MINERAL WEALTH OF AUSTRALIA AND NEW ZEALAND.

The foundation of the nationhood of Australia and New Zealand was laid when the news of the discovery of gold in payable quantities spreading throughout the World brought the first great inrush of population. Since that date the total value of the production of mineral wealth in the Commonwealth of Australia exceeds £1,000,000,000, while in New Zealand the total production has been £110,000,000, With such a record as evidence the conclusion is inevitable that the mineral wealth of these two Nations is on a vast scale and is of the very greatest national importance.

The object of the present article is to give some indication of the amount and extent of this mineral wealth awaiting development and utilisation in the Commonwealth of Australia and in the Dominion of New Zealand.

Gold:

The total production of gold in Australia and New Zealand up to date is £700,000,000. This production has been a great exhaustion of the alluvial gold deposits, and in addition has nearly exhausted several of the more important goldfields. Thus the previously important Ballarat field is now nearly exhausted, and the production at fields like Bendigo, Kalgoorlie, Mount Morgan and Waihi is very much below what it was some years ago. The ore reserves in these districts and in many others have been largely depleted, but cannot be said to be exhausted. The future of gold mining in Australia is not by any means black although perhaps its best days are over. There are, however, large areas in Western Australia, the Northern Territory and Papua which are definitely known to be gold-bearing and in which future prospecting will surely disclose payable gold deposits.

Osmiridium:

This metal being one of the rarer precious metals is mentioned next to gold not because of the aggregate value of the output, but because of the unique position Australia holds in regard to the world's production. This mineral or alloy of metals is used largely in the manufacture of fountain pens, and Tasmania, the smallest State of the Commonwealth, produces approximately 90 per cent of the world's output. The price for this mineral reached the figure of £42.10.0 per ounce in March 1919. The present price is in the vicinity of £18. The total production from Tasmania to date is valued at £170,000.

An investigation by the Geological Survey of Tasmania of these deposits has shown that they are of considerable extent and importance and are destined to supply an appreciable output for many years to come.

Osmiridium also occurs in Papua, and indiciations undoubtedly point to an appreciable potential output from that region.

Zinc, Lead and Silver:

The reputation of Australia as a silver producer began with the first production at Broken Hill. The romantic early days of that field are associated with the

production of high grade silver ores. With penetration to greater depths the silver production has become subordinate to that of zinc and lead, and at present our silver production is intimately bound up with the production of zinc and lead throughout the Commonwealth.

In New Zealand the silver production was associated with that of gold and with the falling off of the gold yield the silver yield has decreased also.

The Commonwealth of Australia, however, possesses very great and valuable resources in zinc, lead and silver. The two great fields which possess reserves of these metals of great national importance are Broken Hill in New South Wales and Read-Rosebery in Tasmania. In the former field the definitely proved ore reserves exceed 12,000,000 tons carrying zinc 13 per cent, lead 15 per cent and silver 8 ozs. to the ton. The Read-Rosebery district contains proved ore reserves in the vicinity of 2,000,000 tons of the average value zinc 27 per cent, lead 7 per cent, silver 9 ozs. per ton, gold 3 dwts. per ton. At Broken Hill there is a belt 3 miles in length not completely explored, and in Tasmania a length exceeding 7 miles.

Copper:

Australia possesses very valuable and important reserves of copper. The great copper mines of Mount Lyell, Mount Morgan, Walaroo and Moonta, Great Cobar, Mt. Elliott, Cloncurry, etc., indicate the importance of this metal's production in the past. Some of these mines have closed down or are working on a reduced scale, as for example, Cobar, Mt. Elliott and Walaroo and Moonta. The Mount Lyell and Mount Morgan mines, however, still contain very large ore reserves.

In addition to these mines there exist undeveloped copper deposits in various parts of the Commonwealth of an inestimable future value.

In the Mount Lyell district there are great future possibilities quite apart from the ore bodies at present being worked.

In every State of the Commonwealth, with the exception of Victoria, there are zones of copper deposition which must ultimately give rise to important copper mines.

Important copper deposits are known in Papua, and this country must in the future become an important copper producer.

The Cloncurry district in Queensland, which is probably the richest and most extensive copper-bearing area in the Commonwealth, has not been developed to anything approaching its possibilities owing to transport conditions. When these troubles are overcome the production of this district, combined with that of the important deposits of Western Australia, Tasmania, New South Wales and South Australia, will add very considerably to the total annual production of the primary products of the Commonwealth.

Tin:

The Commonwealth of Australia is rich in tin. The three States of Tasmania, New South Wales and Queensland supply the main production. The achievements in the past are indicated by the reputations gained by the Mount Bischoff

Mine, Briseis and Pioneer in Tasmania, and the various mines operating in the New England district in New South Wales and the Herberton district in Queensland. The production of some of these mines is now appreciably less than previously and their ore reserves are being depleted. The undeveloped portions of the tin fields of these three States however are of such extent as to warrant the statement that Australia must continue to be a valuable tin producer for many years to come.

The field which will undoubtedly be a big tin producer in the future is the Renison Bell field in Tasmania. This field contains large ore bodies of dense stanniferous pyrrhotite. With the solving of the metallurgical problem in connection with these deposits tin reserves of undoubted national importance will be made available.

Iron:

Whilst the iron resources of the Commonwealth cannot compare with the enormous resources of Europe and America, yet they are undoubtedly considerable and of great importance to the development of Australia as a Nation. It is only within the last few years that there has been any appreciable development of the iron and steel industry in the Commonwealth, and consequently the production of iron ore up to the present is relatively small. The trend of industrial development within the British Empire indicates, however, that in the very near future our iron ore resources will be put to more effective use.

The iron ore deposits of importance so far discovered are confined to South Australia, Tasmania, Western Australia and New South Wales. The Iron Knob and Iron Monarch deposits in South Australia, now being utilised by the Broken Hill Proprietary Co., at the rate of approximately a quarter of a million tons per annum, are estimated to contain at least 21,000,000 tons of high grade ore.

The iron ores of Tasmania, with a total reserve of approximately 42,000,000 tons, consist partly of the haematite ores of Blythe and Ilfracombe and partly of the high grade magnetite ores of Rio Tinto and Comstock.

The Cadia, Talawang etc., deposits of New South Wales are estimated to contain some millions of tons.

The deposits of Western Australia are extensive and important, particularly the ores of the Murchison field and of Koolan Island, Yampi Sound. The latter deposit has exceptional facilities in that deep water is available right up to the edge of the deposit which can be worked by open cut methods. This field is estimated to contain many millions of tons.

Sufficient is already known with regard to the iron deposits of the Commonwealth to ensure there is such a quantity available as will ensure that Australia will be able to fulfil her greatest destiny as a Nation.

The iron ore resources of New Zealand are also very considerable, and must undoubtedly play a great part in the development of that Dominion. These iron deposits are located in the Para Para and New Plymouth Districts and consist of limonite ores in the former division and magnetite iron sands in the latter district. The estimated reserves in the Para Para district are given as at least 64,000,000 tons. The New Plymouth iron sands are of very

great extent. No estimate of quantity has yet been made, but undoubtedly amounts to many millions of tons.

Tungsten:

The States of Queensland and Tasmania, together with the Northern Territory, are rich in tungsten deposits. The chief mineral is wolfram which occurs in very large deposits particularly in Queensland and the Northern Territory. The inaccessibility of a large number of these deposits is a present drawback, but future development of Australia will overcome this difficulty. In Tasmania valuable wolfram lodes occur, and a very important deposit of scheelite occurs at King Island.

In the Dominion of New Zealand there occur very valuable deposits of scheelite which are undoubtedly future sources of the metal tungsten.

Coal:

Australia and New Zealand both possess immense reserves of coal. The varieties of these coals range from lignites and brown coal through all grades of bituminous coals to sub-anthracitic, but it is noticeable that there is almost a complete absence of true anthracites. The coal reserves, however, are more than adequate to ensure the maximum of national development.

Of the States of the Commonwealth of Australia, New South Wales and Queensland undoubtedly possess the greatest coal reserves. The only State of the Commonwealth which does not possess adequate coal reserves is South Australia, which however possesses valuable deposits of brown coal over an area of approximately 42 square miles.

The coal reserves of New South Wales are estimated at approximately 116,000,000,000 tons. The quality is a high grade bituminous coal.

In Queensland there are even larger coal reserves of fair to high grade bituminous coals. The Ipswich and Burram fields alone occupying an area of approximately 30,000 square miles. At Callide occurs what is the thickest known coal seam in the World, namely 90 feet of high grade coal without a single band. The coal reserves of Queensland are put down as a minimum of approximately 20,000,000,000 tons.

In Victoria the South Gippsland field contains fair grade sub-bituminous coal which is mined at the Victoria State Coal Mine at Wonthaggi. The reserves of this class of coal are estimated at approximately 15,000,000 tons. Victoria, however, possesses enormous reserves of brown coal. These beds which occur in the Gippsland and neighbouring districts reach the enormous thickness of between 800 and 900 feet. They are of similar grade to the brown coals of the Rhine Valley in Germany and are now being exploited in a manner similar to the method of utilisation in Germany. The available reserve is estimated at 30,000,000,000 tons.

Important coal reserves occur in the South-western portion of Western Australia, particularly in the Collie District. The coal is of a sub-bituminous character.

In Tasmania the coalfields are widely distributed throughout the State. The coal is of a bituminous and sub-bituminous character, and the total coal reserves are estimated at 200,000,000 tons.

The coal reserves of the Commonwealth of Australia may therefore be stated to be simply enormous, and possessing such a valuable asset as this coal undoubtedly forms the future of Australia cannot be anything but very great.

New Zealand possesses valuable and considerable coal reserves. It is evenly distributed throughout the North and South Islands. The quality ranges from lignites through bituminous coals to sub-anthracitic coals. The Westport coal of New Zealand is perhaps the best steaming coal produced in the Southern Pacific. The total coal reserves of New Zealand are estimated at 3,300,000,000 tons.

Oil Shale:

Oil shales of different varieties are known to occur in New South Wales, Tasmania and Queensland. The deposits of kerosene shale in New South Wales have been worked at intervals, but unfortunately not with any very pronounced economic success. This is due partly to the inconstant nature of the deposits themselves and the absence of preliminary work to accurately estimate reserves, and partly to the incompleteness of the technology of distillation. The known oil shale reserves are very considerable and undoubtedly represent the basis of a very important industry in the development of the Commonwealth.

In Tasmania there are two types of oil shale - the Tasmanite of the Mersey Basin which yields 40 gallons of oil to the ton, with a reserve of at least 12,000,000 tons, and the several varieties of kerosene shale at Preolenna and Barn Bluff. These kerosene shales yield from 50 to 120 gallons of oil to the ton and the reserves are of the order of some millions of tons. These deposits are not at present successfully worked. This is due to the fact that no systematic investigation of the deposits by boring has been attempted, nor has the method of distillation been attacked in the light of modern knowledge.

In Queensland oil shales yielding from 5 to 37 gallons of oil to the ton are found in the Port Curtis District, and also in the Ipswich district.

These oil shale deposits of the Commonwealth, in view of the absence of liquid oil in the south-eastern portion of Australia at least, are of the greatest national importance and are destined to play a very great part in a the economics of the Australian Nation.

In New Zealand oil shales are widely distributed, particularly at Orepuki near Invercargill and at Waikaia. The yield of oil is in the vicinity of 30 gallons to the ton. The known reserves of oil shale run inton several millions of tons.

Cement Materials and Miscellaneous Minerals:

Australia is rich in the raw materials used in the manufacture of Portland cement. This applies to practically all the States, but particularly to New South Wales and Tasmania.

Paint materials are widespread and valuable.

Clays suitable for the ceramic industries occur in Western Australia, Victoria and Tasmania.

Nickel does not occur to any extent on the Mainland of Australia, but in Tasmania rich nickel deposits occur in the neighbourhood of Zeehan.

Asbestos of good quality occurs in Western Australia, New South Wales and Tasmania.

Gypsum is available in large quantities in South Australia.

Magnesite occurs in South Australia, Western Australia, New South Wales and Victoria.

Salt from salt lakes is obtained in Victoria and South Australia and Western Australia. Salt beds have been recently discovered in South-eastern Tasmania.

Sulphur in the form of iron pyrites is available in large quantities of the West Coast of Tasmania as well as in other parts of the Commonwealth. New Zealand contains rich deposits of free sulphur.

Arsenic ores occur particularly in Queensland and Victoria.

Bismuth has been produced for years in New South Wales, Queensland and Tasmania, and there are considerable reserves of this metal.

Molybdenite occurs in both New South Wales and Queensland in sufficient quantity to ensure appreciable production for years to come.

Manganese occurs in large quantities in South Australia and Queensland.

The rare metal tantalum, as the mineral tantalite, occurs in large quantities in Western Australia.

The precious metal platinum is found in both New South Wales and Victoria.

Conclusion:

It is hoped that this short summary of the mineral wealth of the Commonwealth and New Zealand will have given to the reader some conception of the resources that are awaiting development and which are available wherewith to build up to their highest state these two young Nations of the Southern Pacific.

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