

CHAPTER XXI.

MINERAL INDUSTRY.

§ 1. The Mineral Wealth of Australia.

1. **Place of Mining in Australian Development.**—The value of production from the mineral industry is now considerably less than that returned by the agricultural or the pastoral industry, nevertheless it was the discovery of gold in payable quantities that first attracted population to Australia, and thus laid the foundation of its nationhood. Prior to 1851, the year when Hargraves' memorable discovery was made, coal and copper had both been mined to some extent, and the existence of deposits of other minerals, including gold, had been proved. But it was the news of the sensational finds of the precious metal in 1851 and the year immediately following that brought about a constant stream of immigration, and caused an increase in population from 405,000 at the end of 1850 to upwards of 1,146,000 at the end of 1860.

2. **Extent of Mineral Wealth.**—The extent of the total mineral wealth of Australia cannot yet be regarded as completely ascertained, as large areas of country still await systematic prospecting. The presence of considerable deposits of valuable minerals has long been known. Thus, coal was discovered in 1797, and a shipload was exported to Bengal in 1799, silver was discovered as early as 1839, and was worked as early as 1864; copper mining dates back to 1844; lead to about 1848; iron to about 1850; while the discovery of gold in payable quantities dates back to 1851. Cobalt, nickel, manganese, chromium, tungsten, molybdenum, mercury, antimony, bismuth, zinc, cadmium, radio-active ores, etc., have all been found, some in fairly large quantities. During recent years osmiridium has figured largely in the Tasmanian returns.

Among the more valuable non-metalliferous substances other than coal may be mentioned coke, kerosene shale, graphite, alunite, asbestos, diatomaceous earth, phosphate, clays, ochres, etc.; in building stones—sandstones, syenites, granites, basalts, augite-andesite, porphyries, serpentines, slates, limestones, and marbles; in precious stones—diamonds, emeralds, rubies, sapphires, amethysts, precious opal, turquoise, topazes, garnets, chrysolites, cairngorm, agates, etc.

3. **Quantity and Value of Production during 1926.**—The quantities (where available) and the values of the principal minerals produced in each State, and in Australia as a whole during the year 1926, are given in the tables immediately following. It must be clearly understood that the figures quoted in these tables refer to the quantities and values of the various minerals in the form in which they were reported to the States Mines Departments, and represent amounts which the Mines Departments consider may fairly be taken as accruing to the mineral industry as such. They are not to be regarded as representative of Australia's potentiality as a producer of *metals*, this matter being dealt with separately in § 18 hereinafter. It may be explained, therefore, that the item pig-iron in New South Wales refers only to metal produced from locally-raised ore and so reported to the Mines Department. New South Wales is, of course, in normal times, a large producer of iron and steel from ironstone mined in South Australia. As the table shows, the latter State receives credit for this ironstone in its mineral returns, but the iron and steel produced therefrom cannot be assigned to the mineral industry of New South Wales. Similarly lead, silver-lead, and zinc are credited in the form reported to the State of origin—chiefly New South Wales—although the actual metal extraction is carried out to a large extent elsewhere.

MINERAL PRODUCTION.—QUANTITIES, 1926.

Minerals.	Unit.	N.S.W.	Vic.	Q'land.	S. Aust.	W. Aust.	Tas.	N.T. (d)	Australia.
Alunite	ton	580	..	..	..	..	..	..	580
Antimony .. ..	..	85	..	10	..	5	..	..	100
Arsenic .. ..	..	405	..	815	..	(c)	..	..	1,220
Asbestos .. ..	..	5	..	..	..	105	..	..	110
Barytes .. ..	..	200	..	..	1,742	..	..	..	1,942
Bismuth	cwt.	165	..	..	..	..	..	..	165
Brown Coal	ton	..	957,935	..	..	..	..	..	957,935
Chromite .. ..	..	597	..	..	..	..	..	..	597
Coal .. ..	..	10,885,766	591,001	1,221,059	..	474,819	102,358	..	13,275,003
Cobalt .. ..	..	..	..	27	..	..	..	..	27
Copper (ingot, matte, etc.) .. ..	..	357	..	1,217	232	1	6,915	..	8,722
Copper ore .. ..	..	..	..	..	..	..	..	7	7
Diatomaceous earth .. ..	..	911	..	..	..	..	..	..	911
Gold	fine oz.	19,435	49,078	10,339	758	437,343	4,222	140	521,315
Gypsum	ton	817	10,217	..	65,613	3,918	..	..	80,565
Iron (pig) (b) .. ..	..	105,201	..	..	..	..	..	..	105,201
Iron oxide .. ..	..	3,251	..	..	..	..	..	..	3,251
Ironstone .. ..	..	..	..	4,412	583,745	..	..	..	588,157
Kaolin .. ..	..	4,748	3,153	..	200	..	..	..	8,101
Lead .. ..	..	..	..	3,735	23	..	5,893	..	9,656
Lead and silver ore, concentrates, etc. .. ..	..	274,513	..	..	..	4,162	..	52	278,727
Limestone flux .. ..	..	109,698	..	72,426	119,714	..	153,707	..	455,545
Magnesite .. ..	..	10,263	94	..	226	..	..	..	10,583
Manganese ore .. ..	..	1,290	..	20	..	82	..	..	1,392
Molybdenite	cwt.	8	840	..	..	..	..	..	848
Osmiridium	oz.	..	..	..	..	..	3,173	..	3,173
Phosphate	ton	253	120	..	882	..	..	..	1,255
Pigments .. ..	..	526	2,338	..	36	..	38	..	2,938
Platinum	oz.	397	..	..	..	..	..	..	397
Salt .. ..	..	..	(a)	..	91,101	..	..	..	91,101
Sapphires .. ..	..	1,808	..	..	..	..	..	..	1,808
Shale (oil)	ton	..	..	..	..	..	2,127	..	2,127
Silver	fine oz.	9,342	2,373	252,540	353	68,413	766,653	..	1,099,674
Tin and tin ore	ton	1,134	29	1,058	..	67	1,096	98	3,482
Wolfram .. ..	..	..	..	1	..	..	83	..	84
Zinc and concen- trates .. ..	..	267,533	..	200	..	..	5,378	..	273,111

(a) Not available for publication. (b) See letterpress preceding this table. (c) Quantity not stated: Contained in gold ore. (d) Year ended 30th June.

The values of the minerals raised in each State during 1926 are given in the following table:—

MINERAL PRODUCTION.—VALUE, 1926.

Minerals.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	N.T. (e)	Australia.
	£	£	£	£	£	£	£	£
Alunite	2,320	..	..	..	..	..	..	2,320
Antimony	1,236	..	105	..	85	..	..	1,426
Arsenic	5,837	..	5,450	..	347	..	..	11,634
Asbestos	20	..	..	..	2,728	..	..	2,748
Barytes	400	..	..	5,226	..	..	..	5,626
Bismuth	773	..	..	..	..	..	..	773
Brown Coal .. ..	..	188,899	..	..	..	..	..	188,899
Chromite	1,704	..	..	..	..	..	..	1,704
Coal	9,436,520	657,798	1,098,927	..	394,400	90,401	..	11,678,046
Cobalt .. ..	..	..	5,430	..	..	..	..	5,430
Copper (ingot and matte)	22,473	..	73,591	14,681	84	454,854	..	565,683
Copper ore .. ..	..	..	..	..	..	..	60	60
Diamonds	77	..	..	..	..	..	..	77
Diatomaceous earth	1,765	..	..	..	..	..	..	1,765
Gold	82,551	208,471	43,914	3,219	1,857,716	17,936	594	2,214,401
Gypsum	1,287	7,613	..	57,411	5,618	..	..	71,929
Iron (pig) (b)	578,605	..	..	..	..	..	..	578,605
Iron oxide	1,958	..	..	..	..	..	..	1,958
Ironstone .. ..	..	..	3,914	671,307	..	..	..	675,221
Kaolin	5,087	4,157	..	900	..	..	..	10,144
Lead .. ..	..	..	116,156	819	..	183,167	..	300,142
Lead and silver- lead ore, concen- trates, etc.	4,398,823	..	..	..	76,741	..	447	4,476,011

For notes see next page.

MINERAL PRODUCTION—VALUE, 1926—continued.

Minerals.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	N. T. (e)	Australia.
	£	£	£	£	£	£	£	£
Limestone flux ..	27,049	..	36,657	44,893	..	153,219	..	261,818
Magnesite ..	14,375	281	..	565	..	..	..	15,221
Manganese ore ..	3,955	..	40	..	503	..	..	4,498
Molybdenite ..	41	7,350	..	..	..	..	..	7,391
Opal ..	11,485	..	600	10,330	..	..	..	22,415
Osmiridium ..	..	..	..	..	..	61,908	..	61,908
Phosphate ..	316	120	..	864	..	..	..	1,300
Pigments ..	644	1,935	..	297	..	69	..	2,945
Platinum ..	6,910	..	..	..	..	..	..	6,910
Salt ..	..	(a)	..	204,977	..	..	..	204,977
Sapphires ..	2,418	..	6,799	..	..	..	..	9,217
Shale (oil) ..	..	..	..	..	..	1,475	..	1,475
Silver ..	1,130	307	31,563	46	8,863	97,983	..	139,902
Tin and tin ore ..	326,474	5,075	174,147	..	10,450	322,526	15,852	854,524
Wolfram ..	..	..	48	..	..	5,265	..	5,313
Zinc & concentrates	1,359,588	..	6,827	..	..	183,362	..	1,549,777
Unenumerated ..	(d) 23,444	..	4,488	16,818	14,329	1,827	(c) 2,132	63,038
Total ..	16,319,265	1,082,006	1,608,661	1,032,353	2,371,864	1,573,997	19,085	24,007,231

(a) Not available for publication.

(b) See letterpress, page 751.

(c) Mica.

(d) Includes

dolomite £5,900, silica £9,700, and fireclay £6,900.

(e) Year ended 30th June.

It may be pointed out in connexion with the figures given in the above table that the totals are exclusive of returns relating to certain commodities, such as stone for building and industrial uses, sand, gravel, brick and pottery clays, lime, cement, and slates, which might rightly be included under the generic term "mineral." Valuations of the production of some of these may be obtained from the reports of the various Mines Departments, but in regard to others it is impossible to obtain adequate information. In certain instances, moreover, the published information is of little value. By restricting the comparison to items in connexion with which properly comparable information can be obtained for each State, it is believed that a satisfactory estimate of the progress of the mineral industry can be more readily obtained. The items excluded from the total for New South Wales in 1926 consist of—lime, £127,360; building stone, £168,216; Portland cement, £1,473,522; coke, £940,416; road materials, £567,481; shell grit, £335; mineral water, £205; sulphur and sulphuric acids, £92,297; and brick and pottery clays, £361,419. From the Queensland returns, marble, £80 has been deducted, while carbide, £68,400, and cement £166,447 have been excluded from the Tasmanian figures.

4. Value of Production, 1922 to 1926.—The value of the mineral production in each State during the five years 1922 to 1926 is given in the table hereunder:—

MINERAL PRODUCTION.—VALUE, 1922 TO 1926.

Year.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	N. T.	Australia.
	£	£	£	£	£	£	£	£
1922 ..	12,951,164	1,244,966	1,859,034	331,866	3,041,112	878,009	9,959	20,316,160
1923 ..	14,176,688	1,031,223	2,215,498	890,378	2,747,101	1,154,397	16,612	22,231,897
1924 ..	16,299,835	964,917	2,305,669	953,592	2,776,796	1,325,967	19,138	24,645,914
1925 ..	16,657,585	1,000,763	2,012,456	1,028,396	2,393,890	1,477,944	21,715	24,592,749
1926 ..	16,319,265	1,082,006	1,608,661	1,032,353	2,371,864	1,573,997	19,085	24,007,231

For New South Wales the value of production in 1926 was about £338,000 lower than that for 1925, which was the highest ever recorded. The falling-off in 1926 was largely due to the decreased returns from silver, lead, and zinc, which were offset to some extent by increases in tin, iron, and coal.

The increase in the Victorian returns for 1926 was chiefly due to improved figures for coal, the value of black coal showing a yield of £62,000 in excess of that for 1925, while the value of brown coal produced rose by £22,000. For 1926 the value of brown coal was nearly £189,000, as compared with £41,000 in 1924.

In Queensland the falling-off in production in 1926 was due to lessened returns from gold, copper, silver, and lead. The Mines Department, however, states that obsolete plant and methods of treatment are responsible for a large proportion of the reduced output. Some of the mining companies have recognized this, and are introducing improvements which it is believed will result in enhanced returns from such metals as copper and tin. The very small return shown in South Australia for 1922 was due principally to the temporary cessation of operations at the ironstone deposits at Iron Knob, the value of the ore raised being £58,000, as compared with £587,000 in 1921. The improvement in the returns for this State during the last four years was largely resultant on the increased production of iron ore, the value of which rose to over £671,000 in 1926. The yield from salt advanced from £109,000 in 1922 to nearly £205,000 in 1926, while good increases were shown in gypsum and limestone flux. In Western Australia the returns for 1926 show a decrease of about £22,000 on the total for 1925, the fall being due to the decline in the returns from gold and silver lead, although the figures for coal showed a good increase. The increased production for 1926 in Tasmania was largely due to zinc, which showed a rise of £72,000 on the total for 1925, while there were higher yields from limestone flux, tin, coal, and copper, than those returned in the previous year. On the other hand the value of osmiridium produced was about £41,000 lower than in 1925, the decline being due to the lower price received for the metal in 1926. It is stated that the decline in the Northern Territory returns for 1926 as compared with 1925 was due to the fact that some of those engaged in mining forsook it to take up more profitable work in other pursuits.

5. Total Production to end of 1926.—In the next table will be found the estimated value of the total mineral production in each State up to the end of 1926. The figures given in the table are also exclusive of the same items referred to in connexion with the preceding table. Thus the total for New South Wales falls short by £26,307,000 of that published by the State Department of Mines, the principal items excluded being coke, £11,014,000; cement, £12,088,000; lime, £1,245,000; and considerable values for marble, slate, granite, chert, gravels, etc., which the Department now includes in the returns for quarries.

MINERAL PRODUCTION.—VALUE TO END OF 1926.

Minerals.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	Nor.Ter.(a)	Australia.
	£	£	£	£	£	£	£	Million. £
Gold ..	63,704,810	303,076,885	85,631,144	1,628,227	158,517,414	8,908,720	2,282,263	624
Silver and lead ..	108,902,368	264,326	4,129,596	381,251	2,215,685	8,261,110	63,579	124
Copper ..	15,540,299	216,656	25,767,115	33,091,881	1,805,082	18,224,367	232,852	95
Iron ..	6,741,852	15,641	472,279	5,404,847	36,721	52,110	..	13
Tin ..	13,678,138	948,709	10,626,749	..	1,547,916	16,463,413	584,640	44
Wolfram ..	272,187	11,885	1,061,672	301	1,441	202,175	216,859	2
Zinc ..	19,974,741	..	13,460	15,993	5,437	420,858	..	20
Coal ..	160,390,428	9,280,659	15,341,114	..	4,952,736	1,434,912	..	191
Other ..	7,567,276	829,784	2,832,200	3,537,498	161,560	1,378,544	40,626	16
Total ..	396,772,099	314,644,545	145,875,329	44,059,998	169,243,992	55,346,209	3,420,819	1,129

(a) To 30th June, 1926.

The "other" minerals in New South Wales include alunite, £209,000; antimony, £346,000; bismuth, £233,000; chrome, £121,000; diamonds, £144,000; limestone flux, £1,102,000; molybdenite, £212,000; opal, £1,561,000; scheelite, £192,000; and oil shale, £2,691,000. In the Victorian returns antimony ore was responsible for £612,000. The value for coal in this State includes £653,000 for brown coal. Included in "other" in the Queensland production were opal, £183,000; gems, £611,000; bismuth, £118,000; cobalt, £148,000; molybdenite, £599,000; and limestone flux, £815,000. The chief items in South Australian "other" minerals were salt, £2,131,000; limestone flux, £418,000; gypsum, £462,000; and phosphate, £130,000. In the Tasmanian returns limestone flux was responsible for £546,000, osmiridium for £474,000, scheelite for £112,000, and iron pyrites for £94,000.

6. **Decline in the Metalliferous Industry.**—On the 1st December, 1921, a Select Committee was appointed by the Legislative Assembly of New South Wales to inquire into and report upon the serious decline in the metalliferous industry. The result of the Committee's investigations was published in a Report issued in 1922, wherein the chief contributing causes of the decline in New South Wales and in Australia generally were summarized as follows:—(1) High cost of production: (2) Deterioration in ore values in existing mines: (3) Inadequate machinery: (4) High freights: (5) High treatment charges: (6) Imperfect labour conditions in mines: (7) Lack of new payable discoveries: (8) Lack of efficiently-supported prospecting.

7. **Geophysical Methods for Detection of Ore Deposits.**—Recently considerable attention has been devoted to gravimetric, surface potential, inductive, or magnetic methods of locating ore bodies, and the Empire Marketing Board has provided a sum of £16,000 spread over two years, conditionally on the Commonwealth Government making available an equal amount for the purpose of undertaking test surveys. The Government Geologist of New South Wales, after a close study of the methods in use in other countries, whilst deprecating undue optimism, suggested the Hunter River Basin, the Broken Hill District, and the Greater Cobar District as suitable fields for the application of geophysical methods.

8. **Precious Metals Prospecting Act of 1926.**—Under the provisions of this Act a sum of £40,000 was allocated by the Commonwealth Government to assist persons or companies engaged in prospecting for precious metals. Of the total sum an amount of £15,000 was set aside for the Northern Territory, and the balance to the States in proportions to be determined by the Minister.

§ 2. Gold.

1. **Discovery in Various States.**—The discovery of gold in payable quantities was an epoch-making event in Australian history, for, as one writer aptly phrases it, this event "precipitated Australia into nationhood." A more or less detailed account of the finding of gold in the various States appears under this section in Official Year Books Nos. 1 to 4, but considerations of space preclude its repetition in the present issue.

2. **Production at Various Periods.**—In the following table will be found the value of the gold raised in the several States and in Australia as a whole during each of the six decennial periods from 1851 to 1920, and in single years from 1921 to 1926, from the dates when payable discoveries were first reported. Owing to defective information in the earlier years the figures fall considerably short of the actual totals, for during the first stages of mining development, large quantities of gold were taken out of Australia by successful diggers, who preferred to keep the amount of their wealth secret.

GOLD.—VALUE OF PRODUCTION, 1851 TO 1926.

Year.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	Nor. Ter.	Australia.
	£	£	£	£	£	£	£	£
1851-60..	11,530,583	93,337,052	14,565	..	..	788,564	..	105,670,764
1861-70..	13,676,103	65,106,264	2,076,494	..	..	12,174	..	80,871,035
1871-80..	8,576,654	40,625,188	10,733,048	579,068	..	700,048	79,022	91,293,028
1881-90..	4,306,541	28,413,792	13,843,081	246,668	178,473	1,514,921	713,345	49,216,821
1891-1900	10,332,120	29,904,152	23,989,359	219,931	22,308,524	2,338,336	906,988	89,999,410
1901-10..	9,569,492	30,136,686	23,412,395	310,080	75,540,415	2,566,170	473,871	142,009,109
1911-20..	4,938,377	13,354,217	9,876,677	238,808	46,808,351	873,302	100,652	76,240,384
1921 ..	271,302	554,087	214,060	13,933	2,935,893	28,311	1,299	4,018,686
1922 ..	118,359	501,515	378,154	4,693	2,525,811	16,101	540	3,545,173
1923 ..	83,325	422,105	392,563	4,199	2,232,179	16,300	743	3,151,414
1924 ..	86,905	312,398	459,716	4,093	2,255,932	21,516	3,270	3,143,830
1925..	82,498	200,958	197,119	3,535	1,874,320	15,041	1,939	2,375,409
1926 ..	82,551	208,874	43,914	3,219	1,857,716	17,936	594	2,214,401
Total ..	63,704,810	303,076,885	85,631,144	1,628,227	158,517,414	3,908,720	2,282,263	623,749,463

The value of the gold yield in 1926 was the lowest recorded since the discovery of the precious metal in 1851.

The amount of gold raised in Australia in any one year attained its maximum in 1903, in which year Western Australia also reached its highest point. For the other States the years in which the greatest yields were obtained were as follows:—New South Wales, 1852; Victoria, 1856; Queensland, 1900; South Australia, 1904; and Tasmania, 1899.

The following table shows the quantity in fine ounces of gold raised in each State and in Australia during each of the last five years, the value of one ounce fine being taken at £4 13s. 10½d. in 1922, at £4 8s. 5½d. in 1923, at £4 13s. 0½d. in 1924, and £4 4s. 11½d. in 1925 and 1926:—

GOLD.—QUANTITY PRODUCED, 1922 TO 1926.

Year.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tasmania.	Nor. Ter.	Australia.
	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.
1922 ..	25,222	106,872	80,584	1,000	538,246	3,431	(a) 115	755,470
1923 ..	18,833	95,403	88,726	949	504,511	3,684	(a) 168	712,274
1924 ..	18,685	67,167	93,841	880	485,035	4,626	(a) 703	675,937
1925 ..	19,422	47,296	46,406	832	441,252	3,524	(a) 456	559,188
1926 ..	19,435	49,078	10,339	758	437,343	4,222	(a) 140	521,315

(a) Year ended 30th June.

Unfortunately the general decline which has characterized Australia's gold output for a number of years has not been checked by new finds of importance, and unless more economic methods of exploiting existing low-grade deposits can be evolved the depression is likely to continue.

3. Changes in Relative Positions of States as Gold Producers.—A glance at the figures in the table showing the value of gold raised will sufficiently explain the enormous increase in the population of Victoria during the period 1851 to 1861, when an average of over 40,000 persons reached the State each year. With the exception of the year 1889, when its output was surpassed by that of Queensland, Victoria maintained its position as the chief gold-producer for a period of forty-seven years, or up to 1898, when its production was outstripped by that of Western Australia, the latter State from this year onward contributing practically half, and so far as recent years are concerned more than half the entire yield of Australia. New South Wales occupied the second place on the list until 1874, when Queensland returns exceeded those of the parent State, and, with the exception of the year 1921, maintained this pre-eminence to the end of 1924. South Australia has occupied the position of lowest contributor to the total gold yield since the year 1871. Taking the average of the last ten years, the relative position of each State in regard to the gold production of Australia was as follows:—

GOLD.—RELATIVE POSITION OF STATES AS PRODUCERS, 1917 TO 1926.

State.	Annual Average of Gold Production, 1917 to 1926.	Percentage on Total.	State.	Annual Average of Gold Production, 1917 to 1926.	Percentage on Total.
	Ozs.			Ozs.	
Total ..	372,286	100·0	New South Wales	43,673	5·00
Western Australia ..	615,885	70·7	Tasmania ..	6,379	0·07
Victoria ..	111,925	12·8	South Australia ..	2,529	0·03
Queensland ..	91,441	10·5	Northern Territory	454	..

4. Methods of Gold Mining adopted in Each State.—(i) *New South Wales.* Approximately half the production in 1926 was obtained by dredges operating in the Adelong and Gundagai divisions. The yields from alluvial other than by dredging amounted to

1,802 ozs., of which 108 ozs. were won in the Tumut and Adelong district, 340 ozs. at Tambaroora and Turon, 222 ozs. at Peel and Uralla, 130 ozs. in the Southern area, 287 ozs. at Mudgee, and 485 ozs. at Bathurst. From stone treated the production was 5,155 ozs., about 3,000 ozs. of the total coming from the Lachlan district. The Southern district contributed 600 ozs., Bathurst, 450 ozs.; Hunter and Macleay, 400 ozs.; Tambaroora and Turon, 300 ozs., and smaller quantities were returned from the New England and Peel and Uralla areas. From the Cobar district, which for many years was the principal producer, the yield in 1926 was only 69 ozs., as compared with over 3,000 ozs. in 1922.

(ii) *Victoria.* Reef mining predominates in Victoria, although gold is also obtained from alluvial workings, both surface and deep leads. Owing to the exhaustion of much of the payable auriferous area the yield has been on the down grade for many years, and with the exception of 1925, the return for 1926 was the lowest experienced since 1851. A considerable amount of attention is given to dredging and hydraulic sluicing, particularly in the Beechworth, Maryborough, Castlemaine, Ararat, Stawell, Gippsland, and Ballarat districts. The yields from alluvial and quartz respectively as returned (in crude ounces) from the chief mining districts of the State during 1926 were as follows:—Ararat and Stawell, 1,492 and 35; Ballarat, 712 and 1,474; Beechworth, 3,384 and 15,905; Bendigo, 367 and 16,415; Castlemaine, 1,110 and 10,887; Gippsland, 212 and 1,103; and Maryborough, 185 and 738. The yield from the cyanide plants amounted to 1,323 ozs.

The largest output from quartz mining in the Bendigo district was furnished by the Hercules and Energetic, 6,392 ozs., £25,230, followed by the New Red, White, and Blue, 5,157 ozs., £20,624; and Carlisle, 1,753 ozs., £7,018. In the Beechworth district the Rose, Thistle, and Shamrock at Harrietville returned 5,886 ozs., £24,164; and the Morning Star, at Woods Point, 2,077 ozs., £6,856. In the Daylesford area of the Castlemaine district the Ajax returned 3,522 ozs., £13,087; the Nuggetty North, 908 ozs., £3,632; and the Ajax North, 691 ozs., £2,780. In the Tarrengower area of this district, the New Oswald returned 2,503 ozs., £10,008; and the Goldsbrough, 1,491 ozs., £7,089. In the Gippsland district the Loch Fyne Co. at Jericho produced 3,526 ozs., valued at £13,183; and the Golden Lily at Donnelly's Creek, 722 ozs., valued at £2,979. From the once famous Ballarat area the yield in 1926 was only slightly in excess of £5,000.

From alluvial the principal yield was obtained by Cock's Pioneer Gold and Tin Mines, with 2,250 ozs., valued at £9,002. This Company, which operates in the Beechworth district, also produced about £5,000 worth of tin during the year. The Langi Logan mines at Ararat returned 1,558 ozs., valued at £6,178.

(iii) *Queensland.* Operations in Queensland are chiefly confined to reefing, and to the production of gold in connexion with the smelting of copper and other ores, the yield from alluvial in 1926 being only 1,321 ozs., of which 1,020 ozs. were obtained at Batavia River, while the quantity produced from stone treated was 5,956 ozs.; from copper and other ores 863 ozs.; and from old tailings 2,199 ozs.; making a total production of 10,339 ozs. The yields from the principal fields were—Ravenswood, 2,806 ozs.; Gympie, 2,745 ozs.; Mount Coolon, 1,569 ozs.; and Etheridge, 1,026 ozs. From the Mount Morgan field, which returned nearly 34,000 ozs. in 1925, the yield in 1926 was only 34 ozs. Owing to the fire and subsequent flooding of the mine, underground working has been replaced by quarrying, and it is hoped that improved methods of treatment of the ore will result in an increase in the yield. The once famous Charters Towers field is apparently approaching exhaustion. Recently a Company has been formed to test the old Palmer River field by systematic dredging.

(iv) *South Australia.* Gold is found in widely-scattered localities in South Australia, but the production has at no period been large. During the last five years the yield has declined from 1,000 ozs. in 1922 to 758 ozs. in 1926. Of the total yield in the latter year, over 700 ozs. were produced at Tarcoola.

(v) *Western Australia.* A grouping of the auriferous deposits of Western Australia under various headings was given in previous issues (see Official Year Book 19, p. 725), but considerations of space preclude its retention in the present issue.

The yields from the principal fields in order of importance were as follows:—East Coolgardie, 304,037 ozs.; Mt. Margaret, 43,628 ozs.; Murchison, 33,487 ozs.; Yilgarn, 11,792 ozs.; Yalgoo, 6,382 ozs.; North East Coolgardie, 6,199 ozs.; Coolgardie, 5,993

ozs.; East Murchison, 5,336 ozs.; Dundas, 2,682 ozs.; North Coolgardie, 2,472 ozs.; Pilbara, 2,376 ozs.; Peak Hill, 2,140 ozs. and Broad Arrow, 1,460 ozs. Of the total yield of 428,330 ozs. reported to the Mines Department, 423,818 ozs. were obtained from ore treated, 2,645 ozs. from dollied and specimens, while the return from alluvial was about 1,867 ozs. The total referred to differs somewhat from that quoted in the first table in this chapter, which represents gold exported and minted. It may be noted here that the total amount of dividends paid by Western Australian mining companies to the end of the year 1926 was £28,622,000.

Western Australia reached its zenith as a gold-producer in 1903, when the output was valued at £8,771,000, but since then there has been a more or less steady decline until in 1926 the total had dropped to £1,858,000. Three causes may be adduced to account for this falling-off—(1) Exhaustion of known rich deposits: (2) Unwise development, *i.e.*, "picking the eyes" of good mines: (3) Increased cost of stores, equipment, and labour, rendering it unprofitable to treat low-grade ores. During the year 1926 the Commonwealth Development and Migration Commission appointed a technical Committee to report on the best means of reviving the industry. This Committee made various recommendations in regard to the Kalgoorlie and Gwalia areas, and negotiations were in progress in 1927 between the Governments and the mining and financial interests concerned with a view to giving effect to these recommendations.

(vi) *Tasmania*. The yield in Tasmania in 1926 amounted to 4,222 ozs., an advance about 700 ozs. on the total for 1925. The principal producers in 1926 were the Mt. Lyell Co. with 2,306 ozs. (from copper matte), and the Golden Gate, with 1,481 ozs. About 130 ozs. were obtained by the Round Hill mine from silver-lead ore.

(vii) *Northern Territory*. The production for 1926 amounted to only 140 ozs. fine. It is stated that the potentialities of the older fields have by no means been exhausted, although a revival of the industry depends on the expenditure of large sums of money, either by the Government or by mining speculators, on developmental work. The bulk of the production came from Fletcher's Gully. A small quantity of alluvial and dollied gold has been obtained at Kurinally, in the Hatches Creek locality, and auriferous country is found in the Kurundi district, near Bonney Well. The metal is also found in the Tanami area, and at the Granites about 63 miles south-east therefrom, but the locality is practically inaccessible in dry seasons.

5. **Remarkable Masses of Gold.**—Allusion has already been made in preceding Year Books to the discovery of "nuggets" and other remarkable masses of gold, but it is not proposed to repeat this information in the present issue. (See Year Book No. 4, page 500.)

6. **Modes of Occurrence of Gold in Australia.**—This subject has been alluded to on some length in earlier issues of the Year Book, but considerations of space will not permit of repetition in the present issue.

7. **Place of Australia in the World's Gold Production.**—In the table given below will be found the estimated value of the world's gold production, and the share of Australia therein during the five years 1922 to 1926. The figures given in the table have been compiled chiefly from returns obtained directly by the Commonwealth Bureau of Census and Statistics from the gold-producing countries of the world.

GOLD.—WORLD'S PRODUCTION, 1922 TO 1926.

Year.	World's Production of Gold.	Gold Produced in Australia.	Percentage of Australia on Total.
			%
1922	£ 71,653,000	£ 3,545,000	4.9
1923	78,367,000	3,153,000	4.0
1924	87,640,000	3,142,000	3.6
1925	80,739,000	2,375,000	2.9
1926	81,836,718	2,214,401	2.7

The value of the gold yield in the ten chief producing countries during each of the five years 1922 to 1926 is given in the table hereunder. Particulars of the quantity and value of the gold production for all countries for the ten years 1917-26 will be found in the Bulletin of Australian Production issued by this Bureau.

GOLD.—PRODUCTION, CHIEF COUNTRIES, 1922 TO 1926.

Country.	1922.	1923.	1924.	1925.	1926.
	£	£	£	£	£
Union of South Africa	32,895,000	40,480,000	44,534,000	40,768,000	42,285,000
United States ..	10,743,000	10,736,000	11,378,000	9,854,000	9,599,000
Canada ..	5,929,000	5,457,000	7,095,000	7,373,000	7,451,482
Australia ..	3,545,000	3,153,000	3,142,000	2,375,000	2,214,000
Mexico ..	3,512,000	3,437,000	3,686,000	3,351,000	3,282,000
Rhodesia ..	3,063,000	2,865,000	2,920,000	2,470,000	2,521,000
India ..	1,832,000	1,697,000	1,843,000	1,673,000	1,632,000
Colombia ..	1,201,000	1,220,000	450,000	325,000	321,000
Japan ..	1,239,000	1,154,000	1,177,000	1,189,000	1,285,600
Gold Coast ..	998,000	883,000	958,000	844,000	848,000
Russia ..	942,000	1,381,000	4,456,000	4,507,000	4,214,000

It has been deemed advisable to apportion values in accordance with Australian currency, i.e., at £4 13s. 10½d. for 1922, £4 8s. 5½d. for 1923, £4 13s. 0½d. for 1924, and £4 4s. 11½d. for 1925 and 1926.

The next table shows the average yearly value in order of importance of the yield in the chief gold-producing countries for the decennium 1917–1926.

GOLD.—AVERAGE ANNUAL PRODUCTION, CHIEF COUNTRIES, 1917 TO 1926.

Country.	Value.	Country.	Value.
	£		£
Union of South Africa ..	40,657,000	Russia	2,400,000
United States	12,377,000	India	1,995,000
Canada	5,255,000	Japan	1,261,000
Australia	4,080,000	Gold Coast	1,117,000
Mexico	3,559,000	Colombia	1,011,000
Rhodesia	2,931,000		

The comparison has been restricted to countries where the average for the period is in excess of a million sterling.

8. Employment in Gold Mining.—The number of persons engaged in gold mining in each State in 1901 and during each of the last five years is shown in the following table:—

GOLD MINING.—PERSONS EMPLOYED, 1901, AND 1922 TO 1926.

Year.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	Nor. Ter.	Total.
	No.	No.	No.	No.	No.	No.	No.	No.
1901 ..	12,064	27,387	9,438	1,000	19,771	1,112	200	70,972
1922 ..	1,197	3,310	767	40	5,787	106	12	11,219
1923 ..	1,141	2,982	603	32	5,555	119	30	10,462
1924 ..	1,014	2,651	452	30	5,296	128	18	9,589
1925 ..	831	2,353	347	34	5,009	103	32	8,709
1926 ..	806	1,967	321	26	4,483	107	26	7,741

The heavy decline noticeable since 1901 is of course due to the exhaustion of accessible payable deposits and the failure to locate any considerable fresh sources of supply.

§ 3. Platinum and Platinoid Metals.

1. Platinum.—(i) *New South Wales*. The deposits at present worked in the State are situated at Platina in the Fifield division, near Parkes, and the production in 1926 amounted to 397 ozs., valued at £6,910, as compared with 573 ozs., valued at £11,061 in the preceding year, while the total production recorded to the end of 1926 amounted to 18,220 ozs., valued at £109,626. The local price for the metal at the end of the year was £17 an ounce. During the year 1927 the Geological Survey proposed to put down a series of bores and shafts with a view to further prospect the field.

(ii) *Victoria*. In Gippsland the metal has been found in association with copper, and 127 ozs. were produced in 1913, but there was no production in recent years.

(iii) *Queensland*. Platinum associated with osmiridium has been found in the beach sands between Southport and Currumbin, in creeks on the Russell goldfield near Innisfail, and in alluvial deposits on the Gympie gold-field, but no production has been recorded.

2. *Osmium, Iridium, etc.*—(i) *New South Wales*. Small quantities of osmium, iridium, and rhodium are found in various localities. Platinum, associated with iridium and osmium, has been found in the washings from the Aberfoil River, about 15 miles from Oban; on the beach sands of the northern coast; in the gem sand at Bingara, Mudgee, Bathurst, and other places. In some cases, as for example in the beach sands of Ballina, the osmiridium and other platinoid metals amount to as much as 40 per cent. of the platinum, or about 28 per cent. of the whole metallic content.

(ii) *Victoria*. In Victoria, iridosmine has been found near Foster, and at Waratah Range, South Gippsland.

(iii) *Tasmania*. For many years osmiridium has been known to exist in the bed of the Savage River, on the West Coast, and in rivulets and creeks in the serpentine country. The first recorded production was in 1910, when 120 ozs., valued at £530, or £4 8s 4d. per oz., were raised. In 1914 the yield had increased to 1,019 ozs., valued at £10,076, or nearly £9 18s. per oz. From 1915 to 1917 the amount raised fell off considerably, owing to difficulty in disposing of the metal, but in 1918 there was an increase to 1,607 ozs., valued at £44,833; while in 1920 the 2,009 ozs. produced returned £77,114, or over £38 7s. 8d. per oz. In October of that year as much as £42 per oz. was obtained. For 1921 the production was 1,751 ozs., valued at £42,935, or about £24 10s. per oz. The output in 1925 was 3,366 ozs., valued at £103,570, or over £30 15s. per oz. Towards the middle of that year the discovery of rich alluvial wash on the Adams River in the south-west of the State led to a "rush," and within a few months over 1,000 men were on the field. As in the case with other fields in Tasmania the osmiridium is shed from serpentine derived from bronzitite rocks, and the claims worked in 1925 were all alluvial. In 1926 the output was 3,173 ozs., valued at £61,908, the heavy decline as compared with 1925 being due to the slump in prices which averaged £23 10s. in the first quarter, and dropped to £11 7s. in the last quarter of 1926. Attempts to bring about a stabilization of the market met with little success.

§ 4. Silver and Lead.

1. *Occurrence in Each State*.—Particulars regarding the occurrence of silver in each State will be found in preceding Year Books, Nos. 1 to 5, but considerations of space preclude the repetition of this matter in the present volume.

2. *Development of Silver Mining*.—The value of the production of silver, silver-lead and ore, and lead from each State during the five years ending 1926 is given hereunder:—

SILVER AND LEAD.—PRODUCTION, 1922 TO 1926.

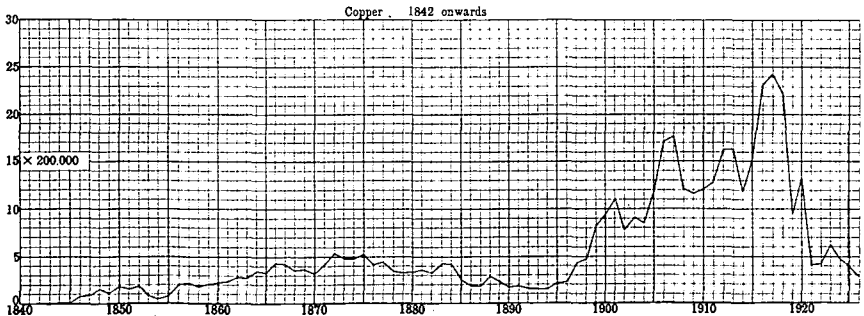
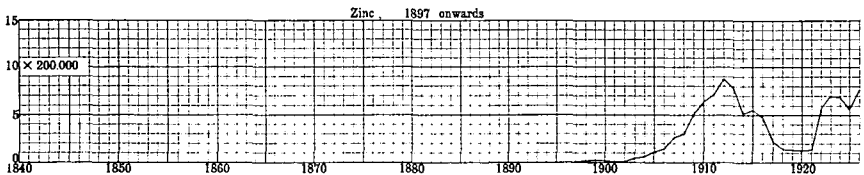
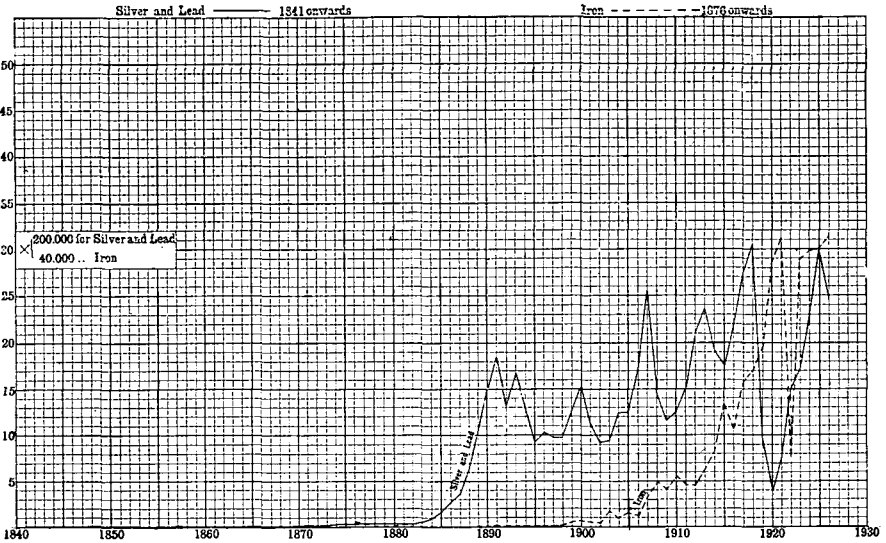
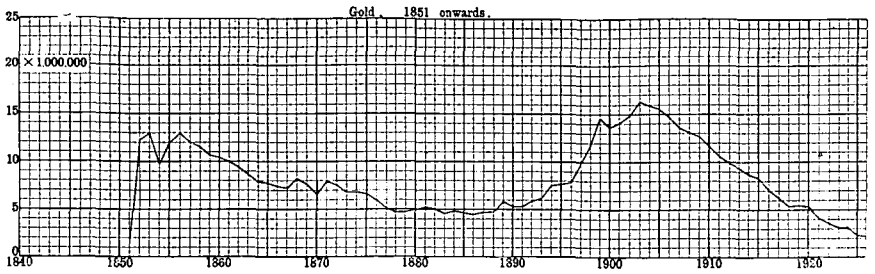
Year.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	Nor. Ter.	Australia.
	£	£	£	£	£	£	£	£
1922 ..	2,574,108	1,080	109,350	377	87,692	241,694	..	3,014,301
1923 ..	2,956,862	963	216,645	60	60,061	218,881	..	3,453,472
1924 ..	4,310,360	645	167,469	373	96,504	252,718	..	4,828,069
1925 ..	5,320,976	291	240,684	1,655	114,961	302,961	(a) 617	5,982,145
1926 ..	4,399,953	307	147,724	865	85,604	281,155	(a) 447	4,916,055

(a) Year ended 30th June.

Production in New South Wales during 1924 was greatly stimulated by the favourable price of the metals, and with the exception of the Central mine, where work was restricted to fire-fighting, the chief mines on the Broken Hill lode were in full operation. Renewed activity resulted from the high prices of lead and zinc in 1925, when the Central mine rejoined the list of producers, the fire areas having been isolated by water curtains on the various levels as required. The decline in value recorded in 1926 was due to the fall in the average prices of lead and spelter during the year.

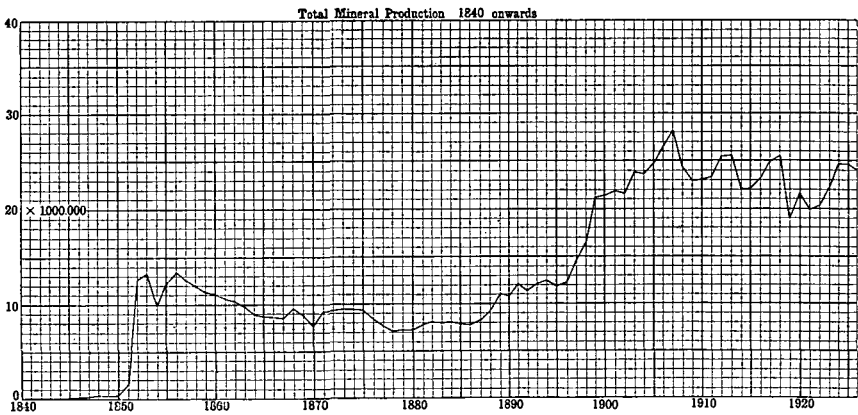
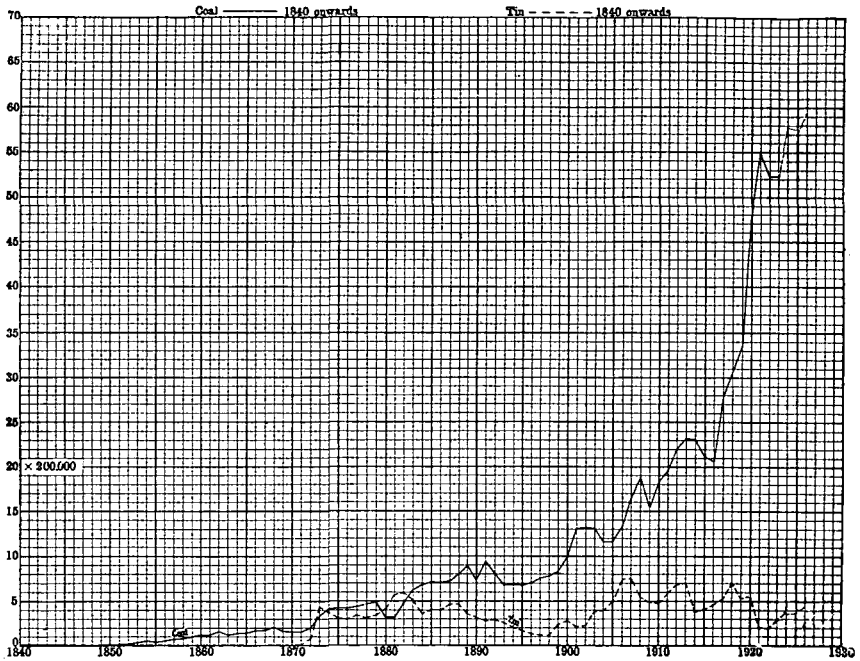
It must be understood that the totals for New South Wales in the above table represent the *net* value of the product (excluding zinc) of the silver-lead mines of the State. In

VALUES OF THE PRINCIPAL MINERALS PRODUCED—AUSTRALIA, 1840 TO 1926



EXPLANATION.—The values shown are those of the total Australian production of certain of the most important minerals in successive years from 1840 onwards.

The base of each small square represents an interval of one year, and the vertical height represents in the case of gold £1,000,000; in the case of silver and lead, zinc and copper £200,000; and in the case of iron, £40,000.

VALUES OF PRINCIPAL MINERALS PRODUCED—AUSTRALIA, 1840 TO 1926—*continued.*

EXPLANATION.—The values shown are those of the total Australian production of certain of the most important minerals in successive years from 1840 onwards.

The base of each small square represents an interval of one year, and the vertical height represents in the case of coal and tin £200,000, and in the case of total mineral production £1,000,000.

explanation of the values thus given, it may be noted that the metallic contents of the larger portion of the output from the silver-lead mines in the State are extracted outside New South Wales, and the Mines Department considers, therefore, that the State should not take full credit for the finished product. The real importance of the State as a producer of silver, lead, and zinc is thus to some extent lost sight of. The next table, however, which indicates the quantity of these metals locally produced, and the average contents by assay of concentrates exported during the last five years, will show, as regards New South Wales, the estimated total production and the value accruing to Australia from the three metals:—

SILVER-LEAD MINES.—NEW SOUTH WALES, TOTAL PRODUCTION, 1922 TO 1926.

Year.	Metal Produced within Australia.				Contents of Concentrates Exported.			
	Silver.	Lead.	Zinc.	Value.	Silver.	Lead.	Zinc.	Value.
	ozs. fine.	tons.	tons.	£	ozs. fine.	tons.	tons.	£
1922 ..	6,648,825	97,367	23,724	4,113,427	3,264,102	19,328	132,136	1,272,274
1923 ..	7,233,236	124,570	41,153	5,707,739	4,634,718	40,606	149,319	1,813,287
1924 ..	6,232,678	120,380	43,579	6,472,312	2,963,683	21,513	114,374	1,292,220
1925 ..	7,437,967	139,339	39,991	7,539,130	1,782,193	30,752	75,435	1,371,183
1926 ..	7,338,477	142,654	39,277	6,730,089	2,371,264	23,242	96,167	1,591,673

The figures given above are quoted on the authority of the Mines Department of New South Wales. During the later years considerable quantities of cadmium were also produced.

3. Sources of Production.—Broken Hill, in New South Wales, is the chief centre of silver production in Australia.

(i) *New South Wales.* (a) *Broken Hill.* A description of the silver-bearing area in this district is given in earlier issues of the Year Book. During 1913 the output of ore raised amounted to 1,744,000 tons, the highest recorded in the history of the field. For the four years 1915 to 1918 the production averaged over 1,200,000 tons, but, owing to the cessation of operations through industrial troubles and the fall in the price of metals there was a decline in 1919 to 415,400 tons, and in 1920, when operations were carried on for a few weeks only, to 38,661 tons. Thenceforward there was a continuous increase, and in 1926 the tonnage raised amounted to 1,296,750, of which 1,279,462 tons consisted of sulphides, and 17,288 tons of carbonate and siliceous ores. The major portion of the latter is sent for treatment to Port Pirie in South Australia, while the remaining ore is concentrated on the field, and the silver-lead concentrates are forwarded to Port Pirie for smelting and refining. Portion of the zinc concentrates produced is treated at the Electrolytic Zinc Company's works at Risdon in Tasmania, and the balance is sent overseas.

Although the returns are not complete in all cases, the following table relating to the companies controlling the principal mines at Broken Hill will give some idea of the richness of the field:—

SILVER.—BROKEN HILL RETURNS TO END OF 1926.

Mine.	Value of Output to end of 1926.	Dividends and Bonuses Paid to end of 1926.
	£	£
Broken Hill Proprietary Co. Ltd.	52,133,719	12,983,320
Broken Hill Proprietary Block 14 Co. Ltd.	4,535,323	653,660
British Australian Broken Hill Co. Ltd.	5,858,998	821,280
Broken Hill Proprietary Block 10 Co. Ltd.	4,946,989	1,432,500
Sulphide Corporation Ltd. (Central and Junction Mines)	24,287,230	3,024,375
Broken Hill South Ltd.	18,010,114	4,215,000
North Broken Hill Ltd.	12,758,719	3,968,940
Broken Hill Junction Lead Mining Co.	1,185,058	87,500
Junction North Broken Hill Mine	3,323,846	171,431
The Zinc Corporation Ltd.	6,381,540	2,364,972
Barrier South Ltd.	151,517	50,000
Totals	133,572,853	29,772,978

The returns relating to dividends and bonuses paid are exclusive of £1,744,000 representing the nominal value of shares in Block 14, British, and Block 10 companies, allotted to shareholders of Broken Hill Proprietary Company. If the output of the companies engaged in treating the tailings, etc., be taken into consideration, the totals for output and dividends shown in the table would be increased to about 141 millions and 33 millions respectively. The authorized capital of the various companies amounted to £6,823,000.

(b) *Picton Division.* The mines in the Yerranderie area produced 1,856 tons of ore in 1926, yielding 95,021 ozs. of silver, besides 412 ozs. of gold, and 419 tons of lead, the total production being valued at £26,115. Of the yield from this area in 1926, the production from the Wollondilly mine was valued at £6,552.

(c) *Other Areas.* Small quantities of ore were raised during the year from the Moruya, Mudgee, Tuena and Yass divisions.

(ii) *Victoria.* The silver produced in 1926 amounted to 2,373 ozs. of concentrates, valued at £307, and was obtained in the refining of gold at the Melbourne Mint.

(iii) *Queensland.* The yields from the chief silver and lead producing centres in 1926 were as follows:—Chillagoe, silver £13,783, lead £58,651; Herberton, silver £12,315, lead £33,580; Etheridge, silver £3,437, lead £15,767; and Cloncurry, silver £1,110, lead £2,372. Some of the mining leases in the Chillagoe area are owned by the State. The Mount Isa silver-lead field in the Cloncurry district was discovered in 1923, and the lodes so far opened are distributed over a length of 5 miles by a width of one mile along the west bank of the West Leichhardt River. Large accumulations of high grade carbonate of lead are in sight on this field, which, according to experts, is the largest find in importance since the discovery of Broken Hill. During the years 1925 and 1926 good progress was made with developmental work.

(iv) *South Australia.* Silver ore has been discovered at Miltalie and Poonana, in the Franklin Harbour district, also at Mount Malvern and Olivaster, near Rapid Bay, and in the vicinity of Blinman and Farina, at Baratta, and elsewhere. The production of silver in 1926 was valued at £46, and of silver-lead ore at £819.

(v) *Western Australia.* The quantity of silver obtained as a by-product and exported in 1926 was 68,413 ozs., valued at £8,863. In addition, 4,162 tons of lead and silver-lead ore and concentrates valued at £76,741 were exported. The production of lead ore from the Northampton mineral field amounted in 1926 to 23,973 tons.

(vi) *Tasmania.* The silver produced in 1926 amounted to 766,653 ozs., valued at £97,988, and the lead to 5,893 tons, valued at £183,167. Of the silver the chief producers were the Hercules-Rosebery, with 262,010 ozs., the North Mt. Farrell with 173,295 ozs., and the Mt. Lyell with 134,516 ozs. From the first mentioned, the silver was produced from zinc lead ore, while the Mt. Lyell product was obtained from copper ore. The principal producers of lead were the Hercules-Rosebery and North Mt. Farrell in the Western division, with 2,184 tons and 1,790 tons respectively, the Magnet mines with 1,011 tons in the North West, and Round Hill, with 395 tons, in the Dundas area.

(vii) *Northern Territory.* Silver-lead ores are found near Pine Creek, and at Mount Shoebridge near Brock's Creek railway station. There are a number of fair-sized galena lodes in the Pine Creek and McArthur River districts, but, owing to costs of transport and realization little attention is devoted to them. No mining for this class of mineral took place in 1926, the small production recorded having been obtained from the dumps of the Evelyn silver-lead and zinc mines which were closed down in the year 1890. About 10 tons of galena were raised on the Fergusson River, near Hidden Valley.

4. **World's Production.**—The world's production of silver during the last five years for which particulars are available is estimated to have been as follows:—

SILVER.—WORLD'S PRODUCTION, 1922-1926.

Total.	1922.	1923.	1924.	1925.	1926.
World's production in 1,000 fine ozs.	213,541	243,265	239,107	245,186	251,797

The share of Australia in the world's silver production in 1919 was estimated at 7,800,000 ozs., or about 4½ per cent. on the total production, but in 1921, owing to the cessation of operations at the Broken Hill field, the total local extraction fell to 4,573,000 ozs., and the estimated silver contents of the ores, bullion, and concentrates exported to 732,000 ozs., the total being a little over 3 per cent. on the world's production. For 1926 local extraction was set down as 8,946,000 ozs., and exports as 1,397,000 ozs., the total being equivalent to a little over 4 per cent. on production for the world. The figures for the world's production are given on the authority of *The Mineral Industry*.

Arranged in order of importance the estimated yields in 1926 from the chief silver producing countries were as follows:—

SILVER.—PRODUCTION, CHIEF COUNTRIES, 1926.

Country.	Production.	Country.	Production.
	Fine ozs. ('000 omitted.)		Fine ozs. ('000 omitted.)
Mexico	98,000	British India	5,000
United States	62,029	Central America	3,000
South America	30,000	East Indies	2,500
Canada	22,436	Transvaal	1,200
Australia	10,343	China	190
Europe	10,000	Rhodesia	160
Japan	6,000		

5. **Prices.**—As the production of silver is dependent to a very large extent on the price realized, a statement of the average price per standard ounce in the London market during the last five years is given below:—

SILVER.—PRICES, 1922 TO 1926.

Price.	1922.	1923.	1924.	1925.	1926.
Pence per standard oz.	34.41	31.93	33.97	32.09	28.69

The average price in cents per fine ounce in New York fell from 69.07 in 1925 to 62.11 in 1926. Apparently the decline in 1926 was due to the circumstance that the bear element gained control of a weak market. Chinese and Indian speculators sold largely for a time, and from the latter part of September until the third week in October the market was demoralized. Continental selling in October, chiefly in connexion with the Bank of France, also contributed to the final stages of the decline.

6. **Employment in Silver Mining.**—The number of persons employed in silver mining during each of the last five years is given below :—

SILVER MINING.—PERSONS EMPLOYED, 1922 TO 1926.

Year.	N.S.W. (a)	Q'land.	W. Aust.	Tasmania.	Nor. Ter.	Australia.
1922	4,712	321	(b) 152	495	..	(c) 5,686
1923	5,155	133	(b) 96	510	..	5,894
1924	5,468	759	(b) 141	479	15	(d) 6,874
1925	5,770	590	(b) 204	579	4	(e) 7,166
1926	5,924	390	(b) 138	523	2	(f) 7,002

(a) Silver, lead, and zinc. (b) Principally lead ore. (c) Including 6 in South Australia.
(d) Including 12 in South Australia. (e) Including 19 in South Australia. (f) Including 25 in South Australia.

The bulk of the employment up to 1924, when Queensland assumed importance, was in New South Wales and Tasmania, the quantity of silver raised in the other States being unimportant.

§ 5. Copper.

1. **Production.**—The production of copper in the various States has been influenced considerably by the ruling prices, which have undergone extraordinary fluctuations. The quantity and value of the local production as reported and credited to the mineral industry for the years 1922 to 1926 are shown in the following table :—

COPPER.—PRODUCTION, 1922 TO 1926.

State.	1922.	1923.	1924.	1925.	1926.
QUANTITY.					
	Tons.	Tons.	Tons.	Tons.	Tons.
New South Wales	Ingot and Matte 575	1,182	1,129	478	357
	Ore 50	79	..	..	..
Queensland	Ingot and Matte 5,104	6,243	5,630	3,909	1,217
	Ore .. .. ..	..	..	..	..
South Australia	Ingot and Matte 1,185	3,523	405	570	232
	Ore .. .. ..	..	..	..	..
Western Australia	Ingot and Matte 660	1,057	..	..	1
	Ore	352	3,394	1,201	..
Tasmania	Ingot and Matte 5,616	6,065	6,698	6,539	6,915
	Ore .. .. ..	..	..	..	..
Northern Territory	Ingot and Matte ..	..	..	..	..
	Ore	(a) 58	..	(a) 4	(a) 7
			(a) 32	(a) 4	(a) 7
VALUE.					
	£	£	£	£	£
New South Wales	36,233	82,375	71,658	30,215	22,473
Queensland	321,535	430,746	380,025	254,074	73,591
South Australia	73,646	232,172	26,046	35,878	14,681
Western Australia	20,379	65,100	40,676	18,200	84
Tasmania	391,535	435,413	457,386	436,661	454,854
Northern Territory	(a) 798	(a) 30	(a) 239	(a) 15	(a) 60
Australia	844,126	1,245,836	976,030	775,043	565,743

(a) Year ended 30th June.

The total value of the production in 1920 was £2,658,000, and the heavy fall during recent years was due to the low price of the metal preventing the profitable working of many of the copper mines throughout Australia.

2. Sources of Production.—(i) *New South Wales.* The depression in this branch of the mining industry during the last few years is likely to continue, unless copper appreciates in value, and less costly methods of production are evolved. Practically the only mines in operation were the Mt. Royal group at Tottenham, the Budgery mine at Hermidale, and the Copper Hill mine at Molong. In addition to the 357 tons of (electrolytic) copper shown in the table, about 700 tons of the metal were obtained at the Port Pirie smelters from Broken Hill silver-lead-zinc ores, and a small quantity was contained in the silver-lead concentrates exported overseas.

(ii) *Queensland.* The yield in this State amounted in 1926 to 1,217 tons valued at £73,591, and shows a serious decline as compared with 1920 when nearly 16,000 tons valued at £1,552,000 were raised. The falling-off in the yield in recent years was due partly to the low prices realized for copper and partly to old-fashioned plant and methods of treatment. Returns from the chief producing areas in 1926 were as follows:—Cloncurry, 1,098 tons, £66,444; and Chillagoe, 90 tons, £5,415. These yields naturally compare very unfavourably with those of 1920. The Cloncurry district—reckoned the richest and most extensive cupriferous area in Australia—which under normal circumstances produces more than half the copper output of the State, returned a yield of 1,098 tons, as against 7,640 tons in 1920. Mount Morgan, which in 1925 contributed a yield of 2,634 tons, valued at £171,242, did not figure in the returns for 1926.

(iii) *South Australia.* Taking the entire period over which production extended, the yield of copper in South Australia easily outstrips that of any other State. In recent years, however, Queensland, Tasmania, and New South Wales have come to the front as copper producers, as the table on the preceding page shows. Deposits of copper ore are found over a large portion of South Australia. A short account of the discovery, etc., of some of the principal mining areas, such as Kapunda, Burra Burra, Wallaroo, and Moonta, was given in earlier issues of the Official Year Book. In 1926 the production amounted to 232 tons, valued at £14,681, as compared with 7,213 tons, valued at over £902,000 in 1917.

(iv) *Western Australia.* The value of the copper exported from this State in 1926 was only £84 as compared with £18,200 in 1925, the absence of production in 1927 being due to the low price ruling for the metal.

(v) *Tasmania.* The quantity of copper produced in Tasmania during 1926 was 6,915 tons, valued at £454,854, the whole of the production being due to the Mount Lyell Mining and Railway Co. Ltd. This Company treated 44,856 tons of ore and concentrates and produced 6,980 tons of blister copper, containing copper, 6,915 tons; silver, 134,587 ozs.; and gold, 2,306 ozs.; the whole being valued at £481,846. The employees in 1926 numbered 952, of whom 481 were in the mining branch, 386 were engaged in the reduction works, and 85 in the railway department. Current for power and lighting is obtained from the Lake Margaret hydro-electric plant which also supplies the municipal requirements of Queenstown and Gormanston, and the Company's sub-station at Zeehan. Recognizing the fluctuating character of the returns from copper mining, and keeping in view the possibility of future exhaustion of the deposits, the directors wisely endeavoured to give permanence to the enterprise by investing portion of the profits in industrial undertakings, such as the manufacture of superphosphates and other chemical products. Success was early achieved, and this branch of the Company's business yields highly satisfactory returns. To the end of 1926 this Company had paid upwards of £4,442,000 in dividends.

(vi) *Northern Territory.* Copper has been found at various places, but lack of capital and difficulty of transport prevent the development of the deposits. In 1926, the production was returned at 7 tons of ore, valued at £60, obtained near Kilgour gorge in the Borrooloola district.

3. Prices.—The great variation in price that the metal has undergone is shown in the following table, which gives the average price in London and New York during each of the last five years. The figures are given on the authority of the *The Mineral Industry*.

COPPER.—PRICES, 1922 TO 1926.

Year.				Average London Price per Ton Standard Copper.	Average New York Price in Cents per lb. Electrolytic Copper.
				£	Cents.
1922	..	..	..	62.12	13.38
1923	..	..	..	65.84	14.42
1924	..	..	..	63.15	13.02
1925	..	..	..	61.92	14.04
1926	..	..	..	57.97	13.80

As evidence of the tremendous monthly variation in the price of copper it may be noted that in December, 1916, the average London price of standard copper was £145.32 per ton, while in May, 1926, it was quoted at £56.49. In 1926 the highest price was £59.67, recorded in February.

4. World's Production of Copper.—The world's production of copper during the five years 1922 to 1926, is estimated to have been as follows. The figures for foreign countries have been taken from the latest issue of *The Mineral Industry*, and differ somewhat from those quoted in the previous issue:—

COPPER.—WORLD'S PRODUCTION, 1922 TO 1926.

Year	1922.	1923.	1924.	1925.	1926.
World's production—tons ..	867,000	1,245,700	1,366,700	1,434,700	1,469,500

The yields from the chief copper-producing countries in 1926 were as follows:—

COPPER.—PRODUCTION, CHIEF COUNTRIES, 1926.

Country.		Production.	Country.		Production.
		Tons.			Tons.
United States	.. .. .	776,600	Australia	.. .. .	12,300
Chile	.. .. .	199,100	Norway	.. .. .	12,300
Africa	.. .. .	96,400	Russia	.. .. .	11,800
Japan	.. .. .	64,500	Cuba	.. .. .	11,600
Canada	.. .. .	57,300	Jugo-Slavia	.. .. .	9,600
Spain and Portugal	.. .. .	57,100	Bolivia	.. .. .	6,300
Mexico	.. .. .	55,600	Austria	.. .. .	3,600
Peru	.. .. .	38,100	Sweden	.. .. .	2,100
Germany	.. .. .	21,300			

The Australian production in 1926 amounted to under 1 per cent. of the total.

During the year 1926 more than half the world's copper output was produced by the United States. A cartel known as Copper Exporters Incorporated formed there in that year controls about 90 per cent. of the world's production of the metal.

5. Employment in Copper Mining.—The number of persons employed in copper mining during each of the last five years was as follows :—

COPPER MINING.—PERSONS EMPLOYED, 1922 TO 1926.

Year.	N.S.W.	Q'land.	S. Aust.	W. Aust.	Tas.	Nor. Ter.	Australia.
1922	66	882	70	10	948	6	1,982
1923	85	1,176	420	80	1,066	3	2,830
1924	52	1,017	34	110	532	12	1,757
1925	47	878	55	34	743	6	1,763
1926	31	270	26	8	697	..	1,032

§ 6. Tin.

1. Production.—The development of tin mining is, of course, largely dependent on the price realized for the metal, and, as in the case of copper, the production has been subject to somewhat violent fluctuations. The tables below show the quantity and value of the production as reported to the Mines Departments in each of the States during the five years 1922 to 1926 :—

TIN.—PRODUCTION, 1922 TO 1926.

State.	1922.	1923.	1924.	1925.	1926.
--------	-------	-------	-------	-------	-------

QUANTITY.

		Tons.	Tons.	Tons.	Tons.	Tons.
New South Wales	{ Ingots	734	896	1,041	957	1,134
	{ Ore ..	410	..	..	..	..
Victoria	{ Ingots	..	..	..	..	..
	{ Ore ..	115	78	38	69	29
Queensland	{ Ingots	(a)	(a)	(a)	(a)	(a)
	{ Ore ..	1,098	903	1,196	1,012	1,058
Western Australia	{ Ingots	..	..	..	..	..
	{ Ore ..	110	131	87	108	67
Tasmania	{ Ingots	679	1,160	1,108	1,130	1,096
	{ Ore ..	..	..	..	..	..
Northern Territory	{ Ore ..	(b) 79	(b) 136	(b) 97	(b) 110	(b) 98

VALUE.

		£	£	£	£	£
New South Wales	.. ..	154,698	180,789	259,485	250,944	326,474
Victoria .. ..	.. ..	12,071	10,371	6,056	11,592	5,075
Queensland .. ..	.. ..	99,758	114,945	175,509	161,500	174,147
Western Australia	.. ..	10,930	15,095	12,008	15,392	10,450
Tasmania .. ..	.. ..	112,407	236,955	275,014	297,515	322,526
Northern Territory	.. ..	(b) 5,891	(b) 13,887	(b) 12,855	(b) 15,966	(b) 15,852
Total .. ..	.. ..	395,755	572,042	740,927	752,909	854,524

(a) Included with ore. (b) Year ending 30th June.

The rise in the price of tin during the period covered by the table is reflected in the increased value of production. In 1922, the average London price was £159 9s. per ton, while in 1926 it had advanced to £291 2s. per ton.

2. Sources of Production.—(i) *New South Wales.* Tin-mining operations were stimulated by the high price of the metal in 1926, and renewed activity was manifested in the New England and Ardlathan districts, where the principal tin fields are situated. Operations on the northern areas were, however, somewhat hampered by shortage of water. A large proportion of the output in New South Wales is obtained by dredging, the quantity so won in 1926 being 814 tons, valued at £157,476. Forty-three dredges were in operation during the year. In the Tingha division of the Peel and Uralla district the yield amounted to 473 tons, valued at £91,534. The Emmaville division in the New England district showed a yield of 402 tons, valued at £71,453. In the Wilson's Downfall division, 58 tons, valued at £11,710, were raised. From the Torrington division, 150 tons, valued at £27,525, were returned. The Ardlathan field, in the Lachlan division, produced 362 tons of concentrates, valued at £57,760, while Torrington returned 124 tons, valued at £22,580.

(ii) *Victoria.* The production in 1926 was obtained by dredging, the Cock's Pioneer Gold and Tin Co. in the Beechworth district contributing the whole of the output which amounted to 29 tons.

(iii) *Queensland.* The chief producing districts in Queensland during 1926 were Herberton, 571 tons, valued at £94,504; Kangaroo Hills, 222 tons, £31,546; Stanthorpe, 146 tons, £27,180; Cooktown, 41 tons, £7,578; and Chillagoe, 74 tons, £12,769. Despite the satisfactory prices realized in 1926, the total production valued at £174,000 was much below that of 1920, when the yield was valued at £252,000. Improved methods of production, coupled with more vigorous prospecting will, it is hoped, result in improved returns in future years.

(iv) *Western Australia.* The export of tin from the State during 1926 amounted to 67 tons, valued at £10,450. The production from the Greenbushes field amounted to 61 tons of black tin, valued at £10,126, and from the Pilbara field 35 tons, valued at £5,446. Deposits of tin occur in widely-separated localities in the Kimberley division, the Thomas River in the Gascoyne Valley, and at Poona on the Murchison gold-field.

(v) *Tasmania.* During 1926 the output of tin amounted to 1,096 tons, valued at £322,526, the principal producers being the Briseis, Endurance, Pioneer, and Mt. Bischoff mines. The increased price of the metal led to renewed activity and there is every prospect of larger yields in the near future.

(vi) *Northern Territory.* The yield of tin concentrates in 1926 amounted to 98 tons, valued at £15,852, of which 36 tons were raised at Marranboy, 29 tons at Mt. Wells, and 13 tons at Hayes Creek, while small quantities were raised at Hidden Valley, Collia, and Muldiva, and elsewhere. About 15 tons of concentrates were produced from alluvial tin, half of which came from the Pine Creek and Umbrawarra localities where it was obtained mainly by Chinese fossickers.

3. World's Production.—According to *The Mineral Industry* the world's production of tin during each of the last five years was as follows. The figures for previous years have been amended since last issue.

TIN.—WORLD'S PRODUCTION, 1922 TO 1926.

1922.	1923.	1924.	1925.	1926.
Tons. 130,344	Tons. 130,254	Tons. 140,447	Tons. 144,761	Tons. 143,968

The yields from the chief producing countries in 1926 were as follows:—

TIN.—PRODUCTION, CHIEF COUNTRIES, 1926.

Country.	Production.	Country.	Production.
	Tons.		Tons.
Federated Malay States ..	45,900	Australia	(a) 3,200
Netherlands East Indies ..	33,000	Great Britain	2,900
Bolivia	32,100	Unfederated Malay States	2,200
Nigeria	7,000	Congo	1,700
Siam	7,000	India	1,300
China	6,500	South Africa	1,100

(a) As quoted by Australian Mines and Metals Association.

Based on the results for the last three years, Australia's share of the world's tin production would appear to be about 2.2 per cent.

4. Prices.—The average price of the metal in the London market for the years 1922 to 1926 was as follows:—

TIN.—PRICES, 1922 TO 1926.

Year.	Average Price per Ton.	Year.	Average Price per Ton.
	£ s. d.		£ s. d.
1922.. ..	159 9 0	1925	261 1 6
1923.. ..	202 5 0	1926	291 2 0
1924.. ..	248 14 10		

The large and continuous advances in price since 1922 are due to the fact that the growing demand for the metal for industrial uses has not been offset by the emergence of outstanding new sources of production. In 1926 the lowest price reached was in the early part of June, when the coal strike depressed the market in sympathy with all other branches of business, while the highest price was reached in October, when £321½ was realized. Monthly averages for the year 1926 ranged from £272 per ton in June to £300 5s. in December.

5. Employment in Tin Mining.—The number of persons employed in tin mining during the last five years is shown below:—

TIN MINING.—PERSONS EMPLOYED, 1922 TO 1926.

Year.	N.S.W.	Victoria.	Q'land.	W. Aust.	Tas.	Nor. Ter.	Australia.
	No.	No.	No.	No.	No.	No.	No.
1922	1,090	13	659	31	620	120	2,533
1923	1,047	7	703	35	842	170	2,804
1924	1,004	2	698	40	781	115	2,640
1925	1,012	(a)	653	55	1,035	118	(b)2,875
1926	1,235	(a)	714	78	1,057	112	3,196

(a) The tin produced in Victoria was raised by a dredging company operating primarily for gold.

(b) Including 2 in South Australia.

§ 7. Zinc.

1. Production.—(i) *New South Wales.* (a) *Values Assigned.* The production of zinciferous concentrates is chiefly confined to the Broken Hill district of New South Wales, where zinblende forms one of the chief constituents in the enormous deposits of sulphide ores. During the earlier years of mining activity on this field a considerable amount of zinc was left unrecovered in tailings, but from 1909 onwards improved methods of treatment resulted in the profitable extraction of the zinc contents of the accumulations at the various mines.

As the metallic contents of the bulk of the concentrates, etc., raised in the Broken Hill District are extracted outside New South Wales, the mineral industry of that State is not credited by the Mines Department with the value of the finished product. The figures given hereunder, therefore, refer to the quantity and value of the zinc concentrates actually exported during the years specified.

ZINC.—CONCENTRATES, ETC., EXPORTED FROM NEW SOUTH WALES,
1889 TO 1926.

Year.	Quantity of Zinc Concentrates, etc., Exported.	Value.	Year.	Quantity of Zinc Concentrates, etc., Exported.	Value.
	Tons.	£		Tons.	£
1889	97	988	1923	426,049	1,411,652
1891	219	2,622	1924	353,650	1,296,571
1899	49,879	49,207	1925	226,525	1,022,016
1922	363,681	1,157,458	1926	267,533	1,359,588

(b) *Local and Foreign Extraction.* A statement of the quantity of zinc extracted in Australia and the estimated zinc contents of concentrates exported overseas during the five years 1922 to 1926 will be found in § 18 hereinafter.

(ii) *Queensland.* The total production of zinc in 1926 was returned at 200 tons, valued at £6,827, produced from ores raised in the Chillagoe area.

(iii) *South Australia.* Zinc is known to exist in various localities in South Australia, but there has been no production during recent years.

(iv) *Tasmania.* Investigations in regard to the Read-Rosebery zinc-lead deposits in Tasmania have proved the existence of 1,680,000 tons of ore, which, added to an estimated quantity of 915,000 tons of "probable" ore, make a total supply of 2,595,000 tons. During the year 1926 the production from local ores was taken as 5,378 tons, valued at £183,362, the principal producer being the Hercules-Rosebery, with 5,162 tons.

The Electrolytic Zinc Co. at Risdon worked on raw materials obtained partly from the West Coast district of Tasmania, but chiefly from Broken Hill in New South Wales. Production from other than Tasmanian ores in 1926 consisted of 41,836 tons of zinc valued at £1,427,845, and 150 tons of cadmium, valued at £27,746. Over 1,000 men were employed at these works. Satisfactory results were obtained at the Hercules-Rosebery experimental plant, and will doubtless lead to increased exploitation of the large zinciferous area on the West Coast.

2. *Prices.*—During the four years 1911 to 1914, the London price of zinc averaged £23 15s. per ton, ranging from £21 in 1914 to £26 3s. 4d. in 1912. Owing to the heavy demand and other circumstances arising out of the war, the prices in 1915 and 1916 reached the very high average of £67 11s. 1d. and £72 1s. 5d. per ton respectively. For 1921 the average recorded was £25 16s. 11d.; for 1922, £30; for 1923, £33 1s. 2d.; for 1924, £33 14s. 7d.; for 1925, £36 12s. 6d.; and for 1926, £34 2s. 1d. per ton.

§ 8. Iron.

1. *General.*—The fact that iron-ore is widely distributed in Australia has long been known, and extensive deposits have been discovered from time to time at various places throughout the States, but the utilization of these deposits for the production of iron and steel is, at present, confined to New South Wales.

2. Production.—(i) *New South Wales.* (a) *Extent of Deposits.* Iron ores of various composition are found widely distributed throughout the State, but some of the deposits are at present of no commercial importance on account of their small and scattered extent, or by reason of their distance from means of transport. Excluding deposits too far from existing railways, or too small to warrant exploitation, as well as aluminous ores, the quantity of iron ore available by quarrying has been set down as 15 million tons. There is, in addition, a large tonnage available by the more costly method of mining. Altogether it appears probable that the total quantity available for smelting is about 53 million tons. The chief sources of supply during recent years were the deposits at Cadia, in the Orange division, and Tallawang, in the Gulgong division.

(b) *Lithgow Iron Works.* Reference to the events leading up to the establishment of ironworks at Lithgow will be found in earlier issues of the Year Book (see No. 3, p. 508). During 1926 the following materials were received at the blast furnaces: Iron ore, 178,746 tons; limestone, 72,636 tons; slag, 4,777 tons; manganese ore, 261 tons; and coke, 157,990 tons. Practically the whole of the ores, fluxes, and fuels used were produced in the State. The iron ore was raised from quarries owned by the Company at Tallawang and Cadia, and the pig iron produced therefrom amounted to 105,201 tons, valued at £578,605. Operations are in progress to test deposits in other areas held by the Company.

The following table shows the quantity and value of pig iron produced in New South Wales during the last five years from locally-raised ores only:—

PIG IRON.—PRODUCTION FROM LOCAL ORES, NEW SOUTH WALES, 1922 TO 1926.

Particulars.		1922.	1923.	1924.	1925.	1926.
Quantity	.. Tons	54,856	94,350	74,075	95,530	105,201
Value	.. £	248,909	707,625	518,525	525,415	578,605

The figures quoted above refer to production from *local* ores only, and as such credited to the New South Wales mineral industry. They do not, of course, represent the total production of pig iron in New South Wales, since, as shown in the succeeding paragraph, a considerable quantity of ore raised in South Australia, and credited therefore to the mineral returns of that State, is treated in New South Wales.

(c) *Newcastle Iron Works.* The Broken Hill Proprietary Company established works for the manufacture of iron and steel on a large scale at Newcastle, and operations were started early in 1915. The Company is utilizing the immense deposit of iron ore at the Iron Knob quarries in South Australia, which are connected with the seaboard at Whyalla, a distance of about 34 miles, by the Company's tramway. The ore quarried for the year ended 30th November, 1927, amounted to 730,780 tons. Extensive limestone works and loading bin at Devonport, Tasmania, as well as quarries in New South Wales for dolomite, magnesite, etc., are also owned by the Company.

The output of pig iron for the year ended 30th November, 1927, amounted to 416,533 tons, and of steel ingots to 387,929 tons. Further details in regard to the activities of these works in 1921 were given on page 347 of Official Year Book No. 15. The steel works possess three blast furnaces of a normal daily producing capacity of 1,300 tons, and a fourth furnace of 100 tons for the production of foundry iron. There are nine 65-ton basic open-hearth furnaces capable of producing 10 to 12,000 tons of ingot steel weekly. The works are supplied with a 35-inch blooming mill for the production of blooms, plates, etc., a 28-inch rolling mill for the manufacture of heavy rails, structural steel, billets, etc., an 18-inch mill for making light rails, structural shapes, fishplates, and heavy sections of merchant bars and billets, a 12-inch mill and an 8-inch mill, each for merchant bars, etc., a continuous rod mill for the production of wire rods, and a fishplate mill. A steel foundry, containing one acid open-hearth furnace, and a cupola furnace for iron castings, with a direct metal foundry which takes the hot metal from the blast furnaces, supply all necessary castings.

The company also possesses 224 by-product coke ovens, and connected with this department are the tar, sulphate of ammonia, and benzol plants.

(d) *Port Kembla Iron Works.* A Company with a nominal capital of £5,000,000 has been formed to establish iron and steel works at Port Kembla in the South Coast district. Complete and up-to-date plant has been acquired, and operations will be started at an early date.

(e) *Iron Oxide, etc.* A quantity of iron oxide is purchased by the various gasworks for use in purifying gas, and it is also to some extent employed as a pigment, the output in New South Wales being drawn chiefly from the deposits in the Port Macquarie, Moss Vale, Goulburn, and Newcastle Divisions. During 1926 the iron oxide raised amounted to 3,251 tons, valued at £1,958. Since the closing down of the Sulphide Corporation's Works at Cockle Creek in 1922 there has been no production of ironstone for fluxing purposes.

(ii) *Victoria.* Iron ore has been located at various places in Victoria, but without special assistance to the industry there does not seem to be any prospect of the deposits being profitably worked.

(iii) *Queensland.* Queensland possesses some extensive deposits of iron ore, which are mined chiefly for fluxing purposes in connexion with the reduction of gold and copper ores. During the year 1921, 4,061 tons of ironstone flux, valued at £5,976, were raised, the bulk of which came from Iron Island in the Rockhampton district. The production in subsequent years was small until 1926, when 4,412 tons, valued at £3,914 were raised from deposits in the Chillagoe area. It is stated that Queensland possesses within its own borders an abundance of the ore, fuel, and fluxes required for the carrying on of a large ironworks.

(iv) *South Australia.* South Australia possesses some rich deposits of iron ore capable of being mined for an indefinite period. The best known deposit is the Iron Knob, a veritable hill of iron ore of high percentage, situated about 40 miles W.S.W. from Port Augusta. A recent survey places the probable reserves of ore in the Iron Knob and Iron Monarch deposits at 133 million tons, with an average content of 63.64 per cent. iron. The Broken Hill company utilizes ore from this quarry at its ironworks at Newcastle, New South Wales, and the amount raised for the year 1927 was 583,745 tons, valued at £671,307. It is estimated that the deposits in the Middleback Range contain 32 million tons of slightly higher grade ore than that at the Iron Knob.

(v) *Western Australia.* This State has some very rich deposits of iron ore, but, owing to their geographical position, the most extensive fields at the present time are practically unexploited, the production in the State being confined chiefly to that needed for fluxing purposes. Allusion to the extent of these deposits will be found in previous Year Books. (See No. 20, page 747.) There is a possibility that the extensive deposits at Yampi Sound will be exploited at an early date with British capital.

(vi) *Tasmania.*—In Official Year Book No. 19, p. 742, some account was given of the position and magnitude of the deposits of iron ore in Tasmania, and it was pointed out that the quantity of ore available was estimated at 100 million tons. During the year 1908 about 3,600 tons of ore were raised, but there was no subsequent record of production. Exploitation of the deposits is at present dependent on the demand from the mainland.

(vii) *Northern Territory.* Large bodies of rich ironstone have been discovered in various parts of the Territory, particularly between the Adelaide River and Rum Jungle. Owing to the lack of local coal, however, the deposits possess no immediate value.

3. *Iron and Steel Bounties.*—The local production of iron and steel has been encouraged by various legislative enactments (see Official Year Book No. 15, p. 348). Under "The Iron and Steel Products Bounty Act 1922," bounties are payable on fencing wire, galvanized sheets, wire-netting, and traction engines made in Australia. It is essential that these articles be made from materials produced and manufactured in Australia, unless imported material is authorized after inquiry and report by the Tariff Board. The total payments in any one financial year must not exceed £250,000. Rates of bounty are—for fencing wire and galvanized sheets, £2 12s. per ton; for wire-netting, £3 8s. per ton; and for traction engines from £40 to £90 each, according to capacity. The amounts paid in each case during the year ended 30th June, 1927, were £93,389, £67,915, £90,299, and £250. Under the amending Act of 1927, the bounty on galvanized sheets was

increased to £3 12s. per ton, and no bounty is payable on traction engines where the cost of materials or parts not produced in Australia amounts to more than 40 per cent. of the total cost.

4. *World's Production of Iron and Steel.*—The Australian production of iron and steel at present forms a very small proportion of the world's output. According to *The Mineral Industry*, the world's production of each commodity in the years specified for the principal countries was as follows:—

PIG IRON AND STEEL.—WORLD'S PRODUCTION, 1913, AND 1924 TO 1926.

Country.	Pig Iron.				Steel Ingots and Castings.			
	1913.	1924.	1925.	1926.	1913.	1924.	1925.	1926.
	Thousands of Tons.				Thousands of Tons.			
United States ..	30,653	31,077	36,370	39,373	31,301	37,932	45,400	48,294
Germany ..	19,000	7,687	10,014	9,491	18,632	9,678	11,998	12,147
France ..	5,126	7,570	8,358	9,245	4,614	6,791	7,327	8,255
Saar Territory ..	..	1,367	1,430	1,600	..	1,423	1,550	1,700
Belgium ..	2,445	2,798	2,501	3,346	2,428	2,829	2,372	3,150
Luxemburg ..	..	2,123	2,325	2,472	..	1,857	2,053	2,208
Austria ..	2,344	263	374	325	2,585	371	462	480
Italy ..	420	299	474	513	919	1,337	1,757	1,685
Spain ..	418	489	461	460	238	531	571	615
Czecho-Slovakia ..	..	1,033	1,147	1,230	..	1,328	1,476	1,574
Sweden ..	732	505	425	460	582	493	467	486
Russia ..	4,563	746	1,521	2,300	4,181	1,122	2,087	2,975
China ..	150	300	300	300	100	150	150	150
Japan ..	236	807	825	850	300	1,081	1,150	1,200
United Kingdom..	10,260	7,307	6,236	2,441	7,664	8,201	7,397	3,497
India ..	204	877	888	902	..	335	449	450
Canada ..	1,015	619	596	738	1,043	650	753	777
Australia ..	47	416	439	450	..	306	351	360
Total—All Countries ..	77,813	66,928	75,336	77,725	74,687	77,529	88,975	91,232

For 1913 the figures for Germany include the production from Luxemburg, the Saar, and portion of Poland, and those for Austria include a large portion of Czecho-Slovakia and Hungary. The Japanese totals are inclusive of Manchuria and Korea.

§ 9. Other Metallic Minerals.

1. *Antimony.*—The production of antimony ore in New South Wales amounted in 1926 to 85 tons, valued at £1,236, the output being obtained at Hillgrove, Baryulgil and Macksville, while small quantities were raised at Uralla and Kempsey. The total quantity of antimony (metal and ore) raised in New South Wales up to the end of 1926 was 19,146 tons, valued at £346,219. The production of antimony concentrates in Victoria during 1925 amounted to 120 tons, valued at £5,380. The whole of the production came from ore raised by a company operating at Costerfield, but none was recorded in 1926. In Queensland extensive deposits were found at Neerdie in the Wide Bay district, at Wolfram Camp, on the Hodgkinson field, on the Palmer River in the Ravenswood district, and at various places in the Herberton district. Ore has also been obtained in the Dividing Range near Herberton and adjacent to some of the central tributaries of Emu Creek. Owing to the low price of the metal no production was recorded since the year 1919, except in 1926, when about 10 tons of ore valued at £105 were raised from deposits in the Clermont district. In Western Australia lodes of stibnite carrying gold have been found in the Roeburne district. During 1917, 12 tons of antimony, valued at £258 were exported, but there was no subsequent production until 1920, when 3 tons, valued at £45, were exported, and 1926, when an export of 4 tons, valued at £85 was recorded.

2. **Arsenic.**—In New South Wales the production of refined arsenic and concentrates in 1926 amounted to 405 tons, valued at £5,837, of which 206 tons of concentrates were produced by the Valla Gold Mines in the Bellingen division; 59 tons of refined arsenic at the Ottery Mine in the Emmaville division; 140 tons in the Hillgrove division; while small quantities of ore were raised in the Torrington division. A certain quantity of arsenic was also contained in silver lead concentrates exported overseas. During 1917 the high price ruling for arsenic and the urgency for the need of supplies in connexion with the destruction of prickly pear, led to the reservation by the Queensland Mines Department of an extensive area of arsenic-bearing deposits at Jibbinbar, in the Stanthorpe district. Production in 1926 from the Stanthorpe district amounted to 815 tons valued at £5,450. No arsenic was locally produced in 1926, the whole of the ore raised being sold for treatment outside the State. In South Australia arsenic-bearing minerals are found at some of the old mines, but, owing to slackness in the demand, only 100 tons of ore were raised in 1925, and none was raised in 1926. The arsenical ore (contained in gold ore) exported from Western Australia in 1926 was valued at £347.

3. **Bismuth.**—Ores of this metal are found in association with tungsten and molybdenum, and sometimes tin, in New South Wales, but owing to lack of a market the production of ore and concentrates in 1926 was only 8 tons valued at £773, the greater portion of the yield being obtained in the Oberon division. About 1 ton of concentrates was obtained at Kingsgate in the Glen Innes division. The total production to the end of 1926 was 813 tons, valued at £233,277. In Queensland wolfram and bismuth have been found in various districts, but, owing to the low prices obtainable, production in 1925 was small, amounting to 10 cwt., valued at £79, raised in the Chillagoe district, while there was no record of production in 1926. In South Australia deposits are found at Balhannah, at Mount Macdonald, and at Murninnie on the shores of Spencer's Gulf. A small quantity of bismuth was exported from Western Australia in 1919, but none was recorded subsequently. In Tasmania a small quantity, valued at £21, was raised in 1921 by the S. & M. mine at Middlesex, but there was no production in recent years.

4. **Cadmium.**—The cadmium contained in the zinc ores mined at Broken Hill is recovered at Risdon, Tasmania, as a by-product in the electrolytic treatment of calcined zinc concentrates. During the four years, 1922 to 1926, amounts of 36 tons, valued at £13,189; 123 tons, valued at £34,776; 150 tons, valued at £33,478; 156 tons, valued at £35,067, and 133 tons, valued at £24,577 respectively were so obtained, but, as pointed out previously, credit is not taken for the value of the finished product in the New South Wales returns as the metal is not recovered in the State. Tasmania in 1926 credited its mineral returns with 10 tons of cadmium, valued at £1,827, obtained from zinc calcines produced from local ore.

5. **Chromium.**—The output of chromite in New South Wales during 1926 was estimated at 597 tons, valued at £1,704, of which 510 tons were raised in the Barraba division, and 87 tons in the Copmanhurst division. Chrome iron ore is found in Queensland in the Rockhampton district, and about 160 tons were raised in 1920 by the Mount Morgan Company at Glen Geddes, but there was no production during the last six years. Chromite has been discovered at Coobina on the overland route between Peak Hill and Nullagine in Western Australia, but, on account of the difficulties of transport and the low price of the mineral, there is no immediate likelihood of production.

6. **Cobalt.**—This metal was found at Carcoar in New South Wales in 1889, and subsequently of Bungonia, Port Macquarie, and various other places. There was no export of cobalt since 1911, and the total produced since 1860 amounted in value to only a little over £10,000. In Queensland a rich deposit was opened up in 1920 at Mount Cobalt in the Cloncurry area, and the production in 1926 amounted to 27 tons, valued at £5,430. Although the product is a valuable one, greater development is hindered by the uncertainty of the demand.

7. **Lead.**—Lead mining *per se* is not practised to any extent in Australia, the supply of the metal being chiefly obtained in conjunction with silver and zinc. In New South Wales the Mines Department took credit in 1922 for 8,113 tons, valued at £194,712, and the production to the end of 1922 was taken as 327,000 tons, valued at £6,442,000. Owing to the closing down of the treatment works at Cockle Creek in 1922 no subsequent production was recorded, the whole of the lead concentrates being

forwarded for treatment outside the State, principally at Port Pirie in South Australia. As stated previously, the metallic contents of the major portion of the silver-lead ores are extracted outside New South Wales, and the figures quoted above refer only to lead values assigned as the produce of the State. In Victoria, oxides, sulphides, and carbonates of lead are found in the reefs on most of the gold-fields. The deposits are not, however, of sufficient extent to repay the cost of working. In Queensland the deposits are worked chiefly for the silver, copper or gold contents of the ore, the lead produced in 1926 amounting to 3,735 tons, valued at £116,156. Of this total the Chillagoe area produced 1,886 tons, valued at £58,651; the Herberton area, 1,080 tons, valued at £33,580; Etheridge, 507 tons, £15,767; Cloncurry, 76 tons, valued at £2,372; and the Burketown area, 170 tons, valued at £5,287. Lead has been found at many places in South Australia, although, with few exceptions, the lodes are not of great size. Production in 1926 was returned at 28 tons, valued at £819. During 1926, lead and silver-lead ore exported from Western Australia amounted to 4,162 tons, valued at £76,741. The bulk of the product consists of lead ore raised on the Northampton field. Tasmanian lead production in 1926 was returned as 5,893 tons, valued at £183,167. The centres of production have already been referred to under §4.3. vi. hereinbefore.

8. *Manganese*.—During 1926 the output of manganese ore in New South Wales amounted to 1,290 tons, valued at £3,955, of which 1,007 tons were raised in the Grenfell division, 150 tons in the Deepwater division, 73 tons in the Tamworth division, and 30 tons each in the Gulgong and Cootamundra division. In Victoria the production in 1922 amounted to 150 tons, valued at £930, raised in the Heathcote division, but none was raised during the last four years. In Queensland there are extensive deposits of low-grade manganese ores in various places. High-grade ore is not available in quantity, but the deposits of medium grade at Kandanga should in future become a valuable asset in the steel industry. Production in 1926 amounted to 20 tons, valued at £40, raised in the Gympie area. Extensive deposits of the ore were mined at Boolcunda in South Australia some years ago, and it is found also at Pernatty, Hawker, and Gordon. The production in 1924 was valued at £1,128, but there was no output recorded in 1925 or 1926. The Pernatty ore is of high grade, and being free from deleterious substances is specially suited for use in making high-grade steel. In Western Australia, ores of the metal are found widely scattered, the black oxide being especially plentiful in the Kimberley district. Extensive deposits exist in a locality 18 miles north-west from Peak Hill. In the northern part of the Cue district the deposits cannot at present be profitably worked owing to absence of cheap transport facilities. The export of manganese in 1926 consisted of 82 tons, valued at £503.

9. *Molybdenum*.—The production of molybdenite in New South Wales during the year 1926 amounted to 10 cwt., valued at £41, obtained from mines at Kingsgate in the Glen Innes division. The total production of molybdenite since its discovery is stated at 827 tons, valued at £211,800. In Victoria 42 tons of concentrates valued at £7,350 were produced in 1926 at Everton. The production in Queensland for 1925 was 3 tons, valued at £271, partly raised on the Chillagoe field, and partly at Mount Perry, but none was raised in 1926. The Wombah mine near Mount Perry is regarded by geologists as one of the most promising sources of molybdenite in Australia. A small quantity was at one time produced from the mines in the Moonta district in South Australia, and the occurrence of the metal is reported from various other localities, but no production was recorded during the last five years. Molybdenite occurs in small quantities at various localities in Western Australia, the production recorded in 1922 being valued at £500, but none was recorded in later years. In the Northern Territory, molybdenite is found at Yenberrie, where it is stated that the ore increases in richness as the workings become deeper.

10. *Radium*.—Deposits of radio active ores occur in lode form in South Australia, and are believed to be richer and more extensive than any others so far located. There is an extensive deposit at Radium Hill, Olary, about 12 miles from Cutana railway siding, and another at Mount Painter in the Northern Flinders Ranges. Ores from both localities have yielded radium. Pure radium bromide was produced at a treatment plant in Sydney, and up to the end of 1914, when operations were suspended, 466 milligrammes were extracted. The Radium and Rare Earths Treatment Co. has been formed to exploit the radio-active ores at Olary, and a syndicate has taken up the

workings at Mount Painter. A sample of 11 milligrammes of radium bromide was extracted from $2\frac{1}{2}$ tons of crude ore in 1925 by experts attached to the first named company. Extensive plant and buildings have been erected, and it is hoped that production on a large scale will shortly be possible. The value of ore raised in 1925 was set down at £172, but none was recorded in 1926.

11. **Tungsten.**—Wolfram and scheelite, the principal ores of tungsten, are both found in New South Wales, but the low prices obtainable caused a cessation of mining activity in this direction in recent years. Since 1920 there has been no production of scheelite, while the value of the wolfram produced was only £545. In Victoria the production of wolfram was returned in 1920 as $7\frac{1}{2}$ tons, valued at £355, yields being obtained at Mount Murphy and the Tambo River, but there was no subsequent production. In Queensland, tungsten ores are found in several districts but, owing to low prices production in 1926 was insignificant, about 10 cwt. of wolfram being obtained in the Chillagoe area. (See also "Bismuth.") A deposit of wolfram was discovered near Yankalilla, in South Australia, as far back as 1893, but no production has been recorded since the year 1917. The mineral is also found at Callawonga Creek. There was no production of tungsten minerals in 1926 in Western Australia. Tungsten ores are commonly met with in the gold reefs, and both wolfram and scheelite have been recorded as occurring in several widely-separated localities. Wolfram is mined at various points in Tasmania, the production for 1926 being 83 tons, valued at £5,265. The price of the mineral was too low to allow of the mines being operated for wolfram alone, and the output was obtained from material associated with tin ore. Scheelite has been discovered on King Island in Bass Strait, but there was no recent production. In the Northern Territory wolfram is found at Hatches Creek, Wauchope Creek, Wolfram Creek, Hidden Valley, and Yenberrie. Numerous samples of high grade ore have been obtained at the Frew River in Central Australia. The production in 1923 was, however, trifling, and none was recorded later.

12. **Other Metals.**—In addition to the metals enumerated above there is a large number of others occurring in greater or less degree, while fresh discoveries are being constantly reported.

§ 10. Coal.

1. **Production in each State.**—An account of the discovery of coal in each State will be found in preceding issues of the Year Book. (See No. 3, pp. 515-6.) The quantity and value of the production in each State, and in Australia, during the five years 1922 to 1926, are given in the table hereunder:—

COAL.—PRODUCTION, 1922 TO 1926.

Year.	N.S.W.	(a) Victoria.	Q'land.	S. Aust.	W. Aust.	Tasmania.	Australia.
QUANTITY.							
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
1922 ..	10,183,133	559,284	958,519	..	438,443	69,238	12,208,617
1923 ..	10,478,513	476,823	1,060,662	..	420,714	80,718	12,517,430
1924 ..	11,618,216	518,315	1,123,117	..	421,864	75,988	13,757,500
1925 ..	11,396,199	534,246	1,177,173	..	437,461	81,698	13,626,777
1926 ..	10,885,766	591,001	1,221,059	..	474,819	102,358	13,275,003
VALUE.							
	£	£	£	£	£	£	£
1922 ..	8,507,946	664,251	840,472	..	381,555	61,016	10,455,240
1923 ..	8,607,892	525,270	925,227	..	368,949	70,797	10,498,135
1924 ..	9,589,547	569,555	985,542	..	363,255	66,555	11,574,454
1925 ..	9,302,515	596,117	1,037,956	..	363,203	70,424	11,370,215
1926 ..	9,436,520	657,798	1,098,927	..	394,400	90,401	11,678,046

(a) Exclusive of brown coal.

The figures for Victoria quoted above are exclusive of brown coal, the quantity and value of which during the last six years were as follows:—

BROWN COAL.—PRODUCTION, VICTORIA, 1921 TO 1926.

Year.			Quantity.	Value.	Year.			Quantity.	Value.
			Tons.	£			Tons.	£	
1921	..	..	79,224	31,074	1924	..	127,490	41,116
1922	..	..	90,402	31,179	1925	..	876,468	166,404
1923	..	..	116,888	38,019	1926	..	957,935	188,899

2. Distribution and Production of Coal in each State.—(i) *New South Wales.*—Estimates of the quantity of merchantable coal available in the deposits in each State were given in preceding issues of the Official Year Book (See No. 20, pp. 752 *et seq.*), but considerations of space preclude the repetition of the information in the present issue.

The coal from the various districts differs considerably in quality—that from the Northern district being especially suitable for gas-making and household purposes, while the product of the Southern (Illawarra) and Western (Lithgow) is an excellent steaming coal. At the present time the Greta coal seams are being extensively worked between West Maitland and Cessnock, and this stretch of country, covering a distance of 15 miles, is now the most important coal-mining district in Australasia. The Permo-Carboniferous measures have in various places been disturbed by intrusions of volcanic rocks, which in some instances have completely cindered the seams in close proximity to the intrusive masses, while in other instances the coal has been turned into a natural coke, portion of which some years ago realized good prices as fuel.

The table hereunder gives the yields in each of the three districts during the five years 1922 to 1926:—

COAL.—PRODUCTION IN DISTRICTS, NEW SOUTH WALES, 1922 TO 1926.

District.	1922.	1923.	1924.	1925.	1926.
	Tons.	Tons.	Tons.	Tons.	Tons.
Northern	7,156,921	6,861,759	8,077,689	7,637,953	7,257,598
Southern	1,878,594	2,170,699	1,973,855	2,052,963	2,024,520
Western	1,147,618	1,446,055	1,566,672	1,705,283	1,603,648
Total	10,183,133	10,478,513	11,618,216	11,396,199	10,885,766

The output in 1926, though much smaller than in each of the two preceding years may be considered satisfactory in view of the general stoppage on all the fields during the year.

(ii) *Victoria.* (a) *Black Coal.* The deposits of black coal in Victoria occur in the Jurassic system, the workable seams, of a thickness ranging from two feet three inches to six feet, being all in the Southern Gippsland district. An estimate, by R. H. Cambage, of the tonnage of extractable black coal places the total at 25 million tons, of which 20 millions are in the Wonthaggi area, 2 millions at Korumburra, Jumbunna, and Outtrim, and the balance in other small areas.

The output of black coal in Victoria during the last five years was as follows :—

BLACK COAL.—PRODUCTION, VICTORIA, 1922 TO 1926.

Year.			State Coal Mine.	Other Coal Mines.	Total Production.	Value.
			Tons.	Tons.	Tons.	£
1922	..	..	511,174	48,110	559,284	664,251
1923	..	..	418,394	58,429	476,823	523,270
1924	..	..	452,032	66,283	518,315	569,555
1925	..	..	468,146	66,100	534,246	596,117
1926	..	..	531,869	59,132	591,001	657,798

Amongst the other coal mines the chief producers in 1926 were the Sunbeam Colliery at Korumburra, with 16,576 tons; the Austral at Korumburra South, with 12,462 tons; and the Jumbunna Coal Pty. Ltd. at Jumbunna, with 10,733 tons.

(b) *Brown Coal.*—(1) *General.* Deposits of brown coal and lignite of immense extent occur in gravels, sands, and clays of the Cainozoic period throughout Gippsland, Mornington Peninsula, Werribee Plains, Gellibrand, and Barwon and Moorabool basins. In the Latrobe Valley, the beds reach a thickness of over 800 feet. As estimated by boring, the total tonnage of brown coal available, according to a report by the Government Geologist, amounts to 10,378 million tons, of which 5,000 million tons are situated in the Morwell district, a similar quantity in the Traralgon district, 250 million tons at Welshpool-Gelliondale, while the Altona, Lal Lal, and Wensleydale areas are capable of supplying 100 millions, 25 millions, and 3 millions respectively. In 1917 an Advisory Committee appointed to report on the brown coal deposits of Victoria recommended the establishment of an open-cut mine at Morwell in connexion with a comprehensive scheme of electrical power generation and transmission, as well as for the supply of brown coal for other requirements. The recommendations of this Committee were incorporated in the "Electricity Commissioners Act" of 1918. The Commission is actively engaged in the work of opening up the Morwell deposits, and the product is being utilized for the generation of electricity, which is transferred to Melbourne and to other towns in Victoria within economic distance. The first generator at the Yallourn power station was brought into operation on the 15th June, 1924, and the works are now assisting in meeting the increasing demands for electric energy in the metropolitan and country areas of Victoria, and in certain areas in the south of New South Wales. The energy sold during the year 1926-27 amounted to about 246 million kw.-hours. A township has been established at Yallourn, with provision for an ultimate population of 3,000. On the 30th June, 1927, there were 2,160 employees engaged on the various works of the Commission as follows :—At Yallourn, 1,459; Transmission Lines, 187; Metropolitan Works, 250; Water Power Investigation, 13; District Undertakings, 167; and Rubicon Hydro-Electric Scheme, 84. Overhead lines erected to the 30th June, 1927, amounted to 1,129 route miles, and length of cable to 3,802 miles. At the same date about 157 miles of underground cable had been laid.

The brown coal produced in Victoria was raised chiefly at the State Open Cut at Yallourn, where the output in 1926 amounted to 734,004 tons, while 219,376 tons were raised at the old open cut at Morwell. During the year 3,252 tons were also raised by the Otway Coal Co., at Bambra, and 1,153 tons by the Victorian Central Coal and Iron Co. at Lal Lal, while 150 tons were won at Morwell by the Australian Commonwealth Fuels and Oils Ltd.

(2) *Production of Briquettes.* The briquetting plant started operations in November 1924, and the monthly output in 1926-27 was 9,123 tons, the total for the year being 109,500 tons. It should be noted, however, that the Yallourn plant is what is known as a "half factory," and economic production will necessitate an extension thereof. It is expected that the additions at present in progress will be in operation in 1928. The Yallourn briquettes are considered to be equal in quality to those produced in the best German factories.

According to the Report of the Geological Survey of the United States the world's production of briquettes in 1924 was 42 million tons, of which over 33 million tons were

produced in Germany, 3 million tons in France, 2 million tons in Belgium, 1 million tons in the United Kingdom, while Spain, Netherlands, and the United States each produced about $\frac{1}{2}$ million tons.

(3) *Distillation Products.* A new industry is in contemplation for the distillation of oil, motor spirit, and other valuable substances from brown coal, experiments in this direction on a small scale having yielded very satisfactory results.

(iii) *Queensland.* The distribution of production during the last three years was as follows:—

COAL PRODUCTION.—QUEENSLAND, 1924 TO 1926.

Districts.	1924.	1925.	1926.
	Tons.	Tons.	Tons.
Ipswich	596,720	614,053	649,184
Darling Downs	93,252	108,275	104,535
Wide Bay and Maryborough	105,181	119,704	109,519
Rockhampton (Central)	123,781	101,076	87,974
Clermont	55,799	62,204	77,947
Bowen	103,987	128,497	174,904
Mount Mulligan (Chillagoe)	44,397	43,364	36,852
Bundaberg .. .. .	..	..	144
Total	1,123,117	1,177,173	1,221,059

The output in 1926 was the highest recorded. There were 35 collieries operating in the Ipswich district, 7 in the Darling Downs, 10 in the Maryborough area, 8 in the Central district, 1 at Mount Mulligan in the Chillagoe district, and 2 in the Bowen district. State coal mines are in operation at Collinsville in the Bowen field, at Mount Mulligan in the Chillagoe field, and at Baralaba and Styx in the Central area.

(iv) *South Australia.* Thin seams of black coal similar to the Jurassic coal of Victoria have been proved by a bore at Robe, but the depth at which the seams were located, i.e., between 2,830 feet and 3,950 feet, renders exploitation thereof unlikely. Reference to the situation and probable content of the widely distributed brown coal deposits in this State was made in Official Year Book No. 19, p. 750. In 1925, an expert commissioned by the Government to report on these deposits stated, amongst other things, that the brown coals at present known contain fairly large percentages of moisture, and have a high sulphur and ash content. Owing to their situation, deep-mining methods would be necessary to win the coal, at an estimated cost of 10s. per ton. An extensive system of "scout" boring was recommended, with a view to discovering deposits suitable for mining by open-cut methods.

(v) *Western Australia.* The production from the five collieries situated at Collie amounted in 1926 to 474,819 tons, of which 269,700 tons were supplied to the railways. The total output was over 37,000 tons in excess of that for the preceding year, and if the demand warranted it, the yield could be considerably increased.

(vi) *Tasmania.* Of the output in 1926, amounting to 102,358 tons, the Cornwall, Mt. Nicholas and Jubilee Collieries on the East Coast raised 46,000, 29,500, and 14,400 tons respectively. The Catamaran collieries returned an output of 9,950 tons of excellent steaming coal, a variety much needed in Tasmania. It is hoped that exploitation will develop a tonnage sufficient to make the State independent of outside supplies.

(vii) *Australia's Coal Reserves.* A summary of the information available in regard to estimated actual and possible reserves of coal for Australia as a whole was given in tabular form on p. 755 of Official Year Book No. 20, but considerations of space preclude its repetition in the present issue.

3. *Production in Various Countries.*—The total known coal production of the world in 1926 amounted to about 1,334 million tons, towards which Australia contributed nearly 14 $\frac{1}{2}$ million tons, or about 1 per cent. The following tables show the production of the chief British and foreign countries during each of the last three years where the returns are available. As the table shows there was a fall of 117 million tons in the returns for Great Britain in 1926, the reduced output being due to the strike.

COAL PRODUCTION.—BRITISH EMPIRE, 1924 TO 1926.

Year.	Great Britain.	British India.	Canada.	Australia.	New Zealand.	Union of S. Africa.
-------	----------------	----------------	---------	------------	--------------	---------------------

BLACK COAL.

	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
1924	267,118,200	21,174,000	8,995,000	13,757,500	1,085,000	11,633,000
1925	243,176,200	20,904,000	8,490,000	13,626,800	1,005,000	12,115,000
1926	126,278,500	20,668,000	11,492,000	13,275,000	1,196,000	12,634,000

BROWN COAL, LIGNITE.

1924 .. ..	..	..	3,182,000	127,500	998,200	..
1925 .. ..	..	..	3,233,000	876,500	1,070,300	..
1926 .. ..	..	..	3,203,000	957,900	1,044,000	..

COAL PRODUCTION.—FOREIGN COUNTRIES, 1924 TO 1926.

Year.	Germany.	Belgium.	France.	Czecho-Slovakia.	Poland.	Netherlands.	Russia.	Japan.	United States.
-------	----------	----------	---------	------------------	---------	--------------	---------	--------	----------------

BLACK COAL.

	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
1924	130,924,000	22,970,000	43,272,000	14,924,000	31,684,000	6,076,000	13,698,000	31,488,000	510,363,000
1925	130,499,000	22,744,000	46,258,000	12,339,000	28,656,000	6,997,000	14,109,000	29,034,000	519,521,000
1926	142,921,000	24,895,000	51,596,000	14,166,000	34,762,000	8,514,000	24,900,000	..	591,715,000

BROWN COAL, LIGNITE.

1924	122,543,000	..	928,000	20,160,000	86,600	188,200	..	173,900	(a)
1925	137,442,000	..	990,000	17,738,000	61,000	204,300	..	..	(a)
1926	137,527,000	..	..	18,301,000	(a)	(a)	..	..	(a)

(a) Included with black coal.

4. Exports.—The exports of coal from Australia are chiefly confined to New South Wales.

The total quantity of coal of Australian production (exclusive of bunker coal) exported to other countries in 1926-27 was 807,000 tons, valued at £966,000, of which 803,000 tons were exported from New South Wales, and about 4,000 tons from Queensland.

In the following table will be found the quantity and value of the exports from New South Wales, during the last five years. The figures are given on the authority of the Mines Department of that State, and include both bunker coal and coal exported from New South Wales to other States.

COAL.—EXPORTS, NEW SOUTH WALES, 1922 TO 1926.

Year	..	..	..	..	1922.	1923.	1924.	1925.	1926.
Quantity, 1,000 tons	..	..	..	..	5,239	4,900	5,414	4,771	4,538
Value, £1,000	..	..	..	..	5,929	5,481	6,037	5,243	5,229

Of the 4,538,000 tons of coal exported from New South Wales in 1926, over 86 per cent., or 3,921,000 tons, were shipped at Newcastle; 316,000 tons (including bunker coal, 161,000 tons) at Port Kembla and Bellambi; and about 300,000 tons, mostly bunker coal, at Sydney.

The principal countries to which coal was forwarded from Newcastle during the last three years were as follows:—

EXPORTS OF COAL FROM NEWCASTLE, NEW SOUTH WALES, 1924 to 1926.

Country of Destination.	1924.	1925.	1926.
	Tons.	Tons.	Tons.
Victoria	1,691,000	1,502,000	1,389,000
New Zealand	715,900	616,000	495,000
South Australia	903,600	934,600	887,000
Tasmania	153,400	125,200	116,300
Western Australia	81,900	115,000	76,600
Queensland	78,100	101,300	103,600
United Kingdom	196,900	166,700	195,500
Java	31,300	93,800	102,800
Chile	109,600	4,600	13,200
United States	56,900	47,000	56,000
Philippine Islands	175,400	112,000	122,800
Argentine .. . . .	.. . . .	.. . . .	91,100
India	54,700	34,900	34,800
Straits Settlements	110,700	37,100	22,900
Sandwich Islands	15,900	11,700	.. . . .
Fiji	31,200	48,300	36,700
Noumea	17,600	33,800	11,000
Peru	28,700	36,400	23,600
Japan	25,100	13,300	11,000
Ocean Island	19,000	20,900	20,700
Nauru	24,600	21,400	13,700
Canada	9,400	21,200	9,600
Germany	18,200	15,900	19,000
Total—All Countries	4,688,000	4,174,000	3,921,000

During the year 1926 the exports from Port Kembla and Bellambi to other States amounted to 108,000 tons, while 25,000 tons were sent to New Caledonia, 13,000 tons to the Argentine, and 8,800 tons to Egypt. The coal shipped from Sydney went principally to the Gilbert and British Solomon Islands. For the twelve months ended 30th June, 1926, about 20,000 tons of coal were dispatched to interstate ports from the jetty at Catherine Hill Bay, near Newcastle.

The distribution of the total output from New South Wales collieries during the last five years was as follows, the particulars given of quantity exported including coal shipped as bunker coal:—

COAL.—DISTRIBUTION OF OUTPUT, NEW SOUTH WALES, 1922 TO 1926.

Year.	Exports to Australian Ports.	Exports to Foreign Ports.	Local Consumption.	Total.
	Tons.	Tons.	Tons.	Tons.
1922	2,841,263	2,398,144	4,943,736	10,183,133
1923	2,518,579	2,381,549	5,578,385	10,478,513
1924	3,096,881	2,317,063	6,204,272	11,618,216
1925	3,001,823	1,769,215	6,625,161	11,396,199
1926	2,740,570	1,797,257	6,347,939	10,885,766

For the period of five years shown in the table above, 26 per cent. of the total output was exported to other States, 20 per cent. was sent overseas, and 54 per cent. was consumed locally.

The figures quoted are given on the authority of the New South Wales Mines Department.

5. *Consumption in Australia.*—An estimate of the consumption of coal in Australia may be arrived at by adding the imports to the home production, and deducting the exports (including bunker coal taken by oversea vessels). The following table shows the consumption computed in the manner specified, for the last five years :—

COAL.—CONSUMPTION, AUSTRALIA, 1922 TO 1926.

Year.	Quantity of Coal Consumed.		
	Home Produce.	Produce of Other Countries.	Total.
	Tons.	Tons.	Tons.
1922	9,531,274	46,620	9,577,894
1923	10,022,228	62,660	10,084,888
1924	11,395,631	9,234	11,404,865
1925	12,536,179	9,137	12,545,316
1926	12,338,644	26,080	12,364,724

The bunker coal taken away in 1926 was estimated at 1,023,000 tons.

6. *Prices.*—(i) *New South Wales.* The price of New South Wales coal depends on the district from which it is obtained, the northern district coal always realizing a much higher rate than the southern or western product. The average price on the mine in each district and for the State as a whole during the last five years was as follows :—

COAL.—PRICES, NEW SOUTH WALES, 1922 TO 1926.

Year.	Northern District.	Southern District.	Western District.	Average for State.
	Per ton. <i>s. d.</i>	Per ton. <i>s. d.</i>	Per ton. <i>s. d.</i>	Per ton. <i>s. d.</i>
1922	17 6	16 3	12 8	16 9
1923	17 7	16 1	11 5	16 5
1924	17 8	16 2	11 2	16 7
1925	17 7	15 11	11 1	16 4
1926	18 10	16 5	11 9	17 4

(ii) *Victoria.* In Victoria the average price of coal in 1922 was 23s. 9d.; in 1923, 22s.; in 1924, 21s.; in 1925, 22s. 4d.; and in 1926, 22s. 3d. per ton. These averages are exclusive of brown coal, the production of which in 1926 was valued at 3s. 11d. per ton.

(iii) *Queensland.* Prices in the principal coal-producing districts during the last five years were as follows :—

COAL.—PRICES, QUEENSLAND, 1922 TO 1926.

District.	Value at Pit's Mouth.				
	1922.	1923.	1924.	1925.	1926.
	Per ton. <i>s. d.</i>	Per ton. <i>s. d.</i>	Per ton. <i>s. d.</i>	Per ton. <i>s. d.</i>	Per ton. <i>s. d.</i>
Ipswich	16 8	16 11	16 8	16 7	17 2
Darling Downs	18 11	19 1	18 10	18 8	19 2
Wide Bay and Maryborough	27 2	25 0	24 3	24 3	24 2
Bundaberg .. .. .	.. .. .	.. .. .	.. .. .	.. .. .	24 7
Rockhampton	16 5	15 5	15 0	16 1	17 10
Clermont	13 10	12 10	11 0	12 0	13 6
Bowen (State Coal Mine) ..	16 1	16 0	16 5	16 0	16 2
Mount Mulligan (Chillagoe)	20 0	22 6	29 6	31 3	30 4
Average for State	17 6	17 5	17 8	17 8	18 0

The readjustment of prices and wages in the industry was responsible for the increases in the averages during the last four years.

(iv) *Western Australia.* The average price of the Collie (Western Australia) coal during the last five years was as follows:—In 1922, 17s. 5d.; in 1923, 17s. 6d.; in 1924, 17s. 3d.; in 1925, 16s. 7d.; and in 1926, 16s. 7d. per ton.

(v) *Tasmania.* The average price per ton of coal at the pit's mouth in Tasmania for the five years 1922 to 1926 was:—In 1922, 17s. 7d.; in 1923, 17s. 6d.; in 1924, 17s. 6d.; in 1925, 17s. 3d.; and in 1926, 17s. 8d. per ton.

7. Prices in the United Kingdom.—During the five years 1922 to 1926 the average selling value of coal at the pit's mouth in the United Kingdom was:—In 1922, 17s. 7d.; in 1923, 18s. 10d.; in 1924, 18s. 10d.; in 1925, 16s. 4d.; and in 1926, 19s. 6d. per ton.

8. Employment and Accidents in Coal Mining.—The number of persons employed in coal mining in each of the States during the year 1926 is shown below. The table also gives the number of persons killed and injured, with the proportion per 1,000 employed, while further columns are added showing the quantity of coal raised for each person killed and injured, this being a factor which must be reckoned with in any consideration of the degree of risk attending mining operations. A further table gives the rate of fatalities during the last five years.

According to the report of the Chief Inspector of Mines the average death-rate per 1,000 miners from accidents in coal mines in Great Britain during the quinquennium 1922–26 was 1.02, the rates varying between 1.08 in 1926, and 0.95 in 1922, while, as shown in the table following, the rate for Australia for the same period was 1.01. In the United States during the three years 1923–25 the death rate per 1,000 employees averaged 4.9 for bituminous coal miners, and 3.7 for anthracite miners. Rates for other coal-producing countries for the same period were—Canada, 2.7; South Africa, 2.7; Germany, 2.2; Spain, 1.7; Belgium, 1.1; France, 1.0. In comparing these rates, allowance must be made for the circumstance that the methods of calculation are not identical in all countries.

COAL MINING.—EMPLOYMENT AND ACCIDENTS, 1926.

State.	Persons Employed in Coal Mining.	No. of Persons.		Proportion per 1,000 Employed.		Tons of Coal raised for each Person.	
		Killed.	Injured.	Killed.	Injured.	Killed.	Injured.
New South Wales ..	24,781	25	102	1.01	4.11	435,400	106,700
Victoria ..	2,939	1	6	0.34	2.04	1,548,900	258,200
Queensland ..	3,020	2	88	0.66	29.14	610,500	13,900
Western Australia ..	686	..	89	..	129.74	..	5,300
Tasmania ..	348	..	6	..	17.24	..	17,100
Total ..	31,774	28	291	0.88	9.16	508,300	48,900

Owing to lack of uniformity in the definition of "injury," the figures relating to persons injured possess little comparative value.

The next table shows the average number of miners employed, number of fatalities, and rate per 1,000 during the quinquennium 1922–26:—

COAL MINING.—FATALITIES, 1922 TO 1926.

State.	Average No. of Coal Miners.	Average No. of Fatal Accidents.	Rate per 1,000 Employed.
New South Wales ..	23,297	24.4	1.05
Victoria ..	2,383	2.0	0.84
Queensland ..	2,756	2.6	0.94
South Australia ..	4	..	..
Western Australia ..	698	0.4	0.57
Tasmania ..	287	0.2	0.70
Total ..	29,425	29.6	1.01

Figures for coal miners in South Australia appeared for the first time in 1922, the miners being engaged chiefly on work in connexion with the brown coal deposits.

For Queensland the rate for the quinquennium 1922-6 was 2.6, as against 17.6 for the five years 1921-5, when the figures were swollen by the inclusion in 1921 of the 75 deaths in the disaster at Mount Mulligan.

§ 11. Coke.

1. Production.—Notwithstanding the large deposits of excellent coal in Australia, there was, prior to the war, a fairly considerable amount of coke imported from abroad. During recent years, however, a high standard of excellence has been attained in the local product, and the necessity for import has to a large extent disappeared. During the year 1926-27 the coke imported amounted to 29,000 tons, of which 17,000 tons were obtained from the United Kingdom and 12,000 tons from Germany, the bulk of the product being taken by South Australia for use in the ore-treating works at Port Pirie. The table hereunder gives the production in New South Wales during the last five years :—

COKE.—PRODUCTION, NEW SOUTH WALES, 1922 TO 1926.

Year	..	..	..	1922.	1923.	1924.	1925.	1926.
Quantity	..	tons		240,229	580,374	564,372	609,418	597,663
Value, total	..	£		382,926	941,323	932,926	942,448	940,416
Value, per ton	..	..		31s. 10d.	32s. 5d.	33s. 1d.	30s. 11d.	31s. 6d.

The figures quoted refer to metallurgical coke, the product of coke ovens, and are exclusive of coke produced in the ordinary way at gas works.

During recent years the industry has made considerable progress, and with the development of local iron and steel works, as well as metal refineries and smelting establishments, its future prospects ought to be assured. The small quantity made in 1922 was due to the lessened demand consequent on the closing down of the steel works at Newcastle, while the improvement manifested in 1923 was resultant on the recommencement of operations.

A small quantity of coke is made in Queensland, the quantity returned in 1926 being 6,191 tons, valued at £10,741, but the coke consumed in the State is to some extent obtained from outside sources. The following table shows the amount manufactured locally during the last five years :—

COKE.—PRODUCTION, QUEENSLAND, 1922 TO 1926.

Year	..	..	..	1922.	1923.	1924.	1925.	1926.
Quantity	..	tons		6,748	5,244	7,116	5,384	6,191

Information regarding the exact quantity of coke imported from New South Wales and elsewhere is not available.

In order to avoid duplication with coal values the returns for coke have not been included in the general tables of mineral production in the early part of this chapter.

§ 12. Oil Shale and Mineral Oil.

1. Production.—(i) *New South Wales.* The production of kerosene shale amounted during 1924 to 642 tons, valued at £962, as compared with 32,489 tons valued at £77,380 in 1921, but none was mined in 1925 or in 1926. It is estimated that the total quantity of shale in the State amounts to 40 million tons, but its profitable exploitation depends on economic methods of production. Up to date there has been no production of petroleum, but boring operations were carried out at the Loder dome site in the Singleton division. The prospects of striking flow oil in the Belford dome and the associated structures known as the Loder and Sedgefield domes in the Hunter River district appeared encouraging, and the Federal Government offered to subsidize on a £1 for £1 basis up to £22,500 approved boring operations in this area by the State or a private company. The Government Geologist of New South Wales has, however, expressed the opinion that "there is nothing in the nature of evidence to justify a belief in the existence of commercial supplies of oil or gas in the domes under consideration." A small supply of natural gas was encountered in a bore in the Belford area.

(ii) *Victoria.* Up to the present no extensive deposit of oil shale has been located in Victoria. Bores in search of oil have been put down from time to time, but so far without result, and the State geological authorities take an unfavourable view of the prospects of obtaining it. A small quantity of heavy grade crude mineral oil was recently recovered from a bore at Lakes Entrance.

(iii) *Queensland.* The Lander Oil Co. ceased operations in 1926, when its drilling plant and equipment were taken over by the Roma Oil Corporation Ltd. which is vigorously prospecting for oil in the vicinity of Roma. A small quantity of oil has already been produced, and indications are encouraging, but at the time of writing it is too early to express decided views as to the possibilities of commercial supplies becoming available. It may be noted that the lack of sufficient rock exposures in the Roma area renders the task of selecting satisfactory bore sites an extremely difficult one.

The Commonwealth Government has allocated to the State a sum of £5,000 for detailed geological survey work. (See also Official Year Book No. 18, p. 801, and No. 19, p. 756).

(iv) *South Australia.* A considerable amount of money has been spent by private companies and individuals in the search for oil, but the results so far have been negative. Unfortunately a good deal of boring has been done either without or against the advice of competent geologists. The South Australian Government offers a bonus of £5,000 to the person or company first producing 100,000 gals. of crude petroleum from a bore or well in the State.

(v) *Western Australia.* In this State the chief interest in the search for oil centres in the Kimberley division. At Mount Wynne, in West Kimberley, the gas which bubbles freely in a hot spring has been found to contain hydrocarbons. Indications of free petroleum have been obtained in bores on Price's Creek, about 100 miles south-east of Mount Wynne, and traces of mineral oil have been detected in a seepage. In East Kimberley a black bitumen, residual from an asphaltic oil, has been found in weathered basalt in two localities 5 miles apart, thus indicating the former circulation of petroleum in the area. Boring operations were in progress during 1926 at "Freney's" in the Northern area, on sites selected by an expert on behalf of the Federal Government. At times excitement has been aroused by the discovery in various localities of accumulations of coorongite, but the mineral is not in any way connected with seepages of petroleum as it consists of a rubber-like aggregation of a microscopic single-celled alga on the surface of swamps.

(vi) *Tasmania.* The deposits of oil shale in Tasmania in the Latrobe-Railton-Kimberley, Onah, Beulah, Quamby Bluff, and Nook areas have an estimated capacity of upwards of 40 million tons. In addition the recently discovered deposits at Cheshunt are known to be large, but their full extent has not been determined. During the last ten years exploitation of the vast areas available has been comparatively very small. For 1926 the output was 2,127 tons, valued at £1,475, the largest producer being the Australian Shale Oil Corporation at Latrobe. It is hoped that the problem of efficiently and economically retorting on a large scale will shortly be solved. A new discovery of shale was recently made near Chudleigh, in the Deloraine district.

(vii) *Northern Territory.* Considerable activity has been displayed during recent years by speculators in acquiring areas under coal and oil prospecting licences along the north-western boundary of the Territory, and northerly along the western coast to the Daly River, but so far no developments have been recorded, although what are regarded locally as good indications of oil have been discovered. Many of the licences have been forfeited, and, so far, no success has attended the boring operations at Elcho Island, although the prospects were considered satisfactory.

(viii) *Papua.* In 1911 indications of petroleum were reported near the Vailala River, and, acting on the reports of geologists, an oil expert was despatched by the Commonwealth Government to sink trial bores on the site. Early in 1913 a small quantity of oil was obtained from a shallow bore. Later on, extensive geological surveys were made of the country between Yule Island and the Purari Delta, and oil was encountered in several trial bores. In 1919 the Anglo-Persian Oil Co., under agreement with the British and Commonwealth Governments, and latterly with the Commonwealth Government only, has been engaged in work on the field. At the 30th June, 1927, there were nine mineral oil and coal licences embracing an area of 7,822 square miles. The Anglo-Persian Co. is putting down a fourth bore at Popo, and other Companies have sunk bores in the Gulf Division, in the Western Division, and near Cape Vogel on the north-east coast.

(ix) *New Guinea.* At Matapau, about 54 miles from Aitape on the north coast of what was formerly German New Guinea, oil has been struck in a shallow bore, and hopes are entertained that the product will be encountered in large volume at a greater depth. At 30th June, 1927, there were in force 8 licences to prospect for mineral oil and coal.

2. *Expert's Report.*—A report by Dr. Wade presented to the Senate in October, 1924, by the Minister for Home and Territories was generally unfavourable to the prospects of finding commercial supplies of petroleum in the northern portions of Western Australia and the Northern Territory. The report points out that the marginal areas on the Fitzroy apparently offered the best possibilities, and special mention was made of the Price's Creek region, although the structure there was not satisfactory in regard to present geological knowledge. It was recommended that the district should be tested with boring plant capable of penetrating to a depth of between 3,000 and 4,000 feet. Allusion was also made to the possibility of locating oil in the Belford dome area in New South Wales.

3. *Exports.*—During the last five years the exports of kerosene shale have been trifling, only 11 tons being shipped from New South Wales in 1923-24, and 1 ton in 1924-25, while 1 ton was exported from Victoria in 1925-26. There was no export in 1926-27.

4. *Mineral Oil Bounties.*—The offer by the Commonwealth Government of a reward up to £50,000 for the discovery of oil in Australia was withdrawn in 1925, and under the Petroleum Prospecting Act of 1926 a sum of £60,000 was allocated for providing aid to persons or companies engaged in the search for oil and to assist in geological survey work. The whole of the money has been expended, and legislation is foreshadowed providing for a further sum of £100,000.

§ 13. Other Non-metallic Minerals.

1. *Alunite.*—The production of this mineral in New South Wales amounted during 1926 to 580 tons, valued at £2,320, raised in the Bullahdelah division. The mineral is sent to England for treatment, and, to the end of 1926, the exports were 58,200 tons, valued at £209,000.

In South Australia a deposit of the mineral was located in 1913 at Carrickalinga Head, on the coast north of Normanville, and within a short distance of Adelaide. Fresh discoveries were later reported on the western shores of St. Vincent's Gulf. Systematic prospecting has proved the existence of a deposit of at least 41,000 tons near Stansbury, on the eastern coast of Yorke Peninsula. The mineral returns show a production of 95 tons in 1922, but none was recorded subsequently.

The exploitation of the alunite deposits in the North-East Coolgardie field in Western Australia has been retarded pending the result of field experiments to determine the suitability or otherwise of the product as a fertilizer in its unroasted state. Deposits of the mineral are also found in the Kalgoorlie area.

2. **Asbestos.**—This substance has been found in various parts of Australia, but up to the present has not been produced in any considerable quantity. In New South Wales the production in 1926 amounted to 4 tons, valued at £20, raised at Byng in the Orange division. In Queensland seams of asbestos have been found over a belt of country extending from Cawarral to Canoona, as well as in other districts. Samples of the fibre proved suitable for the manufacture of fibro-cement sheeting and tiles, but so far the deposits have not been commercially exploited. Deposits of asbestos have been located at various places in South Australia. Production in 1924 amounted to 80 cwt., valued at £80, but none was raised in 1925 and 1926. Chrysotile asbestos of high grade is found in various localities in Western Australia, particularly in the Serpentine rocks between Nullagine and Roeburne, over a distance of 200 miles. The production in 1926 amounted to 105 tons, valued at £2,728, of which 91 tons were obtained in the Pilbara field and 14 tons in the West Pilbara field. In 1918, 2,854 tons of asbestos, valued at £5,008, were produced in Tasmania. A small quantity was raised in 1919, but there was no production during recent years.

3. **Barytes.**—In New South Wales large quantities of this mineral are available at Kempfield in the Trunkey division, but the production in 1926 amounted to only 200 tons, valued at £400. Deposits are also found in the Candelo and Tazalga divisions. The production in South Australia during 1926 was given as 1,742 tons, valued at £5,226. In this State there are extensive deposits at Noarlunga and Pernatty Lagoon. The mineral is also worked near Williamstown, while new sources of supply have been located near Eudunda. High grade natural white barytes is obtained from some of the workings, but a large amount of lower grade ore is discarded or wasted owing to lack of facilities for cleaning and bleaching. Barytes in fair-sized veins occurs at many places in Western Australia, especially at Cranbrook in the south-west division. The export in 1921 was, however, small, being valued at under £20, and none was recorded in later years. About 1,000 tons of barytes, valued at £4,000, were produced in Tasmania in 1920, the greater portion being won from deposits near Queenstown and Mt. Jukes, and the balance from Beulah and elsewhere, but there was no further production recorded until 1925, when a little over 3 tons, valued at £16, was raised, while none was raised in 1926. It is stated that cost of transport is too high to allow of profitable production at present rates.

4. **Clays and Pigments.**—Valuable deposits of clays and pigments of various sorts are found throughout Australia. There is a considerable local production of earthenware, bricks, and tiles, but the finer clays have not as yet been extensively used. In New South Wales the production of pigments amounted in 1926 to 526 tons, valued at £844. The returns show that 300 tons of yellow ochre were raised at Delroy in the Dubbo division, and 85 tons of red ochre in the Gulgong division, while production was also reported from the Binalong, Milton, Newcastle, and Sydney divisions. About 4,800 tons of white clay, valued at £6,700, were raised from various areas during the year. The output of fireclay amounted to 18,420 tons, valued at £5,087, obtained chiefly in the Wollongong and Sydney divisions. In Victoria 3,153 tons of kaolin, valued at £4,157, were produced in 1926 from deposits at Stawell, Mt. Egerton, Bendigo, Heathcote, and Pynlong, and 2,278 tons of pigment clays, valued at £1,275, were raised from leases at Ballarat, Berringa, Castlemaine, and Heathcote. Sixty tons of jarosite pigment, valued at £660, were raised at Port Addis. In Queensland, 335 tons of fireclay, valued at £184, were mined during 1925 in the Mount Morgan district. Deposits of fine white clay have been located near Wondai and Kingaroy. In South Australia ochre is obtained at the Copper King pigment mine near Beltana, and is also raised near Oodnadatta. Production in 1926 amounted to 36 tons, valued at £297. Red oxide of suitable quality as well as ochres of various hues have been found in different and widely-separated localities in Western Australia. Investigation has proved the existence of a deposit of a fine white-ware clay about 4 miles from the railway at Wagin. Fireclay of good quality has been found at Clackline on the Eastern railway, about 50 miles from Perth. Porcelain and other clays of good quality have been found in

Tasmania at Beaconsfield, Sorell, Hagley, etc. Oil and water paints have been made from coloured ochres from Sorell, and deposits of ochre have been located near Mowbray and Beaconsfield. In 1926 the output was 38 tons, valued at £69.

5. **Felspar.**—During 1926, the production of this mineral in New South Wales was 11 tons, valued at £11, raised at Brewongle. A fairly extensive deposit of felspar has been located at Black Ridge near Williamstown in South Australia, and the mineral has also been found near Myponga. Production in 1926 amounted to 103 tons, valued at £309. About 8 tons of felspar, valued at £250, were exported during 1926 from Western Australia. A large deposit of the mineral has been located near Jacob's Siding, and it occurs in the Coolgardie area.

6. **Fluorspar.**—At Carboona in the Tumbarumba division in New South Wales this mineral is mined with silver and lead, the production in 1924 amounting to 470 tons, but none was raised in 1925 and 1926. In Victoria 196 tons, valued at £625, were raised in 1921 by a company operating at Walwa, but none was recorded in later years. A high grade fluorspar occurs at the Perseverance mine on the Chillagoe railway in Queensland. Production in 1926 amounted to 2,311 tons, valued at £4,148. The output is, however, retarded by lack of a permanent market, low price, and increased mining costs at depth.

7. **Fuller's Earth.**—About 30 tons of this material, valued at £50, were produced in 1925 from deposits in the Mudjee division, New South Wales, but no output was recorded in 1926. A large deposit of excellent quality has been located near Jennaubbine in Western Australia.

8. **Graphite.**—This mineral is widely distributed throughout Australia, but there was no record of production in 1926. (See Official Year Book 19, p. 760.) In South Australia flake graphite has been found at various places on Eyre Peninsula. An extensive deposit has been located near Port Lincoln and a company has been formed to exploit the area.

9. **Gypsum.**—The output of gypsum in New South Wales during 1926 was 817 tons, valued at £1,287, of which 717 tons were raised in the Hillston division, and 100 tons in the Hay division. In Victoria during 1926 there was a production of 10,217 tons, valued at £7,613, of which 831 tons were raised from leases at Boort; 126 tons at Cowangie; 2,311 tons at Waitchie; 6,388 tons at Bolton; 307 tons at Lake Boga; 214 tons at Murraydale; and 40 tons at Chillingollah. South Australia possesses valuable deposits at Lake MacDonnell, and at Marion Bay and Cape Spencer in Yorke Peninsula. The production in 1926 amounted to 65,613 tons, valued at £57,411. A considerable quantity is used in the manufacture of plaster and cement, as well as for agricultural purposes. Gypsum is widely distributed in Western Australia in tertiary and late tertiary deposits associated chiefly with the salt lakes of the arid regions of the interior south of the tropics. Many of these lacustrine deposits are capable of yielding large tonnages. The production in 1926 amounted to 3,918 tons, valued at £5,618.

10. **Magnesite.**—Deposits of this mineral have been discovered at several localities in New South Wales. During 1926 the output was 10,263 tons, valued at £14,375, of which about 8,000 tons were raised at Attunga in the Tamworth division, 1,800 tons in the Fifield division, and 120 tons in the Cobar division. The mineral is found at Heathcote in Victoria, where 94 tons, valued at £281, were produced in 1926. There are deposits in the neighbourhood of Rockhampton and Bowen in Queensland, and in 1925 an output of 267 tons was recorded from the Rockhampton area, but there was no output in 1926. The deposits at present being worked in South Australia are situated at Paratoo, Robertstown, and Copley. Several other deposits have been located on Eyre Peninsula, near Port Pirie, and near Oladdie. Production in 1926 amounted to 226 tons, valued at £565. A large area of magnesite-bearing country has been located in Western Australia at Bulong, about 20 miles east of Kalgoorlie, and deposits have also been found at Coolgardie and other places. The mineral is of a high degree of purity, but there has been no production of importance since 1915.

11. **Mica.**—Mica is found at various places in Australia, and in 1925 a small quantity was raised at Wanda Vale in the Broken Hill division in New South Wales, and a little prospecting was carried out in the Narrabri division. There was no record of production in 1926. Muscovite in fairly large quantities is found at Mica Creek, near Mount Isa

in Queensland. The production in 1925 amounted to 10 cwt., valued at £700, and the report thereon was so satisfactory that it was proposed to exploit the deposits on a large scale, but none was raised in 1926. A company was recently formed in London to exploit a deposit at Yinnietharra, about 240 miles from Carnarvon in Western Australia. In 1926 an export of 4 tons, valued at £8,328, was recorded, but it would appear that the value is overestimated. The production of mica in the Northern Territory during 1925 was returned at 7,440 lb., valued at £2,835, obtained chiefly from the Hart's Range area.

12. Phosphate Rock.—During 1926, 253 tons of phosphate, valued at £316, were obtained in New South Wales, of which 170 tons were won in the Molong division, 35 in the Inverell division, and 48 in the Kempsey division. In Victoria 120 tons, valued at £120, were raised in 1926 at Mansfield. The production in Queensland amounted in 1922 to 65 tons valued at £279, raised by the Holbourne Island Phosphate Company in the Bowen district. Difficulty in finding a market for the product was responsible for the small output, and none was raised in the last four years. South Australia possesses deposits scattered over a belt of country 200 miles in length, from Myponga in the south to the district round Carrieton, in the north. Production in 1926 amounted to 882 tons, valued at £864, obtained in the Light division of the Central area. It is stated that the industry is meeting with severe competition in the high grade phosphate imported from Nauru. In Western Australia the known phosphate deposits occur principally on the coastal islands, and in portion of the coastal plain between Dongarra and Perth. Some years ago guano digging on the islands was a large and profitable industry.

13. Salt.—Salt is obtained from salt lakes in the Western and North-Western districts of Victoria, and from salterns in the neighbourhood of Geelong. Figures regarding production are, however, not available for publication. Large quantities are obtained from the shallow salt lakes of South Australia, chiefly on Yorke Peninsula. Lake Hart, about 60 square miles in area, situated about 120 miles N.W. from Port Augusta, contains immense supplies of salt of good quality, and supplies are also obtained from Lake Bumbunga north of the head of St. Vincent's Gulf. During recent years a fair amount has been produced by evaporation of sea water at the heads of Spencer's and St. Vincent's Gulfs. About 91,000 tons of crude salt, valued at £205,000, were produced during 1926, these figures being the largest yet recorded. In Western Australia salt is obtained from depressions in the calcareous sandstones of the coast, which are filled to a shallow depth in winter with salt water. In summer the depressions dry up, leaving a layer of salt two or three inches thick, which is collected and refined. Up to the present, the four chief localities producing salt were Rottnest Island, off Fremantle; Middle Island, near Esperance; Yarra Yarra Lakes, near Three Springs; and Lynton, near Port Gregory. There is a very large number of salt and brine lakes which may ultimately be used as sources of salt. In the Northern Territory a small quantity of salt is produced from salt pans on Ludmillah Creek near Fannie Bay.

14. Diatomaceous Earth.—Although this mineral has been found at various localities in New South Wales, the deposits have not been worked commercially on any considerable scale. The output in 1926 was 911 tons, valued at £1,765, of which 427 tons were raised in the Coonabarabran division, 434 tons in the Barraba division, and 49 tons at Bunyan in the Cooma division. A small quantity also was raised in the Lismore division. Part of the product is used as a filtering medium in the manufacture of gelatine, and part for the manufacture of metal polish in powdered and liquid form. In Victoria there is a remarkably pure deposit at Lillieur, near Talbot, while beds of the mineral are also met with at other places in the Loddon Valley, near Ballarat, at various places close to Melbourne, at Craigieburn, Lancefield, Portland, Swan Hill, Bacchus Marsh, etc. During 1920, a production of 1,000 tons, valued at £5,000, was recorded, but no production was returned in later years. Fairly extensive deposits of diatomite exist in Queensland, in the Nerang, Beaudesert, and Canungar areas, but the various outcrops have as yet been only partly examined. In Tasmania a deposit of diatomaceous earth has been located at Oatlands, but its use for the manufacture of explosives is apparently prejudiced by the circumstance that the diatoms are pulverized and contaminated with clay.

§ 14. Gems and Gemstones.

1. **Diamonds.**—It is difficult to secure accurate returns in connexion with the production of precious stones, but the yield of diamonds in 1926 in New South Wales was estimated at 64 carats, valued at £77, while the total production to the end of 1926 is given at 202,232 carats, valued at £144,529. The yield in 1926 was obtained chiefly at Copeton in the Tingha division and a small return was reported from the Crookwell division. Small quantities of diamonds are found in Victoria in the gravels of streams running through granite country in the Beechworth district, at Kongbool in the Western District, and near Benalla. The stones are generally small, and the production up to date has been trifling. In 1912, eleven small diamonds, valued at £20, were picked out of the sluice boxes of the Great Southern alluvial mine at Rutherglen. In Queensland a discovery was made in 1924 at Diamond Vale, about 2 miles east of Stanthorpe, the stones being found in alluvial tin wash. A flawless green diamond weighing 1 carat, a slightly smaller green, and a white weighing 1 carat, were recovered. The green diamond is extremely rare, and a specimen weighing $1\frac{1}{2}$ carats, exhibited at Wembley Park, was valued at £1,750. In South Australia diamonds have been found on the Echunga gold-fields, the most notable gem being Glover's diamond, which was sold for £70. A few small diamonds have been found in the Pilbara district in Western Australia. Small diamonds have, from time to time, been found in Tasmania, chiefly while sluicing for gold in the Donaldson district.

2. **Sapphires.**—The production of sapphires in New South Wales during 1926 was returned as 1,808 ozs., valued at £2,418, obtained at Horse Gully, Sapphire and Nullamanna in the Inverell division. It is probable that the output is understated owing to the difficulty of obtaining accurate returns from individual miners and prospectors. A fair quantity of machine stones, zircon and corundum, was also raised, but values thereof are not included in the figures above. Operations in 1926 were greatly retarded by scarcity of water.

In Queensland during the early months of 1926 sapphires to the value of £6,799 were purchased by the Government under the gem pool scheme from miners on the Anakie field. Fancy stones occasionally bring high prices, an orange yellow which cut at 31 carats, valued at £300, being found in 1925. Amongst good stones found in 1926 were a golden-yellow, valued at £30, another at £60, and a blue weighing 3 ozs, 4 dwt. The latter was valued at £60, and was the largest blue sapphire found on the field for several years. There is a lapidary on the Anakie field, but many stones are sent away for cutting.

Sapphires are plentifully found in the tin drifts of the Ringarooma and Portland districts in Tasmania, but the stones are, as a rule, small and not worth saving.

3. **Precious Opal.**—The estimated value of the opal won in New South Wales during the year 1926 was £11,485, of which gem to the value of £6,525 was obtained on the Lightning Ridge field, £4,948 on the South Grawin field about 30 miles from Lightning Ridge, while a small quantity was won on the old Rocky Bridge field near Trunkey. Some very fine stones are at times obtained, one weighing 5 ozs. and valued at £300 being recovered in 1911. Occasionally, black opals of very fine quality are found, one specimen from the Wallangulla field, weighing $6\frac{1}{2}$ carats, being sold in 1910 for £102, while in the early part of 1920 a specimen realized £600. It is stated that this locality is the only place in the world where the "black" variety of the gem has been found. The total value of opal won in New South Wales since the year 1890 is estimated at £1,581,000, but it is a well known fact that fine pieces of the gem have been found and sold privately without notification to the Mines Department.

Small quantities of precious opal are found in the Beechworth district in Victoria.

The opaliferous district in Queensland stretches over a considerable area of the western interior of the State, from Kynuna and Opalton as far down as Cunnamulla. The yield in 1926 was estimated at £600, and up to the end of that year at about

£183,000. These figures are, however, merely approximations, as large quantities of opal, of which no record is obtained, are disposed of privately. At present the industry, which is not followed by practical miners, suffers from the peculiar disability that in good seasons there is plenty of work available on the pastoral stations, and most men prefer this to the uncertain results obtainable by fossicking, while in dry seasons, when constant work is not obtainable, the search for opal is blocked by the absence of grass and water on the fields.

At the Coober Pedy opal field situated in the Stuart Range in South Australia, between 50 and 70 miners were engaged in 1926, the estimated value of the production being £10,000. The field is extremely prolific, and only a small portion of the known opal-bearing area has been tested.

According to a report a few years ago by the Australian Trade Commissioner in the East there is a good sale for the gems in China. It is stated that there is no difficulty in cutting and polishing, as the Chinese method of dealing with jade, dating back many centuries, can also be applied to opal.

4. **Other Gems.**—Various other gems and precious stones have from time to time been discovered in the different States, the list including agates, amethysts, beryls, chialstolite, emeralds, garnets, olivines, moonstones, rubies, topazes, tourmalines, turquoises, and zircons.

§ 15. Numbers Engaged, Wages Paid, and Accidents in Mining.

1. **Total Employment in Mining.**—The number of persons engaged in the mining industry in Australia fluctuates according to the season, the price of industrial metals, the state of the labour markets, and according to the permanence of new finds, and the development of the established mines. During the year 1926 the number so employed was as follows :—

NUMBER OF PERSONS ENGAGED IN MINING, 1926.

State.	Number of Persons engaged in Mining for—						Total.
	Gold.	Silver, Lead, and Zinc.	Copper.	Tin.	Coal.	Other.	
New South Wales	808	5,924	31	1,235	24,781	1,962	34,741
Victoria	1,967	..	..	..	2,939	112	5,018
Queensland	321	390	270	714	3,020	409	5,124
South Australia	26	25	26	..	..	886	963
Western Australia	4,488	138	8	78	686	39	5,437
Tasmania	107	523	697	1,057	348	1,221	3,953
Northern Territory	26	2	..	112	..	23	163
Australia	7,743	7,002	1,032	3,196	31,774	4,652	55,399

Included in the figures for "other" in South Australia were 423 engaged in mining for iron, 160 gypsum miners, 181 salt gatherers, and 60 opal miners. The Tasmanian figures include 404 osmiridium miners and 352 zinc miners, and those for the Northern Territory were mica miners.

The following table shows the number of persons engaged in mining in Australia during each of the years 1891, 1901, and 1926, together with the proportion of the total population so engaged:—

NUMBER ENGAGED IN MINING PER 100,000 OF POPULATION, 1891, 1901, AND 1926.

State.	1891.		1901.		1926.	
	Miners employed.	No. per 100,000 of Population.	Miners employed.	No. per 100,000 of Population.	Miners employed.	No. per 100,000 of Population.
New South Wales	30,604	2,700	36,615	2,685	34,741	1,493
Victoria	24,649	2,151	28,670	2,381	5,018	296
Queensland	11,627	2,934	13,352	2,664	5,124	585
South Australia	2,683	834	7,007	1,931	963	172
Western Australia	1,269	2,496	20,895	11,087	5,437	1,450
Tasmania	3,988	2,695	6,923	4,017	3,953	1,871
Northern Territory .. ..	..	..	..	..	163	4,329
Australia	74,820	2,341	113,462	2,992	55,399	916

The general falling-off since 1901 is largely due to the causes mentioned in §1.6 *ante*.

2. Wages Paid in Mining.—Information regarding rates of wages paid in the mining industry, which in earlier issues of the Year Book was given in this chapter, is now contained in the Labour Report issued by this Bureau.

3. Accidents in Mining, 1926.—The following table gives particulars of the number of men killed and injured in mining accidents during the year 1926:—

MINING ACCIDENTS, 1926.

Mining for—	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	N.T.	Australia.
KILLED.								
Coal	25	1	2	..	..	..	..	28
Copper .. .. .	..	..	..	..	..	..	..	..
Gold .. .. .	..	5	1	..	7	1	..	14
Silver, lead, and zinc	14	..	..	..	..	1	..	15
Tin	1	..	..	..	..	2	..	3
Other minerals	2	1	1	1	..	..	..	5
Total	42	7	4	1	7	4	..	65
INJURED.								
Coal	102	6	88	..	89	6	..	291
Copper .. .. .	..	..	12	..	..	5	..	17
Gold .. .. .	..	14	3	..	286	2	..	305
Silver, lead, and zinc	46	..	5	..	..	12	..	63
Tin	1	..	..	..	..	7	1	9
Other minerals	5	..	..	14	..	6	..	25
Total	154	20	108	14	375	38	1	710

The number killed in mining accidents in 1925 was considerably less than that for 1921 when 132 deaths were recorded, the figures for the earlier year being swollen by the 75 fatalities in the Colliery disaster at Mount Mulligan in Queensland.

§ 16. Government Aid to Mining.

1. **Commonwealth.**—Assistance to mining is given by the Commonwealth under the provisions of the *Precious Metals Prospecting Act 1926*, and the *Petroleum Prospecting Act 1926*.

The first-mentioned Act provides for a sum of £40,000, of which £15,000 is to be expended in the Northern Territory, and the balance is to be allocated to the States in such proportions as the Minister determines.

Under the Petroleum Prospecting Act a trust account of £60,000 was established to assist in the search for oil. The Minister was authorized to make advances out of the money standing to the credit of this account to persons or companies engaged in the search for oil, and to assist persons, companies, or State Governments to make geological surveys.

2. **New South Wales.**—The chief aid given in this State is in the direction of assistance to prospectors. Up to the end of 1926 the total sum expended in this manner amounted to £574,109, of which £9,084 was advanced in 1926. A sum of £1,000 was made available during the year for the purpose of assisting in the erection of crushing batteries or reduction plants, but no advances were made therefrom. The reward for the discovery of new mineral fields within the State has been increased from £500 to £1,000, with provision for sums of £250 and £500 in respect of fields not large enough to qualify for the full amount, and the conditions have been made more liberal. A sum of £5,000 was made available by the Commonwealth Government to assist in the search for precious metals in the event of the prospecting vote becoming exhausted within the financial year.

3. **Victoria.**—During the year 1926 expenditure in connexion with mining development amounted to £25,008, of which £3,973 represented advances to miners, £3,652 aid to mining companies, while £11,483 was expended on boring, £611 on covering abandoned shafts, £2,956 on testing plants, and £2,333 on geological surveys.

4. **Queensland.**—State assistance to the mining industry in 1925–26 amounted to £15,694, of which £2,279 consisted of loans in aid of deep sinking; £9,533 grants in aid of prospecting, and £3,882 in aid of roads and bridges to gold and mineral fields and water supply. In addition, a sum of £4,540 was expended in loans under the Act of 1906, £40,881 on State Coal Mines, £6,475 in aid of mining, and £10,000 on State Smelting Works.

During the year the Chillagoe State Smelters produced 3,599 tons of lead bullion containing 923 ozs. of gold, 261,332 ozs. silver, and 3,508 tons of lead, in addition to 606 tons of blister copper containing 142 ozs. gold, 43,097 ozs. silver, and 589 tons copper. Four State batteries were in operation during 1926 as follows, the works at Irvinebank producing 151 tons of tin concentrates; 456 ozs. of gold were extracted by the battery at Kidston, which was not fully occupied owing to insufficient ore supplies and shortage of water; at Charters Towers parcels of ore were treated for miners and prospectors; and at Bamford tin crushing was carried on intermittently for a return of 10½ tons of black tin. The State Assay Office at Cloncurry, in addition to free assays, dealt with 487 parcels of samples aggregating 5,840 tons.

5. *South Australia.*—Aid is given to the mining industry under the terms of the Mining Act of 1893, and previous measures. Up to the end of 1926 the total amount of subsidy paid was £67,679, of which £13,375 has been repaid, and £4,549 written off, leaving a debit of £49,755. Portion of this amount is represented by machinery that has fallen into the hands of the Government. Repayments must be provided from profits, but in only two instances have the profits enabled a full return to be made. During the year 1926 assays and pan tests numbering 308 were made by State batteries and cyanide works of small parcels of ore or tailings received from prospectors. Thirty-four parcels of ore weighing 691 tons were treated for a return of 861 ozs. gold valued at £3,000.

6. *Western Australia.*—Under the Mining Development Act of 1902 assistance was granted in 1926 in accordance with the subjoined statement:—Advances in aid of mining work and equipment of mines with machinery, £10,971; aid to prospectors, £4,800; subsidies paid on stone crushed for the public, £149; making a total of £15,920. In addition, a sum of £49,503 was charged against the vote on account of rebates to the Gold-fields Water Supply Branch, and other assistance amounted to £14,184. The receipts under the Act, exclusive of interest payments, came to £8,336, of which £4,737 consisted of refunds of advances. The industry has been further assisted by Government guarantees to banks on behalf of various companies, and at the end of 1926 the liability in this respect amounted to £54,500.

In 1926 there were 29 State batteries in operation. The amount expended thereon up to the end of 1926 was £91,981 from revenue and £316,463 from loan, giving a total of £408,444. During the year receipts amounted to £19,269, and working expenditure to £29,648. The total value of gold and tin recovered to the end of 1926 at the State plants was £6,033,386, resulting from the treatment of 1,436,980 tons of gold ore and 80,728 tons of tin ore, together with a small amount from residues. Free assays and determinations of mineral values for prospectors are made at the Kalgoorlie School of Mines.

7. *Tasmania.*—In the Aid to Mining area at Zeehan the expenditure in 1926 amounted to £1,606, of which £534 represented salaries and wages, £835 advances to prospectors, and £230 a loan to a gold mining company. The amount received from ore sales was £1,863, of which £1,726 was paid to tributers. Receipts amounted to £1,255, included in which was a sum of £1,000 received from the Commonwealth Government.

Tributers' assays are made at a nominal charge, and all tribute surveys are carried out free of charge by the Assay and Survey Office at Zeehan.

8. *Northern Territory.*—During the year 1925-26 a sum of £339 was expended on State aid to mining, about two-thirds of the amount being granted to the Hidden Valley Battery Syndicate, and the balance divided amongst 7 prospectors.

The Government maintains a battery at Marranboy, and the Government Assayer makes free assays for prospectors, and arranges for the sampling, storage, and sale of ores.

§ 17. Commonwealth Government Control of Industrial Metals.

The proclamation under the Customs Act prohibiting the exportation of metals without the consent of the Minister for Trade and Customs is still in force, but consent is granted in every case where the contract relating to the sale of the metals has been approved.

§ 18. Metallic Contents of Ores, etc., Produced and Exported.

1. Local Production.—According to returns compiled from various sources by the Australian Mines and Metals Association the quantities of the principal metals (exclusive of gold) extracted in Australia during the five years 1922 to 1926 were as follows :—

REFINED METALS PRODUCED IN AUSTRALIA, 1922 TO 1926.

Metal.			1922.	1923.	1924.	1925.	1926.
Silver	..	ozs.	7,896,052	7,645,689	7,631,213	8,573,506	8,946,218
Lead, pig	..	tons	105,528	118,513	126,625	146,129	150,460
Zinc	..	tons	23,724	41,153	46,372	45,698	47,356
Copper	..	tons	11,524	17,825	14,100	10,984	11,148
Tin	..	tons	2,657	3,053	3,167	3,171	3,188

The local production of pig iron during the last five years ranged between 330,000 tons in 1923, and 439,000 tons in 1926.

2. Metallic Contents of Ores, Concentrates, etc., Exported.—The estimated metallic contents of ores, concentrates, etc., exported during the five years 1922 to 1926 are given in the following table :—

METALLIC CONTENTS OF ORES, CONCENTRATES, ETC., EXPORTED, 1922 TO 1926.

Metal.		Contained in—	1922.	1923.	1924.	1925.	1926.		
Silver	ozs.	Lead—Silver—Gold Bullion	165,290	283,453	158,361	189,223	..		
		Lead Concentrates and Ores	281,728	1,298,750	90,360	850,552	190,647		
		Zinc Concentrates and Ores	3,390,964	3,526,774	1,941,507	1,270,166	1,206,313		
		Copper Ores	..	12,261	1,378	51,942	
		Total	..	3,850,243	5,110,355	2,242,170	2,309,941	1,396,960	
Lead	tons	Lead—Silver—Gold Bullion	1,790	3,564	1,808	2,751	2,483		
		Lead Concentrates and Ores	2,959	18,572	4,852	19,651	7,174		
		Zinc Concentrates and Ores	19,910	425	19,859	12,428	13,943		
		Total	..	24,659	22,561	26,519	34,825	23,600	
		Zinc	tons	Lead Concentrates and Ores	384	366	529
Zinc Concentrates and Ores	135,690			146,693	122,305	79,996	94,043		
Total	..			135,690	146,693	122,689	80,362	94,572	
Copper	tons			Ores, Matte, etc.	..	326	2,182	875	864
				Total	..	326	2,182	875	864	1,112
Tin	tons	Concentrates and Ores	..	..	4	..	1

§ 19. Oversea Exports of Ores, Metals, etc.

The following table shows the quantity and value of the principal oversea exports of ores, concentrates, and metals, the produce of Australia, together with the countries to which the respective products were forwarded, for the year 1926-27:—

OVERSEA EXPORTS OF AUSTRALIAN ORES, METALS, ETC., 1926-27.

Article.	Total Exports.	Exports to—						
		United Kingdom.	United States.	Belgium.	Germany.	Japan.	New Zealand.	Other Countries.
QUANTITY.								
Ores—	cwt.	cwt.	cwt.	cwt.	cwt.	cwt.	cwt.	cwt.
Alunite	25,600	25,600	..	..	..	..	..	..
Silver and Silver-lead	118,740	93	..	83,975	33,678	..	..	994
Concentrates—								
Silver and Silver-lead	501,950	..	..	434,863	63,835	..	..	(e) 3,252
Zinc	1,999,875	1,732,441	..	38,794	228,440	..	..	..
Cadmium—Blocks, Ingots, etc.	2,854	2,489	..	..	..	145	..	(a) 220
Copper—								
Matte	57,305	3	5,274	28,021	24,007	..	..	..
Ingot	25,630	20,400	..	..	..	..	130	(b) 5,100
Tin—Ingot	37,206	14,433	18,480	..	..	..	4,276	17
Lead—								
Matte .. ..	..	..	..	..	..	..	..	..
Pig .. ..	..	..	..	..	..	..	..	..
Zinc—Bars, Blocks, etc.	536,563	153,031	..	15,001	155,039	187,969	421	(d) 25,102
	oz.	oz.	oz.	oz.	oz.	oz.	oz.	oz.
Platinum, Osmium, etc.	1,494	498	682	..	193	..	..	(c) 121
Gold—								
Matte	358	358	..	..	..	..	..	..
Bar, Dust, etc.	156,330	770	290	..	..	..	..	(f) 155,270
Silver—								
Matte	39,148	39,148	..	..	..	..	..	..
Bar, Ingot, etc.	7,876,539	2,830	..	..	..	..	1,953	(g) 7,671,756

VALUE—£.

Ores—								
Alunite	5,320	5,320	..	..	..	..	..	..
Silver and Silver-lead	99,567	40	..	80,708	17,856	..	..	963
Concentrates—								
Silver and Silver-lead	429,429	..	..	367,756	58,201	..	..	3,472
Zinc	548,101	441,407	..	16,976	89,718	..	..	..
Cadmium—Blocks, Ingots, etc.	28,164	24,082	..	..	..	1,642	..	2 440
Copper—								
Matte	78,984	8	5,907	46,171	26,898	..	..	..
Ingot	81,923	64,690	..	..	..	..	495	16,738
Tin—Ingot	549,559	213,984	271,843	..	..	..	63,463	269
Lead—								
Matte .. ..	..	..	..	..	..	..	..	..
Pig .. ..	..	..	..	..	..	..	..	..
Zinc—Bars, Blocks, etc.	926,131	261,450	..	26,250	261,750	332,288	838	43,555
Platinum, Osmium, etc.	25,678	7,535	12,177	..	3,600	..	..	2,366
Gold—								
Matte	1,362	1,362	..	..	..	..	..	..
Bar, Dust, etc.	609,167	3,214	590	..	..	..	..	605,363
Silver—								
Matte	4,563	4,563	..	..	..	..	..	..
Bar, Ingot, etc.	911,107	330	..	..	..	..	235	910,542

(a) Sweden. (b) India. (c) France, 120 oz. (d) Hong Kong, 500 cwt.; India, 14,601 cwt.; France, 10,001 cwt. (e) Netherlands. (f) India, 155,267 oz. (g) Ceylon, 119,278 oz.; India, 7,545,974 oz.; Fiji, 6,504 oz.