MINERAL RESOURCES.

ALMOST all the principal metals of economic value are found in Australasia, and many are common to several of the States. In dealing with the occurrence and value of mineral deposits, a classification has been made into noble and other metals, carbon minerals, salts, stones and clays, and diamonds and other gem stones.

GOLD.

Gold, the most valuable of noble metals, is found throughout Australasia, and the important position at present occupied by these States is largely due to discoveries of this metal, the development of other industries being, in a country of varied resources, a natural sequence to the acquisition of mineral treasure. Settlement in Australia was still young when many-tongued rumour spoke of the existence of the precious metal, but it was not until the 16th February, 1823, that the Government was officially apprised of a discovery destined to be the precursor of a prosperity seldom surpassed in the history of nations. On the date mentioned Mr. Assistant-Surveyor M'Brien reported that at a spot on the Fish River, about 15 miles east of Bathurst, he had discovered gold. Mention is made in the early records of New South Wales of several other finds, but it remained for Count Strzelecki and the Rev. W. B. Clarke to demonstrate the existence of the precious metal in payable quantities, and to assert their belief in its abundance, an opinion strongly supported in England by several eminent authorities, and substantiated by Hargraves' discovery in the year 1851. The gold-fields of Lewis Ponds and Summer Hill Creek had hardly been opened up when, on the day that witnessed the severance of the Port Phillip district from the mother colony of New South Wales, Mr. J. M. Esmond discovered gold in Victoria. Shortly afterwards a rush set in for Ballarat, and the gold fever took possession of Australia. The following year (1852) saw gold found in South Australia and Tasmania; the rush to Canoona, in what is now Queensland, took place in 1858; and gold was discovered in New Zealand in the same year, though it was not until 1861 that a large population was, by the prospect of rapidly obtaining wealth, attracted to the last-mentioned colony. The last of the States in which extensive deposits of the precious metal were found was Western Australia, and the mines there are now the richest in Australasia, and have proved an enormous source of wealth to the State.

From the date of its first discovery, gold to the value of nearly 460 million pounds sterling has been obtained in Australasia. Towards this total Victoria has contributed no less than 260 millions, and for many

years that State was the largest gold producer of Australasia. In the year 1897, however, for the first time, the production was surpassed by that of Western Australia, and the latter State has increased its advantage each year until in 1901 the output was valued at £7,235,653, as against £3,102,753 in Victoria. The yield of gold in Victoria has been well maintained for many years, and each successive year from 1893 to 1899 showed an increase. In 1900, however, the output fell considerably short of that in 1899, being only 807,407 oz. compared with 854,500 oz., and in 1901 there was a further reduction to 789,562 oz., valued at £3,102,753. In 1901 the Bendigo district, with 212,026 oz., supplied the largest portion of the gold yield of the State, followed by the Ballarat district with 169,433 oz., and Beechworth with 114,331 oz. The number of men engaged in gold-mining during 1901 was 27,777, of whom 12,886 were alluvial miners and 14,891 quartz miners, the total being 1,258 less than the number in 1900. The dredging operations carried on during the year were attended with fair success. The quantity of material treated was about 6,000,000 cubic yards, from which 28,717 oz. of gold were recovered. The number of men engaged was 919.

Queensland promised at one time to overtake Victoria in the annual production of gold, but so far the southern State has maintained its position, although the production of Queensland advanced steadily up to the year 1900. In 1889 the production was valued at £2,586,860, but it then diminished, and this amount was not again reached until 1898 when the value was £2,750,349. In 1899 it increased to £2,838,119, and in 1900 to £2,871,709, being the highest value yet recorded. In 1901 the gold won amounted to 835,553 oz. or 589,382 oz. fine, valued at £2,541,892, showing a decrease of £329,817 on the value of the preceding year. The decrease is not attributed to the waning productiveness of the mines, but to the exhaustion of the creek sands and the heaps of old tailings that have for some years past helped to swell the output. The scanty water supply on some of the fields, especially Mount Morgan, where partial closing of the mines was necessitated, also tended to diminish production. The attempt to recover gold by the process of dredging has so far proved a failure. During 1901 five dredges were at work, but not one was even moderately successful, the roughness of the ground and want of water being the causes of failure.

For many years the Charters Towers field has been the chief gold-producing centre, and the year 1901 was no exception, although the output was considerably less than in 1900. The production in 1901 amounted to 366,431 oz., valued at £999,545, being 88,248 oz. less than in 1900. The decrease is due to the extinction of the industry having for its object the recovery of gold which had lodged in the beds of those creeks which in times past had served as channels for the escape of residue from the mills. Charters Towers is a field of deep sinking, and a gold-bearing reef has been intersected at a depth of 1,815 feet, while operations are now in progress by which it is hoped to cut one of the largest reefs at depths of 2,500 and 3,000 feet respectively.

The yield of the Mount Morgan field in 1901 amounted to 155,888 oz., valued at £615,679, and of this quantity no less than 155,421 oz. were obtained from the celebrated Mount Morgan mine. This mine continues to yield payable ore as fast as the treatment works can deal with it, notwithstanding the fact that up to 30th June, 1901, no less than 2,333,105 oz. of gold, valued at £9,516,694, had been obtained. The output for 1901 was 39,617 oz. less than in the preceding year, but this was caused by the scanty supply of water. The machinery employed in the Mount Morgan mine on the 31st December, 1901, was valued at £517,228, while about 2,000 men were employed in the mine and works. The total number of men engaged in gold-mining in Queensland at the end of 1901 was 9,438, of whom 7,340 were quartz miners and 2,098 alluvial miners, 465 of the latter being Chinese. As in Victoria, the number of Chinese engaged in gold-mining is decreasing.

In New South Wales the greatest annual production of gold occurred in 1852, soon after the first discovery of the precious metal, when it was valued at £2,660,946. The only other year which saw a production in excess of two millions sterling was 1862, the amount reaching £2,467,780. In 1874 the yield had fallen to 271,166 oz., valued at £1,041,614, and thenceforth the industry declined considerably in importance, reaching its lowest point in 1888, when only 87,541 oz., valued at £317,241, were produced. From that date a steady improvement took place, and in 1894 the Government took the step of furnishing large numbers of the unemployed with miners' rights and free railway passes, and sending them to the abandoned alluvial fields as fossickers. This action, with the increased attention paid to quartz-mining, nearly doubled the production, the quantity obtained during the year being set down at 324,787 oz., valued at £1,156,717; while in 1895 the yield reached 360,165 oz., of a value of £1,315,929—the highest since 1873. In 1896, however, this yield was not maintained, the production amounting to 296,072 oz., valued at £1,073,360. From 1897 to 1899 the yield showed a decided improvement, and in 1899 the production was 496,196 oz., valued at £1,751,815, being, with the exception of five years, the highest total recorded. In 1900 it fell to 345,650 oz., valued at £1,194,521, while in 1901 the production declined still further, and showed a total of only 267,061 oz., valued at £921,282. The total quantity of gold won up to the end of 1901 was 13,475,633 oz., valued at £49,661,815. The yield for 1901 is the lowest since 1893, and this may be accounted for by the dry season and the reduced number of gold-seekers. Owing to the scarcity of labour in the country districts and, consequently, the higher rate of wages prevailing many prospectors were induced to abandon their claims in favour of employment less precarious and more remunerative. In the Western district most of the mines, including Cobar, the chief gold-producing centre, were hampered in their operations by the want of water, while others were compelled to close altogether during part of the year. The great hopes entertained as to the future of gold-dredging

have only been partly realised, and until more care is exercised in the selection of suitable sites, a large measure of success cannot be looked for. The quantity of gold saved by dredges during 1901 was 23,585 oz., valued at £89,628. The number of plants erected or in process of erection at the end of the year was 43, and the value £273,333. The principal seats of alluvial mining in the State are the Bathurst and Mudgee districts, and the country watered by the various feeders of the Upper Lachlan, and also the Tumut and Adelong and Braidwood districts; while the principal quartz-veins are situated near Adelong, Armidale, Bathurst, Cobar, Hill End, Orange, Parkes, and Wyalong. Of the mines recently developed, that at Mount Boppy, near Cobar, is by far the most promising. The lode is of good depth and has already been traced over 1,000 feet on its course, and the mine now ranks as one of the foremost in the State. Cobar again maintained the position occupied in the preceding year as the chief gold-producing centre, the output for 1901 being 42,299 oz. The next fields in importance were—Wyalong, 21,717 oz.; Hillgrove, 14,749 oz.; and Araluen, 12,380 oz. The estimated value of the machinery on the gold-fields, including dredging plant, at the end of 1901 was £1,080,065, and the men engaged in the industry numbered 12,064.

Until a comparatively recent date, Western Australia was considered to be destitute of mineral deposits of any value, but it is now known that a rich belt of mineral country extends from north to south. The first important discovery was made in 1882, when gold was found in the Kimberley district, but it was not until a few years later that this rich and extensive area was developed. In 1887 gold was found at Yilgarn, about 200 miles east of Perth, the find possessing importance as the precursor of the discovery of the immense tracts of gold-bearing country, the knowledge of the existence of which has drawn population from all parts of Australasia and brought the State into the prominent position which it occupies at the present time. General attention was first attracted to these fields by further discoveries at Southern Cross, to the east of Yilgarn; and the sensational finds at Coolgardie, which followed in 1892, resulted in a rush to Western Australia which was reminiscent of the experiences of the fifties in the older-settled portions of the continent. Thereafter, before the march of the prospector, the known gold-bearing area was rapidly extended, and in 1894 the country was divided into separate gold-fields, so extensive were the preparations for its exploitation. At the present time, there are nineteen gold-fields in the State, the most important, from the point of production in 1901, being East Coolgardie, Mount Margaret, and North Coolgardie, in the eastern district; and Murchison, in the central district. For the past four years Western Australia has held the premier position among the Australasian States for its gold production, and the wonderful progress of the industry in preceding years has not only been fully maintained during 1901, but has surpassed anticipations. The total production for the year amounted to 1,879,391 oz., valued at £7,235,653, as

compared with 1,580,950 oz., valued at £6,007,610 in 1900. The output was the largest yet recorded, exceeding that for 1899, which had hitherto been the highest by 235,514 oz. Steady progress has been made on all the fields, but the most substantial increases were obtained from the Murchison, East Murchison, Mount Margaret, North Coolgardie, and East Coolgardie fields, the yields ranging from 39 to 18 per cent. higher than those of the preceding year. As there were no discoveries of note made in 1901, and the Phillips River field which was proclaimed during the year has developed but slowly owing to the absence of crushing facilities, the increased output may be ascribed to the more scientific methods employed and the improved class of machinery in use. The number of men engaged in gold-mining at the end of 1901 was 19,771, of whom 16,755 were quartz miners and 3,016 alluvial miners.

New Zealand was for many years a large producer of gold, and from 1865 to 1871 the value won amounted to over £2,000,000 each year. Since then the production has declined until in 1894 it was only £887,839, but this amount has been considerably increased of late years, and in 1901 the production was 455,561 oz., valued at £1,753,783, the highest yield since 1873. The increase of late years is due to the introduction of English capital into the mines which has enabled the claims to be opened up to greater depths, and to the establishment of the gold-dredging industry, which is being carried on successfully in many parts of the colony. A great deal of attention is being paid to the auriferous deposits in river beds and in deep wet ground on the southern gold-fields, and in 1901 there were 145 dredges, valued at £528,600, working in the Otago, Nelson, and West Coast districts. As showing the profitable nature of dredging, the value of the gold obtained in this manner during the year ended 31st March, 1901, was £287,061, while the industry gave employment to 965 men. The number of men engaged in gold-mining in 1901 was 12,533.

Although payable gold was found in Tasmania in 1852, yet it was not until the seventies that the metal was mined for on an extensive scale, the total production to the end of 1870 being less than 4,000 oz. In 1878 the value of gold produced suddenly rose to £100,000, and this total has been gradually increased, until in 1899 it was valued at £327,545, being the highest yet recorded. The production in 1901 amounted to 75,831 oz., valued at £295,176, and showed a slight decrease on the values in the two preceding years. Beaconsfield is the principal gold-field in the State. It is situated on the west side of the river Tamar, 26 miles north-west of Launceston, and formerly produced a large quantity of alluvial gold, while there is also a deep lead carrying good gold. The Tasmania mine, on this field, is the largest gold-producer in the State, and up to 30th June, 1901, yielded 520,614 oz., valued at £1,907,279, out of which £745,072 has been paid in dividends. The Lefroy field has been another important centre of gold-production, and, aided by Government assistance to the amount of £2,000, an effort is

being made to cut the reef by driving at the 1,200-foot level. At Mathinna a large quantity of gold has also been obtained. The principal mine on this field is the New Golden Gate, the deepest in the State, its main shaft being 1,330 feet. This mine has yielded 174,097 oz. of gold, valued at about £643,654, and up to 30th June, 1901, had paid £300,000 in dividends. At Mangana, active prospecting has been going on for some time, and rich stone has been obtained from the Golden Entrance and Fingal Reefs mines. In the Western District a little alluvial gold is obtained, while north of the Pieman River there is a large extent of auriferous country, but owing to the dense vegetation prospecting is difficult. Attempts are being made to recover gold by the process of dredging, and three dredges were at work on 30th June, 1901, but the results were disappointing. The men engaged in gold-mining during 1901 numbered 1,112.

Of all the Australian States, South Australia has produced the smallest quantity of gold, the total output from the commencement of mining operations being valued at less than £2,400,000. The highest production was in 1893, when it reached £153,132; but it has gradually declined, and the value has not amounted to £100,000 in any of the last four years. In the state proper the yield is very small, amounting to but 4,918 oz. in 1901, the balance of 22,572 oz. being obtained from the Northern Territory, the total value amounting to £93,222. The mines in the Northern Territory are largely in the hands of Chinese, but a number of properties have been acquired by an English company, which has erected the works necessary for their development. The total number of men engaged in gold-mining in South Australia was 2,000, of whom 1,000 were in the Northern Territory, the majority of the latter being Chinese. About a fourth of these Chinese are physically incapable of doing a fair day's work, and are dangerous from a sanitary point of view. Possessed of no means whatever, and with no proper tools for the search for the precious metal, they eke out a miserable existence by mining a little alluvial gold.

The following table gives the value of gold raised in each State up to the end of 1901, and its proportion to the total amount:—

State.	Production of Gold.	
	Value.	Proportion raised in each State.
	£	per cent.
New South Wales	49,661,815	10·8
Victoria	260,489,201	56·7
Queensland	52,751,675	11·5
South Australia	2,388,197	0·5
Western Australia	30,149,712	6·5
Tasmania	4,893,588	1·1
Commonwealth	400,334,188	87·1
New Zealand	59,159,883	12·9
Australasia	459,494,071	100·0

It will be readily understood from this and the following table how Victoria, although in area the smallest of the group with the exception of Tasmania, achieved the foremost position amongst the Australasian States, and retained that place so long as the powerful attraction of gold continued, while the source of Western Australia's progress is also fully disclosed. The following table shows the value of the gold raised in the various States during each year for which records are available, but, for reasons which are explained in the next paragraph, discrepancies exist in the total values shown for several of the States :—

Year.	New South Wales.	Victoria.	Queensland.	South Australia.	Western Australia.	Tasmania.	Commonwealth.	New Zealand.
	£	£	£	£	£	£	£	£
1851	468,336	580,548	.....	.....	.....	.....	1,048,884	.....
1852	2,660,946	10,953,936	.....	.....	.....	.....	13,614,882	.....
1853	1,781,172	12,600,084	.....	.....	.....	.....	14,381,256	.....
1854	773,209	9,568,260	.....	.....	.....	.....	10,341,469	.....
1855	654,594	11,172,260	.....	.....	.....	.....	11,826,854	.....
1856	689,174	11,942,940	.....	.....	.....	.....	12,632,114	.....
1857	674,477	11,046,268	.....	.....	.....	.....	11,720,745	40,422
1858	1,104,175	10,112,908	.....	.....	.....	.....	11,217,083	52,464
1859	1,259,127	9,122,868	.....	730	.....	.....	10,382,725	28,427
1860	1,465,373	8,626,800	.....	.....	.....	.....	10,092,173	17,685
1861	1,806,171	7,869,812	.....	.....	.....	.....	9,675,983	751,873
1862	2,467,780	6,633,124	.....	12,442	.....	.....	9,113,346	1,591,389
1863	1,796,170	6,503,420	30,000	880	.....	.....	8,335,470	2,431,723
1864	1,304,926	6,181,748	.....	.....	.....	.....	7,486,674	1,856,837
1865	1,231,243	6,172,752	.....	.....	.....	.....	7,403,995	2,226,474
1866	1,116,404	5,913,120	79,143	.. ..	.....	4,382	7,113,049	2,844,517
1867	1,053,578	5,732,984	170,090	.....	.....	2,536	6,959,188	2,698,862
1868	994,665	6,536,800	429,907	2,936	.....	514	7,964,822	2,504,326
1869	974,149	5,349,184	451,352	15,593	.....	7,475	6,797,753	2,362,905
1870	931,016	4,891,192	351,412	24,217	.....	14,218	6,212,055	2,157,585
1871	1,250,485	5,421,908	504,876	6,000	.....	16,055	7,199,324	2,787,520
1872	1,644,177	5,130,084	592,993	6,363	.....	15,309	7,388,926	1,731,261
1873	1,396,375	4,964,820	555,310	293	.....	18,390	6,935,188	1,987,425
1874	1,041,614	4,623,888	561,255	4,175	.....	18,491	6,249,423	1,505,331
1875	877,694	4,383,148	596,242	7,034	.....	11,982	5,876,100	1,407,770
1876	613,190	3,855,040	660,136	9,888	.....	44,923	5,183,177	1,284,328
1877	471,448	3,238,612	838,544	.....	.....	23,289	4,571,893	1,496,080
1878	430,200	3,101,088	1,085,864	1,225	.....	100,000	4,718,377	1,240,079
1879	407,210	3,035,788	1,009,946	90	.....	230,895	4,683,938	1,148,108
1880	444,253	3,316,484	934,976	.....	.....	201,297	4,897,010	1,227,252
1881	573,532	3,435,400	948,318	112,825	.....	216,901	5,287,026	1,080,790
1882	526,522	3,594,144	787,125	80,720	.....	187,337	5,175,848	1,002,720
1883	458,530	3,240,188	744,731	87,729	.....	176,442	4,707,620	993,352
1884	396,059	3,114,472	1,077,314	93,404	.....	160,404	4,841,653	921,797
1885	378,665	2,940,872	1,088,294	83,709	.....	155,309	4,651,849	948,615
1886	366,294	2,660,784	1,193,493	95,674	1,148	117,250	4,434,643	903,569
1887	394,579	2,471,004	1,490,730	138,302	18,517	158,533	4,671,665	811,100
1888	317,241	2,500,104	1,685,750	66,160	13,273	147,154	4,729,682	801,066
1889	434,784	2,459,356	2,586,860	76,780	58,872	119,703	5,736,355	808,549
1890	460,285	2,354,244	2,137,054	106,105	86,664	87,114	5,231,466	773,438
1891	559,231	2,305,600	2,017,536	125,529	115,182	149,816	5,272,894	1,007,488
1892	575,299	2,617,824	2,154,453	139,370	226,234	174,070	5,887,300	954,744
1893	651,286	2,634,504	2,159,290	153,132	421,385	145,875	6,215,472	913,138
1894	1,156,717	2,694,720	2,378,289	152,092	787,099	225,485	7,394,402	887,839
1895	1,315,929	2,960,344	2,210,837	123,792	879,748	212,329	7,703,029	1,162,164
1896	1,073,360	3,220,348	2,241,347	112,759	1,068,808	237,574	7,954,196	1,041,428
1897	1,128,164	3,251,064	2,553,141	120,044	2,564,977	289,241	9,906,631	980,264
1898	1,244,330	3,349,028	2,750,349	95,143	3,990,698	281,485	11,711,033	1,080,691
1899	1,751,815	3,418,000	2,338,119	79,041	6,246,733	327,545	14,661,253	1,513,173
1900	1,194,521	3,229,628	2,871,709	82,188	6,007,610	316,220	13,701,876	1,439,602
1901	921,282	3,102,753	2,541,892	93,222	7,235,653	295,176	14,189,978	1,753,783

These figures do not in all cases add up to the total value of the production given elsewhere, as the information regarding earlier years is imperfect. The total for Victoria is £297,952 less than the actual value of production, while for Queensland the amount is deficient to the extent of £3,442,948, accounted for by the fact that prior to 1878 the figures only represent the gold sent by escort. There is a deficiency of £68,611 in South Australia which cannot be traced owing to the imperfect nature of the returns available in earlier years. The figures shown for Western Australia are £427,061 less than the total value of gold produced, as prior to 1899 they only show the value of gold exported. There is also a slight deficiency of £2,869 in the total shown for Tasmania. The gross production of gold in each State during 1901 and the contents in fine gold, are given below :—

State.	Weight of Gold.		Value of Gold.	
	Gross.	Fine Gold.	Total.	Proportion raised in each State.
	oz.	oz.	£	per cent.
New South Wales	267,061	216,888	921,282	5·8
Victoria	789,562	730,453	3,102,753	19·5
Queensland	835,553	598,332	2,541,892	15·9
South Australia	27,490	21,939	93,222	0·6
Western Australia	1,879,391	1,703,416	7,235,653	45·4
Tasmania	75,831	69,491	295,176	1·8
Commonwealth	3,874,888	3,340,569	14,189,978	89·0
New Zealand	455,561	412,855	1,753,783	11·0
Australasia	4,330,449	3,753,424	15,943,761	100·0

The number of men engaged in mining for gold is shown in the following table, and it would appear that the average value of gold won by each miner is £188 5s. 0d. per annum. It is probable that the number of gold-miners in several of the States is largely overstated, otherwise the industry must be carried on at a great loss; and this will be the more apparent when it is remembered that a fairly large quantity of gold is obtained with other metals, the men employed at the working of which are not classified as gold-miners. Most likely many of the men employ themselves in mining for only a portion of their time, and devote the rest to more remunerative pursuits. But when full allowance is made on this score, it will be evident that, in some of the States at least, the search for gold is not a profitable occupation. The small return for South Australia is due to the large number of Chinese engaged in the

industry, many of them not possessing proper appliances for working the claims.

State.	Miners Employed.	Average production of Gold.	
		Quantity.	Value.
	No.	oz.	£ s. d.
New South Wales	12,064	22·14	76 7 4
Victoria	27,777	28·43	111 14 0
Queensland	9,438	88·53	269 6 6
South Australia	2,000	13·75	46 12 3
Western Australia	19,771	95·06	365 19 6
Tasmania	1,112	68·19	265 8 11
Commonwealth	72,162	53·70	196 12 10
New Zealand	12,533	36·35	139 18 8
Australasia	84,695	51·13	188 5 0

The greatest development of quartz-reefing is found in Victoria, some of the mines being of a great depth. At the end of 1901 there were eight mines in the Bendigo district over 3,000 feet deep, and fourteen over 2,500 feet deep. In the Victoria mine a depth of 3,750 feet had been reached, and in the Lazarus Mine, 3,424 feet. On other fields there were six mines over 1,500 feet deep, the deepest of which were the South Star mine in the Ballarat district, where the shaft is down 2,520 feet, and the North Long Tunnel mine in the Walhalla district where a depth of 2,516 feet has been reached.

A notice of gold-mining would be incomplete without some reference to the remarkably large finds made at various times. Information on this point is meagre and not altogether reliable, as doubtless many nuggets were unearthed of which particulars were never published. Victoria's record is the best, and includes the following nuggets:—

	lb.	oz.	dwt.
"The Welcome Stranger," found 9th February, 1869	190	0	0
"The Welcome," found 9th June, 1858	184	9	16
Nugget found at Canadian Gully, 31st January, 1853	134	11	0

And others of the following weights:—98 lb. 1 oz. 17 dwt., 93 lb. 1 oz. 11 dwt., 84 lb. 3 oz. 15 dwt., 69 lb. 6 oz., 52 lb. 1 oz., 30 lb. 11 oz. 8 dwt., and 30 lb. 11 oz. 2 dwt.

New South Wales can boast of having produced some splendid specimens. In 1851 a mass of gold was found on the Turon, weighing 106 lb.; another, from Burrandong, near Orange, produced when melted at the Sydney Mint 98 lb 6 oz. 6 dwt. of pure gold; and a third, the "Brennan," was sold in Sydney in 1851 for £1,156. During 1880–82 several nuggets were discovered at Temora, weighing from 59 oz. to 1,393 oz.; and others, of 357 oz., 347 oz. (the "Jubilee"), 200 oz., 47 oz., and 32 oz. respectively, were found during the year 1887 in various parts of the State. Veins of gold of extraordinary richness have been worked in New South Wales. In January, 1873, at Beyers and Holterman's claim, at Hill End, 1·02 cwt. of gold was obtained from 10 tons of quartz, and a mass of ore, weighing 630 lb. and estimated to contain £2,000 worth of gold, was exhibited. The Mint returns for this mine during the year 1873 were 16,279·63 oz., valued at £63,234 12s.; obtained from 415 tons of stone. From Krohman's claim, at Hill End, gold to the value of £93,616 11s. 9d. was obtained during the same year. The foregoing figures, however, are insignificant when compared with the enormous yield of the Mount Morgan Mine, in Queensland, which has paid over £5,750,000 in dividends. This mine, which may be designated one of the wonders of the world, is a huge mound of ore, highly ferruginous, the peculiar formation, in the opinion of the Government Geologist of Queensland, being due to the action of thermal springs. To the end of May, 1901, 2,330,106 oz. of gold had been won from 1,509,424 tons of ore, yielding an average of 1 oz. 10 dwt. 21 gr. per ton of ore treated.

For the ten years ended 1901, the world's production of gold is estimated to have been as follows:—

Year.	Value.	Year.	Value.
	£		£
1892	29,260,000	1897	49,023,000
1893	31,110,000	1898	59,038,000
1894	38,035,000	1899	64,299,000
1895	41,413,000	1900	53,579,000
1896	44,077,000	1901	54,421,000

Of the production of £54,421,000 in 1901, Australasia produced 29·3 per cent.

Silver.

Silver has been discovered in all the States, either alone or in the form of sulphides, antimonial and arsenical ores, chloride, bromide,

iodide, and chloro-bromide of silver, and argentiferous lead ores, the largest deposits of the metal being found in the last-mentioned form. The leading silver mines are in New South Wales, the returns from the other States being comparatively insignificant. Up to the year 1882 the quantity of silver raised in New South Wales was very small, but in that and the following years extensive discoveries of the metal, associated principally with lead and copper ore, were made in various parts of the State, notably at Boorook, in the New England district, and later on at Sunny Corner, near Bathurst, and at Silverton and Broken Hill on the Barrier Ranges in the Western district. The Sunny Corner Silver mines in 1886 paid handsome dividends, and produced £160,000 worth of silver, but since that period the yield has largely fallen off.

The fields of the Western district of New South Wales have proved to be of immense value. The yield of silver-lead ore in the Broken Hill and Silverton districts during 1901 was valued at £1,491,547 ; while the machinery employed was valued at £640,887. This is much less than the value set down some years ago, the reduction being chiefly due to the removal of machinery to Port Pirie, in South Australia, where the smelting operations of the Proprietary Company are now wholly carried on. The aggregate output of the mines in the Barrier country to the end of the year named was valued at £29,892,157. This rich silver-field, which was discovered in 1883 by Charles Rasp, a boundary rider on Mount Gipps Run, extends over 2,500 square miles of country, and has developed into one of the principal mining centres of the world. It is situated beyond the river Darling, and close to the boundary between New South Wales and South Australia. In the Barrier Range district the lodes occur in Silurian metamorphic micaceous schists, intruded by granite, porphyry, and diorite, and traversed by numerous quartz reefs, some of which are gold-bearing. The Broken Hill lode is the largest as yet discovered. It varies in width from 10 feet to 200 feet, and may be traced for several miles, the country having been taken up all along the line of the lode, and subdivided into numerous leases, held by mining companies and syndicates.

The Broken Hill Proprietary Company hold the premier position. They have at Port Pirie, in South Australia, a complete smelting plant on the latest and most approved principles. From the commencement of mining operations in 1885 to the end of May, 1902, the company treated 5,908,610 tons of silver and silver-lead ores, producing 114,346,940 oz. of silver and 533,284 tons of lead, valued in the London market at £24,440,000. Dividends and bonuses to the amount of £7,496,000 have been paid, besides the nominal value of shares from the several "Blocks." The sum spent in the erection and construction of plant, from the opening of the property, has been about £1,223,725. The mine wages and salary sheet for the twelve months represented a sum of £648,298, including £131,791 paid to contractors, and £22,705 for quarrying. The net profit for the year was £91,260.

The quantity and value of silver and silver-lead ore exported by New South Wales to the end of 1901 is shown in the following table :—

Year.	Silver.		Silver-Lead.			Total value.
	Quantity.	Value.	Quantity.		Value.	
			Ore.	Metal.		
Up to	oz.	£	tons cwt.	tons cwt.	£	£
1882	765,397	187,429	203 12	.....	5,385	192,814
1883	77,066	16,488	105 17	....	1,625	18,113
1884	93,660	19,780	4,668 1	.....	123,174	142,954
1885	794,174	159,187	2,095 16	190 8	107,626	266,813
1886	1,015,434	197,544	4,802 2	.....	294,485	492,029
1887	177,308	32,458	12,529 3	.....	541,952	574,410
1888	375,064	66,668	11,739 7	18,102 5	1,075,737	1,142,405
1889	416,895	72,001	46,965 9	34,579 17	1,899,197	1,971,198
1890	496,552	95,410	89,719 15	41,319 18	2,667,144	2,762,554
1891	729,590	134,850	92,383 11	55,396 3	3,484,739	3,619,589
1892	350,661	56,884	87,504 15	45,850 4	2,420,952	2,477,836
1893	531,972	78,131	155,859 1	58,401 3	2,953,589	3,031,720
1894	846,822	94,150	137,813 8	42,513 2	2,195,339	2,289,489
1895	550,142	81,858	190,192 19	29,687 7	1,560,813	1,642,671
1896	202,789	26,518	267,363 1	19,573 4	1,758,933	1,785,451
1897	150,005	16,711	270,913 14	18,105 7	1,681,528	1,698,239
1898	533,059	59,278	388,460 4	10,108 13	1,644,777	1,704,055
1899	692,036	76,913	424,337 5	20,289 10	1,993,744	2,070,657
1900	774,203	90,243	420,909 11	17,928 6	2,513,874	2,604,117
1901	448,501	50,484	400,156 18	16,921 5	1,803,979	1,854,463
Total	10,021,330	1,612,985	3,008,723 9	428,966 12	30,728,592	32,341,577

This amount was approximately made up of 148,711,735 oz. of silver, valued at £23,391,985; and of 698,610 tons of lead, valued at £8,949,592. It will be seen that the production of silver in New South Wales rapidly increased until 1891, when it exceeded in value the largest annual production of gold, even in the palmiest days of the diggings. Since that year, however, there has been a decreased output consequent upon the lower grade of the ores now being worked, while the value has been still further reduced by the serious decline in the prices of silver and lead. The heavy fall in the price of silver has been severely felt of late years in mining circles, and in 1901 the strain was still further accentuated by a fall in the price of lead. Owing to the low price of silver many of the lower-grade mines at Broken Hill were only worked at a profit through the high value of lead contained in the ore, and the fall of over £6 per ton in the price of lead caused the closing of all the Barrier mines but three. The serious effects caused by the decline may be judged from a comparison of the employment afforded by the industry during the last three years. The number of miners engaged in silver and lead mines in 1899 was 7,893, and the average value of mineral

won by each miner engaged amounted to £262 6s. 10d.; in 1900, owing to the increase in lead values, the number of men employed rose to 8,196, and the average value to £317 14s. 7d.; while in 1901 the men engaged numbered only 6,298, and the average value of the mineral won was £294 9s. 1d.

There are two large smelting works in New South Wales situated at Cockle Creek, near Newcastle, and at Dapto. These works have proved of great service to the mining community, and the quantity of ore, the product of the State, treated during the year was 32,525 tons, the metal obtained being as follows:—

Gold	17,488 oz.
Silver	661,187 oz.
Lead	6,466 tons.
Copper	548 tons.

The number of men employed on these works during 1901 was 796.

Although indications of silver abound in all the other States, no fields of great importance have yet been discovered, the value of the yield of Australasia to the end of 1901, exclusive of that of New South Wales, being only £4,540,346.

The only other State where silver has been produced to any extent is Tasmania. The industry has been steadily developed, and the production for the last few years shows a considerable advance on that in former years. The value of the output during each of the last five years was—

	£
1897	197,225
1898	270,893
1899	377,788
1900	252,080
1901	207,228

In this State, as in New South Wales, the result of the fall in silver and lead values is seen in the diminished value of production, and in this connection it must be remembered that a decline in price not only decreases the value of the output, but checks production inasmuch as operations are restricted to dealing only with higher-grade ores. The principal silver fields are in the West Coast District, where the most important mines are the Western, Zeehan-Montana, and Mount Zeehan; and in the North-Western District where the Mount Magnet mine is located. The largest output of silver, however, is from the Mount Lyell mine, where it is found in conjunction with copper, and the output from this and the three mines first mentioned, together with that from the Silver Queen and Oonah mines, comprises nearly the whole of the production, as but little work has been done at Mount Magnet pending the completion of the tramway to connect with the Emu Bay railway.

Silver is found in various districts in Queensland, but generally associated with some other mineral, and the mines where silver predominates are but few. The chief of these is the Silver Spur mine in the Stanthorpe district, on the border of New South Wales, from which

75,055 oz. of silver, valued at £8,443, were obtained during 1901. The year 1901 saw a distinct improvement in the production of silver, and this in the face of a great decline in the prices of silver and lead. The production for the year was 571,561 oz., valued at £62,241, being the highest total recorded since 1887, when it amounted to £80,092. The great advance made in copper-mining during the year is responsible for the increased silver production, as these minerals are usually found in association. This may be seen from the fact that the Herberton district, which was the chief copper-producing centre in 1901, also contributed the greatest share of the silver produced.

In New Zealand, silver is found in various localities, principally on the Te Aroha, Thames, and Coromandel fields, but the metal is generally obtained in conjunction with gold. The production of the colony during the year 1901 was valued at £65,258.

There are no silver-mines in Victoria or Western Australia, the small amount of silver produced in those States being usually found associated with gold. During 1901 the value of the silver produced in Western Australia was only £7,609, while there was no production in Victoria. The production of silver in South Australia is very limited, the value in 1901 being only £12,067, and it would seem that the argentiferous lead-ore fields of Broken Hill and Silverton, which are almost on the border of the two States, are exclusively confined within the boundaries of New South Wales.

Up to the end of 1901 New South Wales had produced 87·7 per cent. of the total value of silver raised in Australasia; Tasmania came second with 6·5 per cent.; and of the remaining small proportion, Victoria claimed the largest share. The total production of silver in Australasia in 1901, and up to the end of that year, was as follows:—

State.	Value of Silver produced—	
	During 1901.	To end of 1901.
	£	£
New South Wales	1,854,463	32,341,577
Victoria	.....	856,539
Queensland	62,241	788,042
South Australia	12,067	118,630
Western Australia	7,609	11,453
Tasmania	207,228	2,384,886
Commonwealth	2,143,608	36,501,127
New Zealand	65,258	380,806
Australasia	2,208,866	36,881,933

The world's production of silver during the ten years ended 1901 is estimated to have been as follows:—

Year.	Ounces.	Year.	Ounces.
1892	152,940,000	1897	182,081,000
1893	162,162,000	1898	179,252,000
1894	178,668,000	1899	177,837,000
1895	182,220,000	1900	180,093,000
1896	176,707,000	1901	174,851,000

The output of New South Wales during 1901 therefore represented about 4·3 per cent. of the total production of silver.

Copper.

Copper is known to exist in all the States, and has been mined for extensively in South Australia and Tasmania, and on a smaller scale in New South Wales and Queensland. The fluctuations in the market value of the metal have always been a check to the progress of the industry, and during 1901 some of the lower-grade mines were compelled to suspend operations. South Australia has produced the greatest quantity of copper, but during late years Tasmania has had by far the larger output. In Tasmania deposits were worked on a limited scale for a number of years; but the discovery of a rich belt of copper-bearing country, extending from Mount Lyell past Mount Tyndall, Mount Read, Mount Murchison, and north of the Pieman to the Rocky and Savage Rivers, has completely changed the character of the mining industry in the State, and from a small export of copper ore valued at £1,659 in 1896, the annual production has become the largest in Australasia. The following table, which shows the annual production during the last five years, will give some idea of the progress made:—

	£
1897	323,650
1898	382,640
1899	1,227,532
1900	901,660
1901	917,787

The chief mines belong to the Mount Lyell Mining and Railway Company which is reported to have spent over £400,000 on railway construction and developmental work at the mines before receiving any return. The company possesses reduction works at Queenstown, from

which a railway has been constructed through most difficult country to Teepookana and thence to Strahan. The output from these mines during the year ended 30th June, 1901, was 9,132 tons of copper, 619,734 oz. of silver, and 22,911 oz. of gold, and a bonus of £13,750 was paid in addition to dividends amounting to £110,000.

The discovery of copper had a marked effect upon the fortunes of South Australia at a time when the young and struggling colony was surrounded by difficulties. The first important mine, the Kapunda, was opened up in 1842. It is estimated that at one time 2,000 tons were produced annually, but the mine was closed in 1879. In 1845 the celebrated Burra Burra mine was discovered. This mine proved to be very rich, and paid £800,000 in dividends to the original owners. For a number of years, however, the mine has been suffered to remain idle, owing to the fact that the deposits originally worked were found to be depleted. For many years the average yield was from 10,000 to 13,000 tons of ore, yielding from 22 to 23 per cent. of copper. For the period of thirty years during which the mine was worked the output of ore amounted to 234,648 tons, equal to 51,622 tons of copper, valued at £4,749,224. Boring operations were conducted at the mine for the purpose of determining whether payable ore exists at greater depths than those reached by the original workings. One bore was put down to a depth of 1,004 feet, and in the the opinion of the Government Geologist, the result was highly satisfactory, as it proved the continuance downwards of the copper-bearing strata sufficiently to warrant the reopening of a portion of the mine. For the purpose of further testing the ground a second site for boring has been selected. The Wallaroo and Moonta mines, discovered in 1860 and 1861, proved to be even more valuable than the Burra Burra. The Moonta mine employed at one time upwards of 1,600 hands, and still keeps 1,138 men at work. In 1890 these mines were amalgamated, and the estimated value of the copper produced to the end of 1898 is set down at £9,218,482, out of which about £7,000,000 had been expended in wages. About 1,800 miners are now employed. The total dividends paid by these mines is stated to be upwards of £1,700,000. The production of copper in South Australia during the last few years has again increased, the output in 1899 being valued at £406,208; in 1900, £386,015; and in 1901, £500,077.

The copper-mining industry in New South Wales has been subject to great variations. The production reached its highest point in 1883, when its value was £472,982. From that year, however, there was a general decline, and in 1894 the value was only £63,617. As in the other States, however, increased attention has been paid to the industry of late years, and the production in 1900 and 1901 amounted to £425,301 and £412,292 respectively. The principal deposits of copper are found in the central part of the State, between the Macquarie, Bogan, and Darling Rivers. Deposits have also been found in the New England and Southern districts, as well as at Broken Hill, showing that

the mineral is widely distributed throughout the State. In addition to the mines already established, a new mine was opened in 1901 at Crowl Creek, about 30 miles from Nymagee; and from this mine, now known as Shuttleton, high-grade ore to the value of several thousand pounds sterling has already been obtained. Owing to the unexpected fall in the price of the metal much anxiety was felt as to the position of the copper-mining industry, and the gravity of the situation was accentuated by the fact that many of the mines are situated in the Western district, which has suffered severely through the drought. By the exercise of many economies, however, although the output was restricted, all the large mines were enabled to continue their operations; but some of the less important, and those working on low-grade ores, were compelled to suspend operations, as at the prevailing prices the ore would not realise a profit on the cost of raising and carriage to the smelting works at Cockle Creek or Dapto.

The largest proportion of the output of copper is obtained from the Cobar mining district. The value of the metal raised in this district during 1901 amounted to £246,820, of which £192,989 was received from the Cobar division, where the Great Cobar and Cobar-Chesney mines are situated. The former of these is the leading copper mine in New South Wales, and in the mines and works about 600 men are employed. The Nymagee division of the Cobar district, the locality of the Nymagee and Shuttleton mines, produced copper to the value of £42,191, and in the Mount Hope division an estimated value of £11,640 was raised. The principal mines in the latter district are the New Mount Hope and Great Central, and at each of them work is now being vigorously proceeded with. In the Burraga division of the Bathurst district one of the leading mines, the Lloyd Copper-mine, is situated, and from this mine 21,508 tons of ore, valued at £64,599, were raised during 1901. The lode, which averages 5 feet in width, still maintains its richness, and there are sufficient supplies in sight to last some years. The company employs about 500 men in the mine and works, which are lighted throughout by electricity. The total number of men engaged in copper-mining during 1901 was 2,964, a decrease of 370 on the numbers of the preceding year.

Copper is found in many parts of Queensland, the principal deposits being in the Herberton, Mount Perry, and Cloncurry districts. In earlier years the State occupied a prominent position as a producer of copper, but the output in recent years was very small. The year 1901, however, saw a sudden revival in this branch of the mining industry, despite the great fall in prices, and the value of the production rose from £23,040 in 1900 to £194,227 in 1901, being the highest value recorded with the exception of 1872, when it reached £196,000. A noteworthy feature of the revival was the re-opening of the Mount Perry mine, which again promises to rank, as in former years, amongst the foremost mines in the State. The chief copper-producing centre in 1901 was the Herberton district, and it is, indeed, unfortunate

that a serious difficulty should have arisen at the Chillagoe mines which has caused a cessation of operations. Of the copper-mines in this district, and in the State as a whole, the foremost is Mount Garnet, which has produced copper and silver to the value of £163,000. The mine is well equipped with machinery, and a railway is now in course of construction. One of the chief obstacles to the successful development of copper and silver-mining has been the lack of facilities for transport, but with increased advantages in this respect, which are being afforded year by year, the output of copper and silver may be expected to increase materially.

In Western Australia, copper deposits have been worked for some years. Very rich lodes of the metal have been found in the Mount Malcolm, Northampton, Murchison, West Pilbarra, and Phillips River districts, but operations appear to be carried on systematically only in the first mentioned. The ore raised in this district is treated locally, while in the others it is exported for treatment, and, as the cost of carriage is heavy and the facilities for transport not too favourable, only high-grade ores can be profitably worked. The unfortunate fall in the price of copper has, no doubt, restricted operations, but as there seems no doubt that eminently payable copper lodes, carrying a little gold, exist in the State, it is surprising that the success of the last three years has not further stimulated the progress of the industry. The copper ore raised in the State during 1901 was 10,156 tons, valued at £75,246, of which the Mount Malcolm district contributed 7,660 tons, valued at £40,738. The quantity of ore raised during 1900 was 6,183 tons, valued at £43,673, and in 1899 the production was valued at £35,938. The number of men engaged in copper-mining in 1901 was 321, as against 218 in the preceding year.

Copper-mining has not attained any great proportions in Victoria, although deposits have been found in several parts of the State, particularly in the Beechworth district, where they have been traced over an area of some 50 square miles. The value of the total production is estimated at £206,395, but there has not been any output during the last few years.

The copper deposits of New Zealand have been worked to a small extent only, and for a number of years have been almost entirely neglected, the output in 1901 being valued at only £105.

Copper is sometimes found in the Australasian mines in a virgin state, and beautiful specimens of the pure metal have been exhibited at different times, but it occurs generally in the form of oxidised copper ores, carbonates, sulphates, phosphates, and silicates of copper. The museums of South Australia, Victoria, and New South Wales contain striking samples of azurite and malachite, magnificent blocks of which have been shown from time to time at exhibitions, not only in Australasia, but also in Europe and America. Copper sulphides and arsenides are generally found in deep sinkings. The metal has also been found associated with tin in the form of stannine.

The total value of copper produced in each State during 1901 and up to the end of that year are given below :—

State.	Value of Copper produced.	
	During 1901.	To end of year 1901.
	£	£
New South Wales	412,292	5,857,073
Victoria	.....	206,395
Queensland	194,227	2,249,692
South Australia	500,077	22,822,046
Western Australia	75,246	326,972
Tasmania	917,787	3,921,495
Commonwealth	2,099,629	35,383,673
New Zealand	105	18,088
Australasia	2,099,734	35,401,761

In June, 1872, copper realised as much as £112 per ton, whilst in December, 1886, the lowest price on record until that time was touched, and only £44 could be obtained for South Australian copper. At the end of 1887 the price had risen to £70 per ton, and in September, 1888, to £93. In March, 1889, there was a great fall in the price of the metal, and in April of that year the quotation in London was as low as £43 per ton. This was the lowest price reached until June, 1894, when it fell to £41 10s. From that date there was an upward movement, as the following quotations will show. At the close of 1896 the London price of copper stood at £52 10s. per ton; in February, 1897, £54 10s. was reached; and at the 31st December, 1898, £60 was the market value. This price was further increased during 1899, and in September of that year no less than £77 per ton was quoted. The price was well maintained during 1900, and, at the close of the year, stood at £73 per ton; but during 1901 a heavy fall occurred, and the quotations for the last week of the year were as low as £49 15s. per ton.

Tin.

Tin was known to exist in Australasia almost from the first years of colonisation, the earliest mention of the mineral appearing in a report of a discovery by Surgeon Bass on the north coast of Tasmania. In the form of cassiterite (oxide of tin) it occurs in all the states, but the richest deposits have been found in Tasmania—the Mount Bischoff being the most celebrated tin-mine in Australasia. The wealth of Queensland and the Northern Territory of South Australia in this mineral, according to the reports of Mr. Jack, a Government Geologist of the former State, and the late Rev. Tenison Woods, appears to be very great.

Tasmania has been the largest producer of tin in Australasia. As in New South Wales, a very large proportion of the metal hitherto produced has been from alluvial deposits, and the want of water has proved a great drawback to the successful development of the industry. There are, however, many promising lodes in the island, and the Waratah, Blue Tier, Ben Lomond, St. Helen's, Derby, and West Coast districts all produce large quantities of the metal. In the district first mentioned is situated the Mount Bischoff mine, worked as an open quarry, which, during the year ended 30th June, 1902, produced 1,291 tons of tin, and paid £60,000 in dividends. In the Blue Tier district, the Liberator, Australian, and Anchor mines are all working on good payable stone, and, at the latter mine, wages amounting to £10,727 were paid during the year ended 30th June, 1901. Tin ore is distributed more or less over the whole of the Ben Lomond district, which promises to develop into a very important field in the near future. On the West Coast, the Federation mine has been working successfully, while a parcel of 5 tons of ore, obtained from the North Dundas mine, has given satisfactory results. Tin-dredging has been carried on in some parts of the island; but, so far, only a moderate measure of success has been achieved. The production of tin during 1901 was valued at £216,186, the corresponding value for 1900 being £176,802.

In New South Wales lode tin occurs principally in the granite and stream tin under the basaltic country in the extreme northern portion of the State, at Tenterfield, Emmaville, Tingha, and in other districts of New England. The metal has also been discovered in the Barrier Ranges, at Poolamacca and Euriowie; near Bombala in the Monaro district; at Gundle, near Kempsey; at Jingellic, on the Upper Murray; at Dora Dora, on the Upper Murray; and in the Valley of the Lachlan; but in none of these districts has it been worked to any extent. The mineral was discovered by the Rev. W. B. Clarke so far back as the year 1853, but the opening of the tin-fields of New South Wales only took place in the year 1872. The industry soon attained considerable importance, the value of the output in 1881 amounting to £568,795. In 1889 the total production had fallen to £207,670, and in 1893 to £126,114, while in 1898 the lowest point was reached, when the value was only £45,638. Owing to a recovery in prices there was an increase in value of production in 1899 and 1900 when the totals were £90,482 and £142,724 respectively, but in 1901 there was a decline to £76,544. The fluctuations in the market price of the metal have always had a discouraging effect on the industry and the fall from £125 to £104 per ton no doubt tended to diminish the production during 1901. In addition to the fall in prices, the industry had to contend with a long-sustained drought, and as a large proportion of the tin obtained is recovered from alluvial deposits, any scarcity of water retards successful washing operations. A rich find of tin was made during 1901 at a place distant about 5 miles from Inverell, and a promising lode has been opened up. There is a large body of ore of good quality, and the prospects of the mine, known as the Leviathan,

are very encouraging. What appears to be an extension of the lode has been discovered 5 miles distant, where the Dolcoath Syndicate has opened a mine. Attempts have been made to establish the dredging industry, and the results obtained are fairly satisfactory. At Cope's Creek, the yield was up to expectations; but a larger plant, with more efficient saving appliances, was found to be necessary, and steps in this direction are now being taken. At Glen Elgin and Wylie's Creek dredges have been working with fair success. The total number of persons engaged in tin-mining during 1901 was 1,428, of whom 456 were Chinese.

In Queensland, the value of tin produced during 1873 was £606,184, and ranked next to gold, but it steadily declined, until in 1898 it was only £36,502. Since that year, however, there has been an upward movement, and in 1901 the value reached £93,723. The Herberton district was the chief producing centre, the output being valued at £61,040. The most important mines in this district are the Vulcan and Tornado, which produced 447 tons of black tin during 1901, and had the crushing plant been available this output could have been considerably increased. Of the newer mines opened, the Coolgarra is one of the most promising. The lodes are numerous, and during the short period from October to December the mill crushed 2,563 tons of stone, yielding 67 tons of tin. A new discovery of both lode and alluvial tin was made at Smith's Creek, near Mount Garnet, from which good results are expected. Although there has been a marked improvement during the past few years, it is surprising that greater efforts have not been made to take advantage of the satisfactory prices, which, despite the fall, are still remunerative. At present the mills are quite insufficient to cope with the output from the mines, and this constitutes a great drawback to the industry.

In Western Australia, tin has been found to exist in large quantities, but the ore is not very rich, and, until recent years, but little attention was directed to tin-mining owing to the superior attractions of the goldfields, the average annual production for the three years ending with 1898 being only £3,960. The increased price in 1899, however, stimulated the progress of the industry, and the output increased to £25,270, a total that has been exceeded in 1900 and 1901, when the values were £56,702 and £40,000 respectively. Of the production in 1901, which amounted to 734 tons, the Greenbushes district contributed 321 tons, valued at £18,852, and the Pilbarra field, in the Marble Bar district, 413 tons, valued at £21,148. In both districts the supply of water for treating the tin is inadequate, and consequently the resources of the fields cannot be thoroughly developed.

The yield of tin in Victoria is very small, and until lately no fields of importance had been discovered, but towards the latter end of 1890 extensive deposits were reported to exist in the Gippsland district at Omeo and Tarwin. In 1901 only 77 tons of tin, valued at £4,181, were produced.

In South Australia very little tin is produced. During 1901 the production was 83 tons of ore, valued at £5,584, of which the Northern Territory was responsible for 80 tons, valued at £5,498. There is no record of any production of tin in New Zealand.

The tin-mining industry has been subject to frequent fluctuations, especially of late years. The value of the metal in the European market was £159 per ton in 1872, £52 in 1878, £114 in 1880 and 1882, and £72 in 1884. A gradual recovery then took place, until in 1888 the price reached £121. During the ten years from 1888 to 1898 tin was subject to an almost continuous fall in price, realising in 1898 only one-half of that obtained a decade before. The metal, however, made a great advance in price during 1900, London quotations in December being £125 10s. per ton, as compared with £82 in 1898, and £63 in 1897, and although this value was not maintained during 1901, the prices current at the end of the year averaged £109 10s. per ton; and at this figure tin-mining should prove highly remunerative.

The value of the production of tin in Australasia during 1901, and up to the end of that year, was as given below :—

State.	Value of Tin produced.	
	During 1901.	To end of year 1901.
	£	£
New South Wales	76,544	6,601,806
Victoria	4,181	715,498
Queensland	93,723	4,693,866
South Australia	5,584	32,680
Western Australia	40,000	198,199
Tasmania	216,186	7,276,294
Australasia	436,218	19,518,343

The number of persons engaged in tin-mining in 1901 was as follows :—In New South Wales, 1,428; Tasmania, 1,065; Queensland, 1,148; and Western Australia, 413.

Iron.

Iron is distributed throughout Australasia, but for want of capital in developing the fields this industry has not progressed. In New South Wales extensive deposits of iron ore exist in the Mittagong, Piper's Flat, Goulburn, Queanbeyan, and Port Stephens districts.

At Carcoar and Cadia there are large deposits of rich ore, the quantities in sight being estimated by the Government Geological surveyor at 3,100,000 and 39,000,000 tons respectively. The pig iron produced from the Carcoar ore would be admirably adapted for foundry

purposes, and is suitable for use in the basic process of steel manufacture, while the ore at Cadia contains little phosphorus and could be utilised in the manufacture of steel by the cheaper acid processes. Considerable attention has been given to the question of establishing ironworks in this State, capable of supplying the requirements of Australia, and in 1901 the idea assumed a definite shape. Two schemes were advocated—one to smelt ore at Lithgow from the Carcoar and Cadia deposits, and the other to bring ore from the Blythe River, Tasmania, and smelt it in Sydney or elsewhere on the seaboard. Had the Bonus for Manufactures Bill, introduced into the Federal Parliament, been passed in the same form as submitted, there is no doubt that the first of these schemes would have been adopted and the industry established immediately by private enterprise. The amendments made in the Bill, however, provide only for a bonus to works established by a State of the Commonwealth, and in view of the importance of the question, the Federal Government has appointed a Select Committee to inquire into the whole matter.

The principal works in New South Wales for the manufacture of iron from the ore are situated at Eskbank, near Lithgow, where red siliceous ores, averaging 22 per cent., and brown hematite, yielding 50 per cent., metallic iron, have been successfully treated. Abundance of coal and limestone are found in the neighbourhood. This establishment, however, has for some time abandoned the manufacture of pig-iron, for which it was originally built. The work now carried on consists of the re-rolling of old rails, and the manufacture of iron bars, rods, and nails, and of ordinary castings. The quantity manufactured from scrap during 1901 was 10,424 tons, valued at £123,750. Large quantities of iron ore have been raised from the deposits situated in the Marulan, Picton, and Carcoar districts and despatched to the smelting-works at Dapto and Cockle Creek, where they have been used as flux, the gold contents of the ore helping to defray the extra cost of railway carriage. The total raised in 1901 was 27,803 tons, valued at £22,900. A considerable quantity of iron oxide is also raised each year and used for flux, while there is also a slight export, amounting, in 1901, to 128 tons, valued at £229.

In Tasmania a huge deposit of iron ore has long been known to exist at the Blythe River, near Burnie. During 1901 the deposit was tested by tunnelling and found to maintain its size and quality, and although arrangements for its exploitation are not yet completed, there is little doubt that in the near future it will prove an important addition to the industrial wealth of the State. Up to the present the production of iron ore has not been great, but in 1899 3,577 tons, valued at £3,474, and in 1900 5,375 tons, valued at £5,995, were exported.

In Queensland, deposits of iron ore have been found at Stanthorpe, and 430 tons, valued at £215, were raised during 1901.

Magnetite occurs in great abundance in Western Australia, together with hematite, which would be of enormous value if cheap labour were abundant. A considerable quantity of ironstone is raised in the State

and used for fluxing purposes, the production in 1901 being 20,569 tons, valued at £13,246.

Goethite, limonite, and hematite are found in New South Wales, at the junction of the Hawkesbury sandstone formation and the Wianamatta shale near Nattai, and are enhanced in value by their proximity to coal-beds. Near Lithgow extensive deposits of limonite or clay-band ore are interbedded with coal. Siderite or spathic iron (carbonate of iron) and vivianite (phosphate of iron) are found in New Zealand. The latter also occurs in New South Wales, intermingled with copper and tin ores.

The Government of South Australia has offered a bonus of £2,000 for the first 500 tons of pig-iron produced in that State.

Antimony.

Antimony is widely diffused throughout Australasia, and is sometimes found associated with gold. The low price of the metal during late years has discouraged operations in this branch of the mining industry, and the output in all the States has fallen away considerably. In New South Wales, deposits of antimony occur in various places, chiefly in the Armidale, Bathurst, and Rylstone districts; and at Bowraville on the North Coast. The production, however, is confined to the Hillgrove mines, and in 1901 was valued at only £1,183, the total production to the end of the year being £194,233.

In Victoria the production up to the end of 1898 was valued at £177,174, and there has been no further production since that year, while in Queensland the production ceased in 1899, when the value raised was only £200. In New Zealand also, the production of antimony has practically ceased, although during 1901 there was an export of 3 tons, valued at £101. Good lodes of stibnite (sulphide of antimony) have been found near Roebourne, in Western Australia; but no attempt has yet been made to work them.

The following table shows the value of antimony produced in Australasia up to the end of 1901 :—

State.	Value.
	£
New South Wales	194,233
Victoria	177,174
Queensland	35,458
Commonwealth	406,865
New Zealand	52,462
Australasia	459,327

Bismuth.

Bismuth is known to exist in all the Australian States, but up to the present time it has been mined for in New South Wales, Queensland, South Australia, and Tasmania only. The demand for the metal is limited, and the price is carefully regulated by the Bismuth Association. The output in New South Wales during 1901 was valued at £6,665, and in Queensland £3,684, while the total production for each State up to the end of the year was £63,185 and £64,412 respectively.

Manganese.

Manganese probably exists in all the States, deposits having been found in New South Wales, Victoria, Queensland, South Australia, Western Australia, and New Zealand. Little, however, has been done to utilise the deposits, the demands of the local markets being extremely limited; but in the event of the extensive iron ores of New South Wales being worked on a large scale, the manganese deposits in that State will become of commercial importance. The ore generally occurs in the form of oxides, manganite, and pyrolusite, and contains a high percentage of sesquioxide of manganese. The production has never attained much importance in any of the States; the value of the output in New South Wales during 1901 was £24, making a total of £1,401 up to the end of that year, in Queensland the value during 1901 was £795 and the total value £7,991, while in New Zealand the value during 1900 was £588, and the total raised to the end of that year £60,232. In South Australia there was an export during 1901 of 132 tons, valued at £330.

Platinum.

Platinum and the allied compound metal iridosmine have been found in New South Wales, but so far in inconsiderable quantities, the latter occurring commonly with gold or tin in alluvial drifts. At present mining operations are confined to the deposits in the Fifield district, which, however, give evidence of depletion. A lease of 130 acres has been taken up at Macauley's Lead, about 20 miles from Woodburn, while the old claims at Little Darling Springs and Mulga Springs, in the Broken Hill district, are again to be thoroughly prospected. The value of the production during 1901 was £779, and the total to the end of that year, £13,211. Platinum and iridosmine have also been found in New Zealand.

Tellurium.

The noble metal tellurium has been found in New Zealand, associated with gold and silver (petzite) and with silver only (hessite). It has also been discovered in New South Wales at Bingara and other parts of the northern districts, as well as at Tarana, on the Western Line, though

at present only in such minute quantities as would not repay the cost of working; while at Captain's Flat it has been found in association with bismuth.

At many of the mines at Kalgoorlie, Western Australia, large quantities of ores of telluride of gold have been discovered in the lode formations.

Lead.

Lead is found in each of the Australasian States, but is worked only when associated with silver. In Western Australia the metal occurs in the form of sulphides and carbonates of great richness, but the quantity of silver mixed with it is small, and the production of late years has been very limited. In 1900, 268 tons of lead ore were raised, the value being £533, while in 1901 only 9 tons, valued at £109, were obtained. In Queensland the lead raised during 1901 amounted to 561 tons, valued at £6,993, and from South Australia lead to the value of £722 was exported during the year. As will be gathered from the remarks made in a previous portion of this chapter, the association of lead with silver has proved a source of much wealth to the silver mines in New South Wales—those at Broken Hill particularly—several of these mines being only enabled to continue operations owing to the high price of the lead contained in the ore.

Other Metals.

Mercury, in the form of sulphides or cinnabar, is found in New South Wales, Queensland, and New Zealand. In New South Wales, in the form of cinnabar, it has been discovered on the Cudgegong River, near Rylstone, and it also occurs at Bingara, Solferino, Yulgilbar, and Cooma. In the latter place the assays of ore yielded 22 per cent. of mercury. Very large and rich deposits have been found on Noggriga Creek, near Yulgilbar, and three 40-acre blocks have been taken up. Cinnabar leases have also been applied for in the Bingara district.

Titanium, of the varieties known as octahedrite and brookite, is found in alluvial deposits in New South Wales, in conjunction with diamonds.

Wolfram (tungstate of iron and manganese) occurs in most of the States, notably in New South Wales, Tasmania, Queensland, and New Zealand. For some years there has been a small output in Queensland, and a rise in the price of the mineral so stimulated the industry that in 1899 the production reached £10,060. As the demand is limited, the increased price soon led to overproduction and a consequent fall in prices, and at present they are not sufficiently remunerative to encourage search for this mineral. The value of the production in 1901 was only £1,145. There was a little wolfram exported from South Australia during 1901, the quantity being 5 tons, valued at £175. Since 1899 Tasmania has shown a small output of wolfram, the value in 1900 amounting to £2,058. Scheelite, another variety of tungsten, is found

in Queensland and New Zealand, a little mining being carried on in the latter colony. Molybdenum, in the form of molybdenite (sulphide of molybdenum), is found in New South Wales, Victoria, and Queensland, but only in the last-mentioned State was there any production during 1901, the value being £1,609.

Zinc ores, in the several varieties of carbonates, silicates, oxide, sulphide, and sulphate of zinc, have been found in several of the Australasian States, but have attracted little attention, except in New South Wales, where the metal is usually found associated with silver, lead, and copper; and various experiments are being made for the purpose of ascertaining whether it can be profitably extracted. For some years attention has been directed by the Broken Hill Companies to the production of a high grade zinc concentrate from the sulphide ores, and a fair measure of success has attended their efforts. The Sulphide Corporation has a magnetic separating plant in operation, and is producing high-grade zinc concentrates from the old dump of middlings, while the Australian Metal Company has patented a very simple machine, which is doing excellent work. A zinc distillation plant was in course of operation at Cockle Creek at the end of the year. The profitable extraction of the zinc contents of products hitherto regarded as waste, must have an important effect on the future progress of Broken Hill. The value of zinc produced in the State and exported during 1901was £4,057, the values in 1899 and 1900 being £49,207 and £44,187, while the total to the end of 1901 was £161,123.

Nickel, so abundant in the island of New Caledonia, has up to the present been found only in Queensland and Tasmania; but few attempts have been made to prospect systematically for this valuable mineral. In 1894 Tasmania produced 136 tons of nickel ore, valued at £544; but none has been raised since that date.

Cobalt occurs in New South Wales and Victoria, and efforts have been made in the former State to treat the ore, the metal having a high commercial value; but the market is small, and no attempt has yet been made to produce it on any large scale. The manganese ores of the Bathurst district of New South Wales often contain a small percentage of cobalt—sufficient, indeed, to warrant further attempts towards its extraction. The only deposits being worked at the present time are at Port Macquarie, where very promising ore has been opened up. During 1901, 110 tons, valued at £1,051, were exported.

Chrome iron or chrome ore has been found in New Zealand and Tasmania. In New South Wales chromium is found in the northern portion of the State in the Clarence and Tamworth districts, and also near Gundagai. It is usually associated with serpentine. Mining operations in New South Wales have been confined to the deposits at Gobarralong, near Gundagai, as it is uncertain whether those at Bowling Alley Point could be profitably worked. The export of chrome ore in 1901 was valued at £7,774, the values in 1899 and 1900 being £17,416 and £11,827 respectively, while the total value exported to the end of 1901

was £90,576. In New Zealand chrome ore to the value of £37,367 was extracted between 1858 and 1866, but there was no further production until the year 1900, when the value amounted to only £110.

Sulphur exists in large quantities in the volcanic regions of New Zealand, where it will doubtless some day become an important article of commerce. The output in 1900 was 1,692 tons, valued at £4,824. It is also said to occur in small quantities at Mount Wingen, in the Upper Hunter district of New South Wales; at Tarcutta, near Wagga Wagga; and at Louisa Creek, near Mudgee.

Arsenic, in its well-known and beautiful forms, orpiment and realgar, is found in New South Wales and Victoria. It usually occurs in association with other minerals, in veins.

Coal.

Australasia has been bountifully supplied by Nature with mineral fuel. Five distinct varieties of black coal, of well characterised types, may be distinguished, and these, with the two extremes of brown coal or lignite, and anthracite, form a perfectly continuous series. For statistical purposes, however, they are all included under the generic name of "coal," and therefore these minerals will be considered here only under the three main heads—lignite, coal, and anthracite.

Brown coal or lignite occurs principally in New Zealand and Victoria Attempts have frequently been made to employ the mineral for ordinary fuel purposes, but its inferior quality has prevented its general use. In Victoria there is a small annual output, the quantity raised in 1901 amounting to 150 tons. The fields of lignite in New Zealand are roughly estimated to contain about 500 million tons; the quantity raised annually is increasing, and in 1900 it amounted to 42,538 tons.

Black coal forms one of the principal mineral resources of New South Wales; and in the other states and New Zealand the rich deposits of this valuable substance are rapidly being developed. That they form an important source of commercial prosperity cannot be doubted, as the known areas of the coal-fields of this class in New South Wales have been roughly estimated to contain about 79,198 million tons, and in New Zealand 500 million tons. New Zealand also possesses a superior quality of bituminous coal, which is found on the west coast of the Middle Island. An estimate of the probable contents of these coal-fields is given as 200 million tons. Coal of a very fair description was discovered in the basin of the Irwin River, in Western Australia, as far back as the year 1846. It has been ascertained from recent explorations that the area of carboniferous formation in that state extends from the Irwin northwards to the Gascoyne River, about 300 miles distant, and probably all the way to the Kimberley district. The most important discovery of coal in the state so far is that made in the bed of the Collie River, near Bunbury, to the south of Perth. The coal has been tested and found to be of good quality; and there are

grounds for supposing that there are 250 million tons on this field. Mr. Jack, formerly Government Geologist of Queensland, gave it as his opinion that the extent of the coal-fields of that state is practically unlimited, and that the carboniferous formations extend to a considerable distance under the Great Western Plains. It is roughly estimated that the Coal Measures at present practically explored extend over an area of about 24,000 square miles. In Tasmania and Victoria large deposits of coal have also been found; and in all the states the industry is being prosecuted with vigour.

Coal was first discovered in New South Wales in the year 1797, near Mount Keira, by a man named Clark, the supercargo of a vessel called the Sydney Cove which had been wrecked in Bass Straits. Later in the same year Lieutenant Shortland discovered the river Hunter, with the coal-beds situated at its mouth. Little or no use, however, was made of the discovery, and in 1826 the Australian Agricultural Company obtained a grant of 1,000,000 acres of land, together with the sole right, conferred upon them by charter, of working the coal-seams that were known to exist in the Hunter River district. Although the company held this valuable privilege for twenty years, very little enterprise was exhibited by them in the direction of winning coal, and it was not until the year 1847, when their monopoly ceased and public competition stepped in, that the coal-mining industry began to show signs of progress and prosperity. From the 40,732 tons extracted in 1847, the quantity raised had in 1901 expanded to the large figure of 5,968,426 tons, valued at £2,178,929, both the output and value in the latter year being the highest on record. To the end of 1901, the total quantity of coal extracted from the New South Wales mines, from their opening, amounted to 97,445,059 tons, valued at £39,494,844.

The coal-fields of New South Wales are classed in three districts—the Northern, Southern, and Western districts, but it is thought that coal deposits extend over nearly the whole length of the sea-coast. The first of these comprises chiefly the mines of the Hunter River district; the second includes the Illawarra district and, generally, the coastal regions to the south of Sydney, together with Berrima, on the table-land; and the third consists of the mountainous regions on the Great Western Railway, and extends as far as Dubbo. The total area of the carboniferous strata of New South Wales is estimated at 23,950 square miles. The seams vary in thickness. One of the richest has been found at Greta, in the Hunter River district; it contains an average thickness of 41 feet of clean coal, and the quantity underlying each acre of ground has been computed to be 63,700 tons.

It has long been known that a seam of coal existed under Sydney Harbour, and in 1899 a syndicate was formed to determine at what depth the deposit was situated. After boring operations had been carried on to a depth of 2,917 feet, a seam of coal 10 feet 3 inches—supposed to be identical with that at Bulli—was struck, and the syndicate now known as the Sydney Harbour Collieries (Limited)

acquired mining rights extending over 10,167 acres. Some difficulty occurred in the selection of a site, but it was at length determined to sink the mine at Balmain, and a small seam of coal was found at a depth of 2,880 feet, while two other seams were struck at depths of 2,933 feet and 2,950 feet. It is fully expected that these seams will be found to unite at a distance of about 300 yards from the shaft, and should this prove to be the case, the effect on the industrial progress of Sydney should be most important. At present the output from the mine is limited, but the coal is of good quality, and its capabilities for steaming purposes have been very favourably spoken of.

The number of coal-mines under inspection in New South Wales at the end of the year 1901 was 96 as compared with 95 in the previous year. They gave employment to 12,191 persons, of whom 9,644 were employed under ground, and 2,547 above ground. The average quantity of coal extracted per miner was 619 tons, as against an average of 612 tons in the previous year, and 559 tons in 1899. For the ten years ended 1901, the average quantity of coal extracted per miner was 530 tons, which, at the mean price of coal at the pit's mouth, was equivalent to £166 11s. 8d. Taking all persons employed at the mines, both above and under ground, the average for the ten years would be 428 tons equivalent to £134 10s. 6d. per man. This production is certainly large, and compares favourably with the results exhibited by the principal coal-raising countries of the world, as will be evident from the following figures, giving the averages for the leading countries, based on the number of persons employed :—

Country.	Quantity of coal raised per miner.	Value at the pit's mouth per ton.	Total value of coal raised per miner.
	tons.	s. d.	£ s. d.
New South Wales	428	6 3	134 10 6
Great Britain	272	10 1	137 2 8
United States	536	5 6	147 8 0
Germany	317	7 3	114 18 3
France	203	11 9	119 15 3
Belgium	174	13 5	116 12 6
Austria	605	6 3	189 1 3

A large proportion of the coal raised is consumed in the state, and out of a total production of 5,968,426 tons in 1901, 2,497,441 tons—or

41·84 per cent.—were used locally. The exports to Australasian ports amounted to 2,130,638 tons, or 35·70 per cent., and to ports outside Australasia 1,340,347 tons, or 22·46 per cent. The quantity required for home consumption increases every year, and the annual consumption per head of population has risen from 16 cwt. in 1877 to 36 cwt. in 1901. The increased steam power employed in the manufacturing industries and on the railways accounts for a great deal of the advance in consumption, while the quantities of coal used in smelting works and gas works also account for a large proportion, but it must be borne in mind that the figures include the bunker coal used in the ocean-going steamers, and this amounted in 1901 to about 430,000 tons.

The progress of the export trade of New South Wales, from 1881 to 1901, is shown in the following table:—

Exported to—	Quantity.			Value.		
	1881.	1891.	1901.	1881.	1891.	1901.
	tons.	tons.	tons.	£	£	£
Australasian states	521,025	1,342,055	1,883,654	200,829	664,847	873,272
New Zealand	136,110	168,921	246,984	54,743	90,662	113,560
India, Ceylon, and China	136,511	188,000	60,120	59,944	105,208	25,292
Mauritius	6,249	19,760	10,398	2,414	10,813	5,549
Pacific Islands	19,526	141,055	361,785	8,011	75,803	187,565
United States	150,002	365,623	215,618	63,172	200,851	114,380
South America	8,017	221,700	482,280	3,243	123,136	255,977
Other countries	52,404	67,254	210,146	20,174	35,310	106,229
Total	1,029,844	2,514,368	3,470,985	417,530	1,306,630	1,681,824

None of the other states is in a position to export coal, but New Zealand is slowly working up an export trade, the progress of which since 1881 is shown below.

Exported to—	Quantity.			Value.		
	1881.	1891.	1901.	1881.	1891.	1901.
	tons.	tons.	tons.	£	£	£
Australasian States	6,049	14,277	25,428	5,022	8,488	20,903
United Kingdom	.....	68,871	88,909	.....	76,027	85,259
Fiji and Norfolk Island	21	3,282	8,115	25	2,469	5,999
Pacific Islands, etc.	551	5,234	37,191	563	4,189	30,015
Total	6,621	91,664	159,643	5,610	91,173	142,176

The exports to the United Kingdom from New Zealand, as well as from New South Wales, consisted entirely of bunker coal for the steamers. Most of the coal-beds of the former colony are on the West coast of the South Island. The total value of the coal produced in 1901 was £676,174, while the production in 1900 amounted to 1,093,990 tons, valued at £588,778. The chief mines are situated at Westport, Otago, and Greymouth, and the production in these districts during 1900 amounted to 380,146, 266,213, and 207,919 tons respectively.

There is a steady increase in the quantity of coal raised in the colony, and a corresponding decrease in the importation. In 1901 there were 145 coal-mines in operation in New Zealand, giving employment to 2,754 men, whose average earnings were £133 14s. 7d.

As showing the various kinds of coal found in New Zealand the following figures relating to the production in 1901 will be of interest :—

Bituminous coal	754,953	tons.
Pitch coal	14,584	,,
Brown coal.....	405,152	,,
Lignite	52,949	,,
Total	1,227,638	,,

Coal-mining is an established industry in Queensland, and is progressing satisfactorily. The production is steadily increasing and in 1901 it amounted to 539,472 tons, valued at £189,877, both production and value being in excess of the total for any previous year. The collieries now in operation are situated in the Ipswich and Wide Bay districts, on the Darling Downs, and at Clermont; but coal deposits are known to exist in the neighbourhood of Rockhampton and Gladstone. Operations are being conducted with the view of developing the coal beds in these localities; nine shafts have been sunk and a large seam of coal penetrated which is thought to extend a considerable distance. Should these mines prove successful they may lead to the establishment of an export trade, as their proximity to the coast gives them an advantage over other mines in the state. Of the total production of 539,472 tons during 1901, 420,500 tons were obtained in the Ipswich district, 110,849 tons at Wide Bay, and 7,000 tons in the Clermont district. There were 1,265 men engaged in the industry in 1901.

In Tasmania coal of good quality has been found in the Lower Measures of the Permo-Carboniferous rocks, principally in the basins of the Mersey and the Don in the north, and at Adventure Bay and Port Cygnet in the south, as well as in the Upper Measures of the Triassic or Jurassic rocks, which are extensively developed in the eastern and north-eastern parts of the state. The seams of coal known to exist on the east coast, in the vicinity of the Denison and Douglas Rivers, and at Landaff, are now being tested by means of the diamond drill. In the parish of Boultbee, on the east coast, it is stated that three seams of coal—10 ft. 6 in., 4 ft. 9 in., and 2 ft. 7 in. in thickness—have been discovered. At the Jubilee mine, St. Mary's, a tunnel has been driven over 100 feet in a seam of coal 6 feet thick, which can be worked profitably. The production of coal in the state during 1900 amounted to 43,010 tons, valued at £21,711; and the output from the different collieries was—Cornwall 21,799 tons, Nicholas 17,962 tons, Mount Cygnet 2,345 tons, Dulverton 495 tons, and York Plains 409 tons.

Tasmania still relies largely on New South Wales to supply coal for local requirements. Since 1896 the export of coal from New South Wales to Tasmania has increased from 57,000 tons to 97,000 tons. During 1901 there were 174 men engaged in coal-mining in the state and the output amounted to 45,438 tons, valued at £38,451.

Black coal has been discovered in Victoria, and is now being raised in increasingly large quantities. In 1901 the production amounted to 209,329 tons, valued at £147,191, as compared with 22,834 tons, valued at £19,731, in 1891. There is still a large export of coal from New South Wales to Victoria, however, the quantity in 1901 amounting to 943,336 tons. The principal collieries in the state are the Outtrim Howitt, Jumbunna, and the Coal Creek Proprietary, the output from these during 1901 being 118, 168, 60,237, and 30,924 tons respectively.

In South Australia, coal-beds were discovered at Leigh's Creek, north of Port Augusta, but the results of a trial on the Government railways proved the coal to be unsuitable for use. There was no output during 1901. The export of coal from New South Wales to South Australia during 1901 was 540,282 tons.

The only coal-field in Western Australia is situated at Collie, and during 1901 the production was 117,836 tons, valued at £68,561. This was 574 tons less than in 1900, owing to a fire at the Wallsend, one of the principal collieries, and the fact that the West Collie mine was working on an unprofitable seam of coal. Satisfactory tests of Collie coal have been made, and it is now used extensively on the Government railways and on the gold-fields, and it has also been proved suitable for naval purposes, one great advantage being that it gives out little or no smoke.

The quantity of coal extracted annually in Australasia now exceeds 8,108,000 tons, valued at about £3,299,000. The production of each state during the year 1901 was as follows:—

State.	Quantity.	Value.	
		Total.	Proportion raised in each State.
	tons.	£	per cent.
New South Wales	5,968,426	2,178,929	66·0
Victoria	209,329	147,191	4·5
Queensland	539,472	189,877	5·8
Western Australia	117,836	68,561	2·1
Tasmania	45,438	38,451	1·2
Commonwealth	6,880,501	2,623,009	79·5
New Zealand	1,227,638	676,174	20·5
Australasia	8,108,139	3,299,183	100·0

The total quantity and value of the coal produced in Australasia up to the end of 1901 are shown below. A small quantity has been raised in South Australia, but is not yet of sufficient importance to warrant inclusion in the table :—

State.	Quantity.	Value.
	tons.	£
New South Wales	97,445,059	39,494,844
Victoria	1,947,893	1,042,358
Queensland	6,695,523	2,821,989
Western Australia	294,090	150,972
Tasmania	800,264	445,465
Commonwealth	107,182,829	43,955,628
New Zealand	15,780,508	8,364,567
Australasia	122,963,337	52,320,195

During the year 1901 this industry gave direct employment in and about the mines to the following numbers of persons in the several states :—

	No.
New South Wales	12,191
Victoria	877
Queensland	1,265
South Australia	50
Western Australia	383
Tasmania	174
New Zealand	2,754

The average price of coal per ton varies considerably in the states. In New South Wales, from the date of the commencement of mining to the end of the year 1901, the average price obtained has been 8s. 1d., but the mean of the last ten years has not been more than 6s. 3d. In 1901 the average price per ton of coal at the pit's mouth was as follows :—

	s.	d.
New South Wales	7	4
Victoria	14	1
Queensland	7	0
Western Australia	11	8
Tasmania	16	11
Commonwealth	7	7
New Zealand	11	0
Australasia	8	2

Anthracite is found in several of the Australasian states. It is a hard and heavy mineral, burning with difficulty, and possesses very little commercial value in countries where ordinary coal abounds.

Attention has lately been directed to the question of mining for this mineral in Queensland, and 50 tons are being obtained from the seam discovered at the Dawson River with a view of testing its utility. At Daaringa a bore is about to be sunk at a specially selected site, and the Government has agreed to grant a sum of money in aid of the undertaking.

The following table shows the annual coal production of the principal countries of the world. The figures refer to the year 1900, except those for Great Britain, United States, and Australasia, which refer to the year 1901 :—

Country.	Tons of 2,240 lb.
Great Britain	219,047,000
United States	* 266,079,000
Germany	147,381,000
Austria-Hungary	38,402,000
France	32,867,000
Belgium	23,086,000
Canada	4,760,000
Australasia	8,108,000

* Including lignite.

Kerosene shale (torbanite) is found in several parts of New South Wales. It is a species of cannel-coal, somewhat similar to the boghead mineral of Scotland, but yielding a much larger percentage of volatile hydro-carbon than the Scottish mineral. The richest quality yields about 100 to 130 gallons of crude oil per ton, or 17,000 to 18,000 cubic feet of gas, with an illuminating power of 35 to 40 sperm candles when gas only is extracted from the shale. The New South Wales Shale and Oil Company, at Hartley Vale, and the Australian Kerosene Oil and Mineral Company, at Joadja Creek and Katoomba, not only raise kerosene shale for export, but also manufacture from it petroleum oil and other products. From the year 1865, when the mines were first opened, to the end of 1901, the quantity of kerosene shale raised has amounted to 1,073,468 tons, worth £1,970,623. The average price realised during that period has been £1 16s. 9d. per ton. The prices ruling in 1901, when 54,774 tons were extracted, averaged 15s. 2d. per ton, representing a total value of £41,480 for the production of that year.

Extensive formations of oil shale have been found in New Zealand, in Otago and at Orepuki, in Southland, where a mine has been opened and extensive works erected to treat the mineral for the extraction of oils, paraffin wax, ammonia, &c. A large amount of capital has been sunk in the venture, and great hopes are entertained of its success.

The annual import of kerosene oil into Australasia, based on the returns of the last three years, is shown below :—

State.	Quantity.	Value.
	gallons.	£
New South Wales	4,876,467	181,222
Victoria	4,552,454	151,935
Queensland	1,803,728	74,869
South Australia	1,479,971	44,651
Western Australia	1,552,732	51,062
Tasmania	312,208	12,365
Commonwealth	14,577,560	516,104
New Zealand	2,301,221	89,739
Australasia	16,878,781	605,843

Other Carbon Minerals.

Of all the mineral forms of carbon the diamond is the purest; but as it is usual to class this precious substance under the head of gems that custom will be followed in the present instance.

Graphite, or plumbago, which stands second to the diamond in point of purity, has been discovered in New Zealand, in the form of detached boulders of pure mineral. It also occurs in impure masses where it comes into contact with the Coal Measures. This mineral, up to the present time, has not been found in any of the other states except New South Wales, where in 1889 a lode 6 feet wide, but of inferior quality, was discovered near Undercliff, in the New England district; and in Western Australia, where, however, owing principally to difficulties of transit, very little of it has been worked.

Ozokerite, or mineral wax, is reported to have been found at Coolah, in New South Wales.

Elaterite, mineral caoutchouc, or elastic bitumen, is said to have been discovered in New South Wales and South Australia. In the last-named state a substance very similar to elaterite has been discovered in the Coorong Lagoons, and has received the name of coorongite. Up to the present time neither the extent of these finds nor their commercial value has been ascertained.

Bitumen is known to exist in Victoria, and is reported to have been found near the township of Coonabarabran, in New South Wales.

Kauri gum, a resinous substance somewhat resembling amber in appearance, and like that product an exudation from trees, is found only in the Auckland province of New Zealand, and is included under the head of minerals, although more logically entitled to be considered as a vegetable product. The best is that dug out of the ground;

but considerable quantities of inferior grades are taken from the forks of standing trees. In New Zealand an extensive and lucrative commerce is carried on in kauri gum. It is computed that the total value of this product obtained from 1853 to the end of 1901 was £10,775,945. In the year 1901 the quantity obtained represented a value of £446,114, and gave employment to about 7,000 persons, both European and Maori. Kauri gum is included in the figures in this chapter giving the total mineral production.

Salts.

Common rock salt has been found in rock crevices in several parts of New South Wales, but it is not known to exist in deposits large enough to be of commercial importance. Large quantities of salt are obtained from the salt lakes in South Australia by means of evaporation. The principal source of supply is Lake Fowler, and in summer the entire area is covered with a deposit of salt. In 1900 there were between 300 and 400 men employed in collecting the salt, while 73 hands were employed in refining works. The quantity of salt gathered during the year amounted to 32,574 tons.

Natron is said to occur in the neighbourhood of the Namoi River, in New South Wales. It appears as a deposit from the mud-wells of that region. Epsomite, or epsom salt (sulphate of magnesia), is seen as an efflorescence in caves and overhanging rocks of the Hawkesbury sandstone formation, and is found in various parts of New South Wales.

Large deposits of alum occur close to the village of Bulladelah, 30 miles from Port Stephens, New South Wales. Up to the end of the year 1901, 15,742 tons of alunite had been raised there, most of which had been sent to England for treatment. It is said to yield well, and a quantity of the manufactured alum is sent to Sydney for local consumption. During 1901 the Bulladelah mine yielded 3,146 tons of stone, valued at £9,438.

Stones and Clays.

Marble is found in many parts of New South Wales, South Australia, New Zealand, and Tasmania. In New South Wales marble quarries have been opened in several districts, and some very fine specimens of the stone have been obtained.

Lithographic stone has been found in New Zealand, where another beautiful species of limestone known as Oamaru stone is also procured. This stone has a fine, smooth grain, and is of a beautiful creamy tint. It is in great demand for public buildings, not only in the colony where it is found, but in the great cities of continental Australia, which import large quantities of the stone for the embellishment of public edifices.

Limestone is mined for in New South Wales, and at Capertee the industry is assuming important dimensions, as extensive works, capable of producing 20,000 tons of cement, are being erected. In various

other parts of the state limestone is raised, and the total production in 1901 was 20,855 tons, valued at £16,247. In Western Australia a considerable quantity of limestone is raised for fluxing purposes, the production in 1901 being 20,569 tons, valued at £13,246. The establishment of the cyanide process for the recovery of gold, in which lime is freely used, has led to the opening up of limestone mines in various parts of Queensland, and the production in 1901 amounted to 6,514 tons, valued at £4,901.

Gypsum is found crystallised in clay-beds in New South Wales, and in isolated crystals in the Salt Lakes of South Australia, where a small proportion of sulphate of lime is present in the water. It is also found in portions of Victoria. This mineral is of commercial value for the manufacture of cement and plaster of Paris, and also as a fertiliser. A company in South Australia has recently raised a considerable quantity for this latter purpose. It is found in the form of an insoluble salt in New South Wales, Victoria, and New Zealand.

Apatite, another mineral of considerable commercial importance, and very valuable as a manure, occurs in several districts of New South Wales, principally on the Lachlan River, at the head of the Abercrombie, and in the Clarence River district.

Quartz is of common occurrence in all parts of Australasia. Rock crystal, white, tinted, and smoky quartz are frequently met with, as well as varieties of crystalline quartz, such as amethyst, jasper, and agate, which possess some commercial value.

Tripoli, or rotten stone, an infusorial earth, consisting of hydrous silica, which has some value for commercial purposes, has been found in New South Wales, Victoria, and New Zealand. Meerschaum is reported to have been discovered near Tamworth and in the Richmond River district, in New South Wales.

Mica is also found in granitic country, chiefly in the New England and Barrier districts. In Western Australia very good mica has been found at Bindoon, and also on the Blackwood River, near Cape Leeuwin. Several attempts at mining were made, but they proved unsuccessful, and have been abandoned. Some promising discoveries have been made near Herberton, in Northern Queensland. In the Northern Territory of South Australia mica has been obtained on a small scale. In 1895 the production was valued at £2,638, and in 1896 at £732; but of late years there has been no production.

Kaolin, fire-clays, and brick-clays are common to all the states. Except in the vicinity of cities and townships, however, little use has been made of the abundant deposits of clay. Kaolin, or porcelain clay, although capable of application to commercial purposes, has not as yet been utilised to any extent, though found in several places in New South Wales and in Western Australia.

Asbestos has been found in New South Wales in the Gundagai, Bathurst, and Broken Hill districts—in the last-mentioned district in considerable quantities. Several specimens of very fair quality have

also been met with in Western Australia; and the Government of the state offered a bonus not exceeding £500 for the export of 50 tons of asbestos, of a value of not less than £10 per ton. In Tasmania, in the vicinity of Beaconsfield, asbestos is known to exist in considerable quantities.

Gems and Gemstones.

Many descriptions of gems and gemstones have been discovered in various parts of the Australasian states, but systematic search has been made principally for the diamond and the noble opal.

Diamonds are found in New South Wales, Victoria, Queensland, and South Australia, but only in the first-named state have any attempts been made to work the diamond drifts. The existence of diamonds and other gem-stones in the territory of New South Wales had been known for years before an attempt was made to work the deposits in 1872. In the course of the following year several deposits of adamantiferous wash were discovered at Bingara, in the New England district. The output has never been very considerable, the largest value realised in any year being £15,375. In 1899 the value amounted to £10,350; but the output has declined in the last two years, although, owing to an increase in prices, the value has not decreased in like proportion, as in 1901 it reached £9,756. The total value of the diamonds produced up to the end of 1901 was £65,291; but this amount is believed to be considerably understated.

The finest opal known is obtained in the Upper Cretaceous formation at White Cliffs, near Wilcannia, New South Wales, and there are about 900 miners on the field. During the year 1895 good stone was found at a depth of 50 feet, and as the lower levels are reached the patches of opal appear to improve in quality and to become more regular and frequent. On block 7 a patch of stone was found which realised over £3,000. It is difficult to state with exactitude the value of the production, but it is believed that stone to the value of £576,600 has been sold up to the end of 1901. During 1901 a Special Commission was appointed to inquire into matters connected with the opal industry at White Cliffs. Their investigations tended to show that the annual value of production for some years had amounted to £100,000, and they recommended that the Government should redeem the unexpired portion of the leases held by the White Cliffs Opal Mines, Limited, extending over 300 acres, and that the land should be revested in the Crown and thrown open for mining in small areas under miners' right or mineral leases. No definite reply has yet been received to the offer of purchase by the Crown, but an alternative recommendation, that in lieu of the tribute system the area should be let in blocks at a small rental, has been adopted by the Company, and is working satisfactorily. The value of opal won during 1901 is estimated at £120,000.

In Queensland the opal is found in rocks of the desert sandstone formation, sometimes on the surface, but generally at a depth of about

14 feet. The chief fields are at Cunnamulla, Paroo, and Opalton, in the far western and north-western parts of the State, but the scanty water supply has been a great barrier to the progress of the industry. During 1901 the production was valued at £7,400, and there were 293 men on the fields, although in most cases they only worked in time spared from other occupations.

Other gem-stones, including the sapphire, emerald, oriental emerald, ruby, opal, amethyst, garnet, chrysolite, topaz, cairngorm, onyx, zircon, etc., have been found in the gold and tin-bearing drifts and river gravels in numerous localities throughout the states. The Emerald Proprietary Company, in the Emmaville district, near Glen Innes, New South Wales, have sunk two shafts, 100 feet and 50 feet respectively; and 25,000 carats have been won in a rough state. Their value when cut and finished, if of the best quality, is about £2 per carat. Owing to the difficulties of extraction, and the low price of the gems in the London market, the mines were closed for three years. In 1897 they were again opened up, and, although worked for some time during 1898, they are now closed, the company having obtained a suspension of the labour conditions. No gems were produced during the year.

The sapphire is found in all the States, and considerable attention has lately been directed to the sapphire fields of Anakie, in Queensland. During 1901 the Assistant Government Geologist inspected the locality, and his report indicates that the field is a large one, and the extent of sapphire wash second to none in the world. The gems are of a peculiar colour, quite distinct from those of any other country, and this seems to have slightly prejudiced their value. The value of the production of sapphires in Queensland during 1901 was estimated at £6,000. The oriental topaz has been found in New South Wales. Oriental amethysts also have been found in that State; and the ruby has been found in Queensland, as well as in New South Wales.

According to an authority on the subject of gemstones, rubies, oriental amethysts, emeralds, and topaz have been chiefly obtained from alluvial deposits, but have rarely been met with in a matrix from which it would pay to extract them.

Turquoises have been found near Wangaratta, in Victoria.

Chrysoberyls have been found in New South Wales; spinel rubies, in New South Wales and Victoria; white topaz, in all the states; and yellow topaz, in Tasmania. Chalcedony, carnelian, onyx, and cat's-eye are found in New South Wales; and it is probable that they are also to be met with in the other states, particularly in Queensland. Zircon, tourmaline, garnet, and other gemstones of little commercial value are found throughout Australasia.

In South Australia some very fine specimens of garnet were found, causing some excitement at the time, as the gems were mistaken for rubies. The stones were submitted to the examination of experts,

whose reports disclosed the true nature of the gems, and dispelled the hopes of those who had invested in the supposed ruby-mines of South Australia.

Production of Minerals.

The foregoing pages show that Australasia possesses invaluable mineral resources, and although enormous quantities of minerals of all kinds have been won since their first discovery, yet the deposits, with the exception perhaps of gold, silver, and coal have only reached the first period of their exploitation. The development of the deposits of various other minerals has not reached a sufficiently advanced stage to enable an exact opinion to be expressed regarding their commercial value, though it is confidently held by mining experts that this must be enormous. The mineral production of the various states in 1901 will be found below :—

State.	Total Value.	Proportion of each State.	Average value per head.
	£	per cent.	£ s. d.
New South Wales	5,854,150	23·4	4 5 4
Victoria	3,312,162	13·3	2 15 1
Queensland	3,114,702	12·5	6 3 6
South Australia	613,930	2·5	1 13 10
Western Australia	7,445,772	29·8	39 14 2
Tasmania	1,675,290	6·7	9 13 0
Commonwealth	22,016,006	88·2	5 15 9
New Zealand	2,956,001	11·8	3 15 11
Australasia	24,972,007	100·0	5 9 0

The total value of the minerals raised in Australasia during 1901 was £24,972,007, being £114,198 in excess of the value for 1899, which had hitherto been the highest. The great advance of gold-mining in Western Australia and the increased activity displayed in coal-mining in New South Wales were the chief contributing factors to this desirable result. Gold has always constituted the largest proportion of the value raised, but the search for this mineral has led to the expansion of other branches of the mining industry which are commanding more attention each year. At the present time the number of persons in Australasia who gain their livelihood by mining is greater than at any previous

period. The total employment in each branch of mining during 1901 was :—

State.	Number of Persons engaged in Mining for—						Total.
	Gold.	Silver and Lead.	Copper.	Tin.	Coal, Coke, and Shale.	Other Minerals & Precious Stones.	
New South Wales	12,064	6,298	2,964	1,428	12,415	1,446	36,615
Victoria	27,777	.....	4	.....	877	12	28,670
Queensland	9,438	40	814	1,148	1,265	647	13,352
South Australia.....	2,000	150	4,057	.....	50	750	7,007
Western Australia....	19,771	2	321	413	383	5	20,895
Tasmania.....	1,112	....	†4,543	1,065	174	29	6,923
Commonwealth ..	72,162	6,490	12,703	4,054	15,164	2,889	113,462
New Zealand	12,533	*	*	*	2,754	*	*
Australasia	84,695	.....	.....	.....	17,918	.....	.....

* No information. † Includes silver miners.

The greatest number of persons engaged in mining is in New South Wales, where, owing to the large employment afforded by the coal-mines, the total is 36,615 ; the greatest number of gold-miners is in Victoria. The total number of persons in the Commonwealth engaged in mining pursuits is 113,462, and in view of the known resources which await development, this number is likely to be still further increased.

The following table shows the value of the mineral production of each state during the four years 1871, 1881, 1891 and 1901, as well as the value per inhabitant for the whole of Australasia :—

State.	1871.	1881.	1891.	1901.
	£	£	£	
New South Wales	1,650,000	2,121,000	6,396,000	5,854,150
Victoria	5,400,000	3,467,000	2,339,000	3,312,162
Queensland	806,000	3,165,000	2,300,000	3,114,702
South Australia	725,000	421,000	366,000	613,930
Western Australia.....	5,000	11,000	130,000	7,445,772
Tasmania.....	25,000	604,000	516,000	1,675,290
Commonwealth	8,611,000	9,789,000	12,047,000	22,016,006
New Zealand	3,100,000	1,528,000	1,841,000	2,956,001
Australasia — Total	11,711,000	11,317,000	13,888,000	24,972,007
Australasia — Per head	£ s. d. 6 1 0	£ s. d. 4 1 6	£ s. d. 3 12 3	£ s. d. 5 9 0

The foregoing table shows that the mineral production of 1901 was over eleven millions more than that of 1891. There were increases in all the states with the exception of New South Wales, in which state a decrease of slightly over £542,000 has to be recorded, owing to the fall in the value of silver and lead. The most notable increases were in Western Australia and Tasmania; the production of the former state exceeded that of 1891 by nearly £7,316,000, mainly on account of the great increase in the gold yield, which advanced in value from £115,182 to £7,235,653 during the period under review. The large increase in the Tasmanian production was due to the output of the Mount Lyell Copper-mines. In the other states, the increases were also substantial, ranging from 42 per cent. in Victoria to 68 per cent. in South Australia.

Comparing the value of the mineral production in 1901 with the population, the largest amount is shown by Western Australia, with £39 14s. 2d. per inhabitant; Tasmania ranks second, with £9 13s. 0d. per inhabitant; Queensland third, with £6 3s. 6d.; New South Wales fourth, with £4 5s. 4d.; and New Zealand fifth, with £3 15s. 11d. Victoria follows with an average of £2 15s. 1d. per head, and in South Australia the production per inhabitant was only £1 13s. 10d. The average per inhabitant for Australasia was £5 9s. 0d., and the average for the states constituting the Commonwealth was £5 15s. 9d. per head.

The following table shows the value of production in each of the states during 1901, distinguishing the principal minerals. With regard to some of the states the data are defective in respect to "other minerals," but not to such an extent as to seriously affect the gross total. The column "other minerals" includes kerosene shale in New South Wales and kauri gum in New Zealand:—

State.	Gold.	Silver and Silver-lead.	Copper.	Tin.	Coal.	Other Minerals.	Total.
	£	£	£	£	£	£	£
New South Wales	921,282	1,854,463	412,292	76,544	2,178,929	410,640	5,854,150
Victoria	3,102,753	.....	.....	4,181	147,191	58,037	3,312,162
Queensland	2,541,892	62,241	194,227	93,723	189,877	32,742	3,114,702
South Australia	93,222	12,067	500,077	5,584	.....	2,980	613,930
Western Australia....	7,235,653	7,609	75,246	40,000	68,561	18,703	7,445,772
Tasmania	295,176	207,228	917,787	216,186	38,451	462	1,675,290
Commonwealth ..	14,189,978	2,143,608	2,099,629	436,218	2,623,009	523,564	22,016,006
New Zealand	1,753,783	65,258	105	.....	676,174	*460,681	2,956,001
Australasia	15,943,761	2,208,866	2,099,734	436,218	3,299,183	984,245	24,972,007

* Inclusive of kauri gum of the value of £446,114.

The total mineral production to the end of 1901 is shown in the following table, in which the column "other minerals" again includes kerosene shale and kauri gum :—

State.	Gold.	Silver and Silver-lead.	Copper.	Tin.	Coal.	Other Minerals.	Total.
	£	£	£	£	£	£	£
New South Wales	49,661,815	32,341,577	5,857,073	6,601,806	39,494,844	4,299,947	138,257,062
Victoria	260,489,201	856,539	206,395	715,498	1,042,358	346,031	263,656,022
Queensland	52,751,675	788,042	2,249,692	4,693,366	2,821,989	320,410	63,625,674
South Australia.....	2,388,197	118,630	22,822,046	32,680	.....	509,542	25,871,095
Western Australia....	30,149,712	11,453	326,972	198,199	150,972	414,534	31,251,842
Tasmania.....	4,893,588	2,384,886	3,921,495	7,270,294	445,465	336,932	19,258,660
Commonwealth ..	400,334,188	36,501,127	35,383,673	19,518,343	43,955,628	6,227,396	541,920,355
New Zealand	59,159,883	380,806	18,088	.....	8,364,567	*11,030,547	78,953,891
Australasia	459,494,071	36,881,933	35,401,761	19,518,343	52,320,195	17,257,943	620,874,246

* Inclusive of kauri gum of the value of £10,775,945.

Coal was the only mineral raised in New South Wales prior to 1852, and its production up to that date was valued at £279,923. Deducting that amount from the total value of Australasian minerals raised up to the end of 1901, the remainder, £620,594,323, represents the value of mineral production from 1852, equal to an average of £12,411,886 per annum for the fifty years.