(No. 4.)

TASMANIA

REPORT

OF THE

DIRECTOR OF MINES

FOR

YEAR ENDING DECEMBER 31

1928

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

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REPORT OF THE DIRECTOR OF MINES.

Mines Department,
Hobart, 25th March, 1929.

SIR,

I HAVE the honour to submit herewith a report dealing with the work of the Mines Department during the year 1927-28.

The mode of presentation initiated last year has met with such general commendation that no radical change has been made in the setting out of the information this year. The only addition of note relates to statistics of production. This year two forms of statistics are given: one based upon the ultimate value of the refined metals; the other based upon their values as used or marketed.

In the following pages I have endeavoured to give, in condensed form, as complete an account as possible of the important works performed during the year.

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

A. McINTOSH REID,
Director of Mines.

The Honourable the Minister for Mines, Hobart.

THE WORK OF THE MINES DEPARTMENT DURING 1927-28.

The following report outlines the activities of the Department. This has been a year of extraordinary Departmental activity, especially as regards field investigation, engineering work, drilling, and chemical research. The results of all these works have been supplied to the public in the form of report, and copies have been placed on the official records.

PERSONNEL.

The plan of reorganisation drawn up and approved in 1926 still remains incomplete, but the critical position of last year has been relieved by the appointment of officers to some of the vacant posts. The appointments allow of co-ordination in such manner that one officer may understudy another, and so be ready to act for him or her in case of emergency. Two positions occupied by temporary officers remain unfilled: that of librarian, geological survey, and that of laboratory assistant and clerk, Launceston.

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

Appointments:—
- E. W. Coleman, Sampler, 1/1/28.
- C. B. Askey, Clerk, 2/4/28.
- J. Dobbie, Typist, 28/3/28.
- D. G. Smith, Typist, 27/3/28.
- Thos. E. Parry, Registrar of Mines, Launceston, 1/4/28.
- G. Crosby Gilmore, Acting Warden of Mines, Launceston, 13/4/28.
- O. G. Stubbings, Clerk, 1/7/28.
- J. F. Giffard, Messenger, 1/7/28.
- D. G. Dudgeon, Registrar of Mines, Zeehan, 9/7/28.
- T. T. Mackey, Clerk, Launceston, 29/10/28.
- L. H. Bath, Acting Chief Government Chemist and Assayer, 1/3/28.
- C. A. H. Woods, Clerk, 1/6/28.

Transfers:—
- Geo. Gallop, Messenger, to Treasury, 1/7/28.
- J. T. Herrick, Clerk, to Mental Diseases Hospital, 1/11/28.

Furlough:—
- E. L. Hall, from 1/9/28.

Extended Sick Leave:—
- W. D. Reid, from 1/3/28 to 31/12/28.

Resignations:—
- W. G. Pybus, Acting Registrar of Mines, 31/5/28.
- N. Gumley, services terminated, 27/3/28.
- W. S. R. Brue, services terminated, 31/3/28.
- T. Garrard, services terminated, 14/4/28.
- R. B. Reid, services terminated, 31/12/28

THE GEOLOGICAL SURVEY.

As indicated in my report last year, the Development and Migration Commission, in connection with their scheme for assisting the development of Mining in Tasmania, obtained the services of Dr. W. G. Woolnough, Geological Advisor to the Commonwealth Government to investigate, report, and recommend upon the proposed extension of the Geological Survey. Dr. Woolnough, after holding many conferences with officers of the Geo-

logical Survey, and after visiting almost every section of the country, prepared a favourable and acceptable report upon the work and scope of the survey, and submitted recommendations that met with general approval. During his travels through the country, accompanied by officers of the Department, he was able to form an idea of the difficulties under which the survey has been conducted, and, to use his own words: "When the extraordinary difficulties of terrain, climate, and vegetation are considered, the results accomplished are a veritable marvel. The work involved travelling under most adverse conditions, and necessitated demands upon courage and endurance which have seldom been equalled. All this was necessary and inevitable."

In making his recommendations for the granting of the necessary assistance to institute the regional geological survey, he states: "Since all manner of human activities, such as mining, forestry, utilisation of soil, water-supply, irrigation, and engineering, are influenced profoundly by the geological structure of a region, the necessity for an adequate geological survey can scarcely be questioned. In the present instance consideration must be given to the irreducible minimum which can be regarded as constituting adequate geological survey."

After careful consideration, the Commission endorsed the recommendations of Dr. Woolnough, and the amount of £5000 for the programme set forth in the year 1928-29 was approved by the Commonwealth Government.

The appointment of a staff to continue the systematic geological survey of Tasmania suggests the desirability of presenting for public information the following outline of the work and scope of geological investigation and the need for such work. This statement was prepared by the Government Geologist.

It is a generally accepted opinion that geological surveys are connected with the mining industry in general and the mining of metallic mineral deposits in particular. Actually this is not the true position, as geological survey work has a much wider scope. This opinion has been brought about through two main causes:—

(1) The mining of metallic minerals is the most spectacular phase of mining, and is thus given more prominence in the public eye than the equally important and valuable mining of non-metallic minerals, coal, shale, &c. Similarly it overshadows such other important phases as underground water, engineering problems, &c. As a matter of fact geological survey work is connected with the following, amongst other, subjects:—

- (*a*) Metallic mineral deposits.
- (*b*) Non-metallic mineral deposits.
- (*c*) Coal, oil-shale, limestone, and similar deposits.
- (*d*) Underground water-supplies.
- (*e*) Engineering problems.
- (*f*) Constructional materials.
- (*g*) Soil surveys.

(2) The Geological Survey Departments of various States and countries are attached to the Mines Department of their respective States. This is purely a matter of administration and convenience, and does not necessarily mean that geological survey work is only connected with the mining industry. This is well illustrated in Tasmania, where a geological survey was established under Charles Gould in 1860, which was twenty-three years before the formation of the Mines Department in 1883.

It is evident from the above that the scope of geological survey work extends far beyond mining in general and metallic mineral mining in particular. The items referred to above will be discussed below in greater detail.

Scope of Geological Investigations.

(1) *Mineral Deposits and the Mining Industry.*—Geological investigations are largely connected with the numerous and varied mineral deposits of the State and the mining thereof. These investigations deal with the mode of occurrence and origin of the deposits, and upon these factors depends the whole of the information, advice, and assistance generally that is given in connection with the discovery, extent, and mining of the deposits.

It is found during investigations that mineral deposits were formed during certain definite periods, and are associated with certain definite igneous rock types, *e.g.*, osmiridium is associated with serpentine, tin ores with granite, &c. Moreover, it is found that in addition to the above, the deposits may occur in and be restricted to certain series of sedimentary rocks. The importance of this in connection with the mining industry is extremely great. It enables favourable areas to be marked out for prospecting for definite minerals and ores, and, while thus facilitating the discovery of new mineral deposits and fields, also eliminates the unnecessary waste of time, money, and labour, which would occur in searching for minerals in barren areas.

Coming to the detailed mining operations, it may be stated that each mineral deposit, or group of deposits, have their own characteristics in occurrence, and it is only with a proper knowledge of these that boring campaigns can be efficiently designed and carried out, and that the underground mining works can be satisfactorily designed and located. The importance of these factors in the elimination of unnecessary expenditure in boring, mining, &c., is obvious.

The following examples of geological investigations of recent years may be cited:—

- (*a*) The Mount Bischoff tin field, and, in particular, the determination of the mode of occurrence of the lodes and deposits at Mount Bischoff.
- (*b*) The coalfields of Tasmania in which the different fields were generally outlined, their structure determined, and the probable reserves forecasted.
- (*c*) The oil shale fields of the Mersey Valley, in which the reserves were increased from the previous figure of 10,000,000 tons to approximately 40,000,000 tons.
- (*d*) The Blue Tier tin field, in which the structure and mode of occurrence of the tin ore deposits were determined, as a result of which testing operations can be efficiently carried out.
- (*e*) The Ringarooma Valley tin field, in which the sub-basaltic leads were indicated, thus facilitating future testing.
- (*f*) The Port Davey district, in which a possible new alluvial tin field was discovered.

(2) *Underground Water.*—The location of underground water supplies is one of the most important functions of a geological survey. This aspect of the work has little or nothing to do with the mining industry, but is intimately associated with the agricultural, pastoral, and related industries, provisions of water supplies for railways, and industries generally.

Since 1920, a considerable amount of geological survey work has been devoted to problems of underground water, and a Victorian drill was purchased, partly for the development of these supplies. Altogether ten bore holes have been put down, nine of which were for pastoralists and one for the Railway Department. All were successful in obtaining water-supplies, the quantities available ranging from 200 to over 900 gallons per hour.

The provision of such supplies for pastoral properties in comparatively dry areas like the Midlands is of extreme importance. It gives the pastoralist permanent water-supplies, which enables him to carry more stock and to increase his yield of wool (even without any increase in stock). In some cases the increased yield of wool in one year has more than paid for the cost of the bore hole, equipment, &c.

The bore-hole for the railway (at Nala) cost, with equipment, a sum of about £300, and saved an expense of £5000 which was about to be expended for a dam.

(3) *Engineering Problems.*—Many engineering projects are dependent upon the geological structure of the locality or district with which they are concerned. Among these must be included:—

(*a*) Water Conservation Schemes.—A conservation scheme would be useless if the ground covered by the water was such that large quantities of water would be lost by percolation, subterranean leakage, &c. It is therefore obvious that the geological structure should be investigated and found to be suitable before costly schemes are initiated and carried out. As an instance, the case of a scheme in the Florentine Valley has been found by the Department to be inadvisable on account of the limestone present, which would permit large quantities of water to escape.

(*b*) Foundation for Buildings, Dams, Bridges, &c.—Only a geological survey can indicate what the structure is in a locality where foundations are to be put, and what the danger is that has to be provided against. For example, a foundation might be constructed in basalt, yet, say, two feet below there might be loose sands or slippery clays entirely unbeknown to the builders, unless the area has been geologically examined.

(*c*) Improvement of Harbours, &c.—In the removal of obstructions in harbours and waterways it is essential that a knowledge of the structure of the obstruction should be obtained before plants and methods for their removal are decided upon.

(*d*) Landslips on roads, railways, &c.

(*e*) Construction of tunnels.

(*f*) Control of underground water.

Present Position of the Geological Survey.

At present the geological staff are engaged solely upon short economic examinations. These are, of course, necessary in connection with the mining industry generally, underground water, engineering problems, &c.

Opportunity is taken, when possible, during these examinations to carry out a small amount of geological mapping, and sketch maps are produced. It is only during such restricted surveys that the knowledge we now have has been obtained. This knowledge does not in any way compare, although valuable in itself, with that which would, and should, be obtained by detailed geological surveys.

Necessity for a Detailed Geological Survey.

In attempting to solve any problem connected with the above subjects, the method of attack is the determination of the geological structure and history of the locality. This involves accurate determinations of the rocks (igneous, sedimentary, and metamorphic) and their relations with regard to one another. Accurate knowledge and determinations of the rocks can only be obtained as a result of detailed geological surveys. This knowledge cannot, however, be obtained as a result of the detailed survey of any one district or locality, but only from a large number of continuous surveys embracing a tract of country sufficiently large to contain all, or, at the very least, the greater number, of the rock systems that occur in the State. Such a comprehensive survey will definitely decide:—

(i) The stratigraphy of the sedimentary rock system.

(ii) The age or time of intrusion or extrusion of the igneous rocks and therefore of the mineral deposits.

(iii) The origin and age of alteration of the metamorphic rocks.

(iv) The geological structure of the country surveyed.

With this knowledge, the geological structure (which varies greatly from place to place) can then be determined with confidence and satisfaction.

Results to be Obtained from the Geological Survey.

The results of the survey will be both numerous and important, and will include the following:—

(1) *Topographical Maps.*—All available plans, charts, survey data, &c., will be used, but the geological survey will necessitate a considerable amount of ordinary surveying being performed. The result will be that the geological maps will also represent topographical maps more accurate and complete in detail than any yet produced in the State. The advantages of topographical maps are obvious, and a few uses only need be referred to, such as:—

(*a*) General use in having a detailed map.

(*b*) Location of many engineering undertakings, such as trial routes and sites for roads, railways, water channels, reservoirs, &c.

(*c*) Subdivision of land.

(*d*) Military purposes. (It may be mentioned that even the present maps of the geological survey, which do not compare with the proposed maps, have, in some cases, been adapted and published as military maps. This serves to illustrate how backward is the mapping of the State and what little data is available even for military purposes.)

In one or more of the above ways the maps would be useful to various other departments, such as Railway, Public Works, Hydro-Electric, Forestry, Land, and Closer Settlement, &c.

(2) *Geological Maps.*—Detailed geological maps will be available for the districts surveyed. These would furnish all geological information likely to be required in the future. They would also be invaluable in the elucidation of problems connected with metallic and non-metallic mineral products, coal, shale, underground water, &c. In fact, the maps would obviate the necessity for extended field trips or, indeed, any field trips in the districts mapped.

(3) *Reports.*—Brief reports would be prepared in connection with each map. These reports would indicate descriptions of all mineral deposits, underground water areas, constructional materials (road metals, building stones, &c.), and thus provide information which is in constant demand by the public.

(4) *General Soil Map.*—Soils are of two general types, viz., transported, or those which have been transported by streams, wind, &c., and left in the position they now occupy, and residual, or those which have been formed in place by the weathering and disintegration of the underlying rocks. In Tasmania the soils are almost exclusively of the residual type, and so the geological maps will constitute, with a considerable degree of accuracy, a general soil map.

In the absence of a detailed soil survey the maps should, therefore, be of great value to the Agricultural Department and their investigations. As a matter of fact, the existing geological maps are made use of, to a considerable extent, by the officers of that Department.

The maps, from their aspect of soil maps, would, with the topography, be valuable guides to the Closer Settlement Department in future subdivisions for closer settlements. They would also be invaluable to the Mines, Lands and Forestry Departments, and to the Crown Lands Board in the classification of the Crown Lands for agricultural, pastoral, forestry, and mining purposes.

(5) *Accurate and Detailed Geological Knowledge.*—This will represent the most important result to be obtained from the proposed survey. It has been shown in other parts of this report how wide is the scope of geological work, and how many industries and problems it is associated with.

It need only be stated again that the greater and more accurate the geological knowledge of the State the better will the geological survey staff be fitted to deal with all problems associated with the discovery and mining of all types of mineral deposits, underground water, engineering projects, &c., with resulting advantages to the State and all concerned.

The association of geological investigations with the mining industry, in particular, has already been outlined, and the assistance given to the latter indicated. Important as this assistance has been, it will be even more so as the more accurate and detailed knowledge become available.

Geophysical Prospecting.

Scientific prospecting, or the application of geophysical methods, and determinations to the discovery of mineral deposits, is making rapid advances, and is destined to play a large part in the location of mineral deposits and, therefore, in the mining industry in the future.

Geophysical prospecting does not stand on its own and replace other aids to prospecting, but is merely another link (and a scientific one) in the general chain of operations. It is absolutely useless to attempt to use such methods without having topographical and geological maps and knowledge. The greater the geological knowledge the more closely defined the areas favourable to the occurrence of mineral deposits, then the greater must be the efficiency and economy of geophysical methods, and the greater must be the chance of locating mineral deposits.

It is obvious, therefore, that the greater the amount of geological survey work carried out the greater is the preparation for efficient use of geophysical prospecting methods, which will be the only method available when all those mineral deposits which outcrop at the surface have been found.

It will be seen from the above descriptions that a detailed and accurate geological survey of critical parts of the State is very desirous and necessary. Such a survey is, in fact, of vital importance in districts such as those outlined in the Development and Migration Commission's report in order to accurately determine, amongst other things, the stratigraphy of the Proterozoic and Lower Palæozoic rocks. These districts include the more important of our mineral deposits.

Some of the direct results and advantages which will arise from the survey have been indicated, and are extremely important. There are also the many indirect results which cannot be so readily defined, but which are of equal, if not greater, importance. These will arise from the increased and detailed knowledge of the rocks of the State, and their structure, history, &c. The application of this knowledge in the future will be of the utmost importance and advantage to the mining industry and the various other industries and problems already described.

This knowledge will be applicable to the whole of the mining industry of the State, and not necessarily restricted to any individual deposit, mine, or locality.

The proposed survey is thus justified from all points of view.

TOPOGRAPHIC SURVEY.

Topographic and geologic surveys are regarded as fundamental to the development of any country. In order to indicate how closely these surveys are related in their application to industrial development, it may be stated that geologic features are laid down upon a topographic map and that in the United States of America, for instance, the topographic survey is carried out under the direction and control of the Geological Department.

The plan placed before Sir Nicholas Lockyer for the initiation of these surveys upon systematic

lines was taken in hand by the Development and Migration Commission and thoroughly investigated. At their suggestion, a committee was set up by the Government to consider and give advice upon the report furnished to the Commission by the officers appointed to carry out the investigation. In order to present a more acceptable scheme, owing to the financial position of the time, a recommendation was made by the committee that the survey be spread over a period of fifteen years on the basis of the scheme submitted by a sub-committee. The committee expressed the opinion that the geological and topographical surveys should be conducted together, and that surveys in connection with forestry and soil investigation should be undertaken in conjunction therewith.

In the performance of any geological investigation a topographic survey is necessary, therefore, in the work about to be undertaken by the new field staff, it will be necessary to start with the topographic survey of the area. It is regrettable that a triangulation framework has not been made by authorised surveyors in accordance with the high standard required by the Director of the Commonwealth Surveys for this class of work. This standard is, of course, higher than the geologists require, but the work done thoroughly would be of great value to other departments, also for the preparation of the framework of correct maps and plans.

The proposals to combine the geological and topographical surveys, set before you for consideration of the Government, are based upon the plan that has been in operation in the United States since 1885. That scheme, obviously, has functioned very well. Alterations and additions in the details of the original plan, however, have been made from time to time to meet exigencies resulting from changes in industrial development. The reasons why Dr. Woolnough, Geological Advisor to the Commonwealth Government, regarded this scheme as unworkable in Tasmania are incomprehensible to me. I may add that the surveys (geological and topographical) are combined in other countries. Both being fundamental they are actually inseparable.

Such surveys, extended to their fullest scope, should be charged with the duty of making a topographic and geologic map of the entire area of Tasmania, as well as of studying its mineral, forest, and water resources, and reporting on its economic products. The plan drawn up of surveying first the northern coastal strip should meet with the approval also of the Military Department.

The need for topographic maps may be measured in terms of the uses to which the resulting topographic maps are put. As showing its wide application it may be stated that a topographic map is almost essential to any problem dealing with the use of the land. The following specific examples are given for purpose of illustration:—

(1) Geological maps, special geological problems, determination of mineral and water resources; classification of public lands; soil surveys; forest investigations.

(2) Administration of transportation services; forest reserves; game reserves; national parks, aerial navigation; education.

(3) Administration of highways by Main Roads Board; location of country boundary lines; conservation of natural resources; the selection of routes of travel and transportation.

(4) As a base for military maps for national defence and for manœuvres.

(5) Engineering, in road and railway location; projects for water-power and the generation of electricity; irrigation, drainage, reservoir, power sites, &c.; affording bench marks and triangulation points for further large-scale surveys; adjustment of our present survey system; river and harbour improvements.

(6) Municipal administration of water-supply; flood control; sewerage disposal; establishment of local bench marks and triangulation points; extension of city limits; changes in property lines; sub-division of land.

(7) Aviation, in study of aerial routes, landing fields, &c.; data for preparation for special flight maps.

(8) Educational, in teaching geography and physiography.

(9) Travel, as guide maps.

The chief warrant in co-operative mapping is to expedite the topographic mapping of those areas selected by representatives of the several departments. Fortunately, the plan for the geological survey, drawn up by Dr. Woolnough, after consultation with the technical officers of the Mines Department and approved by the D. and M. Commission, fulfils the immediate requirements of the Forestry and Agricultural Departments, and the information obtained in the working out of that plan will be of service also to the Public Works and Hydro-Electric Departments, as well as to the municipal councils. This work, paid for by the Commonwealth Government, will be available also to the Military and other Federal Departments concerned.

Co-operation in this important work between the several Department mentioned is necessary in order to avoid expensive duplication of work. Moreover, co-operation is necessary to promote the common purpose of advancing knowledge and aiding development, to excite public interest in any scientific work of value to the people of the State, and to maintain cordial relations among departments.

The area that can be covered within a given time is increased by co-operative effort, and the completion is thereby, and to that extent, hastened. This advantage is of especial importance in the work on the topographic maps, which form the bases for the studies of economic resources, geology, hydrography, and the classification of lands.

An agreement could be arranged between the geological survey and the Military Department whereby should be provided such essential information as—

(1) The location and extent of timbered areas.

(2) Important railway cuttings and embankments.

(3) Whether streams are fordable or unfordable.

(4) The width, depth of water, character of bottom and height and steepness of banks of all unfordable streams at points of crossing.

(5) The length, kind, character of material, and height above water of road and railway bridges over the unfordable streams.

(6) The location and highest points of hills and ridges.

(7) The nature of ferries.

(8) The location of mills, waterworks, and prominent public buildings.

(9) Location of standard bridges, railways, and highways.

(10) The preparation of the rectangular grid in use in the army, and the addition of the index number of the quadrangle to each topographic map for military purposes only.

(In the United States the War Department allot to the geological survey not less than 50 per cent. annually of its appropriation for military surveys and maps, to be expended on topographic surveys of selected areas.)

The topographic branch should be organised under the direction of a chief topographic engineer into three field divisions, each of which should be in charge of a division engineer.

One division should be organised as soon as possible, and others next year.

The chief topographic engineer would be responsible for the administration and technical control of all the work of the topographic branch acting under the general supervision of the Mines Department.

Division engineers would be responsible for all technical and administrative work of their respective divisions, acting under the general supervision of the chief topographic engineer.

The division chiefs and the surveyors should be fully qualified authorised surveyors or civil engineers.

CO-OPERATION.

This Department co-operates with other Departments of the State on all matters affecting the development of primary industries, with the Development and Migration Commission in their efforts to rehabilitate certain branches of the mining industry, and with the Council for Scientific and Industrial Research. The Department is represented on the Crown Lands Examination Board, the Australian Standards' Association, the local branch of the Council for Scientific and Industrial Research, the Geophysical Survey Committee, and the Advisory Council.

Representatives attended meetings with and prepared maps and papers for the members of the Economic Delegation and for the members of the Migration and Settlement Delegation.

ADVERTISING MINERAL RESOURCES.

In order to advertise the mineral resources, arrangements were made with the "London Times" for the publication, in serial form, of a number of articles and monographs on the more important minerals and mineral products. These reports were prepared at the suggestion of the Agent-General, and were sent through his office for issue.

A similar series was sent to and published by the "Industrial Australian and Mining Standard."

In addition, articles have been prepared for the local press, and lectures have been delivered through the medium of public bodies in Launceston and Hobart.

Moreover, copies of all printed bulletins, reports, &c., are sent to the leading science institutions and public libraries of the British Empire and other countries.

PUBLICATIONS.

During the year a very large number of special reports on individual mines and on mineral products have been prepared and issued, but only one dealing with a district investigation, namely:—

Bulletin 38.—The Blue Tier Tinfield, by A. McIntosh Reid.

The results of two other surveys are under preparation, and will be issued early next year.

SPECIAL APPROPRIATIONS.

A special appropriation of £5000 has ben provided to assist any approved firm or company on the £ for £ basis to drill the ore-bodies of the Blue Tier southern area, which has recently been under investigation by the Blue Tier Tin Committee.

An appropriation of £2450 has been approved from the amount (£5000) provided under the Development and Migration scheme by the Commonwealth Government for the geological survey.

In addition to the ordinary appropriations for mining and geology, funds are requested for the following works:—

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

SPECIAL INVESTIGATIONS.

No less than 52 special investigations have been made by field officers during the year. These works have entailed such a demand upon the time of officers that the more important district surveys arranged for could not be undertaken.

Special investigations are to be so curtailed that only in exceptional cases will the services of field geologists be made available, such being regarded as coming more within the sphere of action of the State Mining Engineer.

In January, 1927, the Tasmanian Government, acting on the suggestion of the Chairman of the Development and Migration Commission, arranged for a committee, consisting of—

Mr. C. G. Ryan (Chairman),
Mr. Lindsay C. Clark,
Mr. H. A. Curtis,
Mr. A. McIntosh Reid,
Mr. G. Lindsay Clark (Secretary)—

known as the Blue Tier Tin Committee, to be appointed with the following terms of reference:—

"To advise and report upon the economic possibilities of development of a large-scale treatment of tin-bearing granites of North-Eastern Tasmania, and to recommend what further investigations and tests, if any, are necessary to enable the Committee to furnish a final report to the Government."

The Committee, at its first meeting, considered that the terms of reference as set out above involved answering the following questions:—

(1) Are the prospects sufficiently good to warrant an attempt to develop the deposits?

(2) If so, where would work be begun, what method of testing should be adopted, and what would it cost?

(3) If it is decided to test the area, what arrangements should be made with the existing leaseholders?

As a preliminary measure, the Committee advised the Government to withdraw two areas at Blue Tier, known as the southern areas, from the operations of the Mining Act, and also advised existing leaseholders in the southern areas to amalgamate their interests.

Subsequently meetings were held with the leaseholders at Lottah, and at committee meetings the details of boring, developing, methods of working and milling, were discussed and decided upon.

A report, giving all desired information, was prepared this year and submitted to the Government. On the basis of the recommendations contained in the final report, a Bill was submitted to, and approved by, Parliament authorising the Government to assist, on certain conditions, any approved company up to £5000 on the £ for £ basis.

CHEMICAL RESEARCH.

The laboratory staff, in addition to the analysis of a record number of samples of metallic ores, drill cuttings, mineral waters, cement materials, clays, coals, oil shales, &c., has carried out research work on:—

(1) The new process of purifying barytes and bringing it into a physical condition suitable for manufacture into paint (the process depends upon the property of molten sodium chloride of retaining barytes in the melt to the exclusion of other substances).

(2) The separation of ilmenite and tin ore from other heavy minerals in the black sands of King Island, and the separation of titanium oxide from ilmenite; and

(3) The production and distillation of oil from shale.

The annual report of the Chief Chemist is appended.

FUTURE WORK OF THE DEPARTMENT.

During the coming year it is proposed to institute the systematic geological survey of the northern coastal strip, with the objects of ascertaining the geologic structure of the successive rock formations and their relation to mineral deposits. At the same time cognizance will be taken of all mineral deposits, underground water-supplies, coal and shale seams, and sands and gravels that lie within the area under observation. During summer attention will be directed to the formations of the West Coast Range, in which are contained the most valuable minerals, and which will reveal the secrets of geologic structure with relation to ore-deposition.

In addition, it is proposed to continue the work of area surveys by officers of the headquarters staff. Attention is to be directed as soon as possible to the Ringarooma Deep Lead, to the Meredith Range, and to the country in the neighbourhood of Mount Murchison.

A scheme has been drawn up for the drilling of—

(1) Oil shale lands,
(2) Preolenna coalfield,
(3) Ringarooma Deep Lead,
(4) Ore-bodies, and
(5) Underground water-supplies—

in order to obtain reliable data upon which estimates of quantity and value may be based, and information relating to the structure of the deposits. The drill is the most effective arm of the Department, and should be applied in preference to grants to prospectors.

Assistance is being given to the geophysical survey being undertaken under the direction of the Council for Scientific and Industrial Research. It has been arranged to drill the ground regarded as favourable for minerals as a result of that work.

As to the outlook for mining next year, the opinion, based on the statistical position, may be expressed that the output of the more common metals, such as tin, zinc, lead, and copper, will be maintained up to the standard of recent years, and that some mineral products, such as cement and calcium carbide, will show an increase. Copper production, owing chiefly to a rising market, should exceed that of last year.

Given industrial peace a prosperous year may be looked forward to with confidence.

EXPLORATION.

The Government Geologist and I accompanied the expedition to Port Davey and district led by Mr. M. Freney, of Adelaide. As a direct result of the investigation of the Cox Bight and Port Davey areas another tin field has been discovered. Whether it will become of commercial importance remains to be proved by the State-assisted prospectors now engaged there. Outside the areas mentioned, unfavourable conditions prevailed in the country under examination.

State-assisted prospectors have been engaged in the four quarters of the island. A number of discoveries of minor importance have made, but none of any great promise. Perhaps the most important development to be recorded relates to molybdenite at Mount Remus in the Western division. This deposit is noteworthy, not so much for its actual value as showing the extension of the tin and molybdenum-bearing granites and their porphyry offshoots into this little explored area.

Expeditions to the south-western division revealed pre-Cambrian country almost barren of minerals, except osmiridium. In consequence, more attention will be directed in future to the Cambro-Ordovician formation where it is exposed in the Western division.

TRACKS.

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

The following is a statement of the work performed and expenditure thereon during 1928:—

Repairing the road between Rosebery and Stirling Valley £200

Tracks, although suitable for preliminary exploration, are almost useless for the development of lodes of the more common minerals in the difficultly accessible and remote parts. Roads are essential to the successful development of any industry where transport costs count for much. It may be stated that the building of roads in the Western division is the question of first importance in connection with proposals for the advancement of the mining industry in that difficultly accessible territory, which advancement also means the growth and welfare of Tasmania as a whole. Furthermore, it may be affirmed that the future of the Western division will follow closely the future of the highway extensions there.

The object of road building in an unexplored territory is, and should be, to make accessible the resources of that territory. The greatest resource of the Western country is its mineral areas, but an adequate transportation system is a necessity vital to development. No facilities have been provided during the past 20 years for the transport of minerals and goods by road. In many places the cost of transportation amounts to £1 per ton per mile, a rate so excessive that commercial mining becomes impossible. This roadless country has produced £36,000,000 in minerals, but not one settlement has been added since the construction of the railways. It follows that railways, not provided with branch and feeder roads, are not conductive to settlement.

Considering the growth that would accrue by initiating and steadily carrying on a carefully-designed road-building programme, continued over a period of years, and bearing in mind the fact that this territory occupies one-third the area of Tasmania, it will be realised that the necessary expenditure is fully warranted. Outside the areas touched by railways and tramways, the immediate prospects do not appear bright for the reason that cost of transport is too great to allow of profitable operation of any but the largest and richest deposits.

DRILLING AND BORING.

The diamond drill has been kept in operation throughout the year.

At Mathinna four holes were drilled for the Messrs. Brock to determine the lineal and depth extensions of two reefs, the total footage amounting to 897. In both cases the results were unproductive.

The drilling plant was then removed to Blue Tier to test the tin ore-bodies on the leaseholds of Tasmanian Tinstone Association. An aggregate of 737 feet was drilled there with results that indicated the average value of the ore-bodies.

At Latrobe an aggregate of 431 feet was drilled on account of the Tasmanite Shale Oil Co. Ltd. to determine the dip of the shale seam in the area to be attacked first. The results obtained were satisfactory.

A hole was drilled for J. T. Moate on the seashore at Northdown to a depth of 676 feet in order to ascertain the thickness of the Tertiary formation and the underlying Permo-Carboniferous strata. That work completed the scheme drawn up by Mr. Moate for the investigation of the northern district.

Altogether 2741 feet of drilling was performed during the year.

The calyx drilling plant, on hire to Amalgamated Tin Association, has been in use at Renison Bell for 20 months. This drill is urgently required for boring at Conara for the Railway Department, and at Oatlands for the municipal council.

If the scheme of development submitted for consideration be agreed to, namely:—

Boring the tin-ore drifts of Ringarooma Deep Lead.
Boring the seams of coal at Preolenna, and
Boring the shale ground near Latrobe—

this drill will be required in addition to the diamond drill.

It may be stated here that the extra cost of such drilling work will be very little, for the wages of drillmen are already provided. The extra cost will be made up of costs of fuel and water and of transport. This method of development is favoured in preference to expenditure upon exploration in remote areas.

In addition to the use of power drills, hand-boring plants have been used in boring shallow tin-ore drifts and other deposits. The more extended application of such plants is desirable.

AID TO MINING.

The Aid to Mining Act Board dealt with a large number of applications for assistance and a few, though worthy of recommendation, subsequently received the approval of the Minister. These works were carried out under the supervision of the Chief Inspector of Mines and district inspectors. Before receiving consideration, a report was obtained from a field officer on each mine or prospect.

The several works were performed to the satisfaction of the Department, and some were productive of good results.

A large amount of money has been devoted to the Sustenance Allowance to Prospectors. In my opinion, expenditure in this manner should be curtailed and applied more to actual development of mines or prospects likely to become productive as a result of such expenditure. Not more than half the applications were recommended. One of the difficulties in this connection is the supervision of prospecting work, another is the definition of prospecting.

Very little work on the tribute system is now being performed at Zeehan, as will be seen by reference to the accompanying statement of accounts. It does not appear to be generally

known that the tribute system of assistance is applicable to operation on Crown lands in any part of the Island.

Expenditure—	£	s.	d.
Salary and wages	14	11	8
Miscellaneous (motor-spirit, advertising, and insurance)	10	6	0
Assistance to prospectors (driving tunnel)	19	16	3
Sustenance allowance to prospectors	2,626	5	0
Removal of No. 2 Argent machinery	16	0	0
Travelling expenses	4	13	5
Storage No. 6 Argent plant	7	0	0
Grants:			
Tas. Tinstone Ass. N.L. £200 0 0			
Barr and Carson 175 0 0			
Esperance Coal Mining Company, N.L. 200 0 0			
The New Esk Tin Sluicing Co. N.L. 47 10 0			
J. L. Frizoni 100 0 0			
	722	10	0
Checkbores, Groom River Flats	120	19	5
Test bores, Garfield Tin Mining Co. N.L.	95	11	4
	£3,637	13	1

Receipts—	£	s.	d.
Royalty paid by tributors	22	11	1
Sale of Plant—			
No. 6 Argent £65 0 0			
Miner's Dream Mine 25 0 0			
Mrs. E. L. Martin's section 25 0 0			
State Argent Flat Mine 2 0 0			
	117	0	0
Repayment of loan and interest, Renison Bell Prospecting and Mining Company, N.L.	837	6	7
Sale of copper nickel ore	66	10	8
Refunds:			
Amount overpaid on account sustenance allowance £2 0 0			
Amount overpaid on account advance for cutting drive 0 3 8			
	2	3	8
	£1,045	12	0

Ore Sales.—The amount received from ore sales was £243 4s. 10d., which was distributed as follows:—

	£	s.	d.
Paid to tributers	£220	13	9
Royalty paid to State	22	11	1
	£243	4	10

GEOPHYSICAL PROSPECTING.

Early in the year Mr. Broughton Edge, Director of the Geophysical Survey, and Dr. Woolnough, Commonwealth Geological Advisor, visited Tasmania in order to investigate certain mineral areas suggested as suitable for survey. The State Mining Engineer was deputed to accompany them on a visit to Western district. As a result of that visit areas were selected at Zeehan and at Renison Bell for a trial survey with the electromagnetic plants.

Towards the close of the year Dr. E. Bieler (Deputy-Director) with field officers arrived and started work in the selected areas. The Government Geologist accompanied them as geological advisor.

It should be stated here that these geophysical surveys are in the nature of experiments with various types of instrument and by various methods in order to determine the most suitable under existing conditions. The most important instruments are those used to determine the relative electrical specific resistance of rocks in the field as compared with the electrodes. Other methods, such as the gravitational and sonic, are applicable under certain limited conditions.

It has been agreed upon to confirm the results of the surveys by drilling at the places where lodes have been located.

A committee, known as the Geophysical Survey Committee, has been set up by the Goverment at the instance of the Development and Migration Commission to select areas for survey.

THE MOUNT CAMERON WATER-RACE.

This water-race, under the managership of D. Shields, who is responsible only to the Minister, has been placed under the supervision of a Board consisting of:—

The Secretary for Mines,
Mr. C. G. Ryan, of Pioneer, and
A representative of the users to be elected by ballot.

In order that the race might be extended to Native Lass Plain Dam, for the amount (£800) provided by Parliament, the sizes of the cutting and fluming were reduced by half. It is the considered opinion of the State Mining Engineer that with, the repairing of the dam sufficient, water can be conducted and stored to meet the requirements of miners.

Further details are given in the following statement:—

Revenue.—The revenue for the year amounted to £916 13s. 1d., being a decrease of £1066 7s. 5d. on the previous year.

Expenditure.—The expenditure amounted to £1100 2s. 7d., being an increase of £177 18s. 8d. on that of the previous year.

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

Average number of claims supplied per week		10
Greatest number of claims supplied in any one week		14
Total number of sluiceheads supplied—		
Under royalty scale	1154	
Under fixed or cash scale	1019 2/12	
	2173 2/12	

Tin ore raised—

	tons.	cwt.	qr.	lb.
Under fixed scale	14	1	0	0
Under royalty scale	15	11	0	22
Total	29	12	0	22

Average number of men employed per week 19

Receipts—	£	s.	d.	£	s.	d.
Water sold under fixed scale	454	4	1			
Water sold under royalty scale	450	18	1			
Water sold for sanitary and domestic purposes	10	0	0			
Refund half-cost of opening safe	1	11	0			
				916	13	1

Expenditure—						
Salaries and wages	726	18	8			
Insurance	6	14	0			
Stationery and stores	18	3	2			
Repairs to race	28	18	2			
Clearing and scrubbing race	316	6	7			
Miscellaneous	3	2	0			
				1,100	2	7

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

Great Mussel Roe intake	26 in. 38 pts.
Little Mussel Roe intake	26 in. 31 pts.

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

MOUNT CAMERON WATER-RACE.

Manager's Office,
Gladstone, 25th January, 1929.

SIR,

I BEG to submit my annual report for the working of the race for the year ending 1928.

Race.—The race has had a thorough clean-out, and is now in good condition. The old decayed wooden intake-tank at the Little Mussel Roe has been replaced with a concrete tank. The old floodgates have also been replaced with concrete and cement. The walks across the Little Mussel Roe syphon and the Old Chum Creek fluming had been replaced with new timber.

Syphons.—The syphons are in a satisfactory condition, but will need to be scraped and tarred where rust is now showing. This work was to have been carried out last summer, but, by the time we completed the race-cleaning, there was no more suitable weather for tarring.

Deviation.—This work was started by the contractor, R. Long, last November, and good progress was made while the ground was moist. The contractor, wanting to get the bulk of the cutting done while the ground was most suitable, pushed on, leaving some batter and widening of the race to be completd. This work will be done by the contractor with a few men before the work will be completed.

I have, &c.,

D. SHIELDS, Manager.

The Director of Mines, Hobart.

STATISTICS.

This year a more comprehensive scheme for the setting out of statistical information has been put into force. The old method based upon the ultimate value of the refined metals has been retained for purpose of comparison with the production of other countries; but in addition, another method, based upon the actual values of the ores, metals, &c., has been adopted for local information.

Non-metallic products, which the Government Statistician rightly regards as manufactures, when made into marketable products, such as cement and carbide of calcium, have been given their ultimate value as heretofore. In such cases the value of the raw materials only used in the manufacture should be taken into account.

The value of statistics may not be apparent at present, but data relating to production for purposes of comparison, if for no other purpose, would repay the cost of compilation many times. Carefully compiled statistics also present a true reflection of the industrial conditions at the time and are records for future reference.

The statistics of production given hereunder have been prepared by the Chief Inspector of Mines upon a plan drawn by him.

MINERAL PRODUCTION.

The year 1928 may be signalised as one of uninterrupted industrial progress in respect to the production of minerals. Moreover 1928 is noteworthy as marking the time of the completion of great under takings by the Mt. Lyell Mining and Railway Company, and of the beginning of large construction works at the Read-Rosebery group of zinc-lead mines by the Electrolytic Zinc Company. Works of such magnitude are important as indicating the latest results of metallurgical research upon copper and zinc-lead ores.

In addition, the Goliath Portland Cement Company Ltd., operating at Railton, has decided to add another unit to their plant in order to allow of an increase in production to 100,000 tons per annum.

These several large works, when in full operation, will add greatly to the prosperity of the State.

The total value of mineral production for the year, as determined on the basis of metals after refining, is £1,593,828, a decrease of £27,199 as compared with that of 1927. The decrease is more than accounted for by the decrease of £88,323 in the value of production of limestone. An increase in the output of metals is recorded.

RETURN showing the Quantity and Value of Minerals Produced in the State of Tasmania during the Year 1928.

Mineral.	Quantity.	Value.
		£
Cadmium ..... tons	19·7266	4329
Carbide .... ,,	3829	68,877
Copper ... . ,,	6421	444,802
Coal ..... ,,	128,500	106,558
Cement ..... ,,	44,799	189,380
Nickel ..... ,,	10	1697
Gold ..... ozs. f.	3603·43	15,306
Lead ..... tons	4786·78	101,616
Limestone ..... ,,	98,654	79,050
Osmiridium ..... ozs.	1627·186	42,458
Silver ..... ozs. f.	669,326	78,901
Shale .... tons	2595	1297
Tin..... ..... ,,	1140·14	258,676
Talc ..... ,,	32	96
Wolfram ..... ,,	176·15	12,094
Zinc ..... ,,	7112	188,691
Total	...	£1,593,828

The Electrolytic Zinc Company recovered 44,004 tons of Zinc, valued at £1,199,596, and 152·3234 tons of Cadmium, valued at £34,437, from other than Tasmanian ores, and employed an average of 941 men.

Metallic products were valued at £1,148,666 or 72·2 per cent. of the total. Non-metallic products, excluding structural materials, were valued at £107,855 or 6·7 per cent.

Compared with 1927, the metallic products showed an increase of £8536 or 0·74 per cent.; non-metallic products showed an increase of £1297 or 1·22 per cent.; and structural materials a decrease of £41,741 or 11·01 per cent.

In metallic products increases are recorded in copper, zinc, cadmium, tungsten, osmiridium, and talc; decreases are recorded in tin, lead, silver, nickel, and gold. Amongst non-metallic products an increase is recorded in coal, and a slight decrease in shale. Structural materials showed a great increase in calcium carbide and an increase in cement, but a great decrease in limestone.

No records have been kept of the production of clay, sand, gravel, or building stone.

Copper retains its position as first on the list of mineral products, showing a marked increase in both quantity and value. It constitutes over 38 per cent. of the metal production of Tasmania. Although much below copper, second place is taken by tin, which, contrary to expectation, did not reach the output of last year. No great increase is anticipated in the immediate future.

Zinc production shows a progressive increase in both quantity and value. Lead and silver declined considerably.

Coincident with the termination of the Marketing Pool came a sudden rise in the price of osmiridium. That rise is reflected in the output.

Tungsten and gold remain low in the scale.

Coal shows an increase both in tonnage and value; and cement and calcium carbide manufacture are growing into greater importance.

Metals prices of all but copper, osmiridium, and gold fell below the average of recent years. The fall in market is reflected directly in the value of output, and indirectly in the quantity produced.

SMELTER PRODUCTION.

The active smelting companies in 1928 were as follows:—

(1) The Mount Lyell Mining and Railway Company, Queenstown.

(2) The Electrolytic Zinc Company of Australasia Ltd., 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, 1928.

Mining:—Mining operations during the year were again practically confined to the North Mount Lyell Mine, which supplied the whole of the ore treated with the exception of a small tonnage of material recovered from the Lyell Comstock Mine in the course of exploratory and developmental work. Exploratory work was carried out on the Lyell Comstock, Prince Lyell, and Lyell, Royal and South Tharsis properties, this including extensive diamond drilling on the Prince Lyell and Lyell Tharsis sections.

Mount Lyell Mine:—During the period no work was done on this property. A small quantity of copper precipitates was recovered from the mine water.

North Mount Lyell Mine:—Exploratory work and development and ore-breaking were carried on throughout the year on usual lines, the ore extracted totalling 127,458 tons, and 108 tons of copper precipitates were recovered from the mine water. The 9-ft. x 9-ft. section tunnel referred to in last report was completed and placed in commission during the year, this establishing direct communication between the 1100-ft. level of the North Mount Lyell Mine and the Reduction Works, the method of transport being an electrically-operated tramway. The employees in the North Mount Lyell Mine now enter the mine through this tunnel, which is also used as a means of transport for timber and other material required in the mining operations and for the transport of ore to the Reduction Works. The length of the completed tunnel is 6952 feet.

Lyell Comstock Mine:—Exploratory and developmental work was continued in this mine during the year, with the object of re-commencing ore production.

Reduction Works.—The customary ore reduction operations proceeded without intermission throughout the year.

The concentrating plant treated 123,567 tons of North Lyell ore, producing 30,021 tons of concentrate. The metal-bearing material smelted totalled 33,532 tons, comprising 535 tons of Mt. Lyell pyrites, 3645 tons of North Lyell high-grade ore, and 29,352 tons of concentrate produced from North Lyell ore, the results comparing favourably with the previous year, concentrate of considerably higher grade being produced. The blister copper output for the period totalled 6481 tons as compared with 5863 tons for the preceding year.

The electrolytic copper refinery referred to in the previous report was completed and placed in commission during the term, and since May last has been treating the whole of the company's blister copper output with satisfactory results. The furnace refinery plant was also completed, but has not yet been put into commission, the copper being shipped in cathode form.

The ore-reduction plant was maintained up to its usual standard of efficiency, the fine grinding section of the concentrating plant having been extended by the addition of a further ball mill and a Dorr classifier. An equipment of pumps to replace the elevators hitherto used is also being installed, and other additions and improvements of lesser importance have been made.

Hydro-Electric Plant.—The Lake Margaret plant was operated continuously throughout the term, the whole of the company's power and lighting requirements being supplied from this source. The supply of current to the State Hydro-Electric Department for the Electrolytic Zinc Co's works in the Zeehan and Rosebery districts shows an increase on the previous figures, and the needs of the Queenstown and Gormanston Municipalities for lighting and power were also fully supplied.

The Mount Lyell Mining and Railway Company Limited: Return for the Calendar Year 1928.

Ore and metal-bearing material smelted—

	Tons (Dry).
Ore:	
From the Company's Mt. Lyell Mine	535
From the Company's North Lyell Mine	3,645
Concentrates:	
From the Company's North Lyell Mine ore	29,352
Total	33,532

Blister copper produced—6481 tons, containing: copper, 6421 tons; silver, 105,270 oz.; gold, 2025 oz.; approximate value, £465,982.

Average number of men employed—

Mining Department:		
At the Company's Mount Lyell Mine	126	
Ditto North Lyell Mine	434	
Ditto Lyell Comstock Mine	23	
		583
Reduction Works Department (including Lake Margaret)		504
Railway Department—		
Mount Lyell Railway	89	
North Lyell Railway	5	
		94
Total		1,181

Dividends paid during year, £161,149 7s. 6d: 2s. 6d. per share.

Dividends paid from the inception of the Company to the 31st December, 1928, £4,748,561.

Copper produced from the inception of the Company to the 31st December, 1928, 218,599 tons (fine).

Silver produced from the inception of the Company to the 31st December, 1928, 13,828,085 oz. (fine).

Gold produced from the inception of the Company to the 31st December, 1928, 391,247 oz. (fine).

ELECTROLYTIC ZINC COMPANY OF AUSTRALASIA LTD.

The following account of the operations of the Electrolytic Zinc Company of Australasia Ltd. at Risdon has been given by the General Superintendent:—

"Operations at Risdon proceeded steadily and uninterruptedly throughout the year, with small increases in production of slab zinc and by-products.

The tonnage of metal recovered from West Coast ores showed little variation, but a depressed metal market gives a lower setting to actual values.

Research work was actively carried on, and important advances were made in several directions. Minor improvements are continually being effected in plant and process, indicating the company's desire to keep in line with recent metallurgical developments.

The uses for cadmium are being rapidly extended, and the Risdon output of this metal, at one time considerably in excess of market requirements, is now being fully absorbed. Extensions have been made to the cadmium plant which is used in the recovery of this metal as a by-product from the main zinc process.

Owing to adverse seasonal conditions, consumption of fertilisers in Tasmania did not expand as rapidly as had been hoped for. However, it is unquestionable that the farming community is appreciating, more and more, the value of superphosphate as an important factor in increased production, and, given more favourable conditions during 1929, a higher output will, no doubt, be called for.

Both the acid and superphosphate plants are capable, without further extension, of turning out much greater tonnages should the demand improve.

The average number of men employed at the Risdon works is a follows:—During the quarter ended 31st March, 1928, 966; during the quarter ended 30th June, 1928, 962; during the quarter ended 30th September, 1928, 933; during the quarter ended 31st December, 1928, 906; average of the four quarters, 942.

At Zeehan the experimental mill ran throughout the year on further investigation and elaboration of the treatment methods to be adopted in the Rosebery mill.

The roasting plant worked continuously, roasting the zinc concentrates produced, prior to its despatch to Risdon.

At Rosebery construction work on the new mill and the attendant workshops, assay office, &c., was carried steadily forward and is showing satisfactory progress. The development work at both Rosebery and Hercules Mines is well up to schedule, and the mines should be ready to produce the requisite tonnage when the mill is put into operation. Accommodation has been provided for the workmen employed in construction and development work, and a large mess house built, where men can get all meals at a very reasonable rate per week. House building for employees has gone on regularly, and by the end of the year fifty-nine houses and thirty-two two-roomed huts, &c., lighted by electricity were provided and occupied. A large new co-operative store is under construction to enable the Co-operative Council to meet the growing business inaugurated in the present small store. The average number of men employed by the company on the West Coast was 341.

THE MOUNT BISCHOFF T.M. CO., WARATAH.

Statement of Work Performed, Output of Tin Oxide, Income and Expenditure for the Year, 1928.

At the mine the usual exploitation of the surface ore bodies continued, but the heavy fall in the price of tin brought about the cessation of work in the poorer faces. Underground developmental operations comprised 556 feet of driving, 111 feet of rising, and 20 feet of sinking.

Sluicing at the North Valley started in the middle of the year, and for the six months 46,000 cubic yards were treated for a return of 40 tons 19 cwts. of tin oxide assaying 61·70 per cent. tin, being a return of 2 lbs. oxide to the cubic yard. Owing to the unusual composition of the wash a great number of difficulties and a large number of breakages of plant were experienced. These disabilities have been in a large degree overcome and future operations are expected to be fairly profitable at the present metal price.

At the mill 41,000 tons were crushed and the calciners treated 8332 tons of pyrite. Total output 306 tons 15 cwts. of tin oxide assaying 69·4 per cent. tin. Recovery per ton of ore crushed equals 0·53 per cent tin.

Over one-third of the ore treated came from the underground workings.

The total income from all sources for the year was £98,191 17s. 10d., and the total expenditure £98,420 15s. 3d., which gives a loss of £228 17s. 5d.

As the ensuing year did not indicate a better return it was decided to curtail the breaking of ore at the mine to a minimum until the price of tin appreciates considerably.

Average number of men employed, 220.

Smelting of tin at the Launceston works has been carried on almost continuously but under restricted conditions.

ASBESTOS.

The chrysotile and amphibole deposits of asbestos at Anderson's Creek, near Beaconsfield, are again attracting attention. A number of inquiries have been received from the mainland and elsewhere regarding prospective supplies. No definite information can be given until further explorating work has been performed. A proposal to drill the deposits is now under consideration.

Another deposit worthy of investigation is that near Birch Inlet of Macquarie Harbour.

RETURN showing the Quantity and Value of Asbestos produced from 1899 *to* 1920-28 *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
1920-1928	—	—
Total	3565·5	£7105

BISMUTH.

Developments at the Stormont bismuth mine by an Adelaide company seem to be satisfactory for a treatment plant of small capacity is to be erected early next year. Bismuth is found there native and in the forms bismuthenite, bismite, and bismuthite in a garnetised limestone. The richest parts are those where the garnet is crystallised or where mineralisation has been of greatest intensity. Its separation from the containing rock and from its metallic associate magnetite should not prove a difficult problem.

A return to the production of this metal would be well received by metal buyers.

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

CADMIUM.

The progressive increase in the output of cadmium obtained as a by-product on the smelting and refining of zinc, is noteworthy. Cadmium commands a high price as a substitue for tin and its use is being extended in many branches of industry.

Production by the Electrolytic Zinc Company from Tasmanian ores amounted to 19·7266 tons, valued at £4329, as compared with 19·2712 tons, valued at £3233 in 1927. From other than Tasmanian ores the production of that company was 152·3234 tons, valued at £34,437.

Production from Risdon as a result of recent arrangements made to handle cadmium—bearing material from Port Pirie works is likely to be doubled next year.

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

Year.	Quantity.	Value.
	Tons.	£
1924	5·247	1175
1925	5·2454	1178
1926	10·4014	1827
1927	19·2712	3233
1928	19·7266	4329
Total	59·8916	£11,742

COPPER.

The production of copper in 1928 was 6421 tons, valued at £444,802, as compared with 5811 tons, valued at £362,988 in 1927. The whole production came from the Mount Lyell Mining and Railway Company's works in the Western district.

The large increase in production is attributable to two causes; an increase in the market price of copper, and an increase in output due to uninterrupted operation. This year marks, also, the completion of two important works in the development of the mine and treatment plant, one relates to the completion of the long tunnel from the smelting plant to the North Lyell mine; the other relates to the erection of the bullion refining plant at Queenstown. The economic effects of these works cannot be closely estimated but doubtless will be reflected in future balance-sheets.

The statistical position regarding this metal seems sound yet a note of caution should not prove discordant. At the end of the year a copper sales record was established, but it is significant that 90 per cent. of the tonnage was for March and April delivery. This presents quite a different picture to that revealed a year ago when manufacturers were operating on a very meagre basis. It may not be inappropriate to state that the November daily rate of world copper production was about 32 per cent. greater than the average rate in 1927, a tremendous increase in consumption.

From July to the end of the year the price steadily increased and still seems to be on the upward tread.

RETURN showing the Quantity and Value of Copper in Blister Copper and Copper Ore during the Years 1919 *to* 1928 *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

IRON.

Developments of iron ore deposits have been confined to the work of G. and C. Hoskins Ltd. at Tenth Legion, near Zeehan, and at Rio Tinto, west of Waratah. This company during the past nine years has carried on continuously the exploration of the deposits on their holdings, but has not produced any ore for shipment.

Whether this company intends to engage in production soon, or whether by carrying out their covenants to comply with the expenditure clauses of the Mining Act they intend to merely wait for a more convenient time is not made known in their report.

RETURN showing the Quantity and Value of Iron Pyrites produced during the Years 1915 *to* 1928.

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	—	—
Total	68,293·273	£93,916

RETURN showing the Quantity and Value of Iron Ore produced from 1897 *to* 1928.

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
1909-1928	—	—
Total	42,762	£25,701

GOLD.

Gold production has fallen from 5860·7 ounces, valued at £20,646 in 1927, to 3603·43 ounces, valued at £15,306 in 1928.

The greater part of the output was obtained from gold-bearing copper and zinc-lead ores. A little came from the New Golden Gate Mine, now being operated on a small scale by a party of miners under tribute to the company; and a little from miners working alluvial deposits. The New Golden Gate is the only producing gold-bearing quartz mine in Tasmania at present.

At the Old Boys' Mine, Mathinna, the Messrs. Brock are continuing exploration at the 300-ft. level, and finding the results of development encouraging, now have under consideration the sinking of the shaft to 400 feet in order to explore at that level. At Mangana a Hobart syndicate is developing the old Golden Entrance Mine. The Department has lent assistance during the year to many parties of miners in the search for and development of gold-bearing quartz veins, but their works have not been productive of good results.

RETURN showing the Quantity and Value of Gold won from 1880 *to* 1928.

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
Total	1,904,892·196	£7,633,610

LEAD.

Production of lead ore decreased from 5583·12 tons, valued at £135,403 in 1927, to 4786·78 tons, valued at £101,616 in 1928.

The decrease is due to the closing of mines and to the general depletion of the ore reserves of other producers. No new discovery of note has been reported, but attention has been directed again to the low-grade deposits of Heazlewood and Ross Creek. Developments at the Tasman and Crown Lyell Mine have proved encouraging and the work of exploration is proceeding.

The future of lead production lies more in the hands of the Electrolytic Zinc Company with their mines in the Read and Rosebery area than in those of any other company operating in Tasmania. Their decision early in the year to erect large treatment plants at Rosebery, and their later engagements in the work of construction, created a feeling of optimism in the minds of residents, and their entry into the field will result in a much enhanced return.

Interest in the lead market appears to be reviving, although the price this year has remained almost stationary.

RETURN showing the Quantity and Value of Lead included in Silver Lead during the Years 1919 *to* 1928.

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

RETURN showing the Quantity and Value of Silver-Lead Ore produced from 1888 *to* 1928 *inclusive.*

Year.	Quantity.	Value.
	Tons.	£
1888 to 1903 inclusive	300,977·5	2,571,771
1904	51,138	203,702
1905	75,270·5	246,888
1906	87,117·75	462,443
1907	89,762·5	572,560
1908	63,116·9	322,007
1909	80,378·35	298,880
1910	51,226·91	247,576
1911	61,501·195	253,361
1912	90,123·868	309,098
1913	83,289·268	319,997
1914	11,565·54	96,225
1915	10,382·95	91,689
1916	11,229·410	153,796
1917	9575·780	152,122
1918	7241·400	127,176
1919	*—	136,234
1920	—	261,166
1921	—	59,422
1922	—	223,183
1923	—	201,284
1924	—	220,279
1925	—	283,735
1926	—	263,764
1927	—	210,538
1928	—	168,002
Total	—	£8,466,798

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

NICKEL.

Considerable activity has been displayed by engineers and miners in the Five-mile area, and a company has been formed to open and work the northern ore-bodies. Developments at that end of the lode seems satisfactory. At the southern end attention has been confined to exploration at surface.

Nickel occurs here in the form of pentlandite in association with chalcopyrite and pyrrhotite, and is contained in dykes of gabbro and norite and other basic intrusives. The average content may be expressed as 6 per cent. nickel and 3 per cent. copper; and a little gold, platinum, and palladium.

Inquiries from dealers indicate a reviving interest in this metal.

OSMIRIDIUM.

Production in 1928 reached the total of 1627·186 ounces, valued at £42,458, as compared with 632·687 ounces, valued at £7456, in 1927.

The great increase was not due to new discoveries, for the bulk of the material came from miners operating at Adamsfield, but to an enhanced price and a steady market. The prices fluctuated between £26 and £29 per ounce.

From a number of dealers in osmiridium the information is received that pen manufacturers pay a much higher price for graded than ungraded metal, and the question arises: would it not be preferable to grade the metal to the desired sizes and sell at the higher rate? Inquiries in England and America indicate a strong demand.

State-assisted prospectors report discoveries at the headwaters of Boyes River and New River, in the Craycoft Country, in the Weld River Valley and near Arthur Range, but further investigation is necessary to determine whether any is likely to prove of commercial importance. Many of the late employees of the Mount Bischoff Registered have entered the Savage River country and are now engaged at osmiridium digging. The high market rates make it possible to work the low-grade deposits.

RETURN showing the Quantity and Value of Osmiridium produced during the Years 1910 *to* 1928 *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
Total	22,298·784	£524,289

SILVER.

In 1928 the total production of silver from copper, lead and zinc ores was 669,326 fine ounces, valued at £78,901, a decrease of 72,456 ounces as compared with that of 1927.

The decline in the production of argentiferous galena accounts largely for the lower output of silver.

The average price of silver was 25—2·746d. as compared with 25—2·045d. in 1927.

The market is steady, China has been a steady buyer, but India still shows little interest at this price.

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, *and* 1928.

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

TIN.

The output of tin for the year was 1140·14 tons, valued at £258,676, compared with 1105·74 tons, valued at £317,593 in 1927.

The tin market shows little of interest with the Anglo-Oriental group in London keeping the market around £225 by absorbing surplus offerings. There seems no indication of any change in this arrangement and both spot and forward quotations are almost at the same level.

No development worthy of particular notice has been reported, but production from mines has been maintained at the average rate of recent years.

The exploration of the Ringarooma Deep Lead by drilling has come up for further consideration. In the opinion of this Department that is a work of the first importance and one wholly justifiable. The Victoria (calyx) drill would be used for the purpose of testing these deep deposits. If the proportion of the tin ore is found to be high enough to warrant attention the question arises; by what system of dredging can such deep deposits be attacked? (The depth limit of the larger dredges is 80 to 100 feet.)

The completion of the investigations of the Blue Tier Tin Committee may lead to the further development of ore bodies of Blue Tier by mining firms. Almost all the "cream" has been removed from these ore-bodies by parties of miners, and large scale operations only are likely to prove successful in the exploitation of the bodies.

The average price of tin was £227 5s. The highest price (£240) was reached in March, and the lowest (£213 15s. 6d.) in September. At the end of the year the price had risen to £227 12s.

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* 1928.

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
Total	16,946·826	£15,951,977

* Metallic Tin.

TUNGSTEN.

The production comes almost wholly from the Storey Creek Mine, where its ore wolfram is associated with tin ore. These minerals are concentrated in jigs and on tables and then separated by magnetic processes. Production this year amounted to 176·15 tons of wolfram, valued at £12,094, compared with 148·57 tons, valued at £9886 in 1927.

The price of tungsten has remained fairly steady during the year. It is too low to allow of a resumption of operations on the scheelite deposits of King Island.

RETURN showing the Quantity and Value of Wolfram produced from 1899 *to* 1928 *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
Total	1999·892	£224,155

RETURN showing the Quantity and Value of Scheelite produced during the Years 1917 *to* 1928.

Year.	Quantity.	Value.
	Tons.	£
1917	69	12,130
1918	216	39,252
1919	198·98	43,181
1920	105·09	17,905
1921–1928	—	—
Total	589·07	£112,468

ZINC.

The output of zinc for the year was 7112 tons, valued at £188,691, compared with 6326·2 tons, valued at £181,242 last year, an increase of 785·8 tons and of £7449.

The principal producer was the Electrolytic Zinc Company from their Hercules-Rosebery Mines. The plant in course of erection at Rosebery when put into operation will deal with a much larger tonnage.

Developments at the Tasman and Crown Lyell Mine are encouraging and likely to lead to important results. The market for slab zinc shows a gradual increase since the middle of January, with nothing remarkable to report at the end of the year. Volume of sales in December was fairly large, delivery throughout the first half of 1929 having been specified in the various large transactions.

RETURN showing the Quantity and Value of Zinc produced during the Years 1917 *to* 1928 *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
Total...	28,841·69	£922,763

COAL.

Coal production advanced to 128,500 tons, valued at £106,558. An even higher rate was expected, because of the reopening of the Catamaran and Seymour Mines; but owing to difficulties of operation and marketing little addition was made by those companies to the total output.

Tasmanian mines are capable of producing a very much greater output, but, limited to the local market, no extension of the trade can be looked for under existing conditions, owing to the generally high proportion of ash. The Trias-Jura coals of Tasmania, which are the most important, are particularly applicable in powdered form. These pulverised coals have been successfully used in cement kilns and in firing stationary boilers, and may be applied with great advantage to metallurgical furnaces and locomotives. Investigations carried out in the Geological Survey laboratories and on large scale operations at cement works show that no danger of spontaneous combustion need be apprehended, and that the powdered coal may be stored dry with safety. However, self-contained or combined pulverising and burning plants are now coming into general use and prevent that possibility.

The greater part of the coal produced in Tasmania has a high ash and low sulphur content, but it can be burned in the powdered form to advantage in steam generating plants regardless of the high proportion of ash. Laboratory tests show that the ash fuses in most cases at exceptionally high temperatures, hence under ordinary working conditions no clinker is formed.

This scientific method of burning coal in suspension allows the whole combustible material of the coal to be consumed and the feed control to be efficiently regulated. It must ultimately replace all methods of burning lump fuel.

In this connection it is interesting to recall the recent arrival in New Zealand waters of the s.s. "Hororata" equipped with powdered coal-burners. The results of this exeperiment in the raising of steam by the use of powdered coal were entirely satisfactory.

The subject of utilisation of coals in powdered form is fully dealt with in the "The Coal Resources of Tasmania," issued by the Department in 1922.

The Preolenna and other coals of Permo-Carboniferous age are of quite different kind. These contain abnormally high proportions of volatile hydro-carbons and sulphur, but a low proportion of ash. Although of much higher calorific value, they are not as suitable in powdered form as those of the Trias-Jura for steam-raising, because of their much higher sulphur content and the fusibility of their ash. Such coals as these are best applied to the production of oil by low temperature distillation. Investigations, official and unofficial, are being continued with the object of finding the best method of treatment.

Development work has been carried on steadily at the Seymour mine in preparation for mining on a large scale. It is proposed to construct a large jetty to allow of direct shipments to interstate ports.

At Jubilee Mine the Beta seam is being opened in readiness for mining, and the company in order to provide for the handling of a much greater output is considering proposals for the extension of the railway line to the mine.

At the Cornwall and Mount Nicholas Mines, production has been maintained without serious interruption.

Owing to the large proportion of slack (33 per cent.) produced in mining and handling coal at Catamaran, and the difficulty in finding a market therefor, the contractors found it impossible to carry on successfully. The National Portland Cement Company took a small portion of the slack. An offer was received from the Goliath-Portland Cement Company Ltd. of Railton, but steamer and railway freights precluded the transport of the slack at the market price.

At Meunna, near Preolenna, Messrs. Carson and Barr, aided by the Government, extended their dip adit on the seam of steam coal. The seam is flattening and maintains its workable thickness.

RETURN showing the Quantity and Value of Coal raised from 1880 *to* 1928.

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*
Total	2,530,689	£1,985,431

* 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 32 tons, valued at £96.

MONAZITE.

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

OIL SHALE.

Since the last report considerable progress has been made in the development of the oil shale industry. Although active production has not commenced, preparations have been made for the erection of plants to that end.

The acquisition of the assets of Southern Cross Motor Fuels Ltd. by Tasmanite Shale Oil Company Ltd. led to the design and construction of the Long retort. The Salisbury Foundry Company, of Launceston, was the successful tenderer for the manufacture of the retorts and accessory parts. It is proposed to erect one set of four retorts early next year in order to demonstrate the efficacy of the Long process under practical conditions and on a commercial scale.

The Department carried out extensive surveys for this company and drilled the beds near the mine openings.

The holdings of the Australian Shale Oil Company and their plant and other material assets have been acquired by L and N. (Tas.) Ltd., an off-shoot of L. and N. Brown Coal Ltd., of London. This company has been granted, for three years, the privileges enjoyed by the Australian Shale Oil Co., as regards oil shale lands near Latrobe. It is expected that the plant will be delivered early in 1929.

In conjunction with the Goliath Cement Company, operating at Railton, a London group, interested in the oil business, is about to erect another type of retort for experimental purposes. The advent of this company is looked for with unusual interest, because the necessary financial backing is promised if the results of the experiments prove successful.

There are then three companies in the field, with distinct processes, but ready to co-operate with each other in the work of solving the problems of distillation.

Doubtless, as a result of the co-operative effort of these companies, with the assistance given by the Department, and with that of outside investigators, a process will be evolved suitable for the conversion of the kerogenite of this shale into oil, and which will result in the establishment of the industry. Since the early days the records reveal many failures, but at each attempt a little additional knowledge is gained, which in the aggregate becomes of great value to present-day investigators, who, by avoiding the mistakes of others, save both time, money, and effort.

RETURN showing the Quantity and Value of Shale produced during the Years 1910 *to* 1928.

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
Total	15,372	£12,634

PAINT MATERIALS.

Paint materials such as barytes, titanic oxide (from the minerals rutile and ilmenite), and ochres are attracting attention in Tasmania.

Barytes is widely distributed through the porphyroid schists, the most important bodies lying off main lines of transport at Mount Block, Alma, Riana, Gormanston, and Beulah.

Difficulties attendant to the development of this branch of the mining industry are—cost of transport over land, cost of transport over sea, a weak market, and a suitable method of preparation for market.

As regards transport, the Mount Block body may be taken as an example. It lies seven miles east of the Emu Bay railway at the Cue River Crossing. The route is ill-defined and through rough country. Tramway construction would be costly and transport by rail to Burnie and by ship to Melbourne would be so great as to leave no margin for profit. The only scheme that seems likely to prove successful is that of its manufacture at local centres into marketable products such as titanox and lithopone.

RETURN showing the Quantity and Value of Barytes produced during the Years 1916 *to* 1928.

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	—	—
Total	1802·5	£6909

RETURN showing the Quantity and Value of Ochre produced during the Years 1918 *to* 1928.

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

Ilmenite and other titanium ores are found in commercially large alluvial deposits at many places in Tasmania and its dependency, King Island. The chief difficulties to be overcome in their exploitation are—separation from associated heavy minerals, cost of transport, preparation in marketable form, extension of the markets.

In dealing with this subject, notes on the ilmenite-cassiterite sands of Fraser River, King Island, will be given as an example.

Composition of the deposit—Ilmenite, about 60 per cent. (varying between 30 per cent. and 90 per cent.); quartz sand, 30 per cent. (approx.); zircon sand, 10 per cent.

The tin ore content ranges from nil to 60 lbs. per cubic yard. According to report the latest systematic prospecting with the use of a drill gives an average content of 4 1/3 lb. tin oxide per cubic yard over a length of 30 chains and a width of 1 chain. (Weight of a cubic yard—about 2 tons.)

The problems here are—to discover a profitable method of separation of each valuable mineral (tin ore, gold, and ilmenite), and to find a market for ilmenite or a profitable process for bringing that ore into marketable condition.

Wet Method of Concentration of Tin-Ore

Owing to the high specific gravity of the associated ilmenite (4·5 to 5) and of zircon (4·2 to 4·86) sands, effective separation and concentration depend upon classification of the sand either by sieving to even sizes or by grinding the whole mass to a fine powder before passing it over a concentrating table. By the latter process the ilmenite is brought to such a physical condition that a separation of the tin-ore and its concentration to 65 per cent. tin grade can be effected without serious difficulty; but whether the ilmenite can be separated from the gangue in a later operation is questionable.

Dry Concentration by Magnetic Separation of the Ilmenite.

It is found that ilmenite separates easily from the quartz and zircon sands, with a titanic oxide content of 47 per cent. (It is worthy of note here, that the best assay for titanic oxide was obtained from ilmenite concentrated on a Wilfley table.)

Dry concentration reduces the bulk of sand 60 per cent., the residue being quartz, zircon, &c. It seems that grinding or sizing of the residue is necessary before a satisfactory separation of tin ore can be effected by processes of wet concentration.

Marketing.

Frequent inquiries have been received for ilmenite during the past two or three years from paint manufacturers and from company promoters. One mainland paint manufacturer has been supplied with crude ilmenite sand for experimental purposes. That firm was unable to effect a clean separation from the zircon.

Another firm (Sydney) appears to have examined the problem of ilmenite reduction fairly thoroughly, but has not been able to launch out, because it would be necessary to buy the patent rights attaching to the process of reducing ilmenite to titanium white, to import a chemist having actual experience of the work, and to instal a large plant.

After close investigation it was found that production on a commercial scale would be in excess of Australian requirements for paint. When this firm learnt that a high grade ilmenite could be obtained from Tasmania at much lower price than their supplies, the manager suggested the reduction of the ilmenite on the spot to a more marketable form. A smelting process was indicated, but no details were offered regarding the method of treatment nor of the required qualities of the product.

I opine that a survey of existing markets for titanium ores, the development of an Australian

market, and the promotion of industries to those ends are matters of considerable importance to Australia. A more extended market may be obtained by preparing titanium oxide for special cements, which are now coming into more general use.

The potential reserves in King Island and in Tasmania are of such magnitude that thorough investigations of the problems are warranted. Such problems are—

(1) The elimination of the associated zircon.
(2) The separation of tin-ore.
(3) The reduction of the ilmenite compound on the spot in order to concentrate the titanium component and thereby greatly increase the value. (The Department is continuing research to this end.)
(4) The provision of a large market.

As regards ochres, few are of high quality. Attempts to market them in other States have not been successful.

STRUCTURAL MATERIALS AND CLAY PRODUCTS.

Of the many materials that come under this heading statistics are recorded of calcium carbide cement, and of limestone shipped to Newcastle. No account is kept at present of the production of sand, gravel, stone for building and road-making purposes, nor of clay products. It is proposed under the Mining Bill, about to be presented to Parliament, to include such materials in the list of minerals and mineral products as is the case in other countries.

CALCIUM CARBIDE.

The production of carbide by Electro Products Company this year was 3892 tons, valued at £68,877, as compared with 2072 tons, valued at £34,896 in 1927. Last year the plant was not in continuous operation, therefore the extraordinary increase in output.

RETURN showing the Quantity and Value of Carbide produced during the Years 1922 *to* 1928.

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
Total	23,308	£498,109

CEMENT.

The total quantity of cement made in 1928, according to the returns furnished by the manufacturers, amounted to 44,799 tons, valued at £189,380, as compared with 38,690 tons, valued at £176,779 in 1927. This industry is now firmly established. Arrangenments have been made to add another unit to the plant of the Goliath Portland Cement Co. Ltd., operating at Railton, in order to enable the company to increase the rate of production there up to 100,000 tons per annum.

No further information is available regarding the proposal to establish the aluminous cement industry in Tasmania. It is understood that a Launceston syndicate has acquired the Australian rights of the La Farge process and propose the formation of a company to erect works on the western bank of Tamar River.

Titanium cement has not excited interest in Tasmania. Its manufacture has not yet been undertaken on a very large scale, except in America, where it is coming into more general use. It is claimed that titanium cement is more dense and chemically more resistant than any other cement. The process of manufacture is simple, when a mixture of ilmenite, lime, and coke are fused in an electric furnace or a blast furnace, the iron content is converted into pig iron, and the slag, when finely ground, becomes titanium cement.

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

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
Total	170,700	£800,606

CLAY AND CLAY PRODUCTS.

No statistics have been kept in the Mines Office of the production and value of clay. The chief products are bricks, tiles, pottery, drain pipes, and sewer pipes. These articles, limited to domestic requirements, are manufactured in important centres.

A thorough investigation of the more important beds of clay will be undertaken as soon as possible.

LIME.

No record is kept in the Mines Office of the production of lime used in the building trade and other construction works and in agriculture. The market is local.

SAND AND GRAVEL.

The total amount of these materials used locally in structures of all kinds is high, and that amount will be added to very considerably if the plans of Cementoid Silica Ltd., to ship large quantities from their holdings at Beauty Point to the Melbourne and Sydney markets, are carried into effect. These deposits are of great extent and of good quality, and are situated close to ports.

Another company is investigating deposits of sand in other districts with the object of supplying a finer grade to the Melbourne market.

STONE.

Under this heading are included all classes of stone used for buliding, monumental, and ornamental purposes, stone for paving, and curbs, grindstone, and scythestone, rubble, and crushed stone, and limestone, and quartz for furnace fluxes.

The records given hereunder relate only to limestone trained and shipped by the Broken Hill Proprietary Company from Melrose, near Devonport, to their steel works at Newcastle, N.S.W., and that quarried by Electro Products Ltd. and sold to the Electrolytic Zinc Company.

The following is the record of production this year:—

	Tons.
Shipped by the Broken Hill Pty. Co.	89,345
Quarried for the Electrolytic Zinc Co.	9309
Total	98,654

Valued at £79,050.

RETURN showing the Quantity and Value of Limestone produced during the Years 1923 *to* 1928.

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
Total	792,808	£792,880

RETURN showing Value of Minerals and Metal raised in Tasmania from 1880 *to* 1928 *inclusive.*

Mineral or Metal.	Value.
	£
Asbestos	7105
Barytes	6909
Bismuth	23,052
Cadmium	11,742
Carbide	498,109
Cement	800,606
Coal	1,985,431
*Copper (Blister)	18,484,226
Copper Matte	133,736
Copper Ore	579,335
Gold	7,633,610
Iron Ore	25,701
Iron Pyrites	93,916
Limestone	792,880
Nickel	16,353
Ochre	375
Osmiridium	524,289
Scheelite	112,468
Shale	12,634
*Silver-lead	8,491,302
Talc	96
Tin	15,952,177
Wolfram	224,155
Zinc	922,763
Unenumerated prior to 1894	31,988
Total	£57,364,958

* Metallic contents and values are shown in Tables.

RETURN showing the Amounts paid in Dividends by Mining Companies during the Year ending 31*st December*, 1928.

Mines.	Dividends.
	£ s. d.
Copper	45,714 0 0
Gold	...
Tin	6261 0 0
Silver	...
Coal	7248 0 0
Total	£59,223 0 0

RETURN showing the Mining Companies registered during the Year ending 31*st December*, 1928.

Number of Companies.	Capital.
9	£40,960

In addition to the above, 11 Agents for Foreign Companies and 1 Syndicate 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* 1928.

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		

RETURN showing the Average Number of Miners employed during the Year ending 31*st December*, 1928.

Division.	Number.
Northern and Southern	1805
North-Eastern	461
Eastern	576
North-Western	364
Western	1964
	5170

RETURN showing the Total Amount of Rents, Fees, &c., received by the Mines Department during the Year ended 31st December, 1928.

Head of Revenue.	Amount.		
	£	s.	d.
Rent of Auriferous and Mineral Lands	12,255	19	3
Fees, Auriferous and Mineral Lands	1175	7	9
Survey Fees	1482	1	0
Fees under the Explosives and Inflammable Liquid Act	882	5	0
Total	£15,795	13	0

RETURN showing the Total Area of Land and Number of Sluice-heads of Water applied for during the Year ending 31st December, 1928.

Mineral.	Number.	Sluiceheads.	Area.
			Acres.
Clay	1	...	73
Coal	1	...	640
Gold	15	...	298
Iron	2	...	113
Minerals	18	...	723
Nickel	1	...	80
Silver	2	...	160
Sulphides	1	...	40
Sand and Gravel	1	...	25
Tin	99	...	4029
Wolfram	1	...	55
Machinery Sites	4	...	19
Mining Easements	8	...	42
Dredging Claims	18	..	179
Water Rights and Dam Sites	52	84	338
Licences to search for Coal or Oil	7	...	7200
Total	230	84	13,984

RETURN showing Total Number and Area of Leases and Licences issued during the Year ending 31st December, 1928.

Mineral.	Leases.	Sluiceheads.	Area.
			Acres.
Arsenic	...	...	...
Clay	1	...	73
Copper	...	...	...
Coal	8	...	6195
Dredging Claims	37	...	414
Gold	20	...	419
Iron	...	...	...
Limestone	...	...	...
Minerals	23	...	885
Machinery Sites	6	...	51
Mining Easements	13	...	51
Nickel	1	..	80
Osmiridium	...	...	...
Phosphate Rock	...	...	...
Silver Lead	...	...	...
Stone	1	..	40
Shale Oil	...	...	...
Tin	289	...	8253
Wolfram	...	...	...
Zinc Lead	2	...	154
Water Rights and Dam Sites	118	325	95
Licences to search for Coal and Oil	7	...	7200
Total	526	325	23,910

RETURN showing the Total Number of Leases and Licences in force on 31st December, 1928.

Mineral.	No. of Leases.	No. of Sluiceheads.	Area.
			Acres.
Asbestos	1	...	1
Bismuth	1	...	40
Coal	23	...	11,563
Copper	1	...	34
Clay	5	...	102
Dredging Claims	52	...	626
Gold	40	...	830
Gems	1	...	80
Iron	16	...	744
Kaolin	...	...	...
Limestone	12	...	1751
Mining Easements	77	...	475
Machinery Sites	29	...	169
Minerals	139	...	8988
Nickel	...	...	...
Osmiridium	3	...	55
Ochre	1	...	20
Phosphate Rock	...	...	...
Slate	3	...	151
Shale	5	...	1706
Silver-lead	10	...	324
Stone	4	...	134
Tin	549	...	17,751
Water-rights and Dam Sites	371	1581	1552
Wolfram	6	...	66
Zinc Lead	...	...	...
Licences to search for Coal or Oil	7	...	7200
Total	1356	1581	54,362

RETURN showing the Annual Value of Mineral Products for the State of Tasmania from 1880 to 1928.

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	Unenumerated prior to 1894	31,988
			£57,364,958

RETURN showing the Number and Area of Leases held under the Mining Act, in force on 31st December, 1920 to 1928 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.	
	No.	Area.	No.	Area.	No.	Area.	No.	Area.	No.	Area.	No.	Area.	No.	Area.	No.	Area.	No.	Area.
		Acres.		Acres.		Acres.		Acres.		Acres.		Acres.		Acres.		Acres.		Acres.
For Minerals, Silver, Tin, &c.	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
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
For Gold	65	1403	92	1894	127	2424	108	1687	91	1829	70	1340	42	870	38	749	40	830
Dredging Claims	30	410	29	413	36	399	33	369	20	289	20	195	42	363	41	502	52	626
Mining Easements	104	616	97	621	87	607	81	606	77	592	77	570	68	494	77	484	77	475
Machinery Sites	33	147	34	152	31	123	30	124	26	115	27	112	25	150	21	110	29	169
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
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

COMPARATIVE Statement of Revenue from Mines, being Rents, Fees, Storage of Explosives, &c. (exclusive of Survey Fees), paid to the Treasury for the Years ending 30th June, from 1882 to 1903, and for Six months ending 31st December, 1903, and for the Years ending 31st December, 1904 to 1928, 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

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

QUANTITY and Value of Minerals Reported to the Mines Department during Year 1928.

Mineral.	Locality.	Registered Name of Company or Lease.	Quantity Treated.	Quantity Produced.	Output (Metallic).	Value.	Remarks.
			Tons.		Ounces.	£	
GOLD	South Mt. Cameron	Endurance Tin Mining Co.	..	..	14·37	61	Obtained from tin ore
	Queenstown	Mt. Lyell Mining and Railway Co. Ltd.	..	..	2024·00	8,598	Obtained from copper ore
	Rosebery	Electrolytic Zinc Co. of Australasia Ltd. (West Coast Div.)	..	..	891·00	3,785	Obtained from silver-lead ore
	Mathinna	Golden Gate Consolidated	3171	..	506·83	2,153	Quantity treated comprises ore, tailings, and sand
	Ringarooma	Sundry claims	..	..	5·00	21	
	Lisle	Watt's Section	..	..	40·55	172	
	Lisle	H. F. Faulkner	..	..	8·00	34	
	Lisle	Sundry claims	..	..	49·00	208	
	..	Sundry claims	..	..	64·68	274	*Vide* mint returns
				Total	3603·43	15,306	
SILVER	Magnet	Magnet Silver Mine	..	..	133,172	15,665	Obtained from silver-lead ores
	Queenstown	Mt. Lyell Mining and Railway Co. Ltd.	..	..	105,270	12,515	Obtained from copper ore
	Lyell Comstock	Horseshoe Syndicate	..	..	1631	193	Obtained from silver-lead ore
	Zeehan	Perry Bros., Nubeena Mine	..	..	1535	185	Obtained from silver-lead ore
	Comstock	Sunshine Mine	..	..	204	24	Obtained from silver-lead ore
	Comstock	Dunkley's Silver-lead Mine	..	..	7655	892	Obtained from silver-lead ore
	Comstock	Comstock Zinc-lead Mine	..	..	2322	274	Obtained from silver-lead ore
	Dundas	South Comet Mine	..	..	3814	450	Obtained from silver-lead ore
	Rosebery	Electrolytic Zinc Co. of Australasia (West Coast Div.)	..	..	231,401	27,362	Obtained from silver-lead ore
	N. Zeehan	Gem Mine	..	..	2740	303	Obtained from silver-lead ore
	Lyell Comstock	Block 14, Exploration N.L.	..	..	497	60	Obtained from silver-lead ore
	N. Zeehan	West Coast Syndicate	..	..	1806	210	Obtained from silver-lead ore
	Zeehan	Montana Mine Tribute	..	..	51	6	Obtained from silver-lead ore
	Zeehan	Queen Mine Tribute	..	..	138	17	Obtained from silver-lead ore
	Zeehan	Western Mine	..	..	313	38	Obtained from silver-lead ore
	Zeehan	Nike Tribute	..	..	166	18	Obtained from silver-lead ore
	Zeehan	Doric Tribute	..	..	30	3	Obtained from silver-lead ore
	Comstock	Lucknow Syndicate	..	..	187	21	Obtained from silver-lead ore
	Tullah	North Mount Farrell Mine	..	..	176,394	20,665	Obtained from silver-lead ore
				Total	669,326	78,901	
					Tons.		
LEAD	Magnet	Magnet Silver Mine	..	..	871·50	18,569	Obtained from silver-lead ore
	N. Zeehan	West Coast Syndicate	..	..	17·84	383	Obtained from silver-lead ore
	Dundas	South Comet Mine	..	..	83·40	1742	Obtained from silver-lead ore
	Tullah	North Mt. Farrell	..	..	1449·20	30,953	Obtained from silver-lead ore
	Lyell Comstock	Horseshoe Syndicate	..	..	25·40	531	Obtained from silver-lead ore
	Rosebery	Electrolytic Zinc Co. of Australia Ltd. (West Coast Div.)	..	..	2136·00	45,124	Obtained from silver-lead ore
	Comstock	Comstock Lead-zinc Mine	..	..	49·80	1,040	Obtained from silver-lead ore
	N. Zeehan	Gem Mine	..	..	26·91	581	Obtained from silver-lead ore
	Comstock	Sunshine Mine	..	..	2·80	58	Obtained from silver-lead ore
	Comstock	Dunkley's Silver-lead Mine	..	..	68·82	1,462	Obtained from silver-lead ore
	Zeehan	Perry Bros., Nubeena Mine	..	..	32·15	679	Obtained from silver-lead ore
	Lyell Comstock	Block 14, Exploration N.L.	..	..	9·00	194	Obtained from silver-lead ore
	Zeehan	Montana Mine Tribute	..	..	0·30	6	Obtained from silver-lead ore
	Zeehan	Queen Mine Tribute	..	..	3·00	64	Obtained from silver-lead ore
	Zeehan	Western Mine	..	..	2·70	58	Obtained from silver-lead ore

	Zeehan	Nike Tribute	..	..	1·51	33	Obtained from silver-lead ore
	Zeehan	Doric Tribute	..	..	0·44	9	Obtained from silver-lead ore
	Comstock	Lucknow Syndicate	..	..	6·01	130	Obtained from silver-lead ore
				Total	4786·78	101,616	
TIN	..	Cox Bight	..	..	1·60	356	
	Gladstone	Garfield	41,454 yds.	6·05	4·35	1010	
	South Mt. Cameron	Endurance	170,547 yds.	144·84	101·64	23,247	
	Gladstone	Monarch	132,660 yds.	30·59	21·20	4,588	
	South Mt. Cameron	Harman Bros.	10,738 yds.	7·08	5·07	1,133	
	Bradshaw's Creek	Waugh	12,000 yds.	1·62	1·16	260	
	Bradshaw's Creek	Pioneer	474,100 yds.	150·52	106·86	24,245	
	Bradshaw's Creek	Rajah	26,440 yds.	8·67	6·06	1,379	
	Gladstone	Mussell Roe	29,000 yds.	7·61	5·74	1,257	
	South Mt. Cameron	Eastern Lead	10,000 yds.	2·58	1·81	435	
	South Mt. Cameron	New Clifton	15,500 yds.	9·19	5·86	1,387	
	Derby	Briseis	519,000 yds.	302·00	217·38	49,456	
	Derby	Lone Brothers	..	19·20	11·89	2,699	
	Derby	Standage and party	4500 yds.	7·38	5·07	1,157	
	Branxholm	Arba	94,700 yds.	52·70	35·73	8,116	
	Branxholm	Ormuz	..	9·46	5·72	1,282	
	Branxholm	Bells Plan Company	..	..	10·29	2,348	
	Branxholm	Walsh Brothers	..	..	7·69	1,746	
	Branxholm	P. W. Edwards	..	..	19·49	4,420	
	Branxholm	Ronia	..	28·77	15·10	3,445	
	..	Straits Island	..	1·20	0·72	162	
	Weldborough	Laffer	28,000 yds.	5·68	3·94	889	
	Weldborough	Weldborough	16,500 yds.	10·40	7·03	1589	
	Weldborough	Blue Tier	455 tons	6·36	5·71	1,300	
	Moorina	Moorina	59,000 tons	19·53	12·85	2,931	
	Moorina	Weld	19,400 tons	20·21	13·81	3,191	
	St. Helens	Argonant	74,400 tons	26·82	18·54	4,192	
	St. Helens	Georges Bay	89,185 tons	30·04	21·88	4,934	
	St. Helens	Hunt Mine	..	9·63	6·96	1,572	
	St. Helens	Pyramid	55 tons	0·64	0·40	95	
	Avoca	Storey's Creek	10,351 tons	115·18	80·90	18,454	
	Avoca	Riverside	5400 yds	2·17	1·58	377	
	Avoca	New Henbury	18,000 yds	8·01	5·81	1,288	
	Waratah	Bischoff (North Valley)	64,501 tons 22,500 yds	312·00 26.50	224·15	50,680	
	Waratah	Bischoff Extended	1319 tons	7·55	5·26	1,187	
	South Bischoff	E. J. Pryde	..	0·47	0·30	72	
	Renison Bell	Renison Bell	650 tons	3·14	1·85	421	
	Renison Bell	Dreadnought Boulder	..	0·21	0·20	46	
	Renison Bell	Montana	..	0·03	0·02	5	
	Renison Bell	Kemp	..	0·05	0·03	7	
	Dundas	Razor Back	..	0·25	0·12	29	
	Heemskirk	Federation	450 tons	11·79	8·03	1,853	
	X-Gorge	F. Salmon's Tin Mine	..	0·44	0·43	96	
	Mt. Lindsay	Mt. Lindsay Tin Mine	12 tons	0·39	0·17	40	
	Stanley River	Stanley River Reward Mine	..	0·58	0·30	69	
	Waratah	L. & R. Smith's Tin Mine	580 tons	2·36	1·55	351	
	Whyte River	William Davis	..	0·04	0·02	5	
	Balfour	B. Williams	..	0·11	0·07	17	
	Housetop	Ivory Brothers	..	0·32	0·20	48	
	Lottah	Bow's Section	9174 yds.	3·67	2·58	597	
	South Cambria	South Cambria Tin Mine	8700 yds.	5·01	3·45	771	
	St. Helens	Sundry claims	..	7·80	5·44	1,225	
	Lottah	Sundry claims	..	3·56	2·49	598	
	Lottah	Dishington and party	..	3·24	2·23	519	
		Carried Forward		1433·64	1028·73	233,576	

QUANTITY and Value of Minerals Reported to the Mines Department during Year 1928.—continued.

Mineral.	Locality.	Registered Name of Company or Lease.	Quantity Treated.	Quantity Produced.	Output (Metallic).	Value.	Remarks.
					Tons.	£	
		Brought Forward		1433·64	1028·73	233,576	
TIN—*continued*	Gladstone	Sundry claims	..	45·94	37·69	8,519	
	Derby	Sundry claims	..	5·28	3·61	839	
	Branxholm	Sundry claims	..	9·86	11·18	2,535	
	Ringarooma	Sundry claims	..	3·64	2·54	577	
	North Heemskirk	Maynes Section Tributers	..	0·53	0·35	84	
	North Heemskirk	R. Smith and another	..	0·37	0·25	61	
	North Heemskirk	Carmady and Marsh	..	0·55	0·37	87	
	North Heemskirk	McInery and party	..	0·59	0·59	142	
	Storey's Creek	Beames and party	1200 yds.	1·11	0·76	172	
	South Bischoff	R. W. Pryde and another	2160 yds.	1·43	1·03	229	
	Yellow Band	J. Baptist	..	0·04	0·03	7	
	Balfour	H. Davis	..	0·05	0·04	9	
	Balfour	F. W. Emmerton	..	0·33	0·22	48	
	Balfour	B. Cartledge	..	2·53	1·72	371	
	Lottah	Wyniford River Tin Mine	2700 yds.	2·72	1·99	418	
	Moorina	Sundry claims	..	17·23	12·04	2,679	
	Heemskirk	W. Reardon	..	..	0·10	23	
	Heemskirk	F. Bennett and another	..	0·82	1·10	250	
	Heemskirk	R. Smith and another	..	0·52	0·59	134	
	Heemskirk	Sundry claims	..	3·62	4·03	888	
	Southern Districts	Sundry claims	..	..	0·44	100	
	Derby	Ringarooma Tin and Alluvial Ltd.	18,550 yds.	7·39	4·87	1,097	
	Branxholm	Baker's Discovery	5250 yds.	1·40	1·03	230	
	Branxholm	Ruby Flat Tin Mine	24,800 yds.	12·49	9·20	2,057	
	Branxholm	Royal Gordon Mine	1610 yds.	0·80	0·55	118	
	Branxholm	Woods & Bessells' Mine	315 yds.	0·20	0·15	31	
	Eastern Hill	J. Goodall	..	0·38	0·27	61	
	Storey's Creek	Sundry claims	..	1·19	1·43	317	
	Waratah	J. Betts and party	..	1·98	1·39	313	
	Moina	T. Foster	..	0·15	0·06	16	
	Bluff River	W. Aylett	..	0·15	0·12	28	
	X River	D. Williams	..	0·08	0·03	10	
	Renison Bell	Boulder T.M.; R. Mears	..	0·18	0·12	28	
	Renison Bell	Amalgamated T.M. Co.	..	0·08	0·05	12	
	Renison Bell	Pine Hill Kittos T.M.	..	0·20	0·11	26	
	Renison Bell	Federal Tin Mine	..	1·00	0·55	120	
	Renison Bell	A. Kemp	..	0·09	0·05	14	
	Branxholm	Montrose Mine	6000 yds.	3·00	2·09	478	
	Branxholm	Wood's Mine	..	2·50	1·75	398	
	Branxholm	Harridge and party	..	6·23	4·37	994	
	St. Helens	Carter's Marsh Tin Mine	1000 yds.	0·36	0·26	59	
	Storey's Creek	Aberfoyle Tin Mine	100·5 tons	1·18	0·80	183	
	Storey's Creek	C. F. Plummer	..	0·21	0·16	36	
	Balfour	Sundry claims	..	0·48	0·34	78	
	Renison Bell	Montana T.M. Tribute	..	0·42	0·21	48	
	Heemskirk	S. Reardon	..	0·44	0·31	70	
	Heemskirk	A. Abel	..	0·45	0·25	56	
	Heemskirk	H. Cook	..	0·30	0·22	50	
			Total	1574·13	1140·14	258,676	

QUANTITY and Value of Minerals Reported to the Mines Department during Year 1928—*continued.*

Mineral.	Locality.	Registered Name of Company or Lease.	Quantity Produced.	Value.
			Tons.	£
COAL	York Plains	York Plains	1158	1118
	Spreyton	Illamartha	4980	1285
	Catamaran	Catamaran	7677	16,280
	Meunna	Torbanhill Co.	53	92
	Mt. Nicholas	Mt. Nicholas	34,106	17,633
	Cornwall	Cornwall	58,447	22,160
	St. Marys	Jubilee	17,780	27,268
	Seymour	Seymour	900	20,629
	..	Sundry claims	102	93
		Total	125,203	£106,558
SHALE	Latrobe	Goliath Portland Cement Co. Ltd.	9052	23,896
			Tons.	
WOLFRAM	Storey's Creek	Storey's Creek Tin Mining Syn.	176·15	12,094
ZINC	Lyell Comstock	Horseshoe Syndicate	23	598
	Dundas	South Comet Mine	238	6088
	Rosebery	Electrolytic Zinc Co. of Australasia Ltd. (West Coast Div.)	6219	166,121
	Comstock	Comstock Zinc-lead Mine	167	4264
	Tullah	North Mt. Farrell Co.	465	11,620
		Total	7112	£188,691

NOTE.—The Electrolytic Zinc Co. of Australasia Ltd., recovered 44,004 tons of zinc, valued at £1,199,596 from other than Tasmanian ores.

			Ozs.	
OSMIRIDIUM	Southern Districts	Sundry claims	1549·369	40,231
	Western and North Western Districts	Sundry claims	77·817	2227
		Total	1627·186	£42,458
			Tons.	
CADMIUM	Rosebery	Electrolytic Zinc Co. of Australasia Ltd. (West Coast Div.)	19·72	4329

NOTE.—The Electrolytic Zinc Co. of Australasia 152·323 tons of cadmium, valued at £34,437, from other than Tasmanian ores.

			Tons.	
CARBIDE	Electrona	Australian Commonwealth Carbide Co. Ltd.	3829	68,877
LIMESTONE	Melrose	Broken Hill Pty Ltd.	89,345	72,536
	Electrona	Australian Commonwealth Carbide Co. Ltd.	9,309	6514
		Total	98,654	79,050
				£
CEMENT	Maria Island	National Portland Cement	21,723	108,615
	Railton	Goliath Portland Cement Co. Ltd.	23,076	80,765
		Total	44,799	189,380
COPPER	Queenstown	Mt. Lyell Mining and Railway Co. Ltd.	6421	444,802
COPPER NICKEL	Five-mile	Munro's Copper Nickel Mine	10	1697
TALC	Gawler	H. Templar	32	96

FIELD WORK.

In addition to the district surveys performed by me, a number of special investigations have been made of which the following is a list of the more important:—

1. Rex Hill Tin Mine.
2. The Development of Mineral and Rock Resources of Tasmania (in collaboration with the Government Geologist).
3. Some Tin Ore Deposits of Gladstone District.
4. Groom River Alluvial Tin-ore Deposits.
5. George River Tin-ore Deposits.
6. Riverside Tin Mine.
7. Cox Bight Tinfield.
8. Mt. Housetop Tinfield.
9. Central Cascade Tin Mine.
10. Blue Tier Weld Tin Mine.
11. Nelson River Prospects.
12. Blythe Iron Ore-bodies.
13. Tiger Creek Tin-ore Prospect.
14. Kookaburra Tin-ore Prospect.
15. Avoca Sands.

ACKNOWLEDGMENTS.

It is with pleasure that I place on record my appreciation of the manner in which each officer has performed his or her duties. The active support I have received made it possible to extend the scope of operations of this Department without adding to the burden of administrative work. Officers, imbued with the desire for co-operative effort, have given of their best in the service of the State, and it is pleasing to know that their work has met with general approval.

A. McINTOSH REID,
Director of Mines.

REPORT OF THE GOVERNMENT GEOLOGIST FOR YEAR 1928.

Hobart, 22nd February, 1929.

SIR,

I HAVE the honour to submit my report for the year ended 31st December, 1928.

Field Investigations.

The field work during the year consisted, with one exception, of special examinations, of short duration, in connection with individual mines, ore-bodies, areas, underground water localities, &c. These examinations were carried out in response to applications by individuals, syndicates, companies, &c. The time occupied by these examinations, and the reports thereon, did not permit of the carrying out of more than one extended field trip, viz., the geological reconnaissance of the Port Davey District, in south-western Tasmania.

This reconnaissance was the most important trip undertaken, and it also yielded the most important results, viz., the discovery of a virgin tinfield.

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

(1) Geological reconnaissance of the Port Davey District.
(2) Geological examination of the railway tunnel at Rhyndaston.
(3) Geological survey of the Mount Peter-Mount Paul Coalfield.
(4) Geological examination of H. C. Herbert's property, Brighton Junction.
(5) Geological examination of the Esperance (Strathblane) Coal Mine.
(6) Geological examination of Prosser's Forest.
(7) Geological examination of Mr. Rathbone's property at Granton.
(8) Geological examination of the Stanley District.
(9) Geological examination of cores from Northdown Borehole.
(10) Geological examination of the Devon Mines.
(11) Geological examination of the Mount Remus area.
(12) Geological examination of the Cream Creek area.

Short Reports.

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

(1) Preliminary report of the geological survey of the Port Davey District.
(2) Report on the Mount Peter-Mount Paul Coalfield.
(3) Geological report on the railway tunnel at Rhyndaston.
(4) Report on the possibilities of obtaining supplies of underground water on the property of H. C. Herbert, Brighton Junction.
(5) A further report on the Strathblane Coal Mine.
(6) Summary report on the Esperance (Strathblane) Coalfield.
(7) Report on the supposed occurrence of oil shale at Prosser's Forest.
(8) Report on Mr. Rathbone's property, Granton.
(9) Report on possibilities of obtaining underground water supplies at Stanley.
(10) Report on the Borehole at Northdown.
(11) Report on the Devon Mine.
(12) Report on the Molybdenite Prospect at Mount Remus.

Preparation and Publication of Bulletins.

The Adamsfield Bulletin (report and plan) was completed during the year, and is now in the process of being printed as Tasmanian Geological Survey Bulletin No. 39.

A preliminary report was prepared on the Port Davey district and made available to the public. Sufficient information was gathered to warrant the preparation of a bulletin, but it was deemed advisable to wait until the field was more developed before preparing the bulletin.

Routine and Other Duties.

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

(1) Bringing up to date of the Mineral Pamphlet.
(2) Weighing and certifying to considerable quantities of osmiridium.
(3) Attention to drilling plant during the absence of the officers in charge thereof.
(4) Completion of the removal to new rooms and reorganisation of the library; collection of rocks, minerals, fossils, &c.; and stores.
(5) The preparation of the following reports for publication in the English and Australian press—
  (*a*) The mining industry in Tasmania.
  (*b*) Osmiridium in Tasmania.
  (*c*) Sulphide deposits suitable for the production of sulphur or sulphuric acid.
  (*d*) Limestone in Tasmania.
  (*e*) Tungsten in Tasmania.
(6) Preparation of reports for the Imperial Geophysical Experimental Survey:—
  (*a*) Notes on the Zeehan, Renison Bell, and Ringarooma Valley districts.
(7) Preparation of the following for the Economic Delegation:—
  (*a*) Report on the development of the mineral and rock resources of Tasmania (joint report with Mr. A. McIntosh Reid, Director of Mines).
(8) A considerable amount of correspondence was attended to and numerous interviews held with visitors desiring information about mineral deposits, mines, &c.

Staff.

Assistant Geologist.—During the year Mr. F. Blake accompanied me on numerous field examinations. He also carried out many others by himself, and prepared reports thereon. While in office he continued the reorganisation of the mineral (general and economic) rock and fossil collections and the store collections of these materials.

His report for the twelve months is being forwarded to you.

Cadet Geologist.—Mr. Q. J. Henderson continued to carry out the greater part of the drafting work of the geological survey. He accompanied the Director of Mines on several field trips, including the aerial survey of the Avoca district. As opportunities offered he was given work among the rock and mineral collections.

Librarian.—Mr. F. H. Barrett has continued in his temporary appointment as librarian. He has completed card index systems for authors of Tasmanian geology, reports on mines in Tasmania, and reports on districts in Tasmania. He is now engaged in the more comprehensive work of a digest or subject catalogue of the geological survey library. He has assisted the work of the geological survey in numerous ways, *e.g.*, compiling of statistics of mines from old reports, &c.

Mr. Barrett has all the necessary knowledge and experience, and the right temperament for the work connected with the geological survey library, and it would be a great advantage to the Department if the position were made a permanent one.

Typist.—The position of typist was made a permanent one, and Miss J. Dobbie was appointed in March, 1928.

Yours faithfully,

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

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

REPORT OF ASSISTANT GOVERNMENT GEOLOGIST FOR YEAR 1928.

26th February, 1929.

SIR,

I HAVE the honour to submit my annual report as Assistant Government Geologist for the year ending 31st December, 1928.

Field Investigations.

During the year under review I have, acting on instructions received, made various special investigations in connection with mineral deposits. The following list represents a statement of the field work performed:—

(1) Aerial mapping of tin granite dykes of the Blue Tier district.
(2) Sampling of diamond-drill bores at Blue Tier.
(3) Investigation of tin-bearing possibilities of portion of the Gladstone mining field.
(4) Examination of rutile and sand deposits near Abbotsham.
(5) Examination of barite deposits at Alma, Queenstown, Beulah, Riana, Paradise Range, and Penguin.
(6) Examination of pigment materials at Spalford and Penguin Creek.
(7) Visit to Guildford Junction.
(8) Visit to Cygnet district.

In addition, I assisted the Government Geologist in investigations at the following places:—

(1) Adamsfield.
(2) Stormont.
(3) Devon Mine.
(4) Mount Remus.
(5) Rathbone's property at Granton.

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

(1) Tin deposits of portion of Gladstone mining field.
(2) Rutile and sand in the Clayton Rivulet district.
(3) Preliminary report on barite in Tasmania.
(4) Some pigment materials of North-Western Tasmania.

Routine and Other Duties.

During the year reports were compiled for the Agent-General for Tasmania in London, with titles as follows:—

(1) Iron ore deposits.
(2) Oil shale resources of Tasmania.
(3) Copper in Tasmania.
(4) Clay and sand in Tasmania.

The osmiridium handed over to various banks by buyers was inspected and weighed, and certificates as to weight and quality were given.

The classification and arrangement of general and economic sets of minerals for the use of the geological survey was completed.

A good deal of time was taken up in determination and arrangement of rock, mineral, and fossil specimens within the office collection.

A number of small representative sets of economic and rock-forming minerals were arranged and dispatched to various public bodies and elsewhere.

Yours faithfully,

F. BLAKE,
Assistant Government Geologist.

The Director of Mines, Hobart.

REPORT OF THE STATE MINING ENGINEER.

Mines Department,
Hobart, 14th March, 1929.

SIR,

I HAVE the honour to submit my report for the year ended 31st December, 1928.

Field Work.

The demand of mining tenement holders for special examinations and reports were particularly heavy during the period under review, which, together with duties pertaining to the geological survey of the State, also drilling and boring operations, in addition to general routine work, necessitated almost continuous work in the field.

The duties attendant to this branch of the Department embrace—

(1) Special examinations and reports on mining properties.
(2) Examinations of mines, prospects, and tributing areas and recommendations thereon relative to applications for assistance under the Aid to Mining Act, 1927.
(3) Topographical and feature surveys, geological survey branch.
(4) Supervision of diamond drilling operations—testing deposits by mechanical boring machines and by hand-boring methods.
(5) Supervision of Mount Cameron Water Race extension and general constructional work.

Special Investigations.

The following includes a list of properties examined on which reports were prepared:—

(1) Razorback Mine, Dundas.
(2) Packer's Creek, formerly Cliff Mine, South Heemskirk.
(3) Reynolds' Leases, Gipp's Creek, Ben Lomond district.
(4) A. B. Innes' Lease, Herrick.
(5) E. L. Andrews' Leases, Central Cascade, Derby.
(6) Dorset River Alluvial Deposits, Ringarooma.
(7) Blue Tier Weld Mine.
(8) Williams' Freehold Alluvial Deposit, Gould's Country.
(9) Aberfoyle Mine, Story's Creek.
(10) Hunter and others Leases, South Mount Cameron.
(11) Briseis Central Tin Mine, Derby.
(12) Ringarooma Tin (Alluvial), Derby.
(13) Old Pyramid Mine, H. Aulich's Lease, Upper Scamander.
(14) Western Pinnacle Mine, R. Hynds' Lease, Upper Scamander.
(15) Riverside Mine, Avoca.
(16) Laffer Tin Mine, Weldborough.
(17) Robinson & Bonner Leases, Rattler Hill, Weldborough.

Aid to Mining Examinations.

Examinations and reports of the following list of properties were made in connection with applications for assistance under the Aid to Mining Act, 1927:—

(1) Tobanhill Colliery, Meunna.
(2) Devon Mine, Middlesex.
(3) Rising Star Mine, Zeehan.
(4) Bessell Prospect, Lisle Valley.
(5) Garfield Mine, Gladstone.
(6) Pioneer Gold Mine, Mount Huxley.
(7) Federation Tin Mine, South Heemskirk.
(8) J. Eddy's Prospect, Weldborough.

Topographical and feature surveys, geological survey branch—

(1) A comprehensive topographical and feature survey of a considerable portion of the Tasmanite shale areas of Mersey Valley was carried out. This survey included the areas lying to the east of the Mersey River.

(2) Topographical and feature survey of sand deposits at Deviot and Beauty Point, West Tamar.

Diamond Drilling.

Mathinna Gold Field.—The diamond drilling plant was actively engaged throughout the year in various parts of the State.

At the commencement of the term the drill was in operation for Messrs. Brock Bros. on the Mathinna goldfield, and was engaged there until the end of February. Including three holes completed at the close of the previous term, the aggregate depth of the four holes bored was 695 feet.

Towards the end of the year further boring work was undertaken at Mathinna on account of Messrs. Brock Bros. making the total 897 feet.

Blue Tier District.—Early in March the plant was removed to Blue Tier for the purpose of testing the tin-bearing granite formations of that locality on behalf of the Tasmanian Tinstone Association.

In all, ten bore holes, aggregating a depth of 737 feet, were drilled. The results obtained gave much valuable information concerning the nature of these deposits at a moderate depth from the surface.

Mersey Valley Oil Shale Deposits.—On completion of operations at Blue Tier some drilling work was carried out on the Tasmanite shale beds, Mersey River valley, on account of the Tasmanite Shale Oil Co., Melbourne. Three bores, drilled to a depth of 177 feet, 106 feet, and 148 feet respectively on leased areas, gave useful data, which enabled the company to decide on the most suitable point from which to commence mining operations on the shale beds as well as in the selection of a site for retorting plants.

Drilling at Northdown.—On behalf of Mr. J. T. Moate, managing director of the Adelaide Oil Exploration Company, a vertical hole was drilled to a depth of 676 feet, the site selected being on the sea coast west of Port Sorell on the North-West Coast.

Calyx Drilling Plant.

The Victoria drill, which is mechanically operated by an internal combustion engine, was on hire for the full term to the Amalgamated Tin Association, Melbourne. It has been used in drilling the tin-bearing pyrites deposits of Renison Bell district.

Hand-boring Operations.

A considerable amount of hand-boring work was performed on the tin-bearing drifts of the Groom River, North-East Coast; also at the Garfield Mine, Gladstone.

Mount Cameron Water-race Extension.

During the year specifications were prepared, and a contract was subsequently let for the construction of a line of race connecting the terminus of the deviation—a short distance westerly of the township of Gladstone—with Native Lass Dam, the distance between these points being 398½ chains. The survey of this line of race was carried out by this branch of the Department prior to the term under review. The full survey extends two miles beyond the end of the section now under construction.

The completion of the race to Native Lass Dam should be accomplished shortly after the close of the year to which this report relates.

To make a constant water-supply available at various points along the route of the race should be the means of restoring activity in the mining community of Gladstone. The areas served by the race have been specially reserved for small claim holdings, thus giving the opportunity for individual miners or small parties to secure claims which they can operate privately at small capital cost.

Native Lass Dam.

The embankment of this dam, which was constructed many years ago, is in a state of disrepair. Preparations are being made to restore the bank and render it suitable for the storage of surplus water-supplies delivered from the race under construction.

General.

The continued low prices ruling for silver-lead ores has retarded activity on the Zeehan and adjacent mining fields.

Active mining and tributing work is now confined to a small number of operators. With a return to metal prices commensurate with the cost of production on the limited scale usually carried out by individual miners and tributors, the output from these fields should be considerably increased.

In addition to the special duties enumerated, a considerable amount of work devolved upon this branch of the Department, including special reports, mine surveys, conferences in connection with applications for dam sites, &c., consultations with leaseholders and others respecting mining operations, design and erection of treatment plants, water-power schemes, sampling ore bodies and alluvial deposits, and advice of a general character relating to mining operations. Mine owners and prospectors have availed themselves freely of assistance and advice tendered in this connection. The work through the year included a tour of the mining fields of the State with Dr. Woolnough, Geological Adviser to the Commonwealth Government, on behalf of the Development and Migration Commission; also a visit of inspection to the chief mining districts of the West Coast with Mr. A. Broughton Edge, Director of the Imperial Geophysical Survey, and Dr. Woolnough.

Yours obediently,

J. B. SCOTT,
State Mining Engineer.

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

REPORT OF THE CHIEF GOVERNMENT CHEMIST AND ASSAYER, LAUNCESTON, FOR THE YEAR 1928.

Mines Department Laboratory,
Launceston, 20th February, 1929.

SIR.

I HAVE the honour to submit my report dealing with the work of the Mines Department Laboratory for the year, 1928.

During the period under review, 6736 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 analysis 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; analysis of water; analysis of minerals; fusion tests of refractory clays and kaolins; examination and tests of titaniferous iron sands; examination and tests of asphaltum, &c.

The volume of work in this branch of the Mines Department has increased to such an extent that the appointment of a junior chemist-clerk-librarian is essential.

Owing to my absence on sick leave for the greater part of the year, the contemplated research investigations had to be postponed until 1929.

Miss R. B. Reid, who was temporarily appointed to the staff during my absence, relinquished her duties on my return to office.

Early in the year Mr. E. W. Coleman was appointed to the permanent staff as sampler.

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

In order to cope with the large volume of work, it was found necessary to carry out a considerable portion of it after ordinary office hours.

I have the honour to be
Sir,
Your obedient Servant,
W. D. REID,
Chief Government Chemist and Assayer.

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

REPORT OF THE CHIEF INSPECTOR OF MINES.

Mines Department,
Hobart, 19th April, 1929.

SIR,

I HAVE the honour to submit my annual report for the year 1928 on the inspection of mines and the administration of the Mines and Works Regulation Act, 1915.

Tables are included, showing—(1) The number of persons killed and injured in or about mines, works, and quarries of 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 1928.

Accidents.—The total number of accidents reported for the year was 47, as against 70 for the year 1927.

The 47 accidents caused injury to 47 persons, one of which was fatal, and 44 caused injury which necessitated absence from work for more than 14 days. The rate per 1000 persons employed injured and killed was 9·090, compared with 13·877 for the year 1927. The rate per 1000 persons employed in regard to fatal accidents was 0·193, compared with 0·991 for the previous year.

The rate per 1000 persons employed who received serious injury was 8·897, compared with 12·886 for the previous year.

The fatal accident was caused by a fall of ground in a stope. The ground which fell was about 1 cwt., and probably had been overlooked when barring down loose ground. This class of accident can only be obviated by the care of those employed in testing the ground where they are employed.

Of the 46 serious accidents which occurred, 10 were such as to cause fracture, and the remaining 36 were minor injuries which necessitated absence from work for more than fourteen days.

The fatal accident occurred underground, also 14 of the serious accidents and 32 serious accidents occurred on the surface.

Prosecutions.

There were 10 prosecutions for breaches of the Act and Regulations. Convictions were obtained in 9 cases, and the other case was dismissed. Two cases were for failing to use appliances for the prevention of dust. Three cases were for failing to securely cover ore passes underground, two cases for the careless use of explosives underground, and two cases for riding on trucks which were prohibited.

Prospecting.—A vigorous policy of assisting prospectors was continued during the year. Ninety-eight prospectors received sustenance allowance. No discovery of special value was made.

Electrolytic Zinc Co., Risdon.—This company operated continuously during the year, and produced 44,004 tons of zinc, valued at £1,199,596, and 152·323 tons of cadmium from ore produced in other States. There were no material alterations in the plant during the year.

The West Coast mines had a steady production, and the results may be considered satisfactory, as a treatment plant is now in course of erection and should be producing about the end of the present year.

Catamaran Coal Mine produced 7677 tons of coal, being worked on a co-operative scheme. At the end of the year the mine again closed down, largely owing to the difficulty of disposing of the slack coal.

Esperance Coal Mine.—Work of a prospecting nature was continued at this mine, but has been retarded owing to the want of capital to carry out the necessary development.

National Portland Cement Co.—This company produced 21,728 tons of cement, which amount is considerably below the capacity of the plant. The output has again been interfered with by industrial troubles not associated with the work.

A new tin discovery was made in the vicinity of Port Davey. Several men are prospecting the area, and it is hoped that a new tin field will be opened up in this locality.

Quarries.—Five new quarries were brought under the provisions of the Act.

The dust conditions are still receiving attention, and it is hoped that every possible safeguard will be adopted during the present year to safeguard the health of those employed.

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

I have, &c.,

J. O. HUDSON, Chief Inspector of Mines.

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

TABLE showing Rate per Thousand Killed and Injured in different Divisions for the Year 1928.

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	1804	17	...	17	17	9·423	...	9·423
North-Eastern	462	1	...	1	1	2·162	...	2.162
Eastern	576	4	...	4	4	6·944	...	6·944
North-Western	364	4	...	4	4	10·989	...	10·989
Western	1964	21	1	20	21	10·692	0·509	10·183
Total	5170	47	1	46	47	9·090	0·193	8·897

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	1189	18	1	17	18	15·138	0·840	14·297
Zeehan, &c.	775	3	...	3	3	3·871	...	3·871
Total	1964	21	1	20	21	10·692	0·840	10·183

COMPARATIVE Table of Statistics of Accidents in and about the Mines of Tasmania from 1st July 1892, *to 31st December*, 1928.

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

* Mt. Lyell disaster.

TABLE showing the Number of Persons Killed and Injured in and about the Mines of Tasmania during the Year 1928.

Place or Cause of Accident.	Inspection Districts.													
	Northern and Southern Division.		North-Eastern Division.		Eastern Division.		North-Western Division.		Western Division.				Total.	
									Zeehan and other Districts.		Lyell District.			
	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.
Underground—														
Falls of ground	...	...	...	...	...	...	...	1	...	...	1	2	1	3
Shaft Accidents—														
Falling down passes and shafts	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	...	...	...	...	...	...	...	1	...	...	1	2	1	3
Miscellaneous (underground).														
Haulage	...	...	...	...	...	...	...	..	...	...	...	...	...	...
Trams, &c.	...	...	...	...	...	2	...	...	...	...	...	2	...	4
Sundry accidents	...	...	...	...	...	2	...	...	...	...	...	2	...	4
Explosives	...	...	...	...	...	...	...	...	...	1	...	2	...	3
Total	...	...	...	...	...	4	...	...	...	1	...	6	...	11
Total Underground	...	...	...	...	...	4	...	1	...	1	1	8	1	14
On Surface—														
Smelting-works	...	9	...	...	...	...	...	...	...	...	...	5	...	14
Machinery	...	1	...	...	...	...	...	...	...	...	...	...	...	1
Tramways	...	1	...	...	...	1	...	1	...	...	...	1	...	4
Falls of persons	...	3	...	...	...	...	...	...	...	...	...	3	...	6
Explosives	...	...	..	...	...	...	...	...	...	...	...	...	...	...
Miscellaneous	...	3	...	...	.	...	...	1	...	...	...	1	...	5
Sluicing	...	...	...	1	...	...	...	1	...	...	...	...	...	2
Total Surface	...	17	...	1	...	1	...	3	...	...	...	10	...	32
Gross Total, 1928	...	17	...	1	...	5	...	4	..	1	1	18	1	46

REPORT OF CHIEF INSPECTOR OF MAGAZINES AND EXPLOSIVES.

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

Mines Department,
Hobart, 19th April, 1929.

Sir,

I have the honour to submit my annual report in connection with the administration of the Explosives and Inflammable Liquids Act for the year 1928.

The imports of explosives were:—

	lb.
Monobel	14,600
Gelignite	311,150
Blasting gelatine	28,000
Ligdyn	5,000
Gelatine dynamite	6,000
Powder	12,361
Detonators	291,000

The quality of the explosives imported was satisfactory. Owing to the tendency to freeze on the part of one class of explosive, it was considered advisable not to supply this class of explosive to operators in the cold areas of the State. The explosive which was substituted has shown no effect of freezing, and is giving every satisfaction in operations.

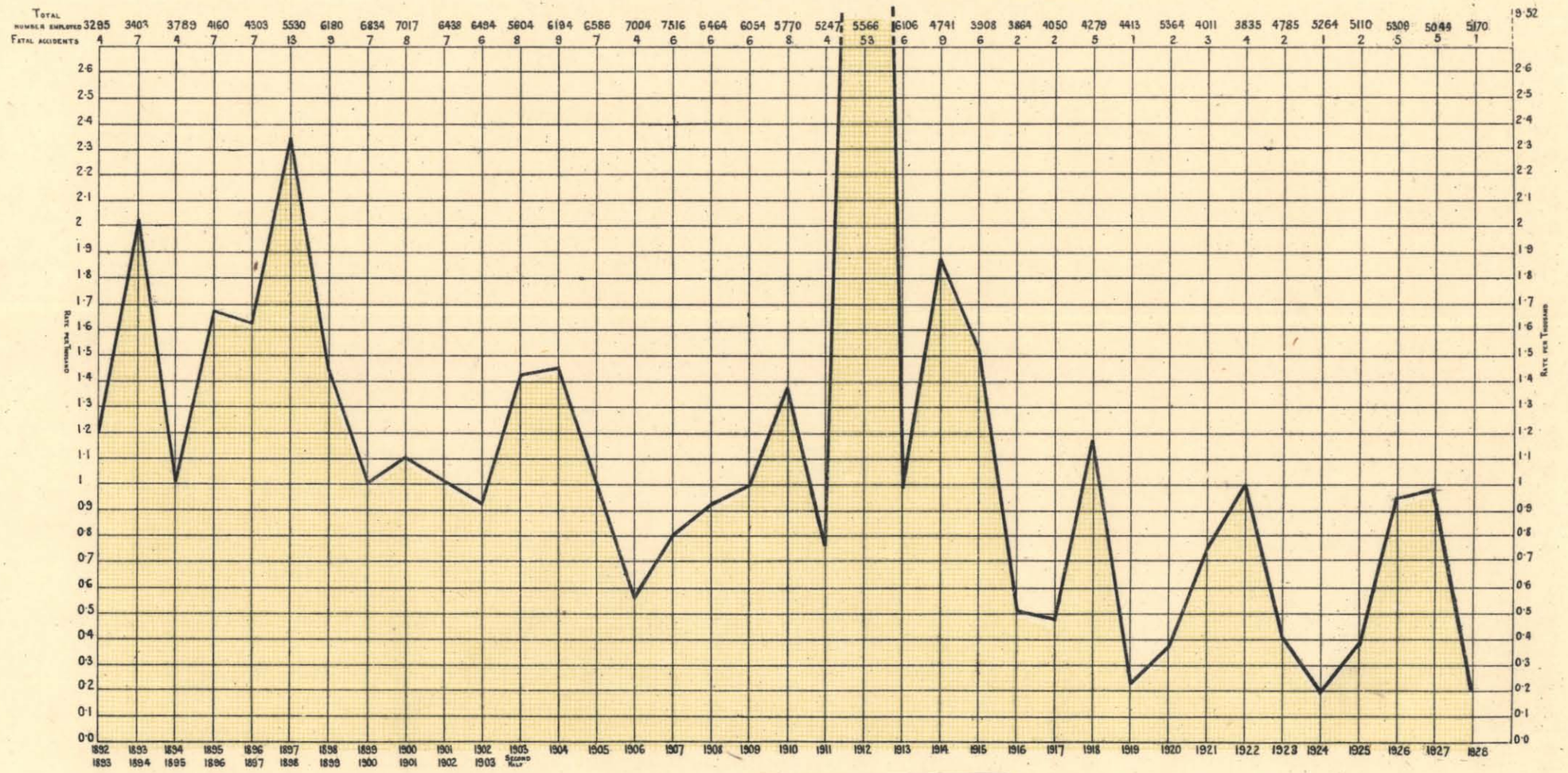
Several small quantities of explosives have been condemned and destroyed. The defects could in no way be attributed to manufacture, but to the careless method in which they have been stored.

During the year it was found that a dangerous consignment of fireworks was being sold in the State. Immediate steps were taken to have the dangerous commodity removed from sale, and a new regulation was enacted prohibiting the importation, keeping, storing, conveying, or selling of any fireworks containing a compound of aluminium, potassium chlorate, and sulphur.

There were three accidents due to explosions, causing serious accident, but no fatalities. Each case was closely investigated, and the occurrences appeared to be due to damage by the coiling of the fuse. This practice is one which has had considerable attention with a view of having it discontinued. Investigation has shown that, in some

Diagram showing the ratio of Fatal Accidents in Mines in Tasmania

Rate per 1000 men employed



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mines, the practice of igniting fuses with a burning plug of explosives on a stick was carried out. This is a very dangerous method, and is prohibited. Every endeavour is being made to prevent the practice.

There were four prosecutions for non-compliance with the provisions of the Explosives Act. Convictions were obtained in all cases.

There were eleven prosecutions for non-compliance with the provisions of the Inflammable Liquids Act. Convictions were obtained in nine cases.

The bulk installations of inflammable liquid have worked in a very satisfactory manner during the year, but the practice of filling cars and motor-cycles with the engine running and flame lamps has caused fire at two kerbside pumps.

It is to be regretted that the new Inflammable Liquid Act has not yet been passed by Parliament. This measure is urgently required to deal with the altered conditions of distribution.

Revenue.	£	s.	d.
Magazine licences (48)	48	0	0
Permits to sell explosives (242)	59	10	0
Permits to convey explosives (48)	12	0	0
Permits to import explosives (10)	20	0	0
Permits to sell fireworks only (81)	10	2	6
Licence for store (374)	371	10	0
Registration of premises (411)	102	15	0
	£623	17	6
Magazine rents	258	7	6
Total	£882	5	0

I have, &c.,

J. O. HUDSON,

Chief Inspector of Magazines and 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 1928 in connection with the work and administration of the various Acts delegated to this office and a resume of the work carried out in the district.

The average number of persons employed was 909.

Accidents.—Reports concerning these, as they have arisen, have been sent forward to head office as required by Section 26 of the Mines and Works Regulation Act, 1915. Ten accidents were registered during the term under review. Four of these happened at a quarry and works, brought under the Act as allowed by Section Six. Three underground and three on the surface. There were 22 other accidents reported to this office, but which were not registered, the persons concerned not losing 14 days work, which is necessary to constitute a serious accident under the Act. These list as follows:—One, 1 day; one, 3 days; one, 5 days; two, 6 days; four, 7 days; four, 9 days; one, 10 days; three, 11 days; one, 12 days; and four, 13 days. Probably there may have been others not reported or brought under my notice. Four of the serious accidents happened at one quarry; the first was caused when shovelling stone into a side-tip truck at a place where the batter of face was considerable. About half a barrow of clay and stone came away from this face, and in turning to get away the man stumbled and a piece of limestone hit him, causing slight rupture of the right kidney. He lost 14 days work. As far as I could ascertain the accident might have happened to anyone.

The second was reported as follows:—A man was pushing a truck of limestone and ricked his back. There was no apparent reason for it, as conditions were as usual. He lost 16 days work. The third, which caused the person to receive a fractured rib and penetrating wound of the right lung, was much more serious. The manager's report was as follows:—"The man was loading stone in the quarry adjacent to the haulage way, and was hit on the back by a falling stone, weighing approximately 5 lb. No one witnessed the accident. The face where he was employed had not been 'shot' for some days, and had been carefully barred down. There was no indication as to whether the stone was from the quarry face or from the haulage way. No one was working above, but a rake of trucks was being hauled at the time." This report was confirmed by the quarry foreman and others when I made inquiries. Personally, I think the stone fell from one of the trucks as they were being pulled up the haulage. This had evidently been overloaded, and when the stone rolled off it hit something hard, which caused it to fly in the air and thus over the face and on to the man. Attention had been drawn previously to the proximity of the top of face to the haulage way. Work has now been stopped in this direction. The man was taken to the hospital, and, as far as I know, is still there, though making a good recovery. The accident happened towards the end of November.

The other accident occurring at the company's works happened through a man slipping whilst getting out of a railway truck where he had been loading cement. He hurt his left knee, and lost 19 days work.

Of the three accidents which occurred underground the most serious was as follows:—A round of sixteen holes had been bored (a cut having been previously bored and fired out), and were all charged. Two men started to light these 16 holes, one holding the light whilst the other was "spitting the fuses." There was some difficulty in lighting one of them, and the man holding the candle wanted to leave, but before they did one charge went off, throwing the man who was "spitting" over the top of his mate. They managed to get away in the dark along the drive into safety before the other six holes which they had lit went off. From what I could hear and see they were looking for trouble, using too short fuses, not giving themselves sufficient time to get away, besides other risks they were taking through explosives being thrown about, owing to "cut-out" holes, &c. One of them lost a few months owing to injuries received to thigh and left side, the other lost a few days owing to shock. The one holding the light was an old miner, the other only a lad. The first should have known much better.

Another person, whilst getting down timber into his working place, was struck on the little finger with a small piece of stone (which evidently the timber displaced), bruising it. He had the finger dressed and went back to his work. He was absent from work for three days, then returned for two days, and then went to the doctor, who ordered him to the hospital, the wound having become septic. The doctor soon afterwards had to remove the finger close up to the hand. The poison still spread, and it looked as if he might lose his hand. However, towards the end of the year he was able to return to work again. If he had used reasonable precaution in the first instance he might have been saved a lot of suffering.

The other person injured underground received a cut head with slight concussion, being hit by a small piece of ore which flew over a door of a chute whilst he was filling a truck therefrom. He lost 15 days work.

Of those accidents occurring on the surface, the most serious was that occurring to a person whilst engaged shunting trucks on the company's tramline. He got his right hand caught between the buffers, crushing the middle finger of the right hand. He continued to work for three days, and then had to go to the doctor, who considered it necessary to amputate it at the second joint. He lost 39 days work.

The other two accidents happened at the same works; one slipped when walking on a plank, injuring his left knee; the other, whilst executing repairs to alarm bell on

stone tram at an alluvial workings, got his right leg crushed above the knee, thinking there was plenty of room for the truck to pass him. They lost just over the 14 days.

There has been a big decrease in the accidents during the year under review, viz.:—Ten against thirty-two. One endeavours in every way to get the assistance of managers, foremen, and men to look to "safety first," and to point out any dangerous or seemingly dangerous practice or places, yet whilst one has to trust to the human element there is always more or less likelihood of these occurring.

Ventilation.—At one mine considerable improvement is being made, a one-hundred-thousand-cubic-feet-per-minute fan being installed, which should be capable of freeing the mine of all smoke and fume in less than half an hour. At another quite a lot of improvement has been noted; but at one other the same old story is told, that metals are low and the company cannot afford it. At this mine, where considerable water is being pumped out of it, more than half is dropped eight hundred feet to bottom level, to be pumped therefrom. This water could be utilised to give sufficient power to ventilate the whole of the mine in a very satisfactory manner, but an occasional rise is put up and natural ventilation is relied on. At times this is satisfactory, but at others the very reverse.

In most cases I find a ready response to try and improve conditions where required in compliance with the Act.

Settlements of Ground.—At a limestone quarry a large vugh was struck just at the foot of the face, extending for some distance under same. The ground settled off for a good length and depth from face of cut and, owing to the amount of clay overburden, made things very unpleasant for some time. The company, being hard pushed for stone, made things much worse, it being necessary for safety to keep the batter of face much flatter than under ordinary conditions. An afternoon shift was put on to deal with the overburden and helped considerably. Most of this settlement has been worked away, but as to whether there will be any further movement owing to this vugh I cannot say. One can only watch the position closely.

Apart from a few places underground (other than the above) where ground moved owing to structural weaknesses, and which gave plently of warning, nothing of a serious nature occurred.

These places are being worked out on square-set timbers with the usual precautional methods, and, as far as I know, no trouble has eventuated.

Change-houses.—These, on the whole, have been satisfactory.

Crib-places.—Improvements in this connection have been made particularly so by one company, who have fitted up a fine place underground with every convenience. One has to still speak very pointedly to some men to get them to place their scraps in the vessels set apart for this purpose.

Explosives and Magazines.—Considerable attention has been given to the safe handling and storage of explosives at the various mines and quarries. The handling and forwarding of these as they arrive from the mainland has been supervised as occasion demanded.

Only small quantities of sodium-nitrate gelignite have had to be destroyed, mostly plugs that should have been used up previously instead of being left too long in canisters and daily supply storage places.

At one company's mine (where in previous years a good deal of frozen explosives was noticed) an occasional plug of frozen blasting gelatine was noticed, just odd plugs, usually one in a packet, but none was seen here this year among either ardeer or sodium-nitrate gelignites.

At a quarry a considerable amount of 25 per cent. ligdyn became frozen, and had to be thawed, but was all used up.

Fuse.—Owing to very bad lateral bursting (sparking) several cases had to be condemned, and all mines and quarries were requested to keep a close watch over same and to warn all men useing fuse not to "loop" or "tuck" it. Slightly lateral bursting is still noticed (which the manufacturers state they cannot remedy). Some of the fuse "jumped" ahead as much as three inches when bursting. Irregular rate of burning was reported from two mines, but on my testing same gave satisfactory results to me. Personally, I think it was the "jumping," as noted above, that was accountable for it. I have not noticed this for some time.

Detonators.—One peculiar case was reported to me at a mine and about an inch of gelignite was handed to me, in which was the tube of a detonator, the top half being intact, the other being mushroomed out under the gelignite, a piece of burnt fuse still in detonator. It was stated an eight-inch long by one-inch diameter plug of gelignite was placed in a ragged hole with a "tail" (half-plug, with detonator and fuse attached). The hole was wet and no tamping used. It was stated no report was heard, and on returning the above was pulled out of the hole. Another tail was inserted and fired. The hole exploded and brought its burden. Personally, I think the detonator was a weak one (the box had only just been opened fresh from a good magazine) and only had enough strength in it to push the bottom of gelignite away and not explode it.

At the same mine they reported two other occasions where detonators were not satisfactory. The tubes of these detonators were made of aluminium, and were the first I have seen in this district. At another mine seven detonators were shown me which were defective, but these appeared to me as if they might have been wet and dried out again. Other than the above I have had no complaints.

A few alterations and additions have been made to main magazines and storage places underground for the daily needs, and, on the whole, are reasonably safe.

One person was proceeded against for contravention of Part 7, Clause 7 (*c*), of the Regulations under the Explosives Act, 1916, also under Part 8, Clause 1. He was conveying explosives without holding a permit, and at the time was smoking. He was fined, on the first count, £1 and 10s. court costs; and on the second, 5s., costs remitted, in default seven days and 24 hours respectively.

Incline Haulages, Machinery, Ropes, &c.—On one haulage a contravention of the Act was noticed, and the matter was taken up with the superintendent, who immediately took strong action and put an end to the unsafe practice, and conditions have been much better since.

Ropes.—These have been inspected as found necessary and requests made for cutting and reshoeing when found overdue.

Machinery and Electrical Wiring.—There are still places where the wiring is not satisfactory underground. These have been recorded against, and the machinery inspector notified. Apart from the above, taken on the whole, conditions have been reasonably safe.

Health and Sanitation.—At one works considerable trouble was experienced in getting the assistance of the management and persuading the men to see the necessity of using respirators for the prevention of inhaling dust. Five men were proceeded against under Regulation 20. The Police Magistrate addressed the men from the Bench, and requested me to do so, as to the foolishness of not protecting their health, and suggested that I should ask him to adjourn the cases *sine die* on their promise to use the necessary appliances. This was done, hoping for the best. However, they did not alter their methods, and it became necessary for the Chief Inspector of Mines to take the matter up with the management, and since then they have used respirators. The "dry" process at this works is to be superseded by what is known as the "wet" one in the near future, and will make conditions much healthier.

At the Queensland Cement and Lime Company's Works, Darra, Queensland, a medical examination was ordered by the Arbitration Court, and was conducted by a medical committee during 1928, and, from data issued, it bore out that what I have stated would occur in connection with the health of employees if they failed to do as requested. The men would not suffer so much from silicosis as from bronchitis, catarrh, &c.

At a quarry a man was found committing a breach of General Rule 13. He had been warned and spoken to previously; he was proceeded against, and was fined £5 and 6s. 6d. court costs. Much better conditions have been obtained at this quarry, and various improvements have been obtained by putting in "wet" machines where old ones are wearing out, &c., but I am sorry to report that I still find signs where men are not using sufficient water to allay dust. One case was met with in December last, which has been reported to head office.

Usually it is difficult to obtain sufficient evidence to get convictions if legal action is taken.

Inflammable Liquids Act, 1920.—Considerable attention has been given to the safe storage of motor spirit under this Act as time has permitted, but there is still plenty to do in this connection.

I understand that a new Act and Regulations are being considered, owing to bulk storage, &c., and for satisfactory working and efficiency I think it very necessary.

Four court proceedings were taken. Two for breaches of Section 10, one for breach of Section 13, (1) VIII., and one for breach of Regulation 20. They were fined £2 and 6s. 6d. court costs; £2 and court costs 10s. 6d., and witness' expenses 13s., in default distress; 10s. and court costs 8s., in default 24 hours; and in the other a conviction was recorded, court costs being remitted. Every encourage-

ment is given to persons concerned to try and obtain the greatest safety possible, but one still finds persons who are very lax in their handling of inflammable liquids failing to see the necessity of taking reasonable precautions.

General.—The various mines, works, and quarries in my district, which are under the provisions of the Mines and Works Regulation Act, 1915, have been regularly inspected as the importance of the operations called for and time permitted. One still finds much loose and affected ground and unnecessary risk being taken, but in the majority of instances my recommendations and suggestions have been heartily appreciated and acted on.

In a few cases bitterness was expressed, but there was no need for it. Any inspector who has interest in his work must point out faulty conditions, and these are not done with any personal antagonism. His desire is to have these conditions remedied as soon as possible. This has been already stated in previous report. Any sane manager must know that it pays to have the very best conditions regarding safety and hygiene for commercial purposes.

I would like to express my appreciation to the various managers, officers, and workmen who have given me, at any time, their hearty assistance in my endeavours to get a reasonable degree of safety and decent working conditions.

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

TIN.

Mount Bischoff Tin Mine, Waratah.—During the year an average of 191¾ men have been employed. Some 41,000 tons of ore was treated at the concentrating mill for a return of 307 tons of tin oxide, carrying 206 tons of metallic tin, an average of ·50244 per cent. tin per ton.

Underground.—Very little development of the "cross-lode" has been carried out during the year, and most of the portion opened up has been mined; this ore-body extends underfoot, and to the north-west the values going underfoot are reported to be not quite as rich as that mined, and the ore to the north-west becomes poor; that to the south-east runs out into small stringers, but, in my opinion, there is a likelihood of values to the north-west and underfoot increasing and is well worthy of being further developed. On the "flat make" a very nice chute of ore has been developed past the formation, which was dirty and came in from the bottom, mentioned in my last report, which at that time cut the values and stopped development. As the good ore was mined to this further to the north-west it was found the values extended through this, and a flat rise was extended on it for some distance. I see no reason why it should not extend. A drive was put in on one of the "makes" mentioned at the "brown face," and some good ore was opened up. It was decided to go to the main tunnel underneath and cross-cut out to it. The ground was extremely hard for hand-steel, and it was extended much farther than expected to cut the ore. A rise was at last put up and cut the formation where it was small and ground very hard. It was left and another rise put up nearer to the main tunnel and holed to where good ore was, and some of it has since been mined.

As reported previously, I consider it a pity that a more progressive policy has not been adopted at this mine underground. It is hard to think that with all the wealth that has come off this mountain that there are not more rich lodes underneath than those already known. A good deal of ore has been mined from the surface during the term, but at the present price of tin, and the method of handling, there is little profit.

The work of erection at the "pontoon workings" at the North Valley was completed, and sluicing operations started. A good deal of interruption has been encountered in one way and another, a good deal of which was expected until the first paddock was got out to make room for the "stone," which is very plentiful, but the "plant" was the biggest source of trouble, not being up to anticipation. However these should soon be overcome, and, if the values continue as showing when I inspected last, the mine should give a good account of itself. Some 46,000 cubic yards were sluiced and a partial clean-up made for 31·5 tons of tin oxide, containing 18·15 tons of metallic tin.

L. & R. Smith Tin Mine.—A Mr. Packett has this on tribute, and has put up a small tailing retreatment plant, and is very pleased with the results he is now obtaining. This plant is on ground just below and adjoining the alluvial ground being mined by the Mount Bischoff Tin Mining Company.

Mount Bischoff Extended Tin Mine.—Most of the work carried out during the year has been of an exploratory character. Some 1319 tons of ore was treated, from which 7·35 tons of tin oxide was obtained carrying 5·2683 tons of metallic tin. Driving was continued in a southerly direction at No. 9 level, but results were on the low side. In my opinion, it is a pity this work was discontinued, for a good chute of ore might be struck at any moment. However, if anything of value is struck in levels above, it can be restarted at any time. These people deserve better results, considering their perseverance.

Pryde and Others, South Bischoff.—A little work is still being carried out in this district, 1·9116 tons of tin oxide being obtained from alluvial ground.

A few bags were obtained in connection with digging for osmiridium at "Yellow Band."

J. Belts and Chambers, who were granted allowance under the Aid to Mining Act, 1927, opened up some tin and osmiridium ground along the new track going towards Parson's Hood from the six-mile peg on the Waratah-Corinna road, and have won some two tons of tin oxide, besides osmiridium, during the last six months. It is reported that there are good prospects in this area.

Leuna Tin Mine.—No work has been carried out, to my knowledge, on this property. It is reported to be under offer to an English company.

Two men, at first assisted by the Government, but latterly by a syndicate, have been doing some work on the sections to the north of Leuna, and report encouraging prospects.

A little prospecting has been carried out in other places in the district, but as far as I know nothing of any importance has been found.

Renison Bell.—A. Victor Leggo and Co., who had options over the Dreadnought-Boulder, Renison Bell, Montana, and Central Mine, put these into what is now registered as the Amalgamated Tin Co., and the developmental work begun has been continued. Average men employed over term, 10. It is reported that results have been satisfactory. There is a considerable tonnage of sulphide ore available, and, if handled on big lines and the by-products can be made use of, there should be a good future before the field. Tributers are still working on most of these properties, and some 5·75535 tons of tin oxide was sent to the Smelters, containing 3·39463 tons of metallic tin. Average men engaged, 7. The tributer at the Renison Bell Mine has not sold all his output, holding for higher price of tin.

Some Adelaide people took up a large area to the north of the township, and have had up to 18 men prospecting during the last half of the year. The manager reports results to be encouraging. The same people have taken up two other properties in the district.

Stanley River District.—A little work has been carried on at the old Stanley Reward and Mount Lindsay Tin Mines and some prospecting work at the top end of the Stanley River and slopes of Parson's Hood. A little tin has been sent away. At the Christmas vacation an inspection was being made of the Stanley River Tin Mine for a Hobart syndicate.

Moina—New Shepherd and Murphy Mine.—Very little work has been carried out here, and at present is shut down.

Kemp's Rainbow Tin Mine, Old Iris.—When water has been available some hydraulic sluicing has been carried out by two men. No ore return has been sent to this office from Mr. Kemp during the year.

A little tin has been sent away from two small claims by two men. Two of the old mineral leases, the Aldina and All Nations, were taken up and some work carried on for a short time, but had ceased at the end of the year.

Balfour District.—A few men have been prospecting in and around the district, and 3·52078 tons of oxide sent to the smelters.

King Island.—At the Sea Elephant Prospecting Association Tin Mine some machinery is being erected for hydraulic sluicing, a dam and race having been put in.

A five-ton parcel of "black sand" was sent to Renison Bell Tin Mine concentrating mill for testing purposes from the East Coast.

Apart from this and the search for oil, I do not know of any other mining work that has been done during 1928.

Mount Farrell District.—Some prospecting work has been carried out by Finn and party towards the Sterling Valley. At the Bluff River Tin Mine a little work has been carried out on two sections, a few bags of tin oxide being sent to market.

ZINC-LEAD-SILVER MINES.

The Electrolytic Zinc Company of Australasia Ltd. have continued their extensive developmental policy both at the Mount Reid and Rosebery group of mines. The erection

of staff and workmen's houses, railway connection, stores, offices, and workshops at Rosebery is completed, and excavations for the 3000 tons per week mill have been started. Everything has a very busy look about it. At the Hercules and South Hercules Mines developments have been very satisfactory, both as to size and values of ore bodies. There has been 10,578 tons of ore broken, and an average of 48½ men employed. At the Rosebery Mine 27,484 tons has been mined and sent to Zeehan treatment works. Average number engaged at Rosebery, 173 men.

SILVER-LEAD MINES.

Waratah District.

Magnet Silver Mine.—An average of 86 men have been employed. For the first half of the year 55 men were employed and 3895 tons raised, from which 395 tons was sold, containing 35,583 ounces of silver and 238 tons of lead. During the last half-year 12,098 tons of ore has been raised, 1274 tons being sold, containing 97,589 ounces of silver and 633½ tons of lead. Average number of men employed, 117.

Magnet Main Ore Body.—Work has been carried out principally in stopes over No. 15 level and extension of main-gallery north at No. 16 level, and some prospecting at No. 10 level, with the usual results common to this body.

Development of what is known as the ore-body "west of dolomite" has been considerably exploited, and, apart from some work at No. 8 level, has turned out to expectations.

Mount Farrell District.

North Mount Farrell Co.—An average of 86 men have been employed. There were 11,713 tons of crude material treated, and 27,189 tons of tailings from current mill and tailing dump, from which some 3589 tons of concentrates was produced, containing 176,394 ounces of silver, 1449 tons of lead, and 488 tons of zinc. Owing to the fall in the prices in metals, the company suspended operations underground, and a tribute was entered into with the men. The men are making a little better than wages. This is keeping over 40 men employed underground, beside the extra men employed at the surface.

It is to be hoped that the company will continue with their development work in the near future. The tributers have to do a certain amount of developmental work in continuing main drives, but even this will not keep the mine running for long at the present rate of production.

The capacity of tube mill was much under the expectation of the previous manager, and will need to be duplicated to treat up to the expected tonnage of tailing from the tailing dump as well as current output from the mine.

New Sterling Valley S.L. Mine, Sterling Valley.—A tribute was let by the company to a local syndicate, and a crosscut was put out from the shaft to intersect the lode at about 35 feet below the tunnel level. The lode was cut, but contents were low in lead and silver and work was stoped. Work was then confined to upper levels. A few tons of ore are stacked in ore-shed ready for bagging, but none has been sold during the term.

Prospecting work is being continued, and it is to be hoped that a rich shoot of ore may be discovered.

Around the district a little prospecting work has been carried out, such as at the Murchison and Thomas Mines, &c., but no ore has been sent away.

Mount Claude and Moina District.

Round Hill S.L. Mine, Cethana.—Owing to the fall in the prices of metal, the tributers had to give up, and the company sold the plant. This has since been removed from the property.

Washington Silver-Lead Mine, Moina.—A Victorian mining expert visited and inspected the mine, and it was shut down.

Prospecting.—A little prospecting work has been carried out around the Dove River, Moina District, also at the sea shore and Dial Range, Penguin, but nothing of any value has been disclosed.

COAL.

Preolenna Coal Mine.—No cutting of coal has been carried out during 1928.

Torban Hill Colliery (Late Meunna Colliery), Meunna.—The main entry has been extended to 159 feet, and 53½ tons of coal has been broken and sold. It is reported to have been of good value. The size of the seam continues very small being about 18 to 20 inches thick. The seam is flattening as it is driven on. The owners state that they are very pleased with developments to date.

Illamatha Colliery, Spreyton.—It is reported that 901 tons of coal has been sold during 1928, an average of 6 men being at work. The grade and thickness of seam is that usual to the district, and just about gives the men a living wage.

SHALE.

Latrobe District.

Goliath Portland Cement Co. Ltd. (Late Tasmanian Cement Pty.).—Some 3577 tons of shale has been mined and crushed and sent to the cement works to be used in making cement. An average of 7¼ men were employed.

L. & N. (Tasmania) Ltd. (Late Australian Shale Oil Corporation).—The main adit workings have been unwatered a few times, for inspection purposes only, during the term. Some experimental work in connection with the oil has been carried out during the term, and some of the products sold.

The property has now been taken over by the L. & N. (Tasmania) Ltd., and the mine is being unwatered, and it is expected that operations will soon be started again on a fairly large scale.

Tasmanite Shale Oil Co. (Late New Southern Cross Motor Fuel Pty.).—A few trial runs with the Long retort were made and considered satisfactory, and a start made to dismantle the old plant. This was done, and two new Long retorts, with other necessary plant equipment, are being installed.

The tramline from plant to mine has been relaid, new ore bins erected, and the mine is being reopened and got ready to produce shale as soon as plant is ready. Everything is being laid down in a substantial manner.

Deloraine District.

As far as I am aware no shale has been mined here during the term.

CEMENT.

The Goliath Portland Cement Co. (Late Tasmanian Cement Pty. Ltd.).—At these works there has been an average of 108 men employed and 23,076 tons of cement produced. Work has been started in connection with the erection of another unit, and, if the equipment is installed as laid down by the officers of the new company, there should be quite a big difference in cost of manufacturing the cement. It is to be hoped that the company will not be hampered for the want of money.

LIMESTONE.

The Broken Hill Pty. Co. Ltd, at their Melrose quarry, has broken and dispatched 89,345 tons of limestone to its works at Newcastle, the average number of men employed being 46½.

LIQUID OIL.

The Adelaide Oil Exploration Co.—The Government diamond-drilling party did some boring for these people at Northdown.

BISMUTH AND GOLD.

Lea River, Moina.—The Stormont Prospecting Prospecting Co. has built a dam, cut water-race, and cut track for pipe-line, and cut out site for concentrating mill, and put in road to get machinery to the mine.

MOLYBDENUM AND VANADIUM.

Some work has been carried out in the Mount Remus district, one shaft being sunk to 11 feet and some trenches cut across a formation. Only one man was employed. Reports are stated to be encouraging, but I have not seen the formation.

OSMIRIDIUM.

Savage River, 19-Mile Creek, Castra River, Mount Stewart, Yellow Band (in Waratah District), and Little Wilson, and Wilson River District.

Owing to the increase in price more men are out in these places now than there has been for some time past. The average number of men employed for the term has been 52.

GENERAL.

The prospects regarding mining owing to the prices of metal are not as encouraging as they were a little while back. The fall in the price of tin and lead has been reflected in the last quarter's figures, but apart from the Mount Bischoff Tin Mining Co., who stopped mining operations at Christmas at the old mine, and milling operations in connection therewith, work in my district is going on much the same as usual.

The number of persons engaged in this district during the last half-year averaged 1030 against 788 during the first six months.

It is to be hoped that there will be an increase in the price of tin and lead in the near future to help the industry.

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

I have the honour to furnish the following report upon the work of inspection and administration of the provisions of the Mines and Works Regulation Act, 1915, the Explosives Act, 1916, and the Inflammable Liquids Act, 1920, within the Northern and North-Eastern inspection division for the year ended on the 31st December, 1928:—

An average number of 1064 men was employed, and due regard was given to the production and maintenance of safe operating conditions at the collieries, metalliferous mines, and quarries. Many irregularities were encountered in details of established mining practices, but, as a general rule, the defects were rectified with reasonable promptitude, and only in four instances was it necessary to deliberately exercise the powers invested in this office by Section 9 (IV.) of the Mines and Works Regulation Act to obtain the desired results.

Accidents.—Five accidents, involving injuries to a like number of persons, were registered under the provisions of Section 26 of the Mines and Works Regulation Act. The injuries were not of a grave or permanent nature, and the occurrences were of a less serious character than those recorded during the previous year.

While hydraulicking operations were in progress at one mine, a quantity of ground fell from the sluicing face and indirectly struck a person who was engaged breaking up pug. He sustained general abrasions and shock to the system.

An official was proceeding along the main adit of a metalliferous mine followed by a trucker pushing an empty truck, when he was bumped by the truck, which caused him to wrench his right ankle.

A lump of coal was being lifted on to a skip when it broke and caused the coal-getter to fall on loose coal on the floor of his working-place and sustain a bruised upper arm.

A person was handling drill steel in a metalliferous mine when a spicule of quartz penetrated his fourth right finger. Septicæmia supervened and incapacitated him for more than 14 ordinary days.

A wheeler incautiously withdrew his hand when coupling up full skips in a colliery, with the result that his fingers were jammed between the buffer blocks.

Health and Sanitation.—Considerable attention was given to matters pertaining to health and sanitation, and, although improved conditions were obtained in several directions, much has yet to be accomplished to satisfy this office.

Altered furnace arrangements and more regular attention to permanent stoppings, regulators, and "bearing-up" curtains resulted in improved ventilating conditions at one colliery, but the desirability of replacing the ventilating furnace with a high displacement fan has been apparent a long time, and it is satisfactory to record that this innovation is to be effected.

Measures taken at another colliery were not effective in rectifying the ventilating conditions referred to in the previous report. The work undertaken failed in its purpose, and as a last resort an entire reversal of the air currents in a large section of the mine was decided upon. Arrangements for effecting this were well advanced at the close of the year. If the result fails to satisfy operating requirements other measures will be taken to increase the quantity of air available for ventilating the working places.

More regular attention to matters governing the air courses improved the ventilation at another colliery. Difficulties were encountered in regard to lingering smoke and fumes after blasting in a fourth colliery, and were not overcome until a connection had been effected with old nearby workings.

Consideration was given to the ventilating conditions at a metalliferous mine where lingering smoke and fumes from blasting operations were deemed to be a nuisance. The manager endeavoured to obviate the nuisance by restricting blasting to crib periods, and by not permitting persons to re-enter the workings until such were considered to be sufficiently clear of smoke and fumes. The latter arrangement, however, gave rise to some dissatisfaction, and attention was directed to the necessity for improved ventilating arrangements to accelerate the dissipation of the fumes. Work in this direction was not finalised owing to suspension of operations at the mine.

Nothing untoward was encountered in regard to the ventilation at the remainder of the collieries and the metalliferous mines.

Measures were taken to repress the dust nuisance at a rock-crusher station. The old crushing and screening machinery is to be scrapped. The engineer in charge of the new plant readily agreed to the installation of a modern dust-collecting unit. It is anticipated that the new plant will be placed in commission during the coming year.

Changing and bathing accommodation and latrine arrangements were not different from those previously existing. The latrine arrangements, serving a quarry and subsidiary works, were found to be objectionable, and it has been agreed to replace the arrangements with modern sewerage disposal. The absence of inclination by employees to make use of changing facilities at the collieries obviated any demand for altered or improved arrangements.

Machinery.—The protection and general safety of the machinery in use at the various mines and works received the attention required under the provisions of the Mines and Works Regulation Act. Three ropes, in use at shafts, were ordered to be replaced owing to excessive wear, and two were found to require immediate attention owing to thimble deterioration.

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

Action was continued in regard to improper practices of handling and storing explosives, and the irregularities previously conspicuous are being gradually eliminated. Although in a lesser degree, certain miners still persist in planting nitro-glycerine compounds and "primers" in the roadside of a colliery. Colliery employees are allowed certain liberties in the handling of explosives, and it is regrettable therefore that a few persist in displaying wanton disregard for the safety of themselves and other workmen. Endeavours have been made to stop the practice, but the great difficulty has been to see a person actually committing the offence or leaving sufficient evidence to convict him of it.

Regular examinations were made of the explosives used, but only small isolated quantities were found to be defective and ordered to be destroyed. No explosive mishap was reported, and no complaint was made, to this office regarding the quality of the fuse in use.

Inflammable Liquids.—Irrespective of the fact that the duties of this office were alleviated to the extent of issuing demands and collecting fees, the work of administering the provisions of the Inflammable Liquids Act increased considerably, and it was frequently necessary, owing to the pressure of other duties, to postpone the work.

In several instances objection had to be taken to the conditions for case storage of inflammable liquids. The objectionable conditions were rectified either by the erection of approved premises or a reduction in storage to the quantity ordinarily exempt from registration. Arrangements for bulk distribution of mineral spirit were followed by a rapid extension of systems for bulk storage in comparatively small to large quantities. Many exceptions had to be taken to the practice of storing petrol in 40-gallon container drums in congested areas. The evolution of bulk storage brought about contentious issues in the storing of motor spirit not provided for in the existing Act, and although finality was generally obtained an amended Act, making full provision for bulk storage, is deemed necessary.

Aid to Mining Act.—Several parties of prospectors carried on operations, under the provisions of this Act, in different parts of the inspection division. Attention was principally directed to gold and tin, and although a few discoveries of interest were reported no noteworthy development ensued. In addition to the duties delegated to this office under other Acts, several reports were prepared and furnished upon applications for monetary advances under the Aid to Mining Act.

Mining Operations and Production.

COAL.

Coal mining was appreciably active, the production from this inspection division advancing to 112,152 tons. As previously, the Cornwall, Mount Nicholas, and Jubilee collieries were the principal producers.

The Cornwall Coal Company employed an average number of 102 men, and produced 58,447 tons at a mine value of £45,296. The main tunnel has now been extended to a mile in length. Seam developments have been satisfactory, and preparations are being made to increase the productive capacity of the mine. The main rope haulage from the pit bank to the screening station and bins has been replaced by an endless-rope haulage system, and an extension of the endless haulage system serving the main tunnel is to be undertaken. An electric power plant is to be installed for the requirements of surface works and for driving a high capacity "Sirocco" fan which is to be installed to replace the furnace-controlled mine ventilation system. Provided the company's project is not interrupted, there should be an increased output from this colliery during the coming year.

The value at the mine bins of 34,106 tons of coal produced at the Mount Nicholas Colliery was £26,512. No additions were made to the surface plant or mine equipment, and production resulted from a regular advancement of hewing places on the seam previously worked.

The Jubilee Colliery produced 17,780 tons, valued at £14,982 at the mine bins. No. 5 heading was advanced to 1500 feet from the tunnel, and it is not anticipated that the major upthrow of the Jubilee seam will be encountered until the heading has been extended a further distance of 500 feet easterly. Seam developments in the eastern area were considered as satisfactory, and, although mine transportation was improved by the installation of a "main and tail rope" haulage system, the productive capacity of the colliery continues to be limited by the capacity of the aerial ropeway, which is restricted to about 80 tons daily, and which is used in the transportation of coal from the mine to the Government railway.

Driving of the dip tunnel was regularly proceeded with at the Seymour Colliery, and the main seam of coal was touched at 710 feet. The tunnel was extended to the pavement, and a heading was driven about 60 feet on the seam which, in this locality, varies from 5 feet 2 inches to 6 feet 6 inches in width. A connection was effected with the old nearby workings for ventilation purposes, and underground operations were then suspended pending the completion of subsidiary works, installation of additional machinery and mine equipment, and the construction of a jetty for coal exportation. An average of 14 men was employed, and the quantity of coal produced, principally for local power requirements, was 900 tons, valued at £900.

Modified long-walling was pursued by three men at the York Plains Colliery, and 896 tons of coal, valued at £1118, was marketed. Restricted operations were pursued at the Excelsior Colliery in the Mount Christie area, but the output of coal did not exceed 23 tons, valued at £14.

TIN.

The gross value of 856·885 tons of metallic tin, recovered from tin ores produced during the year, was £195,076·8. Despite the fact that the market price of tin receded £61·83 from the average value for the previous year and, incidentally, retarded exploitation of the lower grade deposits, marked attention was given to the economic and productive possibilities of alluvial and lode tin deposits in different parts of the division. The Briseis, Pioneer, Endurance, and Story's Creek Mines continued as the principal producers, and developments at several of the smaller mines proved of interest.

Story Creek Tin-mining Syndicate.—This syndicate operated continuously until the close of the year when, owing to certain operating difficulties and low metal prices, mining was suspended indefinitely. The main underlie shaft was sunk and completed to the No. 3 level, and operations at this level were attended with favourable developments in the Nos. 1 and 2 lode channels. It is calamitous that a mine giving employment to an average of 103 men, and with the existing ore exposures, should be forced into a state of dormancy. There were 10,351 tons of ore raised and milled, and the concentrate yielded 80·9 tons of metallic tin and 176·15 tons of wolfram.

Aberfoyle Tin Mine.—Operations at this mine were of an uncertain nature until the latter part of the period under review, when the prosecution of a definite policy of exploration and development was instituted. The project of sinking a main underlie shaft was abandoned; the erection of crushing and concentrating units was temporarily suspended; operations on the ore veins, exposed in the vertical shaft workings, were discontinued; and a commencement was made with the driving of a low level adit crosscut from the western slope of the Aberfoyle gorge. Rock-drilling machines are to be used for driving the adit, and for this purpose the installation of the steam boiler and air compressor was proceeded with and completed. The adit is 8 feet by 6 feet in the clear, is to be driven an estimated distance of 894 feet, and will attain a vertical depth of 224 feet below the collar of the shaft, or approximately 184 feet below the shaft workings. This work will not only explore the veins at depth and reveal the character and value of the ore, but will prospect the zone of mineralisation between the present exposures and the gorge.

The stack of 100·5 tons of ore from operations at the shaft workings were treated by sluicing methods for a recovery of 1·808 tons of concentrate, containing ·803 ton of metallic tin, valued at £182·76.

McPherson's Reward.—A small syndicate was formed and drove a low level adit crosscut from the western slope of the Aberfoyle gorge. The adit was driven 330 feet westerly, but beyond several small and irregular veins of tin-bearing quartz, nothing of economic importance was revealed.

Riverside Tin Mine.—Considerable expense was incurred on preparatory works and in installing a pumping plant on the South Esk River for hydraulicking purposes, but the operating campaign was of short duration, as recoveries were not equal to expectations, and the quantity of boulders to be handled during sluicing exceeded anticipations. The were 2·178 tons of oxides recovered, which returned 1·584 tons of metallic tin, valued at £377·67. Results were unprofitable, and operations were suspended early in the year.

New Henbury Tin Mine.—Sluicing operations were intermittently carried on at this mine. Returns indicate that 24,000 cubic yards of ground were treated for a recovery of 8·31 tons of concentrate, containing 5·82 tons of metallic tin, valued at £1291·4.

Ground sluicers operating in the Storey's Creek and Gipp's Creek areas produced 4·368 tons of tin ore, which returned 3·09 tons of metallic tin, valued at £698·23.

An English company acquired an area of 204 acres of alluvial ground along the course of the St. Paul's River and carried out an appreciable amount of boring, the result of which was disappointing in view of previously reported values.

Operations by Aulich and party at the Pyramid Mine in the Scamander area did not prove much of importance. About 55 tons of ore from surface operations were treated at the five-head stamper battery for a recovery of 0·65 ton of concentrate, which returned 0·407 ton of metallic tin, valued at £97·043. Battery and table losses were heavy, and operations were suspended. An unsuccessful effort was made to dispose of the property during the year.

Added interest was given to mining in the St. Helens district by the acquisition of a large area of alluvial ground in the locality of the Launceston and Constable creeks, and embracing the old Transit and Launceston workings. Extensive prospecting is to be undertaken immediately. It has been stated that the early failure of mining in this locality was due to the absence of an adequate supply of water for sluicing purposes, and, provided prospecting results are satisfactory, the present holders contemplate constructing several miles of race to bring in a large supply from the vicinity of the George's River Falls.

Argonaut Tin Mine.—Sluicing operations were continuously pursued on the shallow tin-bearing drifts overlying Thureau's deep lead. There were 74,500 cubic yards of ground treated for a recovery of 26·834 tons of tin ore, estimated to contain 18·577 tons of metallic tin, and valued at £4201·34.

George's Bay Tin Mine.—Operating in comparatively shallow ground, 89,185 cubic yards was hydraulicked for a recovery of 30·046 tons of concentrate, which returned 21·886 tons of metallic tin, valued at £4935·363.

Hunt Tin Mine.—Five men were employed at this mine, and sluicing operations on the Derwent lead resulted in a production of 6·969 tons of metallic tin, valued at £1572·66.

Several small parties were intermittently engaged in ground sluicing in the St. Helens district, and a production of 5·72 tons of metallic tin, valued at £1288·54, was obtained.

A slight depression ensued in mining activities in the Lottah-Weldborough-Moorina areas, but much interest was centred in the investigations made into the possibilities of exploiting the Blue Tier tin-bearing granites, as any practical issues in this respect will resuscitate a decadent mining area and benefit the East Coast generally.

A small party of tributers operated at selected places in the open-cut workings of the old Anchor Mine, and from

battery crushing and table concentration recovered 7·45 tons of concentrate, which returned 4·25 tons of metallic tin, valued at £1489·34. Hydraulic mining was continuously pursued on the greisen leaders at the South Cambria Mine. There were 13,700 cubic yards treated for a recovery of 5 tons of concentrate, containing 3·5 tons of metallic tin, valued at £786·57. About 24,500 cubic yards of material were treated by shallow ground sluicing at the Weldborough Mine for an output of 10·4 tons of tin ore, which returned 7·1 tons of metallic tin, valued at £1605·5. Three men were continuously engaged at the Laffer Mine and hydraulicked 28,000 cubic yards of ground for a recovery of 5·69 tons of concentrate, containing 3·999 tons of metallic tin, valued at £902·9. Remunerative sluicing was carried on at the Weld Mine. An average of 9 men were employed and 19,400 cubic yards of ground was treated for a recovery of 20·24 tons of concentrate, which finally returned 13·876 tons of metallic tin, valued at £3205·3.

Moorina Tin Mine.—Hydraulicking of the deep drifts in the southern section of the workings was unpayable and was discontinued. Attention was then directed to the northern faces where an old tail-race was repaired and a new box-race and hydro-elevator were installed. Sluicing was then resumed, and as operations veered westerly into the deeper ground the recovery and values improved and results were reported to have been profitable. Over 59,000 cubic yards of ground was treated for a recovery of 19·14 tons of concentrate, which returned 12·963 tons of metallic tin, valued at £2957·34.

Miscellaneous ground sluicers and other operators at small mines in the Lottah-Weldborough-Moorina areas accounted for a production of 36·679 tons of tin ore, containing 25·8 tons of metallic tin, and valued at £5446·75. This production gave employment to an average number of 42 men.

Pioneer Tin Mine.—The usual sluicing campaign was pursued with the Nos. 1 and 2 plants. About 474,100 cubic yards of drifts was treated for a recovery of 150·54 tons of concentrate, estimated to contain 106·868 tons of metallic tin, valued at £24,247·117. An average of 60 men was employed.

Limited operations were pursued at the Rajah and Waugh Mines on the Wyniford River. The Rajah Company hydraulicked 26,440 cubic yards of ground for a recovery of 8·689 tons of tin ore, which returned 6·162 tons of metallic tin, valued at £1401·36. Over 12,000 cubic yards of material was treated at the Waugh Mine for an output of 1·63 tons of concentrate, containing 1·165 tons of metallic tin, valued at £262·6.

Eastern Lead Tin Mine.—The major part of the year was occupied on the installation of additional machinery in order to provide for greater head-pressure. The necessary plant was installed, and sluicing was resumed at the close of the year. During the early part of the year 10,000 cubic yards of ground was treated for a recovery of 2·58 tons of concentrate, which returned 1·85 tons of metallic tin, valued at £435·65.

Operators at the New Clifton Mine produced 9·206 tons of ore, containing 2·885 tons of metallic tin, and valued at £1393·6. Engine troubles were experienced and sluicing was only intermittently pursued.

The shallow drifts on Harmon's section were profitably exploited, and 10,738 cubic yards of material were treated for an output of 7·092 tons of tin oxide, which returned 5·085 tons of metallic tin, valued at £1136·6.

Endurance Tin Mine.—The No. 1 plant was in continuous commission, and 170,547 cubic yards of ground was sluiced for a recovery of 144·847 tons of concentrate, which returned 101·636 tons of metallic tin, valued at £23,247·34; and 14·37 ounces of gold, valued at £61, were separated and recovered from mine produce.

Monarch Tin Mine.—In the early part of the year a conservation dam was constructed on the Boobyalla River to augment the water-supply and extend the period for sluicing. Hydraulicking was then resumed, and 132,660 cubic yards of drift was treated for a production of 30·6 tons of concentrate, containing 21·214 tons of metallic tin, valued at £4589·4.

Garfield Tin Mine.—Operations at this mine were not of economic advantage, and were suspended early in the new year. It is estimated that 41,454 cubic yards of material was sluiced, and an output of 6·05 tons of tin ore was obtained, which returned 4·358 tons of metallic tin, valued at £1011·6.

Mussel Roe Tin Mine.—There were 29,000 cubic yards of ground sluiced for a recovery of 7·63 tons of concentrate, containing 5·762 tons of metallic tin, valued at £1261·4.

Ground sluicers in the Bradshaw's Creek-Mount Cameron-Gladstone areas and other miners using the Mount Cameron Water-race accounted for an output of 53·843 tons of tin ore, which returned 37·709 tons of metallic tin, valued at £8523·8. Operations in this connection gave employment to an average of 59 men.

Briseis Tin-mining Company.—This company operated continuously, and employed an average of 103 men. About 519,000 cubic yards of material was sluiced for an output of 302 tons of concentrate, estimated to contain 217·38 tons of metallic tin, valued at £49,457·4 gross. Of the total quantity of material sluiced, 355,000 cubic yards were sluiced through the drift face and 164,000 cubic yards comprised the amount of basalt overburden removed.

The drift face was worked continuously with the Ringarooma water-supply, augmented at times by Cascade River water. The basalt overburden was worked according to the quantity of Cascade water available, which, during the early part of the year, was sufficient for operations on two shifts only.

The water in the Cascade watershed varies greatly with the seasons, and the Cascade dam was laid out to augment the water-supply by about 3500 sluicehead days, or approximately 750,000,000 gallons, its present capacity.

It is interesting to note that 73,443 shots were fired in reducing the basalt boulders to a size suitable for conveyance and dumping by the belt conveyor.

The gravel pumps, working in two series, operated at an increased lift, and forced the feed through a greater column length than formerly, the total lift being 140 feet and the delivery 600 feet. Series working is favoured for high lifts.

Lone Brother Tin Mine.—Ten men were employed at this mine, and the previously established sluicing policy was continued. The concentrate weighed 19·2 tons, and returned 11·968 tons of metallic tin, valued at £2715·74. Owing to a rapid increase in the height of the face and thickness of barren overburden, consideration is now being given to the application of a double-bench system for more economical and safer working.

Ringarooma Tin (Alluvial) Limited.—Preparatory work was undertaken, and some prospect sluicing was done on the tin drifts at the old Mutual Hill Mine. Records show that 18,550 cubic yards of ground were sluiced for a recovery of 7·396 tons of tin oxide, estimated to contain 4·87 tons of metallic tin, valued at £1097·35. Results were regarded as satisfactory, and towards the close of the year additional water rights were acquired; the construction of a conservation dam for a high-level water-supply was commenced, and preparations were made to open up a face for full-scale operations.

Several small parties operated on the shallow drifts in the Cascade River and Main Creek, and accounted for an output of 12·67 tons of concentrate, which returned 8·79 tons of metallic tin, valued at £2018·34.

Arba Tin-mining Company.—Treatment of tailings, which had accumulated in Branxholm Creek from operations by the company, was profitably continued by a tribute syndicate, which employed 10 men. About 94,700 cubic yards of tailings were sluiced for a recovery of 47 tons of concentrate, containing 34·469 tons of metallic tin, valued at £7819·9.

A second party of tributers accounted for an output of 2·526 tons of metallic tin, valued at £593·7, from the treatment of "seconds" produced during previous operations.

Ormuz Mine.—Seven men were constantly employed on the work of hydraulicking the deep drifts forming the marginal faces of the old Arba workings. The production of 9·48 tons of tin oxide returned 6·399 tons of metallic tin, valued at £1437.

Roma Mine.—Fourteen men were employed at this mine, and good results attended sluicing operations on the western rim of the Branxholm Creek lead. The production of 28·798 tons of concentrate returned 20·84 tons of metallic tin, valued at £4750·98.

Ruby Flat Mine.—An output of 18·065 tons of tin oxide, containing 13·327 tons of metallic tin, valued at £2996·6, resulted from the sluicing of 34,800 cubic yards of ground at the old Ruby Flat workings.

Sluicing operations were intermittently pursued at the New East, Montrose, Royal Gordon, Baker's Discovery, and Woods' Mines for a production of 10·909 tons of concentrate, which returned 7·739 tons of metallic tin, valued at £1757·22.

Ground sluicers in the Branxholm areas accounted for an output of 15·137 tons of tin oxide, containing 10·6 tons of metallic tin, valued at £2405·39. Operations in this connection gave employment to an average number of 15 men.

Tin mining was comparatively quiescent in the Ringarooma area. Ground sluicing was periodically pursued by five men for a recovery of 4·05 tons of concentrate, which returned 2·834 tons of metallic tin, valued at £641·26.

An output of 1·218 tons of tin ore from hydraulic mining on the Strait Islands was sent to the Mount Bischoff Smelting Works, and, after treatment, returned 0·73 ton of metallic tin, valued at £162·62.

GOLD.

Gold mining was not more active than during the previous year. A production of 623·75 ozs., valued at £2649·69, was recorded, but it is probable that this was not the total production in the inspection division, as a little difficulty was experienced in obtaining returns, and the abolition of the Gold Buyers Act has increased the difficulty of obtaining complete records of production.

Golden Gate Consolidated Mine.—Operations at this mine dwindled to underhand stoping with one shift on the New Lode at No. 7 level. The eastern prospecting crosscut from the North Gate shaft at No. 14 level was advanced to 283 feet, but the rich stone alleged to have been penetrated by a bore-hole was not encountered. At 223 feet the crosscut intersected a reef up to 3 feet 6 inches in width. This reef was driven on 15 feet northerly and 17 feet southerly, but, as the gold content ranged from 1 dwt. 4 grains to 4 dwts. 11 grains only, the results were not regarded as encouraging and operations were discontinued. At Nos. 7 and 10 levels 261 tons of stone was mined, and returned, through the battery, 214·1 ozs. of gold, valued at £871·95. Battery sands, weighing 2910 tons, was subjected to cyanide treatment, and 292·73 ozs. of gold was obtained, valued at £1225·3.

Old Boys' Gold Mine.—Prospecting was continued, with three shifts, at the 300 feet level. The south-west drive was extended on the lode channel to a distance of 420 feet from the main crosscut, and passed through short shoots of stone carrying visible gold. At 373 feet a pilot winze was sunk 35 feet, and 60 feet of driving was done from the bottom of the winze. The sinking of a second winze was then proceeded with at a distance of 187 feet from the crosscut. Developments were regarded as satisfactory, and, at the close of the year, it was decided to sink the vertical shaft a further distance of 100 feet to enable additional exploration to be carried out before attempting production of gold. Fourteen men were employed.

Prospecting operations by Chesshire and party on the Entrance line of lode at Mangana were attended with interesting developments. The old Majestic tunnel, which had been driven 45 feet on a well-defined reef of no value, was cleaned out and driven 3 feet, where a shoot of gold-bearing quartz was entered. Driving was continued, and from 48 to 128 feet promising "dolly" prospects were obtained. Samples taken by me assayed from 11·75 dwt. of gold and 2 dwts. of silver to 13·85 ozs. of gold and 9·5 dwts. of silver, the latter result being obtained from a sample taken from a selected width of 8 inches of stone on the footwall side of a slicken-side appearing in the reef. A low-level adit was commenced and driven 100 feet on a large faulted formation carrying quartz veins, but a sufficient distance had not been driven at the close of the year to attain the alignment of the exposure in the upper tunnel.

Ten men were engaged in alluvial mining in the Lisle Basin, and a production of 97·55 ozs. of gold was recorded, but there is nothing of moment to be stated in connection with their operations.

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, 1920, within the Queenstown and Zeehan inspection division for the year ended 31st December, 1928.

Accidents.—During the year 18 accidents were registered in this division, 1 fatal and 7 non-fatal. The following table shows the particulars:—

Casualties:

Surface	10	Queenstown:	
Underground	7	Surface	10
Underground (fatal)	1	Underground	8
	—	Zeehan:	
	18	Surface	—
	—	Underground	—
			—
			18
			—

Average number of men employed, Queenstown	1,189
Zeehan	275
Total number of men employed	1,464

The fatal accident occurred in a stope at North Lyell Mine. A miner and his mate, "a shoveller," had just commenced work on the afternoon shift, when approximately 1 cwt. of ore fell from the roof, striking the shoveller on the head, inflicting fatal injuries, from which the unfortunate man died the next morning. This accident pointed out the great necessity for miners testing the roof before commencing work on their shift. In this case this was not carried out, and evidently the ground had winded and came away without warning.

Early in the year a trucker was seriously injured through a blister charge of one plug of gelignite being knocked down an ore pass after being fired or "spit," and exploding in a truck under the chute. The trucker standing at the end of the truck received serious injuries to his body, but fortunately made a good recovery.

On another occasion two men were working in a timber stope when a large quantity of ore came away, knocking down several sets of timber, one man being pinned under the timber, and was lucky to escape serious injury; the other man escaped without injury.

During the last month in the year an unfortunate accident occurred to a man when barring down some ground after firing five short holes to make room for a leg for an ore-bin. From an inquiry it was ascertained that he had the bar behind a lump of ground, when the bar slipped, the man falling backwards, and when getting up the lump of ground fell out on his leg, breaking the bone just below the knee of the right leg, which he had to have amputated seven days after the accident.

The other accidents were of a miscellaneous nature, and were not serious, although necessitating 14 days' absence from work.

A sad fatal accident occurred on the surface at Queenstown, where a man touched a live electric wire carrying 500 volts and was electrocuted. This case came under the Machinery Department.

Settlements of Ground.—At the North Lyell Mine a settlement of ground occurred at the 850 feet level while a stope was being "picked up." Fortunately, however, this was under observation and no accident occurred therefrom. It conclusively proves that to ensure safety a minimum area of ground should be open when a stope has advanced to the "picking-up" stage.

Ventilation.—This important and necessary factor in regard to mining conditions has received considerable attention, and I am pleased to report that the requests from this office for improvements, where required, have been readily acceded to, the managers recognising the importance and advantages of good ventilation in the mines.

Dust Estimation.—During the year measurements of dust have been carried out with the "konimeter," and where results were not satisfactory requests were made for better conditions. Ventilation plays an important part for good working conditions in this respect, and with the use of plenty of water tends to reduce the quantity of dust in the atmosphere to a minimum.

Prosecutions.—Legal proceedings were instituted against six persons for contravention of the provisions of the Mines and Works Regulation Act. Of these, two men were charged for boring dry and were fined £5 and £3 respectively. Two men were charged for entering tunnel while traffic was coming out, and were fined (with costs) 11s. 6d. each. One man was charged with failing to securely cover an ore pass (he was fined £1 6s. 6d.); and one man was charged with failing to return unused gelignite to the magazine underground (he was fined 16s. 6d.). These prosecutions were necessary for more efficiency in the observance and carrying out of the Mining Regulations.

Explosives.—Periodical examinations have been made of explosives in use and magazines. The partly frozen stuff, viz., 300 cases on hand at the end of 1927, at Queenstown, was successfully used, after which no frozen stuff has been received. It has been necessary at times to request more care in handling and conveying explosives in accordance with the regulations, which requests have been acceded to. Testing of fuse has been regularly carried out. A quantity at Zeehan, which showed excessive lateral bursting, was destroyed. Generally the fuse was found in good order.

During the year 2613 cases of gelignite and 20 boxes of detonators, containing 100,000 detonators, were landed at Regatta Point, the unloading of which came under the supervision of this office to ensure it being carried out in a safe manner.

Inflammable Liquids.—One new depot and two bowsers have been erected in Queenstown for the storage of mineral spirit. In compliance with the provisions of the Inflammable Liquid Act, ispections have been made of depots and premises, and any irregularities discovered have been attended to.

Ropes, Cages, Surface Works, Machinery, &c.—Periodical inspections have been made of surface workings, including quarries and reduction and smelting plants. There has been a satisfactory response to any requests for protection of machinery and general safety; ropes and cages have been examined, and any faulty ropes replaced with new ones. The quarries have been worked under reasonably safe conditions.

Health and Sanitation.—The maintenance of satisfactory conditions pertaining to health and sanitation were given due attention. Changing-houses have been kept clean, with a good supply of water, and latrine accommodation, with a few exceptions, has been reasonably satisfactory.

General.—Considerable attention has been given the underground workings on the Lyell field. The necessity for barring down any affected or loose ground at the commencement of each shift has been emphasised. There has been a tendency to carry the stopes too high, due chiefly to back holes being bored flat or on the incline slightly. This matter has been brought under the notice of the management, who have agreed to comply with the regulations in this respect. During the course of inspections attention has been given to ensure reasonably safe working conditions, and recommendations made are with a view to attain that object, hence promptness in the carrying out of an inspectors "record" is essential for safe working conditions.

Summary of Mining Activities.—Mount Lyell Mining & Railway Co. Ltd.—A large amount of developmental and constructional work has been finalised during the year under review, the most important being the completion of the new refinery for refining the "blister" copper, which is working with excellent results, and the completion of the North Lyell tunnel, approximately 7000 feet long, which connects with the North Lyell Mine at the 1100 feet level, this latter enabling a change over from the North Lyell Mine, *via* the haulage to a direct entrance from the tunnel smelters end. It stands to the great credit of the surveyor of this tunnel, which was being driven from the both ends, *i.e.*, from the shaft at the 1100 feet level and from the approach at the surface, that a most accurate connection was made, the error in alignment being 2¾ inches and in level ⅜-inch only. This tunnel is now the means of transport of ore direct from the mine to the reduction works bins. An electric trolly system tramway is installed, over which a 9-ton electric locomotive hauls approximately a 60-ton rake of ore to the bins. It is noteworthy that a regular service is being maintained.

Development work at the 1200 feet level North Lyell Mine has proved the continuation downward of the rich bornite ore showing at 49 stope of the 1100 feet level.

Important developmental work has been carried out at Lyell Comstock Mine, and it is pleasing to note that preparations are being made to work this area on a large scale. It is understood that a new deviation tramway will enable the ore to be brought direct to the concentration bins for treatment.

Considerable diamond drill prospecting has been carried out on the old "Tharsis" leases, which has proved the existence of a large area and tonnage of low grade copper ore, which, with the present economical methods of treatment and satisfactory price of copper, will probably be mined and treated at a later period.

Block 14 Exploration Company.—This company has taken an option over the old Tasman & Crown Mine, and are engaged with 14 men opening up the mine and carrying out a developmental programme from the bottom tunnel and the 134 feet level. The bottom tunnel is approximately 250 feet below collar of shaft. Systematic work is being carried out, and it is hoped that the management will be successful in opening up large enough silver-lead ore bodies to enable the company to exercise its option.

Prospecting Work, Mt. Huxley.—The Pioneer Syndicate are operating on a quartz formation, carrying gold on the slopes of Mount Huxley. A tunnel is being driven to intercept the lode at approximately 100 feet in depth, this entailing 150 feet of driving. There is now only 20 feet of driving to complete the tunnel to the lode. The future working of this mine will depend on the assay value of the quartz at the 100 feet level.

ZEEHAN DISTRICT.

South Comet Silver-Lead Mine.—Unfortunately this mine ceased operations during the latter period of the year, financial difficulties and the unsuccessful treatment of the zinc-lead ore being the chief reasons. The mine, which is being worked from tunnels, is just at a stage when further development work should be carried out from the lower tunnel. A plan and section of the mine would be helpful to the successful development of the property. It is sincerely hoped that the negotiations now in progress will soon result in a further trial, and with economical management there are good prospects for profitable working.

Federation Tin Mine.—Excellent surface constructional work was carried out on this mine, and an efficient electrical power plant installed. However, just when milling was to be started the mine closed down, being short of capital. Present indications are that, with Government assistance, work will again be resumed at an early date. It is hoped that the tin contents of the lodes will be high enough to show profitable treatment.

Comstock Area.—Considerable work has been done in this area during the year, and results proved that this part of the field is worthy of further prospecting. J. Dunkley and party have been working on a nice deposit of high grade silver-lead ore, which has turned out highly payable. Further prospecting work will be carried out in this part of the field during the current year.

Big Ben Area, North Zeehan.—Work in this area was somewhat retarded during the year, but has again been taken up by the original holders, Messrs. Clark and Blacklow. There are good prospects on this area if the lodes were tested at depth. The grade is high, the silver-lead sulphide is clean, and the lodes show considerable first-class ore. The Government is assisting the owners to the extent of £300, on the £1 for £1 principle, to sink the shaft and test the lodes at a depth of 100 feet. This will help considerably in proving this part of the field.

Tributes.—Several smaller mines or tributes were periodically inspected, but showed nothing of importance.

Dundas Area.—Certain development work was carried out on the Razor Back Tin Mine, chiefly in driving a tunnel to cut the pyritic lode carrying tin in the old winze. However, the prospecting was stopped too soon, and further development work should be carried out on this property.

Copper Nickel Ore.—At the 5-mile from Zeehan operations are being carried out at the copper-nickel mines, and, providing a suitable market can be found, these mines will probably be working during the current year and employing a fair number of men. Negotiations are now in progress for the sale of the ore, which, if satisfactory, will mean the opening up of the copper-nickel mines immediately.

Prospectors.—Several parties of men have been prospecting, with Government assistance under the Aid to Mining Act, at Dundas and in the vicinity of Macquarie Harbour. The very wet and rough weather retarded progress. Nothing of importance, as far as I am aware, was discovered.

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, 1928, are as follows:—

Output.		Value. £
Copper (tons)	6,426	445,172
Gold (ozs.)	2,024	8,598
Silver (ozs.)	128,360	15,211
Lead (tons)	331	6,971
Zinc (tons)	429	10,951
Tin (tons)	16	3,602
Nickel (tons)	10	1,697
Total gross value of output		£492,202

The gross value of the output from the Queenstown-Zeehan division for the year 1928 shows an increase of £61,173 above the value of last year's production.

JOHN VAIL,
GOVERNMENT PRINTER, TASMANIA.