

## 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.

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. More detailed allusion to this matter will be found in preceding Official Year Books.

3. **Quantity and Value of Production during 1928.**—The quantities (where available) and the values of the principal minerals produced in each State, and in Australia as a whole during the year 1928, 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, 1928.

Minerals.	Unit.	N.S.W.	Vic.	Q'land.	S. Aust.	W. Aust.	Tas.	N.T. (d)	Australia.
Antimony ..	ton	47	2	..	..	..	..	..	49
Arsenic ..	"	93	..	..	..	(c)	..	..	93
Asbestos ..	"	..	..	..	..	12	..	..	12
Barytes ..	"	20	..	..	2,366	..	..	..	2,386
Bismuth ..	cwt.	135	..	17	..	..	..	..	152
Brown Coal ..	ton	..	1,591,858	..	..	..	..	..	1,591,858
Coal ..	"	9,448,197	658,323	1,076,340	..	528,420	128,500	..	11,839,780
Copper (Ingot, matte, etc.) ..	"	55	..	2,787	192	..	6,421	..	9,455
Copper ore ..	"	..	..	..	..	100	..	..	100
Diatomaceous earth	"	1,359	..	..	..	..	..	..	1,359
Gold ..	fine oz.	12,831	33,917	13,277	532	393,408	3,603	101	457,669
Gypsum ..	ton	12,559	10,559	..	91,535	4,214	..	..	118,867
Iron (pig) (b) ..	"	56,776	..	..	..	1	..	..	56,777
Iron oxide ..	"	4,658	..	..	..	..	..	..	4,658
Ironstone ..	"	..	..	..	618,316	..	..	..	618,316
Kaolin ..	"	9,249	1,635	..	160	..	..	..	11,044
Lead ..	"	..	..	43	..	..	4,787	..	4,830
Lead and silver- lead ore, concen- trates, etc. ..	"	247,847	5	..	..	248	..	2	248,102
Limestone flux ..	"	79,846	..	72,771	80,968	..	98,654	..	332,239
Magnesite ..	"	10,669	72	..	45	..	..	..	10,786
Manganese ore ..	"	167	..	..	..	..	..	..	167
Molybdenite ..	cwt.	40	..	..	..	..	..	..	40
Osmiridium ..	oz.	..	..	..	..	..	1,627	..	1,627
Phosphate ..	ton	136	..	..	..	..	..	..	136
Pigments ..	"	415	..	..	55	..	..	..	470
Platinum ..	oz.	354	..	..	..	..	..	..	354
Salt ..	"	..	(a)	..	71,428	..	..	..	71,428
Sapphires ..	"	1,707	..	..	..	..	..	..	1,707
Shale (oil) ..	ton	..	..	..	..	..	2,595	..	2,595
Silver ..	fine oz.	8,573	1,454	22,034	..	55,554	669,326	..	756,941
Tin and tin ore ..	ton	1,020	85	1,015	..	85	1,140	79	3,424
Wolfram ..	"	..	..	27	..	..	176	..	203
Zinc and concen- trates ..	"	314,864	..	..	..	..	7,112	..	321,976

(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 1928 are given in the following table:—

## MINERAL PRODUCTION.—VALUE, 1928.

Minerals.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	N.T. (d)	Australia.
	£	£	£	£	£	£	£	£
Antimony ..	3,697	20	..	..	..	..	..	3,717
Arsenic ..	1,380	..	..	..	401	..	..	1,781
Asbestos ..	..	..	..	..	782	..	..	782
Barytes ..	40	..	..	7,098	..	..	..	7,138
Bismuth ..	371	..	71	..	..	..	..	442
Brown Coal ..	..	202,393	..	..	..	..	..	202,393
Coal ..	8,263,729	731,015	971,690	..	420,145	106,558	..	10,493,137
Copper (ingot and matte) ..	3,497	..	177,043	13,321	..	444,802	..	638,663
Copper ore ..	..	..	..	..	765	..	..	765
Diamonds ..	60	..	..	..	..	..	..	60
Diatomaceous earth ..	3,399	..	..	..	..	..	..	3,399
Gold ..	54,503	144,068	56,395	2,258	1,671,093	15,306	431	1,944,054
Gypsum ..	7,012	5,245	..	80,093	5,425	..	..	97,775
Iron (pig) (b) ..	312,268	..	..	..	1	..	..	312,269
Iron Oxide ..	2,660	..	..	..	..	..	..	2,660
Ironstone ..	..	..	..	711,063	..	..	..	711,063
Kaolin ..	10,926	2,388	..	640	..	..	..	13,954
Lead ..	..	..	873	..	..	101,616	..	102,489
Lead and silver-lead ore, concentrates, etc. ..	2,491,153	100	..	..	4,198	..	22	2,495,473
Limestone flux ..	29,942	..	30,900	30,363	..	79,050	..	170,255
Magnesite ..	14,041	237	..	90	..	..	..	14,368
Manganese ore ..	568	..	..	..	..	..	..	568
Molybdenite ..	390	..	..	..	..	..	..	390
Opal ..	11,000	..	600	11,540	..	..	..	23,140
Osmiridium ..	..	..	..	..	..	42,458	..	42,458
Phosphate ..	259	..	..	..	..	..	..	259
Pigments ..	772	..	..	705	..	..	..	1,477
Platinum ..	4,544	..	..	..	..	..	..	4,544
Salt ..	..	(a)	..	160,713	..	..	..	160,713
Sapphires ..	2,859	..	4,130	..	..	..	..	6,989
Shale (oil) ..	..	..	..	..	..	1,297	..	1,297
Silver ..	936	175	2,514	..	6,638	78,901	..	89,164
Tin and tin ore ..	231,843	12,954	134,727	..	15,002	258,676	10,828	664,030
Wolfram ..	..	..	949	..	..	12,094	..	13,043
Zinc & concentrates ..	1,118,541	..	..	..	..	188,691	..	1,807,232
Unenumerated ..	(c) 30,278	96	6,124	(e) 15,068	3,659	(f) 6,122	3,346	64,693
Total ..	12,600,668	1,098,691	1,386,016	1,032,952	2,128,109	1,335,571	14,627	19,596,634

(a) Not available for publication. (b) See letterpress above table. (c) Includes dolomite £9,151, silica £8,881, and fireclay £10,390. (d) Year ended 30th June. (e) Includes fireclay £13,236. (f) Includes cadmium £4,329, and nickel £1,697.

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 1928 consist of—lime, £122,936; building stone, £284,858; Portland cement, £1,718,527; coke, £852,739; road materials, £991,310; shell grit, £1,624; mineral water, £140; sulphur and sulphuric acid, £61,840; and brick and pottery clays, £423,129. From the Queensland returns, marble, £900, has been deducted, while carbide, £68,877, and cement, £189,380, have been excluded from the Tasmanian figures.

4. Value of Production, 1924 to 1928.—The value of the mineral production in each State during the five years 1924 to 1928 is given in the table hereunder:—

MINERAL PRODUCTION.—VALUE, 1924 TO 1928.

Year.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	N.T.	Australia.
	£	£	£	£	£	£	£	£
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	1,603,661	1,032,353	2,371,864	1,573,997	19,085	24,007,231
1927 ..	15,449,702	1,176,378	1,645,111	1,188,522	2,202,437	1,301,312	19,609	22,983,071
1928 ..	12,600,668	1,093,691	1,386,016	1,032,952	2,128,109	1,335,571	14,627	19,506,634

For New South Wales the value of production in 1928 was over £4,000,000 lower than that for 1925, which was the highest ever recorded. The falling-off in 1928 was largely due to the decreased returns from silver-lead and zinc ores and concentrates, and from copper, tin, gold, iron, and coal.

The decrease in the Victorian returns for 1928 was chiefly due to a falling-off in the returns from gold, coal, and gypsum.

In Queensland the falling-off in production in 1928 was due to the heavy decline in the yields from the principal metals. Copper showed a fall of £42,000, tin of £59,000, lead dropped from £22,000 to under £1,000, while gold dwindled from £161,000 to £56,000. In the case of coal the value of the output was nearly £24,000 below that for 1927. The returns for South Australia in 1928 showed a fall of nearly £166,000 as compared with the figures for 1927, the most noteworthy decreases being nearly £120,000 in the case of iron ore, while the value for salt declined by £18,000, and for limestone by £15,000. In Western Australia the returns for 1928 show a decrease of over £74,000 on the total for 1927, the fall being due chiefly to the decline in the returns from gold and silver lead, although the figures for coal showed a good increase. Tasmania was the only State to show increased production in 1928 as compared with 1927, the total increase in value amounting to over £34,000. While there were decreases in the returns for some items, these were more than counterbalanced by large increases in the case of others. Thus, copper showed a rise of £82,000, osmiridium of £35,000, limestone flux of £20,000, and small increases were recorded in respect of zinc and coal. It is stated that the decline in the Northern Territory returns for recent years is due in some measure to the fact that some of those engaged in mining forsook it to take up more profitable work in other pursuits. The number of Chinese miners in the Territory has steadily decreased and those remaining are all old men.

5. Total Production to end of 1928.—In the next table will be found the estimated value of the total mineral production in each State up to the end of 1928. 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 over £32,000,000 of that published by the State Department of Mines, the principal items excluded being coke, £12,999,000; cement, £15,567,000; lime, £1,483,000; 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 1928.

Minerals.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	Nor. Ter. (a)	Australia.
	£	£	£	£	£	£	£	Million. £
Gold ..	63,835,908	303,384,652	85,848,860	1,632,261	161,923,078	8,944,672	2,283,162	628
Silver and lead ..	114,882,437	264,905	4,165,085	381,394	2,256,942	8,664,054	63,980	131
Copper ..	15,556,451	216,650	20,163,000	33,117,654	1,805,948	19,032,157	232,852	96
Iron ..	7,714,126	15,941	472,785	6,946,699	30,722	52,110	..	15
Tin ..	14,197,520	973,117	10,955,250	..	1,576,234	17,039,682	614,222	45
Wolfram ..	272,187	11,885	1,062,749	301	1,441	224,155	216,859	2
Zinc ..	22,090,159	..	13,460	15,993	5,437	790,791	..	23
Coal ..	178,436,159	11,196,600	17,300,269	..	5,780,848	1,641,272	..	214
Other ..	7,837,522	856,158	2,924,998	4,187,170	187,888	1,594,199	43,980	18
Total ..	424,822,469	316,919,614	148,906,456	46,281,472	173,574,538	57,983,092	3,455,055	1,172

(a) To 30th June, 1928.

The "other" minerals in New South Wales include alunite, £209,000; antimony, £355,000; bismuth, £234,000; chrome, £121,000; diamonds, £145,000; molybdenite, £212,000; opal, £1,586,000; 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 £1,075,000 for brown coal. Included in "other" in the Queensland production were opal, £184,000; gems, £617,000; bismuth, £118,000; cobalt, £150,000; molybdenite, £599,000; and limestone flux, £888,800. The chief items in South Australian "other" minerals were salt, £2,470,000; limestone flux, £494,000; gypsum, £624,000; phosphate, £131,000; and opal, £112,000. In the Tasmanian returns limestone flux was responsible for £793,000, osmiridium for £524,000, 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 1928, 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 1928.

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	61,293,028
1881-90..	4,308,541	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	30,136,636	23,412,355	310,080	75,540,415	2,566,170	473,871	142,009,109
1911-20..	4,988,377	13,354,217	9,876,677	238,808	46,808,351	873,302	100,652	76,240,384
1921 ..	271,902	554,087	214,000	13,933	2,935,693	23,311	1,299	4,018,685
1922 ..	119,359	501,515	378,154	4,693	2,525,811	16,101	640	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	197,118	3,535	1,874,320	15,041	1,959	2,375,409
1926 ..	82,551	208,471	43,914	3,219	1,857,716	17,936	594	2,214,401
1927 ..	76,595	163,699	161,321	1,776	1,734,571	20,646	468	2,159,076
1928 ..	54,503	144,068	56,395	2,258	1,671,093	15,306	431	1,944,054
Total ..	63,835,908	303,384,652	85,848,860	1,632,261	161,923,078	8,944,672	2,283,162	627,852,593

The value of the gold yield in 1928 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. 0½d. in 1924, and at £4 4s. 11½d. for each of the last four years:—

## GOLD.—QUANTITY PRODUCED, 1924 TO 1928.

Year.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tasmania.	Nor. Ter.	Australia.
	Fine ozs.							
1924 ..	18,685	67,167	98,841	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
1927 ..	18,032	38,538	37,979	418	408,353	4,861	(a) 110	508,291
1928 ..	12,831	33,917	13,277	532	393,408	3,603	(a) 101	457,669

(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 years 1921 and 1926, maintained this pre-eminence to the end of 1923. 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, 1919 TO 1928.

State.	Annual Average of Gold Production, 1919 to 1928.	Percentage on Total.	State.	Annual Average of Gold Production, 1919 to 1928.	Percentage on Total.
	ozs.			ozs.	
Total .. ..	695,955	100.0	New South Wales	29,838	4.3
Western Australia..	511,379	73.5	Tasmania ..	4,722	0.7
Victoria ..	83,100	11.9	South Australia ..	1,292	0.2
Queensland ..	65,279	9.4	Northern Territory	345	..

4. **Methods of Gold Mining adopted in Each State.**—Allusion to the methods of gold mining adopted in each State, and the production from the chief centres therein will be found in preceding issues of the Official Year Book, but considerations of space preclude reference to these matters in the present issue.

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 at 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 1924 to 1928. 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, 1924 TO 1928.

Year.	World's Production of Gold.	Gold Produced in Australia.	Percentage of Australia on Total.
	£	£	%
1924 .. ..	89,271,000	3,142,000	3.5
1925 .. ..	81,605,000	2,375,000	2.9
1926 .. ..	82,684,000	2,214,000	2.7
1927 .. ..	82,598,000	2,159,000	2.6
1928 .. ..	83,907,000	1,944,000	2.3

The value of the gold yield in the ten chief producing countries during each of the five years 1924 to 1928 is given in the table hereunder. Particulars of the quantity and value of the gold production for all countries for the ten years 1919–28 will be found in the Bulletin of Australian Production issued by this Bureau.

## GOLD.—PRODUCTION, CHIEF COUNTRIES, 1924 TO 1928.

Country.	1924.	1925.	1926.	1927.	1928.
	£	£	£	£	£
Union of South Africa	44,534,000	40,768,000	42,285,000	42,998,000	43,982,000
United States ..	11,378,000	9,854,000	9,509,000	8,993,000	9,110,000
Canada .. ..	7,095,000	7,373,000	7,451,000	7,870,000	8,031,000
Russia .. ..	4,456,000	4,507,000	4,214,000	4,507,000	5,097,000
Mexico .. ..	3,686,000	3,351,000	3,282,000	3,081,000	2,970,000
Rhodesia .. ..	2,920,000	2,470,000	2,521,000	2,470,000	2,447,000
Australia .. ..	3,142,000	2,375,000	2,214,000	2,159,000	1,944,000
India .. ..	1,843,000	1,673,000	1,631,000	1,632,000	1,597,000
Japan .. ..	1,177,000	1,189,000	1,285,000	1,374,000	1,312,000
Gold Coast ..	957,700	844,000	847,600	723,800	670,400
Colombia .. ..	1,391,000	1,070,000	757,000	681,000	608,000

It has been deemed advisable to apportion values in accordance with Australian currency, i.e., at £4 13s. 0½d. for 1924, and £4 4s. 11½d. for each of the last four years.

The next table shows the average yearly value in order of importance of the yield in the chief gold-producing countries for the decennium 1919–1928.

**GOLD.—AVERAGE ANNUAL PRODUCTION, CHIEF COUNTRIES, 1919 TO 1928.**

Country.	Value.	Country.	Value.
	£		£
Union of South Africa ..	41,948,000	Rhodesia .. ..	2,800,000
United States .. ..	11,112,000	Russia .. ..	2,698,000
Canada .. ..	6,233,000	India .. ..	1,889,000
Mexico .. ..	3,497,000	Japan .. ..	1,294,000
Australia .. ..	3,331,000	Colombia .. ..	1,153,000

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 1924 TO 1928.**

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
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 ..	808	1,967	321	26	4,488	107	26	7,743
1927 ..	670	1,126	304	17	4,056	65	12	6,250
1928 ..	736	655	343	30	3,863	47	12	5,686

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 1928 amounted to 354 ozs., valued at £4,544 as compared with 226 ozs., valued at £3,200 in the preceding year, while the total production recorded to the end of 1928 amounted to 18,800 ozs., valued at £117,370. Experiments were in progress during 1928 to find a method of treating commercially the complex platinoid ores found near Broken Hill.

(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 1928 the yield of osmiridium was returned as 1,627 ozs., valued at £42,458, the quantity raised being about 1,000 ozs. higher than in 1927, the increase being due to enhanced price and a steady market. Prices fluctuated between £26 and £29 per oz.

### § 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 1928 is given hereunder :—

#### SILVER AND LEAD.—PRODUCTION, 1924 TO 1928.

Year.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	Nor. Ter.	Australia.
	£	£	£	£	£	£	£	£
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
1927 ..	3,487,980	304	32,102	143	30,421	222,427	(a) 379	3,773,756
1928 ..	2,492,089	275	3,387	..	10,836	180,517	(a) 22	2,637,126

(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 values recorded in the last three years was due to falling prices. Owing to the low price of lead in 1928 several of the Broken Hill mines ceased production.

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 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, 1924 TO 1928.

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.	£
1924 ..	6,292,978	120,380	43,579	6,472,812	2,963,693	21,513	114,374	1,202,220
1925 ..	7,437,967	139,839	39,991	7,539,130	1,782,193	30,752	75,485	1,871,183
1926 ..	7,338,477	142,654	39,277	6,730,689	2,371,284	23,242	98,167	1,591,673
1927 ..	7,901,861	156,306	42,757	5,955,009	2,339,382	26,709	115,123	1,467,235
1928 ..	7,068,964	151,475	44,004	5,256,649	1,259,931	11,372	94,987	836,620

The figures given above are quoted on the authority of the Mines Department of New South Wales. Accurate details in regard to gold, copper, and antimony contained in the silver-lead ores are not available. Cadmium was first extracted in 1922 at Risdon, in Tasmania, and in 1928 the amount won was given as 20 tons, valued at £4,329. As pointed out previously, credit for this value is not taken in the New South Wales returns.

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.

As pointed out previously, production in 1928 was adversely affected by the prices ruling during the year, especially in regard to lead, and the tonnage of ore raised fell to 1,158,461, almost the entire quantity being sulphide.

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 1928.

Mine.	Value of Output to end of 1928.	Dividends and Bonuses Paid to end of 1928.
	£	£
Broken Hill Proprietary Co. Ltd. . . . .	52,731,564	13,520,862
Broken Hill Proprietary Block 14 Co. Ltd. . . . .	4,661,223	670,160
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. (Centraland Junction Mines)	25,703,860	3,174,375
Broken Hill South Ltd. . . . .	20,244,384	4,635,000
North Broken Hill Ltd. . . . .	15,286,085	4,633,940
Broken Hill Junction Lead Mining Co. . . . .	1,185,058	87,500
Junction North Broken Hill Mine . . . . .	3,505,506	171,431
The Zinc Corporation Ltd. . . . .	7,841,107	2,957,606
Barrier South Ltd. . . . .	151,517	50,000
Totals . . . . .	142,116,291	32,154,654

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 149 millions and 35 millions respectively. The authorized capital of the various companies amounted to £8,823,000.

(b) *Other Areas.* Silver is found in various other localities in New South Wales, but the production therefrom in 1928 was unimportant, with the exception of the Yerranderie area from which a production of 206,000 ozs. was reported.

(ii) *Victoria.* The silver produced in 1928 amounted to 1,454 ozs., valued at £175, and was obtained in the refining of gold at the Melbourne Mint. In addition, 5 tons of silver lead ore, valued at £100, were obtained from a lease at Buchan.

(iii) *Queensland.* Owing to low prices, the yields from the chief silver and lead producing centres in 1928 showed a considerable decline, the total value of the production of both metals being only £3,400, as compared with £148,000 in 1926, and £241,000 in 1925.

(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 1927 was valued at £20, and of silver-lead ore at £123. There was no record of production in 1928.

(v) *Western Australia.* The quantity of silver obtained as a by-product and exported in 1928 was 55,554 ozs., valued at £6,638. In addition, 248 tons of lead and silver-lead ore and concentrates valued at £4,198 were exported. The production of lead ore from the Northampton mineral field amounted in 1928 to 112 tons.

(vi) *Tasmania*. The silver produced in 1928 amounted to 669,326 ozs., valued at £78,901, and the lead to 4,787 tons, valued at £101,616. About 564,000 ozs. of the total silver output were contained in silver lead, while 105,000 ozs. were contained in the blister copper produced by the Mount Lyell Co.

(vii) *Northern Territory*. Silver-lead ores are found near Pine Creek, and at Mount Shoobridge 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. The small production recorded in 1928 was obtained from deposits near Mount Shoobridge.

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, 1924 TO 1928.

Total.	1924.	1925.	1926.	1927.	1928.
World's production in 1,000 fine ozs.	239,107	245,186	253,186	251,232	252,187

The share of Australia in the world's silver production in 1919 was estimated at 7,800,000 ozs., or about 4½ per cent. of 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. of the world's production. For 1928 local extraction was set down as 8,053,000 ozs., and exports as 1,571,000 ozs., the total being equivalent to a little under 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 1928 from the chief silver producing countries were as follows:—

## SILVER.—PRODUCTION, CHIEF COUNTRIES, 1928 (a).

Country.	Production.	Country.	Production.
	Fine ozs. ('000 omitted.)		Fine ozs. ('000 omitted.)
Mexico .. .. .	108,537	Japan .. .. .	5,000
United States .. .. .	56,020	Central America .. .. .	3,000
South America .. .. .	26,750	Dutch East Indies .. .. .	2,200
Canada .. .. .	21,923	Transvaal .. .. .	1,031
Europe .. .. .	(a) 11,750	China .. .. .	150
Australia .. .. .	9,624	Rhodesia .. .. .	140
British India .. .. .	7,404		

(a) Partly estimated.

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, 1924 TO 1928.

Price.	1924.	1925.	1926.	1927.	1928.
Pence per standard oz. ..	33.97	32.09	28.69	26.05	26.74

The average price in cents per fine ounce in New York fell from 66.78 in 1924 to 58.18 in 1928.

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, 1924 TO 1928.**

Year.	N.S.W. (a)	Q'land.	W. Aust.	Tasmania. (a)	Nor. Ter.	Australia.
	No.	No.	No.	No.	No.	No.
1924 .. ..	5,468	759	(b) 141	479	15	(c) 6,874
1925 .. ..	5,770	590	(b) 204	579	4	(d) 7,166
1926 .. ..	5,924	390	(b) 138	523	2	(e) 7,002
1927 .. ..	5,833	277	(b) 51	718	..	(f) 6,882
1928 .. ..	4,666	282	(b) 12	627	..	(g) 5,589

(a) Silver, lead, and zinc. (b) Principally lead and silver-lead ore. (c) Including 12 in South Australia. (d) Including 19 in South Australia. (e) Including 25 in South Australia. (f) Including 2 in Victoria and 1 in South Australia. (g) Including 2 in Victoria.

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 value of the local production as reported and credited to the mineral industry for the years 1924 to 1928 is shown in the following table :—

**COPPER.—PRODUCTION, 1924 TO 1928.**

State.	1924.	1925.	1926.	1927.	1928.
	£	£	£	£	£
New South Wales .. ..	71,658	30,215	22,473	12,655	3,497
Queensland .. ..	380,025	254,074	73,591	218,842	177,043
South Australia .. ..	26,046	35,878	14,681	12,452	13,321
Western Australia .. ..	40,676	18,200	84	101	765
Tasmania .. ..	457,386	436,661	454,854	362,988	444,802
Northern Territory .. ..	(a) 239	(a) 15	(a) 60	..	..
<b>Australia .. ..</b>	<b>976,030</b>	<b>775,043</b>	<b>565,743</b>	<b>607,038</b>	<b>639,428</b>

(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. For the year 1917 the yield was valued at upwards of £814,000, in 1918 it was returned at £697,000, while in 1928 it had declined to under £4,000. About 1,200 tons of copper were obtained at the Port Pirie smelters in the refining of New South Wales silver-lead-zinc ores.

(ii) *Queensland.* The yield in this State amounted in 1928 to 2,787 tons valued at £177,043, 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 1928 were as follows :—Cloncurry, 2,339 tons, £148,526; and Mount Morgan, 430 tons, £27,336.

(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. During the year 1928 increased attention was given to the possibility of making fresh discoveries in the Moonta and Wallaroo copper field. Opened in 1860, this field worked continuously until 1923, and produced copper to the value of £20,000,000. In 1928 the production amounted to 192 tons, valued at £13,321.

(iv) *Western Australia.* The value of the copper exported from this State in 1928 was only £765 as compared with £18,200 in 1925, the small production in 1928 being due to the low price ruling for the metal.

(v) *Tasmania.* The quantity of copper produced in Tasmania during 1928 was 6,421 tons, valued at £444,802, the whole of the production being due to the Mount Lyell Mining and Railway Co. Ltd. This Company treated 33,532 tons of ore and concentrates and produced 6,481 tons of blister copper, containing copper, 6,421 tons; silver, 105,270 ozs.; and gold, 2,025 ozs.; the whole being valued at £465,982.

(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 Borroloola district, but none was recorded in 1927 and 1928.

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, 1924 TO 1928.

Year.				Average London Price per Ton Standard Copper.	Average New York Price in Cents per lb. Electrolytic Copper.
				£.	Cents.
1924	..	..	..	63.15	13.02
1925	..	..	..	61.92	14.04
1926	..	..	..	57.97	13.80
1927	..	..	..	55.65	12.92
1928	..	..	..	63.70	14.57

As evidence of the tremendous 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 June, 1927, it was quoted at £54.03. In 1928 the highest average was £69.34, recorded in December.

4. World's Production of Copper.—The world's production of copper during the five years 1924 to 1928 is estimated to have been as follows. The figures for foreign countries have been taken from the latest issue of *The Mineral Industry* :—

COPPER.—WORLD'S PRODUCTION, 1924 TO 1928.

Year	..	..	..	1924.	1925.	1926.	1927.	1928.
World's production—tons				1,359,300	1,417,000	1,456,000	1,495,400	1,681,300

The yields from the chief copper-producing countries in 1928 were as follows:—

**COPPER.—PRODUCTION, CHIEF COUNTRIES, 1928.**

Country.	Production.	Country.	Production.
	Tons.		Tons.
United States .. ..	834,800	Germany .. ..	23,600
Chile .. ..	285,300	Cuba .. ..	16,800
Africa .. ..	126,000	Jugo-Slavia .. ..	14,800
Canada .. ..	86,300	Australia .. ..	13,800
Japan .. ..	65,000	Norway .. ..	12,900
Mexico .. ..	64,800	Russia .. ..	12,800
Spain and Portugal .. ..	53,000	Bolivia .. ..	6,700
Peru .. ..	51,600	Austria .. ..	3,200

The Australian production in 1928 amounted to under 1 per cent. of the total.

During the years 1926 and 1927 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, and as the figures above show, the share of the United States in the world's total was nearly 50 per cent. in 1928.

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, 1924 TO 1928.**

Year.	N.S.W.	Q'land.	S. Aust.	W. Aust.	Tas.	Nor. Ter.	Australia.
	No.	No.	No.	No.	No.	No.	No.
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
1927 .. ..	29	271	20	9	760	..	1,089
1928 .. ..	3	517	14	10	1,181	..	1,725

**§ 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 table below shows the value of the production as reported to the Mines Departments in each of the States during the five years 1924 to 1928:—

**TIN.—PRODUCTION, 1924 TO 1928.**

State.	1924.	1925.	1926.	1927.	1928.
	£	£	£	£	£
New South Wales .. ..	259,485	250,944	326,474	287,539	231,843
Victoria .. ..	6,056	11,592	5,075	11,454	12,954
Queensland .. ..	175,509	161,500	174,147	193,774	134,727
Western Australia .. ..	12,008	15,392	10,450	13,316	15,002
Tasmania .. ..	275,014	297,515	322,526	317,593	258,676
Northern Territory (a) .. ..	12,855	15,966	15,852	18,754	10,828
Total .. ..	740,927	752,909	854,524	842,430	664,030

(a) Year ending 30th June.

The rise in the price of tin during the first four years covered by the table is reflected in the increased value of production. In 1923, the average London price was £202 3s. per ton, while in 1926 it had advanced to £291 2s. per ton. There was a decline in the average for 1927 to £288 19s. per ton, although in March of that year the price was £313 6s. The sharp decline in values is reflected in the decreased production in 1928.

2. Sources of Production.—(i) *New South Wales*. Although the production for the year 1928 exceeded that for 1927 by 44 tons, nevertheless, as the preceding table shows, the fall in price was responsible for a decline in value of nearly £56,000. A large proportion of the output in New South Wales is obtained by dredging, in the New England district the quantity so won in 1928 being 635 tons, valued at £96,121.

(ii) *Victoria*. The production in 1928 was obtained by dredging, the Cock's Pioneer Gold and Tin Co. in the Beechworth district contributing 61 tons valued at £8,816, while 8 tons were raised from leases at Walwa, and 16 tons at Toora.

(iii) *Queensland*. The chief producing districts in Queensland during 1928 were Herberton, 604 tons, valued at £73,753; Kangaroo Hills, 107 tons, £18,753; Stanthorpe, 188 tons, £27,808; Cooktown, 48 tons, £6,292; and Chillagoe, 66 tons, £7,909. Despite the satisfactory prices realized in 1928, the total production valued at £135,000, was much below that of 1920, when the yield was valued at £252,000.

(iv) *Western Australia*. The export of tin from the State during 1928 amounted to 85 tons, valued at £15,002. The production from the Greenbushes field amounted to 55 tons of black tin, valued at £6,355, and from the Pilbara field 35 tons, valued at £5,171.

(v) *Tasmania*. During 1928 the output of tin amounted to 1,140 tons, valued at £258,676, the principal producers being the Bischoff (North Valley) at Waratah, £51,000; Briseis at Derby £49,000; Pioneer at Bradshaw's Creek £24,000; the Endurance at South Mt. Cameron £23,000; and Storey's Creek at Avoca £18,000.

(vi) *Northern Territory*. The yield of tin concentrates and ore in 1928 amounted to 79 tons, valued at £10,828, of which 49 tons were raised at Marranboy, 19 tons at Mt. Wells, and 3 tons at Hayes Creek, while small quantities were raised at Stray Creek, Collia, and elsewhere.

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:—

## TIN.—WORLD'S PRODUCTION, 1924 TO 1928.

1924.	1925.	1926.	1927.	1928.
Tons. 140,783	Tons. 145,804	Tons. 142,989	Tons. 157,000	Tons. 178,000

The yields from the chief producing countries in 1928 were as follows:—

## TIN.—PRODUCTION, CHIEF COUNTRIES, 1928.

Country.	Production.	Country.	Production.
	Tons.		Tons.
Federated Malay States ..	61,900	Great Britain .. ..	2,800
Bolivia .. ..	41,400	Burma .. ..	2,600
Netherlands East Indies ..	34,900	Unfederated Malay States ..	2,500
Nigeria .. ..	9,000	Indo-China and Japan ..	1,500
Siam .. ..	7,600	Spain and Portugal ..	1,500
China .. ..	6,800	South Africa .. ..	1,200
Australia .. ..	3,100		

Based on the results for the last three years, Australia's share of the world's tin production would appear to be a little under 2 per cent.

4. Prices.—The average price of the metal in the London market for the years 1924 to 1928 was as follows, the figures being taken from *The Mineral Industry*.

## TIN.—PRICES, 1924 TO 1928.

Year.			Average Price per Ton.	Year.			Average Price per Ton.
			£ s. d.				£ s. d.
1924..	..	..	248 17 4	1927	..	..	288 1 5
1925..	..	..	261 1 6	1928	..	..	227 4 8
1926..	..	..	291 2 0				

The increase in production for the last two years was accompanied by a fall in price, and this was accentuated in 1928 when the price dropped from an average of £253 6s. 5d. in January to £212 11s. in July. For the remainder of the year there was an upward tendency, but the price in December was only £227 13s. 11d., and the average for the year £227 4s. 8d. It is stated that production costs have fallen in the chief producing centres, and profitable working is, therefore, possible at a lower return.

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, 1924 TO 1928.

Year.		N.S.W.	Victoria.	Q'land.	W. Aust.	Tas.	Nor. Ter.	Australia.
		No.	No.	No.	No.	No.	No.	No.
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
1927	.. ..	1,430	42	906	106	1,230	95	3,809
1928	.. ..	1,275	118	954	119	1,113	95	3,674

(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 zinblend 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.

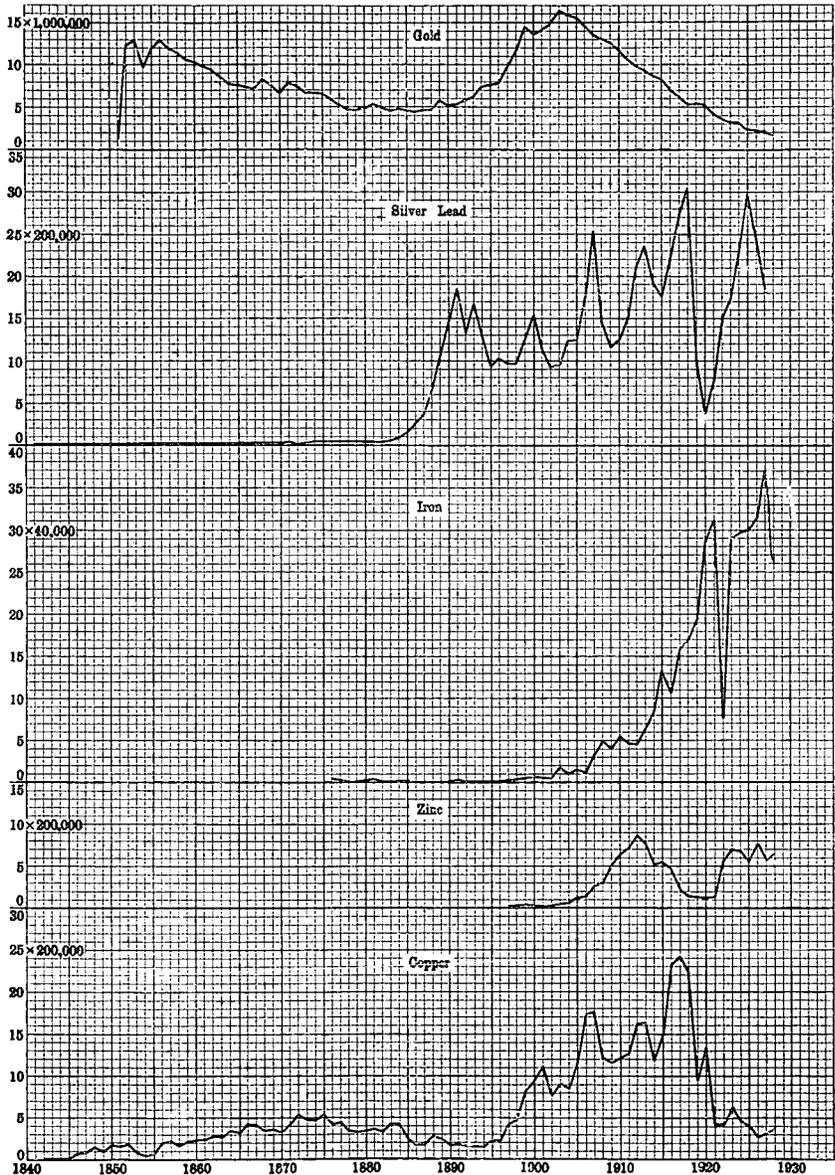
As the metallic contents of the bulk of the concentrates, etc., raised in the Broken Hill district are extracted outside New South Wales, the mineral industry of that State is not credited by the Mines Department with the value of the finished product. During 1928 the zinc concentrates actually exported amounted to 315,000 tons valued at £1,118,000.

(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 1924 to 1928 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, but there was no record of production in 1927 or 1928.

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

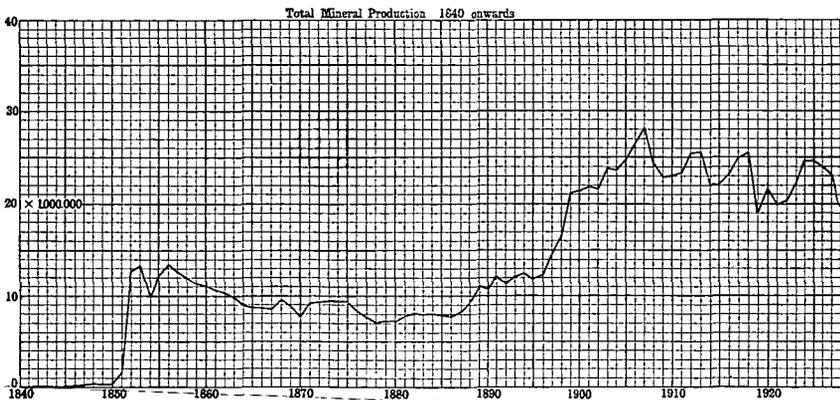
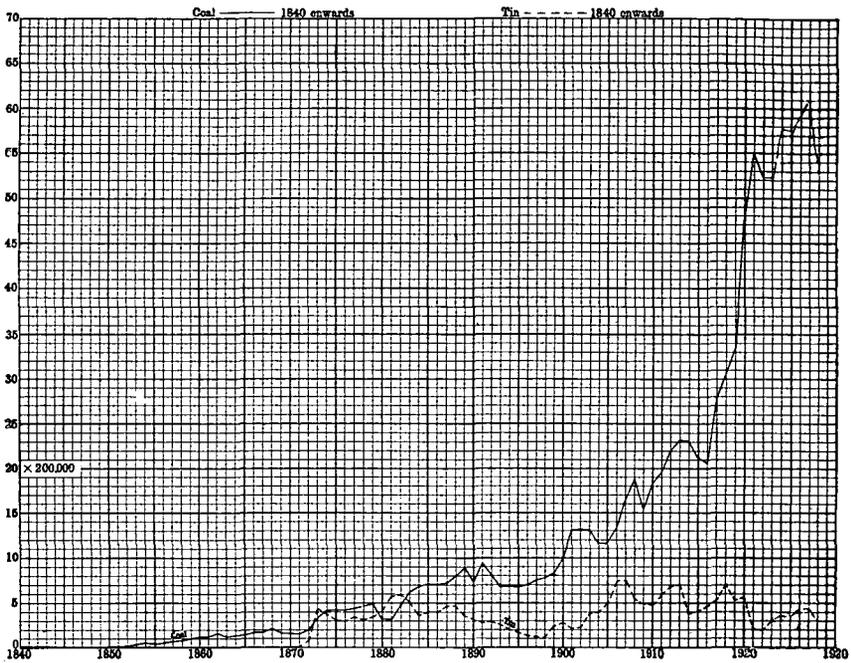
## VALUES OF THE PRINCIPAL MINERALS PRODUCED—AUSTRALIA, 1840 TO 1928.



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 1928—  
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.

(iv) *Tasmania*. During the year 1928 the production from local ores was taken as 7,112 tons, valued at £188,691, the principal producer being the Hercules-Rosebery, worked by the Electrolytic Zinc Co.

The Electrolytic Zinc Co. at Risdon operated 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 1928 consisted of 44,004 tons of zinc valued at £1,199,596, and 152 tons of cadmium, valued at £34,437.

2. *World's Production*.—According to *The Mineral Industry* the world's production of zinc during the five years 1924–28 was as follows:—

ZINC.—WORLD'S PRODUCTION, 1924 TO 1928.

1924.	1925.	1926.	1927.	1928.
Tons. 1,004,600	Tons. 1,130,100	Tons. 1,226,100	Tons. 1,306,900	Tons. 1,407,700

The yields from the chief producing countries in 1928 were as given hereunder.

ZINC.—PRODUCTION, CHIEF COUNTRIES, 1928.

Country.	Production.	Country.	Production.
	Tons.		Tons.
United States .. ..	553,200	Canada .. ..	73,000
Belgium .. ..	206,000	Great Britain .. ..	55,400
Australia .. ..	168,200	Netherlands .. ..	26,500
Poland (a) .. ..	159,400	Japan .. ..	18,700
Germany .. ..	96,600	Spain .. ..	13,300
France .. ..	95,300	Mexico .. ..	11,000

(a) Including Upper Silesia.

The figures for Australia have been taken from returns supplied by the Australian Mines and Metals Association.

3. *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 1923, £33 1s. 2d.; for 1924, £33 14s. 7d.; for 1925, £36 12s. 6d.; for 1926, £34 2s. 1d.; for 1927 and 1928, the average fell to £28 10s. 3d. 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*. The production from local ores only in 1928 amounted to 57,000 tons, valued at £312,000.

These figures do not, of course, represent the total production of pig iron in New South Wales, since 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. For the year ended 30th November, 1929, over 850,000 tons of iron ore were raised at the Iron Knob quarries in South Australia for the Broken Hill Proprietary Company's iron and steel works at Newcastle in New South Wales. 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, and in paper manufacture, the output in New South Wales being drawn chiefly from the deposits in the Port Macquarie, Milton, and Newcastle Divisions. During 1928 the iron oxide raised amounted to 4,658 tons, valued at £2,660.

(ii) *Other States.* Reference to the iron ore deposits in the other States will be found in preceding issues of the Official Year Book (see No. 22, page 779).

3. *Iron and Steel Bounties.*—During the year 1928–29 the bounties paid under the Iron and Steel Bounties Act on articles manufactured from locally produced materials were as follow :—fencing wire, £121,839; galvanized sheets, £102,650; wire-netting, £73,945; traction engines, £7,109.

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, 1926 TO 1928.**

Country.	Fig Iron.			Steel Ingots and Castings.		
	1926.	1927.	1928.	1926.	1927.	1928.
	Thousands of Tons.			Thousands of Tons.		
United States .. .. .	39,373	36,566	38,156	48,294	44,935	51,544
Germany .. .. .	9,491	12,870	11,618	12,147	16,090	14,285
France .. .. .	9,281	9,170	9,928	8,255	8,090	9,238
Saar Territory .. .. .	600	1,740	1,936	360	420	500
Belgium .. .. .	3,315	3,650	3,825	3,150	3,640	3,870
Luxemburg .. .. .	2,518	2,680	2,724	2,208	1,420	2,510
Austria .. .. .	325	428	457	473	551	637
Italy .. .. .	550	520	539	1,685	1,530	1,910
Spain .. .. .	479	583	610	615	700	690
Czecho-Slovakia .. .. .	1,080	1,240	1,400	1,316	1,661	2,100
Poland .. .. .	322	608	662	776	1,223	1,414
Sweden .. .. .	493	447	430	486	480	567
Russia .. .. .	2,160	2,900	3,282	2,863	3,480	4,143
China .. .. .	300	410	400	150	200	300
Japan .. .. .	850	1,200	1,380	1,200	1,550	1,680
United Kingdom .. .. .	2,458	7,294	6,611	3,497	9,170	8,525
India .. .. .	902	910	1,010	450	550	440
Canada .. .. .	815	766	1,083	777	870	1,239
Australia .. .. .	450	410	420	360	420	500
Total—All Countries .. .. .	77,460	84,281	86,760	90,931	98,781	108,109

The figures for Japan include Manchuria and Korea.

### § 9. Other Metallic Minerals.

Detailed information in regard to the occurrence and production of other metallic minerals in each of the States will be found in preceding issues of the Official Year Book, but this information cannot be included in the present issue.

### § 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 1924 to 1928, are given in the table hereunder :—

## COAL.—PRODUCTION, 1924 TO 1928.

Year.	N.S.W.	Victoria. (a)	Q'land.	S. Aust.	W. Aust.	Tasmania.	Australia.
QUANTITY.							
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
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
1927 ..	11,126,114	684,245	1,099,040	..	501,505	112,056	13,522,960
1928 ..	9,448,197	658,323	1,076,340	..	528,420	128,500	11,839,780
VALUE.							
	£	£	£	£	£	£	£
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
1927 ..	9,782,002	762,530	987,465	..	407,967	99,802	12,039,766
1928 ..	8,263,729	731,015	971,690	..	420,145	106,558	10,493,137

(a) Exclusive of brown coal, shown in next table.

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

## BROWN COAL.—PRODUCTION, VICTORIA, 1924 TO 1928.

Year.	Quantity.	Value.	Year.	Quantity.	Value.
	Tons.	£		Tons.	£
1924 .. ..	127,490	41,116	1927 .. ..	1,455,482	220,003
1925 .. ..	876,468	166,404	1928 .. ..	1,591,858	202,393
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 the stretch of country, covering a distance of 15 miles, is now the most important coal-mining district in Australasia.

The table hereunder gives the yields in each of the three districts during the five years 1924 to 1928 :—

## COAL.—PRODUCTION IN DISTRICTS, NEW SOUTH WALES, 1924 TO 1928.

District.	1924.	1925.	1926.	1927.	1928.
	Tons.	Tons.	Tons.	Tons.	Tons.
Northern .. ..	8,077,689	7,637,953	7,257,598	7,145,116	5,978,480
Southern .. ..	1,973,855	2,052,963	2,024,520	2,155,461	1,817,225
Western .. ..	1,566,672	1,705,283	1,603,648	1,825,537	1,652,492
Total .. ..	11,618,216	11,396,199	10,885,766	11,126,114	9,448,197

The output in 1927 has been exceeded on two occasions only *i.e.*, in 1924 and 1925, but the value of the production in 1927, *i.e.*, £9,782,000, is the highest yet recorded. Although the mines and plant are capable of a larger production than in the record year 1924, the output for 1928 was the lowest since 1919. The depression in the coal trade was not peculiar to Australia, but was experienced in many countries.

(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.

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

**BLACK COAL.—PRODUCTION, VICTORIA, 1924 TO 1928.**

Year.	State Coal Mine.	Other Coal Mines.	Total Production.	Value.
	Tons.	Tons.	Tons.	£
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
1927 .. .. .	610,618	73,627	684,245	762,530
1928 .. .. .	600,931	57,392	658,323	731,015

Amongst the other coal mines the chief producers in 1928 were the Sunbeam Colliery at Korumburra, with 25,244 tons; the South Gippsland Coal Mining Co. at Kilcunda, with 14,622 tons; and the Howitt at Outtrim, with 6,433 tons.

(b) *Brown Coal.*—(1) *General.* Some account of the brown coal deposits and of the operations of the State Electricity Commission in connexion therewith will be found in preceding Official Year Books (see No. 22, page 785), but it is not proposed to repeat this information in the present issue. The brown coal produced in Victoria was raised chiefly at the State Open Cut at Yallourn, where the output in 1928 amounted to 1,426,307 tons, while 165,551 tons were raised at the old open cut at Morwell. There was no production from the other areas in 1928.

(2) *Production of Briquettes.* The briquetting plant started operations in November, 1924, and the output for the year 1928-29 was 141,064 tons. It should be noted, however, that the original Yallourn plant is what is known as a "half factory," and economic production necessitates an extension thereof. This work is now proceeding. The Yallourn briquettes are considered to be equal in quality to those produced in the best German factories.

(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 year 1928 was as follows :—

**COAL PRODUCTION.—QUEENSLAND, 1928.**

Districts.	1928.	Districts.	1928.
	Tons.		Tons.
Ipswich .. .. .	583,990	Rockhampton (Central) ..	51,113
Darling Downs .. .. .	98,024	Clermont .. .. .	54,847
Wide Bay and Maryborough	94,031	Bowen .. .. .	161,813
Bundaberg .. .. .	..	Mackay .. .. .	214
Mount Morgan .. .. .	9,088	Mount Mulligan (Chillagoe) ..	23,220
		Total .. .. .	1,076,340

The output in 1928 was about 145,000 tons lower than that for 1926, which was the highest recorded. There were 39 collieries operating in the Ipswich district, 8 in the Darling Downs, 8 in the Maryborough area, 2 in Mount Morgan district, 4 in Clermont district, 2 in Rockhampton district, 1 in Chillagoe district, and 3 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.* So far no coal has been worked in South Australia (see Official Year Book No. 22, page 786).

(v) *Western Australia.* The production from the five collieries operating at Collie amounted in 1928 to 528,420 tons. The output was about 27,000 tons in excess of that for the preceding year, and if the demand warranted it, the yield could be considerably increased. Considerably more than half of the output in 1928 was supplied to the railways. The deposits at Wilga were not worked during the year.

(vi) *Tasmania*. The production in 1928 amounted to 125,000 tons, about 13,000 tons in excess of the total for 1927. Over 58,000 tons of the total output in 1928 were contributed by the Cornwall Colliery; 34,000 tons by the Mt. Nicholas; and 18,000 tons by the Jubilee at St. Marys.

(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 1928 amounted to about 1,430 million tons, towards which Australia contributed about 13½ million tons, or 0.9 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. The comparatively small yield for Great Britain in 1926 was due to the unsettled conditions prevailing in the coal industry during that year.

#### COAL PRODUCTION.—BRITISH EMPIRE, 1926 TO 1928.

Year.	Great Britain.	British India.	Canada.	Australia.	New Zealand.	Union of S. Africa.
BLACK COAL.						
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
1926 .. ..	126,278,500	21,009,200	11,502,500	13,275,000	1,196,400	12,745,500
1927 .. ..	251,232,300	22,082,300	12,145,700	13,523,000	1,290,500	12,381,700
1928 .. ..	237,471,900	22,542,900	12,241,400	11,839,800	1,348,700	12,407,500
BROWN COAL, LIGNITE.						
1926 .. ..	..	..	3,210,100	957,900	1,044,000	..
1927 .. ..	..	..	3,414,000	1,455,500	1,076,200	..
1928 .. ..	640	..	3,432,100	1,591,900	1,088,000	..

#### COAL PRODUCTION.—FOREIGN COUNTRIES, 1926 TO 1928.

Year.	Germany.	Austria.	Hungary.	Belgium.	France. (b)	Czecho-Slovakia.	Jugoslavia.
BLACK COAL.							
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
1926 .. ..	143,001,000	154,800	818,800	24,860,700	50,579,800	13,953,100	187,800
1927 .. ..	151,173,500	172,800	773,400	27,115,800	50,960,800	13,794,800	283,200
1928 .. ..	148,492,900	193,900	770,900	27,107,800	50,554,500	14,330,300	361,900
BROWN COAL, LIGNITE.							
	Poland.	Netherlands.	Russia.	Japan.	China.	United States.	
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	
1926 .. ..	35,182,800	8,471,600	23,119,500	30,930,200	22,000,000	587,325,400	
1927 .. ..	37,482,600	9,175,900	29,335,700	33,001,000	18,000,000	533,802,600	
1928 .. ..	39,974,900	10,747,600	34,657,100	33,325,400	(c)	514,368,600	
BROWN COAL, LIGNITE.							
Year.	Germany.	Austria.	Hungary.	Belgium.	France.	Czecho-Slovakia.	Jugoslavia.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
1926 .. ..	136,952,900	2,911,000	5,730,300	..	1,044,400	18,223,200	3,887,600
1927 .. ..	148,126,800	3,015,700	6,144,800	..	1,050,400	19,310,800	4,385,100
1928 .. ..	163,693,900	3,211,000	6,405,800	..	1,046,900	20,128,400	4,620,300
	Poland.	Netherlands.	Russia.	Japan.	China.	United States.	
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	
1926 .. ..	74,800	207,900	2,256,800	158,600	..	(a)	
1927 .. ..	77,200	198,200	2,590,900	175,800	..	(a)	
1928 .. ..	72,400	193,600	(a)	145,400	..	(a)	

(a) Included with black coal. (b) Exclusive of Saar District, which produced 13,464,800 tons in 1926; 13,391,100 tons in 1927; and 12,899,700 tons in 1928. (c) Not available.

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 1928–29 was 347,000 tons, valued at £429,000, of which 311,608 tons were exported from New South Wales, and 34,723 tons from Queensland.

The total coal exports from New South Wales in 1928 amounted to 3,346,000 tons, valued at £4,041,000.

Of the total exports of coal from New South Wales in 1928, about 86 per cent., or 2,886,000 tons, were shipped from the port of Newcastle. Victoria took 1,129,000 tons, South Australia 711,000 tons, other Australian States 180,000 tons, New Zealand 262,500 tons, while 163,000 tons went to United Kingdom, 50,000 tons to the Philippine Islands, 41,000 tons to Germany, 39,000 tons to Fiji, and 27,000 tons to India. The figures quoted include bunker coal.

During the year 1928 the exports from Port Kembla and Bellambi to other States amounted to 94,600 tons, while 19,000 tons were sent to New Caledonia. The coal shipped from Sydney went principally to New Guinea and the Gilbert and British Solomon Islands. For the twelve months ended 30th June, 1928, about 14,500 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, 1924 TO 1928.**

Year.		Exports to Australian Ports.	Exports to Foreign Ports.	Local Consumption.	Total.
		Tons.	Tons.	Tons.	Tons.
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
1927	.. ..	2,651,492	1,687,716	6,786,906	11,126,114
1928	.. ..	2,209,981	1,135,572	6,102,644	9,448,197

For the period of five years shown in the table above, 25 per cent. of the total output was exported to other States, 16 per cent. was sent overseas, and 59 per cent. was consumed locally. Since 1921 the home consumption has increased from 49 per cent. to 59 per cent. of the total output.

The figures quoted in the table above 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, 1924 TO 1928.**

Year.	Quantity of Coal Consumed.			
	Home Produce.	Produce of Other Countries.	Total.	
	Tons.	Tons.	Tons.	
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
1927	.. ..	13,378,301	23,563	13,401,864
1928	.. ..	12,273,727	17,870	12,291,597

The bunker coal taken away in 1928 was estimated at 846,000 tons. Figures for brown coal produced in Victoria are included in the total for home produce. The whole of the oversea imports in 1928 came from the United Kingdom.

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, 1924 TO 1928.

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>
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
1927 .. ..	19 2	16 8	12 6	17 7
1928 .. ..	19 0	16 6	13 1	17 6

(ii) *Victoria*. In Victoria the average price of coal in 1924 was 21s. ; in 1925, 22s. 4d.; in 1926, 22s. 3d.; in 1927, 22s. 3d.; and in 1928, 22s. 2d. per ton. These averages are exclusive of brown coal, the production of which in 1928 was valued at 2s. 7d. per ton.

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

COAL.—PRICES, QUEENSLAND, 1924 TO 1928.

District.	Value at Pit's Mouth.				
	1924.	1925.	1926.	1927.	1928.
	Per ton. <i>s. d.</i>				
Ipswich .. ..	16 8	16 7	17 2	17 0	16 11
Darling Downs .. ..	18 10	18 8	19 2	19 6	19 5
Wide Bay and Maryborough	24 3	24 3	24 2	23 9	23 8
Bundaberg .. ..	..	..	24 7	23 8	..
Mount Morgan .. ..	..	..	13 11	12 8	12 10
Rockhampton .. ..	15 0	16 1	17 10	22 10	23 3
Clermont .. ..	11 0	12 0	13 6	13 11	14 1
Bowen .. ..	16 5	16 0	16 2	16 3	15 2
Mackay .. ..	..	..	..	29 8	24 4
Mount Mulligan (Chillagoe)	29 6	31 3	30 4	32 0	31 11
Average for State ..	17 8	17 8	18 0	18 0	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 1924, 17s. 3d. ; in 1925, 16s. 7d. ; in 1926, 16s. 7d. ; in 1927, 16s. 3d. ; and in 1928, 15s. 11d. per ton.

(v) *Tasmania*. The average price per ton of coal at the pit's mouth in Tasmania for the five years 1924 to 1928 was :—In 1924, 17s. 6d. ; in 1925, 17s. 3d. ; in 1926, 17s. 8d. ; in 1927, 17s. 10d. ; and in 1928, 16s. 7d. per ton.

7. Prices in the United Kingdom.—During the five years 1924 to 1928 the average selling value of coal at the pit's mouth in the United Kingdom was :—In 1924, 18s. 10d. ; in 1925, 16s. 4d. ; in 1926, 19s. 6d. ; in 1927, 14s. 7d. ; and in 1928, 12s. 10d. 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 1928 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 1924-28 was 1.04, the rates varying between 1.09 in 1927, and 0.98 in 1924, while, as shown in the table following, the rate for Australia for the same period was 1.01. In the United States during the five years 1923-27 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, 2.6; South Africa, 3.4; 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, 1928.

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 ..	21,468	14	103	0.65	4.80	674,900	91,700
Victoria ..	2,224	2	5	0.90	2.25	1,125,100	450,000
Queensland ..	2,676	7	99	2.62	37.00	153,800	10,900
Western Australia ..	798	1	115	1.25	144.11	528,400	4,600
Tasmania ..	356	..	2	..	5.62	..	64,300
Total ..	27,522	24	324	0.87	11.77	559,700	41,500

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 1924-28:—

#### COAL MINING.—FATALITIES, 1924 TO 1928.

State.	Average No. of Coal Miners.	Average No. of Fatal Accidents.	Rate per 1,000 Employed.
New South Wales ..	23,564	23.4	0.99
Victoria ..	2,507	3.0	1.20
Queensland ..	2,838	3.2	1.13
Western Australia ..	717	0.6	0.84
Tasmania ..	317	..	..
Total ..	29,943	30.2	1.01

For Queensland the rate for the quinquennium 1923-27 was 0.78, as against 17.6 for the five years 1921-6, when the figures were swollen by the inclusion in 1921 of the 75 deaths in the disaster at Mount Mulligan.

### § 11. Coke.

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 1928-29 the coke imported amounted to 26,200 tons, of which 23,400 tons were obtained from the United Kingdom and 2,800 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, 1924 TO 1928.

	1924.	1925.	1926.	1927.	1928.
Quantity .. tons	564,372	609,418	597,663	709,342	520,201
Value, total .. £	932,926	942,448	940,416	1,131,335	852,739
Value, per ton ..	33s. 1d.	30s. 11d.	31s. 6d.	31s. 10d.	32s. 9d.

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. As regards both tonnage and value the production in 1927 was the highest recorded.

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.

A small quantity of coke is made in Queensland, the quantity returned in 1928 being 4,058 tons, valued at £6,616. A certain amount is obtained from outside sources, but the import in 1928 was small. The following table shows the amount manufactured locally during the last five years :—

COKE.—PRODUCTION, QUEENSLAND, 1924 TO 1928.

Year.	1924.	1925.	1926.	1927.	1928.
Quantity .. tons	7,116	5,384	6,191	4,196	4,058

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.

Reference to the deposits of oil shale as well as to the efforts put forward in connexion with the search for mineral oil in Australia will be found in Official Year Book No. 22, pages 791 to 793. Tasmania was the sole producer of oil shale in 1928, the quantity raised being about 2,600 tons. So far mineral oil has not been produced in commercial quantities, but hopes are entertained of ultimate success. The Commonwealth Government has provided a bounty to encourage the search for oil and skilled advice in connexion with boring, etc., is given by the Commonwealth Geologist and staff.

### § 13. Other Non-metallic Minerals.

A more or less detailed statement regarding the occurrence and production of other non-metallic minerals is given in preceding Official Year Books (see No. 22, pages 793 to 796), but this information cannot be repeated in the present volume. The tables of quantity and value in § 1 of this Chapter will, however, show the production for each State during the year 1928.

### § 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 1928 in New South Wales was estimated at 28 carats, valued at £60, while the total production to the end of 1928 is given at 202,459 carats, valued at £144,816. The yield in 1928 was obtained principally at Copeton in the Tingha division, the gems being recovered from tail races used in tin mining. There was no production from the other States in 1928.

2. **Sapphires.**—The production of sapphires in New South Wales during 1928 was returned as 1,707 ozs., valued at £2,859, obtained wholly at 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 these were unmarketable. Production in 1928 generally was restricted owing to the unfavourable market.

In Queensland only a few noteworthy gems were found in 1928, the principal being a large blue valued at £60. The total production in 1928 was valued at £4,130.

3. **Precious Opal.**—The estimated value of the opal won in New South Wales during the year 1928 was £11,000, wholly obtained on the Lightning Ridge and Grawin fields. Some very fine stones are at times obtained, one weighing 5 ozs. and valued at £300 being recovered in 1911. Three finds of large stone were made in 1928, the gems weighing 790, 590, and 232 carats respectively, and showing fine fire and lustre. 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 £1,586,000, 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 1928 was estimated at £600, and up to the end of that year at about £184,000. These figures are, however, merely approximations, as large quantities of opal, of which no record is obtained, are disposed of privately.

At the Coober Pedy opal field situated in the Stuart Range in South Australia, the maximum number of miners engaged in 1928 was 90, the estimated value of the production being £11,540. The field is extremely prolific, a large quantity of precious white opal having been raised therefrom, while only a small portion of the known opal-bearing area has been thoroughly 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. In Western Australia 17,564 carats (rough) of emeralds, valued at £910, were produced during 1928 in the Cue district on the Murchison gold-field. Although the stones recovered so far are of low value, it is expected that the quality will improve as the workings deepen.

### § 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 1928 the number so employed was as follows :—

NUMBER OF PERSONS ENGAGED IN MINING, 1928.

State.	Number of Persons engaged in Mining for—						Total.
	Gold.	Silver, Lead, and Zinc.	Copper.	Tin.	Coal.	Other.	
New South Wales ..	736	4,666	3	1,275	21,468	1,711	29,859
Victoria .. .. .	655	2	..	118	2,224	46	3,045
Queensland .. ..	343	282	517	954	2,676	511	5,283
South Australia ..	30	..	14	..	..	549	593
Western Australia ..	3,863	12	10	119	798	51	4,853
Tasmania .. .. .	47	627	1,181	1,113	356	454	3,778
Northern Territory ..	12	..	..	95	..	53	160
Australia .. .. .	5,686	5,589	1,725	3,674	27,522	3,375	47,571

Included in the figures for "other" in South Australia were 187 engaged in mining for iron, 93 gypsum miners, 151 salt gatherers, and 80 opal miners. The Tasmanian figures include 228 osmiridium miners, and those for the Northern Territory 50 mica miners.

NUMBERS ENGAGED, WAGES PAID, AND ACCIDENTS IN MINING. 579

The following table shows the number of persons engaged in mining in Australia during each of the years 1891, 1901, and 1928, together with the proportion of the total population so engaged :—

NUMBER ENGAGED IN MINING PER 100,000 OF POPULATION, 1891, 1901, AND 1928.

State.	1891.		1901.		1928.	
	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	29,859	1,227
Victoria .. ..	24,649	2,151	28,670	2,381	3,045	174
Queensland .. ..	11,627	2,934	13,352	2,664	5,283	580
South Australia .. ..	2,683	834	7,007	1,931	593	103
Western Australia .. ..	1,269	2,496	20,895	11,087	4,853	1,215
Tasmania .. ..	3,988	2,695	6,923	4,017	3,778	1,783
Northern Territory .. ..	..	..	..	..	160	3,803
<b>Australia .. ..</b>	<b>74,820</b>	<b>2,341</b>	<b>113,462</b>	<b>2,992</b>	<b>47,571</b>	<b>757</b>

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, 1928.—The following table gives particulars of the number of men killed and injured in mining accidents during the year 1928 :—

MINING ACCIDENTS, 1928.

Mining for—	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	N.T.	Australia.
<b>KILLED.</b>								
Coal ..	14	2	7	..	1	..	..	24
Copper ..	..	..	..	..	..	1	..	1
Gold ..	..	2	..	..	2	..	..	4
Silver, lead, and zinc ..	8	..	..	..	..	..	..	8
Tin ..	..	..	1	..	..	..	..	1
Other minerals ..	..	..	..	..	1	..	..	1
<b>Total ..</b>	<b>22</b>	<b>4</b>	<b>8</b>	<b>..</b>	<b>4</b>	<b>1</b>	<b>..</b>	<b>39</b>
<b>INJURED.</b>								
Coal ..	103	5	99	..	115	2	..	324
Copper ..	..	..	3	..	..	17	..	20
Gold ..	..	1	2	..	214	..	..	217
Silver, lead, and zinc ..	41	..	4	..	..	4	..	49
Tin ..	2	..	1	..	1	5	..	9
Other minerals ..	..	..	..	30	1	..	..	31
<b>Total ..</b>	<b>146</b>	<b>6</b>	<b>109</b>	<b>30</b>	<b>331</b>	<b>28</b>	<b>..</b>	<b>650</b>

The number killed in mining accidents in 1928 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 Acts* of 1926, 1927, and of 1928.

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. At the 30th June, 1930, the expenditure amounted to £13,031. The States of South Australia and Western Australia had made no claim on the fund at the date specified.

Under the *Petroleum Prospecting Act* 1926–1927 a trust account of £160,000 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. The *Petroleum Prospecting Act* of 1928 provides a further sum of £50,000. The Government has decided to discontinue the granting of subsidies for deep drilling and to confine its attention to assistance in the carrying out of geological surveys and scout boring. A palæontologist has been appointed to give expert advice.

To provide for geophysical prospecting in Australia, a sum of £32,000 has been made available by the Commonwealth Government in conjunction with the Empire Marketing Board.

2. *New South Wales.*—The chief aid given in this State is in the direction of assistance to prospectors. Up to the end of 1928 the total sum expended in this manner amounted to £601,000, of which £13,837 was advanced in 1928. A sum of £500 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 has been made available by the Commonwealth Government under the provisions of the *Precious Metals Prospecting Act* 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 1928 expenditure in connexion with mining development amounted to £27,778, of which £3,723 represented advances to miners, £1,300 aid to mining companies, while £17,263 was expended on boring, £107 on covering abandoned shafts, £2,621 on testing plants, and £2,764 on geological surveys.

4. *Queensland.*—State assistance to the mining industry in 1928–29 amounted to £13,866, of which £9,005 was advanced to prospectors, and £4,302 was expended in connexion with State Coal Mines.

State coal mines are in operation at Bowen, Styx, Baralaba, and Mount Mulligan. There is also a State Assay Office at Cloncurry at which assays and sampling are carried out for the public, and State batteries are maintained at Kidston, Charters Towers, Irvinebank, and Bamford.

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 1928 the total amount of subsidy paid was £68,482, of which £13,569 has been repaid, and £4,549 written off, leaving a debit of over £50,000. 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. The State maintains batteries and cyanide works at Mount Torrens, Peterborough, Tarcoola, and Glenloth, and assays for public purposes are made at the School of Mines.

6. **Western Australia.**—Under the Mining Development Act of 1902 assistance was granted in 1928 in accordance with the subjoined statement:—Advances in aid of mining work and equipment of mines with machinery, £13,591; aid to prospectors, £6,222; subsidies on stone crushed for the public, £24; total, £19,837. In addition to the foregoing the vote was also charged with rebates on water supplied to the amount of £49,231. The industry has been further assisted by Government guarantees to banks on behalf of various companies, and at the end of 1928 the liability in this respect amounted to £51,500.

In 1928 there were 22 State batteries in operation. The amount expended thereon up to the end of 1928 was £91,981 from revenue and £320,584 from loan, giving a total of £412,565. The working expenditure up to the end of 1928 exceeded the revenue by £169,070. The total value of gold and tin recovered to the end of 1928 at the State plants was £6,194,451, resulting from the treatment of 1,474,367 tons of gold ore and 80,935 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.**—Aid to Mining in 1928 amounted to £3,638, of which £2,646 represented assistance and sustenance to prospectors. The amount received from ore sales was £243, the bulk of which was paid to tributers. Receipts amounted to £1,046, included in which was a sum of £837 received from the Renison Bell Co.

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 1927–28 a sum of £171 was expended on State aid to mining, £74 being granted to prospectors for gold, and £97 to prospectors for tin.

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 was revoked on the 13th October, 1927.

### § 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 1924 to 1928 were as follows :—

#### REFINED METALS PRODUCED IN AUSTRALIA, 1924 TO 1928.

Metal.			1924.	1925.	1926.	1927.	1928.
Silver	..	ozs.	7,631,213	8,573,506	8,946,218	9,390,070	8,053,251
Lead, pig	..	tons	126,625	140,129	150,460	164,480	155,076
Zinc	..	tons	46,372	45,698	47,356	49,155	50,223
Copper	..	tons	14,100	10,984	11,148	9,564	11,858
Tin	..	tons	3,167	3,171	3,188	2,989	3,133

The local production of pig iron during the quinquennium 1923-27 ranged between 330,000 tons in 1923, and 517,000 tons in 1927. Complete information for the year 1928 was not available.

2. Metallic Contents of Ores, Concentrates, etc., Exported.—The estimated metallic contents of ores, concentrates, etc., exported during the five years 1924 to 1928 are given in the following table :—

#### METALLIC CONTENTS OF ORES, CONCENTRATES, ETC., EXPORTED, 1924 TO 1928.

Metal.		Contained in—	1924.	1925.	1926.	1927.	1928.		
Silver	ozs.	Lead—Silver—Gold Bullion	158,361	189,223	..	..	..		
		Lead Concentrates and Ores	90,360	850,552	190,647	615,484	117,846		
		Zinc Concentrates and Ores	1,941,507	1,270,166	1,206,313	1,640,891	1,453,396		
		Copper Ores .. ..	51,942	..	..	..	..		
		Total .. ..	2,242,170	2,309,941	1,396,960	2,256,375	1,571,242		
Lead	tons	Lead—Silver—Gold Bullion	1,808	2,751	2,483	488	..		
		Lead Concentrates and Ores	4,852	19,651	7,174	12,115	2,221		
		Zinc Concentrates and Ores	19,859	12,423	13,943	14,198	12,726		
		Total .. ..	26,519	34,825	23,600	26,801	14,947		
		Zinc	tons	Lead Concentrates and Ores	384	366	529	579	77
Zinc Concentrates and Ores	122,305			79,996	94,043	111,755	117,858		
Total .. ..	122,689			80,362	94,572	112,334	117,935		
Copper	tons			Ores, Matte, etc. ..	875	864	1,112	1,597	1,989
				Tin	4	..	1	12	..

## § 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 1928-29 :—

## OVERSEA EXPORTS OF AUSTRALIAN ORES, METALS, ETC., 1928-29.

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.
Copper .. ..	45,239	27,116	9,870	726	7,527	..	..	..
Silver and Silver-lead .. ..	107,705	..	358	95,403	11,944	..	..	..
Iron .. ..	880,024	..	559,740	..	..	24	..	(a) 320,260
Concentrates—								
Silver and Silver-lead	121,680	..	..	89,500	32,180	..	..	..
Zinc .. ..	3,815,263	2,426,978	..	1,099,004	44,825	11,707	..	(b) 232,749
Cadmium—Blocks, Ingots, etc. .. ..	3,557	776	..	220	575	160	..	(c) 1,826
Copper—								
Matte .. ..	74,067	..	..	74,067	..	..	..	..
Ingot .. ..	67,904	42,037	789	15,000	18	..	60	..
Tin—Ingot .. ..	25,634	7,956	13,440	..	12	..	4,211	15
Lead—								
Matte .. ..	39,930	39,930	..	..	..	..	..	..
Pig .. ..	2,852,621	2,032,191	..	616,737	66,104	85,932	18,130	(d) 33,527
Zinc—Bars, Blocks, etc.	652,928	174,151	..	50,004	162,371	265,893	..	509
(e) Platinum, Osmium, etc. .. ..	oz.	oz.	oz.	oz.	oz.	oz.	oz.	oz.
Gold—	693	448	..	..	245	..	..	..
Bar, Dust, etc. .. ..	10,821	533	..	..	14	..	..	(f) 10,274
Silver—								
Bar, Ingot, etc. .. ..	7,741,263	4,277	..	..	312	..	1,262	7,735,412

## VALUE—£.

Ores—								
Copper .. ..	35,356	26,534	5,410	420	2,992	..	..	..
Silver and Silver-lead .. ..	70,605	..	526	64,707	5,372	..	..	..
Iron .. ..	28,880	..	18,070	..	..	1	..	10,809
Concentrates—								
Silver and Silver-lead	89,360	..	..	61,104	28,256	..	..	..
Zinc .. ..	889,881	562,063	..	263,768	7,182	4,212	..	52,666
Cadmium—Blocks, Ingots, etc. .. ..	41,281	9,256	..	2,384	6,412	2,508	..	20,721
Copper—								
Matte .. ..	94,023	..	..	94,023	..	..	..	..
Ingot .. ..	225,029	166,451	1,933	56,315	78	..	257	..
Tin—Ingot .. ..	282,636	87,111	148,351	..	120	..	46,845	269
Lead—								
Matte .. ..	15,820	15,820	..	..	..	..	..	..
Pig .. ..	3,217,570	2,299,470	..	686,784	71,531	100,240	21,763	37,782
Zinc—Bars, Blocks, etc.	913,181	243,108	..	70,000	227,095	372,270	..	708
Platinum, Osmium, etc.	17,688	11,100	..	..	6,588	..	..	..
Gold—								
Bar, Dust, etc. .. ..	42,340	2,275	..	..	59	..	..	40,006
Silver—								
Bar, Ingot, etc. .. ..	608,971	497	..	..	84	..	161	608,279

(a) Netherlands. (b) France. (c) France, 906 cwt.; Sweden, 920 cwt. (d) Hong Kong, 18,891 cwt.; South Africa, 12,221 cwt.; Philippines, 2,329 cwt. (e) Mainly osmium and platinum produced in Tasmania and New South Wales. (f) India.