

CHAPTER XX. 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, the pastoral or the dairying industry, nevertheless it was the discovery of gold in payable quantities that first attracted population to Australia in large numbers and thus accelerated its national development.

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 reference to this matter will be found in preceding issues of the Official Year Book. (See No. 22, p. 755.)

During the years 1934 to 1940, a survey of certain areas in Australia north of the 22nd parallel of south latitude was undertaken by the Governments of the Commonwealth, Queensland and Western Australia. This survey is referred to in § 16 below.

3. **Quantity and Value of Production in 1942.**—The quantities (where available) and the values of certain of the principal minerals produced in each State, and in Australia as a whole, during 1942 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 State 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 § 17 below. 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. The iron and steel produced therefrom cannot be assigned to the mineral industry of New South Wales, but the value of the transformation from ore to metal is credited to the manufacturing industry of that State. Similarly lead, silver lead, cadmium, cobalt 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 principally in South Australia and Tasmania.

The quantities of cadmium and cobalt recovered in Tasmania from zinc ores mined in New South Wales during 1942 are given in § 9 pars. 2 and 3 page 729.

MINERAL PRODUCTION : QUANTITIES, 1942.

Mineral.	Unit.	N.S.W.	Vic.	Q'land.	S. Aust.	W. Aust.	Tas.	N.T.	Australia.
Alunite ..	ton	1,137	..	..	3,571	..	..	..	4,708
Antimony ..	..	443	10	23	..	884	..	..	1,360
Arsenic ..	..	..	..	..	..	2,727	..	..	2,727
Asbestos ..	cwt.	760	..	..	1,260	2,380	140	..	4,540
Barytes ..	ton	2,839	..	..	..	..	..	..	2,839
Bismuth ..	cwt.	4	..	37	..	..	..	4	45
Cadmium ..	ton	(a)	..	..	..	..	41	..	(b) 41
Coal—									
Black ..	ton	12,236,219	312,854	1,637,148	1,650	581,176	134,442	..	14,903,489
Brown ..	..	..	4,933,861	..	..	..	..	..	4,933,861
Copper (Ingot, Matte, etc.) ..	..	3,144	..	6,331	392	47	11,785	..	21,699
Chalk, Talc, Soapstone, etc. ..	..	1,332	..	..	2,536	38	..	..	3,906
Diatomaceous earth ..	..	3,684	414	144	..	..	..	..	4,242
Felspar ..	..	1,446	..	..	1,010	3,252	..	..	5,708
Fireclay ..	..	..	..	..	10,012	798	..	..	10,810
Flint pebbles ..	..	..	..	..	185	..	..	..	185
Glaucinite ..	..	..	..	..	..	260	..	..	260
Gold ..	fine oz.	77,249	101,497	95,117	1,333	848,180	18,353	12,058	1,153,787
Gypsum ..	ton	19,255	8,986	..	57,200	2,878	..	..	88,325
Ironstone ..	..	2,429	22	3,755	2,122,052	150	..	..	2,128,408
Kaolin ..	..	..	6,012	..	1,640	..	1,098	..	8,750
Lead ..	..	(a)	..	33,512	..	..	9,360	..	(b) 42,872
Limestone flux ..	..	323,143	1,058	15,299	70,340	..	168,603	..	578,443
Magnesite ..	..	34,053	13	367	862	25	..	..	35,320

(a) See letterpress preceding this table.

(b) Incomplete.

MINERAL PRODUCTION: QUANTITIES, 1942—continued.

Mineral.	Unit.	N.S.W.	Vic.	Q'land.	S. Aust.	W. Aust.	Tas.	N.T.	Australia.
Manganese Ore ..	ton	780	..	..	9,327	..	..	..	10,107
Molybdenite ..	cwt.	17	60	184	..	..	..	..	261
Ochre and other pigment clays ..	ton	1,692	..	..	..	143	21	1,051	2,907
Osmiridium ..	oz.	..	..	..	..	..	142	..	142
Phosphate ..	ton	116	..	..	13,958	..	..	..	14,074
Platinum ..	oz.	2	..	..	..	..	..	..	2
Salt, crude ..	ton	..	(c)	(c)	174,176	(c)	..	..	(b) 174,176
Shale Oil ..	..	117,324	..	..	..	..	..	..	117,324
Silica ..	..	98,767	..	74	13,635	111	7,308	..	119,895
Silver ..	oz.	(a) 179,038	17,029	3,055,435	3,613	188,421	1,190,061	..	64,633,597
Silver-Lead Ore, etc.	ton	289,198	..	..	..	..	..	..	289,198
Tin and Tin Ore ..	..	1,175	84	746	..	23	1,148	32	3,208
Wolfram ..	cwt.	760	42	3,803	..	4	3,660	3,016	11,285
Zinc and Concentrates ..	ton	273,368	..	21,035	..	..	21,472	..	315,875

(a) See letterpress preceding this table.

(b) Incomplete.

(c) Not available.

The values of the minerals raised in each State in 1942 are given in the following table:—

MINERAL PRODUCTION: VALUES, 1942.

Mineral.	N.S.W. (a)	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas. (a)	N.T.	Australia.
	£	£	£	£	£	£	£	£
Alunite ..	2,060	..	..	11,006	..	..	..	13,066
Antimony ..	14,204	300	644	..	43,089	..	..	58,237
Arsenic ..	..	..	..	..	57,267	..	..	57,267
Asbestos ..	5,070	..	..	943	5,788	20	..	11,821
Barytes ..	4,163	..	..	..	..	..	..	4,163
Bismuth ..	176	..	691	..	..	10	..	877
Cadmium ..	(b)	..	..	..	..	18,462	..	(c) 18,462
Coal—								
Black ..	9,472,363	411,107	1,698,231	1,650	461,495	108,241	..	12,153,087
Brown ..	..	469,699	..	..	..	..	..	469,699
Copper (Ingot, Matte, etc.) ..	277,376	..	625,375	31,715	738	730,675	..	1,665,879
Chalk, Talc, Soapstone, etc. ..	2,730	..	..	8,704	57	..	..	11,491
Diamonds ..	337	..	..	..	..	..	..	337
Diatomaceous earth ..	3,211	1,384	360	..	..	..	..	4,955
Felspar ..	3,624	..	..	2,459	9,734	..	..	15,817
Fireclay ..	..	..	..	6,257	449	..	..	6,706
Flint pebbles ..	..	..	..	1,028	..	..	..	1,028
Gems ..	..	..	1,612	..	..	..	..	1,612
Glauconite ..	..	..	..	..	6,500	..	..	6,500
Gold ..	807,436	1,060,910	994,214	13,930	8,865,806	191,835	126,035	12,060,166
Gypsum ..	10,209	4,932	..	42,905	3,136	..	..	61,182
Ironstone ..	2,289	5	2,677	2,440,360	225	..	..	2,445,556
Kaolin ..	..	6,675	..	2,460	..	1,334	..	10,469
Lead ..	(b)	..	630,977	35,108	..	234,011	..	(c) 900,096
Limestone flux ..	67,305	304	15,974	..	..	63,878	..	147,461
Magnesite ..	75,921	48	275	1,717	100	..	..	78,061
Manganese Ore ..	4,762	..	..	26,776	..	..	..	31,538
Molybdenite ..	294	999	3,059	..	..	..	..	4,352
Ochre and other pigment clays ..	2,855	..	..	..	1,360	53	3,416	7,684
Opal ..	800	..	..	5,976	..	..	..	6,776
Osmiridium ..	..	..	..	..	..	2,930	..	2,930
Phosphate ..	173	..	..	17,511	..	..	..	17,684
Platinum ..	30	..	..	..	..	..	..	30
Salt, crude ..	..	(d)	(d)	348,352	(d)	..	..	(c) 348,352
Shale Oil ..	142,343	..	..	..	..	..	..	142,343
Silica ..	25,099	..	29	7,155	141	3,433	..	35,857
Silver ..	(b) 18,881	2,227	403,573	477	23,916	124,955	..	(c) 574,029
Silver-lead Ore, Concentrates, etc.	4,149,540	..	..	..	..	..	..	4,149,540
Tin and Tin Ore ..	417,210	19,173	150,454	..	4,634	297,919	6,627	896,017
Wolfram ..	11,655	1,059	63,296	6	115	58,397	43,734	178,262
Zinc and Concentrates ..	583,489	..	394,412	..	..	585,116	..	1,563,017
Unenumerated ..	(e) 153,089	2,150	(f) 37,642	6,478	3,012	(g) 72,850	24,554	299,775
Total ..	16,258,694	1,980,972	5,023,495	3,012,973	9,487,562	2,494,119	204,366	38,462,181

(a) For items excluded see letterpress below.

(b) See letterpress preceding this table.

(c) Incomplete.

(d) Not included with mineral production.

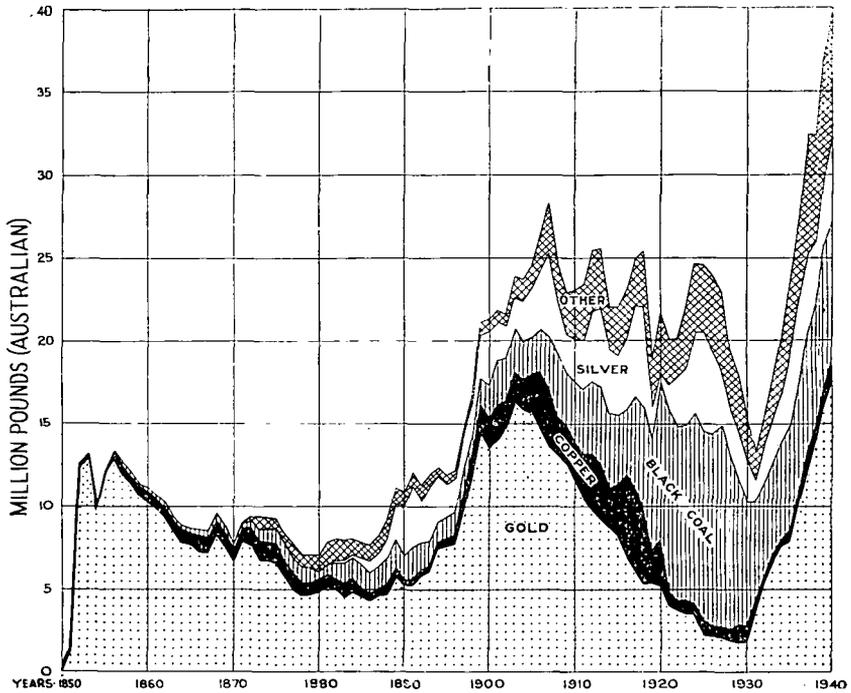
(e) Includes zircon-rutile-ilmenite

(f) Includes scheelite £5,807.

(g) Includes zircon-rutile-ilmenite £31,373.

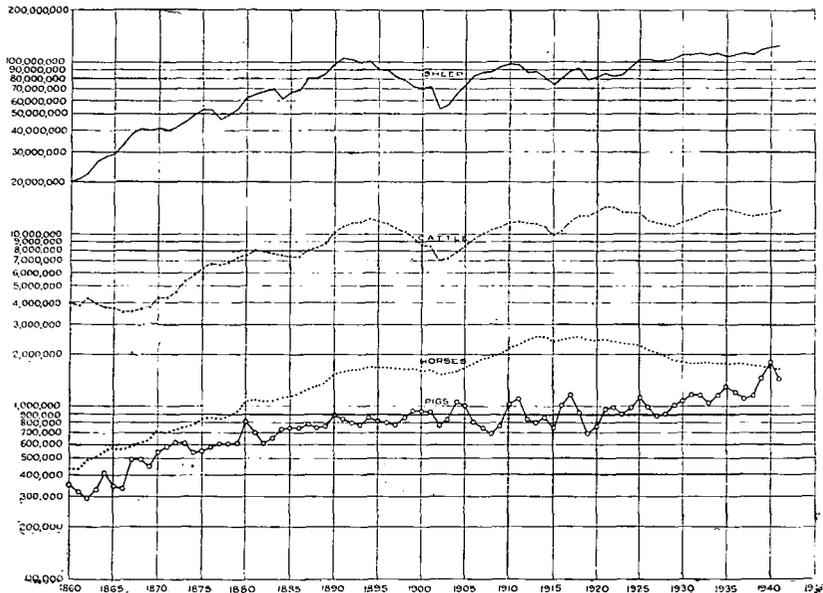
(h) Mica.

VALUE OF PRINCIPAL MINERALS PRODUCED - AUSTRALIA, 1850 TO 1940.



EXPLANATION.—The upper curve represents the total value of mineral production while the vertical distances between the curves represent the value of production of each mineral.

LIVE STOCK—AUSTRALIA, 1850 TO 1941.



(See page 749.)

EXPLANATION.—This is a ratio graph, the vertical scale being logarithmic and the curves rise and fall according to the rate of increase or decrease. Actual numbers are indicated by the scale at the side of the graph.

It should be pointed out in connexion with the figures given in the foregoing table that the totals exclude certain commodities, such as stone for building and industrial uses, sand, gravel, brick and pottery clays, lime, cement and slates, which might be included under the generic term "mineral". Particulars of the production of some of these items are given in par. 6, Quarries, below. Items excluded, such as cement, carbide and sulphuric acid, are included in manufacturing production, and, in any case, only the raw material could properly be included in mineral production. The items excluded from the total for New South Wales in 1942 consisted of—lime, £50,078 building stone, £20,337; Portland cement, £1,011,599; coke, £2,181,623; road material and gravel, £713,040; shell grit, £20,988; sulphur and sulphuric acid, £118,751; and brick and pottery clays, £196,477. Carbide and cement, £395,114, have been excluded from the Tasmanian figures.

4. Value of Production, 1938 to 1942.—The values of the minerals produced in each State during the past five years are given in the table hereunder:—

MINERAL PRODUCTION : VALUES.

Year.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	N.T.	Australia.
	£	£	£	£	£	£	£	£
1938 ..	10,731,391	1,884,015	3,966,119	2,932,473	10,844,469	1,889,804	214,724	32,462,995
1939 ..	12,123,751	2,248,169	4,556,962	3,320,181	12,288,532	2,056,741	244,478	36,838,814
1940 ..	12,791,408	2,596,117	5,105,629	3,218,237	13,230,552	2,749,817	311,024	40,002,784
1941 ..	15,073,833	2,371,568	5,300,600	3,187,093	12,399,351	2,650,271	274,172	41,256,888
1942 ..	16,258,694	1,980,972	5,023,495	3,012,973	9,487,562	2,494,110	204,366	38,162,181

The value of mineral production in Australia during 1942 showed a decided decrease from that for 1941 which was the highest ever recorded. Decreases were recorded in every State except New South Wales which increased by £1,185,000. The greatest decrease was in Western Australia, £2,912,000; followed by Victoria, £390,500; Queensland, £277,000; South Australia, £174,000; Tasmania, £156,000 and Northern Territory, £30,000.

There was a downward movement both in quantity and value for many minerals. The value of gold decreased by nearly £4 million, but was offset by an increase of more than £1.5 million in the value of black coal. The decrease of all mineral production was £2,795,000.

5. Total Production to end of 1942.—In the next table will be found the estimated value of the total mineral production in each State up to the end of 1942. The items excluded from the preceding table are also omitted here, and consequently the total for New South Wales is £58,600,000 less than that published by the State Department of Mines. The principal items excluded from the table below are coke, £28,571,000; cement, £29,096,000; lime, £2,273,000; and considerable values for marble, slate, granite, chert, gravels, etc., which the State Department now includes in the returns for quarries.

MINERAL PRODUCTION : VALUES TO END OF 1942.

Mineral.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	Nor. Terr.	Australia.
	£'000.	£'000.	£'000.	£'000.	£'000.	£'000.	£'000.	£'000.
Gold ..	70,785	315,704	97,200	2,133	260,408	10,556	3,400	760,186
Silver and lead ..	158,100	275	15,099	422	2,515	11,711	67	188,189
Copper ..	16,525	217	29,808	33,331	1,816	27,071	246	109,014
Iron ..	7,757	16	519	31,883	37	97	..	40,309
Tin ..	18,023	1,203	12,993	..	1,670	20,076	685	54,650
Wolfram ..	379	13	1,257	..	2	651	616	2,918
Zinc ..	27,981	..	3,350	16	5	4,492	..	35,844
Coal ..	259,488	20,404	31,300	2	10,721	2,848	..	324,763
Other ..	10,534	1,166	3,127	8,155	1,341	3,203	229	27,755
Total ..	569,572	338,998	194,653	75,942	278,515	80,705	5,243	1,513,628

The "other" minerals in New South Wales include alunite, £221,000; antimony, £402,000; arsenic, £194,000; bismuth, £245,000; chrome, £140,000; diamonds, £149,000; magnesite, £574,000; molybdenite, £228,000; opal, £1,631,000; scheelite, £220,000; and shale oil, £2,991,000. In the Victorian returns antimony ore was responsible for £633,000. The value for coal in this State includes £5,380,000 for brown coal. Included in "other" in the Queensland production were opal, £188,000; gems, £649,000; bismuth, £145,000; cobalt, £158,000; molybdenite, £622,000; limestone flux, £898,000; and arsenic, £124,000. The chief items in South Australian "other" minerals were salt, £5,093,000; limestone flux, £396,000; gypsum, £1,604,000; phosphate, £163,000; and opal, £200,000. In Western Australia arsenic, £540,670; gypsum, £135,000; and asbestos, £122,000 were the principal items included with "other" minerals. In the Tasmanian returns osmiridium was responsible for £650,000, scheelite for £315,500, and limestone flux for £1,225,000.

6. Quarries.—Statistics giving details of the output of quarries were first published in Official Year Book No. 33, 1940. The details were collected following a resolution of the Conference of Australian Statisticians held in 1935.

For the purpose of these statistics the Conference defined a quarry as an establishment in which four hands or more are employed, or in which power other than hand-power is used. The details given in the following table represent the output of quarries conforming to this definition, although in a few relatively unimportant cases details of other establishments have been included.

The authorities responsible for the collection of these statistics are the Government Statistician in New South Wales, Victoria, Queensland and Western Australia, and the Department of Mines in South Australia and Tasmania.

It should be noted that the inclusion of returns from certain small establishments tends to inflate the figures in the following tables, but there is possibly a compensating factor in that some quantities used by shires and municipalities in the repair of roads have not been returned to the collecting authority. Complete details for all States for later years are not available.

OUTPUT OF QUARRIES : AUSTRALIA, 1939.

Description.	N.S.W.	Victoria (a)	Q'land. (a) (b)	S. Aust.	W. Aust. (a)	Tas.	Australia.
QUANTITY.							
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
Building Stone ..	484,356	62,280	1,277	33,314	26,289	246	607,762
Macadam, Ballast, etc. ..	5,377,754	1,395,997	622,373	1,805,181	353,217	..	9,554,522
Limestone (c) ..	863,441	353,726	23,792	7,040	86,540	330,772	1,665,311
Clays ..	1,619,288	(d)	..	216,940	(e)	..	f1,836,228
Other ..	116,215	..	..	..	(e)	..	(f)116,215
Total ..	8,461,054	1,812,003	647,442	2,062,475	(f)466,046	331,018	f13,780,038
VALUE.							
	£	£	£	£	£	£	£
Building Stone ..	177,111	42,182	463	16,577	10,073	885	247,291
Macadam, Ballast, etc. ..	862,539	424,217	166,618	424,420	141,764	..	2,019,558
Limestone (c) ..	174,404	86,489	19,870	1,491	12,830	97,178	392,262
Clays ..	207,294	(d)	..	27,118	36,396	..	(f) 270,808
Other ..	25,579	..	..	..	13,012	..	38,591
Total ..	1,446,927	552,888	186,951	469,606	214,075	98,063	(f)2,968,510

(a) Year ended June, 1940. (b) Estimated. (c) Limestone used as a flux and for the manufacture of lime and cement. It omits quantities used as building stone and as macadam, ballast, etc., which are already included under those headings. (d) Not collected. (e) Not available. (f) Incomplete.

In the following table corresponding details are given for each State for the years 1935 to 1939 :—

OUTPUT OF QUARRIES : AUSTRALIA.

State.	1935.		1936.		1937.		1938.		1939.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	'000 tons.	£	'000 tons.	£	'000 tons.	£	'000 tons.	£	'000 tons.	£
New South Wales	6,142	1,052,989	7,260	1,261,301	8,616	1,662,135	9,402	1,654,887	8,461	1,446,927
Victoria (a) (b) ..	1,609	476,293	1,673	514,984	1,573	474,303	1,621	493,576	1,812	552,888
Queensland (a)(c)	902	168,030	934	255,040	776	242,693	729	213,318	647	186,951
South Aust.	1,005	170,273	1,154	196,957	1,244	226,096	1,765	339,064	2,063	469,606
Western Aust.(a)	164	68,201	272	94,975	367	137,672	500	185,237	(d)466	214,075
Tasmania ..	254	68,357	262	71,243	309	86,986	285	89,655	331	98,063
Total ..	10,076	2,004,143	11,555	2,394,500	12,885	2,830,485	14,305	2,975,737	13,780	2,968,510

(a) Year ended June following. (b) Omits clays. (c) Estimated. (d) Incomplete.

7. Geophysical Methods for Detection of Ore Deposits.—Reference to the application of geophysical survey methods in Australia will be found in Official Year Book No. 24, p. 570.

§ 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.

2. Production at Various Periods.—In the following table will be found the values of the gold raised in the several States and in Australia as a whole during each of the nine decennial periods from 1851 to 1940, and in single years from 1933 to 1942. Owing to the 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 miners who preferred to keep the amount of their wealth secret.

GOLD : VALUE OF PRODUCTION.

Year.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	Nor. Terr.	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	..	80,871,031
1871-80..	8,576,654	40,625,188	10,733,048	579,068	..	700,048	79,022	61,293,028
1881-90..	4,306,541	28,413,792	13,843,081	246,668	178,473	1,514,921	713,345	49,216,821
1891-1900	10,332,120	29,004,152	23,089,359	219,931	22,308,524	2,338,336	906,988	89,999,410
1901-10..	9,569,492	30,136,686	23,412,395	310,080	75,540,415	2,566,170	473,871	142,009,109
1911-20..	4,988,377	13,354,217	9,376,677	238,808	46,808,351	873,302	a 100,652	76,240,384
1921-30..	940,946	2,721,309	1,976,715	47,564	20,462,957	193,833	(b) 11,545	26,354,860
1931-40..	5,115,397	9,444,570	9,118,903	459,330	74,391,204	1,164,492	786,790	100,480,686
1933 ..	226,068	448,228	710,168	49,619	4,915,950	51,579	5,058	6,406,670
1934 ..	307,662	597,040	982,636	58,582	5,534,491	48,139	15,941	7,544,491
1935 ..	439,140	768,401	904,755	64,109	5,677,328	73,143	81,457	8,008,333
1936 ..	525,792	1,018,670	1,048,748	66,593	7,326,309	152,291	65,683	10,204,086
1937 ..	595,855	1,266,507	1,104,760	60,372	8,688,921	176,130	100,462	11,993,007
1938 ..	780,958	1,273,351	1,334,788	46,922	10,285,349	195,579	109,168	14,026,615
1939 ..	848,985	1,533,899	1,428,598	38,895	11,796,085	192,596	163,414	16,002,472
1940 ..	1,068,692	1,924,396	1,351,654	34,892	12,697,219	204,248	238,849	17,519,950
1941 ..	941,244	1,600,016	1,164,621	17,908	11,852,452	212,710	201,599	15,990,550
1942 ..	807,436	1,060,910	994,214	13,930	8,865,806	191,835	126,035	12,060,166
Total—								
1851-1942	70,784,893	315,704,156	97,200,072	2,133,287	260,408,182	10,556,385	3,399,847	760,186,822

(a) Period July, 1911 to June, 1920.

(b) Period July, 1920 to December, 1930.

The values quoted on this page are in Australian currency throughout.

Owing to the exhaustion of the more easily worked deposits and the unprofitableness of gold-mining during the era of high prices following the War of 1914-19, the production of gold in Australia declined from 3,838,029 fine oz. in 1903 to 427,159 fine oz. in 1929, the lowest output since the discovery of the precious metal.

Increased activity in prospecting due to prevailing economic conditions resulted in some improvement in 1930, but the marked development since that year received its impetus from the heavy depreciation of Australian currency in terms of gold. Oversea and local capital were attracted to the industry, and the employment of advanced geological methods and technical improvements brought many difficult or abandoned propositions into profit. The output of gold rose annually from 466,593 fine oz. in 1930 to 1,645,697 fine oz. in 1939, falling slightly to 1,644,000 fine oz. in 1940, but fell considerably in 1941 to 1,496,698 fine oz. and to 1,153,787 fine oz. in 1942.

Due mainly to the price of gold the value in 1940 reached the maximum figure of £17,519,950, exceeding the previous record of £16,294,684 reached in 1903.

Values per fine oz. in Australian currency assigned to the production of gold during recent years in the table above are £7 14s. 3½d. in 1933, £8 10s. 0¼d. in 1934, £8 15s. 1¼d. in 1935, £8 13s. 2d. in 1936, £8 13s. 8d. in 1937, £8 16s. 2½d. in 1938, £9 14s. 5¾d. in 1939, £10 13s. 1¾d. in 1940, £10 13s. 8d. in 1941, and £10 9s. 0¾d. in 1942. Monthly fluctuations in the price of gold in London and in Australia are shown in Chapter XVII. "Public Finance".

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, 1894; and Tasmania, 1899.

The following table shows the quantities of gold raised in the various States and in Australia during each of the five years ended 1942. A separate line is added showing the total production in thousands of fine ounces from 1851 to 1942:—

GOLD : QUANTITY PRODUCED.

Year.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tasmania.	Nor. Terr.	Australia.
	Fine oz.	Fine oz.	Fine oz.	Fine oz.	Fine oz.	Fine oz.	Fine oz.	Fine oz.
1938 ..	88,698	144,243	151,432	5,292	1,167,791	22,200	12,378	1,592,034
1939 ..	87,189	156,522	147,248	3,930	1,214,238	19,984	16,586	1,645,697
1940 ..	100,255	180,567	126,831	3,270	1,191,482	19,171	22,423	1,643,999
1941 ..	88,091	149,769	109,064	1,679	1,109,318	19,908	18,869	1,496,698
1942 ..	77,249	101,497	95,117	1,333	848,180	18,353	12,058	1,153,787
Total(a)— 1851-1942	15,735	72,652	21,359	441	48,737	2,278	651	161,853

(a) '000 omitted.

Preliminary returns of production for 1943 are given in the following table. The figures are subject to minor amendment.

GOLD PRODUCTION : AUSTRALIA, 1943.

Particulars.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	N.T.	Australia.
Quantity .. fine oz.	63,779	56,511	62,838	519	546,475	17,245	3,912	751,279
Value .. £ A'000	666	591	657	5	5,711	180	47	7,851

3. Changes in Relative Positions of States as Gold Producers.—The figures in the table showing the value of gold raised 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 1889, when its output was exceeded by

that of Queensland, Victoria maintained its position as the chief gold producer for a period of forty-seven years, until its production was surpassed by that of Western Australia in 1898. From that year onward the proportion contributed by Western Australia has increased and in 1942 represented 74 per cent. of the entire yield of Australia, the proportion contributed by this State over the period from 1851 to 1942 being 30 per cent. and by Victoria for the same period 45 per cent.

4. *Place of Australia in the World's Gold Production.*—The table given below shows the world's gold production, and the share of Australia therein in decennial periods since 1851 and during each of the last nine years for which returns are available. The figures given in the table have been compiled from the best authoritative sources of information.

GOLD : WORLD'S PRODUCTION.

Period.	World's Production of Gold.		Gold Produced in Australia.	Percentage of Australia on Total.
	Fine oz.		Fine oz.	%
1851-60	61,352,295	24,877,013	40.55	
1861-70	53,675,679	19,038,661	35.47	
1871-80	59,473,314	14,429,599	28.59	
1881-90	51,998,060	11,586,626	22.28	
1891-1900	102,695,748	21,187,661	20.63	
1901-10	182,891,525	33,434,069	18.28	
1911-20	206,114,773	17,426,466	8.45	
1921-30	186,091,278	5,841,902	3.14	
1931	22,786,773	595,123	2.61	
1932	24,204,275	713,882	2.95	
1933	25,568,920	830,332	3.25	
1934	27,032,084	887,490	3.28	
1935	29,434,127	914,736	3.11	
1936	33,167,494	1,178,581	3.55	
1937	34,543,360	1,381,135	4.00	
1938	37,110,594	1,592,034	4.29	
1939	39,524,100	1,645,697	4.16	

In 1939 the world's production of gold in fine oz. was 39,500,000, as compared with a return of 37,100,000 fine oz. in 1938. It is estimated that the world's production in 1940 approximated 40,500,000 fine oz. of which Australia's share amounted to 1,644,000 fine oz. or 4.1 per cent.

The quantities of gold produced in the principal producing countries in each of the five years 1935 to 1939 are given in the table hereunder. Particulars of the quantities and values of gold produced in all countries for the ten years 1930-39 will be found in *Production Bulletin* No. 34, Part II., issued by this Bureau.

GOLD PRODUCTION IN PRINCIPAL COUNTRIES.

Country.	1935.	1936.	1937.	1938.	1939.
	Fine oz.	Fine oz.	Fine oz.	Fine oz.	Fine oz.
Union of South Africa	10,773,991	11,336,214	11,734,575	12,161,392	12,821,507
Canada	3,284,890	3,748,028	4,096,213	4,725,117	5,094,379
U.S.S.R. (Russia) ..	4,500,000	5,500,000	5,000,000	5,000,000	5,000,000
U.S.A.	3,163,166	3,759,645	4,117,078	4,245,368	4,620,567
Australia	914,736	1,178,581	1,381,135	1,592,034	1,645,697
Philippine Islands ..	451,818	599,657	716,967	903,265	990,000
Korea	540,000	650,000	850,000	1,050,000	975,000
Mexico	682,319	753,950	846,381	923,798	944,000
Japan, including					
Formosa	674,030	820,666	832,000	852,000	910,000
Rhodesia	727,928	801,513	808,447	815,191	800,276

The next table shows the average yearly production in the principal gold-producing countries for the decennium 1930 to 1939:—

**GOLD : AVERAGE ANNUAL PRODUCTION IN PRINCIPAL COUNTRIES,
1930 TO 1939.**

Country.	Quantity.	Country.	Quantity.
	Fine oz.		Fine oz.
Union of South Africa ..	11,347,391	Mexico	732,725
U.S.S.R. (Russia) ..	3,663,862	Rhodesia	696,881
Canada	3,471,036	Japan, including Formosa	639,893
U.S.A.	3,145,750	Korea	521,992
Australia	1,020,723	Philippine Islands ..	488,921

5. **Employment in Gold-mining.**—The number of persons engaged in gold-mining in each State at various intervals since 1901 is shown in the following table. The figures include prospectors, etc, so far as they are ascertainable, and include those who may not have worked during the whole of the year.

GOLD-MINING : PERSONS EMPLOYED.

Year.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	Nor. Terr.	Total.
	No.	No.	No.	No.	No.	No.	No.	No.
1901 ..	12,064	27,387	9,438	(a)1,000	19,771	1,112	(a) 200	70,972
1903 (b) ..	11,247	25,208	9,229	(a)1,000	20,716	973	(a) 200	68,573
1913 ..	3,570	11,931	3,123	800	13,445	481	175	33,525
1923 ..	1,141	2,982	603	32	5,555	119	30	10,462
1933 ..	6,913	6,126	4,161	231	9,900	229	95	27,655
1937 ..	3,885	6,180	3,436	192	16,174	179	388	30,434
1938 ..	3,764	6,315	3,378	158	15,374	141	267	29,397
1939 ..	3,441	6,169	3,299	178	15,216	116	421	28,840
1940 ..	2,952	4,783	1,995	157	14,593	123	347	24,950
1941 ..	2,330	2,801	1,630	86	13,106	80	236	20,269
1942 ..	1,571	1,661	1,075	34	8,123	33	(c)	d 12,497

(a) Estimated. (b) Year of maximum production for Australia. (c) Not available.
(d) Excludes Northern Territory.

Owing to causes referred to earlier in this section, the number employed in gold-mining had dwindled to the comparatively small figure of 6,108 in 1929. Stimulated by the enhanced price of gold, employment in the industry rose more than five-fold to 33,113 in 1935, but since then the numbers employed have declined each year to 12,197 in 1942.

6. **Tax on Gold.**—(i) *General.* The Commonwealth Government imposed a tax on gold produced in Australia or in any Territory under its jurisdiction and delivered to the Commonwealth Bank on or after 15th September, 1939. The rate of tax was fixed at 50 per cent. of the price payable by the Bank in excess of £A9 per fine oz. Gold imported from places other than Australian Territories is not subject to the tax, nor is gold coin or wrought gold unless and until the Treasurer otherwise directs by notice in the *Commonwealth Gazette*.

The tax on gold yielded £1,214,621 during 1939-40; £1,452,260 during 1940-41; £1,030,425 in 1941-42; £524,694 in 1942-43; and £317,720 in 1943-44.

(ii) *Development of Gold Mining Industry.* Under the Gold Mining Encouragement Act 1940 a rebate of tax is allowed to bona fide prospectors in respect of the first 25 ounces delivered by them each year, and a refund of the whole or part of the tax is made

to certain producers on low margins. In such cases gold is not taxed if their profits do not exceed 30s. per fine oz. and they only pay tax, but not exceeding the ordinary tax payable, to the extent to which their profits exceed 30s. per fine oz.

Assistance amounting to £150,000 was given to the Gold Mining Industry, through the medium of the States, during 1940-41.

7. **Bounty on Production.**—A reference to the bounty provided by the Commonwealth on gold production in Australia appears in Official Year Book No. 32, p. 579.

§ 3. Platinum and Platinoid Metals.

1. **Platinum.**—(i) *New South Wales.* The deposits at present worked in the State are situated in the Fifield division, near Parkes and in the Ballina division. The production in 1942 from all divisions amounted to 2 oz. valued at £30, as compared with 22 oz. valued at £216 in the preceding year. The total production recorded to the end of 1942 amounted to 20,236 oz., valued at £128,917.

(ii) *Victoria.* In Gippsland the metal has been found in association with copper and 127 oz. were produced in 1913, but there has been 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 gold-field 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 sands 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. There was no production of these metals during 1942.

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

(iii) *Tasmania.* The yield of osmiridium was returned as 142 oz. in 1942 valued at £2,930 compared with the record production in 1925 of 3,365 oz. valued at £103,570. The decrease in later years was largely due to the decline in price from £31 in 1925 to £15 os. 4d. per oz. in 1938 (although the price rose to £24 19s. 1d. per oz. in 1940 and reached £20 12s. 8d. in 1942), but the depletion of the known alluvial deposits was also a factor.

§ 4. Silver, Lead and Zinc.

1. **Occurrence in Each State.**—Particulars regarding the occurrence of silver and associated metals in each State were given in Official Year Books, Nos. 1 to 5.

2. **Production.**—(i) *General.* The values of the production of silver, silver-lead ore and lead from the various States during each of the five years ended 1942 are given in the following table:—

SILVER AND LEAD : VALUE OF PRODUCTION.

Year.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	Nor. Terr.	Australia.
	£	£	£	£	£	£	£	£
1938 ..	3,520,465	647	9:6,614	70	29,477	267,773	..	4,745,046
1939 ..	3,546,440	726	1,010,856	61	32,890	291,980	..	4,882,953
1940 ..	4,454,085	969	1,342,550	391	35,107	500,218	4	6,333,324
1941 ..	4,456,973	2,410	1,324,349	837	37,648	433,643	..	6,255,860
1942 ..	4,168,421	2,227	1,034,550	35,585	23,916	358,966	..	5,623,665

(ii) *New South Wales.* The figures quoted above for New South Wales for 1942 include silver to the value of £18,881 and silver-lead ore and concentrates valued at £4,149,540. Since the Sulphide Corporation Ltd. ceased smelting operations in 1922 the silver (metal) is obtained chiefly in the refining of gold and copper ores, and there has been no production of lead (pig) in the State. It may be noted here that the bulk of the carbonate and siliceous ore from the Broken Hill field is sent for treatment to Port Pirie in South Australia, while the remainder of the ore is concentrated on the field and then dispatched to Port Pirie for refining. The output of silver-lead ores and concentrates for 1942 showed a decrease of 23,218 tons over that of the previous year, and the value declined by more than £300,000.

It must be understood that the totals for New South Wales in the table above 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, as previously mentioned, 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 understated. The next table, however, which indicates the quantities of metals extracted within Australia and the contents by assay of concentrates exported during selected years, will show the estimated total production and the value of the metal contents of all ore mined in New South Wales :—

SILVER AND LEAD : PRODUCTION IN NEW SOUTH WALES.

Year.	Metal Extracted within Australia.				Contents of Concentrates Exported.			
	Silver.	Lead.	Zinc.	Value.	Silver.	Lead.	Zinc.	Value.
	Fine oz.	Ton.	Ton.	£	Fine oz.	Ton.	Ton.	£
1903 ..	6,489,689	92,293	286	1,790,929	1,736,512	29,706	14,625	308,714
1913 ..	5,908,638	106,432	4,121	2,709,867	8,596,251	117,903	184,149	3,759,691
1923 ..	7,233,236	124,570	41,153	5,707,739	4,834,718	40,906	149,319	1,813,287
1933 ..	7,430,479	158,475	53,956	3,579,886	790,792	18,344	63,849	475,161
1938 ..	8,497,637	181,187	47,370	4,438,188	1,060,913	15,213	66,359	479,795
1939 ..	8,910,129	198,776	44,965	4,811,208	674,620	17,636	109,346	650,809
1940 ..	8,266,353	187,705	49,398	6,490,611	311,329	10,111	74,888	538,259
1941 ..	9,192,833	212,665	55,094	7,553,248	164,001	7,775	62,971	451,525
1942 ..	8,640,871	205,630	55,473	7,327,881	464,450	17,144	68,387	753,664

* Further details in regard to zinc are given in § 7 following.

The figures given above are quoted by the Mines Department of New South Wales. Accurate details in regard to gold, copper, antimony, cadmium and cobalt contained in the silver-lead ores are not available. Cadmium was first extracted in 1922 at Risdon, in Tasmania, and in 1942 the amount won from ores of New South Wales origin was given as 121.81 tons, valued at £53,750. As pointed out previously credit for the value is not taken in the New South Wales returns, the value accruing to the State being taken as that of the declared value of the concentrates at the time of their dispatch.

(a) *Broken Hill.* Broken Hill, in New South Wales, is the chief centre of silver production in Australia. A description of the silver-bearing area in this district is given in earlier issues of the Official Year Book. (See No. 4, p. 500.)

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 1939.

Mine.	Value of Output to end of 1939.	Dividends and Bonuses Paid to end of 1939.
	£	£A.
Broken Hill Proprietary Co. Ltd.	54,059,804	17,412,937
Broken Hill Proprietary Block 14 Co. Ltd.	4,750,508	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. (Central and Junction Mines)	30,495,262	4,760,283
Broken Hill South Ltd.	29,192,159	7,855,000
North Broken Hill Ltd.	26,429,365	8,230,190
Broken Hill Junction Lead Mining Co.	1,185,058	87,500
Junction North Broken Hill Mine	3,511,940	171,431
The Zinc Corporation Ltd.	16,209,301	5,026,962
Barrier South Ltd.	151,517	50,000
Total	176,790,901	46,518,243

The returns relating to dividends and bonuses paid exclude £1,744,000, representing the nominal value of shares in Block 14, British, and Block 10 companies, allotted to shareholders of the Broken Hill Proprietary Company. If the output of the companies which were, prior to 1938, 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 £184.1 million and £48.6 million respectively. The authorized capital of the various companies amounted to £18,918,000 in 1939, an increase of £7.5 million on that of 1936 due to the authorized capital of the Broken Hill Proprietary Co. being raised from £7.5 million to £15 million in 1937. In 1939 the dividends and bonuses paid amounted to £1,647,613 shared in by the companies controlling the principal mines as follows :—Zinc Corporation, £184,785 ; North Broken Hill, £280,000 ; Broken Hill South, £320,000 ; Broken Hill Proprietary, £832,828, and Sulphide Corporation, £30,000. The dividend of the latter company is quoted in sterling.

(b) *Other Areas.* Silver is found in various other localities in New South Wales, and production is increasing in importance. Development of the Captain's Flat silver-lead-zinc mine was continued during 1938, and production commenced during 1939. This mine employed 500 men in December, 1939. The initial capacity of the plant was 500 tons per day, increasing to 1,000 tons per day when a relatively small amount of additional equipment is installed. In addition to the production of silver-lead-zinc ores, it is expected that 80,000 tons of iron pyrites will be railed to Port Kembla annually where the sulphur contents will be used for the large-scale manufacture of sulphuric acid and superphosphate. During 1939, 134,794 tons of ore were mined, assaying 6.6 per cent. lead, 11.33 per cent. zinc, 0.72 per cent. copper, 1.34 dwts. gold and 1.33 oz. silver.

(iii) *Victoria.* The silver produced in 1942 amounted to 17,029 oz., valued at £2,227, and was obtained in the refining of gold at the Melbourne Mint.

(iv) *Queensland.* The production of silver in 1942 decreased by 81,079 oz. to about 3.1 million oz., and lead production by 9,761 tons to 33,512 tons, practically all of which was won from the mine and works at Mount Isa in the Cloncurry mineral field.

(v) *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. There was no production

between 1932 and 1935 but subsequently there has been a small output of silver. In 1942 production amounted to 3,613 oz. valued at £477, and in 1943, 352 oz. valued at £49 were produced.

(vi) *Western Australia.* The quantity of silver obtained as a by-product and exported in 1942 was 188,421 fine oz., valued at £23,916.

(vii) *Tasmania.* The silver produced in 1942 amounted to 1,190,061 fine oz., valued at £124,955, and the lead to 9,360 tons, valued at £234,011, being produced in the Western Division of the State. This represents a considerable decrease below that of the previous year as regards quantities and values. About 1,154,000 oz. of the total silver output were contained in silver-lead, while 36,300 oz. were contained in the blister copper produced by the Mount Lyell Co.

(viii) *Northern Territory.* A rich deposit of silver-lead and copper ore was located in 1930 at the Jervois Range about 200 miles east of Alice Springs. Development is hindered, however, by transport difficulties and lack of permanent water. Rich sulphides have been found at Barrow Creek. Production during the past ten years has been very intermittent and not very great in the years when any output was recorded.

3. **Production of Silver in Australia.**—The following table sets out as fully as possible the total production of silver in Australia. It is based on the data published by the Australian Mines and Metals Association and shows the quantities of refined silver recovered by smelters and mints and the estimated metallic contents of ores and concentrates exported :—

SILVER : PRODUCTION IN AUSTRALIA.

Particulars.	1914.	1924.	1934.	1937.	1938.
	Fine oz.	Fine oz.	Fine oz.	Fine oz.	Fine oz.
Metal recovered by—					
Smelters	4,020,904	7,529,845	8,583,133	9,279,983	9,102,178
Mints	226,019	101,368	91,416	230,526	254,961
Metallic contents in ores and concentrates exported ..	8,901,212	2,242,170	2,579,082	4,267,571	4,538,402
Total Production ..	13,148,135	9,873,383	11,253,631	13,778,080	13,895,541

NOTE.—Figures for years later than 1938 are not available.

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.

1935.	1936.	1937.	1938.	1939.
'000 fine oz.				
223,000	249,000	276,000	267,000	258,900

The world's production of silver in millions of fine oz. during 1918, 1928 and 1938 amounted respectively to 203, 253 and 267, of which Australia contributed 10.4 million, 9.6 million and 13.9 million fine oz., or 5.1 per cent., 3.7 per cent. and 5.2 per cent. respectively. The production for Australia includes an estimate of the silver contents of the ores, bullion and concentrates exported.

The estimated yields of the principal silver-producing countries in 1939 were as follows:—

SILVER PRODUCTION IN PRINCIPAL COUNTRIES, 1939.

Country.	Production.	Country.	Production.
	Fine oz. (‘000 omitted.)		Fine oz. (‘000 omitted.)
Mexico	75,869	Bolivia	7,240
United States of America ..	57,808	Burma	(a) 5,920
Canada	23,117	Argentina	3,930
Peru	18,200	Belgian Congo	2,850
Australia	(a) 13,896	Yugoslavia	2,570
Japan	11,000	Newfoundland	1,415
U.S.S.R. (Russia)	7,000	Union of South Africa ..	1,183
Germany	7,000	Chile	1,174

(a) Year 1938.

5. Production of Lead in Australia.—For reasons already mentioned, difficulties arise when an attempt is made to show the production of lead by States. This is due to the fact that production is largely recorded in terms other than metal. As the chief sources of production are New South Wales, Queensland, and Tasmania, the aggregation of their outputs can be accepted as being representative of the production for Australia. This is shown in the following table:—

LEAD : PRODUCTION IN AUSTRALIA.

Year.	New South Wales. (a)	Queensland. (a)	Tasmania.	Total.
	Tons.	Tons.	Tons.	Tons.
1938	196,400	41,196	10,652	248,248
1939	216,412	45,292	11,021	272,725
1940	197,816	48,118	13,551	259,485
1941	220,440	43,273	11,753	275,466
1942	222,774	33,512	9,360	265,646

(a) Estimated lead contents of silver-lead ores.

The following table is compiled from details supplied by the Australian Mines and Metals Association, and are the latest available from that source:—

LEAD : PRODUCTION IN AUSTRALIA.

Particulars.	1934.	1935.	1936.	1937.	1938.
	Tons.	Tons.	Tons.	Tons.	Tons.
Metal recovered in Australia	160,201	181,211	159,504	186,757	182,214
Metallic contents in ores and concentrates exported ..	57,682	48,000	52,534	53,279	57,376
Total Production ..	217,883	229,211	212,038	240,036	239,590

6. Prices of Silver, Lead and Zinc.—In view of the close association in Australia, particularly in New South Wales, of ores containing these metals, the average prices of each metal on the London Metal Exchange during the latest available five years have been incorporated in the table hereunder :—

PRICES OF SILVER, LEAD AND SPELTER.

Metal.	1936.		1937.		1938.		1939.		1940.	
	£	s. d.	£	s. d.	£	s. d.	£	s. d.	£	s. d.
Silver (Standard) per oz.	0	1 8.06	0	1 8.07	0	1 9.06	0	1 10.02	0	1 10.28
Lead .. per ton	17	13 4	23	4 3	15	6 6	15	13 2	25	0 0
Spelter .. "	15	0 9	22	5 9	14	1 7	14	13 3	25	15 0

(a) Maximum price as fixed by the British Ministry of Supply.

At the outbreak of war in September, 1939, the prices of lead and zinc were fixed in London by the Ministry of Supply at £Stg16 12s. 6d. and £Stg15 respectively. On 18th December, 1939, increases to £Stg25 and £Stg25 15s. respectively, were permitted. In Australia prices were fixed on 19th December, 1939, at £A20 17s. 8d. per ton for lead and £A20 2s. 6d. per ton for zinc, and increases to £A22 per ton for each metal were made in February, 1940. No further changes were recorded in either country up to November, 1941.

7. Employment in Silver, Lead and Zinc-mining.—The average number of persons employed in mining for these metals during each of the last five years is given below :—

SILVER, LEAD AND ZINC-MINING : PERSONS EMPLOYED.

Year.	N.S.W.	Q'land.	S. Aust.	W. Aust.	Tasmania.	Nor. Terr.	Australia.
	No.	No.	No.	No.	No.	No.	No.
1938 ..	5,612	530	..	4	421	3	6,570
1939 ..	5,137	550	5	2	401	..	6,095
1940 ..	4,904	493	6	..	367	..	5,770
1941 ..	4,419	461	2	..	554	..	5,436
1942 ..	4,104	471	..	..	509	..	5,084

§ 5. Copper.

1. Production.—Copper is widely distributed throughout Australia, but the chief sources of production are now centred in Tasmania and Queensland. South Australia and New South Wales were once large producers of copper but the output has decreased considerably in those States during recent years. The quantity of copper raised in Australia has been dependent largely upon prices.

The values of the local production as reported and credited to the mineral industry for the years 1938 to 1942 are shown hereunder. Quantities for Australia as a whole as returned by the several State Mines Departments are appended on separate lines at the foot of the table:—

COPPER : PRODUCTION.

State.	1938.	1939.	1940.	1941.	1942.
	£	£	£	£	£
New South Wales	87,905	105,407	103,701	117,490	277,376
Queensland	203,967	289,927	428,263	620,996	625,375
South Australia	15,333	6,612	21,083	41,390	31,715
Western Australia	1,275	1,373	873	154	738
Tasmania	580,238	668,561	717,464	721,985	730,675
Northern Territory	4,362	2,248	1,072	3,185	..
Australia	893,080	1,074,128	1,272,456	1,505,200	1,665,879
	Tons.	Tons.	Tons.	Tons.	Tons.
Ingot, Matte, etc.	18,751	} 21,408	} 20,354	} 21,787	} 21,699
Ore and Concentrates	935				

2. Sources of Production.—(i) *New South Wales.* The production during 1942 amounted to 2,319 tons from copper matte and 825 tons from copper concentrates. All the copper was obtained at Port Kembla from the treatment of copper matte forwarded by the Broken Hill Associated Smelters Pty. Ltd. at Port Pirie. The concentrates were obtained from various centres in New South Wales. Since 1919 the production in New South Wales has rarely exceeded 1,000 tons, whilst previously it had ranged from 2,500 tons in 1915 to 10,600 tons in 1911.

(ii) *Queensland.* In 1942, the yield in this State amounted to 6,331 tons valued at £625,375. Although an improvement on the yields of recent years the output for 1942 was very much less than that of 1920 when nearly 16,000 tons valued at £1,552,000 were raised. The falling-off was due primarily to the low prices realized for copper. The returns from the chief producing areas in 1942 were as follows:—Cloncurry, 1,283 tons, £127,850; Herberton, 273 tons, £26,693; and Mount Morgan, 4,309 tons, £424,075.

(iii) *South Australia.* Deposits of copper are found over a large portion of South Australia and its total production easily exceeds that of any other State. Compared with the output of previous years the production of South Australia has decreased during recent times, and is now exceeded by that of Tasmania, Queensland and New South Wales. A short account of the discovery, etc., of some of the principal mining areas, such as Kapunda, Burra Burra, Wallaroo and Moonta, is given in earlier issues of the Official Year Book. The Moonta and Wallaroo copper field, which was opened in 1860, was worked continuously, and up to the close of 1931, £20,500,000 of copper was produced. Between 1933 and 1938, the field was worked on a co-operative basis known as the Moonta Mining Scheme, to which reference is made in previous issues of the Official Year Book. Owing to the exhaustion of the ore reserves the operations of the Scheme ceased in August, 1938. However, owing to the exploitation of new boreholes, the output has increased and the production of copper in the State in 1942 amounted to 392 tons, valued at £31,715.

(iv) *Western Australia.* During 1942, the quantity of copper reported was 47 tons valued at £738 compared with 6 tons for £154 in 1941.

(v) *Tasmania.* The quantity of copper produced in Tasmania during 1942 was 11,785 tons, valued at £730,675, the Mount Lyell Mining and Railway Co. Ltd. accounting for the whole of the production. This company treated 55,949 tons of ore and concentrates and produced blister copper, containing copper 11,256 tons, silver 36,299 oz., and gold 7,252 oz., the whole being valued at £A1,137,930.

(vi) *Northern Territory.* Copper has been found at various places, but the development of these deposits is hindered by low prices and the difficulties of transport. For the eighteen months ended December, 1936, 204 tons of ore were raised, being the first production recorded since 1932-33. Production in 1939 amounted to 96 tons valued at £2,248; in 1940, 64 tons, £1,072; and in 1941, 300 tons, £3,185. No production was recorded in 1942.

3. *World's Production of Copper.*—The world's production of copper during the five years 1935 to 1939 was estimated as follows. The figures have been taken from the statistical summary prepared by the Imperial Institute or from other authoritative sources.

COPPER : WORLD'S PRODUCTION.

1935.	1936.	1937.	1938.	1939.
Tons. 1,470,000	Tons. 1,700,000	Tons. 2,300,000	Tons. 2,020,000	Tons. 2,160,000

The yields from the principal copper-producing countries in 1939 were as follows:—

COPPER : PRODUCTION IN PRINCIPAL COUNTRIES, 1939.

Country.	Production.	Country.	Production.
	Tons.		Tons.
United States of America ..	661,000	Mexico	49,000
Chile	339,000	Yugoslavia	42,000
Canada	281,000	Peru	35,000
Rhodesia	216,000	Cyprus	24,000
Belgian Congo	122,000	Germany	30,000
U.S.S.R. (Russia)	107,000	Spain	25,000
Japan	77,000	Australia	21,408

During 1938 the share of the United States of America in the world's copper production amounted to nearly one-fourth and in 1939 to 31 per cent. The Australian proportion in 1939 was less than 1 per cent.

4. *Prices.*—The marked fluctuation in the price of copper is shown in the following table of average prices quoted in London and New York. The New York figures are given on the authority of the "Statistical Abstract of the United States, 1942," and "Survey of Current Business".

COPPER PRICES : LONDON AND NEW YORK.

Year.	Average London Price per Ton Standard Copper.	Average New York Price per lb. Electrolytic Copper.
	£ s. d.	Cents.
1935	31 18 1	8.65
1936	38 9 7	9.47
1937	54 10 7	13.17
1938	40 15 0	10.00
1939	43 16 4	10.97
1940	62 0 0	11.30
1941	62 0 0	11.80
1942	62 0 0	11.78

At the outbreak of war in September, 1939, the price of copper in London was fixed at £Stg51 per ton. This was subsequently increased on 18th December, 1939, to £Stg62 per ton, at which price it still remained in May, 1942.

In Australia the price was fixed at £A63 17s. 6d. per ton on 19th December, 1939, and further increased to £A76 per ton on 16th February, 1940, and to £A78 10s. per ton on 7th February, 1941. On the latter date supplies of local and imported copper were pooled and sold to consumers at the increased price to offset the loss on copper imported at a higher figure. The price paid to local producers, however, remained at £A76 per ton. Increased mining costs made a further rise necessary and the price was raised on 5th May, 1941, to £A86 10s. from which an amount of £A1 10s. is set aside to provide a bonus of £A5 per ton on production from new sources or on increased supplies from existing sources. On 28th May, 1942, the price was raised to £105 per ton in an effort to increase Australian production and from this amount a bonus of £A5 per ton is provided for all output which is in excess of the normal.

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.

Year.	N.S.W.	Q'land.	S. Aust.	W. Aust.	Tas.	Nor. Terr.	Australia.
	No.	No.	No.	No.	No.	No.	No.
1938	13	213	67	4	1,015	5	1,317
1939	5	224	36	4	1,017	5	1,291
1940	9	222	45	2	997	5	1,280
1941	20	271	44	2	924	5	1,266
1942	79	419	52	5	1,595	(a)	(b)2,150

(a) Not available.

(b) Excludes Northern Territory.

In 1917 over 9,000 persons were engaged in copper-mining.

§ 6. Tin.

1. **Production.**—The values of the production of tin as reported to the Mines Departments in each of the States during the five years 1938 to 1942 are given in the following table. A separate line is appended showing the recorded tonnage for Australia during each of the specified years.

TIN : PRODUCTION.

State.	1938.	1939.	1940.	1941.	1942.
	£	£	£	£	£
New South Wales	286,768	366,138	373,435	443,123	417,210
Victoria	28,650	47,233	32,253	19,569	19,173
Queensland	141,547	200,652	223,626	204,232	150,454
Western Australia	7,421	3,871	5,174	1,874	4,634
Tasmania	244,037	282,798	367,127	328,340	297,919
Northern Territory	3,205	4,487	4,533	4,041	6,627
Total	711,628	905,179	1,006,148	1,001,179	896,017
	Tons.	Tons.	Tons.	Tons.	Tons.
Ingot, Matte, etc.	3,446	3,831	} 4,665	3,867	3,208
Concentrates	286	252			

2. **Sources of Production.**—(i) *New South Wales.* Production of tin in 1942 was stated at 1,175 tons of ingots, and 3.3 tons of concentrates were exported overseas. A large proportion of the output in this State is obtained in normal years by dredging, principally in the New England district, 178 tons of stream tin being won in 1942. The Kikoiria area was the principal contributor to the output in 1942, the yield from this district comprising 709 tons of concentrates. Amongst other areas, Tingha produced 441 tons and Torington 113 tons.

(ii) *Victoria.* The production of tin in this State is obtained chiefly by dredging in the Beechworth district and by mining in the Toora district in Gippsland. The production in 1942 amounted to 84 tons of concentrates valued at £19,173 compared with 90 tons valued at £19,663 in 1941.

(iii) *Queensland.* The chief producing districts in Queensland during 1942 were Herberton, 396 tons, valued at £73,528; Cooktown, 61 tons, £13,686; Stanthorpe, 145 tons, £33,810; Chillagoe, 48 tons, £9,602 and Kangaroo Hills, 65 tons, £13,137. The total production, 746 tons, £150,454, was a decrease of 339 tons and £73,778 on that for 1937. These figures may be compared with those recorded in the early years of this century when the production ranged between 2,000 and 5,000 tons per annum.

(iv) *Western Australia.* The quantity of tin reported in this State in 1942 amounted to 23 tons, valued at £4,634, and was obtained in the Pilbara and Greenbushes fields.

(v) *Tasmania.* For 1942, the output amounted to 1,148 tons of tin, valued at £297,919, a decrease of 108 tons and £30,421 over the return for the previous year. The production of tin in this State has substantially increased since 1934 when 953 tons were produced. The mines associated with the production of tin are well equipped and the prospects of greater activity are very favourable.

(vi) *Northern Territory.* The production for 1942 amounted to 32 tons of concentrates valued at £6,627, compared with 22 tons of concentrates valued at £4,041 produced during 1941.

3. **World's Production.**—The world's production of tin during each of the last five years was as follows:—

TIN : WORLD'S PRODUCTION.

1935.	1936.	1937.	1938.	1939.
Tons.	Tons.	Tons.	Tons.	Tons.
136,000	179,000	206,000	157,000	183,000

The production of tin reached its maximum in 1937 when 206,000 tons were recorded. The chief producing countries of the world are:—Malaya, Netherlands East Indies, Bolivia and Thailand. These countries produced about three-quarters of the total production in 1939. The agreement controlling the production and export of tin was extended to 1941. The parties to this agreement are those countries already mentioned together with Nigeria, Congo and Indo-China. Production in Australia was not affected.

The yields from the principal producing countries in 1939 were as follows :—

TIN : PRODUCTION IN PRINCIPAL COUNTRIES, 1939.

Country.	Production.	Country.	Production.
	Tons.		Tons.
Malaya	55,950	Burma.. .. .	5,750
Netherlands East Indies	31,281	Australia	(a) 3,732
Bolivia	27,215	Argentina	2,481
Thailand	16,998	United Kingdom	1,800
China	10,859	Japan	1,700
Nigeria	10,855	Indo-China	1,392
Belgian Congo	9,663	Portugal	1,005

(a) Year 1938.

Australia's share of the world's tin production, estimated at 157,000 tons in 1938, would appear to be a little more than 2 per cent.

4. **Prices.**—The average prices of the metal in the London market for the years 1937 to 1942 were as follows :—

TIN PRICES : LONDON.

Year.	Average Price Per Ton.	Year.	Average Price Per Ton.
	£ s. d.		£ s. d.
1937	242 6 7	1940	256 12 3
1938	189 12 1	1941	261 8 0
1939	226 5 6	1942	259 10 0

The average price of tin rose to £242 per ton in 1937 compared with £118 in 1931. In 1938 the price receded to £189 per ton but rose to £261 per ton in 1941, falling slightly to £259 per ton in 1942.

Subsequent to the outbreak of war in September, 1939, the price of tin in London was controlled and fixed at £Stg230 per ton. In December, 1939, the price was unpegged and immediately rose to £Stg271. In Australia the domestic price was raised to £A306 per ton in February, 1940, and to £A320 per ton in April, 1941. It was increased to £A371 per ton in May, 1942, in order to stimulate production, and this price includes a margin of £10 per ton which will be pooled to stimulate development of less profitable areas.

5. **Employment in Tin-mining.**—The number of persons employed in tin-mining during the last five years was as follows :—

TIN-MINING : PERSONS EMPLOYED.

Year.	N.S.W.	Victoria. (a)	Q'land.	W. Aust.	Tas.	Nor. Terr.	Australia.
	No.	No.	No.	No.	No.	No.	No.
1938	1,440	5	1,263	73	1,123	15	3,919
1939	1,566	5	1,375	50	1,100	17	4,113
1940	1,686	5	1,037	39	1,094	40	3,901
1941	1,616	3	985	18	904	45	3,571
1942	1,243	3	589	15	801	(b)	(c) 2,653

(a) The tin produced in Victoria was raised by a dredging company operating primarily for gold.
(b) Not available. (c) Includes two miners in South Australia, but excludes Northern Territory.

§ 7. Zinc.

1. **Production : States.**—(i) *New South Wales.* (a) *Values Assigned.* The production of zinciferous concentrates is confined chiefly to the Broken Hill district of New South Wales, where zincblende 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 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., produced 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 1942 the zinc concentrates produced amounted to 273,368 tons, valued at £583,489. Portion of the zinc concentrates produced is treated at Risdon in Tasmania. The production from these concentrates in 1942 as recorded by the Electrolytic Zinc Company of Australia Ltd. at Risdon amounted to 55,473 tons of zinc, 121.81 tons of cadmium and 16.27 tons of cobalt oxide. This is referred to in the Tasmanian production below. The balance, which in 1942, amounted to 132,025 tons, was exported overseas.

The reopening in 1937 of the mine at Captain's Flat by the Lake George Mines Ltd. was an important development. Production commenced in 1939. Approximately 500 men are employed at the mine. In 1942 32,466 tons of zinc concentrates were produced assaying 54.62 per cent. zinc.

(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 1934 to 1938 will be found in § 17 hereinafter.

(ii) *Queensland.* The production of zinc in the Cloncurry district of Queensland during 1942 was 21,035 tons, valued at £394,412, compared with 27,437 tons valued at £514,437 in 1941 and 4,411 tons valued at £68,863, obtained in 1935. The metal was produced by the Mount Isa Mines Ltd. and is exported overseas as concentrates.

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

(iv) *Tasmania.* The production of zinc from Tasmanian ores was suspended from 1931 to 1935. Developmental work on the Mount Read-Rosebery district was continued during that period and production commenced in 1936. In 1937—the first full year's operations since the inception of milling at Rosebery—23,481 tons, valued at £525,824, were obtained. In 1942, 21,472 tons of zinc, valued at £585,116, were obtained from Tasmanian ores, as well as 41 tons of cadmium valued at £18,462 and 2.25 tons of cobalt oxide valued at £1,497.

In addition to the above, the Electrolytic Zinc Company at Risdon operated on raw materials obtained from Broken Hill in New South Wales. Production from this source during 1942 amounted to 55,473 tons of slab zinc, valued at £1,275,879, 121.81 tons of cadmium, valued at £53,750, and 16.25 tons of sheet cobalt oxide, valued at £7,484.

2. **Production : Australia.**—The details furnished above do not adequately convey the potentialities of Australia as a producer of zinc. This is due to the omission of the metallic contents of ores and concentrates exported overseas, which, in recent years, have been in excess of the amount of metal actually recovered in Australia. In the following table the estimated metallic contents of these exports have been combined with the quantities of metal extracted in Australia to show the total production of zinc from ores mined in Australia. The figures do not include the contents of other zinc-bearing concentrates, e.g., lead concentrates, unless payment has been made for the zinc actually contained in them.

PRODUCTION OF ZINC : AUSTRALIA, 1942.

State of Extraction or Export.	Estimated Metallic Contents and Metal extracted from Ores and Concentrates the Produce of—			
	New South Wales.	Queensland.	Tasmania.	Total.
	Tons.	Tons.	Tons.	Tons.
New South Wales	(a) 69,313	..	..	(a) 69,313
Queensland .. ..	..	21,035	..	21,035
Tasmania	55,473	..	18,809	74,282
Total	124,786	21,035	18,809	164,630

(a) Metallic contents of 132,025 tons of concentrates exported overseas (estimated).

3. **World's Production.**—The world's production of zinc ore in terms of metal during the five years 1934 to 1938 was as follows :—

ZINC : WORLD'S PRODUCTION.

1934.	1935.	1936.	1937.	1938.
Tons. 1,162,000	Tons. 1,540,000	Tons. 1,700,000	Tons. 1,860,000	Tons. 1,840,000

The yields from the principal producing countries in 1938 are given hereunder, the figures referring to slab zinc produced in the various countries, irrespective of the source of the ore :—

ZINC : PRODUCTION IN PRINCIPAL COUNTRIES, 1938.

Country.	Production.	Country.	Production.
	Tons.		Tons.
United States of America ..	398,500	United Kingdom	55,000
Belgium	207,000	Japan	50,000
Germany	191,300	Norway	45,000
Canada	153,500	Mexico	33,100
Poland	106,400	Italy	36,900
Australia	72,736	Netherlands	24,900
U.S.S.R. (Russia)	70,000	Rhodesia	10,200
France	60,000	Czechoslovakia	8,700

The production of Australia quoted above represents the actual quantity of metal extracted in Australia and omits, therefore, the zinc contents of ores and concentrates exported. If this quantity was included, the total production would amount to 162,830 tons, or about 9 per cent. of the world's output.

4. **Prices and Employment.**—Information regarding prices of zinc and employment in zinc-mining will be found on page 718.

§ 8. Iron.

1. **General.**—Although iron ore is widely distributed throughout Australia, the only known ore bodies of large extent, high grade and easy access are those situated at Yampi Sound, Western Australia, and at Iron Knob, South Australia. Estimates of the reserves at these centres place the quantities available at approximately 100 million tons and 150 million tons respectively. Bearing in mind the expansion of the iron industry in Australia, and the limitations of these reserves, the Commonwealth Government prohibited the export of iron ore from 1st July, 1938. A survey of the iron ore resources of Australia undertaken by the Commonwealth Geologist was completed at the end of 1940.

2. **Production.**—(i) *New South Wales.* The production of pig-iron from ores mined in New South Wales amounted to 4,580 tons in 1935, valued at £18,320. No iron ores had been produced since 1935 until the year 1941 when 202,180 tons were mined producing 63,102 tons of pig-iron. In 1942 an increase to 375,297 tons of ore and 182,118 tons of pig-iron were recorded. For many years the chief source of supply has been South Australia.

Small quantities of iron oxide produced in New South Wales are used by the various gas-works for purifying gas, and also in the manufacture of paper, and for pigments. These supplies are drawn chiefly from the deposits in the Port Macquarie Division. During 1942 the iron oxide raised amounted to 2,274 tons, valued at £1,933. Ironstone flux amounting to 2,432 tons valued at £950 was raised in the Goulburn Division during 1933. This is the only production recorded since 1922.

(ii) *Queensland.* Extensive deposits of iron ore are known to exist in Queensland. Their location and size, however, preclude their exploitation in comparison with the more favourable deposits of South Australia. In 1942, 3,755 tons of ore were obtained and used as a flux at the Chillagoe State Smelters.

(iii) *South Australia.* The production from the deposits worked by the Broken Hill Pty. Co. Ltd., at Iron Knob and at Middlebank reached its maximum in 1939, when 2,571,759 tons of ore valued at £2,957,523 were raised, while the production of 122,052 tons valued at £2,440,360 for 1942, represents a decrease of 449,707 tons and £517,163 on the 1939 figures.

(iv) *Western Australia.* The development of the deposits at Yampi Sound was discontinued in 1938 as a result of the embargo on exports. However 150 tons of iron ore valued at £225 were reported in 1942 for the first time since 1938. Exploratory operations are continuing until the survey of the quantity and grade of ore is completed. The expenditure thus incurred is to be the responsibility of the Commonwealth Government.

(v) *Tasmania.* There was no production of ironstone in Tasmania during 1942. The production of iron pyrites which amounted to 34,449 tons, valued at £43,061 in 1942, is not included in the mineral returns, but is credited to the manufacturing industry, as it is a by-product from the flotation of copper ore at Mount Lyell. This product is exported to the mainland, where the sulphur contents have displaced imported sulphur in the manufacture of chemical fertilizers. The recovery has grown considerably since 1932, when the output amounted to 274 tons.

(vi) *Other States.* Reference to the iron ore deposits in the various States appears in preceding issues of the Official Year Book (see No. 22, p. 779).

3. **Iron and Steel Bounties.**—During 1942-43 the bounties paid under the Bounties Acts on articles manufactured from locally produced materials were as follows: Wire-netting, £421; traction engines, £850. Corresponding amounts paid during 1941-42 were £369 and £1,108 respectively.

4. **World's Production of Iron and Steel.**—(i) *General.* According to the *The Mineral Industry*, the production in the principal countries during the latest available three years are shown in the next table. The figures for 1939 are in many instances estimates and, particularly for belligerent countries, should be accepted with some reserve.

PIG-IRON AND STEEL : WORLD'S PRODUCTION.

Country.	Pig-iron.			Steel Ingots and Castings.		
	1937.	1938.	1939.	1937.	1938.	1939.
	Thousands of Tons.			Thousands of Tons.		
U.S.A.	37,127	19,161	31,604	51,792	28,739	47,732
Germany	15,957	18,226	19,828	19,816	22,875	24,139
U.S.S.R. (Russia) ..	14,520	14,479	15,374	17,824	17,802	17,439
Great Britain	8,497	6,763	8,130	12,963	10,394	13,559
France	7,917	5,956	7,826	7,761	6,080	8,402
Japan	3,561	3,040	3,320	6,423	5,930	6,230
Belgium	3,843	2,426	3,019	3,777	2,249	3,061
Italy	790	850	950	2,087	2,285	2,339
Luxemburg	2,513	1,527	1,812	2,510	1,413	1,650
Canada	898	758	831	1,401	1,156	1,385
Australia	664	1,072	1,250	805	1,154	1,250
Czechoslovakia	1,675	1,215	900	2,315	1,733	1,230
Poland	724	952	810	1,450	1,522	1,201
Sweden	646	647	612	1,104	964	1,080
India	1,453	1,628	1,800	971	950	1,050
Hungary	362	345	350	706	650	739
Austria	389	(a)	(a)	650	(a)	(a)
Union of South Africa	272	271	304	332	341	345
Total—All Countries	102,848	80,452	104,494	135,317	107,157	132,857

(a) Included with Germany.

The figures for the world's production of iron and steel reached exceptionally low levels in 1932, namely, pig-iron, 39,275,000 tons; steel, 50,029,000 tons. From that year onwards all steel-producing nations recorded continuous increases in production, but in 1938 a marked decline was recorded. During 1939, however, the fear of war created greater demands for pig-iron and steel. The output of the former metal reached record proportions in Germany, Union of Soviet Socialist Republics, Italy and Japan, while new records in steel production were attained in Great Britain, Germany, Italy and Japan.

The principal producers in Australia are the Broken Hill Pty. Co. Ltd. and the Australian Iron and Steel Ltd., the former situated at Newcastle and the latter at Port Kembla in New South Wales. Additional plant has been authorized at both of these works in order to meet the increasing demand for steel in Australia while an extension of the industry to South Australia is in hand.

(ii) *Australia.* The production of steel and pig-iron in Australia, of which New South Wales is the main producing State, is shown for each of the years 1932-33 to 1941-42.

PIG-IRON AND STEEL : AUSTRALIAN PRODUCTION.

Year ended 30th June—	Pig-iron.	Steel Ingots.	Steel Rails, Bars and Sections.	Year ended 30th June—	Pig-iron.	Steel Ingots.	Steel Rails, Bars and Sections.
	Tons.	Tons.	Tons.		Tons.	Tons.	Tons.
1933 ..	336,246	392,666	295,523	1938 ..	929,676	1,167,340	906,426
1934 ..	487,250	518,326	431,765	1939 ..	1,104,605	1,171,787	985,035
1935 ..	698,493	606,861	585,838	1940 ..	1,212,006	1,292,115	1,034,714
1936 ..	783,233	820,395	671,244	1941 ..	1,475,707	1,647,108	1,319,544
1937 ..	913,406	1,079,854	837,445	1942 ..	1,557,641	1,699,793	1,421,059

§ 9. Other Metallic Minerals.

1. **Wolfram and Scheelite.**—(i) *General.* Tungsten ores occur in several of the States, in the Northern Territory and on King Island in Bass Strait, the last-named being included with Tasmania. It is a minor metal of growing importance in both peace and war. On account of the low prices during recent years, mining activities were restricted and production intermittent. In 1942, however, following a recession in price after 1937, prices soared to the record level of £21 17s. 6d. per cwt., compared with £3 2s. 9d. per cwt. in 1932. As a result, production of wolfram and scheelite responded accordingly. The production during the five years 1938 to 1942 is shown in the following table:—

WOLFRAM AND SCHEELITE : PRODUCTION, AUSTRALIA.

Particulars.		1938.	1939.	1940.	1941.	1942.
WOLFRAM.						
New South Wales	cwt.	1,877	1,653	880	1,175	760
	£	25,740	16,249	8,364	13,044	11,655
Victoria ..	cwt.	..	..	..	5	42
	£	..	..	..	75	1,059
Queensland ..	cwt.	3,015	1,945	2,271	2,400	3,803
	£	30,779	17,590	20,345	22,627	63,296
Western Australia	cwt.	..	20	20	..	4
	£	..	60	211	..	115
Tasmania ..	cwt.	5,982	4,452	4,686	4,720	3,660
	£	63,348	44,356	42,319	42,536	58,397
Northern Territory	cwt.	8,694	6,444	5,800	6,142	3,016
	£	78,277	58,183	47,828	52,326	43,734
Total ..	cwt.	19,568	14,514	13,657	14,442	11,285
	£	198,144	136,438	119,067	130,608	at 178,262
SCHEELITE.						
New South Wales	cwt.	184	292	390	405	260
	£	2,472	3,388	4,603	4,413	5,807
Queensland ..	cwt.	13	25	11	14	28
	£	93	227	94	98	546
Western Australia	cwt.	..	80	145	6	1
	£	..	609	1,559	101	357
Tasmania ..	cwt.	611	3,414	5,510	4,940	4,300
	£	6,193	33,301	49,120	42,700	71,353
Total ..	cwt.	808	3,811	6,056	5,365	4,589
	£	8,758	37,525	55,376	47,312	78,063

(a) Includes South Australia, 31 lb., £6.

2. **Cadmium.**—Cadmium is extracted at Risdon in Tasmania as a by-product from ores mined at Broken Hill in New South Wales, and on the west coast of Tasmania. The particulars given in the following table refer to the production of metal and do not include the cadmium contents of zinc ores or concentrates exported overseas.

3. **Cobalt.**—The recovery of this metal as an oxide is obtained in the same way as cadmium. It is recovered from the treatment of silver, lead and zinc ores of Broken Hill and Tasmanian origin. The production together with that of cadmium is given for the years 1938 to 1942 in the following table :—

PRODUCTION OF CADMIUM AND COBALT : AUSTRALIA.

Year.	Cadmium.				Cobalt Oxide.			
	Extracted in Tasmania from Ores mined in				Extracted in Tasmania from Ores mined in			
	New South Wales.	Tasmania.	Total.		New South Wales.	Tasmania.	Total.	
	Cwt.	Cwt.	Cwt.	£	Cwt.	Cwt.	Cwt.	£
1938	2,943	980	3,923	79,406	377	12	389	8,084
1939	2,488	960	3,448	56,343	390	16	406	9,319
1940	2,449	1,000	3,449	59,390	356	7	363	8,430
1941	2,897	941	3,838	69,749	397	8	405	9,417
1942	2,436	828	3,264	72,218	325	45	370	8,981

The figures given above do not include the metallic contents of cadmium and cobalt contained in the ores and concentrates exported overseas.

4. **Other.**—Detailed information in regard to occurrence and production of other metallic minerals in each of the States appears in Official Year Book No. 22, pp. 780-3 and preceding issues.

§ 10. Coal.

1. **Production in each State.**—An account of the discovery of coal in each State appears in preceding issues of the Official Year Book (see No. 3, pp. 515-6). The quantity and value of the production in each State and in Australia during 1913, 1924, 1931 and each of the years 1938 to 1942 are given in the following table :—

BLACK COAL : PRODUCTION.

Year.	N.S.W.	Victoria. (a)	Q'land.	S. Aust.	W. Aust.	Tasmania.	Australia.
QUANTITY.							
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
1913 ..	10,414,165	593,912	1,037,944	..	313,818	55,043	12,414,882
1924 ..	11,618,216	518,315	1,123,117	..	421,864	75,988	13,757,500
1931 ..	6,432,382	571,342	841,308	..	432,400	123,828	8,401,260
1938 ..	9,570,930	397,258	1,113,426	..	604,792	83,753	11,680,159
1939 ..	11,195,832	364,895	1,317,488	..	557,535	99,392	13,535,142
1940 ..	9,550,098	267,694	1,285,328	..	539,427	83,136	11,725,683
1941 ..	11,765,698	326,441	1,454,024	..	556,574	109,714	14,212,451
1942 ..	12,236,219	312,854	1,637,148	1,650	581,176	134,442	14,903,489
VALUE. (b)							
	£	£	£	£	£	£	£
1913 ..	3,770,375	274,371	403,767	..	153,614	25,367	4,627,494
1924 ..	9,589,547	569,555	985,542	..	363,255	66,555	11,574,454
1931 ..	4,607,343	362,284	699,926	..	336,178	85,004	6,103,735
1938 ..	5,603,842	188,101	958,884	..	375,083	61,991	7,187,901
1939 ..	6,768,659	259,814	1,167,844	..	362,811	74,460	8,633,588
1940 ..	6,125,585	230,452	1,151,567	..	364,500	63,688	7,935,792
1941 ..	8,265,881	303,761	1,404,646	..	389,278	85,311	10,448,877
1942 ..	9,472,363	411,107	1,698,231	1,650	461,495	108,241	12,153,087

(a) Excludes brown coal, shown in next table.

(b) At the pit's mouth.

The figures for Victoria already quoted exclude brown coal, the quantities and values of which were as follows:—

BROWN COAL : PRODUCTION IN VICTORIA.

Year.	Quantity.	Value. (a)	Year.	Quantity.	Value. (a)
	Tons.	£		Tons.	£
1913	2,984	569	1939	3,651,014	385,952
1924	127,490	41,116	1940	4,278,475	391,549
1931	2,194,453	251,511	1941	4,565,638	422,993
1938	3,675,450	351,721	1942	4,933,861	469,699

(a) Cost of Production.

2. *Distribution and Production of Coal in each State.*—(i) *New South Wales.*—The coal deposits of New South Wales constitute the most important and extensively worked in Australia. The principal fields are known as the Northern, Southern and Western, and are situated at Newcastle, Bulli and Lithgow respectively.

The coal from the various districts differs considerably in quality—that from the Northern district being especially suitable for gas-making, household purposes and steam, while the product of the Southern and Western is essentially a steaming coal. At the present time the Greta coal seams in the Northern division are being worked extensively between West Maitland and Cessnock, and this stretch of country, covering a distance of 15 miles, is now the most important coal-mining district in Australia.

The following table gives the yields in each of the three districts during the five years 1938 to 1942:—

COAL : PRODUCTION IN DISTRICTS OF NEW SOUTH WALES.

District.	1938.	1939.	1940.	1941.	1942.
	Tons.	Tons.	Tons.	Tons.	Tons.
Northern	6,294,213	7,365,981	6,324,504	7,891,123	8,300,356
Southern	1,831,408	2,160,717	1,784,418	2,242,490	2,303,071
Western	1,445,309	1,669,134	1,441,176	1,632,085	1,632,792
Total	9,570,930	11,195,832	9,550,098	11,765,698	12,236,219
Total Value (a) £ ..	5,603,842	6,768,659	6,125,585	8,265,881	9,472,363
Average value per ton (a) ..	11s. 8½d.	12s. 1d.	12s. 10d.	14s. 1d.	15s. 6d.

(a) At the pit's mouth.

The production of coal in New South Wales exceeded 10 million tons in each year from 1920 to 1927, reaching its maximum in 1924, when 11,618,000 tons were produced. The output fell to 6,400,000 tons in 1931, but it has steadily increased each year to 11,195,832 tons in 1939, but fell in 1940 to 9,550,098 tons, increasing to 11,765,698 tons in 1941 and to the record figure of 12,236,219 tons in 1942. Of the total quantity of coal won in New South Wales since the commencement of operations to the end of 1942, namely, 500 million tons, about 348 million tons or 68 per cent. was obtained in the Northern District, 101 million tons or 20 per cent. in the Southern District, and 61 million tons or 12 per cent. in the Western District.

(ii) *Victoria. (a) Black Coal.* The deposits of black coal in Victoria occur in three main areas in the southern portion of the State, namely, the Wannon, the Otway and South Gippsland, which total approximately 3,500 square miles. The workable seams are restricted to the South Gippsland area, where the thickness ranges from 2 feet 3 inches to 6 feet. The total quantity of black coal mined in Victoria to the end of 1942 amounted to 19,224,000 tons valued at £15,024,641.

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

BLACK COAL : PRODUCTION IN VICTORIA.

Year.	State Coal-mine.		Other Coal-mines.	Total Production.	Total Value.	Average Value per ton.	
	Tons.		Tons.	Tons.	£	(a)	
1938	253,065	54,193	307,258	188,101	12	3	
1939	312,452	52,443	364,895	259,814	12	10	
1940	214,249	53,445	267,694	230,452	15	3	
1941	276,119	50,322	326,441	303,761	17	2	
1942	270,754	42,100	312,854	411,107	(b)		

(a) At the pit's mouth.

(b) Not available.

(b) *Brown Coal.—(i) General.* Victoria is richly endowed, both in quantity and quality, with brown coal deposits. Some account of these deposits and of the operations of the State Electricity Commission in connexion therewith will be found in preceding Official Year Books (see No. 22, p. 785). The brown coal produced in Victoria in 1942 amounted to 4,933,861 tons, all but 4,313 tons being procured at the State open cut at Yallourn. During 1942-43, 4,978,415 tons of brown coal were produced by the State Electricity Commission, of which 3,344,238 tons went to the power station and 1,634,177 tons to the briquette factory.

(ii) *Production of Briquettes.* The briquetting plant started operations in November, 1924, and in 1926 the output was 95,477 tons which had increased to 180,905 tons in 1930 and to 414,959 in 1942-43. Two and a half tons of brown coal are required to make one ton of briquettes.

(iii) *Queensland.* The distribution of production during the five years 1938 to 1942 was as follows :—

COAL : PRODUCTION IN QUEENSLAND.

District.	1938.	1939.	1940.	1941.	1942.
	Tons.	Tons.	Tons.	Tons.	Tons.
Ipswich	547,901	627,965	625,683	689,680	751,177
Bowen	224,778	246,713	212,412	297,554	347,381
Clermont	88,407	111,945	125,846	110,409	142,607
Maryborough	77,162	101,967	100,682	114,190	127,975
Darling Downs	76,571	88,819	92,692	97,214	112,230
Rockhampton	64,174	88,053	86,108	105,398	119,673
Chillagoe (Mount Mulligan)	19,192	27,911	21,336	20,418	17,544
Mount Morgan	13,698	23,861	20,569	19,161	18,561
Mackay	1,543	254	..	..	..
Total	1,113,426	1,317,488	1,285,328	1,454,024	1,637,148

The record production of 1,637,148 tons in 1942 with that of 1,454,024 tons in 1941 both exceeded the previous peak output of 1,369,000 tons recorded in 1929.

(iv) *South Australia.* A new field of sub-bituminous coal has been opened up at Leigh Creek, South Australia, from which production commenced in 1944. A small amount of 1,650 tons valued at £1,650 was recorded in 1942 as a result of preliminary boring activities.

(v) *Western Australia.* The production from the five collieries operating on the Collie field amounted in 1942 to 581,176 tons, an increase of 24,602 tons over the year 1941. The value of the production increased by £72,217 to £461,495. The number of men employed was 825 and the output per man was 704 tons, which was 11 tons less than in 1941. The total production of coal from the Collie coal-field to the end of 1942 amounted to 16,112,004 tons.

(vi) *Tasmania.* The production in 1942 amounted to 134,442 tons, being 24,728 tons greater than the total for 1941. About 94,265 tons were contributed in 1942 by the Cornwall Coal Company and 21,735 tons by the Jubilee Company, the two mines combined raising nearly 78,000 tons, or about 86 per cent. of the total output of the State.

(vii) *Australia's Coal Reserves.* The latest available estimate of the actual and probable coal reserves of Australia is shown in the Report of the Royal Commission on the Coal Industry 1929-1930, and is based upon that prepared by the Coal and Lignites Panel of the Power Survey Sectional Committee of the Standards Association of Australia. The following table shows the actual and probable coal reserves as determined by that Committee:—

ACTUAL AND PROBABLE COAL RESERVES OF AUSTRALIA.

(Millions of Tons.)

State.	Black Coal.	Sub-bituminous and Brown Coal.
New South Wales	13,929	..
Victoria	40	37,000
Queensland	2,238	67
South Australia .. .. .	..	57
Western Australia .. .. .	..	3,500
Tasmania	244	..
Total	16,451	40,624

New discoveries of shallow coal have been made in South Australia and as a result the sub-bituminous coal reserves of that State should be increased by some 10 million tons.

3. **Production in Various Countries.**—The total known coal production of the world in 1938 amounted to about 1,420 million tons, towards which Australia contributed about 15.4 million tons, or 1 per cent. The following tables show the production of the chief British and foreign countries during each of the four years ended 1938. Similar details for 1939 are not available:—

COAL : PRODUCTION IN BRITISH EMPIRE.

Year.	Great Britain.	British India.	Canada.	Australia.	New Zealand.	Union of S. Africa.
BLACK COAL.						
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
1935 ..	222,249,000	23,017,000	9,193,000	10,888,000	825,000	13,360,000
1936 ..	228,448,000	22,611,000	10,146,000	11,370,000	859,000	14,607,000
1937 ..	240,409,000	25,036,000	10,840,000	12,074,000	970,000	15,246,000
1938 ..	227,015,000	28,343,000	9,623,000	11,680,000	978,000	16,027,000
BROWN COAL, LIGNITE.						
1935 ..	..	..	3,186,000.	2,222,000	1,290,000	..
1936 ..	..	..	3,452,000.	3,045,000	1,281,000	..
1937 ..	..	..	3,299,000	3,394,000	1,308,000	..
1938 ..	..	..	3,098,000	3,675,000	1,244,000	..

COAL : PRODUCTION IN FOREIGN COUNTRIES.

Year.	Germany.	Austria.	Hungary.	Belgium.	France. (a)	Czecho- slovakia.	Yugoslavia.
BLACK COAL.							
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
1935 ..	140,744,000	246,500	810,000	26,087,000	46,363,000	10,791,000	394,000
1936 ..	155,783,000	249,500	814,000	27,427,000	44,512,000	12,040,000	434,000
1937 ..	181,599,000	226,600	903,000	29,213,000	43,618,000	16,513,000	432,000
1938 ..	183,238,000	222,000	(b)	29,106,000	45,763,000	13,300,000	(b)
Year.	Spain.	Poland.	Nether- lands.	U.S.S.R.	Japan.	China. (c)	U.S.A.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
1935 ..	6,905,000	28,091,945	11,690,000	93,736,000	34,354,000	12,000,000	379,046,000
1936 ..	(d)	29,278,000	12,600,000	106,677,000	37,466,000	12,000,000	440,774,000
1937 ..	(d)	35,646,000	14,095,000	120,643,000	(d)	(d)	444,096,000
1938 ..	(d)	37,502,000	13,275,000	130,300,000	(d)	(d)	348,865,000

BROWN COAL, LIGNITE.

Year.	Germany.	Austria.	Hungary.	Belgium.	France.	Czecho- slovakia.	Yugoslavia.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
1935 ..	145,028,000	2,924,000	6,612,000	..	885,000	14,977,000	3,971,000
1936 ..	158,848,000	2,851,000	6,993,000	..	905,000	15,697,000	3,971,000
1937 ..	182,106,000	3,191,000	7,928,000	..	1,000,000	17,613,000	4,523,000
1938 ..	191,899,000	3,477,000	9,212,000	..	1,040,000	12,900,000	5,651,000
Year.	Spain.	Poland.	Nether- lands.	U.S.S.R.	Japan.	China.	U.S.A.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
1935 ..	299,000	18,000	85,000	13,602,000	(d)	..	(e)
1936 ..	(d)	13,000	87,000	17,333,000	(d)	..	(e)
1937 ..	(d)	19,000	141,000	(e)	(d)	..	(e)
1938 ..	(d)	9,000	168,000	(e)	(d)	..	(e)

(a) Excluding Saar District, which produced 11,139,000 tons in 1934, and 1,673,000 tons from 1st January to 17th February, 1935. From this date production has been included with that of Germany.
 (b) Included with brown coal. (c) Including about 300,000 tons of lignite yearly. (d) Not available. (e) Included with black coal.

World production dropped from 1,510 million tons in 1937 to 1,420 million tons in 1938, largely as the result of the decline of nearly 100 million tons in the United States of America. The production of the British Empire amounted to 304 million tons in 1938, a decrease of 11 million tons or 3.5 per cent. on that of 1937. The production of foreign countries also decreased by 80 million tons to 1,120 million tons, or by 6.6 per cent. in the same period.

4. Exports.—(i) *General.* The quantity of coal of Australian production (excluding bunker coal) exported to other countries in 1942-43 was 254,043 tons, valued at £296,533, being from New South Wales. The quantities and values of the oversea exports of Australian coal for the years specified are shown in the following table :—

COAL : OVERSEA EXPORTS, AUSTRALIA.

Year.	Quantity.		Value.		Year.	Quantity.		Value.	
	Tons.		£			Tons.		£	
1913 ..	2,098,505	1,121,505	1939-40 ..	264,649	251,055				
1921-22 ..	1,028,767	1,099,899	1940-41 ..	330,103	331,532				
1931-32 ..	344,015	341,800	1941-42 ..	241,004	259,093				
1938-39 ..	382,085	347,054	1942-43 ..	254,043	296,533				

Australian coal taken for bunker purposes during the same years was as follows :—

COAL : BUNKER, AUSTRALIA.

Year.	Quantity.		Value.		Year.	Quantity.		Value.	
	Tons.		£			Tons.		£	
1913 ..	1,647,870	1,018,375	1939-40 ..	437,806	492,155				
1921-22 ..	1,498,035	2,178,101	1940-41 ..	330,032	391,866				
1931-32 ..	506,140	534,897	1941-42 ..	347,291	509,069				
1938-39 ..	549,453	561,063	1942-43 ..	293,764	461,203				

(ii) *New South Wales.* In 1940, the quantities exported overseas and interstate amounted to 2,605,868 tons, of which 2,526,257 tons, valued at £2,197,024 were shipped from Newcastle. Interstate exports from Newcastle in 1942 amounted to 3,063,248 tons valued at £2,908,075. Oversea exports in 1942 totalled 554,985 tons, valued at £680,370, representing 279,167 tons of bunker coal, valued at £367,768 and 275,818 tons of cargo coal, valued at £312,602.

The distribution of the total output from New South Wales collieries during the five years 1936 to 1940 was as follows, the quantities shown for export include bunker coal :—

COAL : DISTRIBUTION OF OUTPUT, NEW SOUTH WALES.

Year.	Exports to Australian Ports.		Exports to Foreign Ports.		Local Consumption.		Total Production.	
	Tons.		Tons.		Tons.		Tons.	
1936	2,166,241	911,176	6,122,049	9,199,466				
1937	2,407,978	922,515	6,721,026	10,051,519				
1938	2,113,393	910,872	6,546,665	9,570,930				
1939	2,634,310	873,084	7,688,438	11,195,832				
1940	1,986,047	619,821	6,944,230	9,550,098				
1941	(a)	(a)	(a)	11,765,698				
1942	(a)	(a)	(a)	12,236,219				

(a) Not available.

For the period of five years 1936 to 1940 shown in the table above, 23 per cent. of the total output was exported to other States, 8 per cent. was sent overseas, and 69 per cent. was consumed locally.

5. *Consumption in Australia.*—From the information now available it is possible to show particulars of the production of coal and its distribution in Australia.

Under normal circumstances the production and consumption of coal move in the same direction, but in times of industrial trouble large consumers may be compelled to rely upon accumulated stocks, and, consequently annual figures may move out

of alignment. For this reason the following table has been prepared on a quinquennial basis in order to smooth out any variations from the normal.

COAL : PRODUCTION AND UTILIZATION IN AUSTRALIA.

Particulars.	Average for Five Years ended—			
	1938-39.		1942-43.	
BLACK COAL.				
Source—				
Production of Saleable Coal (a) ..	Tons. 11,168,996	% 99.72	Tons. 13,173,250	% 99.82
Imports	30,860	0.28	23,150	0.18
Total Supplies	11,199,856	..	13,196,400	..
Disposal—				
Exported overseas	345,606	3.09	294,377	2.23
Exported as bunker, overseas	592,469	5.29	391,669	2.97
Total	938,075	8.38	686,046	5.20
Consumed as fuel in—				
Electric Light and Power Works	1,795,568	16.03	2,135,130	16.18
Factories (b)	2,067,462	18.46	2,398,796	18.17
Railway Locomotives (c)	2,327,791	20.78	2,851,126	21.61
Total	6,190,821	55.27	7,385,052	55.96
Consumed as raw material in—				
Gas Works	1,110,801	9.92	1,221,566	9.25
Coke Works	1,467,459	13.10	2,161,083	16.38
Total	2,578,260	23.02	3,382,649	25.63
Balance available for consumption including accumulation of stocks (d)	1,492,700	13.33	1,742,653	13.21
Grand Total	11,199,856	100.00	13,196,400	100.00

BROWN COAL.

Particulars.	Tons.		Tons.	
	3,063,879		4,350,877	
Production of Brown Coal				
Utilization—				
As fuel in Electric Light and Power Works	1,673,018	54.60	2,734,385	62.85
Used in Briquette Works (e)	1,390,861	45.40	1,616,492	37.15
Total	3,063,879	100.00	4,350,877	100.00

(a) Estimated. (b) Estimated where details were not available. Excludes brown coal, see Note (e). (c) Government Railways only. (d) Includes bunker coal for Interstate and Intra-state Shipping. (e) A portion of the briquette output is consumed in factories.

The production of coal is ascertained only in calendar years and to relate it to the other factors in the table, it was necessary to use estimates, which are probably accurate enough for the purpose.

6. Prices.—(i) *New South Wales*. The price of New South Wales coal depends on the district from which it is mined. Previously the Northern district coal generally realized a somewhat higher rate than the southern, but the average price in the Southern district is now in excess of that prevailing in the northern. According to the figures compiled by the State Statistician the average prices of saleable coal for the various districts and for the State as a whole during the last five years are given in the following table :—

COAL PRICES : NEW SOUTH WALES.

Year.	Northern District.	Southern District.	Western District.	Average for State.
				Per ton. s. d.
1938	11 11	14 0	9 6	12 0
1939	12 8	14 5	10 8	12 9
1940	13 6	15 0	11 6	13 6
1941	14 7	15 6	12 0	14 4
1942	15 11	17 9	14 3	16 0

(ii) *Victoria*. In Victoria, the average price of black coal per ton at the pit's mouth was in 1938, 12s. 3d.; in 1939, 12s. 10d.; in 1940, 15s. 3d.; in 1941, 17s. 2d. These averages exclude brown coal, which in 1942 cost 1s. 11d. per ton to produce.

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

COAL PRICES : QUEENSLAND.

District.	Value at Pit's Mouth.				
	1938.	1939.	1940.	1941.	1942.
	Per ton. s. d.	Per ton. s. d.	Per ton. s. d.	Per ton. s. d.	Per ton. s. d.
Ipswich	17 0	17 2	17 5	18 11	20 5
Darling Downs	19 11	20 3	20 6	21 9	23 2
Wide Bay and Maryborough	24 0	24 3	25 0	26 0	27 11
Rockhampton	17 0	17 7	18 0	19 8	20 4
Clermont	13 8	13 11	13 7	14 7	16 4
Bowen	14 10	15 10	16 7	17 11	19 8
Chillagoe (Mount Mulligan)	31 6	31 1	29 10	33 3	33 10
Average for State	17 2	17 9	17 11	19 4	20 9

(iv) *South Australia*. The value of the 1942 production was £1 per ton.

(v) *Western Australia*. The average prices per ton of the Collie (Western Australia) coal during the last five years were: 1938, 12s. 5d.; 1939, 13s. 0d.; 1940, 13s. 6d.; 1941, 14s. 0d.; and 1942, 15s. 10½d.

(vi) *Tasmania*. The average prices per ton of coal at the pit's mouth in Tasmania for the last five years were: 1938, 14s. 10d.; 1939, 15s. 0d.; 1940, 15s. 4d.; 1941, 15s. 7d.; and 1942, 16s. 1d.

7. Prices in the United Kingdom.—During the five years 1934 to 1938 the average selling prices of coal per ton at the pit's mouth in the United Kingdom were: 1934, 12s. 11d.; 1935, 13s.; 1936, 14s. 0½d.; 1937, 15s. 2½d.; and 1938, 16s. 7½d. Later details are not available.

8. **Employment in Coal-mines.**—The number of persons employed in coal-mines, both above and below ground, in each of the producing States is given for selected years from 1913 and for each of the last five years :—

COAL-MINES : PERSONS EMPLOYED.

Year.	New South Wales.	Victoria.		Queensland.	Western Australia.	Tasmania.	Total.
		Black.	Brown.				
	No.	No.	No.	No.	No.	No.	No.
1913 ..	18,843	1,377	(a)	2,548	559	136	23,463
1923 ..	22,969	2,131	(a)	2,662	713	268	28,743
1933 ..	13,349	1,517	272	2,448	626	313	18,525
1938 ..	15,815	1,322	444	2,495	765	269	21,110
1939 ..	16,581	1,376	449	2,615	752	238	22,011
1940 ..	17,337	1,374	378	2,660	713	239	22,701
1941 ..	17,351	1,295	620	2,886	781	233	23,166
1942 ..	17,101	1,234	620	2,838	822	243	(b)22,870

(a) Production prior to 1924 was of little importance.

(b) Including twelve miners in South Australia.

The maximum number was employed in 1926 when 31,774 persons were engaged in the coal-mines of Australia. Shortly after that year the industrial depression and a prolonged stoppage of work on one of the principal fields of New South Wales during 1929 and 1930 seriously affected the figures of employment. Since 1933 there has been a gradual improvement, but the numbers employed in 1942 were little more than two-thirds of the maximum figure already quoted. As the production in Australia in 1942 was 14,903,489 tons and exceeded the previous record output of 13.8 million tons in 1924, it is evident that the growth of mechanization in the industry has been a factor in raising production during recent years. In 1942 the quantity of coal cut by machinery in New South Wales amounted to 5,005,000 tons or 40.9 per cent. of the total output, compared with 21.4 per cent. in 1931 and 32.1 per cent. in 1939.

9. **Accidents in Coal-mining.**—(i) *Australia.* The following table gives the number of persons killed or injured, with the proportion per 1,000 employed, and in relation to the quantity of coal raised, this being a factor which must be reckoned with in any consideration of the degree of risk attending mining operations. Although no precise definition of an accident is available, any disablement from misadventure which rendered the injured unfit for work for fourteen or more days appears to have been uniformly adopted by the State Departments of Mines. A further table gives the rate of fatalities during the quinquennium 1938-1942.

COAL-MINING : EMPLOYMENT AND ACCIDENTS, 1942.

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 ..	17,101	23	75	1.34	4.38	532,010	163,150
Victoria (a) ..	1,854	..	7	..	3.78	..	(a)749,531
Queensland ..	2,838	5	192	1.76	67.65	327,430	8,527
Western Australia ..	822	2	252	2.43	306.57	290,588	2,306
Tasmania ..	243	..	7	..	28.80	..	19,206
Total ..	22,858	30	533	1.31	23.32	661,245	37,218

(a) Includes brown coal.

The next table shows the average number employed in mining, number of fatalities, and rate per 1,000 employed during the quinquennium 1938-1942 :—

COAL-MINING : FATALITIES, 1938 TO 1942.

State.	Average No. of Coal-miners Employed.	Average No. of Fatal Accidents.	Rate per 1,000 Employed.
New South Wales	16,837	19.00	1.13
Victoria	1,822	1.40	0.77
Queensland	2,699	3.00	1.11
Western Australia	767	1.80	2.35
Tasmania	245	..	..
Total	22,370	25.20	1.13

(ii) *Other Countries.* 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 1933-37 was 1.11, the rates varying between 1.35 in 1934 and 1.02 in 1936 while the rate for Australia for the same period was 1.14. Details are not available for a later comparison.

§ 11. Coke.

1. *General.*—Notwithstanding the large deposits of excellent coal in Australia, the production of coke was limited to about 250,000 tons prior to the War of 1914-19. This was below local requirements and necessitated a fairly considerable import from abroad. During recent years, however, a high standard has been attained in the local product, imports have almost ceased, and Australian coke is being shipped to New Zealand and other islands in the Pacific. In 1942-43 the quantity exported was 29,944 tons, valued at £64,141 of which 26,363 tons, valued at £55,018, were sent to New Caledonia.

2. *New South Wales.*—The following table gives the production in New South Wales during the five years 1938 to 1942 as recorded by the Department of Mines :—

COKE : PRODUCTION IN NEW SOUTH WALES.

Items.	1938.	1939.	1940.	1941.	1942.
Quantity .. tons	1,135,446	1,349,160	1,272,067	1,711,396	1,618,913
Value, total .. £	1,100,266	1,185,579	1,078,411	2,134,022	2,181,623
Value, per ton	19s. 5d.	17s. 7d.	16s. 11d.	£1 4s. 11d.	£1 6s. 11d.

The figures quoted refer to the product of coke ovens, and exclude coke produced in the ordinary way at gas-works. The output fell to 217,509 tons in 1931, but with the general recovery of trade, the figure rose to a new high level of 1,711,000 tons in 1941, falling slightly to 1,618,913 tons in 1942. During the latter year the number of coke ovens at work totalled 546, and the number of persons engaged in its manufacture was 1,077.

3. *Queensland.*—A small quantity of coke is made in Queensland, the quantity returned in 1938 being 30,984 tons, of which 27,328 tons were produced at the Bowen State Coke Works. The greater proportion of the output of these works was consigned to the Mount Isa Mines Ltd. and to the Chillagoe State smelters. Hitherto the coke used at these ore-treatment works was imported from New South Wales, but now the local output is sufficient to meet the requirements of the State and leave a small surplus

available for export. The following table shows the amount manufactured at the State Coke Works during the five years 1938 to 1942 :—

COKE : PRODUCTION IN STATE COKE WORKS—QUEENSLAND.

Year.		1938.	1939.	1940.	1941.	1942.
Quantity	.. tons	30,984	26,032	19,897	25,213	19,448

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. Shale-oil and Mineral Oil.

1. *Shale-oil.*—(i) *General.* Reference to the deposits of shale and the search for mineral oil in Australia will be found in Official Year Book No. 22, pp. 791-3.

(ii) *New South Wales.* Reference to the establishment of the shale-oil industry in Australia will be found in previous issues of the Official Year Book. In 1937 negotiations were completed between the Commonwealth and New South Wales Governments and the National Oil Proprietary Ltd., by which the latter company undertook to develop the shale-oil industry in the Newnes-Capertee district. The Commonwealth Government agreed to protect the industry by exempting from excise, up to 10 million gallons annually, the Company's output of petrol for a period of 25 years. The successful establishment of this plant will probably lead to an expansion of the industry in Australia and should provide a valuable training ground for technicians. Production commenced in 1940, and the following table shows the production of shale oil during 1940 to 1942 :—

SHALE OIL : PRODUCTION IN NEW SOUTH WALES.

Year.	Northern District.		Southern District.		Western District.		Total.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
1940	..	£	£ ..	43,805	£ 43,805	43,805	£ 43,805
1941	820	540	122,758	96,131	123,578	96,671
1942	..	828 1,881	1,559	1,898	114,937	138,564	117,324	142,343

(iii) *Tasmania.* About 38,000 gallons of crude oil were produced in 1934 from shale treated in Tasmania, while the total quantity of oil distilled from shale up to the end of 1934 was set down at 357,000 gallons. The plant owned by the Tasmanite Shale Oil Company has not operated since the end of January, 1935.

Investigations into the shale-oil deposits of the Mersey Valley are being continued but the establishment of the industry has been handicapped by the low-grade nature of the shale.

2. *Coal Oil.*—Attention has been directed to the production of oil from coal by a number of processes. A committee consisting of nominees of the Commonwealth and State Governments, excepting Western Australia, and of Imperial Chemical Industries Ltd., was appointed to advise on specific questions submitted to it. In a report submitted in June, 1937, it was stated that the stage had not been reached when Australia could

establish plants for the production of oil from coal. The committee recommended, however, that close touch be kept with developments abroad. A report dated 25th July, 1939, on the production of oil from coal was submitted to the Minister by the Standing Committee on Liquid Fuels. The recommendations of this Committee followed the lines of those of its predecessors.

3. **Natural Oil.**—(i) *Australia.* Natural oil has been proved to exist in Queensland, Victoria and Western Australia, the best indications being found in Victoria and Queensland. Many of the conditions favourable to the accumulation of oil in commercial quantities have been shown to be present in Queensland, Western Australia and New South Wales. In the latter State, however, no strong positive evidence of its existence has been recorded. Oil has been proved to occur in noteworthy quantities at Lakes Entrance, Victoria, but it still remains to be demonstrated whether the area can be developed on a commercial basis.

Reference is made in § 16 below to the assistance afforded by the Commonwealth Government in the search for petroleum oil.

(ii) *Victoria.* There was no production of crude petroleum oil in 1942. The total production to the end of that year amounted to 115,283 gallons, valued at £2,769. In conjunction with the State Government, the Commonwealth Government is carrying out a scout-drilling campaign in the Gippsland area.

(iii) *Queensland.* Great hopes are still entertained in regard to the petroliferous area in Queensland. Gas and light to medium gravity oils have been found at Roma, and gas and oily wax at Longreach. Structural conditions favourable to accumulation on a commercial scale have been located at several places between Injune and Springsure. The search for oil was continued during 1939 by several companies in localities situated at Mount Bassett, near Roma, at Hutton Creek and at Arcadia. Test bores have been drilled to bed rock in all the localities mentioned, the deepest being that at Arcadia which exceeded 6,000 feet. Showings of petroliferous gas, amounting at Arcadia to 3,000,000 cubic feet a day, and of petroleum have been encountered in all these bore-holes.

(iv) *South Australia.* Under prescribed conditions, the South Australian Government offers a bonus of £5,000 to the person or body corporate which first obtains from a local bore or well 100,000 gallons of crude petroleum containing not less than 90 per cent. of products obtainable by distillation.

(v) *Western Australia.* Only one company was active in Western Australia during 1939. The company, financially assisted by the Commonwealth and State Governments, commenced deep-drilling operations in the Kimberley district in 1939. No production has been recorded up to the end of 1942.

(vi) *General.* During 1939 efforts were made to secure greater uniformity in State legislation governing the search for oil. A draft Bill based on modern legislation in other countries was prepared by the Commonwealth and submitted to the State Governments. As a result amending legislation was passed in Victoria, Queensland, South Australia and Western Australia. There was immediate response to this in Queensland, where an agreement has been reached between the State Government and one of the major oil companies, whereby the company has undertaken to spend up to £400,000 in the search for oil in that State.

§ 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 issues of the Official Year Book (see No. 22, pp. 793-6). The tables of quantities and values in § 1 of this Chapter will show the production of the principal items in this class for each State during 1942.

§ 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 1942 in New South Wales was estimated at 183 carats, valued at £337. These were won by fossickers in the Inverell district. The total production to the end of 1942 is given at 206,129 carats, valued at £149,000.

2. **Sapphires.**—The production of sapphires in New South Wales during 1929 was returned as 65 oz., valued at £450, obtained wholly at Sapphire in the Inverell district, and the only output recorded since that year was 1,200 oz. valued at £600 in 1941. Production during recent years has been restricted owing to the unfavourable market.

In Queensland, gems to the value of £1,612 were purchased on the Anakie sapphire fields in 1942. It is probable that many were sold privately or held for better prices. For these reasons the returns are considered to be very incomplete. There were about 120 miners operating on the fields during 1934 but their number decreased to 20 in 1939. Production has declined very considerably since 1920, when the yield was valued at £66,000.

3. **Precious Opal.**—The estimated value of the opal won in New South Wales during 1942 was £800. This is not regarded as the total output of the State, however, because in many instances miners, buyers and collectors leave the fields before a record of their production or purchases can be secured. Some very fine stones are at times obtained, one weighing 5 ozs. and valued at £300 being found 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 6½ 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 1890 is estimated at £1,630,668, but, as pointed out above, the figures are to some extent understated.

In Victoria small quantities of precious opal are found in the Bechworth district.

The opaliferous district in Queensland stretches over a considerable area of the western interior of the State, from Kynuna and Opalton as far south as Cunnamulla. The yield in 1930 was estimated at £50, and up to the end of that year at about £188,000. No production has been recorded since 1939. These figures are, however, merely approximations, as large quantities of opal, of which no record is obtained, are disposed of privately. Production during recent years has been limited by the paucity of demand. Only seven men operated during 1939. The greatest recorded output was for the year 1895 when the yield was valued at £32,750.

Owing to the poor market for gems, production from the Coober Pedy opal field, situated in the Stuart Range in South Australia, fell from £11,056 in 1929 to £1,517 in 1934. The production rose in 1937 to £11,887, but declined to £6,020 in 1939, and rose again to £11,568 in 1941. After a further drop in 1942, production in 1943 was valued at £13,881. The field is extremely prolific, a large quantity of precious white opal having been raised therefrom, and only a small portion of the known opal-bearing area has been thoroughly tested. The greatest yield for the State in any one year was obtained in 1920 when the value of production was returned at £24,000.

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, chialtolite, emeralds, garnets, moonstones, olivines, rubies, topazes, tourmalines, turquoises and zircons. In Western Australia, 609 carats (rough) of emeralds, valued at £278, were produced during 1929 in the Cue district on the Murchison gold-field. The value of the 3,750 carats reported from the same area in 1930 was not ascertainable as there were no sales during the year. There has been no recorded production since 1930.

During the three years 1939, 1940 and 1941, 10 tons of beryl were produced in Western Australia, valued at £83. Beryl is required chiefly for special alloys with copper which are used in the manufacture of castings, non-sparking tools and special diamond-drill bits.

§ 15. Number 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 1942, the number so engaged was as follows :—

NUMBER OF PERSONS ENGAGED IN MINING, 1942.

State.	Number of Persons engaged in Mining for—						Total.
	Gold.	Silver, Lead and Zinc.	Copper.	Tin.	Coal.	Other.	
New South Wales ..	1,571	4,104	79	1,243	17,101	1,978	26,076
Victoria ..	1,661	..	..	3	1,854	137	3,655
Queensland ..	1,075	471	419	589	2,838	388	5,780
South Australia ..	34	..	52	2	12	832	932
Western Australia ..	8,123	..	5	15	822	135	9,100
Tasmania ..	33	509	1,595	801	243	216	3,397
Northern Territory (a) ..	236	..	5	45	..	138	424
Australia ..	12,733	5,084	2,155	2,698	22,870	3,824	49,364

(a) Year 1941.

Included in the figures for "other" in South Australia were 223 engaged in mining iron ore, 47 gypsum miners, 229 salt gatherers, and 32 opal miners. The Tasmanian figures include 61 scheelite miners and 31 osmiridium miners.

The following table shows, at intervals since 1911, the number of persons engaged in mining in each State and the proportion so engaged of the total population :—

NUMBER ENGAGED IN MINING PER 100,000 OF POPULATION.

State.	1911.		1921.		1931.	
	Miners engaged.	No. per 100,000 of Population.	Miners engaged.	No. per 100,000 of Population.	Miners engaged.	No. per 100,000 of Population.
New South Wales ..	37,017	2,225	29,701	1,410	30,682	1,200
Victoria ..	15,986	1,210	5,211	339	6,463	359
Queensland ..	13,201	2,147	5,847	766	6,753	730
South Australia ..	6,000	1,457	2,020	406	518	90
Western Australia ..	16,596	5,787	7,084	2,122	7,147	1,653
Tasmania ..	5,247	2,760	3,170	1,486	3,397	1,512
Northern Territory ..	715	21,595	131	3,356	145	2,918
Australia ..	94,762	2,109	53,164	974	55,105	844

NUMBER ENGAGED IN MINING PER 100,000 OF POPULATION—*continued.*

State.	1940.		1941.		1942.	
	Miners engaged.	No. per 100,000 of Population.	Miners engaged.	No. per 100,000 of Population.	Miners engaged.	No. per 100,000 of Population.
New South Wales	28,089	1,013	27,554	987	26,076	925
Victoria	6,606	347	4,839	250	3,655	186
Queensland	6,781	661	6,541	631	5,780	557
South Australia	1,055	176	928	154	932	153
Western Australia	15,499	3,291	14,021	2,959	9,100	1,901
Tasmania	3,203	1,332	2,974	1,248	3,397	1,411
Northern Territory	637	10,184	424	6,756	(a)	(a)
Australia	61,870	880	57,281	807	b 48,940	(b) 682

(a) Not available.

(b) Excludes Northern Territory.

The general falling-off since 1911 is largely due to the causes mentioned in each section above. The proportion to population shows increases between 1931 and 1939 in all States, excepting New South Wales and Tasmania, and was attributable mainly to the larger number engaged in the search for gold. Between those years the increase in the number so engaged was approximately 5,000 persons. The number engaged in mining for tin increased by 1,900, while increases of 2,600 were also recorded in the mining for silver, lead and zinc. The number of copper-miners decreased by 500 over the same period. Since 1939 the number engaged in mining, and the proportion to population have decreased in most States, due mainly to heavy war-time demands upon man-power.

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

3. **Accidents in Mining, 1942.**—The following table gives particulars of the number of men killed or injured in mining accidents during 1942 :—

MINING ACCIDENTS, 1942.

Mining for—	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	N.T. (a)	Australia.
KILLED.								
Coal ..	23	..	5	..	2	..	..	30
Copper ..	..	..	(b)	..	2	..	..	2
Gold ..	..	1	(b)	1	18	..	..	20
Silver, lead and zinc ..	3	..	(b)	..	..	1	..	4
Tin ..	..	..	(b)	..	..	..	..	..
Other minerals	(c) 1	..	3	..	..	..	..	4
Total ..	27	1	8	1	20	3	..	60

(a) Not available.

(b) Included with other minerals.

(c) Includes quarries.

MINING ACCIDENTS, 1942—*continued.*

Mining for—	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	N.T. (a)	Australia.
INJURED.								
Coal ..	75	7	192	..	252	7	..	533
Copper ..	..	..	(b)	..	..	16	..	16
Gold ..	2	8	(b)	..	811	..	..	821
Silver, lead and zinc ..	151	..	(b)	..	..	13	..	164
Tin ..	..	..	(b)	..	..	4	..	4
Other minerals	(c) 12	..	186	57	..	8	..	263
Total ..	240	15	378	57	1,063	48	..	1,801

(a) Not available.

(b) Included with other minerals.

(c) Includes quarries.

§ 16. Government Aid to Mining.

1. Commonwealth.—(i) *General.* Assistance to mining has been given by the Commonwealth under the provisions of the Precious Metals Prospecting Act 1926, the Gold Bounty Act 1930, the Petroleum Oil Search Acts 1936, which superseded the Petroleum Prospecting Acts 1926, 1927 and 1928, the Loan Appropriation (Unemployment Relief) Act 1934, the Northern Australia Survey Act 1934 and the Gold Mining Encouragement Act 1940.

The last-mentioned Act provided financial assistance to the States for the development of the gold-mining industry. The amount granted was £150,000, distributed as follows:—New South Wales, £8,000; Victoria and Queensland, £14,000 each; South Australia, £1,000; Western Australia, £111,000; and Tasmania £2,000. The Act provided further for assistance to bona fide prospectors, marginal producers and low grade mines by refunds, under certain conditions, of the tax on gold.

Expenditure under the other Acts mentioned has been reviewed in previous issues of the Official Year Book. With the exception of the assistance to prospectors, etc., under the Gold Mining Encouragement Act and the Petroleum Oil Search Acts further expenditure under these Acts is not contemplated.

(ii) *Survey of North Australia.* In 1934 the Northern Australia Survey Act was passed. Under this Act the Governments of the Commonwealth and the States of Queensland and Western Australia agreed to co-operate in the conduct of an aerial, geological and geophysical survey over a period of six years of certain areas in Australia north of the 22nd parallel of south latitude. The survey was completed at the end of 1940. The total cost of the survey involved an expenditure of £250,000, of which the Commonwealth Government contributed £140,000, Queensland £67,500 and Western Australia £42,500. The final report was in respect of the period ended 31st December, 1940. In addition to these periodical reports, 180 other reports have been released. These refer to individual areas examined by the survey during the six years of its operations.

(iii) *Search for Oil.* The Commonwealth Government has encouraged the search for oil in Australia, Papua and New Guinea and considerable sums have been spent during recent years in geological surveys and in drilling operations. Details of efforts made during that period are shown in previous issues of the Official Year Book.

In 1936 the Petroleum Oil Search Act was passed and replaced all previous enactments. Under this Act a sum of £250,000 was appropriated to assist in the search for oil in Australia and the Territories of Papua and New Guinea. Considerable preliminary geological surveys have already been conducted and test-drilling has been and still is being done at approved sites in Australia. So far no commercial production has been obtained. An Australian company operating in the Gulf District, Papua, is at present engaged on deep test-drilling.

The moneys made available under the Act mentioned may be applied:—

- (1) to the payment of advances to persons and companies engaged in drilling operations or in the conduct of geological surveys in connexion with the search for petroleum ;
- (2) for the purchase of drilling plants ;
- (3) towards the cost of any geological survey or scout-drilling operations conducted by the Commonwealth in conjunction with a State in connexion with the search for petroleum ; and
- (4) for the purpose of advances to persons engaged in the initial stages of the production of petroleum.

Under the provisions of the Act four modern rotary-drilling plants have been purchased. These are made available on hire to companies engaged in the search. Since their purchase the four plants have been in use in Queensland, Victoria, New South Wales, Western Australia and Papua.

In conjunction with the Government of Victoria the Commonwealth is conducting a scout-drilling campaign in Gippsland.

(iv) *Mineragraphic and Ore-dressing Investigations.* In addition to the assistance mentioned above the Commonwealth Government made a grant of £25,000 in 1934 to the Council for Scientific and Industrial Research to stimulate gold production by conducting mineragraphic and ore-dressing investigations as required by the industry. This amount was expended during the succeeding five years in conducting these investigations, which were carried out conjointly with appropriate State institutions, the three laboratory centres being the School of Mines, Kalgoorlie, the School of Mines and Industries, Adelaide, and the University of Melbourne.

The success of the scheme induced a further grant of £22,000. After providing £2,000 for 1940-41, the balance is to be expended at the rate of £4,000 during each of the succeeding five years. The scheme is administered by a Mining Advisory Committee.

(v) *Standing Committee on Liquid Fuels.* The Commonwealth Government has appointed a Standing Committee on Liquid Fuels to co-ordinate knowledge concerning the production of liquid fuels and the use of substitutes therefor, and to furnish information which will enable Australia to obtain greater independence in regard to fuel supplies. This Committee has undertaken the investigation of such matters as the production of oil from coal, benzol, power alcohol, shale-oil, the use of producer and compressed gas in road vehicles, and tar and other substitutes for fuel oil. Seven reports have been issued by this Committee to date.

2. **New South Wales.**—Assistance given to prospectors in New South Wales during 1942 amounted to £27,122 which was met partly from the Unemployment Relief Fund (£7,717) and partly from funds provided under the National Security (Minerals) Regulations (£19,405).

3. **Victoria.**—Financial assistance to keep their mines unwatered and preserve their assets for future operations has been granted by the Commonwealth Government to several companies which have been forced to suspend operations owing to war conditions and whose workings and plants are liable to serious damage through flooding.

4. **Queensland.**—In 1935 a fund was established for assistance to metalliferous mining in Queensland. The Commonwealth and State contributed £130,500 and £16,864 respectively. During 1941-42 and 1942-43 the Commonwealth Government provided £69,500 for the purpose of accelerating the production of essential minerals by the development of new fields and the reopening of old mines.

Mining operations conducted by the State include three coal-mines situated at Bowen, Styx and at Mount Mulligan, three batteries at Kidston, Charters Towers and Bamford, an assay office at Cloncurry, smelting works at Chillagoe, coke works at Bowen, and the State treatment works at Irvinebank. The battery at Charters Towers continues to be leased privately.

5. **South Australia.**—Aid is given to the mining industry under the terms of the Mining Acts of 1930 and 1931. Assistance from State funds amounted to £26,856. Payments amounting to £44,772 have been made from the Commonwealth Assistance for Metalliferous Mining Fund since 1935 when the State also contributed £17,500. The State maintains batteries and cyanide works at Mount Torrens, Peterborough, Mongolata, 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 granted in 1942 was as follows:—Aid to prospectors, £6,347; subsidies on stone crushed for the public, £407; advances in aid of mining work and equipment of mines with machinery, £3,210. Other assistance granted from the vote on various matters during the year amounted to £449. The total amount involved was £10,413.

In 1942 there were 23 State batteries in operation of which three were leased. The amount expended thereon up to the end of 1942 was £93,726 from revenue, £405,461 from loan fund and £42,408 from other sources, giving a total of £541,595. The working expenditure up to the end of 1942 exceeded the revenue by £74,129. The total value of gold and tin produced to the end of 1942 at the State plants was £12,025,373. Free assays and determinations of mineral values for prospectors are made at the Kalgoorlie School of Mines and at the Government laboratory at Perth.

7. **Tasmania.**—Aid to mining in 1942 amounted to £1,627, of which £194 was expended as sustenance and £1,433 as assistance to prospectors and for the provision of other aid.

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 1939 the assistance granted to prospectors amounted to £1,377. In addition a sum of £11,640 was also granted to assist mining companies and mine owners.

The Government maintains batteries at Maranboy, Pine Creek and Tennant Creek Government Assayers situated at Darwin and Alice Springs make free assays for prospectors, and arrange for the sampling, storage and sale of ores.

§ 17. 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 (excluding gold) extracted in Australia during the five years 1934 to 1938 were as follows:—

REFINED METALS PRODUCED IN AUSTRALIA.

Metal.	1934.	1935.	1936.	1937.	1938.
Silver oz.	8,674,549	8,983,950	8,498,674	9,510,509	9,357,139
Lead, pig tons	160,201	181,211	159,504	186,757	182,214
Zinc "	54,629	67,666	70,509	69,750	69,820
Copper "	7,970	11,768	13,313	17,400	17,098
Tin "	2,330	2,837	2,717	2,907	3,229

NOTE.—Figures for years later than 1938 are not available.

METALLIC CONTENTS OF ORES, ETC., PRODUCED AND EXPORTED. 747

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 later years is not available from the returns published by the Association, but according to the metal extraction returns published in the Statistical Register of New South Wales, the production of pig iron in that State amounted in 1937-38 to 929,676 tons; in 1938-39 to 1,104,605 tons; in 1939-40 to 1,212,006 tons; in 1940-41 to 1,475,707 tons, and in 1941-42 to 1,557,641 tons.

2. *Metallic Contents of Ores, Concentrates, etc., Exported.*—The estimated metallic contents of ores, concentrates, etc., exported during the five years 1934 to 1938 as supplied by the Australian Mines and Metals Association, are given in the following table:—

METALLIC CONTENTS OF ORES, CONCENTRATES, ETC., EXPORTED.

Metal.	Contained in—	1934.	1935.	1936.	1937.	1938.	
Silver	oz. { Lead-Silver-Gold Bullion Lead Concentrates and Ores Zinc Concentrates and Ores Copper and Gold Ores ..	1,819,546	2,506,015	2,810,828	3,505,293	3,400,581	
		612,014	275,154	444,052	557,438	831,809	
		147,522	217,266	222,536	204,840	306,012	
		
	Total	2,579,082	2,998,435	3,477,416	4,267,571	4,538,402	
Lead	tons { Lead-Silver-Gold Bullion Lead Concentrates and Ores Zinc Concentrates and Ores	35,804	36,723	33,450	41,773	40,369	
		21,075	9,619	17,497	10,086	15,049	
		803	1,658	1,587	1,420	1,958	
Total	57,682	48,000	52,534	53,279	57,376		
Zinc	tons { Lead Concentrates and Ores Zinc Concentrates and Ores	..	..	..	..	..
		26,963	54,693	75,391	76,990	93,561	
		Total	26,963	54,693	75,391	76,990	93,561
Copper	tons	Ores, Matte, etc. ..	1,122	1,361	2,770	2,389	3,228
Tin	tons	Concentrates and Ores ..	198	289	246	192	102

NOTE.—Figures for years later than 1938 are not available.