of the excellent work carried out by the officers in this branch of the Department.

I have the honour to be,
Sir,
Your obedient servant,

L. H. BATH,
Government Chemist and Assayer.

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

REPORT OF THE CHIEF INSPECTOR OF MINES.

Mines Department,
Hobart, 31st March, 1930.

SIR,

I HAVE the honour to submit my annual report for the year 1929 on the inspection of mines and the administration of the Mines and Works Regulation Act, 1915.

Tables are attached showing—

(1) The number of persons killed and injured in or about the mines, works, and quarries in Tasmania.
(2) The rate per 1000 killed and injured in the different divisions.
(3) A graph showing the occurrence of fatal accidents from the year 1892 to 1929.
(4) Statistical tables of the output and value of mineral production for the year.

The number of persons employed for the year was 4986, being a reduction of 184 compared with the year 1928.

Accidents.—The total number of accidents reported for the year was 59, being an increase of 12 compared with the year 1928. The 59 accidents caused injury to 72 persons, 17 of which were fatal, and injuries to 55 persons which necessitated absence from employment for 14 days. The rate per thousand persons employed who were killed and injured was 14·440, compared with 9·090 for the year 1928. The rate per thousand persons employed who were killed was 3·409, compared with 0·193 for the year 1928. The rate per thousand persons employed who received injuries was 11·031, compared with 8·897 for the year 1928.

The 17 fatal accidents were caused as follows:—Fourteen were due to a dam bursting, owing to an abnormal fall of rain in the catchment area of the dam. The verdict of the jury at the coronial inquiry was that the accident was due to an abnormal and unprecedented volume of water, which may have been due to a cloud-burst. This accident was regrettable, owing to the loss of life to women and children. The mine workings were flooded, but there was no loss of life, all employees reaching safety.

A fatal accident occurred in the ground floor of a stope. A travelling boss was working down loose ground from the back of the stope, when he slipped, and the stone he was barring down struck him, causing fatal injuries.

A fatal accident occurred at a treatment works. The man had greased the rotating mechanism of a wharf crane, and, in descending by the ladder-way, slipped, falling to the wharf.

The other fatal accident occurred at a works. The man was employed tipping trucks on a coal gantry, and for some unknown reason he fell from the gantry to the ground, receiving injuries, which later proved fatal.

Of the 55 serious accidents, 28 occurred underground and 27 on the surface, and the injuries in 22 cases were such as to cause fracture; the remaining 33 were of a minor nature, which necessitated absence from work for more than 14 days.

Prosecutions.—There were 17 prosecutions for breaches of the Act and regulations during the year. Seven cases were for jumping off moving trucks, five cases in connection with explosives, three cases for failing to use appliances for the prevention of dust, and one case for riotous behaviour. Convictions were obtained in sixteen cases, and one case was dismissed owing to the information being faulty.

Prospecting.—The policy of assisting prospectors was continued during the year. Seventy-six prospectors were granted sustenance allowance. No discovery of special value was reported.

Electrolytic Zinc Company, Risdon.—The company operated continuously during the year, and produced 46,163 tons of zinc, valued at £1,237,361, and 181·5675 tons of cadmium from ore other than produced in the State.

The works at Risdon are being extended to increase the output by 30 per cent.

The mill at Rosebery is in course of erection, and it is anticipated that it will be in full work early in June of this year.

Catamaran Coal Mine produced 8018 tons of coal, valued at £7446. As in the past year, the mine was worked on a co-operative scheme. Development work has been suspended owing to want of capital.

Australian Commonwealth Carbide Company produced 3434 tons, valued at £56,838, and in addition supplied the limestone requirements of the Electrolytic Zinc Company.

The National Portland Cement Company, Maria Island, produced 19,568 tons, valued at £96,040. This company discontinued operations in November, having been absorbed by one of the mainland cement companies.

Esperance Coal Mines.—Prospecting has been continued during the year, but the amount of work was very limited owing to the want of funds.

Quarries.—With the exception of those used for the manufacture of bricks, the quarries worked regularly. In one case careless shooting has been encountered, and steps taken to have it discontinued.

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

I have the honour to be,

Sir,

Your obedient servant,

J. O. HUDSON,
Chief Inspector of Mines.

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

TABLE showing Rate per Thousand Killed and Injured in different Divisions for the Year 1929.

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	1691	6	2	4	6	3·548	1·182	2·365
North-Eastern	390	3	14	2	16	41·025	35·897	5.128
Eastern	490	2	...	2	2	4·081	...	4·081
North-Western	442	13	...	13	13	29·411	...	29·411
Western	1973	35	1	34	35	17·739	0·050	17·232
Total	4986	59	17	55	72	14·440	3·409	11·031

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	1212	16	1	15	16	13·202	0·825	12·376
Zeehan, &c.	761	19	...	19	19	24·967	...	24·967
Total	1973	35	1	34	35	17·739	0·050	17·031

COMPARATIVE Table of Statistics of Accidents in and about the Mines of Tasmania from 1st July 1892, *to 31st December*, 1929.

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	0·391	11·937
„ 1926 „ 1926	5309	54	5	52	57	10·736	0·941	9·794
„ 1927 „ 1927	5044	70	5	65	70	13·877	0·991	12·886
„ 1928 „ 1928	5170	47	1	46	47	9·090	0·193	8·897
„ 1929 „ 1929	4986	59	17	55	72	14·440	3·409	11·031

* Mt. Lyell disaster.

REPORT OF THE CHIEF INSPECTOR OF MAGAZINES AND EXPLOSIVES.

Mines Department,
Hobart, 31st March, 1930.

SIR,

I HAVE the honour to submit my annual report in connection with the administration of the Explosives and Inflammable Liquids Acts for the year 1929.

Imports of explosives were:—

	lb.
Monobel	12,000
Gelignite	351,700
Blasting gelatine	7,500
Ligdyn	13,500
Gelatine dynamite	3,500
Powder	13,250
Detonators	480,000

The quality of the explosives imported was satisfactory during the cold months; there was an absence of freezing, which in previous years caused considerable anxiety.

There was a slight recurrence of dangerous fireworks, but the introducton was met wth by steps which, in all probability, will prevent them again coming on the market. There were no accidents during the year which in any way could be attributed to explosives.

There have been complaints in connection with the detonators now in use. Inspectors have had them under close observation, and it would appear that any defect which has been encountered can be attributed to moisture. This matter is still under observation.

There were nine prosecutions in connection with the use of explosives. Five cases were for not complying with the rules dealing with the use of explosives, one case for igniting fuses with a plug of explosives used as a torch, and three cases for selling prohibited fireworks. Convictions were obtained in all cases.

In connection with the Inflammable Liquids Act there was one presecution and a conviction.

During the year I was deputed to attend a conference in Melbourne for the purpose of drafting regulations for the loading and unloading of inflammable liquid in harbours. The intention was to make uniform regulations for all Australian ports. The cnoference was successful, and regulations have been framed.

A new bulk installation is in course of construction.

A new Act came into force during the year, and regulations are being made to bring legislation into line with present-day practice.

Revenue.

Explosives and Inflammable Liquids Acts—Collections, 1929 (1st January to 31st December).

	£	s.	d.
Magazine licences (57)	55	10	0
Permits to sell explosives (174)	43	5	0
Permits to convey explosives (27)	6	12	6
Permits to import explosives (7)	14	0	0
Permits to sell fireworks only (77)	9	13	9
Licenses for stores (402)	412	0	0
Registration of premises (332)	78	19	6
	£620	0	9
Magazine rents	255	13	5
Total	£875	14	2

I have the honour to be,

Sir,

Your obedient Servant,

J. O. HUDSON,
Chief Inspector of Explosives.

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

REPORTS OF INSPECTORS OF MINES.

INSPECTOR H. A. VAUDEAU reports:—

I have the honour to submit my annual report for the year 1929 in connection with the work of inspection and administration of the various Acts delegated to this office, and a resume of the work carried out in this district.

The average number of persons engaged was 1135 men, against 909 for the year 1928, being an increase of 136 men, due, no doubt, to the construction work being carried out at Rosebery and Railton by the Electrolytic Zinc Company of Australasia Limited and the Goliath Portland Cement Company Limited.

Accidents.—Reports concerning these, as required by Section 26 of the Mines and Works Regulation Act, as they have arisen, have been sent forward to head office. Thirty-one accidents have been registered during the term under review. Seventeen of these occurred underground and 14 on the surface. Fortunately none of these were fatal, though some caused the persons concerned to lose considerable time from their occupation. One lost 154 days, one 120 days, one 87 days, two 60 days, one 50 days, two 48 days, one 47 days, one 45 days, one 44 days, one 43 days, one 41 days, two 36 days, one 35 days, four 32 days, two 29 days, two 25 days; one each 23, 22, and 21 days; three 17 days; and one each 16 and 14 days.

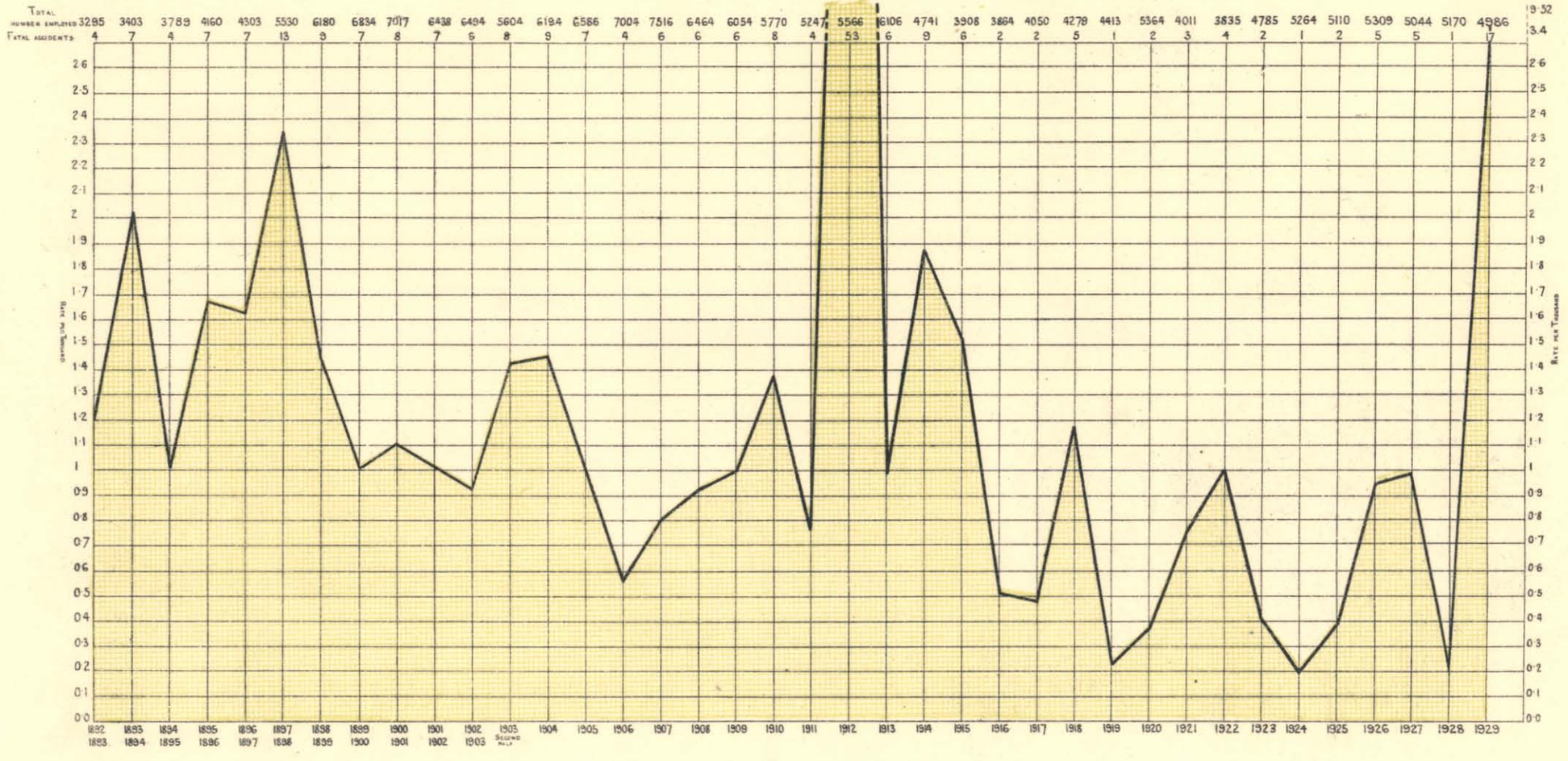
The man who lost the 154 days went to kick over the "points" at a tramline crossing, at a quarry, with his foot; he tripped over them, and an oncoming truck, which was loaded, jambed his leg against the rail, breaking same.

The man who lost 120 days was spawling a rock in a main shaft, when a piece flew up and hit him in the eye. It was thought possible to save the sight for some time; however, they failed. The doctor declared him fit for work on the 15th instant. Another person lost 41 days through getting a splash of hot cement in his eye. The sight was saved.

Six men were hit through falling ground. One was gouging in on soft metal, it being the end of the pay, the men being on tribute-contract. He evidently went in too far without testing the ground on the hanging-wall side, and a lump of this came away and hit him, bruising his back, chest, and limbs. He lost 45 days' work. Another man, with a mate, was cutting over drive, to stand level timber. They stated that they had tested the roof, and considered all safe. Some time after, without any warning, a piece weighing about a hundredweight came away, striking him on the leg. He lost 48 days. Another man was barring down after firing, when a piece came away, and, falling on the heap he was standing on, rolled over on to his shin, just above the ankle, breaking the small bone (fibra) of his left leg. He lost 25 days. Another, whilst engaged barring down, slipped, and fell on his knees, cutting and bruising them. While on his knees, a piece of ground which he had been working at came away, and hit him on the back, cutting and bruising it. He lost 47 days. Another man was going up into his working-face in a stope above. On the previous shift some holes had been fired in the main end just ahead, and evidently had shaken the roof behind them, and was not noticed. As he was going past, a piece of this came away, hitting him on the right ankle and fractur-

Diagram showing the ratio of Fatal Accidents in Mines in Tasmania

Rate per 1000 men employed



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ing the fibra. He lost 22 days. The other man was working in a stope; he dropped his candlestick, and whilst stooping to pick it up a piece of lode material fell from the face, striking him on the head and then on the middle finger of the left hand, knocking it against a piece of hard ore on the heap, and breaking the bone in several places. The doctor amputated the finger at the socket. His head was uninjured. He lost 36 days.

One man lost 60 days' from work. When pushing a truck from a rake of these without chocking those behind, one came after him, jambing his right leg between the two trucks and crushing it badly.

A man was engaged dismantling an old building, and, losing his balance, fell off the staging about 15 feet. He could not account for losing his balance. He lost 87 days.

Three men received injuries, owing to the collapse of a staging, while a sluice-box was being erected. Some 14 men had been previously told to spread out under the box, but while waiting to get the word to lift and push they had got together talking, and when word came, instead of spreading out, they set to work where they were. A cross-tie, on which the planks were resting, gave away, precipitating them to the ground and hurting three of them. They lost respectively 29, 32, and 35 days from work.

The remainder of the accidents do not call for any special comment; with a little more care they need not have happened. Men are often spoken to and danger-risks pointed out, but one finds that some men are inclined to take more than reasonable risk, whether on contract or otherwise.

There has been a considerable number of minor accidents, men losing from a few to 13 days from work, most of these occurring in connection with erection work at two big companies' undertakings.

I have, as much as it was possible, kept in close touch with the various operations, both on the surface and underground, and have been enabled to save what might have caused serious injury on several occasions. Many men are very careless regarding the barring-down of loose and affected ground, and in protecting themselves from this danger. Some men seem to have no idea of safety when barring-down, and get right into danger when doing so.

Ventilation.—At the mine mentioned in my last report, the management decided to instal an exhaust system, and this has been put in. With some additions it can be made adequate to meet all requirements; but as it is at present, it will not be satisfactory when the atmospheric conditions are bad outside. At other mines a ready response has been given in most instances to improve conditions as circumstances required it.

Settlement of Ground.—Nothing of a serious nature occurred during the year. A further settlement took place at the limestone quarry mentioned in my last report, but, apart from making conditions very unpleasant to work in, did no harm. Underground, at two mines, some ground set off owing to structural weaknesses, but gave plenty of warning as it did so, on to the timbers and the filling. A considerable quantity of this has been worked since, and, so far as I know, no accidents occurred in doing so. Reasonable care has been taken by the management in its removal.

Change-houses.—At one mine the change-house was burnt down, but another has been installed. At a big works provision is being made for an up-to-date change-house, which is badly needed. Most of my requests regarding cleanliness and additional heating surface, for hot water and drying of clothes, have been attended to immediately.

Shelter-sheds and Crib Places.—A marked improvement has been noticed in some quarters, but there is still room for improvement in this connection.

Explosives and Magazines.—Considerable attention has been given to the safe handling and storage of explosives at the various mines and quarries which come under the provisions of the Act, and the handling and forwarding of explosives as they arrive from the mainland.

Very little explosives have had to be condemned this term—just a few odd plugs, that should have been used up, instead of being left lying in the daily-supply places. On only a few occasions have I heard of any becoming frozen, and this was thawed and put into use, with no complaints.

Fuse.—This has been much more satisfactory this term, the burning rate being very even, and not nearly so much lateral bursting has been noticed. Only on odd occasions has any been seen or reported to me.

Detonators.—A considerable amount of the new type of these has come to this district this year. As far as my observations have gone, and from reports at the various mines and works, I do not consider these stand up to our Tasmanian conditions as well as the old type. Several complaints have been received in connection with their being weak—that they did not explode the charge, though they did so when another had been put in. One wonders at this, as according to various authorities, the compounds being used, tetryl (trinitro-phenyl-methyl-nitramine) and lead trinitro-resorcinate, with a small percentage of aluminium powder, should be more stable, as it is supposed to withstand the action of moisture much better.

A few alterations and additions have been made to main magazines and storage places underground as required, and on the whole have been satisfactory. Some more quarries have been brought under the provisions of the Mines and Works Regulation Act during the term, and it is hoped to gradually bring those elsewhere in this district under them. Much carelessness is often noticed in connection with these, and also regarding the handling of explosives. Owing to a man leaving some detonators in a tea-tin, under some bushes, where he and others were getting material for road-construction, a young boy, aged six years, got two of them. He held one while his brother, aged 11 years, struck a match near it, expecting it to go off "like a cracker," so he said. The younger boy lost the top of his right thumb and first finger, second finger at the second joint, and first joint off third finger, also receiving a nasty cut on the forehead above the right eye. The elder brother had the tops of the thumb and fingers of his left hand cut about, also cuts on wrist, but, apart from scars, is now all right. A young sister of the two brothers got a cut on the right forearm.

Another complaint was received that men were leaving explosives unprotected where they were getting stone for construction work for a cement works. This was inquired into and made satisfactory.

Incline Haulages, Machinery, Ropes, &c.—When defects have been noticed managers have been requested to have the necessary additions and alterations made as became necessary. These usually receive prompt attention, apart from electrical wiring underground. There is a considerable difference of opinion as to what is required in this latter connection for safety. I ask for that approved of by the British Board of Trade, but a few managers continue to leave things as they are, taking the risk, though I have strongly recorded against the methods adopted in the "mine record books."

Health and Sanitation.—During the year the "Report on an Investigation into the Health and Working Conditions of Employees in the Mining Industry of Victoria and Tasmania, 1928," by Keith R. Moore, M.B., B.S., D.P.H., Melb., was published. It bore out that what I had been doing my utmost to obtain at the various mines and works was absolutely necessary for health reasons.

In Circular No. 6136, of May, 1929 (Information Circular, Department of Commerce, Bureau of Mines)—"Progress in Metal Mine Ventilation," by Mr. D. Harrington—there is some valuable data. I will give an extract here which many may not see otherwise, to show that I have been endeavouring to act on right lines, though some have queried me very strongly in this connection:

> "There is a well-defined tendency to believe that the only dust which is dangerous to inhale is that which is composed largely of silica, especially of free silica. That this is a dangerous fallacy was plainly shown by a study of the effect of dust-inhalation on cement workers, as reported in Bulletin 176 of the U.S.A. Public Health Service in 1928. The results of this study indicated that silica constituted less than 26 per cent. of the dust, and that of this amount of silica only a very small portion was free silica—the material generally held essential for harmfulness from dust. However, breathing large quantities of the very finely divided dust caused the cement workers to have nearly three times the absentee record from colds, bronchitis, influenza, and gippe; resulted in skin diseases causing five times as much disability; and also brought on diseases of the eyes, ears, pharynx, tonsils, and rheumatism three times as often as among workers of the same age-range in a rubber plant of similar size and number of employees. It was found that a large percentage of the workers voluntarily left the industry because of the ill effect of one nature or other on the health, thus leaving in the industry those whose powers of resistance were inherently higher than the average. It was also found that about one-third of the workers who had been employed three years or longer had one or more respiratory defects or chronic respiratory diseases. Of 37 X-rays taken, 15 showed dust diseases of the lungs, three showed

tuberculosis, and eight others more or less evidence of tuberculosis. It was definitely concluded that one of the main problems of the cement industry is dust control; this decision is the more significant from the view-point of the metal mining man, in that the dust had little or no free silica, and that much more than 50 per cent of the dust was lime, which has heretofore been considered by many authorities to be harmless, and by others to have remedial rather than harmful effect when breathed from the air. The application of this conclusion to the mining industry means that any or all finely divided dust in the air and in large quantites, when breathed for considerable periods daily, are likely, in fact almost certain, to be harmful; hence all dusty methods, processes, or practices in metal-mining should be eliminated, or at least limited. The best methods of doing this are the exclusive use of wet drills in drilling, the postponement of blasting of all kinds until the end of the shift, or after the regular shift, and the use of continuous air-currents to and past working regions, or other dust-producing places, to keep the finely divided dust out of the areas where men must work."

There is strong evidence still existing that men are not using the appliances that are required to keep them from the harmful effects of dust; but the trouble is to get sufficient evidence to take legal action.

During the term one man was proceeded against for failing to allay dust during boring operations. He was fined £5, with 6s. 6d. court costs. Two men were proceeded against for failing to use respirators at a cement works. They were each ordered to pay £1 18s. 9d. Another man was found to have been boring dry, and information was laid against him. The mine was shut down, and the man leaving the district, the manager of the mine wrote to head office, Hobart, asking that he be let off on this account. The Hon. the Minister for Mines subsequently gave instructions that I should withdraw the case.

A person was charged with riding on a truck in a cage—a breach of General Rule 37—and was fined £2.

Another person was caught using a plug of gelignite as a torch for igniting fuse on 18th March, 1929. He was proceeded against, and ordered to pay a fine of £3 10s.

It hurts one to have to proceed against men in order to get them to see the foolishness of contravening these general rules and regulations, which are for their own good.

I will be pleased to see the new plant in operation at a works where the old plant, which is a "dry process," will be superseded by a wet one. The portion of the plant connected with the grinding, bagging, &c. (which part of the operations must be kept dry), is being installed, with all the latest devices for the prevention and removal of dust. It should be in full swing by the middle of the year.

A few old West Coasters working in my district have had to give up working underground, the doctors having advised them to do so. Two that I know of have "passed away" with so-called "miner's complaint" during the year.

Inflammable Liquid Act.—Considerable attention has been given, as time has permitted, to the safe storage of motor-spirit, as required by the Act. Owing to the floods early in the year, the regulations had to be eased up considerably; some of those concerned would have made a "welter" of it if they had been allowed to carry on as they desired. It gave one to see the necessity for the restrictions imposed by the Act.

I will be pleased to see the new regulations in force, for there is considerable carelessness existing in connection with "kerbside outfit" that needs putting down. There has been considerable increase in the erection of these in this district.

General.—The various mines, works, and quarries in my district which are under the provisions of the Mines and Works Regulation Act have been regularly inspected, as the importance of the operations called for and as time permitted. In the majority of instances my recommendations and suggestions are readily appreciated and acted on, but there are still some who think the inspector's job is to try and be a nuisance, instead of seeing that what he seeks is for the betterment of all. If men have good health and conditions it must make for better efficiency all round, so that it is to the advantage of the employer as well as the employee.

In a few cases much bitterness has been expressed at my desire that healthy conditions should prevail. To some of these I have passed on the extracts from Mr. D. Harrington's report, mentioned above, and trust they will make for better feeling. To those who have given me their assistance and hearty co-operation in my endeavours to get a reasonable degree of safety and decent working conditions I would like here to express my appreciation.

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

TIN.

Mount Bischoff Tin Mine, Waratah.—For about the first 10 months the mine was working fairly full handed; then, owing to the drop in the price of tin and other causes, the mine was practically closed down, only a few men being retained. At present writing only four small parties are working on the surface (on tribute), and some general repair work is being carried out about the place. At the North Valley pontoon workings some 87,300 yards were treated for 86 tons of SnO_2 giving 53·742 tons of tin. During the first three-quarters of the year 41 men were employed. The average for last quarter worked out at 13 men. The quantity of big stone in the wash was enormous, and the handling of this added greatly to the cost per ton. A system of electric winch haulage, tram-line, and trucks were put in just towards the end of the operations, but was only given a run for a day of two, and should make a considerable difference. But I consider it wants something more flexible. The average value per yard treated at the pontoon worked out at 2·21 lb. SnO_2 (tin oxide), or 1·379 lb. of metallic tin. There is a considerable amount of specimen tin stone in the wash; this was saved and taken to the concentrating mill at Waratah for treatment, and is included in the return mentioned below.

From the old mine at surface and from underground workings, including that from pontoon workings, mentioned above, some 9860 tons was treated; 97·75 tons SnO_2, containing 67 tons metallic tin, was recovered. In connection with the development of the underground workings I can only endorse what I said last year.

Mount Bischoff Extended Tin Mine, Waratah.—For the first nine months a total of 1150 tons of ore was treated, and 8·6 tons of SnO_2, containing 5·28 tons of tin, was recovered. Average number of men, 7. During the last quarter work was suspended, and a general clean-up made around the mill, another 6·22 tons of SnO_2 being obtained, carrying 4·2 tons of tin. Five men at work.

L. & R. Smith Tin Mine, Waratah.—The tributer has been treating old tailings from the Mount Bischoff Tin Mine which have been washed down the river in the past. Three tons of SnO_2, containing 1·96 tons of tin, was recovered. Father and son at work.

Pryde & Others, Parson's Hood Track, Waratah District.—An average of three men employed, working alluvial ground, who obtained 3·42 tons of SnO_2, containing 2·43385 tons of tin, beside some osmiridium and gold.

J. Betts & Others, Waratah District.—A total of 1·059 tons of SnO_2 was obtained by these at odd times. A little prospecting work has also been carried out, but I have not heard of anything sensational being discovered.

Some alluvial ground is being opened up by Pryde, Betts, and others on the Parson's Hood Track, which goes in from the Waratah-Corinna road, and prospects are very encouraging; but the track must be made so that the men can get their tin out and supplies packed in by horses, if work is to continue. At present the tin won has to be carried out by the men themselves for 5 or more miles.

Renison Bell District.—Tribute parties have been engaged at various parts on this tinfield. Average, nine men, obtaining 6·08 tons of SnO_2, containing 3·733 tons of tin. One party is still holding some of its tin, hoping for an increase in the price.

Amalgamated Tin Company.—These people only did a very little work during the first part of the year, and then abandoned the options of the various leases held by them in the district.

A. Victor Leggo & Co. carried out some prospecting work on the edge of the Ring River and St. Star Creek. The manager was very sanguine over the prospects obtained, but nothing has been done at these places for some months now. An average of eight men were working for one quarter, trenching and sinking prospecting shafts. It appeared to me that the area of "wash" was very limited, and water would have to be brought a considerable distance. Owing to the nature of the overburden, considerable pressure would be needed to break it down and get rid of it. However, I have seen some very nice tin values in places there.

Hart's Mines (Tas.).—These (Adelaide) people set in at two places on their leases, treating 5150 yards for ·6125 tons of SnO_2, containing ·383 Sn and 2·5 oz. of gold and some osmiridium. (The latter was not reported to this office.)

At the Royal Tin and Gold Mine (late A. Kemp's Tin Mine), and at the South Renison Bell Mine, these people carried out some work; but at present the whole of the work has been suspended.

Kitto & Davies' Tin Mine.—These two men are engaged sluicing and prospecting on Pine Hill, looking for the source of the Gormanston tin nuggets. They sent away 2·079 tons of SnO_2, which carried 1·34234 tons of tin. Prospects here are decidedly encouraging.

Stanley River District.—Mount Lindsay Tin Mine: A tribute was let to R. Maskell and party, and work was started on the oxidised ore; but this was found to be much less than was expected, also much poorer, and most of the party soon dropped out. They obtained and sold 3·5 tons of SnO_2, containing 2·34449 tons of tin. There is still some ore at the mine ready for market, which is being held in the hope of obtaining a higher price. Average men at work, three.

Stanley River Tin Mine: An option over this property was given to a Hobart syndicate which has carried out some prospecting work on it, and has also done some work on the ground surrounding it. An average of three men have been at work. For part of the term they obtained 1·49 tons of SnO_2, carrying ·84741 tons of tin.

Mount Claude and Moina District.—Kemp's Rainbow Tin Mine, Moina: Two men have been at work here when water has been available. The product won carries tin and wolfram, and as far as I know none has been sold. The ore obtained is being stacked at the Shepherd and Murphy mill, awaiting treatment.

Lawson's Tin Mine, Moina: A little tin was won here, but the ground was too poor to continue.

Godwin's M.R. Claim, Moina: ·61964 tons of SnO_2 was won in a short time in a creek just below the old Shepherd and Murphy Mill; but it was only a patch.

Railton Prospecting Syndicate.—Some prospecting and sampling of old mines in the district was carried out by these people, but as far as I know nothing is being done at present.

Balfour District.—A few men have been working off and on here, and obtained some tin ore carrying 1·22 tons of tin.

King Island.—Sea Elephant Tin Mine: Some 14,920 yards of ground was sluiced, for an output of 4·55 tons of SnO_2, carrying 3·1965 tons of tin. Three men were employed for the first quarter, six since. There is a tin lode on this company's property that is, in my opinion, worth developing.

East Coast.—A little prospecting work has been carried out, and a few tests made, on what is known as the "black sand" deposit. A mineral lease that had been dropped has been taken up again.

ZINC-LEAD-SILVER MINES.

The Electrolytic Zinc Company of Australasia Limited has continued its extensive developmental policy both at Rosebery and Williamsford groups of mines. "G" lode at the Hercules Mine and the lode at the old Mount Read Mine are opening up most encouragingly. The new concentrating mill, aerial ropeway, and other work in conjunction therewith is nearing completion. Everything has a very busy look about it. At Rosebery the average number of men employed on the surface was 242, and 66 underground, and 33,658 tons of ore were broken and dispatched to the works at Zeehan. At Williamsford the average number of men employed on the surface was 27, and 36 underground, some 10,139 tons of ore being broken. For the last part of the term portion of this ore was dumped at the foot of the incline haulage.

SILVER-LEAD MINES.

Waratah District.

Magnet Silver Mine, Magnet.—An average of 110 men have been employed during the term, averaging 50 on the surface and 60 underground. Some 23,307 tons of ore was raised, and 1471 tons of "crudes" was picked out of it, leaving 21,836 tons for the mill to deal with; 1501·2 tons of "crudes" and 1251·2 tons of concentrates, carrying 199,145 oz. of silver and 1255 tons of lead, were sold.

Main Ore-body: Work has been carried out principally in stopes over Nos. 9, 15, and 16 levels.

West of Dolomite Ore-body: A considerable amount of work has been carried out on this at various levels. The values in the ore-bodies are very erratic, but there is a fine lot of ore available. What is badly needed is a flotation plant, together with a thorough rearrangement of appliances and methods of handling of the products from underground to surface works.

Mount Farrell District.

North Mount Farrell Mine, Tullah.—An average of 130 men have been employed—66 underground and 64 on the surface. Fair progress has been made with the sinking of the new main shaft, this work being resumed during the last half-year. A total of 10,902 tons of ore was broken and treated, and 54,620 tons of slimes and tails were handled at the flotation plant. The ore sold totalled 5731 tons, carrying 290,536 oz. of silver, 2279 tons of lead, and 1140·2 tons of zinc.

The men who were working the mine on a contract-tribute agreement averaged a little better than wages.

The No. 9 level, south end, has developed very satisfactorily up to the present.

Prospectors.—Some prospecting work is being carried out by two parties, one doing a little work on the old Murchison Mine at odd times. The other party (four men) towards the end of the year started to drive an adit on the old Victoria Peaks Mine, and earlier in the year were driving an adit near the Murchison River, just below the track leading to the Sterling Valley Mine. This work is being followed with interest, but up to the time of my last visit nothing of commercial value had been discovered. Both of these positions have been gone over with Mr. Tucker's "ore-finder," and good values are considered to exist.

Mount Claude District.

A prospector has been doing some work at and near the old Round Hill Mine. A formation was cut on the side of the main road. A short adit could be driven to intersect this some 50 feet deeper at a small cost. It shows good milling ore where exposed, and is worth developing. A few tons of ore has been broken, but has not been sold yet.

COPPER.

At the old Reward Claim at Balfour some 3·3837 tons of precipitates were obtained from the copper water, giving 2·0782 tons metallic copper. Net value, £125·13.

COAL.

Torbanhill Colliery, Meunna.—Twenty-two tons of coal has been won and sold during the term. A good deal of damage was done by the flood in April last, and this was made good.

Illamatha Colliery, Spreyton.—During the first six months 492 tons of coal was sold, the average number of men employed being nine. During the latter period 1325 tons has been sold, the average number of men employed being 15. Owing to the strike on the mainland there has been an increased demand for this coal.

CEMENT.

Goliath Portland Cement Company Limited, Railton.—A total of 22,221 tons of cement was produced, some 109 men being engaged thereon. An average of 92 men were engaged in connection with the erection of a new and up-to-date unit. This is well on the way, and costs should be reduced considerably when it is put into operation.

LIMESTONE.

Broken Hill Proprietary Company Limited, at its Melrose quarry, has broken and despatched 61,694 tons of limestone to its works at Newcastle, the average number of men employed being 37. The output has been restricted owing to the coal strike on the mainland.

Blenkhorn's Limeworks and Quarry, Railton.—Some 458 tons of ground lime was produced.

SHALE.

Goliath Portland Cement Company Limited, Latrobe.—Some 5279 tons of shale has been mined and crushed, and sent to the cement works to be used in making cement; an average of nine men being employed.

The Mineral Oil Extraction Company Limited, of London, entered into an agreement with this company, and has been engaged erecting a retort to extract the oil from the shale. The London company treats the shale, the cement company supplying it to them, ready broken. The retort was being warmed up on 21.1.30.

A new main tunnel is being driven to open up a new area of shale. To date the shale bed has been a good deal disturbed, which does not help in laying out the work as it is desired, and makes it much more costly to mine.

Tasmanite Shale Oil Company.—The "Long" retorts (3) were completed, and sufficient shale mined and crushed to give these a good try-out. It was soon seen that they were a complete failure. It was then decided by the directors to pull these out, and give Mr. McPherson, the

old manager, a free hand to see what he could do. He has a retort which has just been put into operation, and it is now being tried out.

L. & N. (Tasmania) Limited.—This company unwatered the mine, and started to extend the main tunnel and erect the new retort, known as the "L. & N." They had hardly started the mining work when they stopped, and erected the main portion of the retort, then stopped. Since then a little machinery has been brought to the mine and unloaded, the remainder of it remaining in "bond" at Launceston. The manager, English engineer, and a caretaker are still at the mine, waiting for word to start again.

BISMUTH AND GOLD.

The Stormont Mines N.L., Moina.—The concentrating mill, track, and buildings were completed, and the mill given a run. Results were far from satisfactory, but the previous manager was recalled, and he has made several alterations, and reports extraction as now being satisfactory. Money has run out, and he is waiting for more cash to continue.

BARYTES.

A. Pearson's Barytes Mine, Riana.—A start was made here towards the end of the year, 9½ tons being sent away to the mainland.

OSMIRIDIUM.

Savage River, 19-Mile Creek, Castra River, Mount Stuart, Yellow Band (in the Waratah District), and Wilson River Field.

The average number of men employed for the term works out at 63 men. Some are reported to be doing well, others very little. A new field near the 12-mile peg on the Parson's Hood Track is reported to be opening up satisfactorily in both tin, gold, and osmiridium. But this field is being hung up owing to want of communication.

GENERAL.

The prospects regarding mining, owing to the drop in the prices of metals, are not very encouraging. Money is tight, and the economical outlook far from bright. What is needed is that a new mining field of importance should be discovered. I am one of those who still consider that there is room enough for this to be found in Tasmania. Genuine prospectors should be encouraged to go out into the little prospected areas. Much of the assistance given may have been considered by some to have been expended foolishly. Nevertheless, if one good find is made, even such as Adamsfield, it soon pays for all that has been expended.

With the geophysical methods now adopted in mining, one is still hopeful of good developments on our known fields and elsewhere.

What is also badly needed is that every care should be taken, before installing new and additional plants and systems of work, to see that that which will give greatest flexibility and efficiency is adopted. So often one sees methods adopted that really never give properties a chance.

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, the Explosives Act, and the Inflammable Liquids Act within the Launceston Inspection Division for the year ended on the 31st December, 1929.

The average number of men engaged, in mining and metallurgical operations, was 930, as against 1064 employed during the previous year. The decrease was due to reduced tin mining activities.

The collieries and principal metalliferous mines occupied the greater number of surface and underground inspections. As opportunity permitted, the work of inspection was extended to the smaller mines, but the actual number of visits to these mines was proportionately small owing to special and other duties performed during the period.

The production and the maintenance of safe working conditions were controlled within theoretical and practical limits, and the entire absence of any serious mishap reflects creditably upon the individual and collective conduct of underground mining. Surface operations, however, were not free from accidents, but it will be observed that abnormal and unprecedented circumstances in one case and the absence of individual care in other cases accounted for the regrettable incidents recorded. At one mine it was deemed imperative, in the interests of safety, to condemn the main shaft, and this action, unfortunately, resulted in a total cessation of operations. At a second mine, the deepening of a vertical shaft with the existing whim arrangements was objected to, and caused a temporary suspension of activities, but the difficulty was subsequently overcome by the installation of winding machinery. Defects in the applied methods of stoping and the filling of mined areas at a third mine were opposed, but this action did not interfere with mining, as the operators accepted, applied, and appreciated the counsel given in regard to corrective practices. Towards the close of the year, exception was taken to the method of working an extensive quarry face, and the question of future operations is now being considered. Extensive roof weaknesses developed at two collieries, but reasonable precautions were exercised, and no untoward incident was recorded in connection therewith during the period under observation. Many irregularities were encountered in details of established mining practices, but only in one instance was a lack of reasonable promptitude displayed in correcting the defects.

Accidents.—Five accidents, involving fourteen fatalities and four casualties attended with non-fatal injuries, were registered under the provisions of Section 26 of the Mines and Works Regulation Act. There was no serious underground accident. One machinery accident was investigated and recorded, but not registered.

A most regrettable accident was the bursting of the Briseis Company's Cascade dam during the abnormal floods experienced in the north-eastern part of the State early in the year. Fourteen persons, twelve males and two females, were entrapped and drowned by the violent avalanche of collected and surcharge waters down the Cascade River. The mine workings were inundated, but all employees made a safe exit from the working faces. At the subsequent inquest the jury came to the conclusion that the bursting of the dam was the result of an abnormal and unprecedented volume of water, which may have been caused by a cloud-burst or by an extraordinary rainfall in the catchment area of the dam, and that no blame was attachable to anyone.

During constructional work on the seafront jetty at a colliery, a carpenter was bumped by a corbel, which was being swung into position, and caused to fall on to the beach, a distance of 20 feet. He sustained a fracture of three ribs, an injury to the spine, and miscellaneous injuries. An exercise of full regard for safety by those engaged upon the work would have averted this accident.

An employee was assisting to carry a nozzling pipe from the sluicing face of an alluvial workings when he slipped and sustained three fractured ribs.

When moving away from settling gravel, during breast-sluicing operations at an alluvial workings, a person tripped over a loose boulder, and a lump of cemented wash struck and bruised the muscles of his right leg.

At an alluvial workings a foreman trespassed, unnecessarily, in front of undermined face ground which was being sluiced, when the ground fell away and practically buried him. He sustained a fractured skull, fractured left rib, and general abrasions.

The machinery accident occurred whilst repairs were being effected to an aerial ropeway at a colliery. A tension clamp slipped, and the pawl-bolt of the straining crab-winch sheared simultaneously. The winch motion instantly reversed, and the handle struck and fractured an employee's right upper arm.

Health and Sanitation.—Matters governing health and sanitation received attention, but the desired results were not generally attained.

Measures taken to control the dust nuisance at a rock-crushing station were ineffectual owing to incompleteness of essential details comprising the dust-collecting unit installed. Necessity for correcting the ensuing conditions was referred to those responsible, but no material alteration resulted. This matter will be further dealt with during the coming year.

Nothing of an invidious nature was encountered in regard to the formation or existence of atmospheric dust, due to other than blasting operations, in underground workings. An ill-conceived policy of working at one mine was responsible for objectionable conditions of dust and fumes from blasting operations, and it was deemed necessary, in the interests of health, to suspend operations in the locality concerned.

Slight deficiencies in the ventilating system at a metalliferous mine were met by the introduction of shift-end blasting and the provision of an interval between the

conclusion and commencement of successive shifts. Reversion from a dual to a single ventilating district and general innovations in regard to the circulation and control of air currents materially improved the ventilation at one colliery. Additional improvement is desirable, but this will not be obtained until a proposed new air-shaft is provided to reduce resistance and overcome the present abnormal short-circuiting of air. The installation of a high displacement fan was effected at a second colliery, and the fan was placed in commission early in the new year. Owing to power disabilities and an incompleted system of distribution, the anticipated results did not ensue, but it is expected that the deficiencies will be overcome in the near future.

Thermometrical conditions in the metalliferous mines and the collieries were appreciably below the maximums provided by the Mines and Works Regulation Act.

Changing and bathing accommodation and latrine arrangements were not different from those existing hereto. Matters relating to the latter arrangements were unsatisfactory at several mines, and consideration is being given to the introduction of facilities most likely to eliminate the defects encountered.

Machinery.—The protection and safety of the machinery in use at the mines and works received the attention required by the provisions of the Mines and Works Regulation Act. On two occasions safety-cages failed to respond to applied tests, and were ordered to be removed and overhauled. One rope was condemned, and three winding ropes were required to be cut and reshod owing to defects located on inspection.

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

Irregularities in regard to the handling and storage of explosives were dealt with as occasion demanded. Legal proceedings were instituted against a miner for storing an explosive substance in a coal mine. He was convicted, fined £1, and ordered to pay costs amounting to 8s. This action appeared to have a salutary effect upon the prevalency of a dangerous practice of planting explosives in the roadside-stowing in a colliery.

Except that the 50 per cent. gelignite displayed an inherent tendency to harden at comparatively moderate temperatures, and was not recommended for use in certain localities during the winter period, no outstanding defects were observed in the nitro-compounds used at the mines and quarries.

The behaviour of the lead-azide detonators has been kept under surveillance, and although the data collected were insufficient to condemn the detonators, the reports received at different mines were of a variable nature, and the results were not generally equal to the results obtained from the fulminate of mercury compound. Observations in this regard will be continued.

Inflammable Liquids.—There was a material increase in the amount of work performed under the provisions of the Inflammable Liquids Act, and the full duties of administration actually commanded more service than could be allotted thereto.

Further advances were made in the establishment of bulk depots, and the bulk distribution of mineral spirit was more general. To meet the altered conditions of distribution there was an appreciable increase in the number of kerbside and other pumps installed and a general decrease in the number of premises provided for case storage.

Conditions governing the storage of mineral spirit, mineral oil, and calcium carbide were more regularly controlled, but entire satisfaction will not be obtained until the proposed regulations are established.

No outbreak of fire or other mishap in connection with the handling or storage of inflammable liquids was reported to this office.

Miscellaneous.—In addition to the duties performed under the abovementioned Act, special examinations were made of three mining properties, and reports were prepared upon applications for financial assistance under the Aid to Mining Act. An assessment was made of the damages sustained at the various mines and works as the result of the abnormal floods in the early part of the year, special investigations were made, and a report was prepared upon blasting operations at a quarry not within the province of the Mines and Works Regulation Act; special investigations were made, and a report was prepared, upon the deposition of mine residues in the South Esk and St. Paul's valleys; and a report was furnished upon the pollution of the North Esk River by operations at a gold mine.

Mining Operations and Production.

The abnormal flood visitation in the early part of the year seriously interfered with mining activities throughout the inspection division. The principal mines and a majority of the lesser producers suffered an enforced period of non-productivity owing to damages sustained. Eleven conservation dams were breached, and others were damaged in some degree. Surface workings were inundated, and water races and general mining equipment were either severely damaged or totally destroyed. The value of the damage actually due to flood conditions at the various mines and works was approximated at £76,170.

COAL.

Except for a period of inactivity due to flood conditions interfering with transport facilities and for short period of idleness at one mine owing to an industrial trouble production was continuous at the three principal collieries. The smaller mines were only intermittently worked owing to local disabilities in operating conditions and on account of a restricted trade for the class of coal produced. The output was 8194·5 tons greater than the output for the previous year, the total production advancing to 120,346·5 tons, valued at £95,923·35 at the mine bins. It is anticipated that this output will be exceeded during the coming year.

The Cornwall Coal Company employed an average number of 111 men, and produced 62,753 tons at a mine value of £48,656. The innovations to the mine and haulage equipment, referred to in the previous report, were completed and placed in commission. Progressive mine developments and a change-over from single to dual coal-winning places enabled production to be centralised and confined to a lesser area of workings. This company is now in a favourable position for meeting additional trade requirements.

The value, at the mine bins, of 38,002 tons of coal produced at the Mount Nicholas Colliery was £30,481. Except that a start was made with the back-driving of another tunnel to facilitate mine transportation, there were no additions to the surface plant or pit arrangements. Operations gave employment to an average of 91 men.

The Jubilee Company produced 18,291 tons, valued at £15,298 at the mine bins. The eastern places continued to develop satisfactorily, and a main gaining bord, on the left of No. 5 heading, is revealing improved seam features in a north-westerly direction. No. 5 heading was advanced to 2200 feet from the main heading, and an appreciable distance has yet to be driven to encounter the assumed line of the major upthrow of the Jubilee seam.

Productive operations were quiescent at the Seymour Colliery during the major part of the year, attention being confined to the construction of a jetty for coal exportation. A substantial jetty was constructed and temporarily completed at 1110 feet when attention was directed to developmental work in the mine, following which this colliery entered the list of active coal producers. Disabilities in regard to shipping have been a serious barrier to mining operations, but negotiations have been entered into for the purchase of a vessel, and it is hoped that transportation difficulties will be eliminated. The colliery has yet to be equipped with adequate mining and haulage machinery, storage bins, and loading facilities. An average number of 14 men was employed, and the quantity of coal produced, principally for local power requirements, was 348 tons, valued at £340.

Modified longwalling was pursued from the Boiler and Water tunnels at the York Plains Colliery, and 890 tons of coal, valued at £1111, were marketed. Restricted operations were again pursued at the Excelsior Coal Mine, the output of coal being 62·5 tons, valued at £37·35.

GOLD.

An output of 1087·8 ounces, valued at £4620·87, was recorded, as against 623·75 ounces returned for the previous year. The increase recorded was largely due to an improvement in the matter of obtaining returns, as gold mining was not more active.

Treatment, by cyanidation, of the tailings on the old battery site of the Tasmania Gold Mine, Beaconsfield, was continued for a recovery of 316 ounces of gold, valued at £1342·3.

Eight men were engaged in alluvial mining in the Lisle basin, and 252 ounces, valued at £1070·48, were recovered, but there is nothing of moment to be recorded in connection with operations.

Alluvial mining in the New River area returned 32·6 ounces, valued at £138·5, and small quantities of alluvial gold were recovered from the concentrates produced from sluicing operations at isolated tin mines.

Operations at the Golden Gate Consolidated Mine were of an indifferent nature, and as immediate prospects did not warrant necessary repairs being made to the main shaft the mine was closed down. There were 384·2 ounces of gold, valued at £1631·9, recovered from the cyanidation of 1154 tons of tailings, crushing of 210 tons of mine ore, and treatment of crucible slag and amalgamating plates.

Exploratory work was continued at the Old Boys' Gold Mine at Mathinna. The vertical shaft was deepened to 390 feet, and at 375 feet a crosscut was driven to the main lode channel, which was then driven on 47 feet north-easterly and 100 feet south-westerly without any noteworthy lode development ensuing. Driving is being continued to prove the depth persistence and value of the shoots of gold-bearing quartz passed through at the 300 feet level.

Prospecting operations were continued on the Entrance line of the lode at Mangana, but attention was principally directed to the zone below the old Majestic tunnel, and the results were of a disappointing nature.

Prospecting and developmental operations were proceeded with on a series of parallel and cross reefs at the Golden Hill Mine, Blessington, and the erection of a stamper battery was undertaken towards the close of the year.

Operations were resumed at Hannah's United Gold Mine at Alberton, and a crosscut was driven from the Roslyn tunnel to intersect Hannah's and parallel reefs, but the objective was not attained at the close of the period under review.

An appreciable amount of prospecting was done by several parties in different belts of auriferous country, but no important discovery was reported to this office.

TIN.

The output of metallic tin was 452·87 tons, valued at £92,080·6, as against 856·88 tons, valued at £195,076·8, produced during the previous year.

The reduced production may be attributed to several causes, the principal of which are directly related to flood conditions and an unprecedented decline in the market price of metallic tin. By virtue of its situation and the nature of operations, alluvial tin mining suffered the greatest set back as the result of the flood, the proportional damage being 98·6 per cent. of the total assessment. This interference was aggravated to such an extent by a receding and unstable metal price that several of the principal producers have been disinclined to rehabilitate operations and resume normal production. The low price of tin also militated against active exploitation of ore occurrences, to which considerable preliminary attention had been given, and it created an adverse economic position at several mines that were previously responsible for an appreciable production of metal. Although some occurrences may be profitably exploited for less, a minimum acceptable price for metallic tin would be £250.

The reduced output of tin ore reflected adversely upon operations at the Mount Bischoff Smelting Works, and, at the close of the year, the company decided to suspend operations.

Storey's Creek Tin Mining Syndicate.—The syndicate suspended mining operations at the end of the previous year, but at the close of the second quarter of the period under review the mine was acquired by a local tribute party, and since then production has been continuous.

Operations have been confined to Nos. 1 and 2 lodes at Nos. 2 and 3 levels, and advantage has been taken of a buoyant wolfram market to more actively exploit the wolfram-bearing sections of the lodes. During the operating period the tribute party treated 4772 tons of ore, and sold 16·3 tons of tin concentrates, containing 11·25 tons of metallic tin, valued at £2204·27, and 137·85 tons of wolfram, valued at £16,505.

Early in the year the syndicate raised and treated 215 tons of ore for 32·5 tons of concentrates, which finally returned 3·3 tons of metallic tin and 27·75 tons of wolfram.

Aberfoyle Tin N.L.—The fixed policy of exploration, referred to in the previous report, was adhered to at the Aberfoyle Tin Mine. The adit was continued to approximately 1050 feet from the datum point, and passed through the ore-vein system exposed in the vertical shaft workings. Several small tin-bearing veins, occurring easterly from those workings, were also revealed by the adit. Additional prospecting, by shallow shaft-sinking and crosscutting, was done over a distance of approximately 600 feet on the course of the ore zone, and established a lateral persistence of the vein system and values. Although the veins, as proved, are not individually large nor characteristically regular, their persistency and frequency at varying intervals between the 900 and 1042 points in the adit offer scope for collective and sectional mining. The economic value of the majority of the present disclosures must be regarded collectively with intervening bands of barren slate rather than as individual ore veins, but this aspect does not appear to have been ignored, and, after comprehensively reviewing the results obtained, the company considers the prospects as sufficiently encouraging to warrant the installation of ore concentrating units, and is now moving in that direction. Developmental work and mine equipment, necessary for productive operations, are to be proceeded with immediately.

Sluicing was commenced on Hannah's freehold at Royal George, and two lots of tin concentrates, aggregating 3·1 tons, were produced for a return of 2·278 tons of metallic tin, valued at £433·36. The output of metallic tin by miscellaneous operators in the Avoca district dropped to 2·49 tons, valued at £516.

Shallow prospecting was continued by Messrs. Flaherty Brothers on Lease 1034-M. Occurrences of both coarse and finely crystalline cassiterite have been exposed in the slates and quartzites within the contact series of the intruding granite, but additional prospecting is apparently necessary to determine the full economic importance of the ore zone.

Much interest was manifested in prospecting operations by the Siamese Tin Syndicate in the St. Helens district. Intensive boring and shaft-sinking were done on areas embracing both leads and terrace ground and extending from the immediate locality of St. Helens to the old Transit workings, but the results obtained and the future intentions of the syndicate are not officially known.

Hydraulic mining was pursued, as opportunity permitted, at the Argonaut Mine, and a total of 66,500 cubic yards of material was treated for a recovery of 26·83 tons of tin-oxide, estimated to contain 19·25 tons of metallic tin, valued at £3730·37.

Operations were less active at the George's Bay mine. Several areas of comparatively shallow ground, approximating 54,880 cubic yards, were hydraulicked for a recovery of 15·28 tons of concentrate, which returned 11·16 tons of metallic tin, valued at £2272·49. Latterly, the mine was taken over by a party of tributers.

Sluicing was pursued, partly on the Derwent lead and partly on neighbouring Terrace ground, at the Hunt Mine for a return of 6·87 tons of metallic tin, valued at £1385·24.

Several small parties were intermittently engaged in ground sluicing in the St. Helens district, and accounted for an output of 5·55 tons of metallic tin, valued at £1095·8, but there is nothing of moment to be recorded in connection with operations.

The only development of interest in mining activities in the Lottah-Weldborough-Moorina areas was the proposal to exploit the alluvial and lode occurrences at the Cambria Mine on a more extensive scale than hitherto. The property was acquired by a syndicate, and the future policy of working embraces the provision of additional water for sluicing the alluvial ground and the installation of crushing and concentrating units for treating the quartz-greisen formations.

An appreciable amount of prospect sampling was done on a large quartz-greisen formation at the Laffer Mine with interesting results. Although the exploitation of this formation has been contemplated, it is unlikely that anything material will result with the ruling low price of tin. Sluicing was intermittently pursued on the terrace ground for a production of 3·475 tons of concentrate, which returned 2·42 tons of metallic tin, valued at £487·76.

An average of eight men were employed and an estimated quantity of 17,960 cubic yards of ground was treated at the Weld Mine for an output of 11·836 tons of oxides, containing 8·359 tons of metallic tin, valued at £1745·46.

Several areas of shallow ground were sluiced at the Weldborough Mine for a recovery of 5·92 tons of concentrate, which returned 3·637 tons of metallic tin, valued at £755·1. Latterly, operations were suspended at this mine.

New Moorina Tin Mine.—Hydraulicking of the deep drifts forming the northern and central faces was more actively pursued at this mine. A total quantity of 93,000 cubic yards of ground was sluiced for a recovery of 25·26 tons of tin oxide, which returned 16·89 tons of metallic tin, valued at £3442·9. Operations gave employment to an average number of 10 men.

Miscellaneous ground-sluicers and other operators at small mines in the Lottah-Weldborough-Moorina areas accounted for a production of 27·758 tons of concentrates, which finally returned 19·679 tons of metallic tin, valued at £3924·15.

Pioneer Tin Mine.—No mining was pursued in the lead workings at this mine. The abnormal flood preceded a commencement of the usual sluicing campaign; inundated the workings; seriously damaged the head-water race, Ringarooma syphon and Frome dam; and dislocated the generation of electric power, which functions in the working of the mine. The power service was subsequently restored, and dewatering of the workings was proceeded with for the immediate recovery and overhaul of Nos. 1 and 2 barges. There were 13 tons of concentrates recovered from the treatment of accumulated "seconds," and returned 9·39 tons of metallic tin, valued at £1916·36.

Several areas of drifts, aggregating 28,550 cubic yards, were hydraulicked at the Rajah Mine for a recovery of 9 tons of oxide, which returned 7·1 tons of metallic tin, valued at £1369·8.

Eastern Lead Tin Mine.—A correction of the plant disabilities previously referred to enabled an increased yardage of ground to be treated, but, as was the case with other mines, operations were interrupted by flood conditions. A total quantity of 50,050 cubic yards of ground was treated for an output of 13·89 tons of concentrate, containing 10·17 tons of metallic tin, valued at £2070·58. The prevailing low price of metallic tin reacted adversely upon the economies of sluicing, and operations were suspended towards the close of the year.

Endurance Tin Mines.—Marked interest was centred in the results attained by a boring campaign pursued by the company, and which located a deep tin-bearing lead following the eastern fall of Mount Cameron, extending westerly and underlying areas of tin-bearing drifts that have already been extensively exploited. An option of purchase of the company's holdings was acquired by independent people, intensive boring was done, and the result of their deliberations is awaited.

The No. 1 plant was in continuous commission until the second quarter of the year, when an unaccountable outbreak of fire demolished the barge-house and damaged the machinery. Sufficient repairs were effected to enable the workings to be kept unwatered, but owing to the low price of tin and pending the decision of the optionees full repairs were not undertaken, and productive operations were suspended. During the operating period, 63,000 cubic yards of ground was sluiced for a recovery of 32·25 tons of tin oxides, which returned 22·9 tons of metallic tin, valued at £4935·6. The No. 2 plant and encompassing lease were severely damaged by the excessive flood in the Ringarooma River.

Developments and recoveries were unsatisfactory at the Garfield Mine, and operations were abandoned early in the year. Sluicing was continued at the Monarch Mine until the close of the third quarter, when, owing to improverished drift values and the low price of tin, mining was suspended. During the operating period a total quantity of 53,148 cubic yards of ground was treated for an output of 12·7 tons of concentrate, which returned 8·8 tons of metallic tin, valued at £1790. Five men were employed at the New Mussel Roe Mine, and an estimated quantity of 70,000 cubic yards of ground was sluiced for a recovery of 9·25 tons of tin-oxide, containing 6·38 tons of metallic tin, valued at £1279·16.

Although mining of an extensive nature was not active in the Gladstone district, miscellaneous parties and small-scale operators accounted for an appreciable production of metallic tin in the Bradshaw's Creek-Gladstone areas. Operations in this regard gave employment to an average number of 90 men, and resulted in an output of 95·6 tons of tin-oxides, which returned 67·05 tons of metallic tin, valued at £13,475·2.

Briseis Tin-mining Company.—Operations by this company were seriously interrupted by the abnormal flood in the early part of the year. The Cascade dam burst as the result of a cloud-burst or extraordinary rainfall in the catchment area, and the violent avalanche of water down the Cascade River inundated the mine workings and submerged the operating plant. In addition to an appalling loss of life, mine offices, general buildings, stores, records, syphons, and general equipment were washed away and became a total loss to the company. The Cascade and Ringarooma races were also damaged by flood waters. Facilities for mining were interfered with to such an extent that, in conjunction with the low price of tin, the company has hesitated to raise sufficient capital to rehabilitate normal operations. Proposals for a resumption of operations are now receiving consideration, and it is hoped that something material will result.

Prior to the flood, 48·3 tons of tin oxide were produced, and returned 34·4 tons of metallic tin, valued at £7652·45. Production was not entirely suspended, as, subsequent to the flood, an average of 48 employees and tributers was engaged sluicing, boxing, and streaming previously unworked ground, secondary drifts, and flood debris at the southern end of the leases. Several lots of tin concentrates, totalling 75·2 tons, were recovered, and returned 54·18 tons of metallic tin, valued at £11,773·4.

Lone Brother Tin Mine.—Conditions, due to the abnormal flood in the Ringarooma River, and to the declining price of metallic tin, reacted adversely upon operations at this mine. There were six men employed, and 11·76 tons of oxides, containing 7·5 tons of metallic tin, valued at £1559·23, resulted from sluicing at the previously developed faces and from the treatment of tailings which had accumulated from previous operations.

Ringarooma Tin (Alluvial) Limited.—Operations were of an indifferent nature, and did not merge into any material importance. After undertaking a large amount of preliminary work, and pursuing prospect-sluicing at two places on the tin drifts at the old Mutual Hill Mine, mining operations were suspended. Latterly, the mine was worked by a tribute party.

Arba Tin Mine.—Treatment of tailings, which had accumulated in Branxholm Creek from previous mining operations, was profitably continued by a tribute syndicate. There were 10 men employed, and an estimated quantity of 78,750 cubic yards of tailings was sluiced for a recovery of 41·8 tons of tin oxide, containing 30·5 tons of metallic tin, valued at £6234·39.

Ormuz Mine.—Seven men were again employed on the work of hydraulicking the deep drifts forming the marginal faces of the old Arba workings. A quantity of 10·97 tons of concentrate was produced, and returned 7·49 tons of metallic tin, valued at £1533·69.

The tin-bearing ground on the western rim of the Branxholm Creek lead at the Roma Mine was depleted, and operations were then transferred to Black Creek.

Sluicing was continued at the Ruby Flat, Montrose, and Woods' Mines for an output of 27·8 tons of tin concentrate, estimated to contain 20·22 tons of metallic tin, valued at £3873·96.

Miscellaneous operators in the Branxholm area accounted for a production of 29·17 tons of tin oxide, which returned 20·42 tons of metallic tin, valued at £4098·17. Operations in this regard gave employment to an average number of 23 men, but there is no noteworthy development to be recorded.

Tin mining was not more active in the Ringarooma area. Ground sluicing was intermittently pursued by eight men for a recovery of 6·51 tons of concentrate, containing 4·56 tons of metallic tin, valued at £916·3.

Several small lots of tin oxide, aggregating ·41 ton, were sent to the Mount Bischoff Smelting Works from the Strait Islands, and returned ·21 ton of metallic tin, valued at £43·45.

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 Liquids Act, 1929, within the Queenstown and Zeehan inspection division for the year ended 31st December, 1929:—

Number of Men Employed.—The average number of men employed during the year under review was as follows:—

Queenstown	1212
Zeehan	206
Total	1418

Accidents.—During the year 17 accidents were registered in this division, 1 fatal and 16 non-fatal. The following table shows the particulars:—

Casualties:			
Surface	4	Queenstown:	
Underground	12	Surface	3
Underground (fatal)	1	Underground	13
	17	Zeehan:	
		Surface	1
		Underground	—
			17

The fatal accident occurred at Lyell Comstock Mine in a ground-floor stope, where a travelling boss was fatally injured. The mine foreman and travelling boss, accompanied by a miner, were engaged barring down affected ground from the roof of a stope. The travelling boss took the bar from the foreman, and when barring down a weak boulder of ore he, by some means, fell under the ground, which fell across his back, causing fatal injuries. It appeared from evidence that the bar slipped and he fell forward just as he had freed the affected ground. Approximately 6 cwt. fell from a height of 8 feet. It was a very unfortunate accident, as it was necessary to bar down the ground to ensure safety for the men working in that particular stope.

Two accidents happened to truckers by the truck passing over their toe and foot, causing a crushed toe and badly bruised foot respectively. Another trucker moved off the line to let another truck pass, when he was jammed between truck and chute, causing a bruised side. After tipping a truck of mullock down a pass a trucker was levering back the empty truck, when he by some means slipped, breaking his ankle; this was a very peculiar and simple accident. An official of the mine whilst walking along the trucking-line slipped and badly sprained his ankle. A miner was barring down in a stope at North Lyell mine, when a piece of ore fell on his foot, breaking a small bone. Another miner was drilling under a rise, when a piece of ore fell and caused injuires to his leg, which necessitated 20 days' absence from work. At Lyell Comstock a miner poked his finger in the exhaust of a rock-drill while working, consequently he lost the top of his finger. Whilst engaged handling timber in a stope at North Lyell a log rolled on a miner's foot, badly bruising same. A man on the surface, whilst engaged hooking main hoist to slag boat placed his foot under the latter. The crane lifted back of boat, causing front of same to come forward, which jammed the man's foot, bruising same. Another man on the surface strained his back whilst pushing a truck, which necessitated his absence from work for more than 14 days. At Zeehan Federation Mine the foreman was assisting truck-tipper on end of self-acting haulage to unload a truck of sticky ore, when he slipped as the empty truck moved, and, coming in contact with the truck, he was knocked down, and was unfortunate in having his leg broken. The remaining accidents were not serious, and of a miscellaneous nature, although causing more than 14 days' absence from work.

Settlements of Ground.—No settlements of ground occurred during the year. A considerable amount of "Picking up" of stopes has been in progress, which has necessitated extra care and attention. As previously stated, it is important to have a minimum area of ground open when "Picking up" is in progress.

Ventilation.—Generally speaking ventilation has been satisfactory throughout the mines in this district, any defects in this respect having received prompt attention. The great importance of good ventilation has been emphasised, this being a very necessary factor in regard to the health of the miners.

Ropes, Cages, Machinery, &c.—Periodical inspections have been made of ropes, cages, and machinery. New ropes have been installed where required, and cages tested regularly. Any requests from this office in regard to the ropes or cages have been promptly carried out.

Quarries.—Regular inspections have been made of the quarries at Queenstown, and throughout the year reasonable precautions have been taken to ensure safety, while working conditions have been satisfactory.

Reduction and Smelting Works.—It has been noticed that at times insufficient water has been used in the reduction works for thoroughly wetting the ore and slimes. Irregularities in this respect should not occur, and steps have been taken to ensure more water being used on the ore. In one instance where dust was prevalent it has been decided to box in a dry crusher, and this should materially improve conditions. Constant attention is necessary in the wetting of the dry ore to allay the dust in the crushing stations. Conditions at the smelters have been reasonable.

Health and Sanitation.—Conditions in regard to health and sanitation have been given attention. Changing-houses are satisfactory, with ample heat for drying clothes and a good hot and cold water service. Latrine accommodation has been satisfactory, any defects having been promptly brought before the management and in all cases rectified.

Aid to Mining Act.—Supervision has been given to parties carrying out work under the provisions of this Act, and reports furnished in regard to the work in progress, or on application for assistance.

Prosecutions.—During the year it was found necessary to institute legal proceedings against 11 persons for contravention of the provisions of the Mines and Works Regulation Act. Six persons were proceeded against for jumping off moving carriages, and fines were inflicted ranging from 11s. 6d. to £1 16s. 6d. Two persons were proceeded against for failing to return un-used explosives to magazine, and were fined £1 16s. 6d. Two persons were charged for careless handling of explosives, and were fined 11s. 6d. and £1 16s. 6d. respectively. One man was proceeded against for riotous behaviour, the charge being dismissed on a technical point raised by counsel. It is hoped that the prosecutions will have the desired effect of the men exercising more care in regard to the observance of the mining regulations.

Dust Estimation.—During the year measurements of dust have been carried out with the Konimeter, chiefly underground at the tipplers, where dust is prevalent. A fan has been installed, which has improved conditions, the dust being drawn from the tippler into the upcast shaft; water has also been laid on, which has made conditions better. The estimation of dust will be continued during the current year.

Explosives.—Periodical examinations have been made of explosives in use, and fuse tested. No faulty explosives or fuse has been encountered during the year.

During the year 3096 cases of gelignite and 10 cases of detonators, containing 5000 detonators, were landed at Regatta Point for the Mount Lyell Mining and Railway Company, the unloading of which came under the supervision of this office, and was carried out in a safe manner.

Inflammable Liquids.—1 new depôt has been built in Queenstown for the storage of mineral spirit. Regular inspections have been made of depôts and registered premises, while the licences in regard to storage of fireworks have had attention. Any irregularities discovered have, on request, been promptly attended to.

General.—During the course of inspections particular attention has been given to barring down after firing, and in timber stopes to keeping the timber well up to face, and poling out where necessary, and securely stacking and tomming the sets. It is also important to keep the filling of stopes well in hand, and not to have too large an area of ground open. To ensure good conditions the blasting of holes should only be carried out at midnight, excepting in cases of bad pieces of ground, or when the stope has reached the picking-up stage. Ventilation is a very important factor for good working conditions, and efficient wetting of the ore after broken is very necessary, especially where the ore is dry and of a siliceous nature. Extra water hoses for the shovellers would improve conditions in the big stopes, where a considerable tonnage of ore is often broken down before shovelled into the ore passes. It is the desire of this office to make conditions as good as possible in regard to the health of the miners, especially in connection with ventilation and allaying the dust.

Summary of Mining Activities.

Mount Lyell Mining and Railway Company Limited.—The activities of this company considerably increased during the year, both in regard to mining and treatment operations, consequently a large output of copper was won and important development work carried out. The North Lyell tunnel has greatly improved the transport of ore from the mine to the ore bins at the flotation plant, and an efficient service has been maintained throughout the year on a much-increased tonnage of ore. The development work carried out at the North Lyell Mine at the 1200 and 1300 feet levels has proved the downward continuation of the ore-body at those depths. The Tharsis lode is being explored by a drive from the main tunnel. This has proved the downward continuation of a large body of low-grade ore, which, I understand, is very amenable to flotation, and, occurring in schist, is easy crushing and breaking; hence it is confidently anticipated that the Company will mine and treat this ore profitably, and, if copper maintains its present good price, I have no doubt, with the modern methods of treatment, that the Mount Lyell Company will successfully treat the low-grade ores. This important development will probably add a considerable number of years to the life of the mine.

Lyell Comstock Mine.—A considerable amount of developmental and constructional work has been carried out in this mine during the year. The No. 5 or lower tunnel was enlarged, enabling 10-ton trucks to be used in connection with the transport of the ore over a 2-ft. gauge tramway system. Large ore-bins have been constructed at approximately 900 feet from approach of tunnel, into which the ore is tipped from the upper tunnels. The main tunnel is well lighted with electric light, and a regular output of ore is being maintained from this mine, which is beng systematically opened up. The ore is being transported over a new deviation tramway direct to the ore-bins at the flotation plant, Queenstown. An up-to-date changing-house has been erected for the employees, with a good hot and cold water service and efficient lockers for drying the clothes. The work carried out in this mine has made employment for over 100 men, and I understand the mine is turning out quite up to expectations.

Diamond-Drill Prospecting.—Considerable diamond-drilling has been carried out at the North Lyell mine during the whole of the year, results of which have given valuable information in connection with the downward continuation of the ore-bodies.

New Hydro-Electric Power Plant.—In order to supply the extra power being used by the Company in connection with the increased activities, and also at a later date to supply additional power to the State Hydro-Electric Department, preparations are being made to instal a new power-station 1 mile below Lake Margaret power-station; this will, I understand, provide a further 2500 horsepower. Preliminary work in this connection has been completed, and a considerable number of men are now employed on the construction of this important work.

General.—It is pleasing to report that the increased activities displayed by the Mount Lyell Mining and Railway Company during the year under review have been successful and important in proving the stability of the Lyell mines, which is a great asset to the State.

Block 14 Exploration Company.—This Company has carried out a set programme of development work at the old Tasman and Crown Mine, which has opened up several lenses of zinc-lead sulphide ore. I understand further development work will be carried out, and with this in view an extension of the option has been granted to the Block 14 Exploration Company by the owners.

Prospecting.—Prospecting has been carried out intermittently at Mount Huxley and South Queenstown, but nothing payable has been discovered. Galena was discovered early in the year on the West Coast-road; however, very little work has been done on the show, which will need further prospecting to prove its value.

Zeehan Area.—South Comet Mine.—The Adelong Gold Estates Company took an option over this property, and carried out development work in driving the bottom tunnel, from which satisfactory results were obtained, the lode for a length of 100 feet being considered highly payable. It is pleasing to note that the Company has exercised its option, and are continuing driving the lower tunnel. It is hoped the results of this work will warrant mining being carried out on a profitable scale. The prospects are certainly favourable, and, providing the prices for silver and lead are reasonable, the mine should employ a considerable number of men. The results of the work now in progress will have an important bearing on the future of this mine, and it is hoped the lode will prove to be highly payable for a considerable distance.

Comstock Area.—Assistance to the extent of £300 was given to the Lucknow Syndicate by the Government for cleaning out a tunnel which drains several lode-channels at Comstock, including a shaft down 100 feet on Dunkley's property, and will enable the lodes to be attacked from this lower level. Unfortunately the low prices ruling for lead and silver retarded prospecting from the tunnel; however, work can now at any time be taken up from this lower tunnel, which is an important factor in opening up any of the lodes at Comstock.

Dunkley's Silver Beauty Mine.—J. Dunkley and party erected a small concentrating mill to treat their second-class ore, and also carried out mining at their lower tunnel. The prospects of this mine are very good, and a drive from the shaft, which is 100 feet below their present tunnel working, should give highly payable results. Seventy-six tons of ore and concentrates was produced during the year, containing 4725 oz. of silver and 54·3 tons of lead. The output from this mine should be materially increased during the current year.

Swansea Mine.—The company operating this mine carried out development work at the lower level, and productive work at the upper levels. However, the present low prices of silver and lead does not allow a profitable return above cost of production.

North Tasmanian Mine.—Prospecting work has been carried out on this old property. A tunnel has been driven into a hill for a length of, approximately, 350 feet, and is still in progress. So far nothing payable has been met with; however, it is hoped that the men will eventually meet with deserved success.

Big Ben Area, North Zeehan.—The assistance offered by the Government (£300, on the £ for £ scale), following a report from this office on the mine, was not availed of by the owners. The assistance was granted with a view to sinking a main shaft down to 100 feet, and testing the lodes at that depth. A present shaft is already down 38 feet. Unfortunately, the owners could not carry out the work. The party sunk a winze from the 47-feet level, and sold 37 tons of ore, containing 3127 oz. of silver and 25 tons of lead. This property is well worth testing at a lower level, the galena being high in silver and lead values.

Tributes.—Several parties of tributers carried out mining, chiefly on small veins of ore at a shallow depth. There was nothing of importance discovered to record.

Federation Tin Mine.—During the year productive work was carried out intermittently at this mine. Unfortunately, the low price ruling for tin effected the revenue; 47·3 tons of tin concentrates was produced, containing 31 tons of tin. The mine, at time of writing, is idle, pending the reconstruction of the company in London. It is hoped this will be successful, and a vigorous development policy carrid out at the mine. It is apparent that further capital is required before the mine can obtain profitable results.

Copper Nickel Ore.—At the 5-mile, Zeehan, productive operations have been carried out by the Copper Nickel Company on a small scale. The production of nickel ore mined and sold was 842 tons, containing 85 tons of nickel and 46 tons of copper. This is excellent ore, and, providing a suitable market is available for the purchase of this ore, the copper nickel mines should show profitable working. Unfortunately the development work has not been carried on fast enough, which is essential to successful mining.

Munro's Copper Nickel Mines.—These constitute the old Cuni Mine and also the property some years ago worked profitably by a Melbourne syndicate, the same lode running through both properties. The formation lays between the slate and serpentine rocks, and can be traced on the surface for a considerable distance. Geophysical prospecting has proved this lode to be of great length, while recent trenching has confirmed this. The lode is running through flat swampy country, consequently, water is heavy, particularly in the winter months; however, with electric power this could be dealt with economically, and, provided a suitable market is available for the purchase of the ore and a company formed with sufficient capital to develop and equip these mines, I am of the opinion that this lode could be highly profitably worked.

Value of Output from the Queenstown Zeehan District.—The estimated production and gross value of the output of metallic minerals, based on average quarterly prices of metals for the year ended 31st December, 1929, is as follows:—

Output.		Value.
		£
Copper (tons)	8,705	742,214
Gold (oz.)	2,844	12,040
Silver (oz.)	165,338	18,008
Lead (tons)	203	4,667
Zinc (tons)	128	3,282
Tin (tons)	37	7,433
Nickel (tons)	86	14,720
Total gross value		£802,364

The gross value of the output from the Queenstown-Zeehan Division for the year 1929, shows an appreciable increase of £310,162 above the value of last year's production.

JOHN VAIL,
GOVERNMENT PRINTER, TASMANIA.