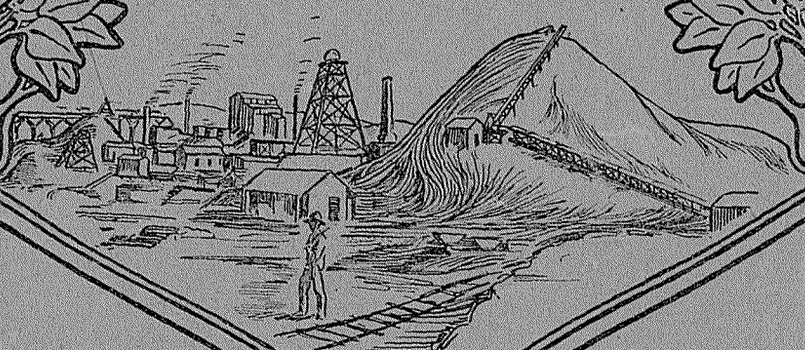
REPORT
OF THE
DEPARTMENT OF MINES
FOR THE YEAR
WESTERN · 1918. · AUSTRALIA



PRESENTED · TO · BOTH · HOUSES · OF · PARLIAMENT · BY · HIS · EXCELLENCY'S · COMMAND ·

1919.

WESTERN AUSTRALIA.

REPORT

OF THE

DEPARTMENT OF MINES

FOR THE

YEAR 1918.

Presented to both Houses of Parliament by His Excellency's Command.

[THIRD SESSION OF THE TENTH PARLIAMENT.]

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ANNUAL REPORT OF THE DEPARTMENT OF MINES, WESTERN AUSTRALIA, 1918.

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DIVISION I.

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STATE OF WESTERN AUSTRALIA.

Report of the Department of Mines for the State of Western Australia, for the Year 1918.

To the Hon. the Minister for Mines.

Sir,

I have the honour to submit the Annual Report of the Department for the year 1918, with summaries of reports from the Wardens, and other officers, together with various comparative tables furnishing statistics relating to the Mining industry of the State.

Reports from the officers controlling the various Sub-Departments are also submitted.

I have, etc.,

M. J. CALANCHINI,
Under Secretary for Mines.

Department of Mines, Perth, 31st March, 1919.

DIVISION I.

Summary by the Under Secretary for Mines.

PART I.—GENERAL REMARKS.

The value of the Mineral output of the State for the year 1918 was £4,265,577, being £363,450 less than that for the previous year.

Copper ore exported showed an increase of 677 tons, and Copper ingots a decrease of 57 tons.

Tin and Coal showed increases, but Silver a decrease.

The value of the gold yield was £3,723,183, being 87.28 per cent. of the total output.

The value of the Coal output was £204,319, of Copper £66,146, Silver £22,711, and Tin £76,952.

The dividends paid by mining companies amounted to £368,295, and in the preceding year £590,856; a decrease of £222,561.

The total dividends paid to the end of 1918 were £27,086,420.

To the same date the total mineral production was £144,171,429 and the total gold production £137,611,514.

GOLD.

The gold yield again shows a decline, being 93,806 fine ounces less than for 1917, which was 91,081 fine ounces less than for 1916.

The average value per ton of ore treated in the State as a whole has risen from 41.49 shillings in 1917 to 43.00 shillings in 1918, and in the East Coolgardie Goldfield, which produced over 61 per cent. of the State's reported yield, from 39.53 shillings to 42.43 shillings.

Comparing the tonnages of ore treated in 1917 and 1918 there is a decrease of 269,114 tons in the latter year, during which 1,691,337 tons were treated.

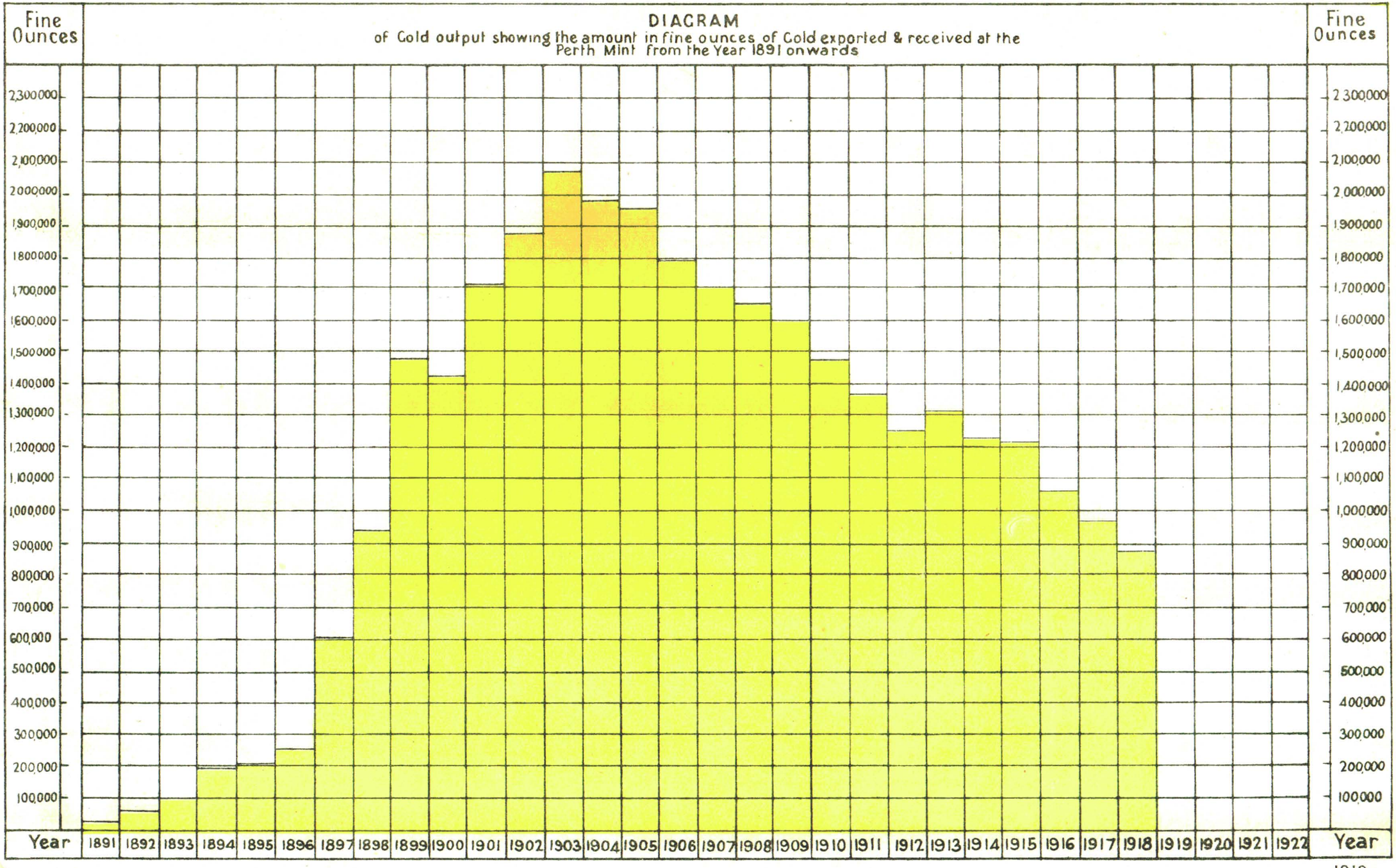
There were decreases in all fields excepting North Coolgardie and Phillips River, where there were increases of 1,168 and 89 tons respectively. The largest decreases were in East Coolgardie, Murchison, and Mount Margaret.

Working costs show an increase, the average cost per ton of 2,000lbs. being as published by the Chamber of Mines:—In 1913, 19/6.6; in 1914, 20/6; in 1915, 19/9; in 1916, 22/3; in 1917, 23/7, and in 1918, 24/8.

There were decreases in the gold outputs of all the fields, with the single exception of North Coolgardie,

DIAGRAM

of Gold output showing the amount in fine ounces of Gold exported & received at the Perth Mint from the Year 1891 onwards



1918.

which showed an improvement on the preceding year.

The acreage held under mining lease for all minerals is 50,862, being a decrease of 2,328 acres when compared with 1917. The area leased for gold mining is less by 2,641 acres, but for minerals greater by 313 acres. The area held under prospecting areas is 16,363 acres, including 9,240 acres for coal and oil. This is an increase of 563 acres on the area held in 1917, and does not include the acreage of several large temporary Reserves which have been made and rights of occupancy granted on special terms to persons desirous of searching for oil. At the close of the year the approximate area comprised in such reserves was 65,000 square miles.

The number of men engaged in all classes of mining is 9,265; a decrease of 776 on the figures for 1917, principally owing to the absence of men at the front, as at many centres there is a dearth of skilled miners.

The number of men engaged in mining for minerals other than gold increased by 186, the increases being principally in Tin and Lead Mines. In gold mining there was a decrease of 962 men.

The average value of gold produced per man employed on gold mines has risen from £471.67 in 1917 to £476.38 in 1918.

The average tonnage raised per man was 223.28 tons, and in the previous year 229.86 tons.

In the East Murchison Field there was a falling off, but in the Lawlers and Wiluna districts there was a good deal of prospecting, and the State Plant at Wiluna was kept going all the year.

In the Black Range district the large mine at Youanmi was in active operation, but elsewhere matters were very quiet.

The Murchison Field recorded a decrease, due to a falling off in the outputs of the Meekatharra and Day Dawn districts. The Great Fingal Mine at Day Dawn closed down and ceased all operations. It is proposed to let the property on tributes. Both the Cue and Mount Magnet districts had improved outputs. In the former the Big Bell and Light of Asia Mines had good productions. In the latter prospecting has been very active.

The Mount Margaret Field had a falling off.

In the Mount Margaret district there was a decrease, and, excepting for the Lancefield Mine, mining was quiet.

In the Mount Morgans district there was also a decrease, and, excepting at Linden, which was somewhat busy, the various centres were quiet.

In the Mt. Malcolm district there was a falling off, principally owing to a smaller output from the Sons of Gwalia Mine, which is still the principal one. There was a fair amount of prospecting in the outlying centres.

The Coolgardie Field had a decrease. There was little change throughout, the greatest activity being in the Kunanalling district, where the existing mines continued producing.

The North Coolgardie Field has the distinction of being the only one recording an improved output, due to an increased yield from the Riverina South Mine in the Ularring district.

Other large producers were the Gladsome and Sand Queen at Comet Vale and the Menzies Consolidated at Yunndaga. At Mt. Ida a good deal of prospecting work is in progress and indications are promising.

In the Ularring district the Riverina South Mine gives much promise.

In the Niagara and Yerilla districts matters remained very quiet.

The North-East Coolgardie Goldfield had a decrease, and gold mining was exceedingly quiet.

The Broad Arrow Goldfield had a decrease, due to lessened production from the large mines at Ora Banda, where operations have in a large measure been centred on development work, good reserves being opened up for future treatment. In the immediate vicinity of Broad Arrow there was a good deal of prospecting, but the other centres were quiet.

In the East Coolgardie Goldfield the number of men engaged in mining was 3,461, and in 1917, 3,711; a decrease of 250. This goldfield gave employment to over 44 per cent. of the number of men engaged in gold mining, and the reported production during the year was 524,823 fine ounces, over 61 per cent. of the total reported yield. The tonnage treated was 1,050,887 tons, being less than in 1917 by 148,249 tons. The average grade of the ore per ton improved from 39.53 shillings in 1917 to 42.43 shillings in 1918.

In the Yilgarn Field there was a decrease, but at Westonia the large mines continued producing regularly and in the outlying centres prospecting was active.

In the Dundas Field there was a decrease and practically no change in the outlook.

The Phillips River Field had a decrease and nothing of note transpired.

In the Northern Goldfields—Kimberley, Pilbara, West Pilbara, Ashburton, and Gascoyne—matters remained unchanged.

In Pilbara the continued high cost of requisites and shortage of skilled miners militate against any early improvement, but the possibilities of this field are good.

TIN.

The quantity of tin exported was 415 tons, valued at £76,952; an increase in tonnage on the preceding year of 32 tons, and in value of £31,664.

The Greenbushes tinfield produced 295.80 tons, valued at £57,653; an increase on the preceding year in tonnage of 57.88 tons, and in value of £27,725; the Pilbara Field, 99.50 tons, valued at £20,984; an increase in tonnage of 30.45 tons, and in value of £11,720. None was produced in any of the other fields.

The good price which obtained for this mineral rendered many low grade propositions payable, hence the improved output.

TANTALITE.

None of this mineral was exported or reported.

COPPER.

The value of the Copper exported was £66,146, being £19,592 less than in 1917. The quantity raised in the West Pilbara Field was 1,844.19 tons, valued at £28,961; an increase on the preceding year in tonnage of 1,060.58 tons, and in value of £15,555. The Whim Well Mine continued operations, but nothing of note transpired.

In the Phillips River Field the production was 2,901.66 tons, valued at £42,978; a decrease on the preceding year in tonnage of 2,353.91 tons, and in value of £23,890. There was little change in this field throughout the year.

In the Peak Hill Field 76.28 tons, valued at £2,480; a decrease in tonnage of 211.56 tons, and in value of £7,203.

The mines at Ilgarere continued to be developed, but as previously, the difficulties of transport consequent on the remoteness of the locality retarded progress.

The only other fields producing were East Murchison, 82.44 tons, valued at £1,314; an increase on the previous year in tonnage of 7.44 tons, but decrease in value of £209, and Murchison 78.34 tons, valued at £1,794; a decrease in tonnage of 4.58 tons, and in value of £370.

The average number of men engaged in copper mining was 158, and in 1917, 154.

COAL.

The output of Coal for the year was 337,039 tons, being 10,489 tons more than in 1917, which was the largest on record.

Most of the mines were actively worked, excepting the Co-operative, where a heavy fall of ground occurred and stopped operations.

The Scottish Collieries opened up a new mine, but many difficulties were encountered, resulting in work being considerably retarded.

During the year a discovery of coal near Wilga Station, on the Donnybrook-Katanning line, and about 16 miles South of Collie, was reported. The examinations are encouraging and many areas have been applied for.

The number of men employed, 618, is greater by 47 than in 1917, and the output per man was in 1917, 572 tons, and in 1918, 545 tons.

GRAPHITE.

Deposits of this mineral exist at Donnelly River, Kendenup, in the Plantagenet District, and Munglinup, between Ravensthorpe and Esperance.

Not much development work was done on any of the properties and only five tons, valued at £75, were exported.

OTHER MINERALS.

The quantity of Silver obtained as a by-product and exported was 109,830 ounces, valued at £22,711, and in the preceding year 222,075 fine ounces, valued at £38,339; a decrease of 112,245 ounces, and in value of £15,628. Lead and Silver Lead to the amount of 282 tons, valued at £3,045, were exported, and in the preceding year 22 tons, valued at £593, also 5,489 tons of Pig Lead, valued at £163,880, and in the preceding year 4,661 tons, valued at £139,940. Pyritic ore, amounting to 2,252 tons, valued at £1,629, was reported, and in the preceding year 3,575 tons, valued at £1,752.

Magnesite to the extent of 62 tons, valued at £225, was exported, and in the preceding year 42 tons, valued at £50.

Arsenical Ore, amounting to 679 tons, valued at £2,564, was exported, and in the preceding year 57 tons, valued at £707.

Molybdenite, amounting to five tons, valued at £97, and Scheelite to the extent of five tons, valued at £720, also a small quantity of Wolfram were exported. No Antimony, Asbestos, Bismuth or Mica was exported or reported.

MINING GENERALLY.

With the exception of New South Wales, which shows an increase of 4,874 fine ounces, the whole of the Australian States, including the Northern Territory and Papua, also New Zealand, each record a decreased gold output for the year. The Western Australian production was 59.85 per cent. of the total for Australasia, and in the previous year 57.93 per cent.

The continually diminishing output, although in some measure due to depleted outputs from many of the big mines, is also largely accounted for by the great number of competent miners who went abroad on active service, and to the huge increases in the cost of practically every commodity essential to the industry. It is hoped that the cessation of hostilities and the early repatriation of the miners will speedily result in an improvement. In mining for base metals the position was well maintained, a result of the excellent prices that were obtaining. At Coolgardie a dressing plant for the treatment of Scheelite and other base metals is being erected, the Department being anxious to stimulate the production of such ores.

The assistance to prospectors by loans of equipment and transport facilities has been continued, and several parties, including many returned soldiers, have been aided. Many of the latter have also been given instruction with a view to enabling them to readily recognise the various minerals they are likely to drop across. The whole of the Department's outfits are in constant use, and from time to time considerable additions are being made.

The area held under prospecting areas for gold and minerals other than Coal and Oil, viz., 7,123 acres, being greater than in the previous year by 163 acres, is exceedingly satisfactory, and indicates that prospecting is still being actively pursued.

The assistance rendered under the provisions of the Mining Development Act, details of which are given in the report of the State Mining Engineer, published as Division II. of this Report, and which aims at assisting in the development of struggling mines, is further evidence that the Government is doing everything possible to encourage and push ahead the industry. Assistance is also rendered by doing diamond drilling wherever there are reasonable prospects of success attending the efforts.

PART II.—MINERALS RAISED.

TABLE 1.

Quantity and Value of all the Minerals produced during 1917 and 1918.

Description of Minerals.	1917.		1918.		Increase or Decrease for Year compared with 1917.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
		£		£		£
1. Antimony (exported), statute tons	12	258	...	...	— 12	— 258
2. Arsenical ore (exported). statute tons	57	707	697	2,564	+ 622	+ 1,857
3. Bismuth (exported), statute tons	½	24	...	...	— ½	— 24
4. Coal (raised), statute tons	326,550	191,822	337,039	204,319	+ 10,489	+ 12,497
5. Copper { Ore (exported), statute tons	966	20,878	1,643	24,877	+ 677	+ 3,999
5. Copper { Ingot, Matte, etc. (exported), statute tons	535	64,860	478	41,269	— 57	— 23,591
6. Gold (exported and minted), fine ounces ...	970,317	4,121,645	876,511	3,723,183	— 93,806	— 398,462
7. Graphite (exported), statute tons	18	158	5	75	— 13	— 83
8. Lead and silver lead (ore and concentrates) (exported), statute tons	22	593	282	3,045	+ 260	+ 2,452
9. Lead, Pig (exported), statute tons	4,661	139,940	5,489	163,880	+ 828	+ 23,940
10. Magnesite (exported), statute tons	42	50	62	225	+ 20	+ 175
11. Molybdenite (exported), statute tons	14	158	5	97	— 9	— 61
12. Pyritic Ore (reported), statute tons	3,575	1,752	2,252	1,629	— 1,323	— 123
13. Silver (exported), fine ounces	222,075	38,339	109,830	22,711	— 112,245	— 15,628
14. Tantalite (exported), statute tons	17	2,513	...	...	— 17	— 2,513
15. Tin (exported), statute tons	383	45,288	415	76,952	+ 32	+ 31,664
16. Tungsten Ore { Scheelite (exported), statute tons	½	42	5	720	+ 4½	+ 678
16. Tungsten Ore { Wolfram (exported), statute tons	...	...	¼	31	+ ¼	+ 31
Total Values	...	4,629,027	...	4,265,577	...	— 363,450

TABLE 2.

Value and Percentage of Mineral Exports in relation to the Value of Total Exports from Western Australia.

Year.	Total Exports.	Mineral Exports (exclusive of Coal).	Percentage.
	£	£	
1901	8,515,623	6,920,118	81·27
1902	9,051,358	7,530,319	83·20
1903	10,324,732	8,727,060	84·53
1904	10,271,489	8,625,676	83·98
1905	9,871,019	7,731,954	78·33
1906	9,832,679	7,570,305	76·99
1907	9,904,860	7,544,992	76·17
1908	9,518,020	7,151,317	75·13
1909	8,860,494	5,906,673	66·66
1910	8,299,781	4,795,654	57·78
1911	10,606,863	7,171,638	67·61
1912	8,941,008	5,462,499	61·09
1913	9,128,607	4,608,188	50·48
1914	8,406,182	3,970,182	47·23
1915	6,291,934	2,969,502	47·19
1916 *...	...	...	...
1917 *...	...	...	...
1918*	...	...	...
15 Years Total ...	137,824,649	96,686,077	70·15

* Particulars not at present available.

TABLE 3.

Showing for every Goldfield the amount of Gold reported to the Mines Department as required by the Regulations; also the percentage for the several Goldfields of the total reported and the average value of the Gold per ton of ore treated.

Goldfield.	Reported Yield.					
	1917.	1918.	Percentage for each Goldfield.		Average Value of Gold per ton of Ore treated.	
			1917.	1918.	1917.	1918.
	fine ozs.	fine ozs.			shillings.	shillings.
1. Kimberley	82	15	·01	·01	...	...
2. Pilbara	5,407	3,748	·57	·44	190·60	224·55
3. West Pilbara	305	120	·03	·02	72·17	291·27
4. Ashburton	7	...	...	...	...	...
5. Gascoyne	...	...	...	...	...	...
6. Peak Hill	1,744	1,089	·18	·13	71·95	65·66
7. East Murchison	32,857	29,211	3·43	3·41	47·90	47·15
8. Murchison	82,306	63,285	8·60	7·39	66·79	60·57
9. Yalgoo	5,813	4,398	·61	·51	66·75	66·41
10. Mt. Margaret	101,874	85,347	10·64	9·97	33·64	31·65
11. North Coolgardie	34,795	36,830	3·64	4·30	54·57	56·54
12. Broad Arrow	16,519	4,126	1·73	·48	67·71	68·69
13. North-East Coolgardie	5,933	3,700	·62	·43	60·60	49·74
14. East Coolgardie	557,983	524,823	58·28	61·31	39·53	42·43
15. Coolgardie	10,286	7,963	1·07	·93	56·09	62·86
16. Yilgarn	78,245	70,766	8·17	8·27	42·36	40·08
17. Dundas	18,419	15,950	1·92	1·86	45·62	43·82
18. Phillips River	4,734	4,479	·49	·52	137·31	126·08
State generally	111	196	·01	·02	...	...
Totals and averages ...	957,420	856,046	100·00	100·00	41·49	43·00

The total gold yield of the State is as shown in Table 1, being the amount of gold exported and also that lodged at the Royal Mint, which total includes alluvial gold and gold not reported to the Department.

When comparisons are made as to the yield from any particular field with the preceding year, the figures reported in the Department are used.

TABLE 4.

Number of Gold-producing Mines in the several Goldfields and Districts during 1917 and 1918.

Goldfield.	District.	1917.		1918.		Increase or Decrease.
		District.	Goldfield.	District.	Goldfield.	
Kimberley	... ...	...	...	...	...	...
Pilbara	Marble Bar	12	19	9	9	—10
	Nullagine	7				
West Pilbara	... ...	...	3	...	2	— 1
Ashburton	... ...	...	...	...	...	...
Gascoyne	... ...	...	...	...	...	...
Peak Hill	... ...	...	9	...	9	...
East Murchison	Lawlers	13	41	11	31	—10
	Wiluna	13		6		
	Black Range	15		14		
Murchison	Cue	13	66	15	60	— 6
	Meekatharra	24		21		
	Day Dawn	4		6		
	Mt. Magnet	25		18		
Yalgoo	... ...	...	20	...	16	— 4
Mt. Margaret	Mt. Morgans	11	43	12	41	— 2
	Mt. Malcolm	12		13		
	Mt. Margaret	20		16		
North Coolgardie	Menzies	19	37	15	30	— 7
	Ularring	6		6		
	Niagara	7		5		
	Yerilla	5		4		
Broad Arrow	... ...	...	23	...	15	— 8
North-East Coolgardie ...	Kanowna	10	11	11	13	+ 2
	Kurnalpi	1		2		
East Coolgardie	East Coolgardie ...	50	52	46	48	— 4
	Bulong	2		2		
Coolgardie	Coolgardie	27	41	27	37	— 4
	Kunanalling	14		10		
Yilgarn	... ...	...	47	...	41	— 6
Dundas	... ...	...	15	...	18	+ 3
Phillips River	... ...	...	17	...	16	— 1
	Totals	...	444	...	386	—58

COMPARATIVE STATISTICAL DIAGRAMS

RELATING TO

OUTPUT AND VALUE OF GOLD AND OTHER MINERALS, LANDS LEASED FOR GOLD MINING

IN WESTERN AUSTRALIA

AND THE GOLD PRODUCTION OF AUSTRALASIA FOR THE YEAR 1918.

Fig 1.

Output of Gold from various Goldfields as reported to Mines Dept.

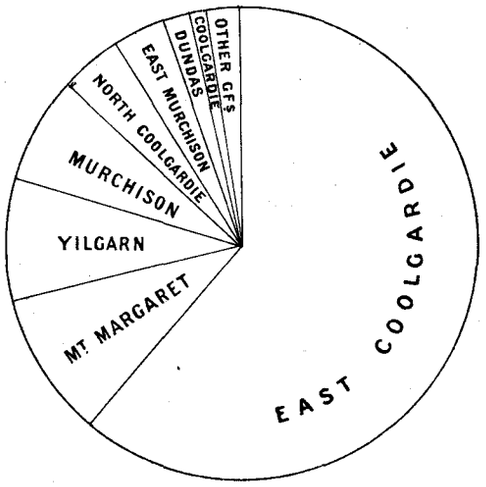


Fig 2.

Gold produced from various Goldfields as given by the Export and Mint Returns.

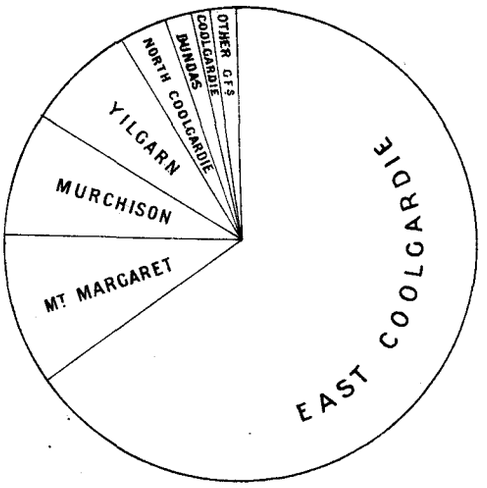


Fig 3.

Value of Gold and other Minerals.

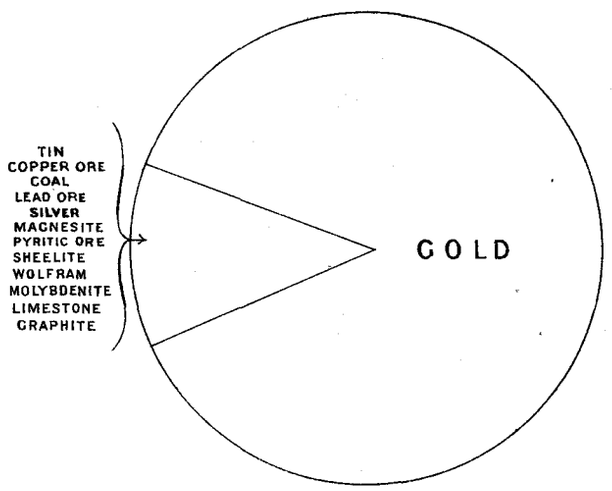


Fig 4.

Value of Minerals other than Gold.

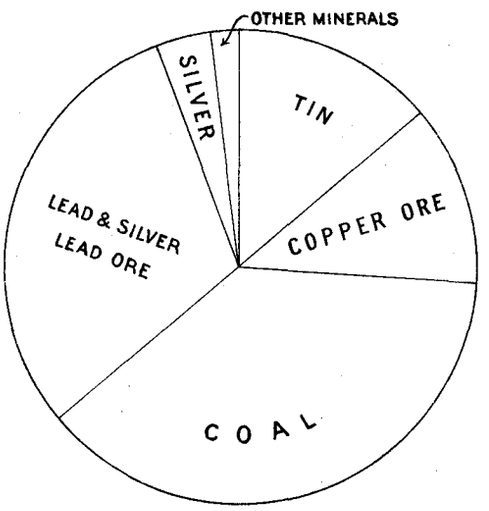


Fig 5.

Areas of Land leased for Goldmining on various Goldfields.

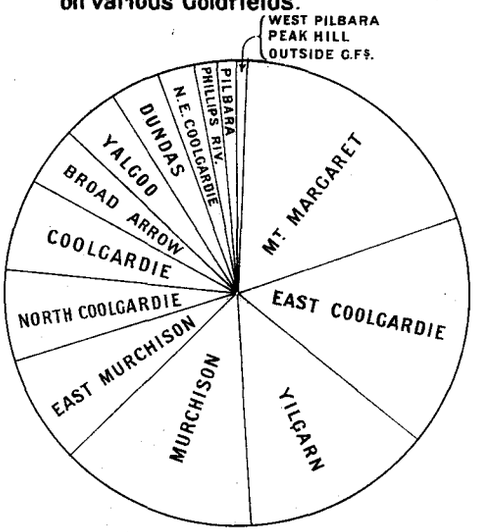
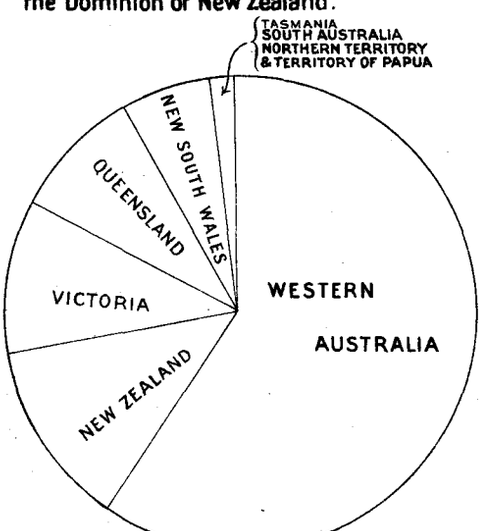


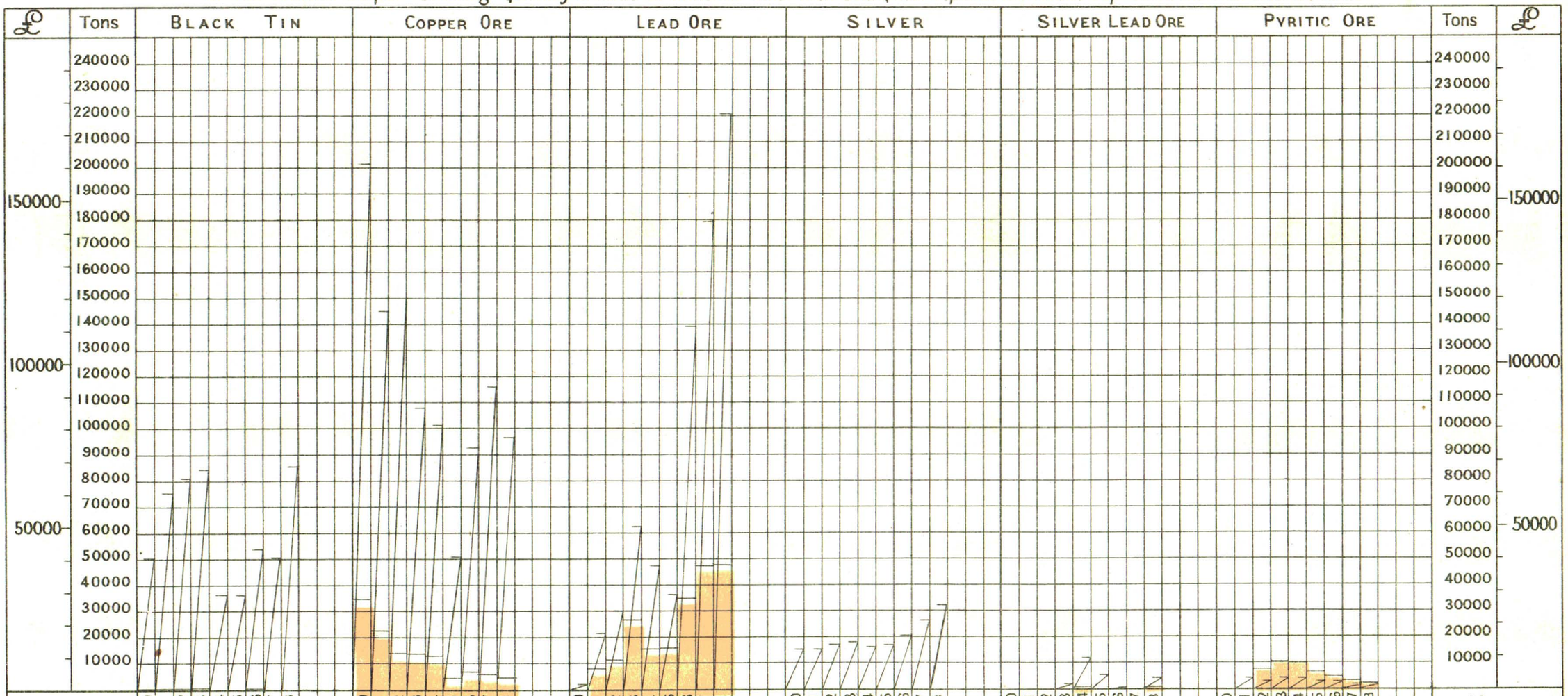
Fig 6.

Output of Gold in the States of Australia and the Dominion of New Zealand.



DIAGRAM

of the Mineral Output - showing Quantity & Value of Minerals other than Gold & Coal reported to the Mines Dept from the Year 1910 onwards



Year		1910	1911	1912	1913	1914	1915	1916	1917	1918
Value	£	40873	60702	65159	67717	29313	29064	43258	39192	78637
Quantity	Tons	471	560	554	601	332	339	435	307	395

Year		1910	1911	1912	1913	1914	1915	1916	1917	1918
Value	£	161606	116318	120158	86615	81241	40998	74376	93711	77527
Quantity	Tons	34352	22676	13607	13428	12775	4499	6697	6489	4983

Year		1910	1911	1912	1913	1914	1915	1916	1917	1918
Value	£	1777	17663	24412	50474	38351	29396	111642	144684	176330
Quantity	Tons	185	8195	11098	26589	15335	15678	34622	46865	47080

Year		1910	1911	1912	1913	1914	1915	1916	1917	1918
Value	£	12449	12317	13932	14752	13010	13793	16714	22872	25442
Quantity	Ozs	124486	118247	110352	118847	114379	130120	118677	124191	118748

Year		1910	1911	1912	1913	1914	1915	1916	1917	1918
Value	£	NIL	NIL	NIL	1757	9807	4429	554	NIL	3461
Quantity	Tons	NIL	NIL	NIL	125	715	299	68	NIL	237

Year		1910	1911	1912	1913	1914	1915	1916	1917	1918
Value	£	NIL	3529	2543	3658	3485	2368	2263	1752	1629
Quantity	Tons	NIL	9938	7626	10216	9759	6558	4409	3575	2252

NOTE. The Pink denotes Quantities produced and Diagonal lines Values thereof

Other Minerals not shewn above viz: Magnesite 105 Tons, Value £334 also reported in the year 1918.

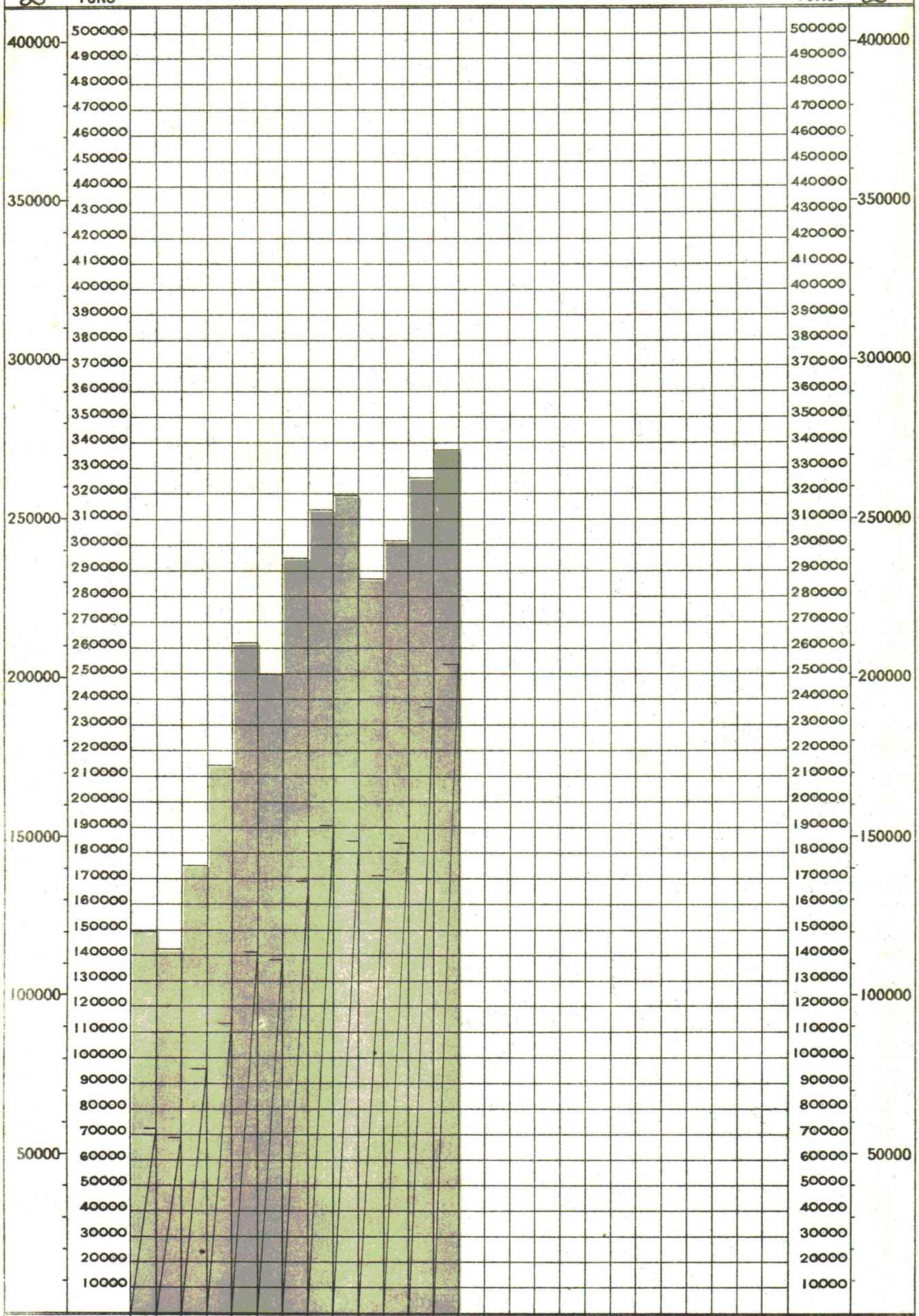
Previous to 1910 the Quantity & Value of various Minerals reported amounted to .....

Black Tin	11781 Tons	£	879138	Silver Lead	1224 Tons £ 10863
Copper	105041 "		688360	Tantalite	89 " 13486
Ironstone	57820 "		36695	Limestone	93706 " 18290
Lead	418 "		2034	Silver	951624 ozs 114386
Asbestos	43 "		1754		Total £ 1765006

1918.

DIAGRAM

Of the Coal Output – Shewing Quantity & Value as reported to Mines Dept from 1906 onwards



Year		1906	1907	1908	1909	1910	1911	1912	1913	1914	1915	1916	1917	1918
Value	£	57998	55158	75694	90965	113699	111154	135857	153614	148684	137589	147823	191822	204319
Quantity	Tons	149765	142373	175248	214302	262166	249890	295079	313818	319210	286666	301526	326550	337039

Year

£ Value

Tons Quantity

1918.

TABLE 5.

Gold Yield from Registered Gold Mining Companies and Gold Mining Leases for the Years 1915, 1916, 1917, AND 1918.

Goldfield.	REGISTERED COMPANIES PRODUCING OVER 12,000 OZS.								REGISTERED COMPANIES PRODUCING UNDER 12,000 OZS.								LEASES, EXCLUSIVE OF SUNDRY CLAIMS AND TREATMENTS.							
	1915.		1916.		1917.		1918.		1915.		1916.		1917.		1918.		1915.		1916.		1917.		1918.	
	No.	Fine ozs.	No.	Fine ozs.	No.	Fine ozs.	No.	Fine ozs.	No.	Fine ozs.	No.	Fine ozs.	No.	Fine ozs.	No.	Fine ozs.	No.	Fine ozs.	No.	Fine ozs.	No.	Fine ozs.	No.	Fine ozs.
Kimberley	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Pilbara	...	...	...	...	...	...	...	...	1	90	...	...	...	...	...	...	29	5,598	24	4,208	19	2,811	9	2,264
West Pilbara	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	1,168	3	508	3	249	2	81
Gascoyne	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	80	1	14	...	...	...	...
Peak Hill	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	13	1,747	12	1,601	9	1,328	9	921
East Murchison	2	36,364	1	18,362	1	14,591	...	...	8	8,830	8	11,154	5	8,302	6	19,967	36	7,393	33	8,440	35	6,703	25	6,676
Murchison	2	29,456	1	15,423	1	21,951	...	...	6	10,942	5	10,715	4	3,167	5	3,751	104	61,333	76	52,121	61	53,056	55	55,565
Yalgoo	...	...	...	...	...	...	...	...	3	4,801	3	3,705	1	1,788	1	311	23	3,222	24	3,397	19	3,696	15	3,718
Mt. Margaret	2	73,721	2	71,579	2	81,599	2	71,006	10	21,784	8	23,406	5	12,303	7	8,109	35	7,251	29	3,603	36	5,750	32	4,284
N. Coolgardie	2	35,348	1	14,134	1	12,531	1	12,845	5	2,180	6	13,029	5	11,053	7	13,502	64	12,609	42	12,584	31	7,019	22	7,449
Broad Arrow	1	14,531	1	12,674	...	...	...	...	1	405	...	...	1	9,398	1	287	24	5,715	23	6,888	22	6,048	14	2,739
N.E. Coolgardie	...	...	...	...	...	...	...	...	1	4,403	1	3,020	1	2,427	1	1,119	16	3,983	14	2,228	10	1,666	12	1,734
E. Coolgardie	9	603,851	9	524,189	9	508,073	10	482,906	15	24,828	12	18,673	14	14,880	11	4,019	25	33,132	28	27,409	29	26,290	27	28,532
Coolgardie	...	...	...	...	...	...	...	...	7	4,570	5	2,610	4	1,180	4	655	41	9,683	41	7,462	37	6,712	33	4,925
Yilgarn	2	59,100	2	54,647	2	45,197	2	34,203	11	16,886	10	18,212	...	19,208	8	24,789	49	7,995	46	9,417	38	9,393	31	7,884
Dundas	1	13,633	1	12,158	...	...	...	...	2	1,047	1	266	2	11,650	2	8,569	17	7,865	13	7,742	13	5,931	16	6,389
Phillips River	...	...	...	...	...	...	...	...	5	630	1	376	1	68	1	52	15	3,130	15	4,994	16	4,487	15	4,405
Total	21	866,004	18	723,166	16	683,942	15	600,960	75	101,396	60	105,166	50	95,424	54	85,130	496	171,904	424	152,616	378	141,139	317	137,565

TABLE 6.

Increase or Decrease in Output of certain producing Gold Mines in 1918, as compared with 1917.

Goldfield.	District.	Name of Mine.	Gold Production.		Increase or Decrease for Year compared with 1917.
			1917.	1918.	
			Fine ozs.	Fine ozs.	Fine ozs.
East Murchison ...	Lawlers	1. Waroonga G.M. Co., Ltd.	1,349·69	1,336·36	— 13·33
Do.	Wiluna	2. Moonlight leases	1,552·40	1,593·14	+ 40·74
Do.	do.	3. Western Machinery Co., Ltd.	4,802·36	5,189·79	+ 387·43
Do.	do.	4. Wiluna G.Ms., Ltd.	1,368·62	...	— 1,368·62
Do.	Black Range ...	5. Yuanmi G.Ms., Ltd. (Youanme)	14,590·77	13,304·65	— 1,286·12
Murchison ...	Cue	6. Big Bell	1,629·35	1,996·60	+ 367·25
Do.	do.	7. Light of Asia and Queen of the May leases ...	4,134·55	3,209·79	— 924·76
Do.	do.	8. Nigel	182·44	1,336·29	+ 1,153·85
Do.	do.	9. Turn of the Tide	1,032·50	572·40	— 460·10
Do.	Meekatharra ...	10. Commodore G.M. Co., N.L.	834·15	141·34	— 692·81
Do.	do.	11. Fenian leases	21,178·42	18,306·33	— 2,872·09
Do.	do.	12. Gwalia	1,275·77	5,694·13	+ 4,418·36
Do.	do.	13. Ingliston Consols Extended leases	14,831·89	14,255·58	— 576·31
Do.	do.	14. Ingliston leases	2,042·50	3,044·28	+ 1,001·78
Do.	Day Dawn ...	15. Black Range Pinnacles Co., N.L.	1,372·21	33·05	— 1,339·16
Do.	do.	16. Great Fingall Consolidated, Ltd.	21,951·05	3,540·51	— 18,410·54
Do.	Mt. Magnet ...	17. Empress leases	239·77	144·26	— 95·51
Do.	do.	18. Gift	33·01	1,654·59	+ 1,621·58
Yalgoo	...	19. Lake View: Paynes' Find Development Co., N.L.	1,787·61	310·58	— 1,477·03
Mt. Margaret ...	Mt. Morgans ...	20. Westralia Mt. Morgans Mines, N.L.	4,451·92	2,716·05	— 1,735·87
Do.	Mt. Malcolm ...	21. Sons of Gwalia, Ltd.	54,669·22	44,724·99	— 9,944·23
Do.	Mt. Margaret ...	22. Ida H. G.M. Co., Ltd.	7,652·39	4,916·37	— 2,736·02
Do.	do.	23. Lancefield G.Ms., Ltd.	26,929·64	26,281·30	— 648·34
North Coolgardie	Menzies	24. Gladsome leases	3,983·03	4,4 6·68	+ 443·65
Do.	do.	25. New Boddington G.M. Syndicate, Ltd. ...	3,298·59	1,940·20	— 1,358·39
Do.	do.	26. Sand Queen G.Ms., Ltd.	7,580·78	6,977·09	— 603·69
Do.	do.	27. Menzies Consolidated G.Ms., Ltd.	12,531·09	12,845·37	+ 314·28
Do.	Ularring	28. Riverina South G.M. Co., N.L.	66·63	3,764·37	+ 3,697·74
Do.	Niagara	29. Cosmopolitan No. 2: Western Machinery Co., Ltd.	86·63	305·85	+ 219·22
Broad Arrow ...	...	30. Associated Northern Blocks (W.A.), Ltd. ...	9,397·64	287·21	— 9,110·43
Do.	...	31. Oversight	329·03 *800·12	117·42 *414·19	— 597·54
North-East Coolgardie	Kanowna ...	32. North White Feather G.Ms., Ltd.	2,426·83	1,118·61	— 1,308·22
East Coolgardie ...	East Coolgardie...	33. Waterfall Gold Mine leases	4,435·22	2,486·75	— 1,948·47
Do.	do.	34. Associated G.Ms. of W.A., Ltd.	25,288·84	25,471·37	+ 182·53
Do.	do.	35. Associated Northern Blocks (W.A.), Ltd. ...	3,707·29	22,323·08	+ 18,615·79
Do.	do.	36. Golden Horseshoe Estates Co., Ltd.	95,654·11	77,104·39	— 18,5 9·72
Do.	do.	37. Great Boulder Perseverance G.M. Co., Ltd.	38,699·06	48,351·58	+ 9,652·52
Do.	do.	38. Great Boulder Proprietary G.Ms., Ltd. ...	125,412·19	113,322·78	— 12,089·41
Do.	do.	39. Idaho leases	7,181·97	8,756·65	+ 1,574·68
Do.	do.	40. Ironsides North leases	12,820·85	14,012·45	+ 1,191·60
Do.	do.	41. Ivanhoe Gold Corporation, Ltd.	91,349·26	81,392·34	— 9,956·92
Do.	do.	42. Kalgurli G.Ms., Ltd.	36,005·27	19,715·59	— 16,289·68
Do.	do.	43. Lake View and Star, Ltd.	44,254·41	40 348·63	— 3,905·78
Do.	do.	44. North Kalgurli (1912), Ltd.	843·13	411·90	— 431·23
Do.	do.	45. Oroya Links, Ltd.	23,065·16	25,081·31	+ 2,016·15
Do.	do.	46. South Kalgurli Consolidated, Ltd.	28,345·00	29,795·41	+ 1,450·41
Do.	do.	47. Adelaide Enterprise Prospecting Syndicate, N.L.	1,179·77	484·96	— 694·81
Do.	do.	48. Hannan's Reward, Ltd.	2,668·35	1,375·30	— 1,293·05
Coolgardie ...	Coolgardie ...	49. Burbanks Birthday G.Ms., Ltd.	398·88	451·91	+ 53·03
Do.	do.	50. Hidden Secret North leases	544·47	382·51	— 161·96
Do.	Kunanalling ...	51. Carbine leases	1,841·52	1,124·81	— 716·71
Yilgarn	...	52. Bullfinch Proprietary (W.A.), Ltd.	14,351·91	14,181·10	— 170·81
Do.	...	53. Great Victoria leases	1,926·22	2,635·30	+ 709·08
Do.	...	54. Edna May Battler G.M. Co., N.L.	915·44	481·98	— 433·46
Do.	...	55. Edna May Central G.M. Co., N.L.	11,141·59	9,785·84	— 1,355·75
Do.	...	56. Edna May Consolidated G.M. Co., N.L. ...	2,322·08	6,277·49	+ 3,955·41
Do.	...	57. Edna May Deep Levels G.M. Co., N.L. ...	6,894·71	7,928·65	+ 1,033·94
Do.	...	58. Edna May G.M. Co., N.L.	30,845·56	20,021·79	— 10,823·77
Do.	...	59. Transvaal leases	...	1,498·32	+ 1,498·32
Dundas	...	60. Mararoa G.M. Co., N.L.	11,393·25	8,542·38	— 2,850·87
Do.	...	61. Viking No. 1 leases	3,438·93	2,854·44	— 584·49
Phillips River ...	...	62. Fair Play leases	402·73	1,415·63	+ 1,012·90
Do.	...	63. Gem Consolidated leases	1,274·80	1,082·55	— 192·25

* Dollied.

TABLE 7.

Averages of Gold Ore raised and treated, and Gold produced therefrom, per man employed on the several Goldfields of the State, during 1917 and 1918.

Goldfield.	1917.				1918.			
	Tons of Gold Ore raised and treated.		Fine Ounces of Gold produced therefrom.		Tons of Gold Ore raised and treated.		Fine Ounces of Gold produced therefrom.	
	Per man employed under ground.	Per man employed above and under ground.	Per man employed under ground.	Per man employed above and under ground.	Per man employed under ground.	Per man employed above and under ground.	Per man employed under ground.	Per man employed above and under ground.
	tons.	tons.	fine ozs.	fine ozs.	tons.	tons.	fine ozs.	fine. ozs.
1. Kimberley	...	...	...	...	...	...	...	...
2. Pilbara	40·17	18·54	86·53	39·94	38·33	22·16	99·51	57·53
3. West Pilbara	59·83	39·89	41·10	27·40	17·50	8·75	40·79	20·40
4. Ashburton	...	...	...	...	...	...	...	...
5. Gascoyne	...	...	...	...	...	...	...	...
6. Peak Hill	205·95	102·98	170·28	85·14	140·90	70·45	103·08	51·54
7. East Murchison	301·95	150·97	166·65	83·33	339·57	168·16	186·14	92·18
8. Murchison...	232·15	133·35	133·77	76·84	215·45	122·43	149·89	85·18
9. Yalgoo	84·07	45·95	64·38	35·19	106·15	56·26	82·90	43·94
10. Mt. Margaret	509·35	280·51	199·95	110·12	464·72	261·23	170·93	96·09
11. North Coolgardie ...	180·56	97·42	115·60	62·37	217·86	113·16	144·00	74·80
12. Broad Arrow	165·80	101·59	107·79	66·05	39·87	24·17	22·32	13·80
13. North-East Coolgardie ...	124·15	67·08	87·99	47·54	150·47	82·07	86·43	47·15
14. East Coolgardie	584·66	324·01	271·11	150·28	550·49	305·22	274·71	152·32
15. Coolgardie	144·24	62·06	87·01	37·44	110·95	46·79	78·26	330·05
16. Yilgarn	298·26	194·17	148·75	96·84	298·80	177·72	140·97	83·85
17. Dundas	398·86	225·67	203·09	114·91	391·45	225·72	189·25	109·13
18. Phillips River	94·48	57·43	152·73	92·83	111·77	75·45	165·87	111·96
Total Averages ...	411·51	229·86	198·79	111·04	402·51	223·28	202·17	112·15

The average value of gold produced per man employed above and below ground was £471·67 in 1917, and £476·38 in 1918. The average tonnage of ore raised shows a decrease from 229·86 tons to 223·28 tons. The average tonnage raised per man is again highest in the East Coolgardie Field, viz., 305·22 tons, average value £647·01, the next being Mt. Margaret Field, with 261·23 tons, average value £408·16.

TABLE 8.

Output of Gold from the Several States of Australia, the Northern Territory, the Territory of Papua, and the Dominion of New Zealand during 1918.

State.	Output of Gold.	Value.	Percentage of total Output of Australasia.
	Fine ozs.	£	
1. Western Australia	876,511	3,723,183	59·85
2. Victoria	158,827	674,655	10·85
3. Queensland	133,571	567,371	9·12
4. New South Wales	87,045	369,743	5·94
5. Tasmania	10,529	44,724	·72
6. South Australia	6,180	26,252	·42
7. Northern Territory	527	2,238	·04
8. Territory of Papua	7,081	30,077	·48
9. New Zealand	184,251	782,650	12·58
Total	1,464,522	6,220,893	100·00

TABLE 9.

Dividends paid by Western Australian Gold Mining Companies during 1918 and Total to date.

(Compiled from information supplied by the Government Statistician's Office and the Chamber of Mines of W.A., Kalgoorlie.)

Goldfield.	Name of Company.	Capital.				Dividends.		
		Authorised.	No. of Shares.	Par Value Shares.	Paid up to.	Paid in 1918.		Grand Total paid to end of 1918.
						No.	Total Amount.	
		£		£ s. d.	£ s. d.		£	£
Peak Hill	Various Companies	...	...	...	...	...	...	160,666
East Murchison	Various Companies	...	...	...	...	...	...	437,968
Murchison	Various Companies	...	...	...	...	...	...	1,835,170
Mt. Margaret	Various Companies	...	...	...	...	...	...	1,431,576
North Coolgardie	Various Companies	...	...	...	...	...	...	575,032
North-East Coolgardie	Various Companies	...	...	...	...	...	...	82,971
East Coolgardie	Golden Horseshoe Estates Co., Ltd.	1,500,000	300,000	5 0 0	5 0 0	1	37,500	3,412,500
Do.	Great Boulder Proprietary G.Ms., Ltd. ...	175,000	1,750,000	0 2 0	0 2 0	3	196,875	5,466,175
Do.	Ivanhoe Gold Corporation, Ltd.	1,000,000	200,000	5 0 0	5 0 0	4	85,000	3,718,750
Do.	Kalgurlie G.Ms., Ltd.	120,000	120,000	1 0 0	1 0 0	1	12,000	1,627,500
Do.	Other Companies	...	...	...	...	...	...	7,216,828
Coolgardie	Various Companies	...	...	...	...	...	...	339,495
Yilgarn	Edna May Consolidated G.M. Co., N.L.	32,500	65,000	0 10 0	0 10 0	2	3,000	3,000
Do.	Edna May Deep Levels G.M. Co., N.L.	75,000	100,000	0 15 0	0 15 0	5	12,500	12,500
Do.	Edna May G.M. Co., N.L.	25,000	42,850	0 10 0	0 10 0	6	21,420	310,655
Do.	Other Companies	...	...	...	...	...	...	161,134
Dundas	Various Companies	...	...	...	...	...	...	294,500
	Total Dividends paid during 1918 ...	...	...	...	...	...	368,295	...
	Total Dividends paid to end of 1918 ...	...	...	...	...	...	...	£27,086,420

TABLE 10.

Value of Gold Production and Percentage of Dividends paid.

Year.	Value of Gold Production.	Dividends paid by Gold Mining Companies.	Dividends % of Total Production.	Value of Gold Production by Gold Mining Companies only.	Dividends % upon Production by Gold Mining Companies.
	£	£	%	£	%
Prior to 1908 ...	78,004,408	17,476,499	22·40	5,722,273	30·37
1908	6,999,882	1,487,303	21·24	5,503,784	27·01
1909	6,776,274	1,359,088	20·05	5,398,725	25·17
1910	6,246,848	1,028,393	16·46	4,815,541	21·36
1911	5,823,075	826,976	14·20	4,628,666	17·87
1912	5,448,385	814,092	14·94	4,304,161	18·91
1913	5,581,701	910,326	16·30	4,528,106	20·10
1914	5,237,353	799,392	15·26	4,094,336	19·52
1915	5,140,228	792,317	15·41	4,109,254	19·28
1916	4,508,532	632,883	14·04	3,518,531	17·99
1917	4,121,645	590,856	14·34	3,310,536	17·85
1918	3,723,183	368,295	9·81	2,914,325	12·64
Total ...	137,611,514	27,086,420	19·68	*52,848,238	*21·47

* Twelve last years only.

TABLE 11.

Quantity and Value of Minerals, other than Gold and Coal, reported to the Mines Department during 1918.

Goldfield, District, or Mineral Field.	1918.		Increase or Decrease for Year compared with 1917.	
	Quantity.	Value.	Quantity.	Value.
	tons.	£	tons.	£
BLACK TIN.				
Pilbara Goldfield (Marble Bar District)	99·50	20,984	+ 30·45	+ 11,720
Greenbushes Mineral Field	295·80	57,653	+ 57·88	+ 27,725
Total	395·30	78,637	+ 88·33	+ 39,445
TANTALITE.				
Pilbara Goldfield	...	...	— 12·50	— 1,782
PYRITIC ORE.				
Mt. Margaret Goldfield (Mt. Morgans District)	2,251·81	1,629	— 1,323·65	— 123
COPPER ORE.				
West Pilbara Goldfield	1,844·19	28,961	+ 1,060·58	+ 15,555
Ashburton Goldfield	...	...	— 3·71	— 67
Peak Hill Goldfield	76·28	2,480	— 211·56	— 7,203
East Murchison Goldfield	82·44	1,314	+ 7·44	— 209
Murchison Goldfield	78·34	1,794	— 4·58	— 370
Phillips River Goldfield	2,901·66	42,978	— 2,353·91	— 23,890
Total	4,982·91	77,527	— 1,505·74	— 16,184
SILVER LEAD ORE.				
Ashburton Goldfield	237·48	3,461	+ 237·48	+ 3,461
LEAD ORE.				
West Pilbara Goldfield	...	...	— 62·57	— 759
Northampton Mineral Field	47,079·68	176,330	+ 277·71	+ 32,405
Total	47,079·68	176,330	+ 215·14	+ 31,646
MAGNESITE.				
East Coolgardie Goldfield	105·25	334	+ 84·75	+ 313

The output of Black Tin shows increases in tonnage of 88.33 tons, and in value of £39,445. There was no output of Tantalite, whilst in the previous year 12.50 tons, valued at £1,782, was reported. In Pyritic Ore, there was a decrease of 1,323.65 tons, and in value of £123. In Copper Ore there was a decrease in tonnage of 1,505.74 tons, and in value of £16,184. The output of Silver Lead Ore was 287.48 tons of a value of £3,461, there being none in the previous year. Lead Ore increased in tonnage by 215.14 tons, and in value £31,646, while Magnesite shows increases in tonnage of 84.75, and in value of £313.

The production of Tin was again confined to Pilbara and Greenbushes Fields, while Copper Ore came from West Pilbara, Peak Hill, East Murchison, Murchison, and Phillips River Fields. Pyritic Ore came from Mount Margaret Goldfield. The production of Lead Ore was confined to Northampton Mineral Field, and of Silver Lead Ore to Ashburton Goldfield, while Magnesite came from East Coolgardie Goldfield.

It will be observed that the figures in this table differ from those in Table 1. The figures above are those reported to the Department, and this table is published as an index to the amount of mining in each field named.

TABLE 12.

Quantity of Coal raised during 1917 and 1918, and estimated Value thereof, with Number of Men employed, and Output per Man.

Coalfield.	Year.	Quantity raised.	Estimated Value.	Men employed.		Quantity raised.	
				Above ground.	Under-ground.	Per Man employed under-ground.	Per Man employed above and under-ground.
		tons.	£			tons.	tons.
Collie	1917	326,550	191,822	140	431	758	572
	1918	**337,039**	**204,319**	**154**	**464**	**726**	**545**

The number of men employed at Collieries has increased by 47, and the output increased by 10,489 tons.

PART III.—LEASES AND OTHER HOLDINGS UNDER THE VARIOUS ACTS RELATING TO MINING.

TABLE 13.

Total Number and Acreage of Leases held for Mining on 31st December, 1917 and 1918.

Description of Leases.	1917.		1918.	
	No.	Acreage.	No.	Acreage.
Gold mining leases on Crown land	1,027	15,089	**847**	**12,448**
„ „ „ private property	...	...	...	...
Mineral leases on Crown land	256	37,981	**284**	**38,282**
„ „ private property	3	120	**4**	**132**
	1,286	53,190	**1,135**	**50,862**

The total number of leases held for mining decreased by 151 and the area by 2,328 acres, as compared with 1917. Leases for gold mining decreased by 180 and in area by 2,641 acres. The number of mineral leases increased by 29 and the area by 313 acres.

TABLE 14.

Number and Acreage of Gold-mining Leases in force each year for the Five Years ending the 31st December, 1918.

Goldfields.		Districts.		1914.		1915.		1916.		1917.		1918.		Percentage of Total Acreage.		Increase or Decrease for 1918 compared with 1917.		Goldfields.
Name.	Proclaimed.	Name.	Proclaimed.	Leases.	Acreage.	Leases.	Acreage.	Leases.	Acreage.	Leases.	Acreage.	Leases.	Acreage.	1917.	1918.	Increase.	Decrease.	
Kimberley ...	20–5–86	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	Kimberley.
Yilgarn	1–10–88	...	...	153	2,932	218	4,381	153	2,985	144	2,702	98	1,742	17·91	13·99	...	960	Yilgarn.
Pilbara	1–10–88	Marble Bar ...	6–11–96	26	265	24	223	18	169	17	169	13	115	1·64	1·30	...	84	Pilbara.
		Nullagine ...	6–11–96	18	149	10	89	10	90	8	78	5	48					
Ashburton ...	11–12–90	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	Ashburton.
Murchison ...	24–9–91	Cue	7–12–94	29	321	24	242	29	323	46	539	30	378	13·45	13·39	...	373	Murchison.
		Meekatharra ...	7–12–94	94	1,227	98	1,317	80	1,052	60	819	56	713					
		Day Dawn ...	10–1–96	44	477	46	507	40	428	38	398	36	377					
		Mount Magnet ...	7–12–94	42	381	45	485	35	321	28	274	21	189					
Dundas	31–8–93	...	...	50	596	43	543	38	465	47	521	41	423	3·45	3·39	...	98	Dundas.
Coolgardie ...	6–4–94	Coolgardie ...	7–12–94	55	758	78	1,132	44	517	40	519	41	594	5·14	6·20	...	2	Coolgardie.
		Kunanalling ...	1–9–97	17	221	14	179	19	239	20	256	15	179					
East Coolgardie ...	1–10–94	East Coolgardie	7–12–94	155	2,140	149	2,028	153	2,186	157	2,269	129	1,836	15·24	15·51	...	368	East Coolgardie.
		Bulong	15–4–96	14	241	7	126	7	120	2	30	5	95					
Yalgoo	23–1–95	...	...	50	753	77	1,295	59	917	34	506	32	484	3·35	3·88	...	22	Yalgoo.
North Coolgardie...	28–6–95	Menzies	15–4–96	50	730	42	609	49	752	42	582	37	522	6·44	6·69	...	139	North Coolgardie.
		Ularring	15–4–96	21	299	21	232	23	250	18	198	16	167					
		Yerilla	15–4–96	29	400	26	401	24	356	5	84	4	72					
		Niagara	1–4–97	14	197	8	95	11	155	7	108	5	72					
East Murchison ...	28–6–95	Lawlers	1–7–04	20	233	21	235	29	339	24	283	16	193	8·62	7·70	...	341	East Murchison.
		Black Range ...	1–7–04	99	1,337	62	787	44	597	36	493	22	365					
		Wiluna	1–3–10	32	535	23	365	27	437	31	524	24	401					
North-East Coolgardie	15–4–96	Kanowna ...	15–4–96	31	381	25	313	34	512	20	275	19	268	2·03	2·31	...	19	N.E. Coolgardie.
		Kurnalpi ...	15–4–96	5	47	4	42	4	38	3	32	2	20					
Broad Arrow ...	20–11–96	...	...	43	610	44	651	39	591	30	453	23	507	3·00	4·07	54	...	Broad Arrow.
Peak Hill ...	1–4–97	...	...	14	159	15	156	14	144	13	123	11	87	·81	·69	...	36	Peak Hill.
Mount Margaret ...	1–4–97	Mount Margaret	1–4–97	70	1,197	75	1,303	65	1,074	52	941	47	815	17·47	19·24	...	241	Mount Margaret.
		Mount Malcolm...	1–4–97	79	1,462	65	1,290	66	1,287	66	1,311	64	1,265					
		Mount Morgans...	2–4–02	8	158	18	286	9	167	24	384	19	315					
West Pilbara ...	1–11–95	Crown Lands ...	...	4	42	3	36	3	42	3	36	2	12	·24	·09	...	24	West Pilbara.
Do. ...	...	Private Property	...	1	6	...	...	...	...	...	...	...	...	...	...	...	...	Do.
Phillips River ...	14–9–00	...	...	12	186	12	185	11	176	11	176	13	182	1·17	1·46	6	...	Phillips River.
Other Localities ...	...	...	...	...	...	...	...	...	...	...	...	1	12	...	...	12	...	Other Localities.
Gascoyne	15–4–97	...	...	...	...	4	28	2	16	1	6	...	...	·04	·09	...	6	Gascoyne.
Totals ...	...	... ...	...	1,282	18,440	1,301	19,561	1,139	16,745	1,027	15,089	847	12,448	100·00	100·00	72	2,713	

Decrease for 1918: Leases 180, acres 2,641. Taking all the Goldfields, the largest percentage of the area leased for Gold Mining is in the Margaret Goldfield, viz., 19·24; then East Coolgardie, Yilgarn, Murchison, East Murchison, and North Coolgardie, with percentages of 15·51, 13·99, 13·39, 7·70 and 6·69 respectively.

TABLE 15.

Number and Acreage of Mineral Leases in force 31st December each year, for the Five Years ending 31st December, 1918.

Mining Districts.		Sub-Districts.		1914.		1915.		1916.		1917.		1918.		Increase or Decrease for 1918, compared with 1917.		Mining Districts.
Name.	Proclaimed.	Name.	Proclaimed.	Leases.	Acreage.	Leases.	Acreage.	Leases.	Acreage.	Leases.	Acreage.	Leases.	Acreage.	Increase.	Decrease	
Ashburton	11–12–90	...	...	5	69	8	177	6	79	6	79	5	69	...	10	Ashburton.
Murchison	24–9–91	Cue	7–12–94	6	163	4	96	1	18	...	...	2	63	39	...	Murchison.
		Meekatharra ...	7–12–94	...	...	...	...	1	12	1	24	...	...			
		Day Dawn ...	10–1–96	1	6	1	6	1	6	1	6	1	6			
		Mt. Magnet ...	7–12–94	...	...	...	...	...	...	...	...	...	...			
Greenbushes ...	7–4–92	...	...	44	627	39	574	35	522	33	492	51	644	152	...	Greenbushes.
Pilbara	16–6–92	Marble Bar ...	16–6–92	8	205	7	127	8	145	8	145	11	259	168	...	Pilbara.
		Nullagine ...	6–11–96	...	...	...	...	...	...	...	...	2	54			
Yalgoo	23–1–95	...	...	11	256	4	84	6	144	11	318	11	282	...	36	Yalgoo.
Yilgarn	22–3–95	...	...	2	15	1	3	...	...	1	48	...	...	...	48	Yilgarn.
Coolgardie	22–3–95	Coolgardie ...	22–3–95	...	...	1	9	1	9	1	9	1	10	1	...	Coolgardie.
		Kunanalling ...	1–9–97	...	...	...	...	...	...	...	...	...	...			
East Coolgardie ...	22–3–95	East Coolgardie	22–3–95	5	23	4	19	3	13	3	13	3	13	...	...	East Coolgardie.
		Bulong	15–4–96	...	...	...	...	...	...	...	...	...	...			
East Murchison ...	28–6–95	Lawlers	17–4–04	...	...	1	24	1	24	1	10	1	10	6	...	East Murchison.
		Black Range ...	1–7–04	2	6	...	...	...	...	...	...	1	6			
		Wiluna	1–3–10	...	...	1	10	1	10	...	...	...	...			
North Coolgardie ...	16–8–95	Menzies	15–4–96	...	...	...	...	...	...	...	...	...	...	...	...	North Coolgardie.
		Ularring	15–4–96	...	...	...	...	...	...	...	...	...	...			
		Yerilla	15–4–96	...	...	...	...	...	...	...	...	...	...			
		Niagara	1–3–97	...	...	...	...	...	...	...	...	...	...			
West Pilbara ...	1–11–95	...	...	16	570	12	470	19	642	17	606	15	550	...	56	West Pilbara.
Dundas	27–12–95	...	...	1	48	1	48	...	...	...	...	...	...	...	...	Dundas.
Collie	21–2–96	...	...	91	28,057	97	29,897	100	30,602	113	34,647	114	34,661	14	...	Collie.
North-East Coolgardie	15–4–96	Kanowna ...	15–4–96	...	...	...	...	...	...	...	...	7	145	145	...	North-East Coolgardie.
		Kurnalpi ...	15–4–96	...	...	...	...	...	...	...	...	...	...			
Broad Arrow ...	20–11–96	...	...	...	...	...	...	1	20	1	20	...	...	...	20	Broad Arrow.
Northampton ...	1–1–97	Crown Lands ...	...	10	157	8	107	8	97	6	124	14	315	203	...	Northampton.
		Private Property	...	2	68	2	68	1	48	2	72	3	84			
Peak Hill	1–4–97	...	...	24	550	9	255	11	300	15	351	9	225	...	126	Peak Hill.
Mt. Margaret ...	1–4–97	Mt. Margaret ...	1–4–97	...	...	...	...	...	...	...	...	...	...	48	...	Mt. Margaret.
		Mt. Malcolm ...	1–4–97	1	48	...	...	...	...	...	...	1	48			
		Mt. Morgans ...	2–4–02	6	134	6	134	4	74	4	74	4	74			
Gascoyne	15–4–97	...	...	...	...	...	...	...	...	...	...	...	...	...	...	Gascoyne.
Yandanooka ...	1–12–97	Crown Lands ...	...	...	...	...	...	...	...	...	...	1	10	10	...	Yandanooka.
		Private Property...	...	...	...	...	...	...	...	...	...	...	...			
Phillips River ...	1–7–99	...	...	23	559	13	407	15	409	18	443	18	447	4	...	Phillips River.
Other localities ...	...	Crown Lands ...	...	14	519	11	428	13	544	16	572	12	391	...	181	Other Localities.
		Private Property	...	...	...	...	...	1	48	1	48	1	48			
Totals ...	...	...	...	272	32,080	230	32,943	237	33,766	259	38,101	288	38,414	790	477	

Increase for 1918: Leases 29, acres 313. In the Collie Mineral Field the largest area is held, *viz.*, 34,661 acres worked entirely for coal; then follow Greenbushes, 644 acres, for tin; West Pilbara, 550 acres, and Phillips River, 447 acres, for copper; Northampton, 399 acres, for lead, and Pilbara, 313 acres, for tin, asbestos, and scheelite proportionately.

Table 16.

Number and Acreage of Mineral Leases in force on 31st December, 1918, showing Minerals for which they are worked.

Goldfield or Mineral Field.	District.	Minerals.																	
		Coal.		Tin.		Copper.		Iron.		Clay.		Limestone.		Wolfram.		Silver and Lead.		Asbestos.	
		Leases.	Acres.	Leases.	Acres.	Leases.	Acres.	Leases.	Acres.	Leases.	Acres.	Leases.	Acres.	Leases.	Acres.	Leases.	Acres.	Leases.	Acres.
Pilbara	Marble Bar ...	...	...	6	125	...	...	...	...	...	...	...	...	...	...	...	...	2	96
	Nullagine	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	54
West Pilbara	... ...	...	...	...	...	14	540	...	...	...	...	1	10	...	...	...	...	...	...
Ashburton	... ...	...	...	...	...	1	24	...	...	...	...	...	...	...	...	3	35	...	...
Peak Hill	... ...	...	...	...	...	9	225	...	...	...	...	...	...	...	...	...	...	...	...
East Murchison	Lawlers	...	...	...	...	1	10	...	...	...	...	...	...	...	...	...	...	...	...
	Black Range ...	...	...	...	...	...	...	...	...	...	...	1	6	...	...	...	...	...	...
Murchison	Day Dawn ...	...	...	...	...	...	...	...	...	1	6	...	...	...	...	...	...	...	...
	Cue	...	...	...	...	2	63	...	...	...	...	...	...	...	...	...	...	...	...
	Yandanooka ...	...	...	...	...	1	10	...	...	...	...	...	...	...	...	...	...	...	...
Yalgoo	... ...	...	...	...	...	...	...	...	...	...	...	...	...	4	120	...	...	...	...
Mt. Margaret	Mt. Malcolm ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Mt. Morgans ...	...	...	...	...	3	69	...	...	...	...	1	5	...	...	...	...	...	...
East Coolgardie	East Coolgardie ...	...	...	...	...	...	...	...	...	3	13	...	...	...	...	...	...	...	...
Coolgardie...	Coolgardie	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
North-East Coolgardie ...	Kanowna	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Phillips River	... ...	...	...	...	...	18	447	...	...	...	...	...	...	...	...	...	...	...	...
Collie	... ...	114	34,661	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Greenbushes	... ...	...	...	51	644	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Northampton	... ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Northampton	(Private Property)	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Northam	(Private Property)	...	...	...	...	...	...	1	48	...	...	...	...	...	...	...	...	...	...
Outside Proclaimed Fields	... ...	...	...	...	...	1	36	...	...	...	...	...	...	...	...	...	...	...	...
Totals		114	34,661	57	769	50	1,424	1	48	4	19	3	21	4	120	3	35	4	150

Goldfield or Mineral Field.	District.	Minerals.														Total No. of Leases.	Total Acreage.
		Tantalite.		Lead.		Scheelite.		Graphite.		Molybdenite.		Mica.		Potash.			
		Leases.	Acres.	Leases.	Acres.	Leases.	Acres.	Leases.	Acres.	Leases.	Acres.	Leases.	Acres.	Leases.	Acres.	Leases.	Acres.
Pilbara	Marble Bar ...	2	20	...	...	1	18	...	...	...	...	...	...	...	...	11	259
	Nullagine	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	54
West Pilbara	... ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	15	550
Ashburton	... ...	...	...	1	10	...	...	...	...	...	...	...	...	...	...	5	69
Peak Hill	... ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	9	225
East Murchison	Lawlers	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	10
	Black Range ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	6
Murchison	Day Dawn ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	6
	Cue	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	63
	Yandanooka ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	10
Yalgoo	... ...	...	...	...	...	...	...	...	...	7	162	...	...	...	...	11	282
Mt. Margaret	Mt. Malcolm ...	...	...	...	...	...	...	...	...	1	48	...	...	...	...	1	48
	Mt. Morgans ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	74
East Coolgardie	East Coolgardie ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	13
Coolgardie	Coolgardie	...	...	...	...	...	...	...	...	...	...	1	10	...	...	1	10
North-East Coolgardie ...	Kanowna	...	...	...	...	...	...	...	...	...	...	...	...	7	145	7	145
Phillips River	... ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	18	447
Collie	... ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	114	34,661
Greenbushes	... ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	51	644
Northampton	... ...	...	...	14	315	...	...	...	...	...	...	...	...	...	...	14	315
Northampton	(Private Property)	...	...	3	84	...	...	...	...	...	...	...	...	...	...	3	84
Northam	(Private Property)	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	48
Outside Proclaimed Fields	... ...	...	...	...	...	...	...	10	307	1	48	...	...	...	...	12	391
Totals		2	20	18	409	1	18	10	307	9	258	1	10	7	145	288	38,414

TABLE 17.

Number and Acreage of Miscellaneous Leases in force from 31st December, 1918.

Goldfield.	District.	Leases.										Total.	
		Tailings.		Tramway.		Water.		Machinery.		Residence.			
		No.	Acres.	No.	Acres.	No.	Acres.	No.	Acres.	No.	Acres.	No.	Acres.
Yalgoo	... ...	...	...	...	...	...	...	1	24	...	...	1	24
West Pilbara	... ...	...	...	2	25	...	...	...	...	...	...	2	25
East Murchison	Black Range	2	36	...	...	...	...	...	...	1	2	3	38
Murchison	Meekatharra	1	10	...	...	...	...	...	...	...	...	1	10
	Day Dawn	...	...	...	...	...	...	...	...	1	1	1	1
Mt. Margaret	Mt. Margaret	1	22	...	...	...	...	...	...	...	...	1	22
North Coolgardie	Menzies	1	12	...	...	2	6	...	...	...	...	3	18
East Coolgardie	East Coolgardie ...	19	379	...	...	2	47	3	21	1	2	25	449
Coolgardie	Coolgardie	...	...	...	...	1	13	...	...	...	...	1	13
Phillips River	... ...	...	...	2	3	...	...	...	...	...	...	2	3
	Total	24	459	4	28	5	66	4	45	3	5	40	603

TABLE 18.

Claims and Authorised Holdings, under "The Mining Act, 1904," and Regulations, existing on 31st December, 1917 and 1918.

Goldfield or Mineral Field.	District.	Prospecting Areas.				Water Rights.				Lode Claims.		Alluvial Claims.		Mineral Claims.	
		Number.		Acreage.		Number.		Acreage.							
		1917.	1918.	1917.	1918.	1917.	1918.	1917.	1918.	1917.	1918.	1917.	1918.	1917.	1918.
Northampton	... ...	5	18	43	271	...	...	...	...	...	...	...	...	...	...
Pilbara	Marble Bar ...	7	6	93	75	3	2	3	2	2	2	3	4	...	...
Do.	Nullagine	5	2	69	24	2	2	13	13	8	4	...	...	...	...
West Pilbara	... ...	9	1	147	9	1	2	2	7	...	...	...	...	...	...
Ashburton	... ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Peak Hill	... ...	12	6	183	137	5	5	18	18	1	...	...	...	...	...
East Murchison	Lawlers	9	9	119	126	10	...	15	...	...	1	...	...	...	...
Do.	Wiluna	12	11	183	183	6	7	10	12	1	...	...	...	...	...
Do.	Black Range ...	10	8	135	101	2	1	6	1	...	...	1	1	...	...
Murchison	Cue	27	11	330	136	4	3	14	13	2	...	1	...	...	...
Do.	Meekatharra ...	20	21	233	244	1	1	1	1	...	...	...	...	...	...
Do.	Day Dawn ...	9	6	105	70	14	13	35	34	...	...	...	...	...	...
Do.	Mt. Magnet ...	14	23	177	276	3	3	3	3	...	...	...	...	...	...
Yalgoo	... ...	26	32	393	475	...	...	...	...	...	...	...	...	...	...
Mt. Margaret	Mt. Morgans ...	14	7	210	93	9	8	12	11	...	...	...	...	...	...
Do.	Mt. Malcolm ...	17	13	221	196	25	25	192	192	...	...	...	...	...	...
Do.	Mt. Margaret ...	18	16	211	213	25	24	59	55	...	...	...	...	...	...
North Coolgardie	Menzies	15	19	211	240	6	6	20	20	...	...	...	...	...	...
Do.	Ularring	7	8	74	92	2	3	2	3	...	...	...	...	...	...
Do.	Niagara	7	5	93	66	4	2	5	2	1	...	...	...	...	...
Do.	Yerilla	4	6	51	78	5	5	7	7	...	...	...	...	...	...
Broad Arrow	... ...	29	47	372	666	3	11	8	27	...	...	...	...	...	...
N.E. Coolgardie	Kanowna	10	10	117	149	3	1	5	3	3	3	...	...	...	1
Do.	Kurnalpi	2	3	15	20	...	...	...	...	...	...	...	...	...	...
East Coolgardie	East Coolgardie ...	47	55	707	800	9	9	31	31	9	7	2	2	...	...
Do.	Bulong	2	...	36	...	...	...	...	...	2	2	...	...	1	2
Coolgardie	Coolgardie	33	56	434	880	9	11	34	37	1	1	...	...	...	...
Do.	Kunanalling ...	8	7	128	102	8	8	44	44	...	...	...	...	...	...
Yilgarn	... ...	134	41	1,619	670	2	2	3	3	...	...	...	...	...	...
Dundas	... ...	6	21	47	251	15	12	90	74	2	2	...	...	...	...
Phillips River	... ...	17	13	262	213	2	2	22	22	...	...	...	...	...	...
Collie	... ...	...	1	...	3,000	...	...	...	...	...	...	...	...	...	...
Greenbushes	... ...	...	4	...	33	9	11	29	43	5	...	26	...	...	...
Gascoyne	... ...	...	...	...	...	...	...	...	...	...	6	...	32	...	...
Outside Proclaimed Fields ...	... ...	25	13	8,782	6,474	...	...	...	...	...	...	...	...	...	1
	Totals	560	499	15,800	16,363	187	179	683	678	37	28	33	39	1	4
Increase or Decrease for 1918 compared with 1917		— 61		+ 563		— 8		— 5		—9		+ 6		+ 3	

Goldfield or Mineral Field.	District.	Dredging Claims.		Residence Areas.		Business Areas.		Machinery Areas.		Tailings Areas.		Garden Areas.		Washing Areas.	
		1917.	1918.	1917.	1918.	1917.	1918.	1917.	1918.	1917.	1918.	1917.	1918.	1917.	1918.
Northampton	... ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Pilbara	Marble Bar ...	...	...	1	1	7	6	2	2	1	1	5	4	...	...
Do.	Nullagine	3	3	3	4	2	2	1	1	...	...	4	4	...	...
West Pilbara	... ...	...	...	6	4	16	15	2	1	...	...	3	3	...	...
Ashburton	... ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Peak Hill	... ...	...	...	3	...	...	...	4	3	2	2	...	...	...	...
East Murchison	Lawlers	...	...	1	...	...	...	3	...	7	...	1	1	...	...
Do.	Wiluna	...	...	...	...	...	...	...	...	...	...	3	3	...	...
Do.	Black Range ...	...	...	77	61	2	2	3	2	1	...	8	8	...	...
Murchison	Cue	...	...	6	6	3	3	...	...	...	...	1	1	...	...
Do.	Meekatharra ...	...	...	4	5	...	6	2	2	2	3	1	1	...	...
Do.	Day Dawn ...	...	...	9	9	14	4	...	...	...	...	2	2	...	...
Do.	Mt. Magnet ...	...	...	1	1	1	2	2	2	1	1	7	7	...	...
Yalgoo	... ...	...	...	4	4	16	14	3	4	...	...	...	...	...	...
Mt. Margaret	Mt. Morgans ...	...	...	...	...	...	...	4	4	1	1	6	6	...	...
Do.	Mt. Malcolm ...	...	...	1	...	5	4	...	...	4	3	11	14	...	...
Do.	Mt. Margaret ...	...	...	8	7	14	12	5	4	1	1	9	8	...	...
North Coolgardie	Menzies	...	...	28	21	11	10	3	3	4	6	7	6	...	...
Do.	Ularring	...	...	...	2	5	13	...	...	...	1	...	1	...	...
Do.	Niagara	...	...	...	...	...	...	1	1	2	2	...	...	...	...
Do.	Yerilla	...	...	...	...	3	3	...	...	...	...	1	1	...	...
Broad Arrow	... ...	...	...	...	...	...	13	2	2	3	4	...	...	...	...
N.E. Coolgardie	Kanowna	...	...	...	...	...	...	3	2	2	2	3	3	...	...
Do.	Kurnalpi	...	...	...	...	...	...	1	1	...	...	...	...	...	...
East Coolgardie	East Coolgardie ...	...	...	1	1	3	3	3	2	6	3	25	23	...	...
Do.	Bulong	...	...	1	1	1	1	1	...	...	...	...	...	...	...
Coolgardie	Coolgardie	...	...	3	...	3	3	4	4	3	3	2	1	...	...
Do.	Kunanalling ...	...	...	2	2	3	2	2	2	...	...	...	...	...	...
Yilgarn	... ...	...	...	191	130	80	88	7	4	2	2	4	1	...	...
Dundas	... ...	...	...	...	...	1	...	4	3	2	3	3	2	...	...
Phill ps River	... ...	...	...	...	...	...	...	2	2	2	2	4	5	...	...
Collie	... ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Greenbushes	... ...	7	11	34	33	1	1	3	3	...	...	14	17	4	6
Gascoyne	... ...	...	...	1	1	1	...1	...	...	...	...	...	...	...	...
Outside Proclaimed Fields ...	... ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Totals	10	14	385	293	192	208	67	54	46	40	124	122	4	6
Increase or Decrease for 1918 compared with 1917		+ 4		— 92		+ 16		— 13		— 6		— 2		+ 2	

Last year the number of prospecting areas held was 560, the total acreage being 15,800, which included five areas of 8,840 acres for coal and oil.

This year the number held is 499, of a total acreage of 16,363, including five areas of 9,240 acres for coal and oil.

TABLE 19.

Miners' Rights issued during 1917 and 1918.

Place of Issue.	Miners' Rights.		Place of Issue.	Miners' Rights.	
	1917.	1918.		1917.	1918.
Albany	10	17	Mount Magnet	105	80
Boulder	28	22	Mount Morgans	35	33
Bridgetown	20	12	Mullewa	...	4
Broad Arrow	86	84	Mulline	4	4
Broome	1	1	Nannine	37	43
Bullfinch	30	22	Narrogin	3	3
Bunbury	1	1	Norseman	60	87
Busselton	7	10	Northampton	39	84
Carnarvon	14	25	Northam	9	3
Collie	2	6	Nullagine	39	27
Coolgardie	170	173	Onslow	17	13
Cue	198	140	Ora Banda	44	50
Derby	7	7	Payne's Find	20	23
Esperance	3	5	Peak Hill	35	27
Geraldton	11	15	Perth	157	260
Greenbushes	164	229	Port Hedland	6	4
Hall's Creek	11	19	Ravensthorpe	73	64
Kalgoorlie	427	647	Roebourne	53	30
Kanowna	35	...	Sandstone	59	39
Kookynie	33	...	Southern Cross	94	70
Kunanalling	...	10	Wagin	1	1
Lake Darlot	8	12	Westonia	279	249
Laverton	119	119	Wiluna	33	26
Lawlers	31	34	Wyndham	2	6
Leonora	86	88	Yalgoo	29	44
Linden	27	11	Yarri	7	8
Marble Bar	74	98	York	...	16
Marvel Loch	37	22	Youanmi	23	19
Meekatharra	96	97			
Menzies	120	166	Total	3,119	3,409

TABLE 20.

Number and Acreage of Miners' Homestead Leases in force on 31st December, 1917 and 1918.

Goldfield.	District.	1917.		1918.		Increase.		Decrease.	
		Leases.	Acreage.	Leases.	Acreage.	Leases.	Acreage.	Leases.	Acreage.
West Pilbara	... ...	...	...	...	...	...	...	...	...
Greenbushes	... ...	9	956	8	834	...	...	1	122
Pilbara	Marble Bar ...	4	58	4	58	...	...	...	...
	Nullagine	...	...	...	...				
Dundas	... ...	29	1,447	27	1,425	...	...	2	22
Broad Arrow	... ...	2	40	2	40	...	...	...	...
Yilgarn	... ...	17	532	19	602	2	70	...	...
Mt. Margaret ...	Mt. Morgans ...	2	120	2	120	...	...	3	64
	Mt. Malcolm ...	6	1,079	4	1,039				
	Mt. Margaret ...	17	483	16	459				
Murchison ...	Cue	8	1,297	8	1,297	...	...	1	20
	Day Dawn ...	11	158	9	128				
	Meekatharra ...	16	1,898	17	1,908				
	Mt. Magnet ...	3	261	3	261				
Yalgoo	... ...	2	680	2	660	...	...	...	...
Coolgardie ...	Coolgardie	27	2,933	26	2,913	...	...	...	...
	Kunanalling ...	2	520	3	540				
East Coolgardie ...	... ...	95	3,118	91	2,766	...	...	4	352
Phillips River	... ...	150	21,493	155	21,729	5	236	...	...
Peak Hill	... ...	5	252	5	252	...	...	...	...
North-East Coolgardie ...	Kanowna	18	822	18	822	...	...	...	...
North Coolgardie	Menzies	8	719	8	719	...	...	...	...
	Yerilla	1	10	1	10				
	Niagara	1	20	1	20				
	Ularring	1	20	1	20				
East Murchison...	Lawlers	5	1,110	5	1,110	...	...	1	30
	Black Range ...	5	130	5	130				
	Wiluna	4	69	3	39				
	Total ...	448	40,225	443	39,921	7	306	12	610

As compared with the year 1917, the number of leases held has decreased by 5 and the area by 304 acres.

Part IV.—MEN EMPLOYED.

Table 21.

Average number of Men engaged in Mining during 1917 and 1918.

Goldfield.	District.	Reef or Lode.		Alluvial.		Total.	
		1917.	1918.	1917.	1918.	1917.	1918.
1. Kimberley	... ...	...	...	12	12	12	12
2. Pilbara	Marble Bar	57	34	10	9	67	43
	Nullagine	73	30	17	17	90	47
3. West Pilbara	... ...	9	4	6	6	15	10
4. Ashburton	... ...	3	3	4	4	7	7
5. Gascoyne	... ...	2	2	4	4	6	6
6. Peak Hill	... ...	20	20	3	3	23	23
7. East Murchison ...	Lawlers	98	51	...	1	98	52
	Wiluna	87	75	...	...	87	75
	Black Range	201	187	...	1	201	188
8. Murchison	Cue	152	117	8	4	160	121
	Meekatharra	523	474	12	13	535	487
	Day Dawn	249	53	6	2	255	55
	Mt. Magnet	131	81	...	...	131	81
9. Yalgoo	... ...	161	100	...	...	161	100
10. Mt. Margaret	Mt. Morgans	109	96	...	2	109	98
	Mt. Malcolm	514	472	3	3	517	475
	Mt. Margaret	294	309	9	6	303	315
	Menzies	341	334	5	11	346	345
11. North Coolgardie ...	Ularring	70	96	...	3	70	99
	Niagara	62	32	12	5	74	37
	Yerilla	83	27	5	4	88	31
12. Broad Arrow	... ...	204	207	37	31	241	238
13. North-East Coolgardie	Kanowna	104	66	18	8	122	74
	Kurnalpi	20	11	8	4	28	15
14. East Coolgardie ...	East Coolgardie	3,683	3,418	8	13	3,691	3,431
	Bulong	17	25	3	5	20	30
15. Coolgardie	Coolgardie	171	168	18	28	189	196
	Kunanalling	80	62	15	16	95	78
16. Yilgarn	... ...	808	844	...	...	808	844
17. Dundas	... ...	152	137	...	...	152	137
18. Phillips River	... ...	51	40	...	...	51	40
State generally	... ...	...	...	...	...	...	...
Total—Gold Mining		8,529	7,575	223	215	8,752	7,790
Minerals other than Gold.							
Tin	Greenbushes	146	207	*24	*19	170	226
	Marble Bar	7	5	*34	*61	41	66
Copper	West Pilbara	46	62	...	...	46	62
	Ashburton	...	...	...	...	...	...
	Phillips River	80	68	...	...	80	68
	Peak Hill	28	28	...	...	28	28
	Meekatharra	...	...	...	...	...	...
	Yalgoo	...	...	...	...	...	...
	State generally	...	...	...	...	...	...
Pyritic Ore	Mt. Morgans	18	19	...	...	18	19
Lead Ore	Northampton	257	297	...	...	257	297
	Ashburton	...	12	...	...	...	12
	State generally	71	73	...	...	71	73
Coal	Collie River	571	618	...	...	571	618
Graphite	State generally	6	4	...	...	6	4
Magnesite	Bulong	1	2	...	...	1	2
	Total—Other Minerals ...	1,231	1,395	58	80	1,289	1,475
	Grand Total ...	9,760	8,970	281	295	10,041	9,265

*Classified elsewhere as employed at mines.

TABLE 22.

Average Number of Men employed at Mines during 1918.

Mineral.	Above ground.	Under ground.	Total.	Percentage of total men employed.	Increase or decrease compared with 1917.
Coal	154	464	618	6·83	+ 47
Copper	75	83	158	1·75	+ 4
Gold	3,373	4,202	7,575	83·70	— 954
Lead	158	224	382	4·22	+ 54
Pyritic Ore	5	14	19	·21	+ 1
Tin	*275	17	292	3·23	+ 81
Magnesite	2	...	2	·02	+ 1
Graphite	2	2	4	·04	— 2
Total	4,044	5,006	9,050	100·00	— 768

* As the tin obtained is principally "stream tin" the average number of alluvial workers has been, in this case, included in the heading "above ground."

The above table deals with men working their own mines, or employed on wages, and is compiled from returns furnished to the Department by mine-owners.

TABLE 23.

Average Number of Men employed at Gold Mines during 1918, classified according to the several Goldfields and the proportion of Men employed in each Goldfield.

Goldfield.	Above Ground.	Under Ground.	Total.	Increase or Decrease compared with 1917.	Percentage of total men employed.	
					1917.	1918.
1. Kimberley	...	...	...	...	...	...
2. Pilbara	27	37	64	— 66	1·53	·84
3. West Pilbara	2	2	4	— 5	·11	·05
4. Ashburton	1	2	3	...	·04	·04
5. Gascoyne	2	...	2	...	·02	·03
6. Peak Hill	10	10	20	...	·23	·26
7. East Murchison	158	155	313	— 73	4·53	4·13
8. Murchison	313	412	725	— 330	12·37	9·57
9. Yalgoo	47	53	100	— 61	1·89	1·32
10. Mt. Margaret	384	493	877	— 40	10·75	11·58
11. North Coolgardie	235	254	489	— 67	6·52	6·46
12. Broad Arrow	79	128	207	+ 3	2·39	2·73
13. North-East Coolgardie	35	42	77	— 47	1·45	1·02
14. East Coolgardie	1,534	1,909	3,443	— 257	43·38	45·45
15. Coolgardie	133	97	230	— 21	2·94	3·04
16. Yilgarn	342	502	844	+ 36	9·47	11·14
17. Dundas	58	79	137	— 15	1·78	1·81
18. Phillips River	13	27	40	— 11	·60	·53
State generally	...	...	...	...	...	...
Total	3,373	4,202	7,575	— 954	100·00	100·00

TABLE 24.

Alluvial Gold Workers.

Goldfield.	1917.	1918.	Increase or Decrease compared with 1917.
1. Kimberley	12	12	...
2. Pilbara	27	26	— 1
3. West Pilbara	6	6	...
4. Ashburton	4	4	...
5. Gascoyne	4	4	...
6. Peak Hill	3	3	...
7. East Murchison	...	2	+ 2
8. Murchison	26	19	— 7
9. Yalgoo	...	...	...
10. Mt. Margaret	12	11	— 1
11. North Coolgardie	22	23	+ 1
12. Broad Arrow	37	31	— 6
13. North-East Coolgardie	26	12	— 14
14. East Coolgardie	11	18	+ 7
15. Coolgardie	33	44	+ 11
16. Yilgarn	...	...	...
17. Dundas	...	...	...
18. Phillips River	...	...	...
Total	223	215	— 8

Table 25.

Rate of Wages in the Mining Industry.

Table showing Wages payable to Workers in Gold-mining and Copper-mining Industries under various Awards of the Court of Arbitration and Industrial Agreements up to 31st December, 1918.

Locality in which Award or Agreement has effect.	Date of Award or Agreement.	Term.	Miner (hand labour) in shafts.	Miner (hand labour) in rises.	Miner (hand labour) in winzes.	Miner (hand labour) in all other places.	Millman in Charge.	Roasterman in Charge.	Slimes Charger.	Slimes Platman (off-sider).	Ropeman.	Men on Cracker.	Men in Dams.	Rock Drill Men, and Chuckmen in Shafts.	Rock Drill Men, and Chuckmen in rises.	Rock Drill Men, and Chuckmen elsewhere.	Rock Drill Men in winzes.	Miners (Hammer and Drill men).	Miners (wet ground, extra allowance) per shift.	Bracemen and Platmen.	Skipmen.	Mullockers and Shovellers.	Shoveller.	Truckers.	Men working in Cyanide Vats and Filterpress Men.	Man in Charge of Dam.	Timbermen.	Surface Labourers.	Boiler Cleaners.	Horse Drivers (including looking after horses).	Drill and Tool Sharpeners.	Mechanics' Labourers.	Oilers and Greasers.	Riggers.	Firemen.	Pipe Fitters (underground).	Pitmen.	Fitters, Turners, and Blacksmiths.	Pattern-makers.	Planers, Slotters, and Shapers.	Radial Drillers.	Electricians.	Motor Attendants.	Linesmen.	Engine-driver. Surface Winding Engines.	Engine-driver. All other classes of Engines.	Engine-driver. Overtime. Week Day. Up to 4 hours.	Engine-driver. Overtime. Week Day. After 4 hours.	Hours of Work per week. Men on Surface (one shift).	Hours of Work per week. Shiftmen and underground workers.
			s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.				
Abbotts (1)	27th February, 1903	29th January, 1903, to 29th July, 1904	..	..	..	..	..	..	..	..	..	..	..	15 6	15 0	14 4	..	13 6	0 10	13 0	..	12 4	..	12 4	13 0	..	14 4	11 10	13 6	12 10	14 9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	48	47
(2)	19th November, 1904	29th July, 1904, to 31st January, 1906	..	..	..	..	..	..	..	..	..	..	..	15 0	14 6	13 10	..	13 0	0 10	12 6	..	11 10	..	11 10	12 6	..	13 10	11 4	13 0	12 4	14 3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	48	47
†(3)	30th August, 1910	30th August, 1910, to 30th August, 1911	..	..	..	..	..	..	..	..	..	..	..	{15 4 / 15 0}	14 10 / 14 6	14 2 / 13 10	..	13 4 / 13 0	.. / 0 10	.. / 12 6	..	12 6 / 11 10	..	12 6 / 11 10	13 6 / 12 6	..	15 0 / 13 10	12 6 / 11 4	13 0 / ..	13 6 / 12 4	14 3 / ..	{12 6 / 12 4}	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	48	47
†(4)	31st May, 1916	31st May, 1916, to 30th May, 1919	15 0	14 6	14 2	13 10	15 0	15 0	15 0	13 4	14 6	13 6	13 6	15 10	15 4	14 8	15 0	..	1 2	13 6	..	¶13 0	..	¶13 0	13 6	..	15 0	12 6	15 0	13 6	15 0	13 0	..	..	..	..	15 0	..	..	..	..	..	..	..	..	..	..	..	48	47
Black Range (1)	4th July, 1905	1st August, 1905, to 1st August, 1906	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	{13 4 / 12 10 / 12 4}	1 8	12 4	..	11 4	..	11 4	12 4	..	14 0	10 10	12 6	11 10	13 4	..	..	..	..	..	13 0	..	..	..	..	..	..	..	..	..	..	..	48	47
(2)	13th July, 1905	1st August, 1905, to 1st February, 1907	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	13 6	14 6	..	..	..	..	..	..	..	..	..	48	..
(3)	17th May, 1907	1st June, 1907, to 31st May 1910	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	{15 0 / 14 0 / 13 4}	1 8	13 6	..	12 0	..	12 0	13 10	..	15 0	11 8	14 0	12 8	14 4	..	..	..	..	..	15 0	..	..	..	..	..	..	..	..	..	..	..	48	47
(4)	20th May, 1908	20th May, 1908, to 31st May, 1910	..	..	..	..	..	..	..	..	..	..	..	15 4	14 10	14 2	..	..	1 8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	47
(5)	14th August, 1908	8th August, 1908, to 31st May, 1910	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	15 8	15 0	1½	1½	{47 and 48}	..
Broad Arrow, Paddington to Kanowna (1)	19th December, 1904	19th December, 1904, to 19th June, 1906	..	..	..	..	..	..	..	..	..	..	..	14 4	13 10	13 4	..	11 8	1 8	11 8	..	10 6	..	10 6	11 8	..	13 4	10 0	11 10	11 0	12 8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	48	47
(2)	13th July, 1905	1st August, 1905, to 1st February, 1907	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	13 0	14 0	..	..	..	..	..	..	..	..	..	48	..
Bullfinch *(1)	28th July, 1911	28th July, 1911, to 2nd August, 1911	..	..	..	..	..	..	..	..	..	..	..	14 4	13 10	13 4	..	{12 8 / 11 8}	..	11 8	..	11 0	..	11 0	..	..	13 4	10 0	..	11 8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	48	47
Bulong (1)	13th July, 1905	1st August, 1905, to 1st February, 1907	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	13 0	14 0	..	..	..	..	..	..	..	..	..	48	..
(2)	13th July, 1905	1st August, 1905, to 31st December, 1905	..	..	..	..	..	..	..	..	..	..	..	14 4	13 10	13 4	..	11 8	..	11 8	..	10 6	..	10 6	11 8	..	13 4	10 0	..	..	..	..	10 6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	48	47
Burtville *	4th September, 1909	6th September, 1909, to 7th March, 1911	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	13 4	1 8	13 4	..	13 4	..	13 4	13 4	..	..	13 4	..	14 4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	47	47
Comet Vale ‖	14th March, 1912	14th March, 1912, to 14th March, 1913	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	14 10	14 2	1½	1½	47	..
Cue-Nannine (1)	27th February, 1903	29th January, 1903, to 29th July, 1904	..	..	..	..	..	..	..	..	..	..	..	14 6	14 0	13 4	..	12 6	0 10	12 0	..	11 4	..	11 4	12 0	..	13 4	10 10	12 6	11 10	13 9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	48	47
*(2)	17th October, 1904	29th July, 1904, to 30th January, 1906	..	..	..	..	..	..	..	..	..	..	..	14 6	14 0	13 4	..	12 6	0 10	12 0	..	11 4	..	11 4	12 0	..	12 4	10 10	12 6	11 10	13 9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	48	47
†(3)	18th December, 1908	1st January, 1909, to 1st January, 1910	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	{15 10 and 14 10}	14 2	1½	1½	{47 and 48}	..
Dundas (1)	29th June, 1903	29th June, 1903, to 1st March, 1904	..	..	..	..	..	..	..	..	..	..	..	14 4	13 10	13 4	..	11 8	1 8	11 8	..	10 8	..	10 8	11 8	..	13 4	10 0	11 8	11 0	12 6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	46	46
(2)	16th December, 1904	16th December, 1904, to 16th June, 1906	..	..	..	..	..	..	..	..	..	..	..	15 0	14 6	14 0	..	{12 4 / 13 10 / 12 4}	1 8	12 4	..	11 4	..	11 4	12 4	..	14 0	10 10	12 6	11 10	13 4	11 10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	48	47
(3)	13th July, 1905	1st August, 1905, to 16th June, 1906	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	14 0	13 0	1½	1½	48	..
(4)	13th July, 1905	1st August, 1905, to 1st February, 1907	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	13 6	14 6	..	..	..	..	..	..	..	..	..	48	..
(5)	16th June, 1910	15th June, 1910, to 15th June, 1913	..	..	..	..	..	..	..	..	..	..	..	14 8	14 2	13 8	..	{13 0 / 12 6 / 12 0}	1 8	12 0	13 8	11 2	..	11 2	12 0	..	13 8	10 8	12 2	11 8	13 0	11 8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	48	47
(6)	16th June, 1910	16th June, 1910, to 16th June, 1911	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	14 4	13 8	1½	1½	{47 and 48}	..
*(7)	11th December, 1913	11th December, 1913, to 10th December, 1916	..	..	..	..	..	..	..	..	..	..	..	14 8	14 2	13 8	..	{13 0 / 12 6 / 12 0}	..	12 0	13 8	11 4	..	11 4	12 0	..	13 8	10 9	12 2	11 9	13 4	11 8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	48	47
Gindalbie	10th November, 1908	16th November, 1908, to 16th November, 1911	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	14 10	14 2	1½	1½	{47 and 48}	..
Higginsville	5th October, 1906	1st November, 1906, to 1st May, 1908	..	..	..	..	..	..	..	..	..	..	..	15 0	14 6	14 0	..	{13 4 / 12 10 / 12 4}	1 8	12 4	..	11 4	..	11 4	12 4	..	14 0	10 10	12 6	11 10	13 4	11 10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	48	47
Ida H.	8th October, 1917	1st August, 1917, to 27th November, 1918	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	13 3	..	{13 3 to 13 9}	..	..	..	..	..	..	..	..	..	18 0	..	..	..	..	..
Kalgoorlie (1)	2nd September, 1902	2nd September, 1902, to 2nd March, 1904	..	..	..	..	..	..	..	..	..	..	..	14 4	13 10	13 4	..	11 8	..	11 8	..	10 6	..	10 6	11 8	..	13 4	10 0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	48	48
*(2)	5th March, 1904	1st March, 1904, to 1st September, 1905	..	..	..	..	..	..	..	..	..	..	..	14 4	13 10	13 4	..	11 8	..	11 8	..	10 6	..	10 6	11 8	..	13 4	10 0	..	..	..	..	10 6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	48	47
*(3)	5th March, 1904	1st March, 1904, to 1st September, 1905	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	11 0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	48	..
*(4)	5th March, 1904	1st March, 1904, to 1st September, 1905	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	11 8	..	..	..	..	..	..	..	..	..	..	..	..	..	48	..
*(5)	5th March, 1904	1st March, 1904, to 1st September, 1905	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	11 8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	48	..
(6)	13th July, 1905	1st August, 1905, to 1st February, 1907	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	13 0	14 0	..	..	..	..	..	..	..	..	..	48	..
*(7)	18th November, 1905	1st September, 1905, to 1st January, 1907	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	11 8	..	..	..	..	..	..	..	..	..	..	..	..	..	48	..
(8)	9th December, 1905	1st September, 1905, to 1st January, 1907	..	..	..	..	..	..	..	..	..	..	..	14 4	13 10	13 4	..	11 8	..	11 8	..	10 6	..	10 6	11 8	..	13 4	10 0	..	..	..	..	10 6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	48	47
*(9)	7th December, 1905	1st September, 1905, to 1st January, 1907	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	{10 0 / 10 6 / 11 0}	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	48	..
*(10)	31st August, 1907	31st August, 1907, to 30th June, 1909	..	..	..	..	..	..	..	..	..	..	..	14 4	13 10	13 4	..	11 8	..	11 8	..	11 0	..	11 0	..	..	13 4	10 0	..	..	..	..	10 6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	48	47
*(11)	31st August, 1907	31st August, 1907, to 30th June, 1909	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	11 8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	48	..
*(12)	31st August, 1907	31st August, 1907, to 30th June, 1909	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	11 8	..	..	..	..	..	..	..	..	..	..	..	..	..	48	..
*(13)	31st August, 1907	31st August, 1907, to 30th June, 1909	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	{10 0 / 10 6 / 11 0}	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	48	..
*(14)	10th March, 1910	10th March, 1910, to 30th September, 1912	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	{15 0 and 14 0}	13 4	..	..	{47 and 48}	..
*(15)	10th March, 1910	10th March, 1910, to 30th September, 1912	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	11 8	..	..	..	..	..	..	..	..	..	11 8	..	..	..	..	..	..	..	..	..	..	..	..	..	48	..
*(16)	10th March, 1910	10th March, 1910, to 30th September, 1912	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	48	..
*(17)	10th March, 1910	10th March, 1910, to 30th September, 1912	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	{10 0 to 15 0}	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	48	..
*(18)	10th March, 1910	10th March, 1910, to 30th September, 1912	..	..	..	..	..	..	..	..	..	..	..	14 4	13 10	13 4	..	11 8	..	11 8	..	11 0	..	11 0	..	..	13 4	10 0	..	..	..	..	10 6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	48	47
Kalgoorlie (Engineers) ‖(19)	14th December, 1911	14th December, 1911, to 30th September, 1912	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	15 0	16 0	..	..	..	..	..	..	..	1	1½	48	..
*(20)	7th August, 1913	16th April, 1913, to 16th April, 1916	..	..	..	..	..	..	..	..	..	..	..	14 4	13 10	13 4	..	11 8	..	11 8	..	11 2	..	11 2	..	..	13 4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	48	47
*(21)	7th August, 1913	16th April, 1913, to 16th April, 1916	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	11 8	..	..	10 9	..	..	..	{10 9 to 15 0}	10 9	..	12 0	..	..	..	..	..	..	..	..	..	..	..	..	..	48	..
*(22)	8th November, 1913	16th April, 1913, to 16th April, 1916	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	{15 0 and 14 0}	13 4	..	..	{47 and 48}	..
*(23)	22nd May, 1914	22nd May, 1914, to 16th April, 1916	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	15 0	16 0	14 0	13 4	..	..	..	..	..	..	..	..	..
*(24)	25th March, 1914	25th March, 1914, to 16th April, 1916	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	15 0	11 8	13 4	..	..	..	..	..	..
Kanowna (For Miners' rates see "Broad Arrow," etc.)	10th November, 1908	16th November, 1908, to 16th November, 1911	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	14 0	13 4	1½	1½	{47 and 48}	..
Kunanalling	21st February, 1910	21st February, 1910, to 30th September, 1912	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	14 10	14 2	1½	1½	{47 and 48}	..
Lawlers and Mt. Sir Samuel (1)	10th July, 1905	1st August, 1905, to 1st February, 1907	..	..	..	..	..	..	..	..	..	..	..	13 4	12 10	12 4	..	{12 8 / 12 4 / 12 0}	1 8	12 0	12 0	11 4	..	11 4	11 8	..	13 0	10 10	12 0	11 10	13 4	11 0	11 0	11 8	11 8	11 0	12 6	..	..	..	..	..	..	..	..	..	..	..	48	47
(2)	13th July, 1905	1st August, 1905, to 1st February, 1907	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	13 6	14 6	..	..	..	..	..	..	..	..	..	48	..
Leonora, Kookynie, Laverton, etc. (1)	28th February, 1903	28th February, 1903, to 28th August, 1904	..	..	..	..	..	..	..	..	..	..	..	16 0	15 6	15 0	..	13 4	..	13 4	15 0	11 8	..	11 8	13 4	..	15 0	11 8	15 0	12 8	15 0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	48	47
(2)	28th February, 1903	28th February, 1903, to 28th August, 1904	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	17 0	15 6	1½	1½	47	..
(3)	16th December, 1904	29th August, 1904, to 28th February, 1906	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	15 9	14 6	1½	1½	47	..
(4)	19th December, 1904	29th August, 1904, to 28th February, 1906	..	..	..	..	..	..	..	..	..	..	..	15 0	14 6	14 0	..	12 4	1 8	12 4	14 0	11 6	..	11 6	12 4	..	14 0	11 0	12 6	12 0	13 4	12 0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	48	47
(5)	13th July, 1905	1st August, 1905, to 28th February, 1906	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	11 8	..	..	..	..	..	..	..	..	..	..	..	..	..	48	..
(6)	13th July, 1905	1st August, 1905, to 1st February, 1907	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	13 0	14 0	..	..	..	..	..	..	..	..	..	48	..
†(7) (a)	19th January, 1909	15th January, 1909, to 1st January, 1910	..	..	..	..	..	..	..	..	..	..	..	{15 0	14 6	14 0	..	12 4	1 8	12 4	14 0	11 6	..	11 6	12 4	..	14 0	11 0	12 6	12 0	13 4	{12 0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	48	47
(b)														14 8	14 2	13 8		12 0	1 8	12 0	13 8	11 2		11 2	12 0		13 8	10 8	12 2	11 8	13 0	11 8}																		
†(8) (a)	19th January, 1909	15th January, 1909, to 1st January, 1910	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	{14 8	14 0	1½	1½	{48 and 47}	..
(b)																																															14 4	13 8}				
Marvel Loch (1)	27th January, 1910	1st February, 1910, to 1st February, 1911	..	..	..	..	..	..	..	..	..	..	..	13 6	13 0	12 6	..	10 1	1 8	10 10	..	10 10	..	10 10	10 10	..	12 0	10 6	..	11 6	12 6	..	..	..	10 6	..	..	..	..	..	..	..	..	..	..	..	..	..	48	47
(2)	21st October, 1912	21st October, 1912, to 31st May, 1914	..	..	..	..	..	..	..	..	..	..	..	14 0	13 6	13 0	..	{12 6 and 11 6}	1 8	11 6	..	11 0	..	11 0	11 4	..	13 0	10 8	..	11 0	12 6	11 0	..	..	11 6	..	..	..	..	..	..	..	..	..	..	..	..	..	48	47
Meekatharra (see "Abbotts")																																																		
Menzies (1)	28th February, 1903	28th February, 1903, to 28th August, 1904	..	..	..	..	..	..	..	..	..	..	..	15 2	14 8	14 2	..	12 6	1 8	12 6	..	11 4	..	11 4	12 6	..	14 2	10 10	..	..	14 2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	48	47
(2)	28th February, 1903	28th February, 1903, to 28th August, 1904	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	16 0	14 6	1½	1½	47	..
(3)	16th December, 1904	29th August, 1904, to 28th February, 1906	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	15 5	14 0	1½	1½	47	..
(4)	19th December, 1904	29th August, 1904, to 28th February, 1906	..	..	..	..	..	..	..	..	..	..	..	14 9	14 3	13 9	..	12 0	1 8	12 0	..	11 0	..	11 0	12 0	..	13 9	10 6	12 0	11 10	13 0	11 6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	48	47
(5)	13th July, 1905	1st August, 1905, to 28th February, 1906	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	11 8	..	..	..	..	..	..	..	..	..	..	..	..	..	48	..
(6)	13th July, 1905	1st August, 1905, to 1st February, 1907	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	13 0	14 0	..	..	..	..	..	..	..	..	..	48	..
Mt. Magnet †(1)	18th December, 1908	1st January, 1909, to 1st January, 1910	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	14 0	13 4	1½	1½	{47 and 48}	..
†(2)	28th November, 1909	17th November, 1909, to 16th November, 1910	..	..	..	..	..	..	..	..	..	..	..	14 6	14 0	13 4	..	12 6	0 10	12 0	..	11 4	..	11 4	12 0	..	..	10 10	12 6	11 10	13 9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	48	47
Mt. Morgans *(1)	17th August, 1903	16th July, 1903, to 28th August, 1904	..	..	..	..	..	..	..	..	..	..	..	16 0	15 6	15 0	..	13 4	1 8	13 4	15 0	11 8	..	11 8	13 4	..	15 0	11 8	15 0	12 8	15 0	13 4	..	13 4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	48	47
*(2)	16th December, 1904	29th August, 1904, to 28th February, 1906	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	15 9	14 6	1½	1½	47	..
(3)	19th December, 1904	29th August, 1904, to 28th February, 1906	..	..	..	..	..	..	..	..	..	..	..	15 0	14 6	14 0	..	12 4	1 8	12 4	14 0	11 6	..	11 6	12 4	..	14 0	11 0	12 6	12 0	13 4	12 0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	48	47
(4)	13th July, 1905	1st August, 1905, to 28th February, 1906	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	11 8	..	..	..	..	..	..	..	..	..	..	..	..	..	48	..
(5)	13th July, 1905	1st August, 1905, to 1st February, 1907	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	13 0	14 0	..	..	..	..	..	..	..	..	..	48	..
†(6)	19th January, 1909	15th January, 1909, to 1st January, 1910	..	..	..	..	..	..	..	..	..	..	..	14 8	14 2	13 8	..	12 0	1 8	12 0	13 8	11 2	..	11 2	12 0	..	13 8	10 8	12 2	11 8	13 0	11 8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	48	47
†(7)	19th January, 1909	15th January, 1909, to 1st January, 1910	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	14 4	13 8	1½	1½	{47 and 48}	..
Northampton †(1)	12th June, 1914; Amendment 10th Oct., 1916	1st June, 1914, to 1st June, 1917	..	..	..	..	..	..	..	..	..	..	..	13 7	13 1	12 5	..	..	..	12 5	..	..	11 3	11 3	..	11 9	14 0	10 9	13 1	12 0	13 5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	{47 and 48}	47
Norseman (see "Dundas.")																																																			
Nullagine *	16th January, 1905	1st February, 1905, to 1st February, 1907	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	14 2	1 8	{14 2 and 13 4}	..	..	..	13 4	14 2	..	16 8	13 4	..	..	16 8	..	..	..	..	..	..	..	..	..	..	..	..	..	‡16 8	‡15 0	..	..	44	44
Peak Hill (1)	27th February, 1903	29th January, 1903, to 29th July, 1904	..	..	..	..	..	..	..	..	..	..	..	16 6	16 0	15 4	..	14 6	0 10	14 0	..	13 0	..	13 4	14 0	..	15 4	12 10	14 6	13 10	15 9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	48	47
(2)	19th November, 1904	29th July, 1904, to 31st January, 1906	..	..	..	..	..	..	..	..	..	..	..	15 6	15 0	14 4	..	13 6	0 10	13 0	..	12 0	..	12 4	13 0	..	14 4	11 10	13 6	12 10	14 9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	48	47
(3)	6th December, 1906	1st October, 1906, to 1st October, 1909	..	..	..	..	..	..	..	..	..	..	..	15 0	14 6	13 10	..	13 0	1 3	12 6	..	11 10	..	11 10	12 6	..	13 10	11 4	13 0	12 4	14 3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	48	47
Southern Cross (1)	13th July, 1905	1st August, 1905, to 1st February, 1907	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	12 0	13 0	..	..	..	..	..	..	..	..	..	48	..
Whim Creek (Copper)	14th August, 1912	14th August, 1912, to 14th June, 1913	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	{15 0 / 14 2§ / 13 4}	1 8	13 4	..	13 4	..	13 4	..	..	15 0	13 4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Wiluna (1)	13th July, 1905	1st August, 1905, to 1st February, 1907	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	13 6	14 6	..	..	..	..	..	..	..	..	..	48	..
(2)	6th December, 1908	1st January, 1907, to 1st January, 1910	..	..	..	..	..	..	..	..	..	..	..	15 6	15 0	14 4	..	13 6	1 3	13 0	13 0	12 4	..	12 4	13 0	..	14 4	11 10	13 6	12 10	14 9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	48	47
Youanmi	22nd July, 1912	22nd July, 1912, to 7th May, 1915	..	..	..	..	..	..	..	..	..	..	..	15 4	14 10§	14 2	..	{15 0 / 14 0§ / 13 4}	1 3	13 6	..	12 8	..	12 8	13 10	..	15 0	11 8	14 0	12 8	14 4	13 4	..	..	13 4	..	15 0	..	..	..	..	..	..	..	..	..	..	..	48	¶47
Do.	23rd March, 1917	22nd March, 1917, to 21st March, 1920	15 0	14 6	14 2	13 10	15 0	15 0	15 0	13 4	15 0	13 6	13 6	15 10	15 4	14 8	15 0	15 0	..	13 6	..	13 0	..	..	13 10	15 0	15 0	12 6	15 0	13 6	..	13 0	..	..	..	..	15 0	..	..	..	..	..	..	..	..	..	..	..	..	..

* Industrial Agreement. † Award continues in operation until amended or rescinded by Court. ‡ Hours of labour for engine-drivers and battery feeders agreed to at 47 per week. § Rises in winzes. ‖ Award and Agreement. ¶ Underground only.

PART V.—ACCIDENTS.

TABLE No. 26.

MEN EMPLOYED IN MINES KILLED AND INJURED IN MINING ACCIDENTS DURING 1917 AND 1918.

A.—*According to Locality of Accident.*

Goldfield.	Killed.		Injured.		Total killed and injured.	
	1917.	1918.	1917.	1918.	1917.	1918.
1. Kimberley	...	...	...	...	...	...
2. Pilbara	...	...	1	...	1	...
3. West Pilbara	...	...	...	...	...	...
4. Ashburton	...	...	...	...	...	...
5. Gascoyne	...	...	...	...	...	...
6. Peak Hill	...	...	...	...	...	...
7. East Murchison	...	1	20	14	20	15
8. Murchison	3	2	60	31	63	33
9. Yalgoo	...	...	1	1	1	1
10. Mt. Margaret	2	4	98	97	100	101
11. North Coolgardie	2	2	13	11	15	13
12. North-East Coolgardie	...	...	2	...	2	...
13. Broad Arrow	1	...	1	...	2	...
14. East Coolgardie	12	12	496	380	508	392
15. Coolgardie	...	...	...	...	...	...
16. Yilgarn	1	1	7	5	8	6
17. Dundas	...	...	2	...	2	...
18. Phillips River	...	1	7	3	7	4
MINING DISTRICTS—						
Northampton	...	...	4	2	4	2
Yandanooka	...	...	...	...	...	...
Greenbushes	...	...	...	1	...	1
Collie	...	2	121	139	121	141
Swean	...	...	1	...	1	...
K ndinup	...	...	...	...	...	...
Roelands	...	...	6	...	6	...
Total	21	25	840	684	861	709

From the above table it will be seen that the total number of fatal accidents for the year 1918 was four more than for 1917. The number of injured shows a decrease of 156 compared with the preceding year. Details of these accidents will be found in the report of the State Mining Engineer, published as Division II. to this report.

B.—*According to Causes of Accidents.*

	1917.		1918.		Comparison with 1917.	
	Fatal.	Serious.	Fatal.	Serious.	Fatal.	Serious.
1. Explosives	...	7	...	17	...	+ 10
2. Falls of Ground	10	93	9	72	— 1	— 21
3. In Shafts	2	25	4	12	+ 2	— 13
4. Miscellaneous, Underground	4	488	7	417	+ 3	— 71
5. Surface	5	227	5	166	...	— 61
Totals	21	840	25	684	+ 4	— 156

Of the fatal accidents 23 occurred in gold mines and two in coal mines. The death-rate per 1,000 men employed on gold mines was 3.04 as against 2.46 in 1917.

TABLE No. 27.

Deaths of Persons employed at Mines from Accidents during 1917 *and* 1918.

	1917.						1918.					
	Number of Persons killed.			Death Rate per 1,000 men employed.			Number of Persons killed.			Death Rate per 1,000 men employed.		
	Above Ground.	Under Ground.	Total.	Above Ground.	Under Ground.	Total.	Above Ground.	Under Ground.	Total.	Above Ground.	Under Ground.	Total.
Coal Mines	...	...	...	...	...	...	1	1	2	6·49	2·16	3·24
Men employed	(140)	(431)	(571)	...	...	...	(154)	(464)	(618)	...	...	...
Gold Mines	5	16	21	1·25	3·36	2·40	4	19	23	1·11	4·52	2·95
Men employed	(3,988)	(4,764)	(8,752)	...	...	...	(3,588)	(4,202)	(7,790)	...	...	...
Other Mines	...	...	...	...	...	...	...	...	...	...	...	...
Men employed	(410)	(308)	(718)	...	...	...	(517)	(340)	(857)	...	...	...
Total for all Mines ...	5	16	21	1·10	2·91	2·09	5	20	25	1·17	3·99	2·70
Total number of Men employed	(4,538)	(5,503)	(10,041)	...	...	...	(4,259)	(5,006)	(9,265)	...	...	...

TABLE No. 28.

Deaths of Persons employed at Quarries from Accidents during 1917 *and* 1918.

Mining District.	Number of Persons employed.						Number of Persons killed.						Death Rate per 1,000 men employed.					
	Above Ground.		Under Ground.		Total.		Above Ground.		Under Ground.		Total.		Above Ground.		Under Ground.		Total.	
	1917.	1918.	1917.	1918	1917.	1918.	1917.	1918.	1917.	1918.	1917.	1918.	1917.	1918.	1917.	1918.	1917.	1918.
Swan	138	140	...	...	138	140	...	...	...	...	...	...	...	...	...	...	...	...
Roelands ...	83	60	...	...	83	60	...	...	...	...	...	...	...	...	...	...	...	...
Totals ...	221	200	...	...	221	200	...	...	...	...	...	...	...	...	...	...	...	...

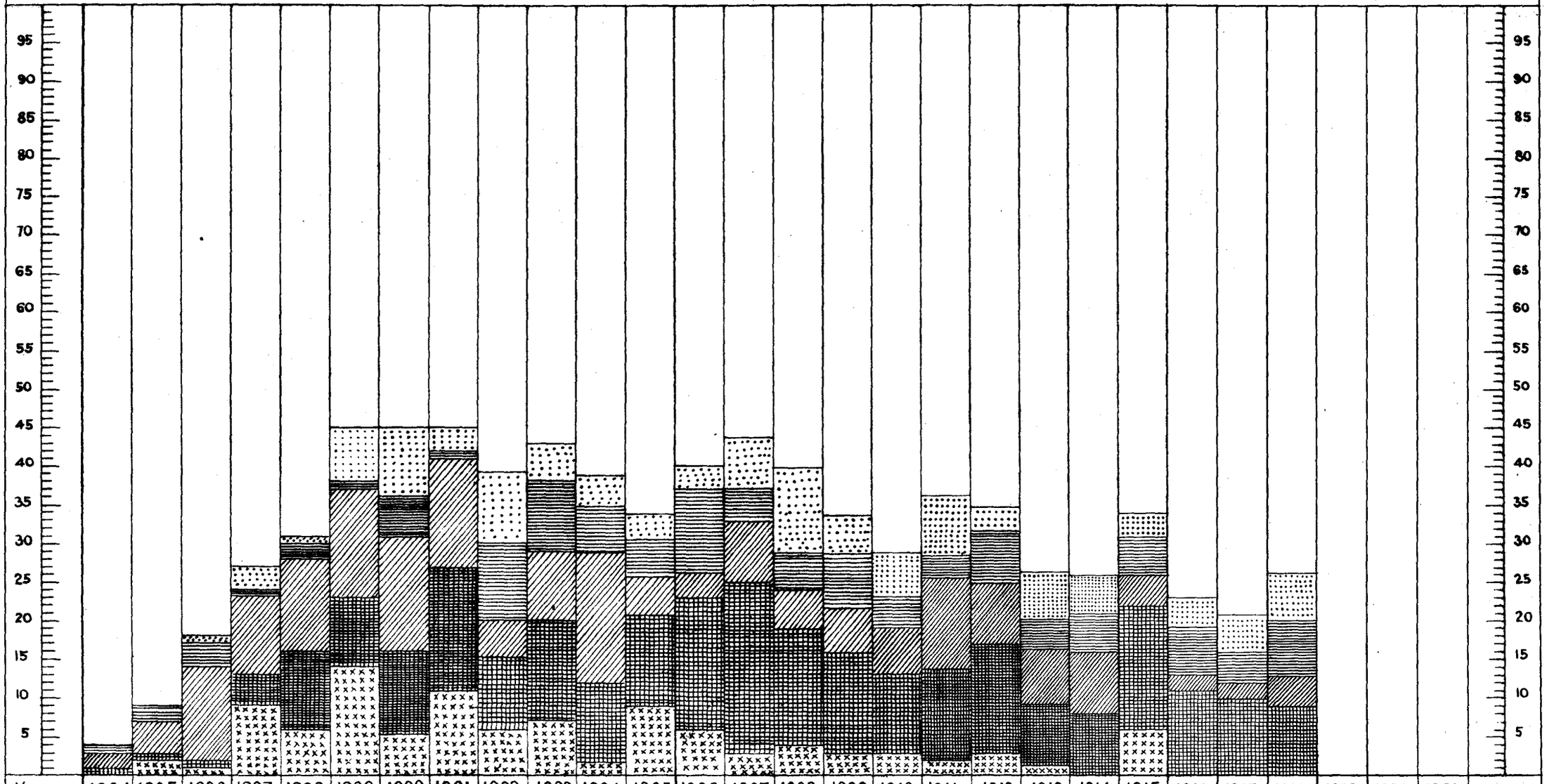
TABLE No. 29.

Deaths from Accidents of Persons employed in Gold Mines during 1918, *and the Death Rate per* 1,000 *men employed and per* 1,000 *tons of Gold Ore raised during* 1917 *and* 1918. (*Number of men taken as in Table No.* 23, *not including Alluvial Gold Workers.*)

Goldfield.	Number of Deaths.			Death Rate per 1,000 men employed.				Number of Deaths per 1,000 tons of Gold Ore raised.	
	1918.			1918.			1917.		
	Above Ground.	Under Ground.	Total.	Above Ground.	Under Ground.	Total.	Total.	1918.	1917.
1. Kimberley	...	...	...	...	...	...	...	...	...
2. Pilbara	...	...	...	...	...	...	...	...	...
3. W. Pilbara	...	...	...	...	...	...	...	...	...
4. Ashburton	...	...	...	...	...	...	...	...	...
5. Gascoyne	...	...	...	...	...	...	...	...	...
6. Peak Hill	...	...	...	...	...	...	...	...	...
7. E. Murchison	...	1	1	...	6·45	3·19	...	·019	...
8. Yalgoo	...	...	...	...	...	...	...	...	...
9. Mt. Margaret	2	2	4	5·21	4·06	4·56	2·18	·017	·008
10. N. Coolgardie	...	2	2	...	7·87	4·09	3·60	·036	·037
11. N.E. Coolgardie	...	...	...	...	...	...	...	...	...
12. Broad Arrow	...	...	...	...	...	...	4·90	...	·048
13. E. Coolgardie	2	10	12	1·30	5·24	3·49	3·24	·011	·010
14. Coolgardie	...	...	...	...	...	...	...	...	...
14. Murchison	...	2	2	...	4·85	2·76	2·84	·022	·021
16. Yilgarn	...	1	1	...	1·99	1·18	1·24	·007	·006
17. Dundas	...	...	...	...	...	...	...	...	...
18. Phillips River	...	1	1	...	37·04	25·00	...	·331	...
	4	19	23	1·19	4·52	3·04	2·46	·014	·011

The number of deaths per 1,000 men employed shows an increase from 2.46 in 1917 to 3.04 in 1918, and that per 1,000 tons of gold ore raised also shows an increase, being .014, as against .011 for the preceding year.

DIAGRAM SHEWING THE NUMBER OF DEATHS FROM ACCIDENTS ARRANGED IN FIVE CLASSES, IN THE MINES OF WESTERN AUSTRALIA DURING THE YEARS 1894 AND ONWARDS.



Part V, Table 26B.

PART VI.—STATE AID TO MINING.

The number of State batteries existing at the end of the year was 33.

From inception to the end of 1918, gold and tin to the value of £5,107,334.81 have been recovered from the State plants. 1,196,736.44 tons of gold ore were treated and produced £4,222,161.93 worth of gold by amalgamation; £610,082.28 worth by cyanidation; £174,410.07 from slimes treatment; £9,353.37 from residues, and 77,816.75 ons of tin ore produced tin to the value of £90,754.83, and in addition a sum of £572.33 has been recovered from residues.

During the year the gold ore treated was 39,329.75 tons for 37,844.97 ozs. of bullion from all processes.

The working expenditure for all plants during the year totalled £43,758 0s. 11d. and the revenue £35,107 13s. 9d., which shows a loss of £8,650 7s. 2d. on the year's operations.

The capital expenditure from the inception of the scheme was £368,830 11s. 8d., £276,849 10s. being paid from loan and £91,981 1s. 8d. from Consolidated Revenue Funds.

The cost of administration for the year was £3,556 2s. 6d., as against £3,343 5s. 10d. for 1917.

The working expenditure from inception to the 31st December, 1918, exceeds the receipts by £84,704 1s. 7d.

GEOLOGICAL SURVEY.

The operations of the Geological Survey during the calendar year 1918, though curtailed in some directions owing to reasons of economy in expenditure, were continued on somewhat similar lines as those hitherto adopted. The accessory divisions in the domains of petrology, mineralogy, and chemistry have been employed to their full capacity.

The demands upon both the resident and the field officers for advice and information in relation to the varied mineral resources, especially those that were required for war purposes or others, the supplies of which had been restricted, showed no abatement.

Considerable progress has been made with the completion of the Handbook, containing an account of the mineral resources of the State, the want of which had been felt for a number of years.

The Handbook has been designed with the view to directing attention to the value, location, and potentialities of the very varied mineral wealth of the State, and will contain information which has not hitherto been available in a collected form, and will also include a general geological map of the State in the scale of 50 miles to the inch.

The work of the year included reports on: the Petroleum Prospects of the Nullabor Plains; the Graphite Deposits of Munglinup; the Manganese Deposits of the Hamersley River; the Country between the Fitzgerald River and Hopetoun; Coal Discovery near Wilga on the Donnybrook-Katanning Railway; the Slate Quarries at Tenterden; the Coastal Limestone Deposits between Leschenault Inlet and Lake Preston; Asbestos near Moora; Molybdenite at Mount Mulgine; Salt Deposits near Perenjori; Aluminium Ores of the Darling Range; Irwin River Coalfield; Clay Deposits of Three Springs and Mount Kokeby; the Geology of the Leonora-Duketon District; the Geology and Mineral Resources of parts of the North-West, Central, and Eastern Divisions.

Full details relating to these investigations will be found in the report of the Government Geologist, which is appended.

ASSISTANCE UNDER MINING DEVELOPMENT ACT, 1902.

The following statement shows the sums advanced during the year 1918 under "The Mining Development Act":—

	£	s.	d.
Advanced in aid of mining work and equipment of mines with machinery	2,620	0	9
Subsidies paid on stone crushed for the public	611	18	9
Boring	161	6	7
Providing means of transport and equipment for prospectors ..	1,248	19	7
	£4,642	5	8

In addition to the above, amounts totalling £1,751 1s. 2d. were expended from Mining Development Vote on various matters for the assistance of mining, such as water supply, subsidies to assist carting of ore long distances, and subsidies for development work done below 100 feet level in small mines, and rebates to prospectors working low grade mines. The subsidies paid on stone crushed for the public, amounting to £611 18s. 9d., are subsidies paid to owners of plants crushing for the public, the conditions being that they crush at fixed rates; in most cases a further requirement being imposed as to purchasing or treating tailings. The ore crushed at such plants during the year amounted to 5,439 tons.

The receipts under the Mining Development Act, exclusive of interest payments, amounted to £960 3s. 3d., and include:—

	£	s.	d.
Refunds of advances	410	8	3
Sales of securities	462	5	0
Miscellaneous refunds	87	10	0

PART VII.—REMARKS ON THE GOLDFIELDS AND MINERAL DISTRICTS AND SUMMARIES OF THE WARDENS' AND OTHER OFFICERS' REPORTS.

ASHBURTON GOLDFIELD.

No gold or copper was reported from this field.

Silver-lead ore to the extent of 237.48 tons, valued at £3,461, was produced, but apart from this there was little or no mining.

BROAD ARROW GOLDFIELD.

The output of gold was 4,126 fine ounces, and in the preceding year 16,519 fine ounces; a decrease of 12,393 fine ounces.

This is accounted for by the fact that on the large mines at Ora Banda operations have been practically confined to development work and good reserves have been opened up for future treatment.

At most of the other centres nothing of note has transpired. In the immediate vicinity of Broad Arrow a good deal of prospecting has been done, but with the exception of a couple of shows nothing of an encouraging nature has been discovered.

COLLIE COAL FIELD.

The output of coal for the year was 337,039 tons, and for the preceding year 326,550 tons; an increase of 10,489 tons.

Most of the mines have been actively worked and the business of the district generally has been good.

The outlook is promising.

COOLGARDIE GOLDFIELD.

The output of gold was 7,963 fine ounces, and in the preceding year 10,286 fine ounces; a decrease of 2,323 fine ounces.

In the Kunanalling District the existing mines were regularly worked, although the output showed a falling off.

There was practically no change at any of the other centres.

DUNDAS GOLDFIELD.

The output of gold for the year was 15,950 fine ounces, and for the preceding year 18,419 fine ounces; a decrease of 2,469 fine ounces. There was practically no change in this field and no developments to justify a prediction of the likelihood of any improvement in the immediate future.

EAST COOLGARDIE GOLDFIELD.

The output of gold was 524,823 fine ounces, and in the preceding year 557,983 fine ounces; a decrease of 33,160 fine ounces.

Magnesite to the amount of 105.25 tons, valued at £334, was raised in the Bulong District, and in the preceding year 20.50 tons, valued at £21; an increase in tonnage of 84.75 tons, and in value of £313.

At Kalgoorlie work has proceeded steadily on the large mines, and although a lessened output is recorded, an improvement may be looked for when costs and labour are again at normal. There were no noteworthy developments.

In the Mount Monger district and the other outlying centres mining was fairly quiet.

EAST MURCHISON GOLDFIELD.

The output of gold was 29,211 fine ounces, and in the preceding year 32,857 fine ounces; a decrease of 3,646 fine ounces.

Copper ore to the extent of 82.44 tons, valued at £1,314, was raised, and in the preceding year 75 tons, valued at £1,523; an increase in tonnage of 7.44 tons, but decrease in value of £209.

In the Lawlers and Wiluna districts prospecting has been active.

In the Black Range district matters have been very quiet.

GASCOYNE GOLDFIELD.

As in the preceding year, no gold was reported from this field, and mining is at a standstill excepting that towards the close of the year some tenements were applied for, for the purpose of mining for mica, which may prove to be payable propositions.

GREENBUSHES MINERAL FIELD.

The output of black tin was 295.80 tons, valued at £57,653, and in the preceding year 237.92 tons, valued at £29,928; an increase in tonnage of 57.88 tons, and in value of £27,725.

There was a good deal of activity on this field, the high price which obtained for tin throughout the year rendering many low grade properties payable.

KIMBERLEY GOLDFIELD.

The output of gold was 15 fine ounces, and in the preceding year 82 fine ounces; a decrease of 67 fine ounces. This was all won by alluvial miners and, apart from them, there were practically no mining operations.

MOUNT MARGARET GOLDFIELD.

The output of gold was 85,347 fine ounces, and in the preceding year 101,874 fine ounces; a decrease of 16,527 fine ounces. In addition 2,251.81 tons of pyritic ore, valued at £1,629 were raised, and in the preceding year 3,575.46 tons, valued at £1,752; a decrease in tonnage of 1,323.65 tons, and in value of £123.

In the Mt. Margaret district there was a decrease, and mining generally was quiet. The Lancefield mine was the principal producer.

In the Mount Morgans district there was also a falling off, the busiest centre being at Linden. No finds of any note were made.

In the Mt. Malcolm district there was also a decrease, due in a large measure to a lessened output from the Sons of Gwalia mine, the principal producer.

There has been a good deal of prospecting in the outlying centres.

MURCHISON GOLDFIELD.

The output of gold was 63,285 fine ounces, and in the preceding year 82,306 fine ounces; a decrease of 19,021 fine ounces.

Copper ore to the extent of 78.34 tons, valued at £1,794, was also produced, and in the previous year 82.92 tons, valued at £2,164.

In the Meekatharra District there was a lessened output, attributable to restriction of operations at a couple of mines.

In the Cue District there was an improvement, the Big Bell and Light of Asia Mines being large contributors.

In the Day Dawn District there was a large falling off, due almost entirely to the closing down of the Great Fingall Mine which, unfortunately, ceased operations in March.

In the Mt. Magnet centre there was an improved output and a good deal of prospecting has been in evidence.

NORTHAMPTON AND YANDANOOKA MINERAL FIELDS.

No minerals were reported from Yandanooka.

In the Northampton field the output of lead ore was 47,079.68 tons, valued at £176,330; and in the preceding year 46,801.97 tons, valued at £143,925; an increase in tonnage of 277.71 tons, and in value of £32,405.

The activity in this field, consequent on the good market which obtained for base metals during the year, has been very pronounced. If it still obtains after the cessation of hostilities, the field will forge ahead.

NORTH COOLGARDIE GOLDFIELD.

The output of gold was 36,830 fine ounces, and in the preceding year 34,795 fine ounces; an increase of 2,035 fine ounces.

In the Menzies District the output was practically the same, and the busiest centre was Comet Vale, where the Sand Queen and Gladsome Mines remained the principal producers.

At Goongarrie the New Boddington unfortunately ceased operations at the end of the year. At Yunndaga the Menzies Consolidated produced steadily.

At Mt. Ida matters were quiet.

In the Ularring District there was a much improved output from the Riverina South Mine, which accounts for the increase in the yield for the field.

Elsewhere the district was quiet.

In the Niagara and Yerilla Districts there was no improvement.

NORTH-EAST COOLGARDIE GOLDFIELD.

The output of gold was 3,700 fine ounces, and in the preceding year 5,933 fine ounces; a decrease of 2,233 fine ounces.

Matters have remained exceedingly quiet throughout this field, the only evidence of activity being in the neighbourhood of Kanowna, where several claims for the working of alunite have been taken up and development is proceeding.

PEAK HILL GOLDFIELD.

The output of gold was 1,089 fine ounces, and in the preceding year 1,744 fine ounces; a decrease of 655 fine ounces.

Copper ore to the extent of 76.28 tons, valued at £2,480, was produced, and in the preceding year 287.84 tons, valued at £9,683; a decrease in tonnage of 211.56 tons, and in value of £7,203.

Mining in this field was very quiet, the development of the copper shows at Kumarina and Ilgarere being retarded by the high cost of commodities and transport.

PHILLIPS RIVER GOLDFIELD.

The output of gold was 4,479 fine ounces, and in the preceding year 4,734 fine ounces; a decrease of 255 fine ounces.

The production of copper was 2,901.66 tons, valued at £42,978, and in the preceding year 5,255.57 tons, valued at £66,868; a decrease in tonnage of 2,353.91 tons, and in value of £23,890.

There was little change in the field during the year, and the uncertainty that obtained towards its close regarding the future market for copper had a somewhat depressing effect.

PILBARA GOLDFIELD.

The output of gold was 3,748 fine ounces, and in the preceding year 5,407 fine ounces; a decrease of 1,659 fine ounces.

Black tin to the amount of 99.50 tons, valued at £20,984, was raised, and in the preceding year 69.05 tons, valued at £9,264; an increase in tonnage of 30.45 tons, and in value of £11,720.

The greatest activity was at Bamboo Creek, where a good deal of ore was raised.

In the Nullagine District gold mining was practically at a standstill, but a good deal of work was carried out on the asbestos deposits which exist there with encouraging results.

Tin mining was confined to the Marble Bar District, nothing payable having so far been discovered outside that district.

There was a great scarcity of efficient labour, and once this drawback is remedied the field should have a good future, for undoubted evidences of mineral wealth exist.

WEST PILBARA GOLDFIELD.

The output of gold was 120 fine ounces, and in the preceding year 305 fine ounces; a decrease of 185 fine ounces.

Copper ore amounting to 1,844.19 tons, valued at £28,961, was produced, and in the preceding year 783.61 tons, valued at £13,406; an increase in tonnage of 1,060.58 tons, and in value £15,555.

No lead ore was reported.

There was very little change in this field, the principal mine of which is the Whim Well Copper Mine at Whim Creek.

WEST KIMBERLEY MAGISTERIAL DISTRICT.

There is nothing of note by way of fresh discoveries to report from this field.

During the year the iron leases at Yampi Sound changed hands, and the new owner expresses an intention of actively developing them, and certain preliminary work is now in hand.

YALGOO GOLDFIELD.

The output of gold was 4,398 fine ounces, and in the preceding year 5,813 fine ounces; a decrease of 415 fine ounces.

This is attributable to a lessened output from the Lake View Mine.

In the Warriedar District the molybdenite shows were actively prospected and the results are encouraging.

At Mt. Gibson a crushing plant, which will be available for the treatment of ore for the public, is in course of erection, and should give a stimulus to the district.

YILGARN GOLDFIELD.

The output of gold was 70,766 fine ounces, and in the preceding year 78,245 fine ounces; a decrease of 7,479 fine ounces.

At Westonia the various mines have been working and producing regularly.

In the other centres a fair amount of prospecting has been in progress, but nothing of note discovered.

TABLE 30.

Value of Mining Machinery and Number of Stamps and other Mills erected on the 31st December, 1918, compared with the previous Year.

Goldfield.	District.	Value of Mining Machinery.		Batteries, Number of Stamps.		Mills.															
						1917.								1918.							
		1917.	1918.	1917.	1918.	Prospecting.	Ball.	Griffin.	Huntington.	Puddlers.	Other Crushers.	Flint.	Grinding Pans.	Prospecting.	Ball.	Griffin.	Huntington.	Puddlers.	Other Crushers.	Flint.	Grinding Pans.
		£	£																		
1. Kimberley	... ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2. Pilbara	Marble Bar	9,651	**8,164**	63	**38**	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Nullagine	31,729	**30,478**	28	**25**	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	**1**
3. West Pilbara	... ...	3,000	**2,550**	40	**40**	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	**2**
4. Ashburton	... ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5. Gascoyne	... ...	1,100	**1,100**	1	**1**	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6. Peak Hill	... ...	7,963	**7,122**	40	**40**	...	...	...	...	...	2	...	...	...	...	...	...	...	2	...	...
7. East Murchison ...	Lawlers	18,266	**13,644**	108	**65**	...	...	...	...	...	1	...	1	...	...	...	...	...	2	...	...
	Wiluna	58,507	**52,191**	85	**85**	1	1	...	...	...	3	5	9	1	...	...	...	...	1	1	**5**
	Black Range ...	110,657	**100,418**	120	**80**	...	1	...	...	...	1	2	5	...	1	...	...	...	...	2	**3**
	Cue	32,368	**40,955**	85	**65**	...	...	...	...	...	3	...	...	...	...	...	...	...	3	...	**1**
	Meekatharra ...	144,542	**129,062**	112	**112**	...	...	...	...	...	2	2	17	...	...	...	...	1	8	2	**12**
8. Murchison	Day Dawn	161,450	**161,210**	65	**60**	...	...	...	...	...	4	...	12	...	...	...	...	...	4	...	**4**
	Mt. Magnet	25,897	**18,195**	50	**35**	2	...	...	...	...	1	...	...	1	1	...	...	...	1	...	...
9. Yalgoo	... ...	32,090	**27,028**	70	**70**	...	...	...	...	...	...	...	5	...	...	...	...	...	1	...	**5**
10. Mt. Margaret	Mt. Morgans	14,824	**13,860**	75	**60**	...	...	...	...	...	1	...	3	...	...	...	...	...	...	...	**3**
	Mt. Malcolm	240,334	**248,582**	117	**127**	...	...	...	...	...	3	4	13	...	...	...	...	...	4	4	**13**
	Mt. Margaret	46,287	**48,717**	75	**70**	...	6	...	...	...	2	...	8	...	6	...	1	...	2	...	**15**
	Menzies	58,577	**55,648**	105	**105**	...	...	...	1	...	2	...	18	...	...	...	1	...	2	...	**19**
	Ularring	34,245	**31,000**	50	**40**	...	...	...	1	...	1	1	2	...	...	...	...	...	1	1	**2**
11. North Coolgardie ...	Niagara	6,220	**6,761**	50	**50**	...	1	...	...	...	...	...	4	...	1	...	...	...	1	...	**3**
	Yerilla	5,244	**4,219**	30	**30**	...	...	...	...	...	1	1	1	...	...	...	...	...	1	...	...
12. Broad Arrow	... ...	71,075	**65,411**	45	**45**	...	1	...	3	...	1	...	10	...	1	...	3	3	1	...	**10**
13. North-East Coolgardie	Kanowna	16,778	**11,333**	138	**85**	...	...	...	...	1	3	...	5	...	...	...	1	...	1	...	**2**
	Kurnalpi	150	**150**	5	**5**	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...
14. East Coolgardie ...	East Coolgardie ...	1,376,294	**1,366,849**	535	**535**	1	39	13	7	3	40	33	165	1	**40**	13	5	3	46	33	**166**
	Bulong	8,000	**8,000**	20	**20**	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...
15. Coolgardie	Coolgardie	51,317	**33,916**	239	**196**	...	...	...	2	...	2	...	8	...	...	...	1	...	5	...	**7**
	Kunanalling	8,250	**7,300**	65	**40**	...	...	...	1	...	1	...	2	...	...	...	...	...	...	...	**2**
16. Yilgarn	... ...	227,343	**211,893**	197	**197**	...	2	...	...	...	...	4	20	...	2	...	...	...	2	4	**21**
17. Dundas	... ...	30,493	**25,100**	85	**65**	...	...	...	...	...	2	...	20	...	...	...	...	...	5	...	**9**
18. Phillips River	... ...	12,600	**10,600**	45	**45**	2	...	...	...	...	1	...	1	2	...	...	...	...	1	...	...
State generally	... ...	30,000	**30,000**	...	...	...	1	...	...	...	1	...	...	...	1	...	...	...	1	...	...
Total Gold-extracting Machinery		2,875,251	**2,771,456**	2,743	**2,431**	8	52	13	15	4	78	52	332	7	**53**	13	12	7	95	47	**305**
Total Machinery, other than Gold-extracting ...		320,631	**301,317**	10	**5**	...	...	...	2	1	23	...	...	...	...	1	1	1	26	...	...
TOTAL MINING MACHINERY		3,195,882	**3,072,773**	2,753	**2,436**	8	52	13	17	5	101	52	332	7	**53**	14	13	8	121	47	**305**

PART VIII.—EXISTING LEGISLATION.

At the close of the year the Acts in force relative to mining were:—

1. "The Mining Act, 1904."
2. "Sluicing and Dredging for Gold Act, 1899."
3. "Mines Regulation Act, 1906."
4. "Coal Mines Regulation Act, 1902."
5. "Mining Development Act, 1902."
6. "Mines and Machinery Inspection Act, 1911."
7. "Mines Regulation Act Amendment Act, 1915."

The following alterations, etc., regarding regulations were gazetted:—

Under "The Mining Act, 1904"—
- An amendment of Regulation 5, Sub-clause (b).
- An amendment of Regulation 10.
- An amendment of Regulation 40B.
- An amendment of Regulation 163.
- An amendment of Regulation 205B.
- Cancellation of Regulation 70B.

Under "Mines Regulation Act, 1906"—
- Amendment of paragraph (g) of Section 32, General Rule (3).

Under "Coal Mines Regulation Act, 1902"—
- An amendment of Regulation 9, Clause (c), Sub-clause (1), under the heading of Part I., Accident Relief Fund.
- An amendment of Regulation 1.
- An amendment and an additional amendment of Regulation 2.
- An additional amendment of Regulation 5.
- An amendment of Regulation 8.
- Amendments of Regulation 9.
- An additional Regulation 11a.
- An amendment of Regulation 14.
- An amendment of Regulation 16.
- An additional amendment of Regulation 22.
- An amendment of Regulation 23.
- An amendment of Regulation 24.

PART IX.—INSPECTION OF MACHINERY.

The Chief Inspector of Machinery reports that the number of useful boilers at the end of the year totalled 3,017 as against 3,026 total for the preceding year, showing a decrease, after all adjustments, of 9 boilers.

Of the total 3,017 useful boilers, 1,705 were out of use at the end of the year; 1,355 thorough, and 182 working inspections were made and 1,367 certificates were issued.

Permanent condemnations totalled 20, and temporary condemnations 49. There were 2 conversions and 13 boilers were exported.

The total number of machinery plants in use was 5,301, against 4,874 for previous year, showing an increase of 427. Inspections made total 3,366, and 3,366 certificates were granted.

111 applications for Engine-drivers' certificates were received and dealt with, and 81 certificates all classes were granted, as follows:—

First Class Competency (including certificates issued under Regulation 27 and Section 63 of the Act)	6
Second Class Competency (including certificates issued under Regulation 27 and Section 63 of the Act)	15
Third Class Competency (including certificates issued under Regulation 27 and Section 63 of the Act)	33
Locomotive Competency (including certificates issued under Regulation 27 and Section 63 of the Act)	13
Traction Competency (including certificates issued under Regulation 27 and Section 63 of the Act)	2
Interim Competency (including certificates issued under Regulation 27 and Section 63 of the Act)	4
Copies Competency (including certificates issued under Regulation 27 and Section 63 of the Act)	8
Total	81

Total mileage travelled was 39,817 miles, of which 16,912 were by rail, 22,896 by road, and 9 by water.

PART X.—SCHOOL OF MINES.

Progress has been well maintained during this, the fifteenth year of the School's existence.

The attendance continued good—in fact there was a record attendance—the increase being particularly marked in the preparatory classes, indicating that the community is alive to the necessity of carrying the education of youths beyond the primary stage. Good work has been accomplished in all the Departments of the School and during the year approval was given for the installation of an experimental plant of a very comprehensive nature, which should be of great value to the students.

The system of free assays for prospectors has been continued, and a total of 551 assays and determinations was made. There has been considerable increase in the work of the Assay Department, and many inquiries have been made and answered regarding minerals of economic value which formerly were little sought for; in this direction the School has been able to supply a large amount of information to prospectors.

CONCLUSION.

In dealing with the operations of the various departments, I have only briefly commented on the principal items. Full and detailed information will be found in the reports of the various officers controlling, published as Divisions II. to VII. of this report.

In conclusion, I desire to acknowledge the support received from all officers of the Department during the year.

M. J. CALANCHINI,
Under Secretary for Mines.

Department of Mines,
Perth, 31st March, 1919.

DIVISION II.

REPORT OF THE STATE MINING ENGINEER FOR THE YEAR 1918.

The Under Secretary for Mines, Perth.

Office of the State Mining Engineer,
Perth, 31st January, 1919.

Sir,—

I have the honour to forward for the information of the Hon. the Minister, a report on the work of my Branch for the year 1918.

INSPECTION OF MINES UNDER "THE MINES REGULATION ACT, 1906," and "THE COAL MINES REGULATION ACT, 1902."

In March Mr. E. J. Gourley returned to his position as an Inspector of Mines, Kalgoorlie, which he had vacated for service in the A.I.F.

In March also Mr. F. J. Price resigned from the position of Ventilation Inspector for the Kalgoorlie District to enter commercial life, and Inspector Phoenix took over his duties.

Workmen's Inspectors of Mines.—The term for which Messrs. L. Darcey and H. M. Crocker were appointed as Workmen's Inspectors of Mines for the Kalgoorlie District having expired, nominations were called for the vacancies and an election was held at Kalgoorlie in June, Messrs. Darcey and Crocker being re-elected for a further term of two years.

In July, a similar election was held for the Murchison District, Mr. J. Goggin being re-elected.

In August the election for the Mt. Margaret District was carried out, Mr. C. Byfield being the successful candidate.

REPORTS OF INSPECTORS OF MINES.

The following are abridged reports of the various Inspectors of Mines.

Abridged Report of Mr. W. M. Deeble, Inspector of Mines, Cue.

Yalgoo Goldfield.

Mining very quiet: Unit mill and machinery on Emerald G.M. transferred to Old Reliance G.M., which is being unwatered—prospects very encouraging.

The Copper, Bismuth, and Molybdenite mines were all shut down during the year.

Murchison Goldfield.

Mt. Magnet.—The mines in this centre have employed a fair number of men, the principal producers being Leap Year, St. Patrick, and Gift.

Lake Austin.— Some high grade ore was obtained from the Moyagee, G.M., and the mine taken over by a syndicate.

Day Dawn.—Tributers on the Great Fingall obtained 124ozs. 4dwts. of gold from 167½ tons of ore, tailings assaying 4dwts. 14 grs. per ton.

Cue.—The main producer, the Light of Asia, acquired by the Mararoa G.M. Co., employed 36 men in erecting machinery and development work: The Big Bell was hampered by an inadequate water supply.

Pinnacles.—Mining generally quiet; a rich find discovered about ¾-mile south of Black Range Pinnacles; 359 ozs. of gold obtained during November and December from a contact leader.

Tuckabianna.—1,307 tons of ore from various mines returned 2,879ozs. gold, the Nigel G.M. being responsible for 390 tons for 1,336ozs. gold.

Culculli.—308 tons of ore treated for 1,184·33ozs. gold, the Turn of the Tide being the main producer.

Nannine, Quinns, and Gabanintha.—Mining very quiet.

Meekatharra.—Ingliston Consols Extended, Ingliston, Commodore, Marmont, and Fenian Gold Mines: Development work has been successfully carried on, giving employment to a number of men, and good prospects for the future of the mines.

Holden's Find.—Only a few men were employed at the Waterloo G.M., owing to shortage of mill water.

Peak Hill Goldfield.

Peak Hill.—The old Peak Hill G.M. shaft was repaired and a Stamper Mill and Pans erected for treatment of refuse from the old mine.

Abridged Report of Mr. A. W. Winzar, Inspector of Mines, Sandstone.

Black Range District.—No new finds of any importance. The gold yield shows a decrease of 1,379 ozs., and tonnage a decrease of 4,127 tons compared with 1917. Black Range Consolidated worked by tributers; trouble with water experienced. Nancy's Reward developed at bottom level; 265 tons crushed for 287 ozs. Comedy King crushed 112 tons for 229 ozs. Entente, portion of Oroya Black Range leases, obtained 613 tons from an old block left by the Company which gave a return of 339 ozs. Pyx deepened to 88ft. below 200ft. level, and drove N. and S. on about 15in. of stone; battery returns disappointing, and mine closed down.

Maninga Marley.—Havilah crushed 351 tons for 385 ozs.

Youanmi.—Youanmi shaft deepened to No. 7 level, no payable values disclosed, rises put up and intermediate level driven on good values. 20,540 tons milled for 13,304 ozs. United obtained 418 ozs. from 1,006 tons; the lode is a continuation north of the Youanmi and a valuable proposition.

Curran's Find.—Red White and Blue, while sinking shaft, struck heavy water, and had to abandon sinking ; attention given to cyanide treatment of sands.

Barrambie.—Two parties worked leaders at the Six Mile and obtained 260 ozs.

Birrigrin.—Pelerin being unwatered, stone hard but values high.

Lawlers District.—Gold yield shows decrease of 355ozs. with an increased tonnage of 555 tons.

Waroonga.—Waroonga the principal producer, crushed 9,320 tons for 1,337ozs.

Lawlers.—700ozs. from 676 tons obtained from the Queen, which is improving at depth.

Sir Samuel.—A little prospecting done and a few tons treated at State Battery.

Kathleen Valley.—Yellow Aster returned 608ozs. from 1,271 tons ; prospects good.

Darlot.—Mining quiet.

Bungarra.—Copper Show at Lawlers abandoned owing to drop in price of copper. 82·4 tons shipped for a return of 12·15 tons copper valued at £1,257.

Wiluna.—Gold yield shows decrease, 15,959 tons yielding 7,892 ozs. Moonlight, the principal producer, crushed 4,073 tons for 1,590ozs. Violet, being worked by tribute, treated 10,158 tons for 5,192ozs. Zig Zag treated 206 tons for 77·5ozs.; mine closed down owing to distance from battery.

Diorite.—Pola & Mosman crushed a parcel at the State Battery, Wiluna (20 miles away), which gave a return of 22 dwts. to the ton.

Mt. Keith.—Mis-deal crushed 685 tons for 581ozs. ; shaft sunk another 45ft. to water. Aurora did a lot of development for poor results owing to heavy ground and water trouble.

Mt. Margaret Goldfield.—Victory and Mt. Clifford, mining quiet.

Wilson's Patch.—Great Western being equipped with pumping and gas plant.

Yalgoo.—Mt. Gibson : Mining quiet. A patch of 200ozs. obtained from one of the shafts of the Golden Harp, which is being equipped with a battery. Wolfram King, small amount of development work effected. Boni Venture, two men tunnelling into hill with hope of striking payable chute.

Field's Find Extended crushed 511 tons for 344ozs. ; mine closed down. From adjoining P.A. 82 tons crushed for 34ozs., and from the Commodore 62 tons for 52½ozs.

Warriedar.—Highland Chief returned 118ozs. from 132 tons. Tributers on Mug's Luck obtained 356½ ozs. from 974 tons, and 188ozs. from 400 tons obtained from Ironclad. Molybdenite deposits at Mt. Mulgine worked with encouraging results.

Payne's Find.—Prospects good, 2,142 tons returned 2,709ozs. Principal producer, the Orchid, crushed 411·5 tons for 852·8ozs. A bar intercepted the reef at 250ft. The Carnation returned 802ozs. from 360 tons, and Sweet William 542ozs. from 391 tons. Reefs small, country rock extremely hard, and rate of boring 6 to 8 feet per shift, single hand ; all stoping is underhand.

Abridged Report of Mr. H. P. Rockett, Inspector of Mines, Leonora.

The total amount of gold won from the Mt. Margaret and North Coolgardie Goldfields for the year 1918 amounted to 122,176 ozs. from 284,440 tons, as compared with 136,670 ozs. from 311,391 tons for the previous year. Copper ore to the extent of 2,245 tons was raised, and two or three truck loads of scheelite were forwarded to Coolgardie.

Leonora Centre.—The Gwalia still holds pride of position as the largest gold producer. During the year £14,000 were expended producing mullock for stopes underground. This work is now practically completed. The Diorite and Trump mines were the only other two producers in this centre.

Laverton Centre.—Attempts are being made to locate the supposed faulted portion of the Lancefield lode. The Lancefield mine produced 26,281ozs. of gold from 71,150 tons. From the Golden Circle, 400ozs. of gold were won chiefly from specimens. The British Lion crushed 161 tons for 83ozs. ; this mine is experiencing water difficulties.

Ida H.—The tributers on the Ida H. treated 7,800 tons of ore for a return of 4,650ozs. The Childe Harold 4,650 tons for 893ozs., and the Lady Harriett 745 tons for 145ozs. These mines are experiencing the bad effects of the rise in price of mining materials

Duketon and Burtville.—From the Duketon Centre only 243ozs. of gold were won for the year, while Burtville produced only 80ozs.

Linden.—Mining has practically stopped here.

Mt. Morgans.—The Westralia Mt. Morgans milled 6,715 tons for a return of 2.727ozs.

Menzies.—As usual, the Menzies Consolidated was the chief producer with 13,540ozs. from the treatment of 23,900 tons. In this district the Lady Shenton produced 910ozs. from 890 tons, and the Crusoe 621ozs. from 660 tons.

Comet Vale.—In this centre the Sand Queen yielded 7,046ozs. from 9,300 tons, and the Gladsome 4,421ozs. from 5,300 tons. The New Boddington has closed down.

Davyhurst.—The Little Dele has ceased operations largely owing to scarcity of water. The Riverina South produced 3,850ozs. from 2,900 tons, and the management are sanguine regarding the future.

Mt. Ida.—The owners of the Unexpected South are sinking their shaft below the 306ft. level. On the Boody mine 250 tons of ore are at grass, ready for the battery.

Yerilla and Edjudina.—A little prospecting is going on in these centres. The Senate produced 238ozs. from 245 tons.

Kookynie.—The Cosmopolitan No. 2 and the D's are the chief producers here, and returned 413ozs. from 386 tons, and 364ozs. respectively.

Prospecting.—On the whole, it has been an unsuitable year for prospecting on account of the small rainfall. One party, however, reached a point 300 miles east of Linden. Several parties are likely to start when rain falls.

Abridged Report of Mr. J. Crabb, Inspector of Mines, Southern Cross.

Coolgardie Goldfield.

Sons of Erin and Hidden Secret North worked by tributers. State Mill kept fairly well employed treating ore from prospectors' shows. Turn of the Tide, worked by Melbourne Syndicate under option, put down the main incline to 225ft. and treated 297 tons for 575ozs. of gold valued at £2,307. A large amount of development work done on the Carbine with satisfactory results.

New discovery of gold near Kurrawang woodline, several leases pegged out, prospects very favourable and worthy attention of prospectors.

Dundas Goldfield.

Red White and Blue, discovery of profitable gold bearing lode material. Mararoa and Viking No. 1, are principal producers of field. 107 tons of scheelite ore treated from various shows, one parcel of 40 tons 10 cwt. from Sons of Erin G.M. returned 6 cwt. 1 qr. scheelite, and another of 22 tons from Petersons show returned 1 ton 5 cwt. of scheelite.

Yilgarn Goldfield.

Edna May Central, developments highly satisfactory, provision made to cope with inflow of water. Edna May made a good profit despite the heavy inflow of water, about 1,000,000 gallons per day, adding to the cost of production. Edna May Consolidated treated 20,000 tons of ore for an average return of 50s. per ton; considerable difficulty experienced in keeping underground workings safe owing to heavy and treacherous nature of ground and lode material. Edna May Deep Levels, steady progress made.

Southern Cross Goldfield.

Mt. Rankin G.M. Co., took over the Dawn and started to unwater main shaft in order to test the lode at 300ft. Transvaal erected a large concentrating plant to deal with Mispickel ore. Bullfinch treated 57,609 tons of ore, value £60,413; total production since inception 394,936 tons, value £551,865; £101,182 paid in dividends.

Marvel Loch, Parker's Range, Forrestania, Golden Valley and Mt. Jackson.—Mining quiet.

ABRIDGED REPORT OF MR. W. F. GREENARD, INSPECTOR OF MINES, KALGOORLIE.

Special attention given to testing air receivers, safety cages, detaching hooks and examination and lubrication of winding ropes. As shafts become deeper the surge in ropes compel the testing of cages in a specially constructed frame.

Great Boulder Proprietary, Golden Horseshoe and Ivanhoe.—Side pressure is causing considerable anxiety, but all possible is being done to resist it in the shape of timbering and filling.

Dust.—In underground workings dust reduced to a minimum. In dry mills all conveyors and openings covered.

Several slight creeps or snaps occurred in Great Boulder Proprietary, Golden Horseshoe, and Ivanhoe owing to continual working of reserves throwing more pressure on timbers and filling.

Mining.—Development on the East Coolgardie Goldfield practically at a standstill. Mayman and party are developing a very promising lode formation. War conditions interfered with the energetic development of the large sulphide lode in the Corn Cob. Tributers won a considerable amount of gold from old stopes of the Oroya Links. Several different tribute parties worked the Great Boulder Perseverance, some doing remarkably well. A small amount of development effected at the Kalgurli, and ore reserves in top levels exhausted, bottom levels flooded by water from North Kalgurli at 900ft. level. Lake View and Star and Chaffers worked partly by the company and partly by tributers. Ivanhoe opened up reserves previously missed in top levels and reached a depth of 3,650ft. and the Great Boulder Proprietary 2,800ft. A small amount of sinking and development work effected at lowest level, 3,200ft., of Golden Horseshoe. Associated Northern worked by tributers, some doing well, others only making wages.

Kanowna.—Mining quiet. Lily and White Feather mines worked by tributers; the latter practically ceased work. Several good crushings obtained from Kanowna Consols.

Kurnalpi, Mulgabbie, Gindalbie, Kalpini, and Jubilee.—Mining very quiet. New ore deposit in Gordon and Sirdar mines tested with good results.

Mulgarrie.—Old battery sold and removed. A Huntington Mill erected on Palm mine.

Broad Arrow.—Morland and Party of Oversight, and Erickson and Party of adjoining claim, put through some good crushings.

Black Flag.—A good deal of prospecting carried on and several small rich contact shoots located. A number of returned soldiers located two or three highly promising prospects.

Bardoc, Vettersburg, and Canegrass.—Mining quiet.

Ora Banda.—On Gimlet and Victorious work confined to development and reserves opened for future treatment. Prospecting practically confined to Grant's Patch and Dark Horse areas, where very rich contact shoots located.

Siberia.—Prospecting continues and good patches of gold occasionally met with.

ABRIDGED REPORT OF MR. E. J. GOURLEY, INSPECTOR OF MINES, KALGOORLIE.

Special Inspection of Ropes and Cages on Mines on Boulder Belt.—With exception of North Kalgurli and Brookman's Boulder, all ropes in good order; Oroya North Blocks' cage condemned and replaced by new one. All air receivers cleaned out and tested.

Waverley.—Mining very quiet. Siberia Consols worked by owner with fair success. Three parties prospected for contact leaders on Christmas reef, very little gold obtained.

Ora Banda.—Mining very quiet. Very good ore in Nos. 3 and 4 levels of Gimlet mine opened up.

Grant's Patch.—New find located, shaft sunk and rich values obtained at 60ft. in brown schist and white sugary quartz leaders; two crushings gave up to 2ozs. per ton; payable values obtained at 100ft. in the leaders, but formation poor.

Mt. Pleasant.—A few dryblowers making a living, and two parties of Returned Soldiers working quartz reefs obtained ounce prospects and installed pumping machinery. Two parties, soldiers, working Bulletin leases—prospects unpayable.

Broad Arrow.—Rich yields from some of the mines attracted prospecting parties, but nothing payable found.

Bardoc.—Zoroastrian worked by four men who obtained small rich parcel.

Kanowna.—Discovery of clay and alunite by Mr. Wyatt about 1½ miles from townsite, a number of leases taken up; clay sold to merchants for whiting; the alunite occurs in small veins and nodules.

Mt. Monger.—About 25 men at work obtained high values.

Bulong.—Very quiet.

Mulgabbie.—Gold discovered on Pinnacles and Rew rd Claim applied for—ore body about 3ft. wide giving values up to 15 dwts. at 30ft. for length of 40ft., then became unpayable and abandoned.

Returned Soldier Prospectors under Repatriation.—20 men granted assistance for prospecting, payable gold reported from Cave Rocks field, and a party at Mt. Pleasant struck payable ore.

Kalgoorlie.—Close attention given to prevention of dust. Golden Horseshoe and Ivanhoe: Large amount of development effected. Lake View and Star, development chiefly confined to stoping and crosscutting; good values obtained at Chaffers at 200 and 300ft. levels. Great Boulder Perseverance: Tribute party obtaining good values, plant kept going with ore from shrink stopes. Great Boulder Proprietary: Development continued by opening up south end of lease. Associated: Ore bodies low in value, and mine struggling to keep going. South Kalgurli: New lode opened up at 10, 12, 13 and 15ft. levels, work confined to stoping and driving. Kalgurli: Development at 16 and 17 levels opened up new ore body with fair values; bottom workings being filled with water from North Kalgurli. Associated Northern: Rich returns obtained by tributers. East of old workings new oxidised ore body averaging about 12ft. in width discovered, giving values about 2ozs. to ton. Oroya Links: Being worked by tributers, who are taking out blocks around old ore pipe.

Abridged Report of Mr. S. Irwin, Inspector of Mines, Kalgoorlie.

The Golden Ridge Co. ceased operations, being unable to locate payable ore. A new company acquired the mine, picked up the east reef on the other side of the fault, put drive in over 100ft., and sunk a winze: good values obtained.

Boorara.—Development of several leases continued throughout the year, Priest and Gray and McIntyre and Party showing best prospects.

Idaho G.M.—Work temporarily suspended on Aberdare Section as oxidised ore above 100ft. exhausted; hanging wall of Idaho reef chiefly composed of kaolin necessitating low stopes and well-filled and timbered walls.

Lake View, Chaffers, Star, Associated Northern, Oroya Links, New North Boulder, and Croesus South Mines have been worked by tribute parties, most of them showing a fair profit over and above working expenses, and in some cases paying large royalties.

The Ironsides North has done a fair amount of development work and kept the 10-head battery running 16 hours a day on payable ore.

Maymans Consols, Sassella Bros., Creswick, Fair Play, Maritana Hill, and Lord Nelson leases have employed a number of men in opening up the mines, crushings therefrom having given good returns.

The Hannans Reward has kept the battery and mill running on low grade ore 16 hours per day. At Cassidy Hill only about four men employed, and returns unsatisfactory.

Hannans Reward North, Belgravia Hill, Rising Sun, and Hewitt and Party: Only a few men employed; a crushing from the latter of over 100 tons gave a return of about 2ozs. per ton.

Abridged Report of Mr. W. Phoenix, Inspector of Mines, Kalgoorlie.

The system of ventilation of each mine has been closely watched under following headings:—

(1.) *Stability.*—Mines where upcast and downcast currents kept separate by doors and brattices are more reliable as far as direction is concerned.

(2.) *Efficiency.*—Temperatures are taken at all accessible points in intake and return air currents; efficiency, when ventilation is by natural means, depends upon the difference in temperature between the upcast and the downcast columns of air.

(3.) *Quantity.*—To ascertain total quantity of air passing through each stope measurements were taken at all points of entrance, anemometer readings over winzes, tops of passes leading from separate stopes, and in upcast and downcast shafts at various levels.

(4.) *Distribution.*—Improvements made in the direction of air currents and brattice doors fixed at various points to prevent intake air reaching the upcast before it has done its work, the general effect being to reduce total quantity. Many air passes in stopes are covered over and tend to contract airways and still further reduce the quantity because there is not sufficient ventilation pressure to overcome the resistance under present climatic conditions, which emphasises the necessity of large and unobstructed air passes in and out of stopes.

Great Boulder Proprietary, Golden Horseshoe, Ivanhoe, and Gimlet mines have installed fans.

Explosives.—A large current of air is required to remove fumes from sand blasting.

Abridged Report of Mr. J. McVee, Inspector of Mines, Collie.

Total production of coal for year 336,799 tons, value £205,890, being an increase of 10,918 tons on 1917 output. The bulk of the coal was taken by the Railways and Tramways, the remainder going to private people.

Proprietary Coal Mine.—Good development of mine, the tunnel widened to allow of double sets of rails and travelling road constructed.

Co-Operative Colliery.—Very heavy fall occurred in February in main tunnel, and mine becoming flooded, it was abandoned after securing most of the machinery, and work confined to the Company's other mine about half a mile away, which was producing coal at end of year.

Westralian Colliery.—Top seam abandoned owing to excessive water from roof and lack of pumping appliances. Bore put down 268 feet and used for pumping. No. 3 seam being developed.

Cardiff Colliery.—Worked fairly regularly, and at end of year able to considerably increase output, if required.

Premier Colliery.—Good progress made; output doubled.

Scottish Colliery.—New mine started but under unfavourable conditions, the roof above the coal consisting of wet sand, and development retarded by frequent breaks while driving, releasing the water. Mine unable yet to produce any quantity of coal.

Abridged Report of Mr. R. C. Wilson, Inspector of Mines, Perth.

Northampton.—Increased mining activity in Northampton and Ajana end of field.

Narra Tarra Lead Mine.—Output maintained and fair amount of development work done.

Baddera Lead Mine.—Reduced output and results disappointing.

Wheal Ellen.—Developments satisfactory and increased output of good grade ore.

Ajana.—Mining brisk; a rich shoot of ore over 200ft. long about 8ft. wide was proved at 35ft. and 71ft. levels of Surprise mine.

Three Sisters, Geraldine, Geraldine South, Wheal May, and Cheritons have shown encouraging results.

At Yandanooka two men were employed developing a copper mine.

Greenbushes.—Operations chiefly confined to sluicing and dredging, the exceptionally high price of tin making the field very prosperous. The principal lode mining has been on the South Cornwall and Kapanga.

Phillips River.—The Elverdton was the largest producer; the mines generally were adversely affected

by the reduced price for copper and increased smelting charges.

Kundip.—Fair Play, Gem, Gem Consolidated, and Hillsborough, considerable development work carried out; excessive cost of unwatering and developing the Western Flag mine resulted in it being closed down.

Pilbara Goldfield.—Marble Bar: Mining very quiet. Bamboo Creek: Rich crushings obtained from Kitchener, Mt. Prophecy and Perseverance Gold Mines.

Moolyella.—Increased price of tin slightly revived mining.

Nullagine.—Asbestos of good quality obtained near Hales' Grave. Sluicing plant for alluvial gold being unprofitable it was dismantled; 37,300 cubic feet treated for 912·26ozs. fine gold.

Quarries.—Swan District continued operations on slightly reduced output.

MINING ACCIDENTS.

The Mining Accidents for the year 1918 are tabulated in tables 26, 27, 28, and 29, with the previous year's totals for comparison, and forwarded herewith for inclusion in your Annual Report, together with diagram of the fatal accidents year by year, and their causes.

The following table shows the total number of fatal accidents recorded as having occurred on mines, whether to persons employed on the mines or not for the last 5 years:—

——	1914.	1915.	1916.	1917.	1918.
Total fatal accidents on Mines reported	26	36	23	21	28
Less accidents to persons not engaged in mining, deaths in Mines due to natural causes, and accidents to persons which were not due to their occupation as miners	...	2	1	...	3
Fatal accidents to men engaged in mining	26	34	22	21	25
Total men engaged in mining (average)	13,174	12,253	10,903	10,041	9,265
Accident death rate per 1,000 men engaged in mining ...	1·97	2·77	1·93	2·09	2·70

Table 26 classifies the accidents according to causes, from which it will be noted that during 1918 25 persons were killed, and 684 seriously injured, as compared with 21 persons killed and 840 seriously injured during the previous year. The diagram shows graphically the totals of fatal accidents year by year since 1891.

Table 27 shows the death rate per 1,000 persons employed on surface and underground in gold, coal, and other mines, the general average rate for 1918 being 2·70 as against 2·09 for 1917. The rates per 1,000 are based upon the figures in table No. 21 (Annual Report, Under Secretary for Mines, 1918), which shows a grand total for 1918 of 9,265 men employed at mines above and under ground, inclusive of alluvial workers.

Table 28 gives the average number of men employed above and under ground at quarries, and the death rate per 1,000 persons employed therein. The total number of men employed during 1917 was 221 as against 200 for 1918, and the death rate for 1917 and 1918 was *nil*.

Table 29 summarises all the fatal accidents for 1918 above and below ground in gold mines only, with rates per 1,000 men employed and per 1,000 tons of ore raised, similar figures for 1917 being given for comparison. The number of men on which these rates are based is taken from table 23 (Annual Report, Under Secretary for Mines, 1918), and does not include alluvial workers.

In the following table all fatal and serious accidents reported to this office during 1918 are classified according to the gold or mineral field in which they occurred, and also according to causes, the totals from each cause for 1917 being shown for comparison.

——	Explosives.		Falls of Ground.		In shafts.		Miscellaneous Underground.		Surface.		Machinery.		Total.	
	F.	S.	F.	S.	F.	S.	F.	S.	F.	S.	F.	S.	F.	S.
1. E. Coolgardie ...	...	3	3	40	4	5	4	227	1	91	2	14	14	380
2. Mt. Margaret ...	...	4	1	10	...	4	1	58	1	14	1	7	4	97
3. Murchison ...	...	5	1	3	1	2	1	18	...	3	...	...	3	31
4. E. Murchison ...	...	...	...	...	...	...	1	8	...	6	...	...	1	14
5. Coolgardie ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6. Yilgarn	...	2	...	...	1	...	...	1	...	...	...	2	1	5
7. N. Coolgardie ...	...	1	2	1	...	...	...	6	...	2	...	1	2	11
8. N.E. Coolgardie	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9. Broad Arrow ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10. Dundas	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11. Pilbara	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12. Peak Hill ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13. Yalgoo	...	...	...	...	...	1	...	...	...	...	...	...	...	1
14. Phillips River ...	...	...	1	...	...	...	...	1	...	2	...	...	1	3
15. Collie	...	1	1	18	...	...	...	98	1	23	...	...	2	140
16. Greenbushes ...	...	1	...	...	...	...	...	...	...	...	...	...	...	1
17. Northampton ...	...	...	...	...	...	...	...	...	...	...	...	2	...	2
18. W. Pilbara, ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19. Swan	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20. Ashburton ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21. Roelands ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22. Kendinup ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total for 1918 ...	...	17	9	72	6	12	7	417	3	141	3	26	28	685
Total for 1917 ...	...	7	10	93	2	25	4	488	2	196	3	31	21	840

FATAL ACCIDENTS.

The following is a brief description of each fatal accident which occurred during the year 1918 :—

In Shafts.

At the Golden Horseshoe G.M., East Coolgardie Goldfield, a man received serious injury while riding in a cage through a piece of wood splintered off the runner piercing his shoulder; septic pneumonia supervening, he died the following day. The Coroner's jury gave a verdict of accidental death. (1190/18).

At the Kalgurli G.M., East Coolgardie Goldfield, a man met his death by falling through the opening at the 100ft. level between the compartments in the main shaft. At the time of the accident deceased was assisting to remove a plat sheet from the No. 6 level to the No. 1 level plat, but just how the accident occurred is unknown, the opening being only 4ft. 6in. high by 2ft. 1in. wide. The Coroner's jury gave a verdict of accidental death (1850/18).

At the Golden Horseshoe G.M., East Coolgardie Goldfield, a man was being raised to the 16 plat when he fell from the cage and was killed. It is surmised that he must have struck one of the wall plates and been knocked out of the cage. A verdict of accidental death, with no blame attachable to anyone, was given by the Coroner's jury. (2063/18).

At the Edna May Consolidated G.M., Yilgarn Goldfield, the surface foreman was killed. Deceased was lifting some decking boards when he lost his balance and fell down the shaft. The Coroner's jury returned a verdict of accidental death. (2320/18).

Falls of Ground.

A man was killed at the Two Boys G.M., Phillips River Goldfield, by a piece of mullock falling from the hanging wall. The day previous to the accident the stope had been mullocked up to within 6ft. of the face, the slab which fell had been left as it appeared safe on sounding. Every precaution seems to have been taken for the safety of the workmen. The finding of the Coroner's jury was accidental death. (225/18).

A shoveller was killed at the Great Boulder Proprietary G.M., East Coolgardie Goldfield, through a fall of ground from a face which had been fired the previous night, but had been barred down and examined prior to the accident and considered safe. The Coroner's jury returned a verdict of accidental death. (646/18).

At the Premier Colliery, Collie Coalfield, a man was killed by a large quantity of stone falling on him from the roof. Every precaution seems to have been taken and the roof examined prior to starting work. The Coroner's jury brought in a verdict of accidental death, with no blame to anyone. (1027/18).

A fatal accident occurred at the Menzies Consolidated G.M., North Coolgardie Goldfield. Two shovellers were working in the stope when a large piece of the hanging wall fell, killing both men instantaneously. The hanging wall, which had a large crack before the accident, was being closely watched and examined before each shift, and considered safe to work under, and every precaution possible appears to have been taken. The Coroner's jury gave a verdict of accidental death, with no blame to anyone. (1645/18).

At the Light of Asia G.M., Murchison Goldfield, a large rock fell from a soapy head in the back of the drive and struck a shoveller, inflicting fatal injuries. The Coroner's jury brought in a verdict of accidental death, no blame attachable to anyone, and a recommendation "that a Regulation be enforced that sounding should take place after firing in future." (1673/18).

A shoveller was killed by a large piece of ground falling from the hanging wall at the Ivanhoe G.M., East Coolgardie Goldfield. The place where the fall occurred was supported by two 9in. toms, which were broken in the fall, and every precaution appears to have been taken. The Coroner's jury brought in a verdict of accidental death. (2460/18).

At the Associated G.M., East Coolgardie Goldfield, a man met his death through a fall of ground while timbering; every precaution had been taken to secure the ground. The Coroner's jury returned a verdict of accidental death, with no blame attributable to anyone. (62/19).

At the Lancefield G.M., Mt. Margaret Goldfield, a heavy fall of ground occurred in a stope, and a man was struck by a small portion of it and killed. Every precaution appears to have been taken. The Coroner's jury returned a verdict of accidental death with no blame attributable to anyone. (327/19).

Miscellaneous Underground.

A miner having been reported missing, a search was made and his body found in an open cut on the Princess Louisa G.M., East Coolgardie Goldfield. The place was protected by a barbed wire fence. The Coroner's jury found that deceased came by his death through falling down an open cut, no evidence to show whether the occurrence was through accident or design. (2064/18).

While engaged in taking out bearers at the 200ft. level of the Associated Northern Blocks G.M., East Coolgardie Goldfield, a man was killed through falling down a shaft; the cause of the accident is unknown. The Coroner's jury brought in a verdict of accidental death. (1518/18).

At the Golden Horseshoe G.M., East Coolgardie Goldfield, a man was killed by falling down a pass. From evidence brought forward at the inquest it would appear that deceased having lost his light was proceeding to some machine men to get a fresh one, when he probably displaced a log on the pass and fell. The Coroner's jury gave a verdict of accidental death, no blame attachable to any one. (1022/18).

A man received fatal injuries at the Great Boulder Proprietary G.M., East Coolgardie Goldfield, through being struck by a stone which became dislodged when deceased placed his hand on the air pipe. The pass and manway were covered and deceased had been warned there was stone in the manway. The Coroner's jury brought in a verdict of accidental death. (832/18).

At the May Bee G.M., East Murchison Goldfield, a stage collapsed and precipitated a man working thereon into the pass, together with the broken timber and ore. Before the body could be recovered the material had to be fired away. The Coroner's jury returned a verdict of accidental death, with no blame attributable to anyone. (763/18).

A trucker at the Fenian G.M., Murchison Goldfield, met his death through falling down a pass at the No. 3 level. The accident seems to have been caused by a rush of mud and water down the chute. The Coroner's jury returned a verdict of accidental death with no blame attributable to anyone. (370/18)

A fatal accident occurred at the Ida H. G.M., Mt. Margaret Goldfield. Deceased, who was riding on the bucket, gave the signal to hoist After hauling a short distance the engine driver, perceiving there were no lights, stopped the engine and called to deceased to light his candle, but again received the signal to hoist. When about 60ft. from the No. 16 level he felt a slight jerk on the rope and immediately stopped, and on asking if deceased were all right, received the reply "don't shift her." Deceased was then seen to strike several matches and shortly afterwards the engine driver heard something bump, and on sending a man to examine, the body was found at the bottom of the winze. The Coroner's jury returned a verdict of accidental death, with no blame to anyone. (369/18).

Surface (including Machinery).

While attempting to spray the ash tip at the Ida H. G.M., Mt. Margaret Goldfield, a man stepped into about 4ft. of hot ashes and received fatal injuries. (63/19).

At the Associated G.Ms., East Coolgardie Goldfield, a deplorable accident occurred. Deceased got between the spokes of two pulley wheels to unloosen a nut underneath the mill room floor (which he could have reached from the other side without getting into the wheels) when the engine was started and deceased killed. He had been warned that the mill would start at a given time. The Coroner's jury found that deceased came by his death whilst in the execution of his duty, through the starting of the mill engine, but considered there was no direct evidence as to who was responsible for the engine starting. (53/19).

At the Leonora Gold Blocks G.M., Mt. Margaret Goldfield, the body of a mill foreman was found jammed between the pan drive pulley and the ground sill; there being no witness to the accident, the cause is unknown. The Coroner's jury brought in a verdict of accidental death, no evidence to show how the accident occurred. (2432/18).

At the Ivanhoe G.M., East Coolgardie Goldfield, a man was killed through being jammed between the distributor and a beam of the roof; there was no witness to the accident. The Coroner's jury returned a verdict of accidental death with no blame to anyone. (1750/18).

A coal Inspector at the Westralian Coal Mine, Collie Coalfield, was struck and knocked down by a coal train, sustaining fatal injuries, to which he succumbed three weeks later. The Coroner's jury brought in a verdict of accidental death, with no blame attachable to any person. (1557/18).

Serious Accidents.

Under Section 26 of "The Mines Regulation Act, 1906," all accidents which render the sufferer incapable for fourteen days or more of performing his ordinary duties in or about a mine are classified as "serious."

Of the 684 "serious" accidents during 1918, 380 were recorded from the East Coolgardie Goldfield, but only 28 cases out of the number were breakages of the larger bones, permanent injury to limbs, or injuries likely to have lasting disabling effects. The balance were injuries of a less serious nature, such as bruises, cuts, broken and crushed fingers and toes, scalds, burns, poisoned cuts, shocks, smaller dislocations, strains, wrenches, jars, etc., but sufficiently serious to require the injured person to be absent from his work for fourteen days or more.

Explosions and Explosives.

Under the above classification 17 men met with serious injury during 1918. Two of the accidents were due to gelignite catching fire, 4 from premature explosions, 2 from shot-firing, 3 from detonators exploding while being handled, 4 from boring into old holes, 1 from pick striking a detonator from a missfire, and in one accident a stick was blown through a man's shoulder.

Falls of Ground.

During 1918, 72 men were injured seriously owing to falling ground. In 15 cases the injuries were received while the men were engaged in the dangerous but necessary work of pulling down loose ground after firing. The majority of these cases were of a purely accidental nature, inseparable from mining and unpreventable.

In Shafts.

12 accidents during 1918 were classified as "In Shafts"; of these five men were struck by stone and timber falling down shafts, two fell from ladders, and one fell down a shaft through the bar he was using slipping and causing him to overbalance. Three men received serious injuries while riding in cages and skips and one sustained a crushed finger while handling timber.

Miscellaneous Underground.

417 men received serious injuries under the above classification. In 123 cases the injuries were received while handling and loading trucks and skips, through fingers and bodies being jammed against chutes and other trucks, toes and feet run over, bodies struck by upsetting of trucks, men slipping and straining themselves while trucking, or lifting derailed trucks or material into trucks, and so on, the injuries being mostly wrenches, sprains, bruises, jars, fractures of fingers and toes, and cuts. In 95 cases the injuries were due to falling and rolling loose rocks and stones, such as runs of ore and mullock, while shovelling, or stones running down rills and ore chutes, and 14 men received severe cuts and bruises while handling sharp stones. 38 men were injured handling rock drills and coal cutting machines, and parts of same, and two by the stages on which machines were erected collapsing. Other falls in the workings from stages and ladders in rills, passes, and so on, caused injury to 40 persons, and 19 were hurt by falling tools and pieces of machinery. Flying splinters of stone and steel were responsible for 21 men being injured, and 19 were hurt while handling timber, while four men were injured falling down ore passes. The remaining 42 cases were due to various accidental

causes—jarring of hands and feet, blows from tools, strains, kicks and bites from horses, and so on.

Surface (including Machinery).

Under the above classification 167 men were seriously injured during 1918. Six men were burnt in various ways; 16 sustained injuries from falls in the course of their work; 27 were hurt by trucks and skips, by being jammed or struck by them, by them capsizing, or by the men sustaining strains while working them. Flying splinters injured five men; falls of timber and pieces of machinery while being handled accounted for 28 cases of injury; 32 cases were caused by machinery in motion, six of these being caused by handling belts in motion. 27 men were hurt while handling timber, 14 were struck by stones and coal, three men received injuries through falling from stages and ladders, and three men received injuries from handling cyanide solution. Other causes of six accidents were strains from lifting heavy weights, tools slipping and inflicting cuts and bruises, and so on.

OTHER ACCIDENTS.

In addition to the above, four other accidents on mines were reported which were not true mining accidents, the persons killed not being employees of the mine at which they occurred. Of these, three were fatal, and one serious. Brief particulars are as follows:—

Surface.

A man, slightly under the influence of liquor, while proceeding to his home, by some means unknown fell down an open cut on the Central and West Boulder G.M., East Coolgardie Goldfield, and was killed. The place was protected by a barbed wire fence. The Coroner's jury found that deceased came by his death through falling down open cut. (2550/18).

In Shafts.

A man, while under the influence of liquor, was proceeding to his camp by night, when he fell down the shaft of P.A. 442; he was the owner of the P.A., and responsible for the safe protection of the shaft. His position was not discovered till three days later, and he succumbed to his injuries six hours after admission to the hospital. The Coroner's jury returned a verdict of accidental death, with no blame attachable to any person. (1269/18).

Several lads were descending into the abandoned shaft of the Brookman's Boulder G.M., East Coolgardie Goldfield, by the ladders, when a platform below one of the ladders gave way, and 3 of the lads were precipitated down the shaft, one being killed and the others receiving minor injuries. From the evidence adduced at the Coroner's inquest it would appear that the shaft had become insufficiently protected, and the ladders and platforms damaged by large stones having been thrown down. The Coroner's jury returned a verdict of accidental death. (2549/18).

Surface (Serious.)

At the Proprietary Coal Mine, Collie Coalfield, three boys went to the mine with some lunch for a man working at the pit top. While there one of the boys fell from the floor of the gantry on to the ground, a distance of 27ft. 3in., and sustained serious injuries. The gantry was protected with two rails, one at a height of 1ft. 10in. above the floor, and the other 2ft. 7in. There was also a notice prohibiting persons from going on to the gantry at all. (412/18).

WINDING MACHINERY ACCIDENTS.

(without serious injury to persons).

The following are brief particulars of the winding machinery accidents reported for the period under review:—

Overwinding.

At the Black Range West G.M. an engine driver was pulling water and left his engine to attend to a water pipe that had burst. The engine crept away from the brakes, and took the tank to the wheel. The uprights carrying the sheaves were broken; no other damage was done. (2669/18).

At the Moonlight G.M. an engine driver forgot to throw out the clutch of the friction winch, and overwound the cap. The cap piece of the poppet head was broken and the wheel displaced. (1329/18).

At the Ingliston Consols Extended G.M. a third-class engine driver was practising on the winding engine hauling water under the supervision of the first-class driver in charge, when he pulled the tank up to the thimble; no damage of any kind was done. (498/18).

Accidents to Skips and Cages in Shafts.

At the Great Boulder Perseverance G.M. the south skip came out of the guides. The safety hook was broken and also one of the guides. As the guides in this shaft have proved to be too light for skip work it has been decided to discontinue their use in this shaft, and in future to use cages instead. (3013/17).

At the Ingliston G.M. four men were being lowered from the surface to the No. 2 level when the safety catches acted, and one man's knee was jarred or twisted. No satisfactory explanation as to the cause of the accident was obtainable. (1373/18).

At the South Kalgurli Consolidated G.M., Ltd., during declutching operations the south skip ran away from the tip to the bottom of the shaft, snapping the rope clear off the drum. The poppet wheel also flew to pieces. The cause of the accident would appear to have been due to the brake being slightly loose and some ore remaining in the skip after tipping. (1508/18).

At the Great Boulder Perseverance G.M. an engine driver was hauling water and forgot when lowering the cage (containing a water tank) that it was to go to the 500ft. level and consequently ran it through the bearer. No damage was done to the cage or timber. (2141/18).

At the Golden Horseshoe G.M., whilst the south cage was descending with eight men to the 21ft. level, the west gate was left standing on the second set of timber in the shaft above the 15ft. level; no satisfactory explanation could be found for the accident—one man only was slightly bruised. (2284/18).

At the Youanmi G.M. the north cage when ascending caught in the shaft a little below the No. 1 level. Several skids were pulled out, and the cage twisted. A loose skid was thought to be the most likely cause of the accident. (274/19).

At the Sons of Gwalia G.M. the north skip came off the rails when tipping; examination showed that the rails had spread and let the front wheels through. (505/19).

At the Lake View and Star G.M., an engine driver landed the cage containing two men rather heavily. The driver was afraid of stopping the cage too suddenly, and apparently made an error in judgment. (1633/19).

On the Sons of Gwalia G.M. there have been nine cases of derailment of skips reported, luckily without serious damage being done. Three of these derailments were caused by split rock, two by broken laths, one by bad junction between rails, and one by the skip being hoisted too high when tipping. In the remaining two cases no reason for the accident could be found. (554/19 ; 557/19 ; 558/19 ; 559/19 ; 560/19 ; 561/19 ; 563/19 ; 564/19 ; 565/19).

Accidents to Winding Ropes.

At the Black Range West G.M. an engine driver had just pulled a full tank to the kick-up when the winding rope broke just above its attachment to the tank. The accident was thought to have been due to a kink in the rope, coupled perhaps with rough driving. (270/18).

At the Menzies Consolidated G.M. the full kibble was hoisted a few feet when the splice in the rope round the " eye " pulled out and allowed the kibble to fall to the bottom of the shaft, slightly injuring a man in so doing by striking him on the leg. (330/19).

On the Light of Asia G.M. a winding rope broke just as the cage was being hoisted above the plat. The grippers on the cage acted, hanging it up. The cause of this accident was internal corrosion of the rope. (1285/18).

Miscellaneous Accidents.

At the New Commodore G.M. the engine driver was hauling a tank of water when the clutch on the north drum broke. The brake was applied, but would not stop the tank, which went to the bottom. Little damage was done. (334/19).

At the Bullfinch G.M. the drum shaft of the hoisting engine broke, apparently because the metal had become fatigued ; calculation showed that an ample margin of safety had been provided. (664/19).

PROSECUTIONS FOR BREACHES OF THE MINES REGULATION ACT AND REGULATIONS.

During the year 1918 proceedings were instituted against 14 persons, but in four instances the charges were subsequently withdrawn. Brief particulars of each case are as follows :—

Section 31.

An Inspector of Mines found that a man had been driving a friction winch without holding an engine driver's certificate, and issued summons against the manager of the mine and the man so employed. The man promptly left the State, and after a full explanation of the circumstances of the case had been made by the manager the Hon. the Minister withdrew proceedings against him on payment of Court costs already incurred. (1329/18).

Section 32.

(3) (*g.*) Two miners were found to be handling explosives carelessly, and each was fined 2s. and 18s. costs for a breach of above section. (16/18).

(3) (*g.*) A man was proceeded against for having fracture near the working face not in a covered tin or canister ; he was fined £2 and 7s. costs. (2430/18).

(3) (*n.*) A miner was found removing gelignite from a hole with a pinch bar. He was prosecuted for a breach of the above section and fined £1 and 13s. costs. (712/18).

General Rule 27.—A manager was prosecuted for non-observance of Section 32, General Rule 27, and fined £3 and costs. (2314/18).

General Rule 9.—Two men were working in a stope just above the No. 2 level in a mine when some ground fell, killing one of the men. The Inspector of Mines considered that the accident was due to faulty securing of the ground. The manager was proceeded against for non-compliance of the above section on two separate charges. He was fined £25 on the first charge and £5 on the second with costs. (3183/17).

General Rule 9.—A manager was prosecuted against for having a shaft on his mine insufficiently protected. He was fined £1 with 3s. costs. (2466/18).

Section 48.

Proceedings were commenced against two managers for failure to supply mine plans as required by the above Regulation. On receipt of the necessary plan from one of the managers and a description of the work done from the other, the proceedings were discontinued on payment of Court fees already incurred. (2205/18).

Section 57.

A man was proceeded against for using the signalling bells to the danger of the platman. While the platman was taking a truck of ore off the cage at the 22ft. level the cage was pulled away. The bridle caught his arm and he was taken up several feet before he managed to free himself. He then narrowly escaped falling down the shaft. A fine of £2 was inflicted and £1 3s. costs. (2213/18)

A man left a shot unprotected at a shoot on a main level and the underground manager had a narrow escape from serious injury The man was proceeded against for a breach of the above Section ; he pleaded guilty and was fined £5 and 5s costs, or the alternative of one month. (2313/18).

Regulation 4, *General Rule* 40.

A man was found in an underground pass, and was fined £3 for a breach of the above Regulation. (817/18).

EXEMPTIONS FROM SECTION 31.

Under Sub-section 4 *of* "*The Mines Regulation Act,* 1906."

During the year 23 persons were granted Exemption Certificates. In each case the Inspector of Mines for the District examined the applicant on the particular machinery for which the permit was required, and satisfied himself that the man was capable of taking charge of it. Holders of these exemptions must present themselves for examin

ation for at least a Third Class Engine-driver's Certificate before a renewal will be approved, and raising and lowering of men by them is not permitted under any consideration.

SUNDAY LABOUR IN MINES.

Thirty-seven Sunday Labour Permits were issued during the year 1918 to admit of the ordinary work of the mine being carried on without interruption during week days. The permits were granted for changing rails in a main shaft skip way, shaft sinking when the inflow of water necessitated continuous work, and for repairs, relaying roads, and for other work to avoid risk of damage to the workings or loss of time in the subsequent working of the mine.

AMENDMENTS AND ADDITIONS DURING 1918 TO THE REGULATIONS UNDER "THE MINES REGULATION ACT, 1906," "THE MINES REGULATION AMENDMENT ACT, 1915," "THE COAL MINES REGULATION ACT, 1902," "THE COAL MINES REGULATION ACT, 1915," AND THE MINING DEVELOPMENT ACT, 1902."

"The Mines Regulation Act, 1906," Sec. 32, General Rule 3, para. (g), relating to explosives. Gazetted 11-1-18.

"The Coal Mines Regulation Act, 1902." Accident Relief Fund. Amendments and additional amendments to Regulations 1, 2, 5, 8, 9, 11*a*, 14, 16, 22, 23, and 24.

PHILLIPS RIVER SMELTING WORKS.

Report of the Manager, Mr. Richard Shepherd, dated 14th March, 1919 :—

"The metallurgical figures of the three campaigns, Nos. 7, 8, and 9 run during the year, were as follows—the corresponding figures for 1917 being given in brackets :—

Total ore smelted	5,453 tons	(7,420 tons)
*Pure copper blister sent to refinery	337·93 „	(486·34 „)
*Gold recovered from blister ...	4,142 ozs.	(456·22 ozs.)
*Silver recovered from blister	3,443 „	(4,894 „)

The average metal recoveries per ton of ore treated being :—

*Copper	6·19 %	(6·49 %)
*Silver	12·62dwts.	(13·06dwts.)
*Gold	15·19 „	(12·43 „)

"As complete returns are not yet to hand from the Port Kembla refinery the figures above, marked * are Works estimates and, though not final, they are close approximations. The serious falling off in the tonnage treated, from that of 1917, is due to several causes. The rapid increase in the cost of mining and treatment due to the War, combined with the declining price of refined copper which has been falling since 1916 and during 1918, had dropped to £106 per ton, made it increasingly difficult to maintain the high grade necessary to be profitable on so isolated and expensive a field as Phillips River. Also, as foreshadowed in the report for 1917, the complete absence of development at depth, below the water level, for lack of suitable machinery and organisation among the Ore Producers made it abundantly clear that the shallow surface workings, from which 32,524 tons of ore have been taken during the past five years, were approaching exhaustion.

"The commercial result of the year's work is not yet ascertainable owing to the termination of the copper contract with the Imperial Munitions Department at the end of the year, and the fact that the copper made during the last quarter of same was not available for sale as refined metal until 1919. In common with all the other Australian Copper Producers the Department has not been able to dispose of this metal and the true post-war price of the same is still a matter of conjecture. But assuming that the whole copper output for the year is disposed of at £106 per ton :—

Gross value of metals sold ...	=	£54,110 (74,772 5 5)
Cost of treatment, interest and realisation	=	£39,781 (49,050 15 2)

"The costs of treatment and realisation rose at a more rapid rate during 1918 than during the earlier years of the War, and it was early evident that the tariff charges to ore-sellers, when sending in ore for treatment, would be insufficient to cover costs. The tariff was amended in August to meet the expected loss. But, though the amount of this loss is even now only a matter of estimate, it is certain that the year's operations resulted in a loss so substantial that the tariff was again amended at the end of the year to prevent further leakage. This further rise in tariff charges has so far reduced the immediate returns to ore sellers as to cause a practical cessation of ore raising on the field. The running of the smelter has been indefinitely suspended pending a stable market for copper, and to give the costs time to revert to something more like normal peace level dimensions. Effort is now being concentrated on the equipment of the various holdings and development below the water level for the resumption of mining the various ore bodies on the field. The records and indications of many of them justify the expectation that capital so spent will be amply repaid when normal costs and a stable copper market are obtainable."

ADVANCES ON ORES.

During the year a number of parcels of ore were received by the Department from prospectors and others. Samples were taken and advances made under the Advances on Ores scheme. The ores were then sold in the best market, and on receipt of proceeds any balances were paid to the owners. A large number of parcels are now being shipped by the producers themselves, and it is the policy of the Department to encourage them to deal with the Smelting Works themselves as much as possible. This particularly applies to the lead ores, most of which were sent directly to the Fremantle Smelter.

Samples of minerals are constantly being received for identification and mode of occurrence, and market value ; this information is always supplied as far as possible, either by this Branch or the Geological Survey.

Nine parcels of copper ore weighing 77·3182 tons were completely realised on for producers during 1918. There were also four other parcels received aggregating 24·6628 tons, of which the final settlement figures are not yet available. Final settlement for these has been greatly delayed by the want of market for copper during the first half of 1919.

Eight parcels of lead ore were handled for mine owners aggregating 88·0167 tons, the amount realised being £926 4s. 5d.

Eight parcels of scheelite were received at the State Treatment Plant at Coolgardie, aggregating 121·9696 tons. Final settlement figures are not yet available, and this matter in the future will be dealt with in the report of the Superintendent of State Batteries.

One parcel of graphite was sent to England; unfortunately it was of very low grade, and the proceeds did not cover the costs of shipping.

One parcel of antimony, weighing 4·7370 tons, was handled by the Department, also a small parcel of Bismuth weighing 3 cwt.

A parcel of asbestos from Nullagine was sold in Melbourne, weighing 1·0558 tons; this was reduced by dressing to 17 cwt.

The results of treatment of above parcels are as tabulated hereunder.

ADVANCES ON ORES.

Statement of Transactions for Year 1918.

MISCELLANEOUS MINERALS.

Mineral.	File.	Tonnage.	Amount advanced.	Expenses in shipping.	Balance of proceeds remitted to owners.	Total amount realised.
			£ s. d.	£ s. d.	£ s. d.	£ s. d.
Copper Ore	88/18	7·9487	71 0 0	17 15 2	27 0 8	115 15 10
Do.	88/18	12·1844	76 0 0	20 0 0	43 13 0	139 13 0
Do.	88/18	8·8329	180 0 0	14 7 4	125 6 3	319 13 7
Do.	468/18	11·9997	115 0 0	22 0 11	56 6 7	193 7 6
Do.	957/18	7·5400	140 0 0	17 12 1	80 4 0	237 16 1
Do.	957/18	7·3820	128 0 0	19 9 4	66 4 10	213 14 2
Do.	1302/18	7·2738	17 0 0	18 5 9	7 2 10	42 8 7
Do.	1634/18	9·0630	155 0 0	12 18 3	75 15 0	243 13 3
Do.	1909/18	5·0937	20 0 0	16 0 2	2 14 4	38 14 6
		77·3182	902 0 0	158 9 0	484 7 6	1,544 16 6
Do.	2078/18	8·8529	110 0 0	Proceeds not to hand		
Do.	2434/18	4·8723	60 0 0	do.		
Do.	2461/18	9·1633	140 0 0	do.		
Do.	2461/18	1·8013	25 0 0	do.		
		101·9810	1,237 0 0	...	...	...
Lead	184/18	9·6651	...	...	...	105 7 4
Do.	1041/18	9·6633	...	...	...	108 12 10
Do.	1311/18	9·5816	...	...	...	100 3 0
Do.	1529/18	9·8508	...	...	...	107 1 8
Do.	1753/18	9·8660	...	...	...	105 5 7
Do.	1892/18	9·8660	...	...	...	107 16 6
Do.	2369/18	9·8883	...	...	...	107 6 11
Do.	2682/18	19·6156	...	...	...	184 10 7
		88·0167	...	...	...	926 4 5
Scheelite	1216/18	108·2696	346 5 4	...	...	...
Do.	1216/18	13·7000	69 1 5	...	...	...
Graphite	2309/17	6·0000	...	27 10 0	...	*Nil* (1)
Antimony	2309/17	4·7370	40 0 0	24 7 10	...	(2) 55 10 3
Bismuth	2534/18	·1866	45 0 0	8 3 3	23 11 11	76 15 2
Asbestos	3178/17	1·0558	...	8 2 2	19 17 10	28 0 0
Total	...	133·9490	...	...	...	...
GRAND TOTAL	...	323·9467	...	...	...	...

(1.) Proceeds did not pay cost of shipping. (2.) Proceeds were not sufficient to recoup advance.

LOANS AND SUBSIDIES UNDER "THE MINING DEVELOPMENT ACT" AND MINING DEVELOPMENT VOTE.

Tables showing the transactions under the above headings are appended. (Appendix 1.)

Charcoal precipitation of Gold from Cyanide Solutions.

Some further details of charcoal precipitation method in use at the Yuanmi Gold mine, collected by Mr. R. C. Wilson, Inspector of Mines, are also appended. (Appendix 2).

I have, etc.,
A. MONTGOMERY,
State Mining Engineer.

APPENDIX I.

SUMMARY OF EXPENDITURE FROM MINING DEVELOPMENT VOTE FROM 1ST JANUARY TO 31ST DECEMBER, 1918.

Mine or Owner.	Mining Centre.	Amount.	Total.
		£ s. d.	£ s. d.
Advances in Aid of Mining Work and Equipment.			
Flag Gold Mine	Ravensthorpe	982 12 1	
Thring, Waun, and Dwyer	Northampton	203 0 0	
W. J. Kingsmill (Ironclad Lease)	Ravensthorpe	198 12 6	
T. R. Byass (Bulletin Mine)	Marble Bar	152 1 10	
J. McCarthy (Pyx Gold Mine)	do.	55 12 6	
Colreavy and Party	Forestania	167 0 0	
Outridge and Hunter	Coolgardie	54 11 10	
Unexpected Gold Mine	Mt. Ida	286 10 0	
W. Southey and others (Aurora)	Mt. Keith	320 0 0	
Mt. Rankin Gold Mine, N.L.	Southern Cross	200 0 0	
		2,620 0 9	
Less Repayments credited to Vote.			
£ s. d.			
T. R. Byass 4 11 11			
J. Currie 50 11 0			
Perron and Party 95 0 6			
Thring, Waun, and Dwyer 3 0 0			
		153 3 5	
			2,466 17 4
Miscellaneous Expenditure.			
Smith and Luke, subsidy	Bridgetown	7 5 0	
S. C. Lang, subsidy	Golden Valley	200 0 0	
A. H. Williams (Rainbow G.M. Co.)	Coolgardie	45 0 0	
W. Foley, subsidy	Moonyoonooka	54 5 0	
Manjimup Prospecting Syndicate	... ...	30 0 0	
Maintenance Securities	... ...	118 10 0	
Lease of Marda Tank	... ...	60 0 0	
Rebates *re* Water Supply	... ...	50 12 6	
Preliminary Investigations—Sampling Mines	... ...	321 17 10	
			887 10 4
Boring.			
Mt. McMahon	... ...	2 7 8	
J. Johnstone	Irwin River	158 18 11	
			161 6 7
Providing Transport and Equipment for Prospectors.			
Purchase of horses, camels, equipment, etc.	... ...	1,248 19 7	
Less credits to Vote	... ...	5 1 7	
			1,243 18 0
Subsidies Development Work.			
Meatcham, L. J.	Black Range	25 0 0	
Bennett, E. A.	Coolgardie	11 5 0	
Thomas, E.	Sandstone	7 4 0	
			43 9 0
Subsidies to Batteries—Crushing for Public.			
Patterson, W. A.	419½ tons Parker's Range	42 5 0	
Garland, J. P.	3,843 ,, Holden's Find	434 7 6	
Lang, S. C.	575 ,, Golden Valley	83 12 6	
Hastedt, Robt.	65 ,, Leonora ...	4 17 6	
Edna May G.M. Co., N.L.	30 ,, Westonia ...	3 0 0	
Mandelstam, A. S.	202½ ,, Edjudina ...	15 4 3	
Graham, S.	72 ,, Southern Cross	5 8 0	
Northey, D.	232 ,, Broad Arrow	23 4 0	
			611 18 9
Rebates to Prospectors—Crushing at State Batteries (War Rates)	... ...	...	752 2 10
Subsidies Carting Long Distances to Batteries.			
Brewer, D.	Edjudina	5 3 6	
Roberts, R. W.	Laverton	12 10 0	
Evans, R.	Forestania	40 0 0	
Ryan and Gully	Ravensthorpe	10 5 6	
			67 19 0
Total (according to net Treasury figures for year) ...	... ...	...	£6,235 1 10

SUMMARY OF EXPENDITURE FROM MINING DEVELOPMENT VOTE, ETC.—*continued.*

Mine or Owner.	Amount.	Total.
	£ s. d.	£ s. d.
Advances Refunded.		
Yellow Aster	123 0 10	
Elverdton	181 12 2	
Lady Pratt	37 18 9	
Havilah Development G.M.	13 7 11	
Auram	12 15 0	
Aurora	24 13 3	
Red, White, and Blue	17 0 4	
		410 8 3
Recovered from Sale of Securities.		
Chunderloo G.M.	32 15 0	
Southern Cross G.M.	350 0 0	
Triplicate	10 0 0	
Ravensthorpe Battery Company	25 0 0	
Hornsby G.M.	42 10 0	
Hawk G.M.	2 0 0	
		462 5 0
Miscellaneous Refunds.		
Fraser's Gold Mine	...	87 10 0
Total, inclusive of refunds shown in foregoing table credited to Mining Development Vote; balance having been paid to Government Property Sales Fund Receipts	...	£960 3 3

THE MINING DEVELOPMENT ACT, 1902—ADVANCES WRITTEN OFF TO 31ST DECEMBER, 1918.

	£ s. d.	
Previously reported (1914 Annual Report) ...	16,366 4 1	
Year 1915	*Nil*	
Year 1916	*Nil*	
Year 1917	*Nil*	
Year 1918	13,625 11 5	
		£29,991 15 6

MINING DEVELOPMENT EXPENDITURE

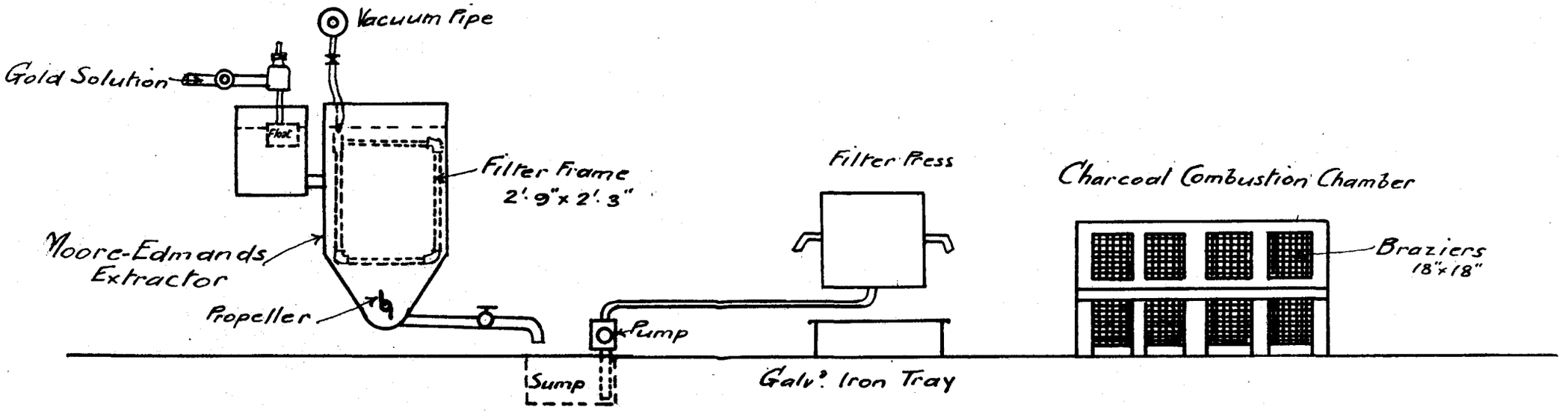
Advances Outstanding, 31st December, 1918.

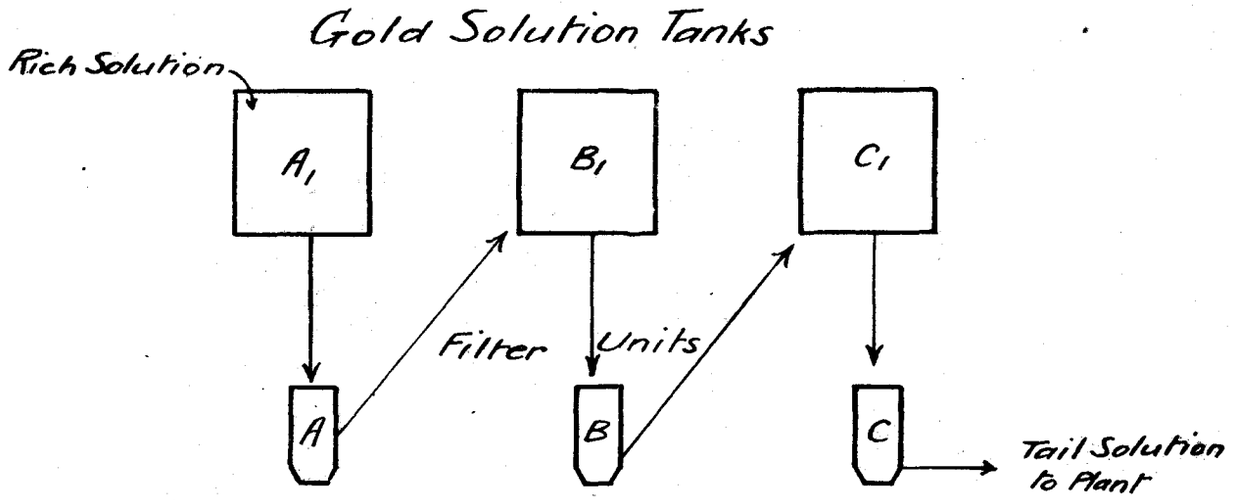
	Name of Lease, Mine, or Borrower.	No. of Lease.	District.	Amount authorised.	Principal Moneys advanced		Principal Moneys		Interest		Total Principal and Interest outstanding at 31st December, 1918.
					Previous to 1918.	During 1918.	Repaid, including Sale of Securities, etc.	Balance outstanding.	Paid.	Outstanding.	
	A.—PIONEER MINING AND PROSPECTING.			£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
90/12	Alicia	254F	Mt. Morgans	245 0 0	195 0 0	...	...	195 0 0	4 2 6	54 14 8	249 14 8
472/16	Aurora	201J	Mt. Keith	320 0 0	...	320 0 0	24 13 3	295 6 9	...	7 16 5	303 3 2
367/18	Bulletin	795	Marble Bar	600 0 0	255 17 7	152 1 10	5 8 10	402 10 7	6 11 2	18 19 11	421 10 6
909/12	Brittania	953M	Mt. Magnet	150 0 0	114 12 6	...	43 10 0	71 2 6	...	9 4 6	80 7 0
...	Colreavy and Party	2229/15	Yilgarn	630 0 0	79 0 0	167 0 0	...	246 0 0	...	7 9 5	253 9 5
2257/12	Champion South	817, 1039N	Nannine	400 0 0	400 0 0	...	350 0 0	50 0 0	29 11 8	19 19 8	69 19 8
3166/09	Emily	1510	Day Dawn	400 0 0	372 1 9	...	...	372 1 9	...	44 7 10	416 9 7
2208/08	Elverdton	...	Ravensthorpe	3,500 0 0	3,498 17 10	...	3,083 19 6	414 18 4	415 17 8	15 13 2	430 11 6
1444/12	Eclipse	1047X	Gindalbie	498 19 1	498 19 1	...	252 5 0	246 14 1	62 8 11	...	246 14 1
3594/09	Globe G.M.	912M	Nannine	500 0 0	444 12 9	...	145 18 2	298 14 7	77 17 10	15 8 1	314 2 8
3056/15	Golden Spinifex	2035T, 2044T	...	750 0 0	162 15 0	...	...	162 15 0	...	2 10 5	165 5 5
624/11	Glideaway	2272	Yilgarn	200 0 0	140 0 0	...	...	140 0 0	17 1 10	3 10 7	143 10 7
1985/16	Hardcaste G.M.	...	Randalls	450 0 0	450 0 0	...	250 0 0	200 0 0	...	...	200 0 0
4689/06	Havilah	345B	Black Range	600 0 0	553 2 1	...	294 12 10	258 9 3	129 4 10	6 13 11	265 3 2
1963/16	Hassell and Others (Flag)	136–7–8	...	3,500 0 0	2,088 7 8	991 16 1	...	3,080 3 9	...	177 9 6	3,257 13 3
4738/09	Hawk	725G	Desdemona	120 0 0	116 12 2	...	22 5 11	94 6 3	3 7 10	...	94 6 3
3681/16	Ironclad	M.L. 367	Ravensthorpe	300 0 0	...	198 12 6	...	198 12 6	...	5 15 7	204 8 1
319/12	Jupiter	771	Mt. Magnet	401 0 0	401 0 0	...	109 14 1	291 5 11	5 0 0	45 11 3	336 17 2
2825/07	Kingdom Come	M.L. 112	Northampton	204 14 0	204 14 0	...	...	204 14 0	5 8 6	15 11 0	220 5 0
4548/11	Klondyke Boulder	604	Warrawoona	1,000 0 0	999 10 7	...	143 5 6	856 5 1	34 5 4	150 12 7	1,006 17 8
2186/14	Kirkland, A. G.	M.A., 12N	Nannine	500 0 0	500 0 0	...	336 · 11	163 10 1	20 17 4	12 12 5	176 2 6
3507/13	Loader and Nevill	711	Yalgoo	200 0 0	135 0 0	...	12 15 0	122 5 0	24 17 7	3 6 5	125 11 5
2167/14	Lake View Extended	4536E	...	1,050 0 0	892 15 5	...	650 0 0	242 15 5	...	54 11 1	297 6 6
2977/15	Little Dele	972U	Ularring	600 0 0	600 0 0	...	...	600 0 0	...	48 16 5	648 16 5
4000/05	Mindeloo	1518	Mindoolah	300 0 0	198 17 0	...	10 0 0	188 17 0	...	8 1 1	196 18 1
2126/11	Mt. Rankin Gold Mines, N.L.	2416	Yilgarn	535 6 3	535 6 3	...	...	535 6 3	2 7 0	38 7 1	573 13 4
491/18	Mt. Rankin Gold Mines, N.L.	3135–6	Yilgarn	1,000 0 0	...	200 0 0	...	200 0 0	...	0 8 3	200 8 3
2937/17	Mitchell and Judd	...	Coolgardie	500 0 0	500 0 0	...	...	500 0 0	...	...	500 0 0
174/13	Nevill, P. W.	680	...	500 0 0	330 0 0	...	...	330 0 0	...	31 2 3	361 2 3
...	Nooka Lead Mining Co., N.L.	M.L. 142	Northampton	500 0 0	500 0 0	...	...	500 0 0	...	25 8 0	525 8 0
3292/13	Pearl	1095M	Meekatharra	76 0 0	76 0 0	...	...	76 0 0	...	16 1 0	92 1 0
289/13	Pyx G.M.	789B	...	600 0 0	515 12 2	55 12 6	13 0 7	558 4 1	12 14 5	24 15 0	582 19 1
3612/15	Premier Coal Mining Co., N.L.	260/1/2, 363/4/5/6, and 271	Collie	500 0 0	500 0 0	...	1 1 10	498 18 2	30 3 8	44 10 0	543 8 2
3409/12	Rupe & Young	M. area	Nannine	848 17 5	848 17 5	...	500 0 0	348 17 5	...	24 13 5	373 10 10
461/17	Shamrock	871S	...	150 0 0	74 11 10	...	...	74 11 10	...	4 0 9	78 12 7
977/12	South Cornwall	567	Greenbushes	1,170 2 0	1,170 2 0	...	26 0 0	1,144 2 0	...	...	1,144 2 0
2376/10	Stanley G.M.	1271X	Kanowna	150 0 0	112 0 0	...	...	112 0 0	2 6 0	36 19 2	148 19 2
3212/15	Sunset	1300X	Kanowna	500 0 0	500 0 0	...	...	500 0 0	...	...	500 0 0
2425/15	Try It	1188	Lawlers	328 9 8	328 9 8	...	42 9 6	286 0 2	...	18 2 2	304 2 4
97/15	The Scots Greys	2801	Yilgarn	200 0 0	200 0 0	...	...	200 0 0	...	17 6 1	217 6 1
413/17	Unexpected Gold Mines	5454Z, 5290Z	Mt. Ida	500 0 0	...	286 10 0	...	286 10 0	...	4 9 5	290 19 5
2426/11	V's United	271F	Mt. Morgans	672 2 0	578 16 1	...	170 0 0	408 16 1	3 19 5	34 14 1	443 10 2
2427/11	Westralia Tasmania	1665, 1745T	Erlistoun	300 0 0	300 4 9	...	51 0 0	249 4 9	90 2 8	68 12 0	317 16 9
1807/09	Wheal May	Loc. 6	Northampton	302 4 6	302 4 6	...	40 0 0	262 4 6	5 15 9	14 9 8	276 14 2
2416/99, 1776/18	Yellow Aster	...	Lawlers	600 0 0	500 11 0	...	256 0 10	244 10 2	26 4 0	8 3 8	252 13 10
				...	21,174 11 1	2,371 12 11	6,834 10 9	16,711 13 3	1,010 5 11	1,140 17 11	17,852 11 2

MINING DEVELOPMENT EXPENDITURE.—*Advances Outstanding, 31st December, 1918*—continued.

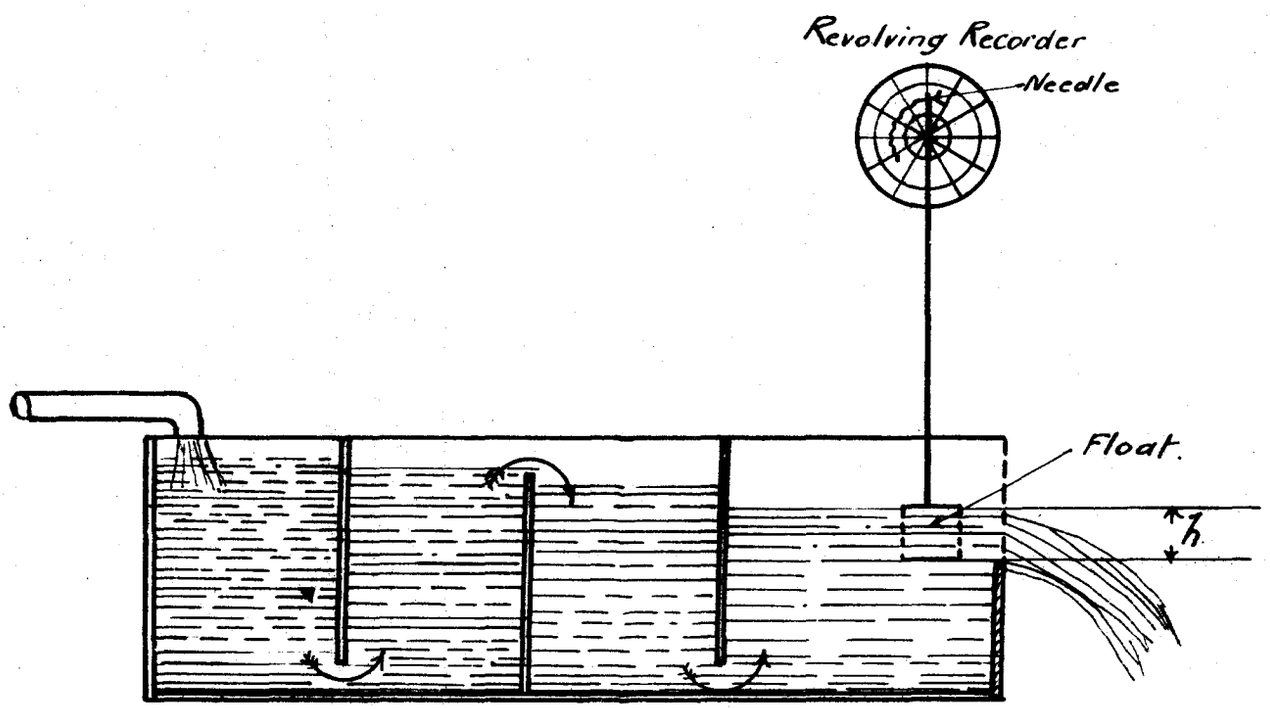
	Name of Lease, Mine, or Borrower.	No. of Lease.	District.	Amount authorised.	Principal Moneys advanced		Principal Moneys		Interest		Total Principal and Interest outstanding at 31st December, 1918.
					Previous to 1918.	During 1918.	Repaid, including Sale of Securities, etc.	Balance outstanding.	Paid.	Outstanding.	
	B.—Assistance in erecting Batteries and Treatment Plants to be used for Crushing for the Public.			£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
2120/09	Battlesville Mine	931R	Yundamindera	1,063 16 2	1,063 16 2	...	...	1,063 16 2	91 7 9	341 18 0	1,405 14 2
5651/10	Butcher Bird	1933 O.L.	Yilgarn	1,560 17 9	1,560 17 9	...	17 16 2	1,543 1 7	137 3 10	116 1 6	1,659 3 1
...	Butcher Bird	...	...	302 16 5	302 16 5	...	...	302 16 5	...	8 4 11	311 1 4
15947/10	Chunderloo	1048N	Nannine	2,032 12 8	1,730 10 2	...	424 9 2	1,306 1 0	...	218 16 2	1,524 17 2
3145/12	Donovan's Find	768	Jacoletti	1,000 0 0	1,000 10 0	...	...	1,000 10 0	432 12 7	143 7 10	1,143 17 10
3155/11	Great Victoria Leases	719, 944/5, 1229	Southern Cross	2,000 0 0	1,642 5 0	...	1 7 9	1,640 17 3	525 2 4	42 5 7	1,683 2 10
1343/07	Hodder, E.	M. Area 64	Randalls	253 3 2	253 3 2	...	148 13 0	104 10 2	6 8 4	35 11 3	140 1 5
1353/10	Red, White, and Blue	641B	Curran's Find	2,676 9 0	2,676 9 0	...	155 6 4	2,521 2 8	665 13 2	69 8 6	2,590 11 2
919/14	Rocklee G.M.	...	Yalgoginda	350 0 0	350 0 0	...	8 0 0	342 0 0	12 2 0	21 14 1	363 14 1
2253/11	Ravensthorpe Battery Co.	...	Ravensthorpe	1,300 0 0	1,038 8 2	...	25 0 0	1,013 8 2	...	326 1 2	1,339 9 4
4726/11	Southern Cross and Southern Cross South	1067, 1067WR, 27Y	Bulong	1,000 0 0	1,650 0 0	...	1,342 12 3	307 7 9	31 12 6	202 8 10	509 16 7
3551/10	Randwick	978C	Malcolm	584 14 0	577 3 5	...	43 4 6	533 18 11	...	45 3 5	579 2 4
4222/07	Star of Fremantle	6458	Kunanalling	325 0 0	320 10 0	...	0 10 0	320 0 0	83 2 7	25 18 6	345 18 6
3362/11	Spring Hill	721	Parker's Range	655 16 5	655 16 5	...	19 2 0	636 14 5	328 5 10	82 16 3	719 10 8
3971/15	Triplicate	1914	Murchison	500 0 0	608 17 7	...	66 13 10	542 3 9	25 10 8	10 13 3	552 17 0
1525/13	Thring Bros. and Dwyer	127	Northampton	2,050 0 0	2,028 2 9	...	31 17 4	1,996 5 5	360 3 10	76 5 0	2,072 10 5
				200 0 0	...	200 0 0	...	200 0 0	...	5 8 5	205 8 5
3215/05	Langford, F.	910 E.M.	Lawlers	800 0 0	585 17 0	...	29 7 0	556 10 0	119 19 3	14 3 2	570 13 2
2985/13	Mandelstam, A. S.	1010R	Edjudina	200 0 0	200 0 0	...	16 12 2	183 7 10	34 3 1	5 5 2	188 13 0
4416/11	Malcolm Prospecting Co.	1175C	Malcolm	1,500 0 0	1,550 0 0	...	...	1,550 0 0	410 6 10	642 11 9	2,192 11 9
363/12	McCahon and Party	...	Mt. Ida	400 0 0	400 0 0	...	...	400 0 0	...	27 14 5	427 14 5
2911/10	Phoenix	622N	Quinn's	250 0 0	250 0 0	...	22 5 9	227 14 3	17 2 1	17 5 11	245 0 2
				...	20,445 3 0	200 0 0	2,352 17 3	18,292 5 9	3,280 16 8	2,479 3 1	20,771 8 10
	C.—Boring.										
	Mt. McMahon	...	...	...	472 0 0	2 7 8	...	474 7 8	...	...	474 7 8
	Irwin River	...	...	...	...	158 18 11	...	158 18 11	...	...	158 18 11
				...	472 0 0	161 6 7	...	203 6 7	...	...	633 6 7
	D.—Miscellaneous Advances.										
	Bonnie Venture	...	...	...	62 17 2	...	...	62 17 2	...	...	62 17 2
	Foley, Wm.	...	...	100 0 0	...	54 5 0	...	54 5 0	...	...	54 5 0
	Mararoa	...	...	...	394 4 3	...	...	394 4 3	...	...	394 4 3
	McCulloch	...	...	50 0 0	50 0 0	...	...	50 0 0	...	...	50 0 0
	North Baddera	...	...	40 0 0	40 0 0	...	...	40 0 0	...	...	40 0 0
	Rainbow G.M. Co., N.L.	P.A. 1446	Coolgardie	180 0 0	...	45 0 0	...	45 0 0	...	...	45 0 0
				...	547 1 5	99 5 0	...	646 6 5	...	...	646 6 5
	A.—Pioneer Mining and Prospecting			...	21,174 11 1	2,371 12 11	6,834 10 9	16,711 13 3	1,010 5 11	1,140 17 11	17,852 11 2
	B.—Assistance Erecting Batteries, etc.			...	20,445 3 0	200 0 0	2,352 17 3	18,292 5 9	3,280 16 8	2,479 3 1	20,771 8 10
	C.—Boring			...	472 0 0	161 6 7	...	203 6 7	...	...	633 6 7
	D.—Miscellaneous Advances			...	547 1 5	99 5 0	...	646 6 5	...	...	646 6 5
				...	42,638 15 6	2,832 4 6	9,187 8 0	35,853 12 0	4,291 2 7	3,620 1 0	39,903 13 0

Charcoal Precipitation Plant





Arrangement of Filter Units



Automatic Solution Recorder

APPENDIX II.

Charcoal Dust Precipitation on Yuanmi Gold Mine.

(By R. C. Wilson, Inspector of Mines.)

In October last, when visiting the Yuanmi Gold Mine, in the ordinary course of inspection I took the opportunity thus afforded to carefully examine the charcoal precipitation plant, and to note any additions or alterations that had been made in the two years which had elapsed since last seeing it in operation. In so doing I was afforded every facility and help by the mine officials, and the general manager of the company has kindly consented to the publication of all information received.

A general description of this plant has already been published in our Annual Report of 1916, and a more detailed description will be found in Mr. H. R. Edmonds' paper in the "Proceedings of the Institution of Mining and Metallurgy," February 28th, 1918.

Under the circumstances a certain amount of repetition is almost unavoidable, but I have confined my remarks as far as possible to additional practical details in the successful working of the plant, which I think will be of general interest, more especially as after a trial of over two years this company would not revert to zinc shaving precipitation under any conditions and no matter how cheaply these were procurable.

Preparation of the Charcoal.—Charcoal from the wood gas producer, which would otherwise be wasted, is ground with one-third of its weight of added water in a revolving barrel containing a piece of old shafting for 20 hours. The barrel dimensions are 6ft. long by 2ft. diameter.

Flow of Solution through Units.—Previously it was the custom to alter the direction of the flow of the solution whenever a unit was cleaned up and a fresh charcoal added. To simplify matters, the solution is now allowed to move in one direction only, and there is no chance of any mistake being made. Whenever the charcoal in unit A will precipitate no more gold it is run out. The charcoal in B is moved up to A and similarly that in C to B. The whole process resembles the moving up of zinc from the bottom of the box to the top. It is done easily and quickly by means of a centrifugal pump, and of course the fresh charcoal is now always added to unit C.

Measurement of Solution.—This has no real connection with charcoal precipitation, but it is important to know the amount as well as the value of the solution passing through the units in order to estimate the amount of gold called for in the clean-up and as the method used is original and very ingenious, I will briefly describe it. The measurement is on the weir principle and the height of the solution (*h*) above the lip of the weir is indicated right throughout the 24 hours by an automatic solution recorder in the following way:—A box which is partitioned like a zinc box to steady the flowing solution has a vertical slot at one end five inches across. The solution flows out through the slot and its height is constantly recorded on a revolving indicator card by a needle which is directly attached to a float. For the purpose an old Bristol clock is used, and from the information supplied by the card the amount of the solution for the 24 hours is easily computed, and is said to be remarkably accurate.

The Clean Up.—The sludge in unit A is run into a sump, from which it is pumped into a small filter press; this takes about half an hour. Air is then blown into the press for 15 to 30 minutes, when the charcoal cakes are sufficiently dry to burn and are dumped into a galvanised iron tray under the press.

The burning is done in coarse wire braziers or baskets, 18in. x 18in. x 18in., made of screening $\frac{3}{8}$ or $\frac{1}{2}$in. apertures. Sixteen of these are enclosed in a sheet iron chamber. About one and a-half inches of live coals are placed in the brazier, and the damp charcoal dust from the filter press is shovelled on. The chamber is then locked till the charcoal has burnt.

The ash obtained contains about 14 per cent. of gold, and when a sufficient quantity has been obtained it is fluxed and smelted.

The flux used is as follows:—

Borax 45 per cent. to 55 per cent. of the weight of ash.
Sand 35 per cent. to 60 per cent. of the weight of ash.

A very clean fusible slag is obtained, and remarkably pure gold.

General Remarks.—The tonnage of ore treated per day on the mine is at present about 70 tons, and the solution 250 tons. The units, however, are capable of handling 450 tons. The charcoal dust in each unit is 300lbs. Every third day the charcoal in unit A is burnt, and 300lbs. of charcoal are added to unit C, so that the consumption of charcoal dust is 100lbs. per day. On an average the 300lbs. of charcoal burns to 40lbs. of ash. With high lime as much as 60lbs. of ash may be obtained If 40lbs. of ash is obtained in three days there will be 400lbs. at the end of a 30 day month. Additional ash is also obtained by burning discarded filter press cloths, and as the solution happens to be saturated with gypsum a certain amount dries on the cloths. In all there is usually about 700lbs. of ash, etc., to be smelted per month, yielding 1,200ozs. of gold.

In round figures it may be said that charcoal ash contains about 14 per cent. of gold, and sludge from zinc shavings about 30 per cent. of gold, so that there is twice as much material to be smelted from a charcoal dust precipitation plant as from a zinc shaving precipitation plant. This is a small consideration, however, when it is remembered that the acidng of zinc shavings, which is both tedious and unhealthy, is entirely done away with, that no zinc or acid have to be purchased, and much purer gold is obtained.

Annual Report of the Board of Examiners for Colliery Managers' and Under Managers' Certificates under "The Coal Mines Regulation Act, 1902."

Office of the State Mining Engineer,
Mines Department, Perth, 24th April, 1919.

The Secretary for Mines, Perth, W.A.

Sir,

We have the honour to forward, for the information of the Hon. the Minister for Mines, the Annual Report of the Board of Examiners for the year 1918.

Two ordinary meetings were held, one in April, the other in October. One of the members, Mr. A. Gibb Maitland, being on leave at both dates, was represented by Mr. E. S. Simpson (Government Mineralogist and Assayer) at the April meeting, and by Mr. T. Blatchford (Assistant Government Geologist) at the October one.

Examinations for Certificates.

Two examinations for Certificates of Competency were held during the year. In April, applications were called for First and Second Class Certificates of Competency, but only one was received, viz. :—T. K. Chippington for 1st Class Certificate. The examination was held at Collie on the 3rd, 4th, and 5th April ; the examinee, gaining a pass, was granted a First Class Certificate of Competency.

Applications were again called in October for First and Second Class Certificates, Mr. Walter Pickstock applying for a Second Class. The examination was held at Collie on 2nd and 3rd October, at which Mr. Pickstock gained a Second Class Certificate of Competency.

Copy of the papers set for the examinations attached hereto.

We have, etc.,

A. MONTGOMERY,
State Mining Engineer, Chairman.

A. GIBB MAITLAND,
Government Geologist, Member.

JAS. McVEE,
Inspector of Mines, Member.

F. A. LANE,
Secretary.

THE COAL MINES REGULATION ACT, 1902.

Examination for First-Class Certificate of Competency.

SUBJECT : ARITHMETIC.

Wednesday, 3rd April, 1918, 10 a.m. to 11 a.m.

Possible marks	
30	1.—The capacity of a chamber is 7,850 cubic feet. It is filled with an atmosphere as follows :—
	%
	Nitrogen 79
	Oxygen ... ... 20·96
	Carbon dioxide ... ... ·04
	What is the number of cubic feet of each gas contained in the chamber ?
30	2.—A haulage rope which cost £250 after hauling 450 tons of coal per day for three years of 250 working days each is found to be worn out : what was the cost of the rope per ton handled ?
40	3.—The normal daily output of a colliery is 1,800 tons at a total wage cost of 7s. 5d. per ton. Owing to an accident the output is reduced by 15 per cent., what is the alteration in the cost per ton due to the lesser output assuming full wages to be paid to all hands except the miners, who are paid a contract price of 2s. 9d. per ton ?
35	4.—Extract the square roots of 102·01 and 6·249, and the cube root of 614,125.
30	5.—Add $\frac{2}{5}$ of $\frac{3}{7}$ to $\frac{3}{7}$ of $2\frac{1}{3}$, and multiply the result by—($\frac{2}{3}$ of $\frac{5}{6} \div \frac{5}{4} + \frac{4}{5}$)
35	6.—Find the compound interest on £7,500 for 3 years, at 4 %.
200	

SUBJECT : SURVEYING.

Wednesday 3rd April, 1918, 11 a.m. to 1 p.m.

40	1.—Describe the transit theodolite, and show how it is used in carrying out the underground survey of a colliery.
30	2.—How many tons of coal are there in a property of 672 acres, containing one horizontal seam of coal 3 feet 7 inches thick, taking the specific gravity of the coal to be 1·27 and allowing 20 per cent. reduction for faults, etc.
30	3.—Describe the Y level and its adjustments, and state in what respects it is superior to the Dumpy level.
30	4.—Explain how to level and plot a section.
40	5.—What source of error must be guarded against in consulting old colliery plans ? What methods are usually adopted for the preservation of colliery plans.

SUBJECT: GEOLOGY.

Wednesday, 3rd April, 1918, 2 p.m. to 4 p.m.

Possible Marks.

20 1.—Describe how mud may be converted into roofing slate. Define limestone, basalt, and conglomerate.

15 2.—What are the rocks usually found associated with coal measures?

15 3.—Enumerate the effects usually produced in coal measures by faults. Distinguish the different kinds of faults.

15 4.—Give the essential characteristics of the different classes of coal.

15 5.—What method is usually adopted to find the true dip of a coal seam from observations on its apparent dip?

15 6.—Give a succinct account of the salient geological features of any coal field with which you are acquainted, and illustrate it by a geological section of the field.

SUBJECT: THE COAL MINES REGULATION ACT, 1902.

Wednesday, 3rd April, 1918, 4 p.m. to 5 p.m.

20 1.—What are the provisions of the Act with regard to abandonment of mines?

15 2.—What are the provisions of the Act as to single shafts, tunnels or outlets?

15 3.—What does the Coal Mines Regulation Act say about—

(*a.*) Boys.

(*b.*) Manholes.

15 4.—What does the Act require as to division of Mine into parts?

15 5.—What are the requirements of the Act regarding firing of shots on a dry and dusty haulage road?

20 6.—What powers under the Act are given to workmen to inspect the workings? When and by whom may such powers be exercised?

100

SUBJECT: MACHINERY.

Thursday, 4th April, 1918, 10 a.m. to 1 p.m.

30 1.—Give a list of the fittings on a Lancashire boiler, and state briefly the purpose of each.

30 2.—Describe a coal screening and picking plant to deal with 400 tons of coal in 8 hours, making 3 sizes of coal.

30 3.—Show by sketches the methods of fixing up guide ropes in a winding shaft, say 800 feet deep.

30 4.—Calculate speed of direct haulage rope in feet per minute to haul 20 tons of coal and skips up an incline 1,000 yards long rising 1 in 10, when K = 1/30 including rope, factor of safety 8. B.H. Power 120.

30 5.—Discuss the uses of compressed air and electricity in underground workings, pointing out the particular purposes for which each is best suited, and the advantages and disadvantages of both.

30 6.—Describe with sketches the methods you would adopt for the disposal of debris at a sinking shaft.

30 7.—A fan electrically driven, what arrangements would you make to enable it to be driven at two different speeds without stopping the fan?

30 8.—What arrangements would you make for keeping an endless rope taut? Where would you place these, and why?

Possible Marks.

30 9.—What is meant by scale in boilers? What does it usually consist of, what effect has it if allowed to accumulate in boilers? How do you prevent it accumulating?

30 10.—How would you fasten electric cables in a shaft 500 feet deep?

300

SUBJECT: MINING OF COAL.

Thursday, 4th April, 1918, 2 p.m. to 5 p.m.

30 1.—There is a dangerous accumulation of water in an old working and it is necessary to put in bore holes in order to conform to General Rule 25, Section 50 of the Coal Mines Regulation Act. Make a sketch, giving length, directions, and particulars of bore holes. Also say in detail how the work should be done, and give the routine covering a series of shifts.

30 2.—Describe in detail how you would fire shots in a wet shaft 900 feet deep.

30 3.—Two seams of coal separated by 30 feet of hard shales and sandstone have to be developed. No. 1 is 6 feet thick, the overlying strata giving off a large quantity of water. No. 2 seam is 9 feet thick and contains a band of shale 18 inches thick. Explain fully how you would operate the seams and in what order.

30 4.—Regarding first-aid work:

How would you treat a person suffering from—

(*a.*) A broken thigh.

(*b.*) Suffering from burns.

(*c.*) Electric shock.

30 5.—Describe in full detail the required treatment of safety lamps from the time they are given out to a workman until they are again given out to the workman on the following day.

30 6.—What are the advantages to be derived from systematic timbering? Describe with sketches the various systems you are acquainted with.

30 7.—Give your opinion on the question of methods of haulage in a large mine. Assume tunnels as starting points and that the main roads will be three miles long when boundary is reached.

30 8.—Show by sketches how you would work a main and tail haulage system with two branches.

30 9.—Draw a section of the coal, roof, and floor of the seam worked at your colliery. Describe the method of working and the advantage or disadvantage of the present method of working as compared with any alternative method.

30 10.—A stone drift is to be driven through a down fault in search of the coal, its estimated length is 120 yards. What provision would you make for winding the debris and ventilating the drift. Grade is 1 in 4.

300

SUBJECT: VENTILATION AND DANGEROUS GASES.

Friday, 5th April, 1918, 10 a.m. to 1 p.m.

25 1.—In which airway will you obtain highest water gauge

(*a.*) 10ft. x 6ft. passing 60,000 cubic feet per minute.

(*b.*) 6ft. x 6ft. passing 36,000 cubic feet per minute. Length, same in each case. Work out from

$$P A = K S V^2.$$

30 2.—A mixture of $C H_4$ and air at its most explosive point is passing in an airway 9ft. x 6ft. at a velocity of 300ft. per minute. What quantity of fresh air must be added to this current so that one will not be able to detect the gas on a safety lamp?

Possible Marks.

30 3.—A seam of coal liable to spontaneous combustion is to be worked, how would you lay out and ventilate the workings of such a seam ? What provisions and preparations would you make to promptly deal with an outbreak of fire ?

30 4.—What are the chief points to be considered in establishing and maintaining substantial and reliable ventilation in coal mines ?

35 5.—Ventilate the accompanying plan with due regard to requirements of haulage.

30 6.—If 30,000 cubic feet of gas are at temperature 60° Fah., pressure 30in. barometer, what will be volume when temperature 80° Fah. and pressure 29in. barometer ?

30 7.—Make a table showing name, symbol, density, specific gravity, and weight of a cubic foot of gases met with in coal mines.

30 8.—Describe in detail how carbon monoxide is produced, its properties, and effects on man and lights.

30 9.—What precautions should be taken at the edges of a goaf in a mine in which fire damp is occasionally seen and where it is necessary to fire shots ?

30 10.—Under what conditions might an explosion occur in a dusty mine in the absence of firedamp ?

300

Examination for Second Class Certificates of Competency as Under Manager or Overman.

SUBJECT : VENTILATION AND DANGEROUS GASES.

Wednesday, 2nd October, 1918, 10 a.m. to 11·30 a.m.

Possible Marks.

50 1.—If the total pressure upon a ventilating door is 400lbs. when the water gauge is $2\frac{1}{2}$ inches, what is the area of the opening, and what is the height of the door if its breadth is 5 feet 6 inches ?

50 2.—What is the object of "splitting" the air ? To what general result is it conducive, and how is it affected ?

50 3.—Given an airway 9 feet high with a semi-circular arch 10 feet in diameter, describe how you would proceed to find the velocity of air passing through it. Supposing the velocity to be 520 feet per minute, give the details of calculation you would make to ascertain the volume of air passing per minute.

50 4.—Show on the accompanying plan how you would ventilate the workings therein, with due regard to haulage.

50 5.—What is a "regulator"; how is it constructed; where is it placed; and how is the ventilation of a mine affected by the placing of a regulator in the air current ?

50 6.—What are the principal dangerous gases met with in Coal Mines ? Describe the principal characteristics of each.

300

SUBJECT : THE MINING OF COAL.

Wednesday, 2nd October, 1918, 11·30 a.m. to 1 p.m.

50 1.—How would you proceed to clear away a heavy fall on a level roadway ? Give sketches showing how you would secure the ground as the work proceeded.

50 2.—To what points would you specially direct your attention while examining (*a*) a miner's working face, and (*b*) the roads leading thereto ?

50 3.—A place is approaching old workings containing water : how would you work it to provide for safety ? Describe some method whereby you could control the flow of water through a borehole.

50 4.—Describe with sketches how you would proceed to construct an air-crossing—
(*a.*) Over a main haulage road.
(*b.*) Under a main haulage road.

Possible Marks.

50 5.—In working a seam of coal subject to spontaneous combustion what instructions should be given to officials and workmen (i.) to prevent gob fires, (ii.) to ensure early detection of same ?

50 6.—What are the dangers incidental to dry and dusty mines, and how would you guard against them ?

300

SUBJECT : ARITHMETIC.

Wednesday, 2nd October, 1918, 10 a.m. to 11·30 a.m.

17 1.—One first-class shiftman at 16s. per shift, three second-class shiftmen at 12s. 6d. per shift, one boy and horse at 9s. per shift, worked 5 shifts each ridding an airway of 60 yards in length. What was their cost per yard ?

16 2.—How much would a miner's wages amount to in a fortnight of eleven days if he produced $4\frac{1}{2}$ tons per day at a rate of 3s. 4d. per ton ?

17 3.—How many gallons of water are there in a sump 8ft. wide 90 feet long and 10 feet deep when it is quite full ? How long will it take for a pump discharging 80 gallons of water per minute to empty this sump ?

17 4.—What weight of rails will be required to lay a double track 480 yards in length with rails weighing 25lbs. per yard, and what will be the cost of the rails at 12s. 6d. per cwt. ?

16 5.—If the output of a colliery for a year is 155,875 tons and 5,216 tons 6 cwt. are consumed at the colliery, what percentage of the whole output is consumed at the colliery ?

17 6.—Add $\frac{3}{5}$ of $\frac{3}{7}$ to $\frac{3}{8}$ of $2\frac{1}{3}$ and multiply the result by $(\frac{2}{3}$ of $\frac{5}{6}) \div (\frac{5}{4} + \frac{4}{5})$.

100

SUBJECT : ROADWAYS.

Wednesday, 2nd October, 1918, 3 p.m. to 4 p.m.

60 1.—A roadway is to be laid out with a uniform grade of 1 in 6. Describe the means you would adopt for setting out and maintaining the grade.

60 2.—Describe how you would construct and keep in order a horse-road, the floor being wet and soft.

60 3.—Show by sketches and describe the methods you would adopt to prevent skips running back in case of breakaways on endless rope haulage, also for putting derailed skips on to the road again.

60 4.—What are the commonest causes of accidents on haulage roads, and how can they best be prevented ?

60 5.—Under what conditions would you prefer main and tail rope haulage to endless rope or direct haulage ?

300

SUBJECT : THE COAL MINES REGULATION ACT, 1902.

Wednesday, 2nd October, 1918, 4 p.m. to 5 p.m.

16 1.—What are the duties of (*a*) a manager (*b*) an undermanager under the Act.

16 2.—What is required by the Act as to inspection before commencing ordinary mining operations underground ?

16 3.—What is the requirement of the Act as to provision of manholes on travelling ways ?

18 4.—What are the provisions of the General Rules as regards ventilation of Coal Mines ?

18 5.—What are the requirements of the Act in respect of having a second shaft or outlet to a mine ? Under what conditions may a single shaft or outlet be allowed ?

16 6.—What are the requirements of the General Rules as to provision of ambulance appliances.

100

DIVISION III.

REPORT OF SUPERINTENDENT OF STATE BATTERIES.

Department of Mines,
State Batteries Branch,
Perth, 20th May, 1919.

The Under Secretary for Mines.

Sir,—

I have the honour to submit my annual report for the year 1918, for the information of the Hon. the Minister for Mines.

MILLING.

During the year 31 batteries were kept available for the treatment of ore, comprising 215 head of stamps, and one 10-stamp battery (Tuckanarra) was leased. During November the Department's lease of the Tuckabianna battery expired and was not renewed.

Tonnage Milled.—The 10-stamp batteries at Burtville, Darlot, and Mulwarrie, the leased battery at Tuckanarra, and the 5-stamp batteries at Mt. Ida and Siberia were inoperative through lack of ore supplies. 39,329¾ tons of ore were milled at 26 batteries. Altogether a total of 615 parcels of ore were handled, their mean tonnage being 63.94 tons per parcel. During 1917 the tonnage crushed amounted to 42,947½ tons, made up of 595 parcels, having a mean weight of 72.18 tons per parcel. Compared with the returns for 1917 milling operations showed a decrease of 3,617¾ tons, whilst the number of parcels handled showed an increase of 20. At Wiluna 10,444¼ tons of lode material were milled, equal to 26.5 per cent. of the total tonnage, which were not treated by amalgamation. (Schedules 1, 5, and 8.)

Amalgamation.—29,090½ tons were treated by amalgamation, 33,617ozs. of bullion, estimated to contain 28,489.74 fine ozs., were recovered, equal to 77.6 per cent. of the gross value of the ore. The percentage recoveries from amalgamation during 1916 and 1917 were 76.7 and 76.08 respectively. (Schedule 5.)

Duty per Stamp.—The stamps at batteries vary between 1,000lbs. and 1,150lbs. in weight, and, with the exception of Wiluna, are called upon to do the crushing without further aid. The screens used varied between 700 holes and 900 holes per square inch, the mean being about 800 holes. The 26 batteries which crushed ore during the year were only kept employed 17.3 per cent. of full time (Sundays excluded), and the mean duty per stamp was 4.54 tons per 24 hours. The 5-stamp batteries averaged 4.12 tons and the 10-stamp mills averaged 4.9 tons per 24 hours.

During 1917 the stamp duty at all mills was 4.58 tons per 24 hours.

Charges.—During the year, crushing charges as amended on 25th June, 1917, remained in force at all batteries except Wiluna. The alterations were embodied in last year's report. Clause 2 was availed of to the extent of 152 tons being crushed free of charge, representing the amount of £77 5s. 6d.

At Wiluna treatment charges were reduced from 17s. 6d. per ton to 16s. 3d. per ton at 1st May in order to permit producers to handle lower grade ore, of which there are large deposits in the district. The loss of revenue is reflected in the financial statements attached. 6,934½ tons of low-grade ore were milled at batteries at reduced rates, the amount of reduction in ordinary charges being £846 3s. 1d.

Expenditure.—The total milling expenditure was £26,044 12s. 7d., equal to 13/2.93 per ton, and includes £2,981 9s. 8d. spent on repairs and renewals. The expenditure shows an increase of 13.37 pence per ton when compared with the expenditure during 1917. Accidents to two gas engines and consequent heavy cost of renewals, decreased tonnage and increased cost of stores, were responsible for the increase.

Revenue.—£17,602 19s. 1d. was collected as milling revenue, equal to 8/11.42 per ton, which was only 0.62 pence less per ton than during 1917.

Milling operations showed a loss of £8,441 13s. 6d., compared with £6,714 9s. 11d. during 1917, and £8,017 15s. 5d. during 1916.

TIN TREATMENT.

At Greenbushes two tin-dressing plants were operated. On account of the high market price for black tin at certain periods of the year, the public worked the deposits more extensively than during the previous few years and sent 5,985 yards of ore to the mills for treatment, whilst we took advantage of the tin market to retreat 1,339 tons of tailing from previous treatment. 29.353 tons of black tin were recovered from ore supplied by the public. During 1917 only 1,118 yards of ore were submitted for treatment.

Expenditure amounted to £1,459 7s. 2d. for ore treated, equal to 4/10.2 per yard, compared with 11/2.9 per yard during 1917, when only 1,118 yards were handled. Tailing retreatment accounted for an expenditure of £376 12s. 9d.

Revenue.—£900 18s. 2d. was obtained from ore treatment and £288 13s. 4d. from tailing retreatment, equal to 3/0.28 and 4/8.42 per ton respectively.

The total loss at both plants was £646 8s. 5d., and includes £283 2s. 2d. spent on repairs and renewals. On account of the revenue from the treatment of public ore being so small it was decided to make a

minimum charge of 3s. 6d. per yard (Schedules 5, 8, and 9).

TAILING TREATMENT.

Fourteen leaching plants were engaged upon the treatment of tailing during certain months of the year, and handled 24,364 tons, compared with 24,674 tons treated during 1917.

The mean head value of tailings treated was 6.805dwts. per ton, and the mean residue value 1.387 dwts. per ton, showing an assay extraction of 79.61 per cent. The value of gold called for was £28,394, whilst the actual recovery was £28,809, which represents an actual recovery of 80.77 per cent.

The total quantity of untreated tailing at batteries at 31st December, 1918, excluding Marble Bar and Mt. Ida, where they are neither purchased nor treated on account of their refractoriness, and Peak Hill, where a contractor handles them at State Battery rates, was 27,964 tons, compared with 31,500 tons at 31st December, 1917.

Expenditure amounted to £10,126 13s. 6d., equal to 8/3.74 per ton, compared with 8/3.31 per ton during 1917.

Revenue.—On account of segregation and the discard of tailings too low in value to pay for treatment, the revenue has continued to rise and during the year was £11,546 7s. 3d., equal to 9/5.74 per ton, compared with 8/10.37 during 1917.

The profit made on tailing treatment operations was £1,419 13s. 9d. (Schedule 9.)

SLIME TREATMENT.

11,676 tons of slime were treated at Wiluna and 216 tons were treated at Mulwarrie during the year, total 11,892 tons.

The mean head value of the slime treated at Wiluna was 10.601dwts. per ton, whilst the mean assay value of the residues was 2.139dwts. per ton, equal to a 79.82 per cent. recovery. The actual gold recovered fell £355 short of the assay return, but slag values have still to be accounted for.

Expenditure.—The total expenditure for slime treatment was £5,593 15s. 7d., equal to 9/4.87 per ton, compared with 9/8.5 per ton during 1917, an improvement of 3.63 pence per ton.

Revenue.—£4,611 16s. 7d., equal to 7/9.07 per ton, compared with 8/3.18 per ton during 1917. The revenue allowed for slime treatment at Wiluna is 7s. 6d. per ton of the total of 16s. 3d. per ton charged for total treatment.

The loss on slime treatment operations was £981 19s. (Schedule 9.)

REPAIRS AND RENEWALS.

The following amounts were expended on repairs and renewals to plants:—

	£	s.	d.
Batteries	2,981	9	8
Leaching plants ..	152	17	7
Slime plants	743	11	9
Tin plants	283	2	2
	£4,161	1	2

The total cost of repairs and renewals during 1917 was £4,211 11s. 1d. (Schedules 8 and 9.)

TOTAL OPERATIONS.

During the year 83,173¾ tons were treated in all operations, compared with 86,522½ tons during 1917 and 103,266¼ tons during 1916.

The gross expenditure for these operations was £43,758 0s. 11d., equal to 10s. 6.26d. per ton, compared with 10s. 5.84d. per ton during 1917.

The gross revenue from all operations was £35,107 13s. 9d., equal to 8s. 5.31d. per ton, compared with 8s. 8.89d. per ton during 1917.

During the year all operations showed a loss of £8,650 7s. 2d., compared with a loss of £7,554 0s. 5d. during 1917.

Comparative Synopsis of Results of State Batteries for twelve months ending 31st December, 1918 and 1917.

Operation.	1918.			1917.		
	Tonnage.	Expenditure per ton.	Revenue per ton.	Tonnage.	Expenditure per ton.	Revenue per ton.
		s. d.	s. d.		s. d.	s. d.
Milling	39,329·75	13 2·93	8 11·42	42,947·50	12 1·56	9 0·04
Tailings Treatment ...	24,364	8 3·74	9 5·74	24,674	8 3·31	8 10·37
Slimes Treatment ...	11,892	9 4·87	7 9·07	15,408	9 8·50	8 3·18
Residues Treatment ...	264	11 10·68	11 10·68	2,231	8 4·08	8 4·08
Tin Treatment	5,985	4 10·20	3 0·28	1,118	11 2·90	3 8·27
Tin Residues	1,339	5 7·61	4 8·42	144	10 1·41	4 5·52

RECEIPTS AND EXPENDITURE, 1918.

Operation.	Tonnage.	Expenditure.	Revenue.	Profit.	Loss.
		£ s. d.	£ s. d.	£ s. d.	£ s. d.
Milling	38,329·75	26,044 12 7	17,602 19 1	...	8,441 13 6
Tailings Treatment	24,364	10,126 13 6	11,546 7 3	1,419 13 9	...
Slimes Treatment	11,892	5,593 15 7	4,611 16 7	...	981 19 0
Residues Treatment	264	156 19 4	156 19 4	...	...
Tin Treatment	5,985	1,459 7 2	900 18 2	...	558 9 0
Tin Residues Treatment	1,339	376 12 9	288 13 4	...	87 19 5
	83,173·75	43,758 0 11	35,107 13 9	1,419 13 9	10,070 0 11
			Less Profit		1,419 13 9
			Loss		8,650 7 2

PURCHASE OF TAILINGS.

22,564¼ tons of tailings were purchased for £20,809 14s. 3d. by the Department. (Schedule 7.)

At Peak Hill 451 tons were purchased by contractors at State Battery rates for £233.

From 39,329¾ tons of ore crushed 34,149¼ tons of tailings were produced, and were dealt with as follows:—

25,110 tons having an assay value of 3 dwts. per ton and over, to be purchased by the Department.

451 tons purchased by contractors.

154 tons worth 3 dwts. per ton and over, being refractory, were neither purchased nor treated.

8,434¼ tons worth under 3 dwts. per ton reverted to the Department under Regulation No. 11.

RETURN FROM AURIFEROUS ORE TREATED.

1. 29,090½ tons of ore were milled and treated in the first instance by amalgamation for 33,617.04 ozs. of bullion valued at £121,022. The gross value of the tailing was £34,876, and the gross value of the ore £155,898, or 107/2 per ton (Schedule 5). Milling charges absorbed £14,223, leaving £106,799 net to customers from milling operations.

The net amount paid and due for tailing was £15,270, and the net return received by customers for their ore was £122,069, or 78.33 per cent. of its gross value.

2. *Wiluna Lode Treatment.*—10,444¼ tons of lode material were treated at Wiluna having a gross value of £22,990 10s. 8d. The net amount paid to owners was £10,469 19s. 4d., whilst treatment charges absorbed £8,726 5s. 2d.

OUTPUT SINCE INCEPTION.

1898 to 1918, inclusive.

Tons of auriferous ore treated, 1,196,736.

Production.	£
By Amalgamation	4,222,162
„ Sands and Tailing Treatment	610,082
„ Slime Treatment	174,410
„ Residue Treatment ..	9,353
	£5,016,007
Tons of Tin ore treated, 77,817.	
Production	91,327
	£5,107,334

NEW PLANTS.

Preliminary work in connection with the installation of an ore-dressing plant at Coolgardie was put in hand during the year. After several mining centres in the Eastern States had been visited where treatment plants were examined and much useful information collected by the writer, plans for an installation to suit local requirements were prepared and arrangements made for the purchase and delivery of machinery and material. At the close of the year preparations were so far advanced that the work of construction could be commenced early in 1919.

In order to test the mines at Tuckabianna, the Department leased and worked the "Triplicate" battery during the year. 1,716¾ tons of ore were crushed for a return of 2,265ozs. of gold bullion, whilst the tailings had a mean assay value of nearly an ounce per ton. Although the operations show high values in the ore, they did not forecast sufficient encouragement to warrant the Department continuing activities, and it was arranged that the battery be taken over by Mr. A. Brown, who had acted as our manager at Tuckabianna during the year. The lessee will treat ore for the public at State battery rates and will be subsidised to the extent of 3s. per ton crushed from the Development of Mining Vote for so doing.

THE STAFF.

During the year Mr. Edwin Thorley was retired after 17 years service on account of age, the management of the Greenbushes plants being taken over by Mr. T. W. Lees, transferred from Mulline.

Mr. Arthur Brown resigned after a service of 12 years to undertake treatment operations on his own behalf at Tuckabianna. As the Department's operations at this centre ceased in November, it was not necessary to fill the vacancy.

Mr. F. A. Lund resigned his position as Acting Manager at Norseman to undertake other work in Victoria, and was succeeded by Mr. J. A. McLean, transferred from Leonora.

At the close of the year the managerial staff consisted of 12 managers and three acting managers, which is two officers less than at the close of 1917. Head Office staff remained unaltered. I wish to thank all members of the staff for their good and energetic work in forwarding the Department's interests.

GENERAL REMARKS.

Once again a decrease in tonnage of gold bearing ore offered for treatment has been recorded, *i.e.*, 39,329¾ tons compared with 42,947 tons during 1917. Ten years ago 95,628 tons were brought to the batteries for treatment, and since 1911, when a sudden fall to 59,373 tons was recorded, there has been a steady decline. Active steps have been taken from time to time to cope with the decline, charges having been revised, and reduced on several occasions, and conditions made easier and better in order to induce prospectors to continue operations. The effect of these reductions and concessions has had a direct bearing on the financial result of operations and rigid economies have been exercised to prevent losses becoming unwieldly. Very considerable retrenchment in the staff has of necessity been made during the past decade. During the past three years the difficulty of keeping costs down has been great, the abnormality of conditions and the markets being anything but easy matters to cope with in conjunction with decreasing tonnage. The following table shows the tons treated in all operations, cost, and revenue per ton during the past six years.

Year.	Tons.	Cost per ton.	Revenue per ton.
		s. d.	s. d.
1913	106,071¾	10 6·03	9 0·57
1914	116,139⅓	10 1·22	8 8·28
1915	99,933⅓	9 4·25	8 3·32
1916	103,266¼	9 10·94	8 9·18
1917	86,522½	10 5·84	8 8·89
1918	83,173¾	10 6·26	8 5·31

It is satisfactory to know that the cost of all operations has not risen higher than 10/6.26 per

ton, and that revenue has been comparatively well maintained.

The mean gross value of ore offered for treatment was 90/6 per ton, showing a considerable increase over the figure for 1917, when it was 72s. per ton. The rise in value cannot be altogether regarded as a good sign, for the reason that it was due not only to several high grade parcels being treated, but to the fact that prospectors in present circumstances find it impossible to make low grade ores pay the cost of mining and treatment. The net return from the treatment of ore (excepting Wiluna) was 78.30 per cent. of its gross value. During 1917 the net return was 70.97 per cent.

Most of the galvanised iron vats at the tailings treatment plants are worn out and will require to be replaced before operations can be resumed next summer. Many of the water supply tanks are rusted badly and are only being held together by straps, tar and cement. As soon as galvanised iron is procurable, sufficient quantities to make about 150 vats and tanks must be obtained.

To the present time there has been no instance where we have been unable to treat ore supplied. Although the war ceased in November, there are no indications at the time of writing that supplies are likely to be easier to procure or that prices will fall in the near future. The condition of the markets is such that the cost of treatment during 1919 is likely to show a sharp rise. Despite existing difficulties, the plants have been well maintained with the exception of vats, tanks, and other items made of galvanised iron.

The State Battery system attained its majority during the year, having completed 21 years of continuous operation. In March, 1898, an officer was appointed to initiate the system. During that year much preliminary work was undertaken, including the selection of localities for the first half dozen batteries, *i.e.*, Lennonville, Leonora, Mt. Ida, Mulline, Norseman, and Tuckanarra. Soon afterwards Bulong, Yalgoo, and Yerilla were added to the list. The 10-stamp batteries at Leonora and Norseman were the first to be started, each treating a little ore before the close of 1898. Activities have been continued to the present time, and altogether 57 centres have been served by State Batteries, of which 33 are still operative, 24 having been removed or disposed of after having served their purpose.

The State Battery system when first launched was established to provide a means whereby prospectors could get ore crushed with a view to determining its value in a practical manner, and charges varying between 14s. 6d. and 17s. 6d. per ton were made for crushing only. Very early in the system's history, however, it was recognised that if it were to fulfil its mission of public utility, provision would have to be made for the treatment of tailing from ore crushed. Before the close of 1899 the question was considered and a decision arrived at providing for the installation of leaching plants for the treatment of sand only. During 1900 leaching plants were erected and commenced operations, under the following conditions: *i.e.*, the Department to treat sand from crushings for 10s. per ton, handing owners the actual gold recovered from treatment. It was soon found that slime held considerable values, and the scope of the system was once again extended to embrace the treatment of it at a few centres. A filter press plant was erected and commenced operations at Mulline during 1905, and another was installed at Norseman later, and they did good work in extracting the gold from the slime, but the tonnage available for treatment was too small to permit of satisfactory costs being maintained. During 1908 two vacuum filter plants were erected (Leonora and Menzies), but again the tonnage was too small to permit them being made a financial success, although the recovery of gold was satisfactory. Since the 1st January, 1908, tailing (sand and slime) production from crushings has been purchased at all batteries on the following terms:—(1) Tonnage of tailing to be not less than 80 per cent. and not more than 90 per cent. of the tonnage milled. (2) A deduction of 3dwts. per ton from the assay value to be made to cover treatment charges, etc. (3) The balance of the gold in tailing to be paid for on the basis of 75 per cent. extraction at £4 per ounce. (4) Payment to be made within 14 days of the date of agreement of assays.

At the present time tailing is purchased at all batteries, except Mt. Ida and Marble Bar, where copper interferes with treatment operations. When the Department decided to purchase slime as well as sand, it became necessary to realise upon both products. Accumulations of slime at several batteries were sold by public tender, and others were treated by mixing with sand residues, proceeds being distributed to owners. Treatment showed that the cost of mixing sand residues of low value with slime entailed loss in handling the former when they did not yield sufficient gold from second treatment to pay for the labour. During 1912 it was decided that direct sand treatment should be abolished, that sand and slime should be accumulated in dams and during the summer months be mixed together and leached. Reconstruction of plants was undertaken and the new system was commenced in 1913. It is still in vogue and has proved very successful, both from a point of view of cost and extraction. At Wiluna the treatment is an "all slime" process and a Ridgeway vacuum filter plant is used, the nature of the ore demanding such treatment.

The growth of the system during 21 years has demanded much capital expenditure and many modifications of procedure. At the commencement of operations, secondhand batteries were purchased for certain localities, which, in addition to various classes of new batteries acquired, did not tend towards standardisation of machinery. Although a number of the old plants are still operative, standardisation has been adhered to for some years, which greatly facilitates and economises the replacement of worn parts. As improved appliances have been launched, they have been adopted at State Batteries, the most noteworthy being gas power plants, and to the Department belongs the honour of having purchased the first producer gas power plant sold in this State. Charcoal was first used to generate gas, but later wood was used and has proved much cheaper than charcoal, and less than half the cost of wood for producing steam power. At the present time 17 batteries are fitted with producer gas power plants. It is interesting

to note the comparative costs of fuel per horse-power hour at plants during 1918.

1.	At 10 steam power plants (Cornish Boiler, gallowed tubes and compound condensing engines)	Per h.p. hour. 0.865 pence.
2.	At 10 producer gas power plants (using charcoal)	0.692 „
3.	At 7 producer gas power plants (using wood)	0.425 „

In recent years ore supplied for treatment has frequently not been free treating, and some of the operations have demanded more than a superficial knowledge of metallurgy to bring them to the successful issue attained. The system is being extended to embrace the treatment of heavy mineral and base metal ores, so that its sphere of operations now covers a fairly wide field. From inception to end of 1918 the capital cost of batteries, buildings, treatment plants and water supplies, etc., has been £368,830 11s. 8d. The gross expenditure on all operations has been £1,173,506 17s. 1d., and the gross revenue £1,088,802 15s. 6d., the loss on operations being £84,704 1s. 7d.

From the 1st January, 1908, to the 31st December, 1918, the sum of £404,899 15s. 0d. has been paid for the purchase of tailing.

The gross output is given in a previous paragraph of this report.

The appendix shows the tons treated, expenditure per ton, Revenue per ton, Profit and Loss for (1) Milling, (2) Sand and Tailing Treatment, (3) Slime Treatment, and (4) Tin Treatment, and also the loss on all operations from 1899 to 1918.

I have, etc.,
A. M. HOWE,
Superintendent of State Batteries.

APPENDIX.

State Battery Statistics from 1899 to 1918.

Year.	Milling.				Sand and Tailing Treatment.				Slime Treatment.				Tin Treatment.				Gross Loss.
	Tons.	Expenditure per ton.	Revenue per ton.	Loss.	Tons.	Expenditure per ton.	Revenue per ton.	Profit.	Tons.	Expenditure per ton.	Revenue per ton.	Loss.	Tons.	Expenditure per ton.	Revenue per ton.	Loss.	
		s. d.	s. d.	£		s. d.	s. d.	£		s. d.	s. d.	£		s. d.	s. d.	£	£
1899 ...	18,806	...	...	2,827	...	...	...	...	...	...	...	...	...	...	...	...	2,827
1900 ...	22,675	22 10·1	17 4·5	7,611	...	...	...	...	...	...	...	...	...	...	...	...	7,611
1901 ...	26,775	18 0·0	16 6·0	1,983	9,534	16 9	...	1,337	...	...	...	...	...	...	...	...	646
1902 ...	39,516	14 8·6	14 8·2	169	9,721	22 3	...	724	...	...	...	...	1,170	12 2	...	286	†269
1903 ...	49,233	13 6·8	12 10·6	1,250	33,369	7 7	...	1,442	...	...	...	...	2,009	8 2	...	153	†2,539
1904 ...	71,616	14 4·4	12 6·5	6,423	43,251	7 10	...	1,448	...	...	...	...	2,337	8 2	...	165	5,141
1905 ...	85,018	12 4·0	12 2·5	957	54,420	7 3	9 8·5	6,689	7,028	12 1	...	410	3,697	5 8	5 0·3	324	†3,342
1906 ...	95,831	12 2·0	11 3·8	4,076	65,159	7 4	9 2·1	5,549	4,737	11 8	12 1·1	†2,254	11,428	4 2	4 3·3	†156	†2,880
1907 ...	95,280	12 6·0	11 4·8	8,724	64,514	6 8·7	9 2·8	6,474	8,220	8 7·6	13 5·5	†1,983	10,496	4 4·4	4 8·8	†191	1,688
1908 ...	95,628	12 1·9	9 3·6	13,669	62,272	6 4·7	8 11·0	8,017	5,818	12 0·9	11 8·0	120	5,573	4 5·2	3 6·3	254	7,278
1909 ...	94,218	11 1·7	9 6·6	7,568	61,032	6 5·8	8 9·7	7,096	16,848	10 0·7	9 6·7	423	5,043	4 8·2	3 7·5	267	1,965
1910 ...	89,278	11 3·3	9 6·6	7,709	43,391	6 2·9	8 6·1	4,903	28,600	8 9·1	9 11·5	†1,723	3,769	5 5·5	3 4·1	401	2,365
1911 ...	59,373	12 6·9	9 10·3	8,058	27,362	6 5·9	8 9·7	3,173	28,183	10 10·5	9 5·3	1,666	6,061	4 0·3	3 4·9	188	7,490
1912 ...	56,636	12 9·2	9 8·7	8,616	18,600	8 3·5	8 8·6	397	8,085	11 8·6	10 5·2	519	5,330	4 5·1	3 7·6	210	9,786
1913 ...	60,573	12 5·6	9 5·4	9,155	31,378*	7 5·0	9 5·2	3,160	6,089	12 4·1	9 6·1	862	8,032	5 5·1	4 1·7	513	7,711
1914 ...	56,570	12 6·8	9 2·9	9,413	38,942	6 6·5	8 2·2	3,202	6,246	10 10·2	9 0·0	578	3,340	7 10·6	4 6·6	557	7,418
1915 ...	49,595	11 10·7	9 2·6	6,642	31,887	6 9·3	8 0·6	2,041	3,454	12 6·2	9 10·1	462	1,767	8 1·2	3 11·7	364	5,502
1916 ...	47,304	12 6·7	9 1·9	8,018	35,665	7 1·7	8 7·3	2,510	15,536	8 8·2	8 7·3	56	943	11 11·6	4 0·3	374	6,189
1917 ...	42,947	12 1·5	9 0·0	6,714	24,674	8 3·3	8 10·3	727	15,408	9 8·5	8 3·1	1,104	1,118	11 2·9	3 8·2	422	7,554
1918 ...	39,330	13 2·9	8 11·4	8,442	24,364	8 3·7	9 5·7	1,420	11,892	9 4·8	7 9·0	982	5,985	4 10·2	3 0·2	558	8,650

* Tailing Treatment commenced 1913. † Profit.

Schedule 1.

Return showing the number of tons crushed, gold yield, average per ton in shillings, and total value for year ending 31st December, 1918.

Battery.	Tons Crushed.	Gold Yield, Bullion.	Average per ton in shillings.	Total Value.
		ozs.	s.	£
Bamboo Creek ...	1,108·75	2,507·90	162·86	9,028·44
Black Range ...	1,427·50	1,509·25	76·12	5,433·30
Boogardie	2,533·00	2,956·55	83·87	10,643·58
Coolgardie	4,883·00	2,528·90	37·29	9,104·04
Laverton	801·50	703·75	63·20	2,533·50
Leonora	163·00	438·70	193·78	1,579·32
Linden	552·50	588·40	76·68	2,118·24
Marble Bar	195·00	240·60	88·84	866·16
Meekatharra	2,306·00	6,674·50	208·40	24,028·20
Mt. Egerton	226·00	82·10	72·65	295·56
Mt. Keith	963·50	910·15	68·01	3,276·54
Mt. Sir Samuel ...	344·50	238·75	49·90	859·50
Mulline	376·50	380·10	72·69	1,368·36
Niagara	672·25	644·20	68·99	2,319·12
Norseman	1,860·50	3,021·05	116·91	10,875·78
Ora Banda	1,813·00	1,421·75	56·46	5,118·30
Payne's Find ...	2,262·50	3,099·30	98·62	11,157·48
Peak Hill	1,183·00	1,114·35	67·82	4,011·66
Quinn's	219·00	68·30	22·45	245·88
Sandy Creek	319·75	399·55	89·97	1,438·38
Tuckabianna	1,176·75	2,265·50	95·01	8,155·80
Warriedar	1,026·50	575·65	40·38	2,072·34
Wiluna	502·00	242·90	34·84	874·44
Yarri	438·50	425·85	69·92	1,533·06
Yerilla	26·00	20·55	56·91	73·98
Youanme	1,065·00	525·22	35·51	1,890·79
	28,990·50	33,583·82	83·408	120,901·75
Wiluna Lode ...	10,339·25			
	39,329·75			

Tin Plants.

Plant.	Yards of Tin ore treated.	Yield.
		Tons.
Greenbushes, Bunbury End	4,122	14·543
Greenbushes, Salt Water Gully	1,863	4·704
	5,985	19 247

Schedule 2.

Return showing the number of tons crushed, gold yield, average per ton, and value since inception to 31st December, 1918.

Battery.	Tons Crushed.	Gold Yield, Bullion.	Average Gold per ton.	Value.
		ozs.		£
Bamboo Creek ...	7,134·00	11,378·31	1·595	40.961·92
Black Range ...	66,974·90	70,310·60	1·049	253,313·49
Boogardie	58,695·40	37,634·64	·641	136,878·89
Burtville	30,458·00	66,078·71	2·169	239,189·17
Coolgardie	86,821·00	67,581·47	·778	243,346·77
Darlot	33,210·00	37,637·74	1·133	138,928·25
Laverton	15,806·00	16,790·51	1·064	61,617·56
Leonora	53,012·95	58,491·34	1·103	214,049·15
Linden	17,834·50	19,976·48	1·120	71,915·42
Meekatharra	72,885·50	87,120·04	1·195	316,311·53
Marble Bar	9,638·50	12,267·50	1·273	44,162·95
Mt. Egerton	7,340·25	3,921·96	·534	13,385·88
Mt. Ida	40,025·90	52,867·11	1·328	193,623·77
Mt. Keith	7,940·75	7,072·05	·778	25,459·38
Mt. Sir Samuel ...	8,962·75	7,106·00	·793	25,581·59
Mulline	76,064·45	97,975·34	1·288	351,881·37
Mulwarrie	31,153·90	36,075·91	1·158	133,129·97
Niagara	63,283·00	56,357·79	·808	205,076·24
Norseman	56,134·20	61,287·67	1·092	223,818·08
Ora Banda	13,021·50	6,612·49	·508	23,804·94
Payne's Find ...	16,795·50	20,150·56	1·194	72,542·01
Peak Hill	17,131·80	18,779·57	1·096	68,777·69
Pinjin	17,088·65	12,912·63	·761	46,485·04
Quinn's	11,389·50	6,258·43	·549	22,539·35
Siberia	14,793·75	16,284·04	1·101	58,547·87
20-Mile Sandy ...	12,184·15	19,055·77	1·564	68,930·34
Tuckabianna	1,716·75	2,265·50	1·319	8,155·80
Tuckanarra	15,476·85	21,276·06	1·374	78,217·53
Warriedar	2,671·25	1,249·35	·468	4,497·66
Wiluna	54,663·75	29,356·62	·537	105,829·01
Yarri	45,250·00	29,746·96	·658	107,088·88
Yerilla	14,372·25	13,068·55	·909	44,245·70
Youanme	26,443·00	9,130·73	·345	32,870·62
Batteries Closed ...	153,242·04	133,589·03	·996	488,030·06
	1,159,616·69	1,147,667·46	·989	4,163,184·88
Wiluna (Lode) ...	37,119·75	16,292·83	·434	58,977·05
	1,196,736·44	1,163,960·29	·973	4,222,161·93

Tin Plants.

Plant.	Tons.	Yield Tons Black Tin.
Greenbushes—Bunbury End	55,212·50	705·917
Greenbushes—Salt Water Gully	6,800·00	59·866
Plants Closed	15,804·25	189·531
	77,816·75	955·314

Milling.	Tons.	ozs.
Up to 1901 (3 years)	68,791	75,533
1902	39,517	57,255
1903	49,233	58,305
1904	71,616	78,309
1905	85,018	92,327
1906	95,831	94,187
1907	95,280	97,962
1908	95,624	89,875
1909	94,218	83,127
1910	89,278	80,074
1911	59,373	56,265
1912	56,636	53,868
1913	60,573	52,515
1914	56,570	45,641
1915	49,595	39,095
1916	47,330	31,734
1917	42,947	38,015
1918	39,329	33,583

Cyaniding Sands.	Tons.
Up to 1902	29,255
1903	33,369
1904	42,559
1905	54,420
1906	60,422
1907	63,778
1908	62,081
1909	61,265

Cyaniding Sands—continued.	Tons.
1910	43,915
1911	27,444
1912	18,599
1913	18,300
1914	6,219
Tailings.	
1913	13,078
1914	32,723
1915	31,887
1916	34,725
1917	24,890
1918	24,364
Slimes Treatment.	
Up to 1904	691
1905	7,028
1906	...
1907	8,220
1908	5,818
1909	16,848
1910	28,819
1911	20,821
1912	8,085
1913	6,089
1914	6,246
1915	3,454
1916	15,536
1917	13,086
1918	11,892

Schedule 3.

Sands and Tailings Treatment for 1918.

Battery.	Tons.	Yield.	Value.
		Fine ozs.	£
Bamboo Creek	1,176·00	459·60	1,965·64
Black Range	2,780·00	1,181·79	5,020·19
Boogardie	3,264·00	810·93	3,384·67
Coolgardie	4,995·00	1,019·31	4,330·34
Linden	1,100·00	620·64	2,653·21
Meekatharra	3,450·00	975·08	4,141·98
Mt. Keith	960·00	132·72	563·79
Mulline	1,290·00	250·16	1,062·71
Niagara	756·00	63·42	269·41
Norseman	1,750·00	640·10	2,719·17
Ora Banda	1,025·00	306·52	1,302·07
Payne's Find	420·00	28·94	122·92
Sandy Creek	852·00	210·43	893·85
Youanmi	530·00	124·04	526·93
Total for 12 months ...	24,348·00	6,823·68	28,956·88
Less Tonnage Revenue not collected until 1918 ...	424·00		
	23,924·00		
Add Tonnage, November and December Treatment, Revenue not collected ...	440·00		
Total	24,364·00		

Slimes Treatment for 1918.

Battery.	Tons.	Yield.	Value.
		Fine ozs.	£
Mulwarrie	1,318·00	204·26	867·68
Wiluna	12,896·00	5,405·69	22,962·65
Totals	14,214·00	5,609·95	23,830·33
Less Tonnage Revenue not collected, 1917	2,322·00		
Total	11,892·00		

Residues Treatment for 1918.

Battery.	Tons.	Yield.	Value.
		Fine ozs.	£
Mulwarrie	682·00	101·97	433·19
Less Tonnage Revenue not collected, 1917	418·00		
Total	264·00		

Tin—Residues Treatment for 1918.

	Tons.
Greenbushes—Bunbury End	315
Greenbushes—Salt Water Gully	1,024
	1,339

Schedule 4.

Sand and Tailing Treatment since Inception to 31st December, 1918.

Battery.	Tons.	Yield.	Value.
		Fine ozs.	£
Bamboo Creek	5,152·00	1,519·18	6,466·52
Black Range	43,218·00	12,046·34	50,886·16
Boogardie	40,772·00	11,073·85	46,448·11
Burtville	16,788·75	5,464·13	22,793·76
Coolgardie	50,916·00	8,133·03	34,224·34
Darlot	23,654·00	2,699·17	11,042·16
Devon	261·50	120·44	511·64
Duketon	2,083·50	250·51	1,025·77
Laverton	13,796·00	2,245·06	9,341·00
Lennovnille	24,309·00	6,592·43	26,653·23
Leonora	37,139·50	9,056·71	37,699·89
Linden	15,437·00	5,221·43	22,197·84
Meekatharra	49,040·00	9,726·55	40,698·44
Menzies	31,487·50	7,975·80	33,434·78
Mt. Ida	3,570·00	357·97	1,423·64
Mt. Keith	5,913·00	683·77	2,904·10
Mt. Sir Samuel	5,886·00	1,355·67	5,758·89
Mulline	44,794·50	12,261·27	49,863·24
Mulwarrie	23,309·25	4,675·53	19,220·11
Nannine	3,650·00	410·12	1,742·50
Niagara	42,270·00	6,481·87	26,954·66
Norseman	39,489·50	8,449·71	35,135·27
Ora Banda	5,336·00	1,240·82	5,271·27
Payne's Find	11,673·00	1,408·63	5,983·78
Pig Well	11,379·00	2,373·25	9,962·50
Pinjin	11,718·00	1,243·07	5,256·01
Quinn's	7,486·00	686·56	2,916·43
Randell's	791·00	56·05	224·80
Sandy Creek	11,496·25	3,491·00	14,547·62
Siberia	5,550·00	1,201·56	5,105·20
Southern Cross	3,471·00	452·75	1,815·18
Wiluna	17,852·00	7,930·79	33,590·87
Yarri	43,550·00	4,077·62	17,057·36
Yerilla	13,620·00	1,622·66	6,892·92
Youanmi	11,215·00	2,953·52	12,542·64
Yundamindera	4,977·00	920·33	3,909·25
Totals	683,551·25	146,459·15	611,501·88

Residue Treatment from Inception to 31st December, 1818.

Battery.	Tons.	Yield.	Value.
		Fine ozs.	£
Linden	670·00	95·14	349·34
Menzies	24,270·00	1,579·26	6,679·01
Mulwarrie	4,618·00	546·85	2,325·02
Totals	29,558·00	2,221·25	9,353·37

Slime Plant Treatment since Inception to 31st December, 1918.

Battery.	Tons.	Yield.	Value.
		Fine ozs.	£
Black Range	13,040·00	2,604·59	11,064·71
Boogardie	2,100·00	426·35	1,811·08
Burtville	1,643·00	519·00	2,204·71
Darlot	570·00	52·61	223·55
Laverton	273·00	45·24	192·19
Leonora	12,440·00	2,198·09	9,338·73
Linden	419·00	87·30	370·90
Meekatharra	1,980·00	462·78	1,966·08
Menzies	21,905·50	5,454·53	23,171·45
Mulline	21,576·75	6,833·05	24,557·11
Niagara	13,875·00	2,175·15	9,242·12
Norseman	16,177·50	3,577·15	15,195·06
Mulwarrie	4,733·50	751·79	3,194·22
Pig Well	340·00	64·65	274·57
Sandy Creek	293·50	75·00	318·68
Siberia	347·00	104·47	443·73
Wiluna	44,154·00	16,734·34	71,082·59
Yarri	3,792·00	364·06	1,546·62
Yerilla	424·00	44·55	189·33
Totals	160,083·75	42,575·79	176,387·43

Schedule 5.

Return showing Number of Parcels treated and Tons crushed at State Batteries for Year 1918.

Number of Parcels crushed.	Battery.	Tons.	Yield by Amalgamation. Bullion.	Yield by Amalgamation. Fine Gold.	Gross Contents of Tailings. Fine Gold.	Total Contents of Ore. Fine Gold.	Average per ton. Fine Gold.	Gross Value of Ore per ton.
			ozs.	ozs.	ozs.	ozs.	dwts. grs.	£ s. d.
19	Bamboo Creek	1,108·75	2,507·92	2,125·36	418·91	2,544·27	45 22½	9 18 0
21	Black Range	1,427·50	1,509·25	1,227·85	624·48	1,902·33	26 16	5 13 1
72	Boogardie	2,538·00	2,956·65	2,505·55	733·50	3,239·05	25 12½	5 8 4
104	Coolgardie	4,883·00	2,528·92	2,143·15	648·46	2,791·61	11 10½	2 8 3
28	Laverton	801·50	703·77	509·64	276·63	786·27	19 14½	4 3 11
7	Leonora	163·00	438·70	392·43	55·37	447·80	44 22	9 10 5
19	Linden	552·50	588·40	526·35	157·34	683·69	24 17	5 4 10
5	Marble Bar	195·00	241·60	204·75	31·91	236·66	24 6½	5 3 0
33	Meekatharra	2,306·00	6,674·50	5,656·36	807·68	6,464·04	46 1	9 15 6
2	Mount Egerton	226·00	82·10	69·58	44·32	113·90	10 2	2 2 10
9	Mt. Keith	963·50	910·15	771·31	47·38	818·69	16 23¾	3 12 1
9	Mt. Sir Samuel	344·50	238·75	202·33	72·00	274·33	15 22	3 7 7
15	Mulline	376·50	380·10	363·44	57·32	420·76	22 8	4 14 9
18	Niagara	672·25	644·17	545·90	127·43	673·33	20 0	4 4 11½
30	Norseman	1,820·50	3,021·05	2,560·21	720·52	3,280·73	36 1	7 13 1
35	Ora Banda	1,813·00	1,453·85	1,232·08	206·04	1,438·12	15 21	3 7 5
47	Payne's Find	2,262·50	3,099·30	2,625·52	237·89	2,863·41	25 7½	5 7 5
21	Peak Hill	1,183·00	1,114·35	944·36	173·79	1,118·15	12 13	2 13 3
4	Quinn's	219·00	68·32	57·89	23·89	81·78	8 0	1 13 9
9	Sandy Creek	459·75	399·55	338·60	73·07	411·67	17 22	3 16 1
38	Tuckablanna	1,716·75	2,265·55	1,919·96	1,709·37	3,629·33	42 6¾	8 19 6
13	Wiluna	502·00	242·90	205·85	216·47	442·32	16 20	3 11 5
15	Warriedar	1,026·50	575·65	487·84	442·47	930·31	18 3	3 17 0
13	Yarri	438·50	425·87	360·91	111·61	472·52	21 13	4 11 4
1	Yerilla	26·00	20·55	17·42	7·34	24·76	19 1	4 1 11
4	Youanmi	1,065·00	525·22	445·10	184·80	629·90	11 20	2 10 1
591	Total treated	29,090·50	33,617·04	28,489·74	8,210·19	36,699·93	25 5½	5 7 2
24	Wiluna Lode	10,444·25	No. Amalgamation.		5,412·19	5,412·19	10 8¾	2 3 11
615		39,534·75						
	Add Tonnage not completed 31st December, 1918	152·00						
		39,686·75						
	Less Tonnage not completed 31st December, 1917	357·00						
		39,329·75						

Tin Plants.

—	Yards of Tin ground treated.	Yield. Tons.	Average per yard.
Greenbushes—Bunbury End	4,122	15,053	8·064
Greenbushes—Salt Water Gully	1,863	14,300	17·248
	5,985	29,353	10·976

Schedule 6.

Expenditure from Consolidated Revenue Vote and Loan Expenditure Funds on Erection of State Batteries for year ending 31st December, 1918, and totals since Inception.

Battery.	From Revenue.	From Loan.	Total.
	£ s. d.	£ s. d.	£ s. d.
Warriedar Battery Water Supply	...	28 14 0	28 14 0
Warriedar Battery, Erection of	...	1 3 3	1 3 3
Tazewell Samplers, Erection of	...	11 8 3	11 8 3
Coolgardie Scheelite Plant, Erection	...	573 10 9	573 10 9
Tuckabianna Battery and Improvements thereto	...	660 6 5	660 6 5
Laverton, Additions to Manager's Quarters	...	103 5 2	103 5 2
Wiluna, Engineer's Quarters	...	267 15 0	267 15 0
Tuckabianna Battery, Lease of	...	31 7 0	31 7 0
Greenbushes, Installation of Tailings Pump	...	100 13 0	100 13 0
Erection of State Battery, Cue	...	513 17 1	513 17 1
	...	2,291 19 11	2,291 19 11
Erection of State Batteries, Expenditure to 31st December, 1907	91,981 1 8	...	...
Loan Expenditure to 31st December, 1917	...	274,557 10 1	366,538 11 9
Totals	91,981 1 8	276,849 10 0	368,830 11 8

Schedule 7.

Direct Purchase of Tailing for 1918.

Battery.	Tons.	Amount.
		£ s. d.
Bamboo Creek	495·00	550 19 0
Black Range	1,044·75	1,203 7 4
Boogardie	1,422·00	1,410 8 2
Coolgardie	1,301·75	703 18 1
Laverton	395·00	436 0 0
Leonora	358·00	362 7 8
Linden	421·25	452 4 4
Meekatharra	1,168·25	1,545 3 8
Mt. Keith	621·25	88 2 6
Mt. Egerton	32·00	4 16 0
Mulline	137·25	29 7 7
Niagara	326·25	100 3 11
Norseman	1,032·00	910 16 7
Ora Banda	414·75	386 10 0
Payne's Find	392·00	112 18 0
Quinn's	28·00	10 10 0
Sandy Creek	225·50	67 13 0
Wiluna Lode, No. 1	494·50	584 8 4
Wiluna Lode, No. 2	10,679·25	10,920 8 6
Warriedar	477·50	597 5 9
Yarri	271·75	144 4 3
Yerilla	21·50	12 7 3
Youanmi	804·75	175 14 4
Totals	22,564·25	20,809 14 3

Schedule 7a.

Return showing Tailing payable and unpayable and Gross Contents.

Battery.	Tailings purchased.		Unpayable.		Totals.	
	Tons.	Gross Contents.	Tons.	Gross Contents.	Tons.	Gross Contents.
		ozs. dwts. grs.		ozs. dwts. grs.		ozs. dwts. grs.
Bamboo Creek	815½	412 17 3	53	6 1 12	868½	418 18 15
Black Range	1,194	622 12 15½	17½	1 16 23½	1,212	624 9 15
Boogardie	1,360¼	648 12 21	676	84 17 7¼	2,036¼	733 10 4¼
Coolgardie	1,029½	389 14 16½	3,089½	258 14 18¼	4,119½	648 9 11¼
Laverton	644½	273 0 7	32½	3 12 12	677¼	276 12 19
Leonora	104	52 0 20½	34	3 6 14	138	55 7 10½
Linden	393½	149 12 12½	67½	7 4 10	461	157 6 22¾
Marble Bar	154	31 18 6	...	...	154	31 18 6
Meekatharra	1,422	766 12 5	411	41 1 0	1,833	807 13 5
Mt. Keith	548½	30 15 23	222½	16 11 16	770¾	47 7 15
Mt. Egerton	180	44 6 12	...	...	180	44 6 12
Mt. Sir Samuel	256¼	72 0 4½	...	...	256¼	72 0 4½
Mulline	251	52 1 2½	52¼	5 5 10½	303¼	57 6 13
Niagara	461¾	118 5 20	92¾	9 2 18	554½	127 8 14
Norseman	1,381½	701 18 3¾	156	18 12 7	1,537½	720 10 10½
Ora Banda	224¼	101 2 20¾	1,198¼	104 17 23½	1,422½	206 0 20½
Payne's Find	528	117 0 3	1,279	120 17 17½	1,807	237 17 20½
Peak Hill	451	144 16 18	484	28 19 5	935	173 15 23
Quinn's	27½	10 19 7½	146	12 18 13	173½	28 17 20½
Sandy Creek	229½	57 5 14	134½	15 15 20	364	73 1 10
Tuckabianna	1,235¼	1,693 11 20¼	166¼	15 15 15	1,401½	1,709 7 11¼
Warriedar	789½	437 0 21¾	52½	5 8 19½	841¾	442 9 17
Wiluna	401½	214 2 21½	19½	2 6 12	421¼	216 9 9½
Yarri	361½	111 12 7½	...	...	361½	111 12 7½
Yerilla	21½	7 6 22	...	...	21½	7 6 22
Youanmi	804¾	179 5 14	49	5 10 12	853¾	184 16 2
	15,270¾	7,440 14 7	8,434½	769 7 23	23,705	8,210 2 6
Wiluna Lode	10,444½	5,412 3 22½	...	...	10,444½	5,412 3 22½
Total	25,715	12,852 18 5½	8,434½	769 7 23	34,149½	13,622 6 4½

Schedule 8.

Report 1918.—Statement of Receipts and Expenditure for Year ending 31st December, 1918 (exclusive of Additions and Equipment).

MILLING AND TIN.

Plant.	Tonnage.	Management.	Wages.	Stores.	Total Working Expenditure.	Cost per ton.	Repairs and Renewals.	Sundries.	Gross Expenditure.	Cost per ton.	Receipts.	Per ton.	Profit.	Loss.
		£ s. d.	£ s. d.	£ s. d.	£ s. d.	s. d.	£ s. d.	£ s. d.	£ s. d.	s. d.	£ s. d.	s. d.	£ s. d.	£ s. d.
Bamboo Creek	1,108·75	104 0 9	481 3 11	274 6 3	859 10 11	15 6·00	77 0 11	83 13 0	1,020 4 10	18 4·80	699 15 5	12 7·46	...	320 9 5
Black Range	1,427·50	116 0 0	265 6 2	228 9 10	609 16 0	8 5·40	356 18 7	157 0 1	1,123 14 8	15 8·92	695 6 1	9 7·20	...	428 8 7
Boogardie	2,538·00	202 10 0	661 15 8	421 3 5	1,285 9 1	10 1·45	108 8 0	204 15 3	1,598 12 4	12 6·20	1,255 15 4	9 1·15	...	342 17 0
Burtville	...	...	104 5 3	40 6 10	144 12 1	...	...	6 6 6	150 18 7	...	6 0 0	...	...	144 18 7
Coolgardie	4,883·00	211 0 0	465 9 7	607 3 6	1,283 13 1	5 3·07	182 0 1	509 12 6	1,975 5 8	8 0·96	1,856 1 0	7 7·20	...	119 4 8
Darlot	...	...	104 5 3	...	104 5 3	...	...	...	104 5 3	...	...	...	...	104 5 3
Laverton	801·50	231 0 0	241 1 5	232 5 8	704 7 1	...	82 10 4	90 11 5	877 8 10	21 10·73	410 19 1	10 4·80	...	466 9 9
Leonora	163·00	115 0 0	84 3 2	51 12 2	250 15 4	30 9·12	38 5 5	54 18 4	343 19 1	42 2·42	122 3 9	14 11·76	...	221 15 4
Linden	552·50	99 0 0	131 9 2	81 10 6	311 19 8	11 3·53	62 17 10	112 8 6	487 6 0	18 4·80	239 13 3	8 9·40	...	247 12 9
Lennonville	...	...	...	...	...	...	...	...	...	...	3 0 0	...	3 0 0	...
Marble Bar	195·00	100 0 0	150 16 11	128 1 0	378 17 11	37 1·68	8 1 8	54 19 10	421 19 5	41 6·72	117 0 0	12 0	...	304 19 5
Meekatharra	2,306·00	315 0 0	517 17 8	242 8 8	1,075 6 4	9 3·91	47 17 0	209 2 6	1,332 5 10	11 6·65	948 8 0	8 2·26	...	383 17 10
Menzies	...	...	...	0 5 0	0 5 0	...	...	...	0 5 0	...	57 1 6	...	56 16 6	...
Mt. Egerton	226·00	59 0 0	94 9 2	134 15 0	288 4 2	24 6·00	59 17 10	35 2 8	383 4 8	33 10·80	118 13 0	10 6	...	264 11 8
Mt. Ida	...	...	104 5 3	1 16 6	106 1 9	...	...	...	106 1 9	...	20 7 1	...	...	85 14 8
Mt. Keith	963·50	76 10 0	383 13 3	169 12 6	629 15 9	13 0·86	49 3 7	152 19 2	831 18 6	17 3·22	505 19 9	10 6·45	...	325 18 9
Mt. Sir Samuel	344·50	65 0 0	190 3 4	102 2 8	357 6 0	20 7·20	66 11 1	64 18 7	488 15 8	28 4·32	180 17 3	10 6	...	307 18 5
Mulline	376·50	28 0 0	149 18 10	85 19 10	263 18 8	14 0·02	28 3 7	30 19 0	323 1 3	17 1·92	251 19 4	13 2·40	...	71 1 11
Mulwarrie	...	9 0 0	60 14 6	12 2 6	81 17 0	...	5 7 10	4 0 0	91 4 10	...	11 4 0	...	...	80 0 10
Niagara	672·25	187 10 0	180 4 2	169 15 10	537 10 0	15 9·60	86 1 5	114 8 10	738 0 3	21 11·52	349 12 7	10 4·29	...	388 7 8
Norseman	1,860·50	121 15 7	661 8 4	382 12 2	1,165 16 1	12 6·14	106 9 7	158 13 3	1,430 18 11	15 2·40	940 8 7	10 1·29	...	490 10 4
Ora Banda	1,813·00	236 6 6	357 6 4	314 6 3	907 19 1	10 0·85	119 13 1	179 3 11	1,206 16 1	13 4·56	709 19 3	7 10·30	...	496 16 10
Payne's Find	2,262·50	225 0 0	635 0 1	350 15 1	1,210 15 2	10 7·36	147 18 3	204 2 1	1,562 15 6	13 9·76	1,188 8 9	10 6	...	374 6 9
Peak Hill	1,183·00	286 1 5	251 19 6	148 4 2	686 5 1	11 7·22	63 3 2	89 10 5	838 18 8	14 2·18	489 6 9	8 3·12	...	349 11 11
Pinjin	...	...	...	...	...	...	...	...	...	...	5 10 0	...	5 10 0	...
Quinn's	219·00	2 10 0	136 14 2	43 10 11	182 15 1	17 5·80	8 13 4	40 14 2	232 2 7	22 2·54	117 0 1	11 2·28	...	115 2 6
Sandy Creek	319·75	55 19 5	165 5 10	103 6 9	324 12 0	20 2·40	0 16 8	38 7 9	363 16 5	20 0·25	367 9 10	22 2·40	3 13 5	...
Siberia	...	...	4 10 0	7 2 5	11 12 5	...	...	3 10 0	15 2 5	...	1 15 0	...	...	13 7 5
Tuckabianna	1,716·75	306 15 6	515 12 8	413 10 0	1,235 18 2	14 2·50	100 4 4	181 16 7	1,517 19 1	17 7·20	979 13 6	11 4·80	...	538 5 7
Tuckanarra	...	...	...	...	...	...	...	...	...	...	22 6 5	...	22 6 5	...
Warriedar	1,026·50	120 0 0	310 10 8	301 2 0	731 12 8	14 3·05	4 2 6	134 5 6	870 0 8	16 11·42	582 12 10	11 4·10	...	287 7 10
Wiluna	10,841·25	241 13 4	1,340 15 2	775 5 1	2,357 13 7	4 4·20	1,066 18 3	738 2 11	4,162 14 9	7 8·16	3,369 13 8	6 2·59	...	793 1 1
Yarri	438·50	32 10 0	146 4 3	129 11 4	318 5 7	14 7·48	10 13 4	41 14 1	370 13 0	16 10·84	229 9 2	10 5·59	...	141 3 10
Yerilla	26·00	5 0 0	...	7 13 2	12 13 2	...	...	8 10 3	21 3 5	16 3·04	16 18 4	13 0·14	...	4 5 1
Youanme	1,065·00	38 0 0	423 4 3	150 3 11	611 8 2	11 5·18	81 11 3	143 0 1	835 19 6	15 7·68	515 11 4	9 8·16	...	320 8 2
	39,329·75	3,590 2 6	9,329 13 11	6,111 0 11	19,030 17 4	9 8·14	2,969 8 11	3,827 7 2	25,827 13 5	13 1·61	17,385 19 11	8 10·23	91 6 4	8,532 19 10
SALES.														
Black Range	...	...	...	35 6 3	35 6 3	...	...	...	35 6 3	...	35 6 3	...	...	...
Laverton	...	...	...	5 17 6	5 17 6	...	...	...	5 17 6	...	5 17 6	...	...	...
Linden	...	...	...	25 9 0	25 9 0	...	...	...	25 9 0	...	25 9 0	...	...	...
Meekatharra	...	...	...	35 18 0	35 18 0	...	...	...	35 18 0	...	35 18 0	...	...	...
Menzies	...	...	...	13 13 2	13 13 2	...	...	...	13 13 2	...	13 13 2	...	...	...
Mt. Keith	...	...	...	13 19 0	13 19 0	...	...	...	13 19 0	...	13 19 0	...	...	...
Peak Hill	...	...	...	86 0 3	86 0 3	...	...	...	86 0 3	...	86 0 3	...	...	...
Wiluna	...	...	...	0 16 0	0 16 0	...	...	...	0 16 0	...	0 16 0	...	...	...
	39,329·75	3,590 2 6	9,329 13 11	6,328 0 1	19,247 16 6	9 9·46	2,969 8 11	3,827 7 2	26,044 12 7	13 2·93	17,602 19 1	8 11·42	...	8,532 19 10
TIN PLANTS.														
Greenbushes—														
Bunbury End	4,122·00	163 8 6	191 12 7	222 18 6	577 19 7	2 9·65	117 13 0	130 2 8	825 15 3	4 0·07	463 18 11	2 2·30	...	361 16 4
Salt Water Gully	1,863·00	129 4 1	186 4 0	110 3 2	425 11 3	4 6·72	154 4 8	53 16 0	633 11 11	6 9·62	436 19 3	4 8·30	...	196 12 8
	45,314·75	3,882 15 1	9,707 10 6	6,661 1 9	20,251 7 4	...	3,241 6 7	4,011 5 10	27,503 19 9	...	18,503 17 3	...	91 6 4	9,091 8 10

Schedule 9.

Annual Report, 1918.—Statement of Receipts and Expenditure for 12 Months ending 31st December, 1918, exclusive of Additions and Equipment.

TAILINGS, SLIMES, AND RESIDUES.

Plant.	Tonnage.	Management.	Wages.	Assays.	Stores.	Total Working Expenditure.	Cost per ton.	Repairs and Renewals.	Sundries.	Gross Expenditure.	Cost per ton.	Receipts.	Per ton.	Profit.	Loss.
		£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	s. d.	£ s. d.	£ s. d.	£ s. d.	s. d.	£ s. d.	s. d.	£ s. d.	£ s. d.
Bamboo Creek ...	1,176	70 13 10	189 0 0	37 10 11	222 4 4	519 9 1	8 10·03	26 11 5	67 7 3	613 7 9	10 5·18	546 13 2	9 3·52	...	66 14 7
Black Range ...	2,780	186 0 0	348 18 6	60 6 11	529 5 8	1,124 11 1	8 1·08	23 4 6	164 14 4	1,312 9 11	9 5·30	1,374 7 8	9 10·65	61 17 9	...
Boogardie	2,900	157 10 0	368 11 3	58 11 5	401 13 10	986 6 6	6 9·62	32 7 8	135 7 1	1,154 1 3	7 11·28	1,401 10 5	9 4·96	247 9 2	...
Coolgardie	4,995	147 0 0	614 16 6	60 10 6	672 7 5	1,494 14 5	5 11·76	18 14 2	308 6 9	1,821 15 4	7 3·40	2,208 12 4	8 10·08	386 17 0	...
Laverton	...	...	12 9 9	...	...	12 9 9	...	5 4 11	0 4 6	17 19 2	...	23 8 11	...	5 9 9	...
Leonora	...	...	...	6 12 9	...	6 12 9	...	...	...	6 12 9	...	...	...	...	6 12 9
Linden	1,100	30 0 0	151 16 8	34 7 8	160 5 11	376 10 3	6 10·08	2 9 6	91 3 8	470 3 5	8 6·48	623 13 4	11 4·06	153 9 11	...
Meekatharra ...	3,450	73 0 0	516 14 7	27 7 3	478 3 6	1,095 5 4	6 4·17	44 19 8	178 7 7	1,318 12 7	7 7·72	1,515 16 7	8 9·50	197 4 0	...
Menzies	...	...	...	...	...	...	...	...	...	...	...	18 0 3	...	18 0 3	...
Mt. Keith	960	51 13 9	136 13 4	20 3 0	120 14 5	329 4 6	6 10·30	5 10 0	49 10 1	384 4 7	8 0·00	374 1 1	7 9·36	...	10 3 6
Mt. Sir Samuel ...	...	...	...	...	3 6 3	3 6 3	...	1 10 0	...	4 16 3	...	...	...	...	4 16 3
Niagara	756	45 0 0	97 1 5	26 18 2	96 0 9	265 0 4	7 0·16	...	38 4 10	303 5 2	8 0·28	332 13 10	7 10·82	29 8 8	...
Norseman	1,750	57 7 2	181 15 0	21 3 1	230 12 8	490 17 11	5 7·82	3 2 0	85 11 1	579 11 0	6 7·45	819 4 11	9 4·52	239 13 11	...
Ora Banda	1,405	109 16 1	166 18 4	21 0 4	318 11 2	616 5 11	8 9·26	3 9 4	69 16 8	689 11 11	9 9·79	715 7 5	10 2·16	25 15 6	...
Payne's Find ...	420	35 0 0	52 16 4	8 7 8	76 18 5	173 2 5	8 2·72	...	33 17 3	206 19 8	9 9·60	148 17 4	7 0·96	...	58 2 4
Sandy Creek ...	852	97 8 10	129 13 9	14 19 6	135 1 2	377 3 3	8 9·36	3 0 0	45 2 2	425 5 5	9 10·80	461 15 8	10 10·08	36 10 3	...
Yarri	...	...	...	...	...	...	...	...	...	...	...	18 14 3	...	18 14 3	...
Youanme	530	20 0 0	76 17 0	20 12 5	64 5 2	181 14 7	6 10·08	5 16 2	38 17 7	226 8 4	8 6·53	359 6 1	13 6·70	132 17 9	...
Mulline	1,290	20 11 5	180 6 8	27 1 0	297 2 4	525 1 5	8 1·68	6 11 8	59 15 11	591 9 0	9 1·92	604 4 0	9 4·32	12 15 0	...
	24,364	1,101 1 1	3,224 9 1	445 12 7	3,806 13 0	8,577 15 9	7 0·65	182 11 0	1,366 6 9	10,126 13 6	8 3·74	11,546 7 3	9 5·74	1,566 3 2	146 9 5
SLIMES.															
Mulwarrie	216	...	49 15 10	9 18 7	62 10 4	122 4 9	11 3·81	...	14 7 5	136 12 2	12 8·01	101 9 8	9 4·75	...	35 2 6
Wiluna	11,676	230 6 8	1,729 10 2	167 4 10	1,907 10 5	4,034 12 1	6 10·92	743 11 9	678 19 7	5,457 3 5	9 4·15	4,510 6 11	7 8·71	...	946 16 6
RESIDUES.															
Mulwarrie	264	...	62 5 7	8 2 6	68 9 0	138 17 1	10 6·26	...	18 2 3	156 19 4	11 10·68	156 19 4	11 10·68	...	...
TIN RESIDUES.															
Greenbushes, Bunbury End	315	...	45 3 8	...	27 14 6	72 18 2	4 7·56	8 14 10	4 11 2	86 4 2	5 5·69	26 8 6	0 10·73	...	59 15 8
Greenbushes, S.W. Gully	1,024	30 4 9	180 0 11	...	57 2 0	267 7 8	5 2·64	2 9 8	20 11 3	290 8 7	5 8·06	262 4 10	5 1·46	...	28 3 9
	37,859	1,361 12 6	5,291 5 3	630 18 6	5,929 19 3	13,213 15 6	6 11·76	937 7 3	2,102 18 5	16,254 1 2	8 7·03	16,603 16 6	8 9·26	1,566 3 2	1,216 7 10

Schedule 10.

STATE BATTERIES.

	£ s. d.	£ s. d.		£ s. d.	£ s. d.
To Capital Expenditure:			By Batteries, Cyanide and Slimes Plants ...	368,830 11 8	
From General Loan Fund ...	276,849 10 0		Less Depreciation...	285,010 13 3	
,, Consolidated Revenue	91,981 1 8				83,819 18 5
		368,830 11 8			
To Treasury		102,412 9 10	,, Stores		11,020 5 11
,, Interest and Sinking Fund ...		234,563 14 10	,, Sundry Debtors		9,860 10 8
,, Sundry Creditors		3,172 8 4	,, Profit and Loss		604,278 9 8
		£708,979 4 8			£708,979 4 8

Profit and Loss Account.

	£ s. d.	£ s. d.		£ s. d.	£ s. d.
To Expenditure— Head Office and all Batteries	1,173,506 17 1	1,173,506 17 1	By Revenue ... ... Less Working carried down	1,088,802 15 6 / 84,704 1 7	1,173,506 17 1
,, Loss on Working brought down	84,704 1 7				
,, Interest at 3½ per cent. and Sinking Fund at 1¼ per cent. on Capital Expenditure ...	234,563 14 10				
,, Depreciation	285,010 13 3	604,278 9 8	Gross Loss		604,278 9 8
		£604,278 9 8			£604,278 9 8

Schedule 11.

Working Profit and Loss for Year ending 31st December, 1918.

	£ s. d.		£ s. d
To Expenditure as per attached statement—		By Revenue as per statement—	18,503 17 3
Batteries and Tin Plants	27,503 19 9	,, Tailings and Slimes Charges	16,603 16 6
Tailings and Slimes Plants	16,254 1 2	,, Net Loss on year's operations	8,650 7 2
	£43,758 0 11		£43,758 0 11

DIVISION IV.

ANNUAL PROGRESS REPORT

OF THE

GEOLOGICAL SURVEY

FOR THE YEAR 1918.

WITH A GEOLOGICAL SKETCH MAP OF WESTERN AUSTRALIA.

The Hon. J. Scaddan M.L.A.
Minister for Mines.

GEOLOGICAL SKETCH MAP OF WESTERN AUSTRALIA.

BASED ON THE WORK OF THE GEOLOGICAL SURVEY.

A. GIBB MAITLAND
GOVERNMENT GEOLOGIST.

Preliminary Edition.

1919.

Scale of English statute miles.

50 40 30 20 10 0 50 100 150 200

REFERENCE

Towns ..... shown thus ..... ◉ EUCLA
Railways ..... ,, ...
Land District Boundaries ..... ,, ...
Land Division ..... ,, ...
Goldfields ..... ,, ...
Telegraph Lines & Stations ..... ,, ...
Lighthouses ..... ,, ...
Stock Routes ..... ,, ...
Heights in feet ..... ,, ... (3800)
Steamer Routes ..... ,, ...

Geology compiled by F.R. Feldtmann.

LEGEND.

CAINOZOIC
κ — Tertiary and Post-Tertiary. *Coastal limestones, sand, alluvium, etc.*

MESOZOIC
cr — Cretaceous.
J — Jurassic and undifferentiated Cretaceous.

PALÆOZOIC
c — Permo-Carboniferous and Carboniferous.
d — Devonian.
or — Ordovician.
cm — Cambrian.

? (Possibly Upper Proterozoic)
n — Nullagine. *(Auriferous conglomerates in places)*

PROTEROZOIC
m — Mosquito Creek, and Stirling Range Beds *(Auriferous reefs in places)*

ARCHÆOZOIC
α — Undifferentiated metamorphic rocks.

IGNEOUS.
G — Granite and gneiss.
P — Porphyries and porphyrites.
B — Basalt
D_1 — Dolerite dykes and sills *(Post-gold "greenstones")*
D — Gabbro, dolerite, epidiorite, serpentine, etc. *(Pre-gold "greenstones")*

C. B. Kidson, del.

By Authority: Fred. Wm. Simpson, Government Printer, Perth.

Longitude 121° East of Greenwich.

TABLE OF CONTENTS.

GEOLOGICAL SKETCH MAP OF WESTERN AUSTRALIA.

Annual Progress Report of the Geological Survey for the Year 1918.

War conditions, as has been the case during the past four years, were reflected in the work carried on by the staff of the Geological Survey during the calendar year 1918.

The demands upon the staff (both in the office and in the field) for information and advice in relation to the varied mineral resources of the State have shown no abatement. Field and laboratory investigations into mineral deposits continue to receive the special attention of the officers of the staff.

The unavoidable absence of myself from the 4th of April, 1918, to the 1st December, 1918, on long service leave, to some extent affected the work of the department, inasmuch as a deal of accumulated personal work had to be left uncompleted.

THE STAFF.

The work of the Survey has, during the year 1918, been carried out by 15 classified officers, but, as a result of Treasury exigencies, it was found necessary to make some reduction in the *personnel*. Mr. R. H. Irwin, senior draughtsman, who joined the Survey in February of 1897, shortly after its inauguration, was retired under the Public Service Regulations; many of the various maps and other matter in illustration of the manifold work of the department bear internal evidence of his skill in the direction of geological cartography. Mr. Jno. T. Jutson, one of the senior Field Geologists who joined the staff when it was considerably increased in the year 1911, also severed his connection with the Survey on the 1st July, 1918, as a result of the financial requirements of the Government. During his term of service this officer, in addition to his principal work on the Goldfields, has devoted considerable attention to physiographic problems, and his paper "An Outline of the Physiographical Geology of Western Australia," Bulletin No. 61, will for many years to come remain a standard work on the specialised subject of which it treats. By Mr. Jutson's retirement the Department loses the services of an officer with specialised knowledge which it will be not easy to replace should financial considerations at any future time permit of departmental expansion in the ranks of the field staff.

FIELD WORK.

Part of the field work of the year was carried out, as has been the case in the past, with the distinct object of investigating not only the character and behaviour of the main geological formations, but more especially the association and distribution of any mineral deposits occurring in them.

There is, perhaps, no State in the Commonwealth that can show a greater diversity in geological resources. In this connection attention may be again drawn to the statement in Report 59, Bulletin 64, page 93, that the valuable ores have a very wide distribution, instead of, with certain notable exceptions, being concentrated into very rich deposits. Whilst this is so, the results obtained by geological exploration, prospecting and mining operations, indicate quite clearly that the mineral industry of the State will not only be progressive, but great. An increase in the gold production of Western Australia can, however, only be brought about by the discovery of new fields or fresh deposits on existing fields, in addition to its being possible to profitably handle ore of a decreasing average grade. The future of gold mining in Western Australia must in a great measure depend upon the exploitation of its low-grade deposits of which there are very many; this, however, is a problem entirely outside the province of the geologist. Given a proper discrimination in the selection of properties, and the exercise of judgment in the expenditure of capital, the State must continue to be a gold producer.

The attached Table shows the distribution of the field work and gives the names of the officers engaged in the different districts during the calendar year:—

Table showing the Distribution of Field Work for the Year 1918.

Goldfield or Land Division.	T. Blatchford.		J. T. Jutson.		H. W. B. Talbot.		E. de C. Clarke.		F. R. Feldtmann.	
	No. of days in the field.	Percentage of working days.	No. of days in the field.	Percentage of working days.	No. of days in the field.	Percentage of working days.	No. of days in the field.	Percentage of working days.	No. of days in the field.	Percentage of working days.
Mt. Margaret and East Murchison	...	...	...	...	...	...	181	49·58	...	...
Darling Range	...	...	...	...	...	...	4	1·09	...	...
Irwin River Coalfield ...	...	...	...	...	...	...	9	2·46	...	...
South-West Division—										
Three Springs and Mt. Kokeby	...	...	...	...	...	...	...	...	26	7·1
Yalgoo Goldfield	...	...	...	...	66	18·08	...	...	...	...
North-West Division ...	...	...	...	...	167	45·75	...	...	...	...
South-West Division—										
Mingenew	6	1·64	...	...	...	...	...	...	...	...
Ravensthorpe	47	12·87	...	...	...	...	...	...	...	...
Moora	6	1·64	...	...	...	...	...	...	...	...
Bunbury	11	3·0	...	...	...	...	...	...	...	...
Geraldton	13	3·56	...	...	...	...	...	...	...	...
Waroona	3	·82	...	...	...	...	...	...	...	...
Yalgoo Goldfield	11	3·00	...	...	...	...	...	...	...	...
Yilgarn Goldfield	5	1·36	...	...	...	...	...	...	...	...
North-East Coolgardie ...	7	1·91	...	...	...	...	...	...	...	...
Totals ...	**109**	**29·80**	**...**	**...**	**233**	**63·83**	**194**	**53·13**	**26**	**7·1**

As has been the case in the past, administrative duties prevented me carrying out any systematic work in the field. Some progress was made with the Mining Handbook containing a mass of information relating to the mineral resources of the State, which has not hitherto been available in a collected form, and will also include a general geological map of the State on the scale of 50 miles to the inch. The Mining Handbook will contain chapters on the following subjects:—

Chapter I.—A Summary of the Geology of Western Australia.
" II.—The Economic Geology and Mineral Resources of Western Australia.
" III.—The Physiography of Western Australia and its relation to Prospecting and Mining.
" IV.—Minerals of Economic Value and their preparation for the market.
" V.—Petrology and its application in Economic Geology, together with an account of the Chief Rock-making Minerals and Rocks.
" VI.—Relation of the Law to Prospecting and Mining in Western Australia.
" VII.—Assistance to Prospecting and Mining Development; and a
" VIII.—Glossary of some Common Terms used in Mining, Field, and Physiographical Geology.

In January a report by myself was made on the Petroleum prospects in the Nullabor Plains, Eucla Division, which will be found at length on a later page 68.

The time of the resident scientific officers has been devoted to work arising out of the field investigations, etc. Under certain limitations they determine and examine mineral and rock specimens in the interests of the public, and, whenever necessary, such are analysed and reported upon. The rocks were, in most cases, examined microscopically, and in some economic associations of similar types found elsewhere were noted, and other matters of importance from the view of applied geology dealt with.

T. Blatchford, Assistant Geologist:

For the first two months of the year the t
this officer was occupied chiefly in routine work at headquarters and preparing for an extended trip to the Southern portion of the State in the vicinity of Hopetoun and the Mount Barren Ranges. Two short excursions were, however, made during this period, one to the Gingin limestone deposits, the other to the Irwin River coal seams, to inspect recent development work there.

From May to the end of November Mr. Blatchford filled the position of Acting Government Geologist, and in this capacity, in addition to the ordinary routine of the office, was able to pay brief visits to Youanmi, East Murchison Goldfield; Kanowna in connection with the alunite discoveries; Moora in the South-West Division; Perenjori on the Wongan Hills Railway line; Tenterden slate quarries; Leschenault Inlet lime deposits; Abrolhos Islands, and Wilga, near Collie.

The total number of days devoted by Mr. Blatchford to field work amounted to 109.

J. T. Jutson, Field Geologist:

Up to the time of his retirement, Mr. Jutson was fully occupied at headquarters writing up the final results of his work in the field at Comet Vale and Goongarrie, on the East Coolgardie Goldfield, which appear in Bulletin 79.

E. de C. Clarke, Field Geologist:

Mr. Clarke resumed work in the office after returning from his annual leave on January 11th.

From 11th January to 7th February he was engaged at head office in indexing, and correcting the proofs of Bulletin No. 75 on the Country between Laverton and the South Australian border, written in conjunction with Mr. H. W. B. Talbot.

On 7th February Mr. Clarke left Perth for Leonora, and, from that time till 7th August, when he returned to Perth, his time was employed in the completion of the geological survey of the Leonora-Duketon area, that is, of parts of the Mt. Margaret and East Murchison Goldfields as defined in the annual report of the Geological Survey of W.A. for the year 1917, p. 11. Before leaving the district, lectures on the geology of the district and its bearing on future prospecting were delivered at Gwalia and Laverton. Five days were also spent in investigating the supposed "deep leads" at Yundamindera.

From the date of his return to Perth until 16th December, when his annual leave began, Mr. Clarke's time was mainly taken up with the examination of material collected in the Mt. Margaret and East Murchison Goldfields, and in the preparation of a topographical and geological map of the country concerned. Concurrently, Mr. R. A. Farquharson was investigating the petrology of a representative suite of specimens from the district, and as a result of his work some alterations in the geological description published in the last annual report were found to be necessary.

The preparation of the report on the Leonora-Duketon country was dropped from time to time in order that preliminary investigations might be made:—

(a) (For the Federal Government) of the possibilities of the Darling Range bauxites as a source of aluminium; and

(b) of the extent and economic possibilities of the Irwin River Coal Field in the light of recent boring operations.

The total number of days spent in the field by Mr. Clarke amounted to 194.

H. W. B. Talbot, Field Geologist:

From the beginning of the year until the 11th of January, Mr. Talbot was absent on recreation leave for 1917.

From 12th January to 3rd February was devoted to correcting and revising typed copy of the manuscript of Bulletin 83, arranging the illustrative material therefor, and preparing the necessary plans with which to illustrate the text. A flying survey with camels of the southern portion of the Yalgoo Goldfield occupied Mr. Talbot's time to the 10th of April. 11th April to 19th May found him at the head office preparing the maps of the work done in Yalgoo Goldfield and making a synoptical report of

Bulletin 83, and a geological map of the area covered thereby on a scale of 10 miles to one inch.

The period between the 20th of May and the 2nd of November was employed on a geological reconnaissance of part of the Ashburton Drainage Basin, and the country southward to Meekatharra.

From the 3rd of November to the end of the year, except when on annual leave (from the 2nd to the 15th December), Mr. Talbot was actively engaged in preparing plans and writing up an account of his field work in the Ashburton.

The total number of days devoted by Mr. Talbot to work in the field amounted to 233.

F. R. Feldtmann, Field Geologist :

The period following his return from annual leave and the completion of the report for the year 1917 was devoted by Mr. Feldtmann to the writing up the results of his work at the mining centre of Quinn's on the Murchison, and a brief report on the occurrence of asbestos at Bulong. The time of this officer up to the end of May was devoted to the preparation of maps and plans on the Warriedar Gold Mining Centre on the Yalgoo Goldfield.

The preparation of the final report, maps and plans on the magnesite deposits of Bulong also occupied a considerable portion of Mr. Feldtmann's time. The compilation of this report which, *inter alia*, included an account of the properties, preparation, and uses of magnesite, necessitated a careful examination of all the available literature on the subject, and involved some considerable labour on his part.

The period between the 22nd of September and the 5th of October was spent in an examination of the clay deposits at Three Springs, whilst from the 18th to the 30th November was devoted to similar investigations into clay deposits at Mt. Kokeby.

In consequence of the reorganisation necessitated by the reductions in the numerical strength of the staff, Mr. Feldtmann was placed in charge of the drafting room, and portions of the second half of the year were devoted to drafting work of various kinds and in supervision.

Mr. Feldtmann spent 26 days in field work.

PRINCIPAL RESULTS OF THE YEAR'S OPERATIONS.

PETROLEUM PROSPECTS IN THE NULLABOR PLAINS—EUCLA DIVISION.

(A. Gibb Maitland.)

General.

Mr. J. H. Mitchell, of Southern Cross, in a letter to the Hon. the Premier, dated the 17th of December, 1917, stated that in his opinion there are great possibilities in the Nullabor Plains of striking a big supply of petroleum at a moderate depth below the limestone formation. Further, that, if deemed of sufficient national importance, he was prepared to give many reasons why petroleum would be found under that big limestone formation, and that, should the Government desire to obtain a full explanation of his views—based on long practical and geological experience—Mr. Mitchell was prepared to set about gathering together all knowledge he possessed relating to the subject.

Physiographical Features.

The Nullabor Plains (Premier Downs) in the Eucla Division forms part (and the largest) of the relatively high plateau generally known as the "Eucla Limestone Plateau," which extends into the adjoining State of South Australia.

The plateau, at its southern extremity at the head of the Great Australian Bight, is from 200 to 400 feet above sea level; it is more or less abruptly truncated by cliffs which, in part, form the coast line and elsewhere occur at varying distances inland. The plateau steadily rises to the north, and where it is traversed by the Great Western Railway its altitude above sea level varies about 450 to 650 feet; from the railway line it gradually passes northwards into the Central Division of the State, where, so far as the meagre evidence at present available goes, the average altitude of the Eucla Limestone Plateau is about 1,000 feet above sea level.

There are no rivers on the plateau, and the rainfall, except on the coast, is under 10 inches per annum; such rain as does fall is absorbed by the rocks, and at times after heavy rains considerable streams may be seen running into the "blow holes" with which the plateau is studded. The only surface water procurable on the limestone plateau occurs in those small rock-holes worn out of the upper crust of the limestone; these hold water only for a comparatively short time after rain and are to be found few and far between.

Over certain portions of the surface of the plateau there are shallow circular depressions (locally termed "dongas") varying in diameter from five to twenty chains, the origin of which is probably due to the caving in of subterranean chambers in the limestone.

A fair idea can be gathered of the form of the basin from the data furnished by the bores put down along the Great Western Railway, from which it may be inferred that the old floor of ancient crystalline and other metamorphic rocks was one of topographical regularity in an east and west direction. The absence of bores, reaching bed-rock, to the south of the railway, however, precludes any adequate conception as to its subterranean contour in this direction.

Geology.

It being generally recognised that "the foundation of successful petroleum enterprise must be laid by the geologist rather than by the engineer" it has, in order to correctly understand the geological structure and constitution of the plateau, been deemed necessary to give a brief *aperçu* of its main stratigraphical features as ascertained by the Geological Survey, together with the results of the deep boring carried out in different portions of the plain, and the published work of other unofficial geologists. It is not at present possible, owing to the comparative paucity of geological observations, to give a comprehensive and detailed description of the entire area known as the Nullabor Plains.

The very extensive cover of practically horizontal superficial deposits almost entirely masks the boundary between the sedimentary series of the plains and the crystalline and allied rocks, so that the precise geological delimitation of the area presents very many difficulties.

The strata of which the Nullabor Plains are built up consists of more or less cavernous limestone (The Eucla Limestone), associated with soft sandstone, clay shales, and occasionally conglomerates. Good opportunities have been afforded of obtaining some knowledge of the strata, their lithological character, thickness, etc., underlying the plateau by means of

the bores put down in connection with the Water Supply of the Great Western Railway. It is now known that these sedimentary rocks have attained a thickness of at least 2,000 feet.

The limestone maintains a fairly uniform lithological character over its whole length, though, as might be expected, it varies very much in thickness.

The following table gives the results of analyses, made in the Survey Laboratory, of five samples of the Eucla Limestones. These were made primarily for the purpose of determining their suitability for burning into lime.

No.	3043	3044	3045	3047	3053
Specific Gravity ...	2·69	...	...	2·57	2·58
Lime, CaO	31·36	53·73	54·52	55·23	49·34
Magnesia, MgO ...	16·40	·68	1·20	·67	1·40
Ferrous oxide, FeO ...	1·48	·56	...	...	1·47
Ferric oxide, Fe_2O_3 ...	1·02	Trace	} ·65	·38	3·41
Alumina, Al_2O_3 ...	2·43	·24			
Silica, SiO_2	2·38	·70	·45	·36	5·49
Carbonic anhydride, CO_2, etc.	44·93	44·09	43·18	43·36	38·89
	100·00	100·00	100·00	100·00	100·00
Analyst ...	Simpson.		Williams.		

No. 3043.—From Lat. 31° 17′, Long. 124° 30′.
No. 3044.—From Lat. 31° 22′, Long. 125° 45′.
No. 3045.—From Lat. 31° 30′, Long. 126° 0′.
No. 3047.—From near Yayoudle Rock-hole.
No. 3053.—From Lat. 31° 0′, Long. 126° 0′.

The records of the following bores show the variation in thickness:—280 miles (from Kalgoorlie) at an altitude of 545 feet above sea level the thickness of the Eucla Limestone is 485 feet; 310 miles at 508 feet above the sea, 535 feet thick; 337 miles 61 chains at 576 feet above sea level, it is 603 feet thick; whilst at 419 miles 72 chains, at 504 feet above sea level its thickness proves to be 689 feet.

In the bore on the coast near the foot of the Hampton Range at Madura, 903 feet of limestone was pierced before penetrating the underlying shales, etc. The shaley beds beneath the limestone become, so far as is disclosed by the bores, much more sandy in their character as the western rim of the basin is approached. The beds all have a prevailing gentle dip towards the Great Australian Bight, and if the base of the limestone as exposed in the above holes may be taken as a fair average, the dip amounts to from four to five degrees to the south.

All the available fossil evidence indicates that the age of the Eucla Limestone is Miocene Tertiary. The cores obtained from the bore put down at 337 miles 61 chains from Kalgoorlie, along the Great Western Railway Line, show that beneath the Eucla Limestone, which is 603 feet thick, the shaley beds are 667 feet in thickness and contain the fossils *Aucella hughendensis* and *MacCoyella corbiensis*, which are characteristic of the Lower Cretaceous Strata of South Australia and Queensland, indicating the occurrence of rocks, the geological equivalents of the Rolling Downs Beds as developed in Eastern Australia.

The whole thickness of the strata underlying the plateau have been pierced by several bore-holes put down in Western Australia as well as some in South Australia; the floor of ancient crystalline rocks having been unequivocally reached in some of them at the depths given below.

The western margin of the limestone plateau has been geologically examined in two localities, viz., (a) along the route of the Great Western Railway, and (b) along the stock route from Newman's Rocks (south latitude 32°) to Balladonia. In the latter locality no actual junction between the sedimentary rocks of the Eucla Plateau and the ancient crystalline rocks can be seen, owing to the surface being covered by a variable thickness of residual and other superficial deposits. Occasionally, however, flaggy limestones can be seen outcropping beneath the light coloured loam, which soil seems the characteristic decomposition product of the Eucla Limestone. So far as can be ascertained the contact between the two discordant series lies somewhere about nine miles west of Wahgoninga Rocks, though no actual junction between the limestone, its associates and the main granite belt is to be seen, but the gradual change from the lighter coloured loam of the calcareous plains to the more or less siliceous sand of the granitic areas in all probability marks the boundary.

It does not appear, however, that the basal beds of the plateau sedimentary series reach the surface; they probably impinge directly on the subterranean slope of the continental foundation of ancient crystalline rocks.

A somewhat similar condition of affairs prevails along the railway line where, just to the east of the 167 mile peg, there is a marked change from light-coloured loam flats to sand plains which in all probability marks the boundary between the rocks of the Archaean crystalline complex and the Eucla Limestone. No rock outcrops are visible for a number of miles both east and west.

The records of the deep bores which have been put down on the plateau disclose the nature of the beds underlying the Eucla Limestone, and the fossil contents therein enable a definite opinion to be formed as to the position of the infra-Eucla Limestone Beds in the geological time scale.

A bore put down on the Railway line at 280 miles from Kalgoorlie at an altitude of 545 feet above sea-level passed through:—

	feet.
Eucla limestone	485
Shales (mudstones)	399
	884

This bore was not carried deep enough to reach the floor of crystalline rocks.

At 310 miles another bore, at about 508 feet above sea-level, reached bed rock at 1,350 feet; it passed through:—

	feet.	in.
Eucla limestone	535	0
Shales and sandstones ..	815	0
Granite (decomposed) ..	21	9
	1,371	9

A band of earthy black mudstone partly carbonaceous, 25 feet thick, was passed through between 535 and 560 feet below the surface.

At 337 miles 61 chains from Kalgoorlie, at 576 feet above sea-level, was carried down to a depth of 1,372 feet, and judging from the record it appears that the strata pierced consisted of:—

	Feet.
Eucla limestone	603
Shales	667
Fine and coarse sand with hard bands (sandstone) and granite boulders (conglomerate)	74
Granite	28
	1,372

At 419 miles 72 chains from Kalgoorlie, at an altitude of 504 feet above sea-level, the strata pierced consisted of:—

	Feet.
Eucla limestone	434
Shales	467
Sandstone (?)	33
Granite	56
	990

Not far from the coast at Madura, at a height of about 110 feet above sea-level, and about 30 chains south of the escarpment of the Hampton Range, a bore was put down to a vertical depth of 2,041 feet. The strata pierced consisted of:—

	Feet.
Eucla limestone	903
Shales, thin bands of dolomitic limestone and glauconite mudstones ..	1,138
	2,041

A second bore at an altitude of 300 feet above the sea-level of that at Madura was put down at a spot 30 miles to the north, and was carried down to a depth of 430 feet in the Eucla Limestone, but did not penetrate the underlying shales and sandy beds.

A similar succession of strata has been met with in certain of the bores put down on the South Australian side of the Border. The section in these bores invariably shows a thickness of sandy beds covered by limestone (the Eucla Limestone) of from 300 to 500 feet in thickness, and the beds have a prevailing dip towards the coast.

The bore nearest to the Western Australian border Albakaroo No. 3, 45 miles east of Eucla, and 300 feet above sea-level, gave the following section:—

	Feet.
Eucla limestone	565
Clay (? shale)	426
Hard rock (undetermined)	82
Granite	11
	1,084

The next bore further to the east, Guinewarra No. 4, 300 feet above sea-level, passed through the following:—

	Feet.
Eucla limestone	570
Sand and limestone	29
Clay (? shale)	509
Conglomerate	12
Hard blue and red rock (?) ..	133
Granite	24
	1,277

Three other bores further to the east, of which records are not at present available, nowhere exceeded 850 feet in depth, and were not carried down sufficiently far to reach the floor of crystalline rocks upon which the sedimentary beds were laid down. The geological information in connection with these has been thrown into a tabular form for convenience of reference:—

Nature of Strata.	Nullabor Plains.		Roberts's Bore.
	No. 2.	No. 5.	
	ft. in.	ft. in.	ft. in.
Red Loam and Travertine Soil	5 3	...	1 0
Eucla Limestone	466 0	330 0	412 6
Clay (? Shale)	266 0	262 6	334 6
Sand and Gravel with Clay beds	81 2	77 0	28 0
Total	818 5	669 6	776 0

The strata exposed in all the lofty cliff sections along the coast appear quite horizontal, and nowhere do they exhibit any signs of disturbance, faulting, or folding.

Very little is known of the geology of the country to the north of the Railway line; this was traversed, however, by the Elder Exploring Expedition in the year 1891-2, the Geologist (the late Mr. Victor Streich) attached to which described and showed upon the geological sketch map accompanying the report a great expanse of Recent, Tertiary, and Mesozoic Rocks extending over seven degrees of latitude between Lake Lefroy and the Townsend Range. The Mesozoic rocks are described by him as consisting in descending order of: clay (indurated); jasper rock; conglomerate; quartzite (desert quartzite), and sandstone; but no estimate is given as to the total thickness of the series. The conglomerates are stated to be only slightly consolidated. These beds are covered with drift sand and other residual deposits which naturally prevent many actual sections being seen. So far as the dip of the Mesozoic beds could be observed, Mr. Streich points out that it nowhere exceeded 15 degrees from the horizontal, and was invariably towards the north-east. The altitude of the Mesozoic area, traversed by Mr. Streich, is stated to vary between 700 to 1,300 feet. The boundary between the Mesozoic rocks and the older Metamorphic series is shown by Mr. Streich as being somewhere between the Ponton River and Queen Victoria Spring, though as elsewhere in the plateau the actual junction is masked by the ubiquitous cover of superficial deposits.

Some further information as to the northern extension of these beds has been obtained by Messrs. Talbot and Clarke in the Geological Expedition during 1916, from Laverton to the South Australian Border, *via* the Warburton Range. This recent work in the vicinity of the Townsend Range, by definitely proving the presence of the basal beds of the series exposed in the bores on the Railway line, is of considerable importance.

In the traverse from Dunge's Hill to the Townsend Range a wide expanse of practically horizontally bedded, slightly compacted current-bedded sandstones and claystones with occasional conglomerates and boulder beds was encountered. The base of the series at Dunge's Hill lies at about 1,570 feet above sea-level, whilst near the Townsend Range its altitude was about 1,900 feet, elevations considerably higher than the country further to the south traversed by Mr. Streich. No fossils were found in these beds, but from such meagre stratigraphical evidence as is at present available their geological age seems to be late Mesozoic, or at least Early Tertiary. The beds are probably the inshore representatives of the strata lying beneath the Eucla Limestone. The results of such geological investigations as have at present been made shows that in East Longitude 127° an extensive sedimentary formation extends northwards for about 400 miles from the coast and covers some thousands of square miles between Israelite Bay and Eucla in Western Australia, and eastwards between the South Australian Border and Point Sinclair, near Fowlers Bay.

Prospects of Finding Petroleum.

Having dealt as fully as possible with the geology of the Nullabor Plains (Premier Downs, or Eucla Plateau) so far as such is at present known, it seems necessary that some reference should be made to the possibility or otherwise of finding crude petroleum

within the area in question. In attempting to give an answer to this question, it may be pointed out that geological inquiry has to be guided to a large extent by a knowledge of the origin of petroleum and other cognate points, such as source of supply, conditions of deposition, general geology of the area, the stratigraphy of the series, and the geological structure of the locality.

Apart however from the very much debated scientific aspect of the organic or inorganic origin (*i.e.*, source of supply) of petroleum, there are certain important points ("indications") in connection with oil occurrences to which attention should be paid before the search for petroleum can be undertaken with any degree of certainty:—

(a) The conditions of deposition necessitate the presence of porous rocks which act as reservoirs covered above and bounded below by more impervious rocks, as well as the occurrence of large quantities of organic material from which oil can be formed. Oil occurs in porous rocks at various depths, and in distribution and behaviour it has certain resemblances to underground water. Sandstones, shales and grits, conglomerates, marls, etc., are the principal containers, though in a few places oil is found in limestone. In Egypt the oil is mostly derived from a cavernous limestone which, however, appears to be merely a reservoir, for the source of oil is attributed by competent scientific opinion to the lower beds of Globigerina Marl, known to be of Miocene Tertiary Age.

(b) The most important evidence in regard to the oil-carrying character of the strata in unexplored areas and formations consists of traces or residues of oil, viz.:—(1) oil residues, *i.e.*, black veinlets of solid hydrocarbons, which undoubtedly indicate the former presence and circulation of oil, though they are not necessary evidence that oil still remains in the rock; and (2) oil seepages, that is, places where liquid oil is seen escaping at the surface.

As a rule oil seepages stain the rocks for some distance around them, and are invariably accompanied by a characteristic odour which it is seldom possible to mistake.

Asphaltum, a true petroleum residual, occurs along the shores of the Great Australian Bight, but never beyond the possible limits of deposition by the sea.

In all the leading oil fields of the world it was the occurrence of seepages which ultimately led to their development; such seepages, however, are not to be regarded as a necessary indication that oil in payable quantities occur.

Oil seepages, while of the utmost importance as "indicators," are not the only thing required, for the structural features of the strata must be suitable, for seepages do not occur in those localities where the rocks are whole and undisturbed.

(c) Oil appears to occur almost entirely in what may be best described as the outer zones of those regions which have been subject to folding, etc., in the oil-bearing districts the strata has been thrown into a series of waves or folds (anticlines) of slight elevation. These folds have everywhere been found to exhibit a general parallelism, and in most oil fields the principal deposits have been found along what have been called "oil-lines" which correspond to the crests of the anticlinal folds. This anticlinal structure favours the accumulation of oil in the summits or on the flanks of the arches or domes.

Summarising the available evidence in regard to the Nullabor Plains, it appears that:—

(1) There is a large area of Tertiary or Late Cretaceous rocks, which contain amongst their members sandstones, etc., of varying degrees of porosity.

(2) The beds dip at a very low angle to the south, about five degrees.

(3) The cliff sections on the coast show that the beds are virtually horizontal and have not been subject to disturbance, nor in any way thrown into folds.

(4) No oil seepages have been noticed anywhere in the plateau.

(5) Asphaltum, a residue of petroleum, occurs amid the *flotsam* and *jetsam* of the coast, but has not been found anywhere inland beyond possible deposition by the sea.

(6) There are no known extensive deposits of organic origin anywhere associated with the beds of the Nullabor Plains which are capable of producing oil.

Conclusions and Recommendations.

While the need for oil is great, and it being desirable to take every reasonable step to search for it, it cannot be said that if there is a lack of it on the Australian Mainland such will retard the progress of the Commonwealth, having regard to the vast area of undeveloped coalfields in the Eastern portion of the Continent, for coal must, for many generations to come, always remain the chief source of power.

In a memorandum dealing with certain proposals submitted to the Minister for Mines relating to the occurrence of petroleum in the neighbourhood of the mouth of the Blackwood River on the South Coast, it was pointed out that:—

An obligation rests upon the State to see that every possible inducement to search for oil (or indeed any other mineral deposits) along legitimate and healthy lines is held out, and to this end I would strongly urge upon the Government the advisability of offering a substantial bonus for the discovery of oil . . . I would therefore . . . . recommend the Government to offer a substantial bonus of, say, from £6,000 to £8,000 for the first 50,000 gallons of crude petroleum obtained from an oil pool within the confines of Western Australia.

Should the Government deem it necessary, Mr. Mitchell could be asked to supply his reasons for believing that petroleum occurs in the Nullabor Plains, and when his evidence has been received such might be referred to this office for the purpose of scientific and critical investigation.

It is also desirable that an early opportunity should be taken of geologically mapping the Western margin of the Eucla Limestone Series between Mount

Fleming and the Ponton River where it crosses the Great Western Railway Line.

THE GRAPHITE DEPOSITS AT MUNGLINUP, EUCLA DIVISION.

(T. BLATCHFORD.)

Since my first visit in 1917 to this locality a considerable amount of development work has been done on the Black Diamond Graphite Mine.

This work consists in the deepening of Stewart's shaft, cross-cutting east from the 80ft. level, sinking a new shaft, No. E, 100 feet east of Stewart's shaft to a depth of 50 feet, cross-cutting west from the bottom of this shaft, and sinking a new shaft (Snake shaft) to a depth of some 50 feet, east of Herbert's shaft. Unfortunately, the workings in Stewart's shaft were under water and therefore inaccessible. Shaft E was sampled from top to bottom also the west crosscut over its total length of 40 feet. The results of the sampling are appended and the positions from which the samples were drawn are shown on the accompanying plan. As not only were the graphite contents of the samples low, but also the carbon in the concentrates. Experiments were carried out on the concentrates with the object of ascertaining whether by regrinding and reconcentrating the first concentrates a product containing a higher percentage of carbon could not be obtained.

The results of these experiments is also appended, and there seems little doubt that the low percentage of carbon in the concentrates is due chiefly to the presence of mica, often interfoliated, and magnesite, which cannot be extracted by grinding and floating in a Standard Morgans Concentrating Plant. It is unlikely therefore that a marketable product can be obtained from the ore in these workings. There is one point, however, to be considered before a definite conclusion can be formed, which is, that both the contaminating minerals are secondary and the products of the encasing rock. Magnesite in particular, is a surface weathering product and will probably disappear in depth. Mica, though more prevalent in the upper zones, is also as a secondary mineral found at considerable depth, but not so abundantly deep down as near the surface. The present development, therefore, cannot be taken as final evidence, and deeper workings are necessary before it can be definitely stated that the proposition is hopeless or even unpayable.

The second shaft sunk, known as the Snake shaft, not being accessible was not sampled.*

Whilst in Kalgoorlie with the Ministerial party in April, I visited the Great Boulder mine to see a modification of the Morgans Graphite Concentrating Plant, such as is to be found in the Geological Survey office. The modification was a simple one and consisted of altering the flow of water over the first plate, and it is claimed that this alteration gives very much higher concentrating results. It was my intention to have experimented with the Survey concentrating plant when occasion offered.

MANGANESE DEPOSITS OF THE HAMERSLEY RIVER.

(T. BLATCHFORD.)

During a delay at Ravensthorpe, arising from wet weather and horse troubles, the opportunity was taken to inspect a manganese deposit on Mount Desmond. Reference has already been made to the occurrence of manganese lodes on Mount Desmond by the State Mining Engineer*, but not to the particular one visited which lies about one and a half miles from the Elverton Gold Mine on a bearing of 287 degrees. A little work has been done on this particular lode in the way of two shafts sunk to shallow depths, which show that the lode dips to the north-east at a low angle and strikes parallel to the Range, i.e., in a north-west south-east direction. The writer is of the same opinion as the State Mining Engineer, that the manganese occurs as a true lode following probably the bedding planes of the encasing quartzites. Unfortunately, it was not possible to sample the sections showing in the shafts, but a rough grab sample of the two dumps yielded the following results:—

MnO_2	28.98
MnO	1.98
Fe_2O_3	40.85
H_2O	11.66
Insoluble	10.62
Undetermined ..	5.91
	100.00

This sample is low in manganese and probably is representative only of the seconds, for a bulk sample is reported to have been shipped some years previously from the ore raised from these workings. Unfortunately, authentic returns of the sample are not procurable.

The copper and manganese lodes of the Hamersley River described in the State Mining Engineer's report* need little comment, as practically with one exception no development has taken place since his inspection. On page 21 Mr. Montgomery refers to a large manganese lode on the western side of the Gorge. A shaft has since been sunk on this lode to a depth of some 30 feet in a low grade manganese ore, a sample of which, taken across a distance of six feet of the portion exposed in the shaft, yielded the following result:—

MnO_2	42.19	
MnO	7.64	Mn, 32.58%
Fe_2O_3	21.31	
H_2O	6.44	
Insoluble	21.42	
Undetermined ..	1.30	

THE COUNTRY BETWEEN HOPETOUN AND THE FITZGERALD RIVER.

(T. BLATCHFORD.)

The country extending westward from Hopetoun presents several extremely interesting features when viewed from the geological standpoint. Until the Lee Steere River is crossed the country is chiefly granite or shallow surface beds and patches of heavy sand. After passing the West River, however, there is a sudden change both in the contour and geological formation.

To the south of the road which follows the main telegraph line one sees a long chain of ragged peaks following the coast line and rising at times to a vertical height of 1,600ft. above the sea level. This range will be referred to as the Barren Range Series. Immediately to the north of this range is a more or less even plain or slightly elevated tableland which

* For a full description of the geology and previous samplings *vide* Bulletin 75. Perth: By Authority, 1917.

* Development of the Phillips River Copper lodes. By A. Montgomery, M.A., F.G.S. Perth: By Authority, 1914.

rises gradually to the north. The rivers have cut their way through the rocks forming this plain, thus forming rather good sections, even exposing at times the underlying rocks. In the eastern end the plain is some eight miles in width but widens out to a maximum of about 20 miles in the vicinity of the Gardner River.

Underlying the surface rocks of the plain above referred to is another series of rocks, distinct both from the upper beds and the Barren Range Series.

The Surface Beds.—Unfortunately, the writer was unable to investigate any of the country west of the Fitzgerald River, and even up to this point, owing to a combination of circumstances, only a cursory examination was possible.

According to a map plotted by the late H. P. Woodward, the beds forming the tableland extend in a general east and west direction from No Tree Hill, north of Eyre's Range, to the Pallinup River, but evidence collected since tends to show that there is a strong probability that a further extension will be traceable through Ongerup, Gnowangerup, and Tambellup as far west as Kojonup.

About a mile north of the point where the Hamersley River crosses the Telegraph Line a breakaway was examined which was teeming with marine remains, chiefly of sponges of probable Tertiary age. The breakaway, which is an irregular cliff some 40-50ft. in height, extends in a general east and west direction towards Mt. Drummond. It was not examined for fossils except in the spot mentioned. The rocks exposed in the cliffs consist of much weathered soft mudstones or incipient shales, capped with a thin harder coating impregnated with iron oxides. As far as could be ascertained these beds are horizontal and lie unconformably on another sedimentary formation of a much greater age.

Underlying Rocks of Undetermined Age.—The underlying rocks may be seen in a section cut by the Hamersley River some 1½ miles south of the Telegraph Line. They consist, where exposed in the section, of slates, schists and decomposed basic rocks, probably intrusive dykes or sills. The latter, however, are so weathered as not to be easy of identification. Associated with them are bands and nodules of almost pure magnesite, which testify to their basic origin. The strike of these beds is approximately east and west with a dip at an angle of from 25°-30° to the south. In the Gorge cut by the Eastern Creek, a tributary of the Hamersley on the east side, another imperfect section, of probably the same formation, shows also the presence of crushed quartz conglomerates and quartz mica schists. Unfortunately, no fossils were found in the few exposures of these rocks, and as the greater portion is covered over by the Tertiary Beds, their age and composition is still undetermined. A careful traverse of the rivers, however, which have dissected the Tertiary Beds to no little extent, would probably produce more and useful evidence than at present available.

As far as could be ascertained, the Mount Barren Series abuts against these rocks, the junction being marked probably by the Eastern Creek Gorge.

The Mount Barren Range.

Lithologically, the Mount Barren formation differs entirely from the first two. It is not quite clear how these ranges have been formed, but the evidence pointed to the possibility of their being highly folded quartzites with basic sills. The accompanying sketch section* has been drawn on this assumption. At the surface one finds a repetition of quartzites and quartz dolerites standing at a high angle, probably from 75° to 85°, and striking approximately east and west. The prevailing dip is to the south.

The same characteristics pertain to the Eyre Range, photos. of which clearly show the surface configuration and successive bands of quartzites. [Photos. 1696 to 1700.]

Viewed from a distance these ranges stand out in bold relief, the highest peaks in which are the East, Middle, and West Mount Barrens.

The surface of the range is extremely rugged, and though bare of the larger vegetation, is covered with a variety of stunted scrub, which makes walking extremely difficult.

Whether these ranges represent an uplift similar to the Stirling Ranges, and whether they are portion of the same series was not decided, though the possibilities of both being the case is highly probable.

The possible relationship of the Mount Barren Series to other formations is interesting. Mr. Montgomery is inclined to look upon the Ravensthorpe quartzites as a northward continuation, and when the lithological characteristics are compared there certainly is no obstacle in that direction. Furthermore, it is remarkable how the series turns round to the northward in the Eyre Range and heads straight for Ravensthorpe.

There is a marked difference lithologically between the Mount Barren and Stirling Range Series. Still, it is quite possible that they are the same group of rocks only subjected to different conditions since being laid down. The mere fact of volcanic action being almost absent in the Stirling Ranges would naturally suggest a limited amount of metamorphism in the rocks, whereas in the Mount Barrens the visible volcanics are almost in excess of the quartzites. A very much more detailed examination of the Barrens would be necessary, however, before any definite conclusion could be arrived at on this point.

The occurrence of Tertiary fossils in the Hamersley River basin is important and proves definitely the eastward extension of the Tertiary Beds.

That Tertiary Beds extend in such a persistent line from Eyre's Range to Kojonup and probably still further west, would indicate that a valley must have existed north of the Stirling Range, and therefore excites the curiosity as to what the underlying beds are, and whether the valley is connected with the Collie River Basin. This is an important piece of geological work for future investigation.

ON THE DISCOVERY OF COAL 5½ MILES NORTH-EAST OF WILGA SIDING ON THE DONNYBROOK-KATANNING RAILWAY.

(T. Blatchford.)

In accordance with verbal instructions received from the Government Geologist to investigate a recent discovery of coal in the vicinity of Wilga, and more particularly to locate the prospector's workings and if possible draw samples from any coal seams, the following report was submitted:—

Locality of Workings and General Description.

The workings, with one exception, are situated on the north-west corner of Location 2009, lying at a

* Not reproduced.

direct distance of 5½ miles north-east of Wilga Siding.

They consist of eight shafts in all, seven of which have fallen in almost to the surface and are now unsafe and inaccessible. To what depths these shafts were sunk I was unable to ascertain. The last shaft sunk, number 8, has reached a vertical depth of approximately 100 feet. It is close timbered almost to the bottom, which made it impossible to examine the strata pierced. From hearsay evidence, it appears that two coal seams have been cut in this shaft, one five feet thick at 55 feet, and one four feet thick at 85 feet.

On account of the timber the top seam was not visible. Fortunately, some of the timber opposite the bottom seam was open and part of a section of the lower seam was visible, though the strike, dip and thickness were not procurable.

The coal seam here is, however, more than three feet thick, and a sample was drawn over that dimension, the result of which is appended with Mr. Simpson's remarks.

Taking these results and the general appearance of the coal for a guide, there is every reason to believe that the lower seam is of the same age and quality of several of the Collie River seams; but it is not equal to the higher grade Collie coal. It is certainly not a coking coal.

Extent.

The probable extent of the new coal area cannot be even roughly determined without a more thorough and lengthy examination, for the country in the vicinity is mostly void of outcrops, and for the most part covered with ironstone, gravels, etc.

The presence of a belt of granite striking approximately east and west a short distance north of the workings indicate that, though it is probably a geological replica of the Collie Area, it is not directly connected with that field.

However, there is a certain amount of importance in the discovery, inasmuch as it has increased the probable area in which coal of the Collie River type is likely to be discovered, and, therefore, in that direction, increases the State reserves.

The following Analyses of the coal were made in the Geological Survey Laboratory:—

G.S.L. No.	3677E.	3631E.
	%	%
Moisture	18.57	18.43
Volatile Hydrocarbons ..	33.88	29.20
Fixed Carbon	42.60	47.13
Ash	4.95	5.24
	100.00	100.00
Calorific Value ..	8,717 B.T.U.	9,253 B.T.U.

[3677E.] This is a thin bedded coal of the Hydrous Bituminous class, similar in all respects to that found in the lower parts of the Collie basin. It loses moisture rapidly on exposure to the air, increasing thereby in calorific value.

Analyst, E. S. Simpson.

Locality: O'Grady's Shaft, 670 paces E., 11 N., of Traverse Peg 54, N.E. of Wilga Railway Station.

[3631E.] This is a thin bedded coal of the Hydrous Bituminous class similar in all respects to that found in the lower parts of the Collie basin. It loses moisture rapidly on exposure to the air, increasing thereby in calorific value but losing cohesion to a large extent. It does not coke when retorted.

Analyst, D. G. Murray.

Locality: Five miles S.W. of Wilga.

THE SLATE QUARRIES NEAR TENTERDEN, SOUTH-WEST DIVISION.

(T. Blatchford.)

Location.

The slate deposits in question occur at the western end of the Stirling Range, and lies at a distance of about six miles due east from Tenterden, a station on the Perth-Albany railway line.

The quarries themselves lie on the eastern side of Slate Quarry Creek.

Geology.

The slate beds in which the quarries occur consist apparently of portion of the Stirling Range series and form portion of the western end of the latter. Outcrops in the immediate vicinity of the quarries are rare, and the high ground rising to the east is void of rock exposures for at least a mile.

On the western side of Slate Quarry Creek detached pieces of quartzite are strewn on the surface, but at no great distance farther on granite outcrops mark the discontinuance of the sedimentary beds. The strike of the beds where seen in the quarries varies from North 30°-40° East, with a dip of about 20° East 30°-40° South.

The strata are free from folding, and though there is evidence of faulting, the movements are so slight as to be negligible.

Several sets of joint planes probably occur, but only two were prominent.

In the main or middle quarry, one of these joint planes, which is very much in evidence, has a strike of East 12° South with a dip of South 12° West at an angle of 48°. This set is represented on the enclosed photo by the letter (B), the second set, which strikes North 15° West and is vertical, is seen forming the vertical face in the same photo.

In the south quarry minor joint planes strike east and west with a dip of 60° South, and North 30° East with a dip of 67° East 30° South. These latter bearings and dips must be taken tentatively, as in this locality the rock has been fractured seemingly by local strains only.

Cleavage planes are not well developed. One imperfect set (C), however, does exist and is approximately parallel with the joint plane (B). The rock, however, only fractures along these planes very imperfectly.

In appraising the value of a quarry for the production of slate, the following are the essential features to be considered:—

Composition:

The composition of the rock is highly suitable for the formation of slates. The texture is uniform, and the beds are free from coarse-grained strata.

Cleavage:

Although a considerable amount of rather perfect flagstone has been broken, such has been quarried by using the planes of sedimentation, not the planes of cleavage. These sedimentary planes are very pronounced and perfect, and at times will allow the splitting of the rock into slabs of fair dimensions to a thickness of from 1 inch up to 3 inches.

This is, however, not producing slate, but flags. Along the planes of c eavage the rock will certainly split into thinner plates, but these are so irregular as to be more or less useless, and would certainly entail an enormous amount of dressing. Furthermore, in no instance were they obtained with a thickness less than twice that required for commercial slate. The whole point lies in this: that the slaty cleavage has not been developed sufficiently to be utilised as planes along which the rock can be split. Furthermore, the angle between the planes of sedimentation and cleavage is about 34°, so that, even if the rock did split readily along the cleavage plane, the sedimentation planes being so pronounced and c.ose together would cause a fracturing whenever they were crossed. This alone is sufficient to condemn the proposition in its present state.

Possibility of improvement at depth:

The improvement required to render the deposit suitable for slate quarrying would be an obliteration of the planes of sedimentation, and, more particularly, the perfection of the p anes of cleavage.

As the planes of cleavage stand at an angle of some 48° with the horizontal they have not been caused, except to a limited extent, by the pressure due to overlying strata, but by side pressure due to earth movement. There is no reason, therefore, to suggest that the desired changes would be effected at any reasonab'e depth below the present surface.

Conclusions.

Though mineralogically the Slate in these quarries is of good quality, there are so many essential physical and structural properties wanting that, as a source for obtaining high-grade slates, the deposit is worthless.

That a material improvement in quality might occur at a reasonab'e depth is considered highly improbable.

APPENDIX.

Notes on Purple Slate from near Tenterden.

(R. A. Farquharson.)

The points of value in any slate for the usual uses are:—

(a) The presence of a well-defined plane of splitting called cleavage, developed by metamorphism through the re-arrangement and flattening of the original grains and the development of micaceous minerals.

(b) The absence of pyrite, particularly from the bedding planes.

(c) The absence of any appreciable amount of lime carbonate; and

(d) If the slate is to be used for switchboards, the absence of magnetite grains.

The slate is purplish-red in colour, fairly hard, and finely laminated or in many thin leaves which are not very distinct.

In section, the rock is very fine grained and consists of quartz, in places a yellowish chlorite, minute scales of muscovite, doubtful grains of felspar, all obscured by fine granular hæmatite scattered over the slides as a dust and causing the colour of the stone. There is an absence of pyrite, of lime carbonate, and of magnetite. A few minute needles of rutile are also present.

Mineralogically the slate is of good quality, being free from injurious constituents, but its value is discounted by its physical characteristics. While the bedding is comparatively thin and uniform, the cleavage on which, mainly, depends its power of splitting into the requisite thin slabs, is very imperfect. When the rock is split along the cleavage, the fracture, after running parallel to it for a short distance, frequently travels along the bedding and then back along the cleavage. It is, therefore, impossible to get slabs of the required degree of thinness as well as of perfection from the cleavage. The slate, however, will split rather readily along the bedding, but in some parts it will, under these circumstances, afford slabs about ¼" to ⅜" thick, and about 4" to 6" by 3" to 4" in surface dimensions. Even these slabs, however, cannot be obtained regularly, for most commonly the slab breaks in half, or, when obtained, has an irregular surface which requires chipping. Labour costs, therefore, in producing good uniform slates are certain to be heavy. Moreover, the slabs, even when of maximum area, are so thick that their weight is very considerable. In short, the area of possible is small owing to the imperfection of the cleavage and to the systems of jointing in the deposit, and the thickness of the slabs will commonly be considerable owing to their coming from the bedding and not from the cleavage.

With regard to the question of a possible improvement in the quality of the slate as the depth from the surface increases, owing to the weight of the superincumbent material causing a more perfect cleavage, this is, to say the least, improbable. It must be recognised that though the slates are at the surface now, it is most probable that at the time the original shales were formed into slates, the latter were even then at a considerable depth from the surface, and that they are now at the surface owing to the original overlying material having been worn away. In any case, the weight of superincumbent material would not be sufficient for the change except at depths so considerable that the working of the slates would be unprofitable; and if good cleavage has not been developed in the material near the surface, it is most unlikely that it will appear at depth. I am, therefore, of opinion that a depth of even two hundred feet will not show a slate in which the cleavage is better developed.

THE COASTAL LIMESTONE DEPOSITS BETWEEN LESCHENAULT INLET AND LAKE PRESTON—SOUTH-WEST DIVISION.

(T. Blatchford.)

The boundaries of the Limestone Deposit, extending northward from Bunbury, is shown on the accompanying map,* compiled by the late Mr. H. P. Woodward, Assistant Geologist.

In brief, the deposit consists of one main belt running parallel with the coast, and with minor parallel belts lying to the East. A narrow strip of calcareous sand-dunes separate the limestone ridges from the ocean.

To obtain a true conception of the nature of these limestone deposits it is necessary to describe their history.

At the present day the coastal calcareous sand-dunes may be seen in process of formation, the wind building up ridges or filling in valleys with sand and fragments of shell from the seashore. This is the first stage. Subsequent action on the particles of lime by percolation of water containing carbonic acid forms soluble carbonate of lime which, when rising to the surface by capillary action, deposits the lime as a carbonate. In this way a surface enrichment occurs, forming a "capping" of limestone rich in lime: the "cap" stone of the Cottesloe, Fremantle and other quarries. As a natural corollary when existing capstones are pierced, the deposit becomes poorer in lime and richer in sand the deeper the sink.

* Not reproduced.

The capstone varies in thickness, and probably will not average more than four feet, after which there is a rapid falling away in lime values. On the above assumption, the present sampling was confined to the capstone only, to ascertain whether this richer portion of the deposit was up to required specifications.

The sampling, as a preliminary, was confined to that portion of the deposit within easy access to a waterway suitable for cheap transport; an area being covered sufficiently great to produce a very considerable tonnage if the grade was high enough. In breaking the sample, the harder flint-like rock was separated from the softer varieties, the local experience being that the latter burnt to a very good building lime, whereas the former was stated to be unsuitable for that purpose. The results of the analyses prove that these ideas are not correct, the mistake probably arising from the fact that the softer stone "burns" with greater ease than the more compact, harder varieties.

The sampling, so far as it has been carried out, proves that the capstone averages from 72 to 91 per cent. Calcium carbonate. From casual samples taken from the capstones in the same belt further north, these results are up to expectations, and it seems highly probable that large quantities of capstone will be found averaging over 90 per cent. $CaCO_3$.

Unfortunately, in one instance only could a sample be taken from below the surface, viz., from the well on Moyle's Farm. The grade here was low, being only 75 per cent. $CaCO_3$, but as this well was sunk in a hollow and for water supply, it cannot be considered too seriously.

To ascertain the depth of the capstone, with a view to obtaining some idea of tonnage, trial shafts are at present being sunk. Samples will be drawn from these workings in the near future for analysis, and more samples taken from the capstone of the northern extension of the belt.

Two other probable places, where higher grade limestone is likely to be obtained in the vicinity of Bunbury, are Lakes Clifton and Preston. To sample these lakes at present is practically impossible, owing to the winter rains. These possible sources of lime should, however, be carefully investigated before the question of lime supply is finally settled.

While investigating the phosphatic deposits of the Abrohlos Islands samples were drawn from the West Wallaby Island for analysis. As the limestone forming this island is composed chiefly of coral, it is highly probable that the percentage of lime will be high. Analyses for the lime contents are in hand, the results of which will be forwarded as soon as available.

ASBESTOS.

25 Miles East of Moora—South-West Division.

(T. BLATCHFORD.)

Geology of Area.—The prevailing rock is gneissic granite, the planes of foliation of which strike approximately north by west south by east. Several narrow dykes, probably dolerites, traverse the granite parallel to the lines of foliation. These dykes appear to be of comparatively recent age.

Striking in the same direction and passing diagonally across the block, at a distance of about 40 chains, north by east of the corner opposite Nowrong Well, is a narrow belt of very weathered rock in which the asbestos is found.

This belt has been opened up by a series of shafts, extending over a length of probably 80 chains or more. All these shafts were flooded and sealed from inspection. On all the dumps asbestos could be found in considerable quantities. With one exception, however, the asbestos thus exposed was not of the right kind or quality for market purposes and, though apparently plentiful, at present practically worthless, unless the mineral is useful for some manufacture of which we are unaware.

In a shaft at the north end of the line some samples were found which meet all the requirements for commercial use, and if found in quantity and carefully classed, would yield a highly marketable and profitable product. Unfortunately, as already stated, the extent of this variety was not ascertainable.

Conclusions.—I have no hesitation in stating that the mineral asbestos on this area, and that one variety, is of a high commercial value and worthy of fuller prospecting. There is, however, no means at present of ascertaining the extent of the deposit, as the workings on the date of inspection were flooded and the surface so covered with detritus, that there were no outcrops visible. However, as prospecting has not been extended north of the spot where the high-grade variety has been found, there must be a reasonable possibility of such land containing the mineral in payable quantities.

APPENDIX.

ON A SAMPLE OF ASBESTOS FROM THE MOORA DISTRICT.

(E. S. SIMPSON.)

I have examined the sample of asbestos recently collected by you 25 miles east of Moora, and find that it is of the variety known as Anthophyllite. This differs distinctly in composition from Chrysotile, which forms the greater part of the world's commercial asbestos, as the follwing figures show:—

	Anthophyllite Asbestos.	Chrysotile Asbestos.
	%	%
Silica	57.8	43.0
Magnesia	30.9	38.9
Iron oxide	8.2	2.3
Water	3.1	14.8
	100.0	100.0

The industrial utility and value of chrysotile asbestos depends, however, not upon its composition, but upon the ease with which it can be separated from fibres; the fineness, softness, and flexibility of those fibres; and above all the high tensile strength of the fibres. Any asbestos which satisfies those requirements, no matter what its ultimate composition, will be equally valuable. As a rule, anthophyllite asbestos is very deficient in tensile strength; this sample, however, from Moora is quite different to the ordinary run. The Moora asbestos is in soft flexible fibres, easily separated from one another, from ¼ to 2 inches in length, and possessed of high tensile strength. Such a material should find a ready market, and would be particularly useful for making fibro-cement wall sheets, etc.

As other inferior asbestos also occurs in this district, miners must be on their guard against allowing any such to find its way into their parcels of high grade asbestos. Simple testing by hand of the quality of the separated fibres will enable them readily to distinguish between the valuable and inferior grades.

ON THE MOLYBDENITE OCCURRENCES AT MOUNT MULGINE (WARRIEDAR), YALGOO GOLDFIELD.

(T. BLATCHFORD.)

LOCATION.

The molybdenite occurrences in question occur in the Warriedar district, on Mount Mulgine. Mount Mulgine is situated some six to seven miles south-south-west of Warriedar townsite, and 62 miles south by east from Yalgoo.

GEOLOGY.

A complete geological survey of the molybdenite leases at Mount Mulgine has already been completed by the Government Geologist, and an interim report will be found in the Annual Report of the Geological Survey for the year 1916, pp. 9-10, q.v. The geology of the district will, therefore, only be touched on in the present short report, in so far as it is directly connected with the subject at issue.

Mount Mulgine is a rough, isolated granite hill running to a height of some 300 feet above the surrounding country.

It consists entirely of a foliated quartz microcline felspar granite, containing minor quantities of muscovite mica. Throughout the mass are numerous pegmatitic quartz reefs and pegmatites. The foliation planes strike north-west south-east, and have an almost vertical dip.

The texture of the granite varies from a coarse to an extremely fine grain, the composition being fairly uniform. Small and recent dolerite dykes cross the mass in a north-east south-west direction.

MOLYBDENITE OCCURENCES.

Though molybdenite may be frequently seen in the outcrops, they are difficult to trace for any great distance owing to the roughness and broken nature of the surface rock.

The occurrences are best seen in several cuts made in the side of the mount. The main points to be observed are the following:—

Almost invariably where the mineral occurs in any quantity quartz veins are present. These veins contain traces of felspar and are, without doubt, of pegmatitic origin. They do not contain any appreciable amount of the mineral themselves, but form a core around which the molybdenite occurs in small specks, arranged in a rough parallelism with the foliation planes of the encasing granite. The quantity of molybdenite varies inversely with its distance from this core. Hence there are no defined lodes with walls, but rather impregnated zones which gradually become lower in grade the greater the distance from the core. Closely associated with the molybdenite are the minerals pyrite, scheelite, fluorite, manganese, and occasionally, I am led to believe, wolfram has been found.

The molybdenite rarely occurs in bunches, and when it does is only found along cleavages or cracks cutting horizontally across the the main zones. Hand-picking as a method of concentrating is, therefore, of little value.

Examined in microscopic sections, the molybdenite is found usually in close association with the mica of the granite, either interfoliated with or coating the mica crystals, and at times effecting a complete replacement, all of which are strong evidence that the molybdenite formed after the mica crystallised in the granite.

The association of the molybdenite with pegmatitic veins points to the probability that it was derived from the residual "mother liquor" of the granite at the end of the process of crystallisation of the main rock mass. The associated pegmatitic minerals also lend weight to this conclusion. The molybdenite deposits may, therefore, be considered as impregnated zones. This being the case, there is every reason to anticipate that the mineralisation will extend to a considerable depth.

VALUE OF THE ORE BODIES.

As time would not permit of a thorough sampling of the deposits, typical samples only were broken, to enable a rough estimate to be formed of the value of the ore broken. These samples gave a value of between 3 per cent. and 6 per cent. of molybdenite. Though the results were higher than might have been expected, they correspond with at least one parcel which has been shipped, as well as a sample referred to in the Government Geologist's report, and should represent the value of a considerable quantity of ore, though there is a far greater quantity well below this grade. However, taking 1 per cent. recoverable at £5 per unit as payable, there certainly is quite a lot of ore visible of this, or better grade, with fair mining prospects of much greater quantities.

Unfortunately, hand-picking to the extent of obtaining a shipping ore is not practicable, and it will be without doubt necessary to treat the ore on the spot. I am thoroughly convinced that a treatment plant is warranted, but with regard to recommending that the Government erect such a plant at the present juncture, there are other points to be considered, for the following important reasons:

The leases containing the principal workings and lodes exposed are possessed by or under option to one company. These options do not expire until the end of February next. Another important point to be considered is the price in the near future now war operations have practically ceased. On this point I can offer no advice, but simply state that since the Americans have started molybdenite mining the price per ton has fallen from £1,100 per ton to under £500. At the latter price 1 per cent. (recoverable) ore is worth £5, still a good price, but in the event of the price falling to one-half of this, 2 per cent. ore would be required at Mount Mulgine to show a fair profit unless every facility was available for very cheap treatment. This variable realisation price of the concentrate makes the proposition a much harder

matter to offer an opinion on, for though I still think there is a fair quantity of 2 per cent. ore, the possible higher grade required would reduce the quantity at present exposed considerably.

[My informant for the above was Mr. Bertram, Manager for A. E. Morgans. The leases referred to are M.Ls. 39, 48, and 49.]

CONCLUSIONS.

1. The ore bodies occur in impregnated zones likely to be persistent in depth.

2. There are at least eight of these zones already exposed in shallow workings which may reasonably be expected to produce fair tonnage of payable ore (payable ore based on 1 per cent. recoverable at market price of £5 per unit).

3. If the market price were to fall to 50s. per unit, there would still be a fair quantity of payable ore exposed, *i.e.*, ore over 2 per cent. recoverable, but in this case it would be advisable to encourage further development before incurring expenditure in plant erection.

4. The amount of payable ore (over 1 per cent.) exposed outside the company's options and holdings is at present inadequate to warrant the erection of a State treatment plant.

APPENDIX I.

EXAMINATION OF SPECIMENS FROM THE WARRIEDAR MOLYBDENITE LEASE.

(R. A. FARQUHARSON.)

1. The dense black fine-grained rock:—

This rock is a fine-textured *chloritised basalt*, with phenocrysts of augite and plagioclase—the latter in part zoisitised and chloritised—in a ground-mass of minute felspar laths, green chlorite scales and granular black iron ore, and possibly some partly decomposed granules of augite.

2. The fine-grained greyish-white *aplitic rock*:—

This is a very fine-grained microcline granite, or, since the scales of muscovite are very few in number, a microcline aplite.

3. The coarser yellowish-green *granite* with disseminated molybdenite:—

This rock is again a microcline-granite which differs from No. 2 only in being coarser in texture and in containing more muscovite in larger flakes. Disseminated, too, through the rock and occurring chiefly in association with small aggregates of muscovite flakes are splashes and leaves of molybdenite. In part at least, the mica has been produced at the expense of the felspar, since mica scales occur in the felspar plates.

Facts worthy of note in connection with the presence of the molybdenite are:

(a) The almost invariable association—in the section examined—of the ore with the scales.

(b) The occurrence, in places, of small films of the ore interposed partly along the cleavage planes of the mica, or as a cap to the flakes. While most of the larger splashes occur irregularly in the flaky aggregates, a few enclose individual mica flakes.

(c) The occurrence of molybdenite films along the surface of separation of some of the quartz plates, and, apparently, also along cracks in the quartz.

(d) Where pyrite crystals occur in the section, they are generally—though not invariably—associated closely with the molybdenite.

The interposition of the molybdenite along the cleavage traces of the mica and along the planes of separation of the quartz plates, and the occurrence of the ore moulding and enclosing mica flakes, tend to show that the molybdenite was formed after the crystallisation of the mica had taken place.

The interposition of the molybdenite along the cleavage cracks of the mica will probably also mean that the result of mechanical extraction of the ore will not be so high as expected.

APPENDIX II.

DETERMINATION AND ASSAY OF SAMPLES FROM MULGINE (WARRIEDAR), YALGOO GOLDFIELD.

(E. S. SIMPSON.)

3370E—Black mineral with molybdenite in granite, M.L. 49, Mulgine	Psilomelane (hydrated oxide of manganese). The mineral is in very thin films coating cleavages of the felspars and minute cracks between the other minerals of the rock.	
3367E—1½ tons hand-picked ore, M.L. 39	Molybdenum disulphide, MoS_2	16.40%
3368E—West M.L.50	Molybdenum disulphide, MoS_2	6.93%
3369E—Massive Granite, G. Wakeham's P.A., one mile E. of M.L. 49	Molybdenum disulphide, MoS_2	3.09%

THE SALT DEPOSITS, 11 MILES NORTH-EAST FROM PERENJORI, IN THE BOWGADA ESTATE, SOUTH-WEST DIVISION.

(T. BLATCHFORD.)

An inspection of the above deposits has been made with the following results:—

Location.—The "breakaways" in which the salt is found lie on the eastern side of a chain of lakes, not named on the Lands plans, but locally known as the Bowgada Lakes.

General Description.—In these "breakaways," which do not assume any great height and are not extensive, narrow caves have been formed by the weathering of the softer portions of the cliff faces. These caves are not of any great size, the largest being some 12 feet deep by 15-20 feet long and 2 to 4 feet high. The level of the floors vary, which tends to prove that they have been formed by wind action rather than water erosion.

On the floors of the caves a thin deposit of fine friable rock detritus is invariably found, the thickness varying from 6 to 12 inches. The salt occurs in very irregular masses under this detrital deposit, and rests on the rock floors well back in the caves. The thickness does not exceed 12 inches.

The rock forming most of the roofs of these caves is highly weathered and ironstained and closely resembles a laterite. In two instances, however, both roof and floor were undoubtedly a very much weathered, coarse-grained foliated granite. The rock forming the bed of the lake is of a similar structure, and certainly a granite.

Origin of the Salt in the Caves.—On the protected face of one of the cliffs minute specks of salt were discernable, which proves that the rock in which the caves occur contains salt. The origin of such salt may be due to two causes:—

1. The surface level may have been much higher than at present, and what now represents the top of the breakaway was formerly the floor of a salt lake.
2. Or the salt may have been derived in part from the decomposition of the minerals of the rock itself.

In either or both cases, circulating underground water would readily dissolve such salt, but precipitate it again under atmospheric conditions, to be re-dissolved by the first rain unless protected from the latter.

The only places in which there could possibly be an accumulation of salt would, therefore, be on the lee side of a cliff, or in a cave.

It is noticeable that in the present case little if any salt was found near the mouth of the caves, most of the deposits being invariably well to the back and covered up. Though there is evidence of descending waters taking part in the process of formation, for stalactitic action is noticeable, the major portions of the deposits have nevertheless been derived from the evaporation of solutions ascending by capillarly action.

Conclusions.—From an economic point of view, it is considered that these salt deposits are worthless, the salt occurring only in small quantities in caves of no great extent.

Furthermore, the composition of the salt is such that in its present state it is useless for domestic purposes, and is in insufficient quantity to warrant refining. The following is the result of a partial analysis:—

NaCl	.. .. ..	67 per cent.
Magnesium salts	.. ..	19 „
Moisture	.. .. ..	14 „

The origin of the deposits is due to percolating saline solutions evaporating under atmospheric influence, and depositing the salt on the cave floors, the protection from rain preventing a re-dissolution.

GEOLOGICAL NOTES ON THE LEONORA-DUKETON DISTRICT, MOUNT MARGARET GOLDFIELD.

(E. DE C. CLARKE.)

As remarked in the report for the year 1917, a summary such as this, unaccompanied by maps, etc., would be unintelligible if it dealt with the subject in any but the most general fashion. It will be sufficient here to record the most important alteration in the conception conveyed in my 1917 annual report on the Leonora-Duketon geology.

As a result of petrological work and of more extended field observations, it now appears that the metamorphosed sediments found on Mt. Leonora form only a small patch, the "country for eight or 10 miles to the East" being made up almost entirely of foliated quartz porphyries and not of the same rocks as those of Mt. Leonora. Similar foliated quartz porphyries are fairly common in the eastern part of the district, particularly near Duketon. These rocks probably represent flows and dykes more or less contemporaneous with the "greenstones," they are therefore older than the great masses of intrusive granite which occupy more than half the area included in the Leonora-Duketon district.

The rocks near Pyke Hill, which in last year's report are regarded as probably contemporaneous with those of Mt. Leonora, prove to be entirely different from them, being highly decomposed granite contemporaneous with the main intrusive granite of the district.

The economic possibilities of the Leonora-Duketon district may be very briefly mentioned under two heads:—(a) the future of localities which have been prospected and abandoned, and (b) the possibilities of unprospected areas.

(a) *Abandoned "Shows."*—During the early days of gold mining in this part of the State the development of many shows was abandoned before the locality had had a fair trial, because sensational finds farther afield semed to offer better chances. Again, many mines were worked on mistaken or extravagant lines and were condemned and abandoned because they were not payable under those conditions. Reliable records which give the details of yield, character of ore body and nature of workings of such abandoned shows seem now almost unprocurable, yet it is highly probable that careful investigation of the geology and mining history of these centres would result in the discovery of ore bodies, payable if worked by the best modern methods. The first step towards exploiting such deposits would be a detailed examination of the geology of such centres as Darlot (Woodarra), Mt. Margaret, and Mt. Malcolm, coupled with the careful compilation of all trustworthy records. After this work had been completed it would be possible to determine whether further prospecting by drilling or other methods was justified.

(b) *Unprospected Areas.*—Probably there is but little of the country under review that has not been traversed by one or more parties in search of gold, but, until recently, hardly any attention has been paid to minerals other than gold. Even, however, the gold seeker does not appear to have given the country between Erlistoun and Duketon townsite, nor that between Euro and the Ida H. G.M., nor that between Wilson's Patch, the Victory Group and the Lawlers-Darlôt road, the attention it warrants.

Regarding search for minerals other than gold, large areas of granite lie within the limits of the country under discussion. These granite areas are probably non-auriferous, but should be examined for such minerals as tin, tantalite and molybdenite, although, so far as my observations go, the granite is not of a type likely to yield such minerals, except perhaps in the neighbourhood of Mt. Waite (near Erlistoun Creek) and near Ashwin's homestead (near Mt. Blackburn).

The patches of serpentine, which occur in a number of places, deserve careful searching, more especially for occurrences of copper, magnesite and asbestos. My own brief examination of these patches did not disclose anything of value, but it cannot be too clearly stated that in such broad geological mapping as that now reported on, the geologist's work is that of an explorer who searches for likely regions and hands on the information to properly equipped prospectors.

THE BAUXITES OF THE DARLING RANGE—SOUTH-WEST DIVISION.

(E. DE C. CLARKE.)

The presence of hydrated oxides of aluminium, for which the general term "bauxite" is used, in the laterites of Darling Range, has been known for many years,* and maps showing the distribution of the laterites in portions of the Range have been prepared by various officers of the Geological Survey and are filed in the office of the Geological Survey.

Bauxite is now the principal ore of aluminium, a metal of ever-growing importance, and laterite in sufficient quantity and under suitable conditions, which contains 35 per cent. or more of aluminium soluble in acids, is regarded at present as a payable ore of aluminium.

Before the future of this State as an aluminium producer can be appraised, it will be necessary to undertake the collection and determination of the soluble alumina-content of a large number of laterite samples. A beginning at this work in Darling Range was made in September, following on a request by the Aeroplane Construction Committee of the Commonwealth Department of Defence for bulk samples of bauxitic laterite.

Partial analyses of samples collected as a result of this request are as follows:—

* E. S. Simpson, G.S.W.A., Bull. No. 6, p. 38: No. 67, pp. 118-123.

General Locality.	Between Kalamunnda and and Walliston Stations.											Between Wooroloo-Northam Road and Sanatorium.				
Geological Survey Field No.	B_1.	B_2.	B_3.	B_4.	B_5.	B_6.	C_1.	C_2.	C_3.	C_4.	C_5.	C_6.	C_7.	C_8.	C_9.	—
Geological Survey Lab. No.	2974E.	2975E.	2976E.	2977E.	2978E.	2979E.	3354E.	3355E	3356E	3357E	3358E	3359E	3422E	3423E	3424E	3179E
Soluble in Acids—																
Al_2O_3	35·44	32·20	39·77	31·23	25·43	36·59	34·59	30·75	44·92	38·81	24·34	35·24	49·82	39·76	39·04	44·93
Fe_2O_3	25·26	36·44	23·66	35·59	44·09	27·13	29·70	21·00	22·14	29·46	33·84	33·81	10·22	16·44	22·56	21·67
TiO_2	·90	·94	1·01	·96	1·80	1·56	1·41	1·27	3·14	4·45	5·30	3·05	·96	1·52	2·44	·94
Insoluble in Acids—																
SiO_2	17·22	14·82	11·48	12·50	11·38	12·02	12·26	29·56	4·16	3·70	20·38	6·72	11·30	18·34	12·84	10·12
Al_2O_3, etc.	1·70		1·54											1·00		
Ignition Loss—																
Combined water, H_2O+	19·34	[15·60]	22·78	20·00	[17·30]	29·26	22·04	16·73	25·40	23·23	14·98	21·54	27·15	22·80	22·26	22·58
Hygroscopic Water, H_2O-								·85	·73	·88	1·47		·65		·74	
Total	99·86	100·00	100·24	100·28	100·00	100·26	100·00	100·16	100·49	100·53	100·31	100·36	100·10	99·86	99·88	100·24
Analyst	E. S. Simpson.	E. S. Simpson.	E. S. Simpson.	E. S. Simpson.	E. S. Simpson.	E. S. Simpson.	H. Bowley.	D. G. Murray.	D. G. Murray.	D. G. Murray.	D. G. Murray.	H. Bowley.	D. G. Murray.	E. S. Simpson.	D. G. Murray.	E. S. Simpson.

NOTES—B_1, B_2, B_4, B_5 from laterite on ground 50ft. or more below level of B_3, B_6, C_3, and C4.
B_6 from laterite lying against a dolerite dyke.
C_2 Soft clayey gravel from gravel pit about 20 chains east of Kalamunnda Railway Station.
C_5 Soft clayey gravel from gravel pit near Guppy's Siding.
C_1 Bulk sample (93lb.) Guppy's Siding.
C_6 Bulk sample (53lb.) Walliston Siding.
C_8 Bulk sample (50lb.) Wooroloo-Northam Road near Keaginine Well.
C_9 Laterite along road south of C_8.
C_7 Laterite from gravel pit 10 chains south of Wooroloo Sanatorium, and probably more than 100ft. above level of C_8 and C_9.
3179E Small sample collected by Mr. B. S. Welsh in same locailty as, and prior to, C_8.

With the exception of the bulk samples which were, after partial analysis, forwarded to the Aeroplane Construction Committee for further investigation, these samples were taken with the object of ascertaining, if possible, the conditions which govern the occurrence of commercially valuable bauxitic laterites. To arrive at any degree of finality in such an investigation much more sampling is necessary, but it may be of some assistance to future investigations to describe briefly the appearance and mode of occurrence of the Darling Range laterites and to show how far the mode of occurrence and general appearance of a laterite may be taken as indications of its value as an ore of aluminium.

The laterites of Darling Range are superficial deposits covering the tops of apparently all the hills of the Range and found for some distance down their flanks, but not, so far as I have observed, in the valleys. They are to be seen almost everywhere on the higher ground outcropping amongst the fairly thick undergrowth.

The laterite is a moderately tough rock bearing a superficial resemblance to ironstained conglomerate. Examination of freshly broken surfaces, however, shows that the "pebbles" are nearly all nodules of limonite or other brown iron hydrate having a concentric structure. A few of the pebbles are possibly rounded fragments of a decomposed, ironstained, quartzose rock, but microscopic work to settle this point has not been undertaken. The nodules are embedded in a fine-grained matrix varying in colour from dark red to light yellow and containing numerous quartz grains. The general colour of a freshly broken piece of laterite depends, therefore, on the relative abundance of the reddish brown pebbles and on the colour of the matrix.

Sections in gravel pits and road cuttings show that the fairly compact deposit described above rarely exceeds three feet in thickness and does not form an unbroken covering, being, in some places, absent altogether. Underlying it in some places, and in some places altogether replacing it, is a layer of unconsolidated clayey gravel, the "pebbles" of which are, in the main, limonite nodules like those of the compacted laterite. In some places, however, the hardened "cuirass" rests directly, Mr. Simpson tells me, on the kaolinised country rock. The gravel layer if present is generally at least six feet thick; beneath it, or if it is absent, directly beneath the "cuirass," a considerable thickness of highly weathered rock must, Mr. Simpson informs me, be passed through before the unweathered constituent rocks, the vast majority of which are granitic, are reached.

An account of the theories advanced concerning the origin of laterites is unnecessary here. According to Simpson they are formed at the surface by deposit. from solution in water containing carbonic acid, of hydrates of aluminium and iron.*

Anyone sampling the laterites will be impressed by their great variability both in appearance and in alumina-content. For example, it is not difficult to obtain individual pieces of laterite containing more than 45 per cent. of soluble alumina, but the impartially gathered bulk samples so far examined do not rise above 39 per cent. A question of immediate practical importance therfore is:—Is there any means by which, without chemical analysis, a laterite rich in bauxite can be recognised?

(a) *Appearance of hand specimens.*—The specimens yielding the highest percentage of acid-soluble alumina are generally made up of nodules about the size of peas, scattered through a light yellow matrix. The amount of matrix should be at least equal to that of nodules. The freer the matrix is from quartz grains and from pores the better. Laterite that is much "ironstained," that is the matrix of which is coloured by reddish brown limonite rather than by yellow xanthosiderite, is usually of poor grade.

(b) *Height above sea-level.*—Laterites on the highest ground are, so far as we know at present, richer in soluble alumina than those at lower levels. Thus samples B_1, B_2, B_4, and B_5 are taken close to, but on ground lower by 50 feet or more than, B_3, B_6, C_3, and C_4; C_7 shows the same relationship to C_8 and C_9.

(c) The uncompacted gravel which in many places underlies the laterite, is distinctly lower in soluble alumina—compare C_5 with C_3, C_4 and C_6, which come from the same neighbourhood.

(d) The character of the underlying rock might be expected to influence the composition of the laterite. At present hardly anything is known regarding the variability in composition of Darling Range granites, so that a large amount of work on these rocks—work which would be hampered by the paucity of outcrops in laterite-bearing localities—would be necessary before anything helpful from this point of view could be deduced. It may be noted that B_6 lying against, and probably over, a dolerite dyke is not markedly different in composition from the other samples which come from laterite probably overlying granite.

(e) *Simple test for soluble alumina-content.*—Mr. Simpson has pointed out that "loss on ignition," that is, the amount of combined and hygroscopic water, may be expected to rise with the soluble alumina-content, since Gibbsite, the soluble aluminium hydrate, which probably forms the bulk of "bauxite," contains much more water than any other constituent of the laterite, namely, 34 per cent. A study of the laterite analyses set out above and also of many others made in the Geological Survey Laboratory indicates that if an air-dried Darling Range laterite shows, on ignition, a loss of 25 per cent. or more it will yield in the neighbourhood of 40 per cent. acid-soluble alumina, while if its ignition loss be less than 20 per cent. its value as an aluminium ore is in grave doubt. If the ignition loss lies between 20 and 25 per cent., its soluble alumina will usually be over 35 per cent. and never much less.

It appears from statement (a) above that, after a short experience, any workman could distinguish at sight between low and fairly high grade bauxitic laterites, so that the ore supplied for metallurgical treatment could be maintained at a fairly satisfactory grade by rough hand-picking at the quarry. If this be granted, then it is clear that amounts of payable bauxitic laterite ranging into hundreds of thousands of tons are easily accessible from the railways which traverse Darling Range.

These notes must end with the remark that it will be necessary to enlarge our knowledge of the later-

* E. S. Simpson.—"Laterite in Western Australia," Geol. Mag., N.S., Decade V., Vol. IX., pp. 399–406, Sept. 1912. A discussion of the nomenclature, minerals, conditions of formation, etc., of laterites by Dr. L. L. Fermor, entitled "The Work of Prof. Lacroix on the Laterites of French Guinea," will be found in the Geological Magazine, January-March, 1915.

ites of the State by much work both in the field and in the laboratory before more definite opinions can be offered regarding their commercial possibilities as ores of aluminuim.

IRWIN RIVER COAL FIELD.—SOUTH-WEST DIVISION.

(E. DE C. CLARKE.)

In order that the information obtained from bores put down during the year in the South Branch of the Irwin River might be correlated with what was already known regarding the coal prospects of this region and some idea gained as to whether further expenditure in exploring the neighbourhood was justifiable, I was instructed in October to visit the country between the Irwin and Lockier Rivers and report on the coal prospects there. The following is a summary of the results obtained:—

The coal seams so far discovered in the two branches of Irwin River all lie in a belt of shales and sands about 150ft. thick. Further boring would, however, probably show that the thickness of rocks in which coal may be expected to occur much exceeds 150ft.

The coal series is overlain by sandstones and underlain by rocks containing marine fossils.

The proved portion of the coal series strikes north and south and dips east at about 10deg. It does not extend to the east more than about three miles, where a broad belt of granitic country comes in. The question of the extension of the coal series in a westerly direction was not examined, but is dealt with in Bulletin No. 38.

The same series is found about 18 miles to the south-south-east, in Woolagar Creek, where a coal seam more than a foot in thickness occurs. The coal series is probably continuous between Woolagar Creek and Irwin River, but is covered by overlying sandstones, and continuity can only be proved by boring, etc.

Since the granite boundary is, according to Campbell (Bulletin 38), making west going north, it is unlikely that there will be any notable extension of the coal measures north of the Irwin River.

Data obtained by the latest boring and shaft-sinking are few, apply to a very small portion of the coal-bearing country as defined above, and are not sufficient to justify a pronouncement on the possibilities of the coal series as a whole nor even of that part of it which occurs in the two branches of Irwin River. This latest boring enterprise shows merely that, in the small patch thus exposed, there are five coal seams, all inconstant in thickness and in some places pinching out altogether and making again at greater depth at the same geological horizon. The greatest thickness of coal in any one season is about three feet.

Further boring with a core drill in the Upper South Irwin River, and boring also to test the southern extension are necessary to prove the possibilities of the Irwin River Coalfield. Boring should not, however, be undertaken until the country has been carefully mapped in considerable detail. A geological and topographical survey, though it should not settle the question of the presence or absence of coal seams in this part of the country, would, at the least, materially assist in the selection of bore sites and so save time and money.

MOLYBDENITE NEAR LEONORA, NORTH COOLGARDIE GOLDFIELD.

(E. DE C. CLARKE.)

A molybdenite prospect, sometimes known as "Thomas' Show," lies about 17 miles a little to the east of north of Leonora. The distance by existing tracks either through Mertondale or *via* Dodger's Well is over 20 miles.

The "show" is on one of the many granite knolls which form a belt of rough country to the south of "West Terrace"—a conspicuous line of granite breakaways—and is 2½ miles E.N.E. of No. 9 Well (wrongly shown on Lands Dept. Litho. 43/300).

The country is red orthoclase-microcline granite, in which are bands of more acid composition, pegmatitic in character. These bands in places become so acid that they are practically quartz veins and it is one of these pegmatitic quartz veins, striking east and west and dipping south at about 45° which carries the molybdenite. The vein at the surface is not more than a few inches wide, and through it are scattered flakes of molybdenite up to half an inch in diameter. Pieces of molybdenite-bearing quartz can be found for about five chains along an east and west line, so the vein is probably fairly continuous for this distance. I have been informed that samples from the vein were found to contain 5 per cent. of molybdenite, but do not know who is responsible for this estimate.

One pot hole about five feet deep is practically all the mining so far done on this prospect. One of the difficulties of mining here will be the exceeding hardness and toughness of the granite.

Although molybdenite deposits are often lenticular in character, and although there is no direct evidence as to the behaviour of this one underground—the work so far done being quite inadequate as a test of the ground—I do not think it likely to enlarge at depth, first because the quartz veins in the same kind of country at the "Linger and Die" are small and squibby in character, secondly, because so far as I know no large quartz veins outcrop in this region (and if the veins in this class of country tend as a general rule to bulge in places, surely one would come on some planed down by denudation to where the bulging parts are). If (as is quite likely) other molybdenite veins are discovered in this region, they also will probably be quite small. Moreover, the hardness of the country is a serious bar to extensive prospecting.

NOTES ON THE GEOLOGY AND MINERAL RESOURCES OF PARTS OF THE NORTH-WEST, CENTRAL, AND EASTERN DIVISIONS.

(H. W. B. TALBOT.)

I.—INTRODUCTION.

The following notes must in no sense be regarded as a full and detailed description of the geology of the 95,000 square miles of country examined which lies between Long. 119° and 123°E., and Lat. 22° and 27°S. They are merely a brief description of the salient geological features of the region.

Much of the country is covered by superficial deposits (soil, sand, and laterites), but these were not mapped and will not be shown on the maps attached to Bulletin 83, which will contain a full report on the region, as their delineation on a small scale map

would only tend to obscure our conception of the actual geological structure of the region. Moreover, much more detailed work than the writer was able to do would be required before the boundaries between the different types of superficial deposits could be drawn with any degree of accuracy.

Perhaps in no other area of equal size in the world are there such immense tracts of sedimentary rocks destitute of fossils. It can, therefore, be easily understood that the geologist working in the "back-blocks" of Western Australia labours under a distinct disadvantage when attempting to correlate or to differentiate between outcrops separated by many miles of soil-covered or sandy plain. In this region, owing to the absence of fossils and the wide areas over which no rock outcrops are seen, the observer has to rely solely on lithological resemblances and structural arrangement when correlating isolated outcrops with others previously seen.

The mapping of the large area covered by these notes has disclosed the fact that between latitude 22°and latitude 26°, approximately, the general strike of all strata, and the trend of the axes of folds is almost at right angles to the orientation of these structural lines in the regions to the north and south.

North of latitude 22deg. and south of latitude 26deg., the strike of the schists in the older greenstone belts, the lines of foliation in the granite areas, and the strike of the strata and the trend of the axes of the folds in the sedimentary rocks, have a northerly and southerly direction; but in this middle zone the strike is usually a little to the south of east and north of west. This easterly and westerly strike persists as far as the South Australian border, as was seen by Mr. E. de C. Clarke and the writer during the course of their expedition to the Warburton Range in 1916[1].

In no instance has the point at which the change in direction of the strike been observed in Pre-Nullagine strata. The Nullagine series covers most of the country north of latitude 26deg., and it is only where denudation has removed this formation that the older rocks underlying it are exposed.

The structural arrangement of the older rocks was established in the Pre-Nullagine times, but the Nullagine series has also been folded in some localities considerably, but in others very slightly—and the direction of the strike coincides, approximately, with that of the strata which this formation unconformably overlies; so it is evident that there have been two great series of earth movements operating in both cases in the same direction. In addition to these, there has been local folding in some of the areas where the doleritic dykes and sills have invaded the Nullagine Series. As a general rule, the strata of this series have been tilted into broad and regular folds, although there are areas where the strata are almost, if not quite, horizontal. In some localities (*e.g.*, the eastern portion of the Hamersley-Ophthalmia Plateau and Lofty Range), where sills and dykes are largely developed, the folds are more abrupt and irregular than usual, although the direction of the strike of the strata conforms to the general rule. It is reasonable to suppose that these local folds were caused by stresses operating immediately preceding and during the injection of the doleritic intrusions.

[1] Geol. Surv. Bull. No. 75. Perth: By Authority, 1917.

It is a remarkable fact that no auriferous discoveries of any importance have been made in the region where the structural lines trend east and west. That gold occurs in small quantities is evident from small abandoned workings in widely separated localities, but so far nothing has been found rich enough to justify the idea that payable gold deposits exist in the area.

Excepting Illgarere, Kumerina and Bulla Downs, where prospectors are raising copper ore, the above remarks apply also to the base metals, as outside of these centres nothing large enough or rich enough to pay working expenses has, up to the present, been discovered.

II.—Older Greenstones.

These may perhaps be regarded as the most important rocks of the area, and it is in them that most of the auriferous reefs and lodes are found; and they also furnish the most promising field for future prospecting for gold.

In all, eight belts of Older Greenstones come within the area examined and, with the exception of the Barlows and Mt. Eureka Belts, which extend south beyond the limits of the area examined, and the Cobina Belt, which continues farther west than was visited, the boundaries of the belts have been delineated with some degree of accuracy.

The Older Greenstones of the area under discussion resemble similar formations occurring in the goldfields of the State, and which have been described in many Bulletins of the Geological Survey. They consist of a series of a more or less metamorphosed basic igneous rocks, comprising (a) quartz amphibolites, serpentines, epidiorites, and hornblendites; (b) amphibolised and zoisitic fine-grained dolerites; (c) jaspers. In the field, the rocks of subdivision (b) often resemble the dolerites of the dykes and sills, which have invaded the sedimentary series, but the dolerites of the dykes and sills are invariably wholly massive, whereas a passage from a massive to a schistose facies may often be traced in the amphibolised and zoisitised dolerites of the greenstone areas. Moreover, according to Mr. Farquharson, the amount of alteration that has taken place in the minerals of the latter rock is greater than in any of the dolerites of the dykes and sills. The amphibolised and zoisitised dolerites somewhat resemble the lavas which form such an important part of the Nullagine Series in the north-west of the area, and they may represent intrusions into the older rocks of subdivision (a) at the time that the Nullagine lavas were intruded. They occasionally carry quartz reefs, usually in the form of short lenses, which are apparently quite barren.

Little can be said regarding the relations of the quartz amphibolites, serpentines, hornblendites, and epidiorites of sub-division (a). Careful and detailed field work would be required before this could be done.

Serpentine was seen only in one locality—near Coobina Soak, on Skeleton Creek. The outcrop formed an isolated ridge trending east and west, and was devoid of quartz reefs. Hornblendites, too, are rare, so that the most important of the various rocks which comprise the Older Greenstone Series are the quartz-amphibolites and epidiorites. These rocks are in places massive, in places schistose.

Quartz reefs may be absent or they may be present in large numbers, and it is in these reefs that gold is sometimes found, but although reefs may be numerous, it by no means follows that all of them are auriferous. The gold-bearing reefs are few and far between, and the great majority of them are barren or the gold content is so low that it does not pay to work them.

III.—Granite.

South of latitude 26° 30′ granite occupies the bulk of the country, although in it there are many belts and islands of greenstone. North of latitude 26deg. the greater part of the region is covered with strata of the Nullagine Series, but in most places where denudation has removed these beds, granite is exposed.

Some of the smaller granite belts in the northern areas consist of a mass of low, broken, and rocky hills; but in the larger belts, more especially south of latitude 26deg., outcrops are few and far between, and in most places the monotony of sandy plains is relieved only by occasional "breakaways," isolated rocky hills, or bare granite rocks, although where the granite is traversed by quartz reefs outcrops are sometimes seen on the flats.

The granite is in places sheared and foliated, but in other localities is quite massive, but examination under the microscope of the specimens collected shows that the rock is of uniform type throughout the area, and that even the massive varieties show signs of dynamic strain.

Granite was not seen intruding the Mosquito Creek Series, nor any of the younger formations, but it is clearly of later age than the Older Greenstones, as wherever the latter rock is contiguous to the granite dykes, veins, and tongues of acid rock, emanating from the granite, have invaded the greenstones.

IV.—Mosquito Creek Series.

In Bulletin No. 40 of the Geological Survey of Western Australia, the Government Geologist, Mr. A. Gibb Maitland, has described a series of metamorphosed sedimentary rocks, which he named the Mosquito Creek Series.

In the area covered by this report, which lies to the south of that portion of Pilbara described by Mr. Maitland, rocks resembling the Mosquito Creek Series in lithological character and geological structure occur in widely separated localities. The largest of these belts of sedimentary rocks extends from Yoweereena Hill east-south-eastwards to Lee Steere Range, a distance of about 180 miles, and it has a width of about 30 miles. The rocks of this area consist principally of phyllitic slates which, in many places, are traversed by numerous quartz reefs. The quartz, however, seems to be of a particularly "unkindly" character, and no gold has so far been obtained from any of the reefs.

In the country drained by the head waters of the Murchison and the South Branch of the Gascoyne there is another large area, the western limits of which was not ascertained by the writer, occupied by phyllitic slates, quartzites and conglomerates. At the southern extremity of the belt at "The Hard to Find," a little gold was obtained from a small leader which traversed a band of conglomerate conformably with the bedding planes, and the writer was informed by prospectors that some alluvial gold had also been won from this locality; but beyond this none of the area visited appears to have yielded minerals of any kind.

V.—Nullagine Formation.

This is the most extensive and interesting formation represented in the area covered by these notes. It occupies the bulk of the country north of latitude 26°, and it is only where denudation has exposed the underlying rocks or where it is overlain by a younger formation that there is a break in its continuity.

Two series of totally different rocks comprise the Nullagine Formation; A. Sedimentary Rocks, and B Lava Flows.

A.—*Sedimentary Rocks.*

These form by far the greater part of that portion of the Nullagine Series described in these notes, and it is only in the north-western portion of the country that the volcanic rocks are seen.

The sedimentary rocks consist of conglomerates, grits, sandstones, quartzites, shales, and limestones. Where conglomerates are seen they usually occur at the base of the series, but they do not always form the basal beds as, in some localities, sandstones were seen resting directly upon older rocks; and in the north-western portion of the area the lavas rest upon an eroded granite surface and are overlain by the sedimentary strata.

In the desert areas (*i.e.*, east of the Rabbit-proof Fence) sandstone is the predominant rock, although in a few localities (*e.g.*, in the vicinity of Lake Carnegie and at the head of West Creek) limestones and shales are common. Sandstones are also largely developed west of the Rabbit-proof Fence, but in some districts (*e.g.*, in parts of the Ashburton drainage area) shales are more common than sandstones. In the western portion of the area thin bands of limestones are seen associated with the shales in some localities, but the limestones nowhere exceed fifteen feet in thicknes and are usually much thinner; and in many places where there are thick beds of shale, limestone is entirely absent. Quartzites are seen only as a capping and are sandstones that have been indurated by the deposition of secondary silica.

In the Hamersley-Ophthalmia Plateau the sedimentary rocks, as seen in outcrops and in gorges, have been altered to banded jaspers, which in hand specimens bear a striking resemblance to those jasperoid rocks which are so common in the greenstone areas of the Eastern Goldfields. In the plateau there is a gradual transition from the steeply inclined and sometimes contorted jaspers of the eastern part to the horizontally bedded and altered sedimentary rocks of the north-western part. The ferruginous and banded character of the rock appears to be only a surface phenomenon, as wherever land slides exposed a fresh surface the newly exposed rock contained little or no iron, and the banded structure was not nearly so marked. In all probability boring or sinking would show that within one or two hundred feet of the surface the jasperoid rocks give place to unaltered sandstones, shales, or limestones.

In the southern parts of the area the Nullagine Series have been, as a rule, but little affected by earth movements, although small local folds are occasionally seen. The strata are generally horizontal or in-

clined at angles of less than 10°. But north of latitude 25° 30′ the series has been tilted into broad folds, the axes of which as far north as 22° trend eastwards and westwards. In the northern part of the region under discussion the sedimentary rocks of the Nullagine Series have been invaded by numerous doleritic dykes, bosses, sills, and laccoliths. Of these intrusions the sills are the most common, and in some gorges and cliff faces as many as five sills are seen intercolated with the sedimentary strata which at the contact above and below the sill are more or less indurated for a few inches along the margin.

B.—*Lavas.*

In the north-western portion of the area there are many exposures of basic rock which, from their vesicular character and from the fact that they are often seen resting upon an eroded granite surface, are undoubtedly lava flows. They are best studied in the Northern Plateau, which presents a steep escarpment to the north, and which is trenched by many deep gorges, which the north-flowing creeks have cut back into the plateau. In one of these gorges, near the western edge of the area mapped, an excellent section is exposed. In the plateau above the head of the gorge there are numerous flat-topped hills, which are residuals of the sedimentary series, which still cover the southern portion of the plateau.

In the lower parts of the gorges irregularities in the granite surface extend up the cliffs for distances varying up to 100 feet, and in the bed of the gorges the traveller sees irregular-shaped areas of granite, which represent portions that have been denuded by the corrasion of the streams in the gorges. The lavas have a distinctly bedded appearance, and apparently represent several different flows. They are remarkably uniform in composition, but some are coarser than others, and whereas some beds are vesicular others are compact. In a gorge near the western edge of the area mapped the lavas have a thickness of about 400 feet, but near the top of the cliff there is a band of limestone 40 feet in thickness. Near Nymerina Spring, fifty miles east of the gorge just referred to, the lavas attain a thickness of about 500 feet. There, too, they have a bedded structure, as, in fact, they have wherever they are seen in section.

In portions of the Oakover drainage area the lavas have been more dissected than in the western portion of the area, and here they form broken and rugged hills, and their bedded structure is not so apparent.

From the fact that in many places the lavas rest upon an extremely eroded granite surface and near the Coongan River upon the Older Greenstones, it is obvious that some of the flows are of sub-aerial origin, but the presence of interbedded sedimentary strata indicates that after the solidification of the lower lava beds the area was submerged beneath the sea, and the subsequent lava beds may, therefore, be of submarine origin. More detailed work is necessary before the latter point can be definitely settled, but what little evidence is available is in favour of this view. In the gorge where the band of limestone mentioned above occurs portion of the overlying lava has been removed by denudation, and the upper surface of the limestone band is exposed. It is remarkably smooth and level, and there is no sign of its having been exposed to atmospheric erosion, although it is, of course, possible that elevation of the land followed the period of sedimentation represented by the limestone so quickly that the lavas covered the sedimentary stratum before it was affected by the agencies of erosion.

Work done by Mr. A. Gibb Maitland and Mr. H. P. Woodward in Pilbara and West Pilbara have shown that the lavas extend westward to Roebourne, a distance of over 150 miles from the most westerly point touched by the writer. Lavas having such a wide distribution and consisting as they do of a succession of flows must have been extruded from many different points. In most countries where lavas are largely developed it is thought that they have found their way to the surface through fissures. Well known examples are the lavas of Iceland and the Deccan Traps of India. The only evidence that can be adduced in favour of fissure eruptions is the great thickness, wide distribution of the lavas, and the comparative rarity of agglomerates and tuffs. There is direct evidence, however, that the lavas were in part extruded from vents. During his traverses the writer saw three volcanic necks; and two other vents were observed outside the area by Mr. A. Gibb Maitland during the course of his work in the North-West Division of the State. It is, of course, possible that volcanic vents are numerous. The traverses made by the writer were usually ten miles or more apart, and the finding of a volcanic neck was, therefore, a mere accident. Two of those seen were so reduced by erosion that they were hardly noticeable at a distance of a hundred yards. Detailed work would probably result in the discovery of many more vents; and no doubt more evidence for or against the view that they were extruded from fissures would be obtained.

C.—*Age of the Nullagine Series.*

Although as careful a search was made for fossils as the exigencies of the work permitted, none was found, so that no definite evidence can be adduced as to the age of the formation. The writer is, however, of opinion that there is sufficient indirect evidence to warrant the correlation of the formation with the Ordivician of South Australia.

Space will not here allow a discussion of the evidence obtained for assigning the Nullagine Series to the Ordovician, but that evidence was fully stated in a paper by Mr. de C. Clarke and the writer on "The Geological Results of an Expedition to the South Australian Border and some comparisons between Central and Western Australian geology suggested thereby," which appeared in Vol. VIII. of the Journal and Proceedings of the Royal Society of Western Australia for 1917.

VI.—Paterson Range Series.

Paterson Range, which is situated at the north-east corner of the area mapped, is formed of horizontally bedded or slightly inclined sandstones which rest unconformably upon strata of the Nullagine series. The unconformable junction was seen at the head of Rooney Creek and again near Christmas Pool.

There can be little doubt that the Paterson Range Series is part of the formation that the writer traced from near No. 26 well on the Canning Stock Route to Kimberley. Here it was seen abutting against the steeply inclined strata of Albert Edward and Gardner Ranges, which there are reasons for believing to be of Ordovician age. Rocks similar to the Paterson Range Beds are largely developed in other parts of the Kimberley, and in some localities fossiliferous

limestones are associated with them. Fossils collected from various localities by Hardman * show that the strata are of Carboniferous age. He divides the formation into an Upper or Sandstone series and a Lower or Limestone series. Sandstones occur in the Lower and limestones in the Upper series, but, as the name implies, the predominant rock differs in the upper and lower beds. No limestones were seen by the writer along the Canning Stock Route nor in the formation near Albert Edward or Gardner Range, but Hardman † and Jack ‡ both visited Flora Valley, near the former Range, and they agree that the sandstones there are part of the Carboniferous Formation; and it was the sandstones that occur near Flora Valley that the writer saw extending southwards to near No. 26 Well. There appears, therefore, reasonable grounds for assuming that the whole of this extensive sandstone formation, of which the Paterson Range Series is a part, is of Carboniferous age.

VIII.—Carawine Series.

In the valley of the Oakover between the junction of that river and the Davis and Carawine Pool there are practically horizontally bedded dolomitic limestones through which the rivers and creeks have cut deep gorges. At Carawine Pool the dolomitic limestones have a thickness of about 300 feet. In Wattha Woora Creek they are seen resting unconformably upon strata of the Nullagine Series.

No fossils have so far been found in the Carawine series, so that no evidence beyond the fact that they unconformably overlie rocks that are assumed to be Ordovician can be adduced regarding this age. They appear to be an estuarine deposit in an old river valley which was submerged beneath the sea and uplifted.

VIII.—Doleritic Dykes, Bosses, Sills, and Laccoliths.

A.—*Dykes.*

Doleritic dykes occur over the whole of the western portion of the area covered by this report. They are frequently seen farther north in the Pilbara Goldfield,§ and they are lithologically similar to dykes encountered in the mine workings at Sandstone and Meekatharra. The dykes occur in the sedimentary rocks of the Carawine, Nullagine, and Mosquito Creek Series, and also in the granite and Older Greenstones.

In the granite areas they form quite a conspicuous feature in the landscape, as they often run for many miles in a straight line, and have an elevation amounting in some cases to as much as 200 feet above the granite which flanks them.

In the Older Greenstones the dykes rarely rise many feet above the surface, and in many places are covered by superficial deposits and rock debris. In the sedimentary series some dykes attain an altitude of 100 feet or more, but here, too, their outcrop is in many instances broken by an overburden of rock fragments. The dykes vary considerably in width, ranging from about 30 feet to over one hundred yards.

Although dykes are sometimes seen in horizontally or slightly inclined strata in the basins of the Gascoyne and Ashburton Rivers they are absent in the northern areas except where the sedimentary beds are tilted into folds. In the fine section exposed in the escarpments and gorges of the north-western portion of the Hamersley-Ophthalmia Plateau—where the sedimentary strata attain their greatest thickness—and the Northern Plateau—where there are from 400 to 500 feet of bedded lavas—there are no dykes, although in the older greenstones to the south of the Hamersley-Ophthalmia Plateau and in the granite to the north of the Northern Plateau, there are many large and long dykes. It would therefore appear that, although in this district the dykes were able to invade the schistose greenstones and the foliated granite, they were unable to force their way through the thick superincumbent horizontal strata.

In the mesas and buttes south of the Lofty Range no dykes were seen, although many sills were exposed in cliff faces. Dykes were seen on some of the plains and also close to the base of cliffs, but as dykes traversing horizontal or slightly inclined strata appear to form lines of weakness along which the agencies of erosion can operate faster than elsewhere, the sedimentary beds have been cut down to the base-level of the district in proximity to dykes.

In the northern escarpment of the Lofty Range, about three miles from Conical Hill, a dyke is seen in the cliff face. The dyke extends about 150 feet up the escarpment through shales, but on reaching this point it encounters the more resistant sandstone, and instead of continuing to rise vertically it spreads horizontally as sills along the bedding planes of the shales.

On some of the plains where there are few outcrops of sedimentary rocks, it is difficult to decide whether an outcrop of dolerite is a dyke or a sill, but experience shows that unless the strata are inclined at high angles a dyke forms a narrow ridge, whereas a sill occurs as a broader and lower outcrop.

As a rule the dykes conform to the strike of the strata which they have invaded, but they sometimes follow fault lines which strike at varying angles across the strata. In all probability some of these faults are but little older than the dykes and were formed by earth movements, preceding or during the injection of the large number of doleritic intrusions which occur in this region.

B.—*Bosses.*

In those areas occupied by sedimentary rocks the shape of the dolerite intrusions and the structure of the adjoining rocks is often obscured by rock debris, and it is sometimes difficult to distinguish a boss from a partly covered dyke; a remnant of a sill on level ground may also have the appearance of a boss. Three undoubted bosses were, however, seen, one four miles north of the junction of Goldfields Creek and Ashburton River, another near Tutumunnda Rock-Hole, and a third near Kuninginna Hill. The first is surrounded by a ring of banded flinty quartzite and farther out from the boss, to the north and south, the strata dip away from it. In the vicinity of the second boss referred to the strata are a good deal folded, but this folding appears to be in the nature of a local crumpling of the strata rather than the uplifting of deep-seated beds. The boss near Kuninginna Hill is situated on some elevated ground; it is surrounded by a depression outside which the sedimentary rocks rise to a greater height than the highest point on the boss.

* E. J. Hardman: (1) "Rep. on Geol. of Kimberley Dist." Perth: By Authority, 1884.
(2) "Rep. on Geol. of Kimberley Dist." Perth: By Authority, 1885.

† *Loc cit.*

‡ R. Logan Jack: "The Prospects of obtaining Artesian Water in the Kimberley District." G.S.W.A. Bull., No. 25.

§ Geol. Surv., Bull. No. 40. Perth: By Authority, 1908.

C.—*Sills.*

Sills are largely developed in portions of the area occupied by sedimentary rocks of the Nullagine series. They are most numerous in the drainage basin of the Ashburton, especially in Lofty Range, but they are also common in the eastern part of the Hamersley-Ophthalmia Plateau, and in portions of the Oakover drainage basin, and a few sills were seen in the country drained by the Gascoyne. In the desert portions of the Interior Drainage Area, north of latitude 25 deg., no sills or other dolerite intrusions were seen, and in the southern portion of the Interior Drainage Area they were only seen in the vicinity of Weld Spring, Parker Range, and in Finlayson Range north of Wiluna. The horizontal distance to which these sills penetrate the strata varies considerably. In some instances they extend for some miles and have a uniform thickness, but in other places sills were seen which thinned rapidly and did not penetrate the strata for more than a few hundred yards from the parent dykes. The thickness of the sills, too, varies greatly. The largest seen was 130 feet thick, and all sizes were observed from that down to a few inches.

From the field evidence it is clear that the sills emanated from dykes which have invaded the sedimentary rocks. At the time the dykes forced their way upwards the sedimentary rocks were probably much thicker than at present, and the magma on encountering a hard stratum, found the line of least resistance between the bedding planes. Such a case occurs in the northern escarpment of the Lofty Range, three miles from Conical Hill. Here the dyke does not even reach the present surface of the plateau, and, in all probability, similar dykes with their offshoots are still hidden in the sedimentary rocks and await exposure by the agencies of erosion.

Another clear instance of sills emanating from a dyke occurs on Tongololo Creek, five miles above Peelbegunja. Here the dyke has cut across the horizontal strata and sills from it have forced their way between the planes of stratification in the shales. The strata above the upper sill have been removed by denudation and dolerite now forms the top of the hill.

Owing to the amount of talus on the escarpments the sills are often partially hidden, and only in one instance was a sill seen rising to a higher plane. This was near Mt. Trew, where a sill cuts across the strata and then proceeds at a higher horizon between the planes of stratification. It must, of course, be remembered that the areas in which the sills occur were only visited at widely separated points, and more detailed work would probably disclose many instances such as that near Mt. Trew.

The effect of the invasion of the sedimentary strata by the sills is marked only by an induration of the rock immediately above and below the sills, and the induration extends only for a few inches from the intruding sheet. The texture of an individual sill, too, is remarkably uniform, and it is only at the extreme edge that the dolerite becomes finer in grain, and in no instance was a tachylitic selvage noticed.

D.—*Laccoliths.*

Some of the sills which thin rapidly are probably the remnants of laccoliths. It was noticed that where the sills were short the bottom of the wedge was on a horizontal plane, whereas the upper surface was curved. In some localities (*e.g.* Monkey Creek), the dip of the strata in the vicinity of an outcrop of dolerite indicated that the intrusion was of a laccolitic character.

IX.—Lacustrine Deposits.

Between the Hamersley-Ophthalmia Plateau and the Northern Plateau there is an extensive plain which was at one time the site of a lake. The lake has been filled in and "The Marsh," a shallow, saline depression, is the only surface indication of its presence now left. Shallow wells and bores (the deepest of which the writer obtained particulars was 104 feet) put down by station owners show that water-borne material underlies the whole of the plain. The lake occupied an area of "sunk land" between the two plateaux. No evidence can be adduced regarding the period at which the earth movements which formed the lake basin occurred, and therefore nothing can be said regarding the age of the deposits which have filled the depressions. None of the bores or wells have reached bed rock, so the depth of the lake deposits is unknown.

In the southern portion of the area covered by this report there are numerous "salt lakes." In these lakes the bed rock is sometimes exposed on the surface, but as a rule the bed of the lake consists of mud heavily charged with salts (gypsum, common salt, sulphate of magnesia, etc.), and a few feet below there is always salt water. Little is known regarding the depth to which the mud in the lake descends. Near Lake Cowan, in the vicinity of Norseman, a bore passed through 337 feet of silt, and near Lake Disappointment, on the Canning Stock Route, bores passed throug 60 feet of lake deposits without reaching bottom. It is possible that some of these lakes may be deformation basins, but the writer regards them as being the remnants of an old dismembered river system whose valleys have been filled in as the flow of the rivers was obstructed by the elevation of the south coastal region in late Tertiary or Post-Tertiary times.

RESOURCES.

I.—Mineral.

A.—*Gold.*

Gold has been obtained in varying quantities from all the greenstone areas in the district with the single exception of the Kimberley Range Belt. The absence of official records renders it impossible to estimate the actual quantity of gold won from any of the workings except those at the larger mining centres, on the Wiluna or the Barlows Belts, but from the information obtained by the writer from prospectors and men employed on stations, it appears that none of the other belts has produced more than 100 ounces.

Gold has also been obtained from quartz reefs in granite at Collavilla, near the western margin of the Barlows greenstone Belt. The May Queen Leases at Collavilla returned 496.28ozs. of fine gold from 1,518 tons of quartz, and "Sundry Claims" at the same centre, produced 21.47 ounces of gold from 30 tons of ore.

In the areas of sedimentary rocks, small quantities of gold were obtained from the older metammorphosed series at "Hard to Find," near the head of the Murchison River, from the Nullagine Series, in a band of conglomerates at Rooney's Patch, near Brown Creek, and from the basal beds of Sunday Hill.

The only places where there is at the present time any activity in gold mining are at Wiluna and Mt. Keith, which are both situated on the same greenstone belt; although the former centre has been worked since the early nineties, serious mining was not commenced at Mt. Keith until 1911. This is another instance, quite common in the history of the Goldfields of the State, of payable gold deposits not far removed from established centres awaiting discovery for many years; in all probability systematic prospecting may result in the finding of other, and, perhaps, richer mines elsewhere.

When viewed broadly, it may be said that most of the possibly auriferous areas have received attention from prospectors, but in many instances they were apparently satisfied with "knapping" the outcrops of quartz reefs, and but little work has been done on the stony flats, beneath which the most important reefs and lodes are found in many of the established mining centres.

The following remarks on the individual greenstone belts may, it is hoped, be of some assistance to prospectors and others.

1.—*Kimberley Range Belt.*

Over the greater part of this belt there are but few quartz reefs, and the rubble on flats is of a glassy and "unkindly" type; but along the western margin there is some country that is well worth the attention of prospectors. Here there are numerous outcrops of greenstone schists and many quartz reefs, and there is also a considerable amount of quartz rubble on the flats. The "kindly" character of the quartz at once attracts attention, and, in the writer's opinion, this affords one of the most promising areas of any described in this report.

2.—*Comedy King Belt.*

A little desultory work has been done on this area in two places, but it evidently met with little success. The only rock outcrops seen consisted of jasper bars and quartz lenses, and there is no evidence to warrant the supposition that anything sufficiently rich to work will be found.

3.—*Wiluna Belt.*

This is the most important of the greenstone belts, as it is on it that the mining township of Wiluna is situated. The area appears to have been prospected rather thoroughly, but there is always the possibility that other finds, like Mt. Keith, will be discovered by careful and systematic search.

The long outcrops of gossan, which are so common along the main road from Lawlers to Wiluna, to the eastward of Mt. Lawrence wells deserve, in the writer's opinion, more attention than they have had, as they may represent the caps of auriferous lodes.

4.—*Barlows Belt.*

The Barlows Belt appears to have received, next to the Wiluna Belt, the most attention from prospectors. Mines have been worked at Barlows (New England) and Bronzewing, but both places are now abandoned.

To the north of Barlows the belt does not appear at all promising. The greenstones are generally quite massive, and quartz reefs are few, and there are wide areas covered with soil and ironstone rubble, where the absence of quartz rubble indicates that reefs do not occur beneath the surface covering. South of Barlows, however, there are occasional outcrops of schists and quartz reefs; flats strewn with quartz are common and it is here, if anywhere, that search should be made for further gold deposits.

5.—*Mt. Eureka Belt.*

Only in one place, at the Mt. Eureka Mine, did the writer see any indications of prospecting having been done. At Mt. Eureka shafts have been sunk and a good deal of quartz was raised, but it is still on the "paddock." This belt was crossed by the writer in six places, and he is of opinion that that portion of the greenstone area between the Mt. Eureka Mine and the north end of the Jasper range that extends northwards from Stirling Peaks, warrants systematic prospecting, but the great drawback to this locality is the distance that ore would have to be carted for treatment. The nearest crushing plant is the State Battery at Lake Darlôt, which is over 30 miles distant in a direct line from Stirling Peaks, and over 80 miles from the Eureka Mine.

6.—*The Northern Belts.*

Neither of the northern belts appear to offer much much inducement to prospectors. The Goldfield Creek Belt is less than 20 square miles in area and, although it is possible that small discoveries of alluvial gold might be made, any reefs likely to be found would be too small to pay for the erection of machinery, and the distance that ore would have to be carted to the nearest battery would allow of only exceptionally rich ore being treated.

Although the Coobina Belt has a large area, the bulk of it is not at all promising, and it is only along the southern margin of the eastern half that any gold is likely to occur. The remarks made regarding the probable size of ore bodies in the Goldfields Creek Belt and the difficulties of treatment due to geographical position, apply also to this area.

6.—*Other Possible Auriferous Areas.*

When prospecting along the margins of the greenstone belts, attention should also be paid to reefs in foliated granite near the contact of the two formations. The May Queen leases, at Collavilla, show that such reefs sometimes carry gold, and although the ore crushed at that centre yielded less than seven pennyweights per ton, higher values may possibly occur in other localities.

In the writer's opinion there is but little chance of the metamorphosed sedimentary rocks that occur south of Pilbara, and which have been correlated with the Mosquito Creek Series, yielding gold in payable quantities. This series in Pilbara forms the matrix of many rich gold deposits, but here there are many intrusive dykes which are absent in all similar formations farther south. The quartz forming the reefs, too, is generally of a much more "kindly" character in Pilbara. In the southern areas it is of the glassy "hungry" variety, and there is a marked absence of minerals of any kind in it.

That gold occurs in places in the Nullagine Formation is proved by the alluvial workings at Rooney's Patch near Brown Creek and at Sunday Hill. More important gold deposits occur outside the area dealt with at Nullagine and Just-in-Time. At Sunday Hill, Nullagine, and Just-in-Time the gold is found in the conglomerates at the base of the series; whereas at Rooney's Patch there is a bed of lava beneath the auriferous conglomerate, but as the lava is seen resting upon granite about five miles south of

the "patch" the conglomerate here, too, probably is the lowest bed of the sedimentary strata of the Nullagine Series. The conglomerate is much weathered, and is traversed by numerous reefs of glassy quartz, which conform to the bedding planes, the strike of which is E.S.E. and the dip N.N.E. at an angle of 20°. The old dry-blowing workings are situated in a deep gully which has been eroded along the strike of the beds. No information was obtained as to whether the alluvial gold was derived from the quartz reefs or from the conglomerate; but the quartz was of a particularly "unkindly" character, so that, as in the other places referred to, the gold was probably shed from the base of the conglomerate.

In the light of the discoveries just referred to it would seem advisable to test by dry-blowing the ground below the base of the Nullagine Formation when the basal beds consist of conglomerates. The nature of the underlying rock does not appear to influence the deposition of gold in the basal conglomerates, as at Nullagine they rest upon rocks of the Mosquito Creek Series, at Just-in-Time upon crystalline schists of the Warrawoona Series, at Sunday Hill upon granite, and at Rooney's Patch upon lavas.

B.—*Copper.*

In 1913 discoveries of copper ore at Illgarere and Kumarina (also known as Humphrie's Find and Wonyulgunna), attracted some attention from prospectors and representatives of investors; but owing to the geographical position of the finds, the latter evidently did not consider that the investment of capital was justified, as they failed to acquire any interests in the mines. The prospectors, however, commenced to hand-pick the rich ore—that going over 40 per cent. of copper—and to send it by teams to the rail-head at Meekatharra, a distance by road from Illgarere of about 200 miles and from Kumarina of about 160 miles.

Shortly after work was commenced on the lodes the writer visited the two centres mentioned, and a report on them was furnished.† At that time but little work had been done, and owing to the absence of surface outcrops it was difficult to gain a correct view of the geological structure of the country. It is reported that the mines now look very promising, but even with the present high price of copper it only pays to send away high-grade ore. There must now be a large accumulation of second-grade ore that would be worth a large amount of money if it could be treated locally, but when the war is over the value of copper will probably revert to pre-war prices, and it is doubtful whether it will then pay to erect treatment plants in such a remote locality.

The following table shows the amount and value, as reported to the Mines Department, of the ore sent from Illgarere and Kumarina to the end of 1918.

Locality.	Ore.	Metallic Copper.	Value.
	Tons.	Tons.	£
Illgarere	466·10	167·25	15,744
Kumarina	315·72	108·53	9,554
Voided leases * ...	7·75	3·43	223
Sundry claims * ...	62·03	21·96	1,837
Total ...	**851·60**	**301·22**	**27,358**

* From both centres.

† G.S.W.A. Bull. No. 59.

Mineral leases were applied for near Nuninga Spring, about nine miles north-west of Illgarere. When this locality was visited by the writer no work had been done and the only indications of copper that he saw were some copper stains in the crushed rock filling a fault.

When at Bulla Downs Station the writer was informed that copper had been found at two places about eight miles away, near the junction of Ashburton River and Limestone Creek, although nearly a whole day was spent in searching only one of the copper lodes was found. This was about a mile and a-half east of the junction of the creek and the river. Beyond a few pot holes and costeens no work had been done.

The country rock consisted of shales and fine-grained sandstones, and copper ore could be seen in the lode at intervals over a distance of about half-a-mile.

The strike of the lode is 55°, and so far as could be judged from the very limited outcrops in its vicinity the strata on both sides dip away from it, so here, too, in all probability the lode occurs along a fault.

From returns furnished to the Mines Department up to July 31st, 1917, it would appear that some copper ore has been raised from this locality, as the Mineral Statistics show that from Bulla Downs 78.61 tons of ore containing 20.42 tons of metallic copper, valued at £1,977, were sent away in the years 1915 and 1916, but there is no information available to show whether the ore came from the lode that the writer saw or from the other one in the same locality, which he was unable to find.

A small deposit of rich copper ore was found by the writer four miles north of the junction of Ashburton River and Goldfields Creek. Here, again, the copper occurred in a fault traversing sandstones.

Near Turumunnda Rock Hole, on a small branch of Brown Creek, a small amount of rather inferior copper ore was extracted from a shallow pot hole sunk in reddish shales.

It will be seen from the foregoing remarks that copper ore is found in widely separated localities over a large area. In every instance the copper lodes occur in rocks of the Nullagine Series, and most of them appear to have been found by station hands, as but little real prospecting has been done in that district.

There are no indications to guide the prospector in his search for copper ore except the presence of "floaters" on the surface. The lodes all occur on level country, and there is usually a covering of soil or rock debris. It is reasonable to suppose that similar undiscovered deposits occur in other parts of the extensive Nullagine Formation, but unless they were very rich they would not pay to work under present conditions, as before the miner receives any remuneration for his work, cost of cartage to the railhead, railway charges to the nearest port, and freight by sea to a smelter have to be deducted from the money realised by the sale of his ore. In addition to the above costs there are charges for handling the ore at the different stages of its journey to the smelter.

It is, of course, possible that the lodes at Illgarere and Kumarina will prove large enough and rich enough to justify the erection of local treatment plants, but,

as stated previously, the mines were seen only in their earliest stages of development, and it would be unwise to express an opinion as to their size and richness at a depth.

II.—Pastoral.

Except in the remote area to the north and south of Rudall River practically the whole of the country that is suitable for pastoral purposes has been taken up by pastoralists, and many blocks have been selected that have little to recommend them beyond the occurrence on them of a spring which affords a permanent watering place for stock.

In the extreme north and south of the area pastoralists breed sheep, but in the central portions cattle and horses are the only stock seen on the stations. In good seasons there is abundance of feed, and stock do remarkably well; and even in dry times there is sufficient "top feed" to sustain the stock provided they get enough water; but although some squatters make provision for periods of drought by sinking numerous wells, others rely too much on natural waters, and consequently when these evaporate in dry seasons there is heavy mortality amongst the stock.

During the severe drought of 1911 the writer was struck by the marked difference in condition between the young cattle and the breeding cows. The former were fairly fat whereas the latter were mere walking skeletons. This difference was largely attributed to the fact that the younger and stronger stock were able to walk the long distances necessary to find feed, but the older and weaker beasts had to exist on what they could find on the bare country in the vicinity of the waters, and consequently many of them died from starvation. The heavy loss of stock in dry seasons could be considerably reduced by sinking wells in parts of the runs where there is no surface water. In addition to saving many cattle, the provision of more watering places would largely increase the carrying capacities of the stations.

There are few places on the area where water could not be obtained within 100 feet of the surface, and in most localities good supplies would probably be found at a depth of less than 50 feet. The cost of sinking a well and equipping it with a windmill would be quickly defrayed by the number of stock saved, by giving access to new feeding grounds. Periods of extreme drought will of course occur, unless the climate changes, in which even those stations that are best equipped with wells and windmills will suffer loss; but the mortality will not be nearly so great as on those stations which rely so largely on the natural waters.

As stated above, the only country not taken up by pastoralists is to the north and south of the Rudall River. This locality was twice visited by the writer (in 1909 and in 1914), and on each occasion there was abundance of feed for stock. On the Rudall River there are some pools that would last for some months after rain had fallen, and on Rooney Creek there were deep rocky holes of water that would probably withstand over a year's drought. This district is difficult of access, as over 60 miles of desert country lie between its western end and the rabbit-proof fence, but two or three wells sunk in this desert area would make it accessible for stock and vehicular traffic. Stock for the southern markets could be taken up Butler Creek and around the western end of the McKay Range to the Canning Stock Route, and by that route to Wiluna; but owing to sand ridges, pack horses or pack camels would have to be used for transport.

Settlers in the Rudall country would probably have some trouble with the aborigines, as they appear to be numerous and hostile.

III.—Water Supplies.

A.—Surface Water.

There are many natural surface waters scattered over the area; but unless these are fed by springs none can be regarded as permanent, although some of the larger pools and rock-holes last for many months after being filled with water.

The surface waters are contained in rock-holes, gnamma-holes, clay-pans, and in depressions in the beds of rivers and creeks; and there are also numerous springs which, wherever they occur, act as feeders for the pools.

The rock-holes are found amongst rocky hills traversed by a watercourse, or in a rocky basin near the source of a stream. They occur in granite country or in hills formed of sedimentary rocks, but are never seen in the greenstone areas.

Gnamma-holes are relatively deep rounded or elliptical basins on bare granite rocks* of the southern part of the area. In the eastern part of the State they are found in horizontally bedded sedimentary rocks, but in the country covered by this report they are confined to the southern granite belts.

Gnamma-holes vary in size from small holes holding only a few pints up to large cisterns holding thousands of gallons of water. Gnamma-holes depend for their supplies of water on the rain that falls on the bare rocks, but owing to the small surface area exposed to evaporation they last longer than other waters of larger size.

Clay-pans are shallow circular depressions on flat ground. They vary in diameter from a few yards up to a quarter of a mile. Watercourses seldom flow into them direct although they sometimes occur on the flood-plains of creeks after they have spread out on flats. In comparison with their diameter they are extremely shallow, and in dry weather evaporation is rapid. The water in them is always muddy.

Clay pans are found on all geological formations, even in depressions between sand ridges. All that appears necessary for their formation is a depression in which water containing clay in suspension can lodge. The depressions in which the clay pans occur appear to be the result of deflation.

Pools in rivers and creeks are found in hollows that have been scoured out by water flowing over a hard bar of rock or other obstruction, but, whereas some pools of comparatively small size last a long time after being filled, the waters in others of large size disappear quickly. The length of time that a pool of water will last after rain depends largely

* For particulars regarding the formation of gnamma-holes *see* G.S.W.A. Bulletins Nos. 45, 57, 64 and 75.

upon the underlying rock, although if the river or creek has a clay bottom a pool will last as long on one formation as the other. In areas occupied by massive granite, pools are most numerous and, as a rule, largest. Basins in a river bed traversing granite form a natural tank from which there is little loss of water except by evaporation. The basins are almost invariably partly filled with sand, which carries a large supply of water below the level of the pool and retards evaporation. The water contained in the sand drains into the pool as it becomes lower. Some of the largest pools are found in areas of horizontally bedded or slightly inclined rocks, but those that last any time are generally fed by springs. In these pools the bedding planes and joints in the rocks beneath are closed by a deposit of travertine or chalcedony, which very often coats the whole of the basin.

It is only rarely that pools are found in highly inclined sedimentary strata or in the older greenstones, especially in the latter formation. In these, unless the basin has a clay or travertine bottom, the water disappears within a few days.

Springs are confined almost entirely to areas of sedimentary rocks. They sometimes occur along the courses of creeks and rivers traversing open plains, but they are most numerous in the deep gorges of the plateaux. Springs are also occasionally seen issuing from the base of a cliff, but unless there is a rocky basin to act as a receptacle for the water it quickly disappears through the bedding planes of the strata.

B.—*Ground Water.*

The numerous wells that have been sunk on the area show that, provided a suitable site is selected, water of good quality can be obtained at comparatively shallow depths. Few of the wells seen by the writer were over 100 feet, and some of the largest supplies were obtained from those between 10 and 20 feet deep. Most of the wells have been sunk in the superficial deposits which are so largely developed throughout the area, and of these the travertine undoubtedly yields the largest supply, usually at a very shallow depth. The water from the travertine, however, generally contains more salts in solution than waters from other formations, and although it is excellent for stock it is not palatable to the human taste, and is generally very "hard."

The station owners on the large plain lying between the Hamersley-Ophthalmia Plateau and the Northern Plateau have experienced difficulty in locating potable water, but elsewhere those who were desirous of sinking wells have usually been able to find a supply sufficient for their needs, and it is only very rarely that salt water is struck except in proximity to salt lakes.

Travertine is undeniably the best indication of shallow water, and sinking in this deposit will seldom cause disappointment. The depth at which water occurs in other formations varies considerably in different districts; but provided low-lying ground, preferably close to water channels, is selected as a well site, good supplies will usually be obtained at much less than 100 feet. The deepest well that the writer saw was 110 feet in depth.

C.—*Artesian Water.*

Since sufficient ground water can be obtained to supply the inhabitants and stock of the area, the occurrence of artesian water would not be of the same importance as in districts where the surface pools were not sufficient for requirements, and where great difficulty was experienced in finding water by well sinking. It may, however, be of interest to discuss the possibility of obtaining artesian water in this region.

Only two of the formations represented in the area—the Nullagine Series and the Paterson Range Beds—need be considered in this connection, as it can be definitely stated that the older greenstones, granites, and Mosquito Creek Series will not yield a supply of artesian water. The Carawine Beds consist of porous limestones, and the water which percolates through them reach the surface in the deep gorges by which the beds are dissected. The Brumby Creek Beds are not more than 50 feet in thickness and consist of horizontal beds of chalcedony and limestone, which occur in the form of low mesas and buttes, so that there is little chance of obtaining any water in them.

In the Nullagine Formation to the west of the Rabbit-proof Fence the presence of the numerous doleritic intrusions and the steep folds of the strata preclude the possibility of obtaining artesian water; although it is possible that sub-artesian water might be found in some localities in the drainage basin of the Gascoyne where the strata are arranged in broad folds, and dykes appear to be absent.

East of the Rabbit-proof Fence there are none of the doleritic intrusions so common to the west, and north of latitude 25° 30′ the Nullagine Beds are arranged in broad folds, and since the strata consist of some rocks that are porous and others that are impervious, there is every probability that deep-seated supplies exist in some of the synclines, but since the country is very level it is doubtful whether there would be sufficient pressure to bring water to the surface if it were struck in a bore, so that any supplies likely to be obtained must be regarded rather as sub-artesian than artesian.

In the vicinity of Charles Wells Creek and Lake Carnegie (Wongawall Station) the Nullagine Formation consist of limestones, sandstones, and shales. To the south, these beds rest upon an extremely eroded granite surface, and to the north upon the up-turned edges of the strata, which are provisionally included with the Mosquito Creek Series. Although there are some minor folds, the Nullagine Series in this locality has been but little disturbed, and the strata are horizontal or inclined at a low angle to the east. From the north, west, and south the fall of the country is towards Lake Carnegie, and the writer considers that there is a reasonable chance of obtaining artesian water in the vicinity of the lake, but as far east as the good pastoral country extends there is abundance of good water at a shallow depth, and in good seasons the surface supplies and springs are sufficient for the requirements of the stock.

In Bulletin No. 39 the writer pointed out the existence of an artesian basin in the Carboniferous Formation which extends along the Canning Stock Route from Flora Valley in Kimberley to No. 26 Well. The only localities where any further information was obtained on the expedition dealt with in this report regarding the extent or character of the Carboniferous Formation were near the head of Rooney Creek and at Paterson Range, where sandstones similar to those seen along the Canning Stock

Route rest unconformably upon the Nullagine Formation, and dip eastward at a low angle.

The base of Paterson Range is, by aneroid, 1,250 feet above sea-level, and, since the height of Hall's Creek is 1,225 feet above the sea, the intake area in Kimberley is probably from 100 to 200 feet lower. The Paterson Range Beds are porous enough to absorb and transmit water. This is shown by the marked absence of watercourses, although in the granite area of the Rudall farther south, which has probably the same rainfall, there are many large creeks.

Nothing definite is known regarding the rainfall of this region. The nearest recording station is at Nullagine, about 130 miles away, where the average annual rainfall is 12 inches. At Paterson Range, however, it is probably much lighter, but the artesian basin doubtless draws its largest supply of subterranean water from the intake area in Kimberley, where the average annual rainfall is about 21 inches.

Although there is little likelihood of artesian water being struck in the vicinity of the range, as it is so close to the intake area, the Paterson Range Beds are of interest, as they form the south-eastern rim of the large artesian basin which probably extends northwards to Fitzroy River, and north-eastwards to Albert Edward Range. Unfortunately, south of the settled areas in Kimberley the country is generally a desert waste, and it is quite unsuitable for pastoral purposes.

THE CLAY DEPOSIT AT THREE SPRINGS, SOUTH-WEST DIVISION.

(F. R. Feldtmann.)

Introduction.—Within the last three years two samples of white clay from the vicinity of Three Springs have been examined at the Geological Survey Laboratory. The localities from which these samples were obtained were described as "about one to two miles south of the Railway Station," and "one mile south-east of the Railway Station" respectively. The first sample proved to be a very fine-grained white clay, practically free from grit; the second a white clay containing much coarse grit. It was stated that the clay had been used locally for whitewash.

Location.—Three Springs (Kadathinni townsite) is situated in the South-West Division, on the Midland Railway, 193 miles from Perth. The clay deposit is 1½ miles south-east of the Railway Station, in Block M 754—owned by Mrs. Watson—between the railway line and the telegraph line and road to Carnamah.

Topography.—The country in this district is gently undulating, with extensive soil flats and gently sloping ridges rising to no great height above the flats. The northern extension of the Yarra Yarra chain of lakes, here represented by a number of small lakes or clay-pans, crosses the railway about a mile south-east of the station. In a few places the lake edges are marked by cliffs from 20 to 30 feet high.

Geology.—During his survey of the Irwin River Coalfield in 1909, Mr. W. D. Campbell, then Assistant Geologist to the Department, examined and mapped* the geological features of the country to the north and south of Three Springs. The area immediately surrounding Three Springs was, however, left blank on Mr. Campbell's map. The nearest rocks shown on this map, about 2½ miles north-west, and between five and six miles south of Three Springs, are submarine tuffs, sandstones, quartz conglomerates, and quartzites, of undetermined age, but, according to Campbell,* unconformably underlying the Carboniferous rocks of the Irwin River Series. Copper ores have been found in these sediments of undetermined age, at Arrino and Mounts Muggawa, Misery, and Scratch, associated at the first three places with granite, which is apparently intrusive into the sediments. (*Vide* Bull. No. 38, fig. 11.)

In the immediate neighbourhood of Three Springs there are but few rock exposures, whether outcrops or well-dumps. The rocks exposed comprise clay shales, quartz grits, quartzites, sandstones (?), and siliceous agglomerates, the clay shales and quartz grits predominating. Most of the outcrops have been altered by surface solutions. The strike of the rocks averages about N. 15° W., the dip about 70° E. These rocks undoubtedly form part of the same series as Campbell's "rocks of undetermined age." Occasional rounded and subangular pebbles of white quartz and flint, up to 6 inches in length, are found on the surface, and others were seen *in situ,* in a somewhat clayey matrix, near the top of a ridge crossing the Perenjori Road about 30 chains east of the road to Arrino.

The only rocks, other than those of the above series, seen were outcrops of granite, near the road running south from the townsite, on the south boundaries of Blocks 11 and 12. The outcrops and rock fragments varied greatly in texture, those of a coarse-grained granite with large red felspars apparently predominating; fragments of coarse graphic granite and of a finer-grained aplitic facies were also seen. The granitic rocks were apparently intrusive into the sediments. Granite fragments up to a foot or more in length were also seen along the telegraph line near Block 759, and on top of the cliffs on Block 755; these probably represent other granite dykes.

The Clay Deposit.—The only important exposure of clay is the dump of Watson's Well on Block M 754. The well, which is about halfway up the northern slope of a low ridge, was filled with water to within 20 feet from the surface, but was said to be 80 feet deep, with a short drive at the bottom. The dump is entirely composed of white clay containing varying proportions of quartz grit—some portions of the dump consisting of almost pure clay, others containing a high percentage of grit. It was stated that the well was in clay practically the whole way but that much coarse grit was in evidence at the bottom. One small piece of kaolinic grit and one pebble of icy quartz were found on the dump.

Two large samples of clay were collected from the dump, one from the northern half, the other from the southern half. The northern half appeared to contain, on the average, much less grit.

From an examination of the locality it would seem that the two previously collected samples were obtained from this dump, the only other dump where white clay is exposed being that of the south-west well (now filled in) on Block 17, on the other side of the railway line; here, however, the clay is mixed with innumerable small fragments of finely laminated shale. The dumps of the other two wells on the same block are chiefly composed of small fragments of pale-grey or reddish-grey shale.

A small sample of white clay from a well on Location 7447/68, 19 miles west by south from Three Springs and about two miles south of the 14-mile

* W.A. Geol. Survey, Bull. No. 38, Plate III., 1910.

* *Op. cit.* p. 29 and fig. 13.

peg on the road to Nebru Spring, was given me by Mr. C. Maley, the owner of the location. The well was said to be 30 feet deep—the clay being cut near the bottom of the well. The sample appeared to be of very good quality and to be free from grit. Unfortunately the distance of this deposit from the railway would greatly increase the cost of working it.

Origin.—From the evidence afforded by the other wells in the vicinity, it would appear that the Watson's Well clay has been formed through the alteration of sedimentary clay shales or kaolinic grits by surface solutions. The hill behind the well is covered by soil, but the few rock fragments seen thereon were of a lateritic character, and it is therefore likely that a layer of laterised rock underlies the soil, and that the white clay represents the bleached shales or grits after removal of the colouring matter by surface waters.

Conclusions.—Owing to the fact that the deposit is only exposed in one place, it is impossible to form any estimate as to the quantity of clay available, but from the nature of the occurrence it is probable that it is of considerable horizontal and vertical extent. This, however, can only be ascertained by boring.

The overburden is largely soil, probably underlain in places, by a thin layer of laterite.

The deposit is easy of access, being close to the railway line (along both sides of which there is a road) and the main road to Carnamah, and only one and a half miles from the railway station.

The material exposed contains, on the average, much coarse grit, but boring might reveal layers of better quality.

The two samples collected by me may be regarded as representative of the material in the well as a whole.

Examination of these samples is necessary to show whether it is advisable further to test the deposit.

THE CLAY DEPOSITS AT MT. KOKEBY.—SOUTH-WEST DIVISION.

(F. R. Feldtmann.)

Introduction.—In November, 1915, two samples of clay, from a well near the southern end of Location 16114, eight miles south-west of Mt. Kokeby townsite as the crow flies and 11½ miles by road, were examined in the Geological Survey Laboratory. One of the samples was a pure white clay, the other was a dark brown clay containing 13.2 per cent. of carbonaceous matter.

As certain of the local residents wished to ascertain whether there was any chance of obtaining coal or oil in the locality, and whether the clay deposits were of any value, Mr. H. P. Woodward, late Assistant Government Geologist, was instructed to examine the district. Mr. Woodward visited the district early in 1916 and examined an area of about 3,000 acres, over which Prospecting Area 30PP—which included Location 16114 and other locations to the east—had been taken up.

As the result of his investigations Mr. Woodward, though not holding out any great hope of the existence of coal seams, recommended that a series of bores be put down along a line running east of north from the well or shaft from which the samples had been obtained, the first bore to be close to the shaft.

In consequence of Mr. Woodward's recommendations, three bores were put down on Locations 16114, 15817, and 7454, to depths of 224, 231, and 190 feet respectively. The results, so far as coal or oil were concerned, were discouraging, but the bores passed through several feet of good white clay—suitable for the manufacture of chinaware—starting at depths ranging from 10 to 19 feet from the surface.

As the chief drawback to the successful working of this deposit is its distance from the railway, oral instructions were received to examine the district and ascertain whether there was any possibility of obtaining similar clay nearer the townsite. Mount Kokeby was reached on the 18th November, 1918, and the field examination completed on the 30th of the same month.

Location.—Mt. Kokeby townsite is situated in the South-West Division, 106½ miles from Perth and about seven miles south of Beverley on the Great Southern Railway.

The area examined covers about 19 square miles and includes, in addition to the north-westerly portion of that examined by Mr. Woodward, the country adjoining the townsite and that between the town and the area previously examined.

Topography.—The above-mentioned area lies between the Avon River on the east and the Dale River—a tributary of the Avon—on the west, the west corner of Location 16114 being about three miles east of the Dale River. In general, the country is undulating, but the south-western portion is more strongly so, consisting of numerous hills separated by comparatively narrow valleys, the north-eastern portion consisting mainly of broad flat valleys with a few hills and ridges.

With the exception of Mt. Kokeby itself, about three miles W.N.W. of the railway station, none of the hills in the north-eastern half of the area are of any great height. In the south-western half two hills on Locations 1239 and 852 are nearly as high as the Mount.

The valley which crosses the southern portion of Location 16114 apparently stretches from the Dale River to the Avon, joining the Avon valley immediately south of Mt. Kokeby townsite. It is irregular in width and is joined by other valleys which run into it from the north-west and south-east. One of these valleys runs into the main valley from the W.N.W. about three miles south-west from the townsite.

In the extreme south-west of the area the drainage follows a south-westerly direction towards a small tributary of the Dale River. In the south-eastern portion of the area examined by Mr. Woodward a branch valley runs in an east-south-easterly direction towards a small tributary of the Avon. In the north-eastern half of the area examined by me the drainage is towards the Avon itself. In the western portion of the west-north-west branch valley, the drainage is towards the Dale. The divide between the two rivers appears to run slightly east of north.

Geology.—In the north-eastern half of the area rock exposures are restricted to the higher ground, and even here—as on Loc. 3814, east of the railway, and on the north-east boundary of Loc. 8328—the rocks are obscured in places by laterite, the lower slopes being covered by loose detrital sand derived from the crystalline rocks. Similar sand covers parts of the main valley, the lower portions of the valley, however, being covered by clayey soil.

The rocks exposed on the higher ground are either —as on the hill on Loc. 48—gneissic microcline-biotite granite, with porphyritic felspars up to two inches in length; sheared and somewhat granulated quartz rock, apparently also of granitic origin—as on Mt. Kokeby and in Loc. 9918; or epidiorite, coarse and fine-grained dykes of which intersect both the granite and the quartz rock.

In the south-western half, the higher ground is composed of similar granite, laterised in places and intersected by epidiorite dykes.

The superficial deposits of the main valley have been penetrated in a few places by wells, and, in the south-western half, by the three bores already mentioned. So far as could be ascertained, none of the wells in the north-eastern portion of the main valley reach a greater depth than 35 feet from the surface. As shown by the dumps, they are mainly in loose sand. On the dumps of the wells in Loc. d, and in Loc. 3565 east of the railway line, a few fragments of felspar crystals, similar in appearance to the porphyritic felspars of the granite, were noticed. The material from the bottom of the wells in Loc. d and at the northern end of the townsite consists of compacted sand, or quartz grit, the grains of which are similar to those of the loose sand in the upper portions of the wells.

In the south-western area a series of sedimentary rocks, mentioned in Mr. Woodward's report, underlies the superficial deposits of the main valley and of the south-eastern branch. This sedimentary series comprises beds of kaolin with quartz grains, kaolin, grey shale with leaf impressions (no specimens, unfortunately, of which were obtainable), carbonaceous shale, sandstone (or quartz grit?), and blue clay. The series is shown by the bores to be over 200 feet thick in places, and is probably fully 350 feet thick in the deepest parts of the valley. On the meagre evidence available it would appear that the beds in the neighbourhood of the old shaft and No. 1 Bore dip slightly east of north at about 2½°. The beds were probably formed from material derived from the enclosing crystalline rocks, together with plant remains, and were laid down on the floor of the then comparatively deep valley. On the evidence of the bores it is probable that the beds are lenticular in form. As the flats south and south-west of the townsite form part of the same valley, it is very probable —considering the extent and thickness of these sediments in the south-western part—that they are underlain by similar rocks.

The Clay Deposits.—Other than Locations 16114, 15817, and 7454, in the south-western half of the area, the only locality where white clay of good quality has been exposed is Loc. 10577, where it has been cut in a well, 42 feet deep, near the north-eastern boundary of the location, and about 1¾ miles, as the crow flies, west-south-west of the Railway Station.

In Loc. 16114, the clay has been cut in the old shaft (v.d. 58½ft.), a new shaft (v.d. 23ft.), 4½ chains east of the first, and No. 1 Bore (v.d. 224ft.). In the old shaft there is 13 feet of overburden, followed, according to information supplied to Mr. Woodward, by 5 feet of white kaolin and 6 feet of pinkish white kaolin, below which are 4 feet of light grey shale, with plant remains, and 1½ feet of carbonaceous shale. In the new shaft there is about 19 feet of overburden, chiefly composed of white kaolin, with much coarse quartz grit, white kaolin occupying the remainder of the shaft. The Section of No. 1 Bore, drawn by Mr. A. Frizzell, who was in charge of the boring, also shows 19 feet of overburden consisting of 2 feet of sand, 4 feet of "clay and ironstone conglomerate" (lateritic material), and 13 feet of kaolin with quartz grit; below this is 15 feet of fine kaolin.

The section of No. 2 Bore, at the south end of Loc. 15817 and about ¾-mile north-east of No. 1 Bore, shows an overburden of 10 feet of clayey material, followed by 6 feet of kaolin, below which are beds similar to those in No. 1 Bore, but including only two narrow bands of shale; decomposed granite was cut at 226 feet.

No. 3 Bore, near the western boundary of Loc. 7454 and about 70 chains south-east of No. 1 Bore, also shows 10 feet of overburden, probably largely lateritic, followed by 11 feet of fine kaolin containing fine grit; decomposed granite was cut at 180 feet.

The well on Loc. 10577, in the north-eastern area, is situated about 5 chains south-east of the north-eastern boundary, and about 18 chains north-west of the east corner of the location. It is a few chains north of the northern edge of a small isolated swamp or clay pan, which was filled with water at the time of my visit. I was informed by Mr. W. V. Brown, the owner of the location, that the well was about 42 feet deep, with an additional 5 feet of boring. There was said to be about 7 feet of overburden consisting of loose sand, then clay to about 44 feet from the surface. Below the clay was sandstone, followed by drift sand, carrying a good supply of fresh water, at about 47 feet from the surface. At the time of my visit the well was filled with water to within 2½ feet from the surface. The clay closely resembles that of Loc. 16114.

In addition to the well a couple of potholes had been sunk, a few chains to the south-east, to depths of about 5 feet. These were in somewhat discoloured kaolinic material containing much quartz grit.

Conclusions.—The evidence afforded by the bores and shafts in the south-western portion of the area examined shows that kaolin, probably forming a continuous bed, underlies the superficial deposits of the main valley, the top of the deposit where exposed being from 10 to 19 feet from the surface. The thickness of the bed ranges from 6 to 15 feet, averaging, probably, about 11 feet. Tests made in the Geological Survey Laboratory show the kaolin to be of excellent quality. It has been successfully made up by Mr. Thompson, the owner of Loc. 16114, into whiting for boots and shoes.

Should the kaolin exposed in the bores form parts of the same deposit, the quantity of clay available is very large. Assuming for the deposit a rectangular area based on the distance between the old shaft and No. 2 Bore and that of a line from No. 3 Bore at right angles to the first line—the actual area is probably much greater—and an average depth of 11 feet, there would, taking the weight of a cubic yard of clay as 31cwt., be more than 11,500,000 tons of clay available.

In addition, it is probable that some of the overlying kaolin containing quartz grains, cut in the shafts and in No. 1 Bore, would be found useful for economic purposes.

The great drawback to the successful working of this deposit is its distance from the railway. It has, however, an advantage in the fact that the main bodies of underground water were only encountered at distances ranging from 10 to 40 feet below the bottom of the deposit.

Regarding the deposit on Loc. 10577, this has the very great advantage of being only about 2¼ miles by road from the Railway Station. In addition, it is stated that there is only 7 feet of overburden, and that the deposit is about 37 feet thick. The clay, judging by the samples seen, appears to be equal in quality to that of Loc. 16114. As, however, there appears to be a large body of water immediately below the clay, it would be advisable, when working this deposit, to leave a thin layer of clay underfoot, in order to avoid difficulty with the water. As the clay has only been exposed in the well it is impossible to form any estimate of the extent and tonnage of this deposit. Like that of the south-western area, the clay has evidently been formed through the decomposition and degradation of the crystalline rocks.

As it is by no means improbable that beds of clay, similar to those of Loc. 16114 underlie the flat west and south-west of the townsite, also that kaolin deposits underlie the sand and laterite on the low ridge immediately north-west of the Railway Station, it would, in my opinion, be advisable to test these localities by boring. On the slopes of the ridge north-west of the Railway Station there is less likelihood of a large body of water being met at a short distance from the surface, and I would therefore recommend that this locality be first tested.

It is probable that a considerable thickness of overburden would be found in the flat south-west of the town, nevertheless a bore might be put down somewhere between the railway line and the Government windmill well.

CHEMICAL AND MINERALOGICAL WORK.

(E. S. Simpson.)

During 1918, in consequence of the continuance of the war and the growing necessity for the establishment of local industries to supply manufactures only obtainable at famine prices, the number of samples submitted for examination showed again a marked increase over that for previous years. The figures are:—

Year.	No. of Samples.
1916	1,396
1917	1,671
1918	2,065

The increase of work is even more marked than these bare figures suggest, since more elaborate investigations are now required in very many instances than was formerly the case. Further details are given in the accompanying Table.

Although some temporary assistance has been provided to cope with this extra work, it has been insufficient, and at the end of the year only ten months' work had been completed, and two months' work was carried over to the next year. This is highly unsatisfactory to the staff, and still more to those persons who are waiting for results before they take up mining leases or proceed with new or extended manufacturing processes. The position would have been much worse but for the fact that every member of the staff worked at the highest pressure under most disadvantageous conditions. The housing of the staff is both unsuitable and unhealthy and calls for early amendment. The so-called "temporary" Laboratory has now been occupied for 17 years, with increasing inconvenience from dust, heat, and lack of accommodation and fittings essential for the carrying out of standard professional work as distinct from students' exercises.

Among the more important investigations carried out during the year may be mentioned the following:—

Clays.

The investigation into the clays of those portions of the South-Western and Central Divisions which are within reasonable reach of manufacturing centres was begun on a large scale towards the end of 1917. This has been continued throughout 1918 with funds supplied partly by the State and partly by the Federal Government. The latter authority nominated a controlling Committee consisting of myself (Chairman) and Messrs. A. Gibb Maitland, T. Blatchford, and C. S. Nathan, with Mr. Bowley as secretary. This Committee has held five meetings. With the continued assistance of Mr. T. Rafferty, pottery expert, a very large amount of most interesting and valuable data regarding local clays has already been obtained, which is freely made use of by the potteries already established and by persons who are endeavouring to start new potteries. This data is so complex and full of technical detail that it is impossible to do more here than indicate very broadly the present state of the investigations. Briefly, it has been proved that Western Australia is unusually well endowed with practically every type of clay and of other minerals, such as felspar, which form the basis of the most varied kinds of ceramic industries. It is hoped during the coming year to issue a comp ete report on the whole subject. Meanwhile persons who have submitted samples of clay are one by one receiving comprehensive reports on their individual samples, and manufacturers are being put in communication with persons able to supply them with clays and other minerals to meet their requirements. Owing to the exhaustion of funds these investigations will come to an end early this year.

Potash Supplies.

In view of the local famine in potash compounds so essential for the fertilisation of crops of fruit, potatoes, onions, etc., the search for local sources of these compounds begun in the previous year were continued. The most important result was the discovery of Alunite (hydrous sulphate of potassium, sodium, and aluminium) amongst clay samples sent in from Kanowna, and the consequent search for this mineral on the spot, disclosed numerous small (3 inch to 24 inch) veins of this valuable source of potash scattered over a wide area in the immediate vicinity of Kanowna, the matrix being a kaolinised slate or mica phyllite. The Kanowna mineral is a soft, snow-white material varying in quality from true alunite with 9.32 per cent. of potash and 2.14 per cent. of soda, to a natroalunite with 5.42 per cent. of potash and 4.07 per cent. of soda.

Small veins of alunite have also been found associated with jarosite in a shear zone in granite at Northampton, and jarosite (hydrous sulphate of potassium and iron) on the Upper Kalgan River.

The question of potash supplies is of such pressing importance in Austra'ia at the present time that a Bulletin has been written giving all available infor-

mation regarding local supplies of potash and methods of utilising them. This Bulletin is entitled, "Sources of Industrial Potash in Western Australia," and is now in the Press.

Glass Sands.

A commencement having been made with the erection of the first two glass factories in the State, a demand has arisen for sands suitable for glass manufacture. To satisfy this demand a search has been made by officers of the Survey in the district round Perth, with the result that sand suitable for the manufacture of glass for ordinary bottles and for windows has been found to be abundant in the metropolitan district, whilst sand suitable for ordinary plate glass is not uncommon, and a fair quantity of sand suitable for making mirror plate and fine table glass has been located. The specifications for good glass sand cover three chief items, viz., percentage of silica, iron content, and size of grain. The silica should be not less than 96 per cent., and preferably over 98 per cent. of the total sand. The grade of grain in the specification laid down by the British Ministry of Munitions is that—

> The sand should have at least 70 per cent., and, if possible, more than 90 per cent. of one grade, and that this grade should be in most cases medium sand, *i.e.*, with diameter between 0.25 and 0.5 millimetre.

American writers recommend a slightly coarser sand, viz., between 0.33 and 1.00 millimetre diameter. As regards iron oxide, an American authority (C.R. Fettke) has laid down the following maximum amounts of this constituent for various glasses:—

Optical glass, Max. Fe_2O_3 ..	0.002	per cent.
Best lead flint	0.02	„
Mirror plate	0.10	„
Ordinary plate	0.20	„
Window	0.50	„
Green and brown bottle, 0.5 to	7.0	„

Of 15 samples of sand collected by myself in the Tuart Hill-Wanneroo district all contained over 98 per cent. silica, whilst only one contained over 0.50 per cent. Fe_2O_3; six contained 0.21 to 0.50 per cent.; four, 0.11 to 0.20; and four, 0.02 to 0.10.

As regards size of grain: All the samples contained less than 1 per cent. over 1.0 millimetre diameter; one contained 99 per cent. between 0.1 and 0.5 millimetre; and all but two contained over 90 per cent. between 0.25 and 1.00 millimetre. The majority of the sands, therefore, are rather coarse, judged by the English standard, but quite satisfactory according to American standards. One sand, from Lake Gnangara, was of exceptionally good quality in regard to all three requirements, viz., silica content, freedom from iron and size of grain, the figures being:—

Glass Sand, Lake Gnangara.

Size of grain:	
Over 1.0 millimetre	nil
„ 0.5 „	0.18
„ 0.25 „	89.00
„ 0.10 „	9.82
Under 0.10 „	1.00
	100.00

Composition:	A. per cent.	B. per cent.
Silica	99.81	99.64
Iron oxide	.040	.028
Lime	nil	nil
Magnesia	nil	nil
Alumina	.14	
Titania	.007	
Potash	trace	
	99.997	

In connection with this industry, too, tests have been made of sandstones from various quarries at Donnybrook to determine their suitability for use in building glass melting "tanks." One has been selected as probably suitable and this will be tested in practice alongside Sydney sandstone of proved value for the purpose.

Limestones.

Many of these have been examined during the year, with a view to determining their suitability for agricultural purposes, for cement making, and for use in alkali manufacture. Supplies of a grade suitable for use in agriculture are abundant along the coast from Geraldton to Bunbury. For cement making much of our limestone contains too much quartz, but the marl from Lake Clifton and much of the capstone in the Coastal Limestone area contains less than 10 per cent. silica and is well suited for this purpose.

A minor use, to which only soft limestones are put, is in making putty. The stoppage of supplies of whiting (ground chalk) from England, from which putty is made, led to a search for a local substitute, and it was found that a soft marl from White Lake, Rockingham, after suitable preparation, made putty equal in colour and plasticity to that made from the best English whiting.

Aluminium Ore.

The principal ore from which aluminium is smelted is the so-called bauxite which forms an important portion of the laterites (ironstone gravels) which cover a large portion of the surface of the Darling Ranges. As steps are being taken to start the smelting of aluminium in Australia, many local bauxites have been examined and about 40 samples analysed. The lowest grade ore which is likely to be handled in Australia at present must assay 35 per cent. acid soluble alumina. The 46 samples analysed up to the present are classified thus:—

Acid soluble, Al_2O_3—Under 35 per cent. ..	20
35 to 40 per cent. ..	15
40 to 45 per cent. ..	6
45 to 50 per cent. ..	5
	46

Rather more than one-half, therefore, are possible aluminium ores. The higher grade bauxites weigh 157lbs. to the cubic foot, so that if the average thickness of the bauxite crust be taken at 2ft. each acre of ground should yield over 6,000 tons of aluminium ore.

Pigments.

Steps have been taken towards utilising local ochres and related pigments in place of the imported ones, and a considerable number of chemical and mechanical analyses have been made of crude ochres of various colours, chiefly ochre yellow, sienna, light red, venetian red, and umber. The only ones put on the market so far appear to be two light reds, though many others are of good quality and will, doubtless, be used as time goes on.

Graphite.

A large number of samples of graphite-bearing rocks continue to come in for assay and concentration test. All those of any promise have come from one of two areas, viz., a smaller area lying between Geraldton and the Lower Murchison River, and a much larger area stretching from the Great Southern Railway, between Katanning and Mt. Barker, eastwards to the Oldfield River. Practically the whole of the graphite occurring outside these two areas appears to be of the "amorphous" variety. Many of the samples sent in contain valuable flake,

but in too small quantities to be worth concentrating, though much better material may lie at a few feet depth underneath.

Abrading Papers.

An examination was made of several imported abrading papers, which form the sole supplies at present on the market, with the view to determining whether suitable material was not available in the State for manufacturing these articles. It was found that one brand was made of carefully graded broken bottle glass, a second of crushed vein quartz, a third of crushed emery. Supplies of all these could be obtained locally. Broken bottles can be bought for something under £2 a ton in the metropolitan district; sharp crushed vein quartz could be obtained on many tailing dumps, or could be quarried specially for the purpose close to Gosnells Railway Station, or elsewhere, whilst a superior emery could be obtained in abundance in the West Kimberley District.

Mineral Notes.

Amongst the numerous minerals submitted for classification and valuation during the year, the following were noted:

Gearksutite (hydrous fluoride of calcium and aluminimum), Gingin. This extremely rare mineral occurs as white chalky nodules in a bed of green sand. An analysis has proved that it is of normal composition. If found in sufficient quantity gearksutite would make a valuable flux in aluminium smelting.

Cerargyrite (chloride of silver) and *Brochantite* (hydrous sulphate of copper), Stockyard Creek, North-West Division.—A copper ore sent in from this locality was found to contain 37.65 per cent. of copper, and 67 ounces of silver per ton. The whole of the copper in the ore was proved to be present as brochantite, and the silver as cerargyrite.

Corundum (oxide of aluminium), Richenda River, Kimberley Division.—A dark grey finely crystalline rock from this locality was found to be mainly corundum mixed with diaspore and darkened by the presence of a little carbon. It broke easily into fragments, which were extremely hard, and were found to have high abrasive power either in the form of powder or made into an "emery-wheel" with suitable cement.

Jarosite (hydrous sulphate of potassium and iron). Upper Kalgan River and Mulgine. Jarosite has been found in the form of a fine yellow powder impregnating a very soft and porous sandstone of Miocene age on the Upper Kalgan River. The mineral did not exhibit the characteristic crystalline outline under the microscope, but chemical tests left no doubt as to its identity. A typical mass of the rock contained the following proportions of alkalis soluble in dilute hydrochloric acid:—

K_2O, 4.16 per cent; Na_2O, 0.32 per cent.

A single small mass of jarosite has been found in a molybdenite lode (crushed granite) at Mulgine.

Fire-opal, Yundamindera.—The variety of opal known as fire-opal, on account of its flame-like tints when cut into a facetted gem, has been obtained at Yundamindera forming irregular masses in a chalcedonised rock. A specimen sent to Perth during the year was of typical deep amber colour, and almost perfectly transparent. The whole mass of mineral weighed about 20 grams (100 carats), but on account of fissures only part is capable of being cut into gems. It was considered that at least two cut gems of several carats each could be obtained from the specimen.

Phosphate-rock, Abrolhos Islands.—A careful sampling was made by Mr. T. Blatchford of the limestone immediately beneath the guano deposits of West Wallaby Island in the Abrolhos Group, and his samples were examined in the Laboratory for the presence of rock phosphate. It was found that on much of the limestone there was a very thin crust, at most one-eighth inch thick, of highly phosphatic rock, but immediately beneath this crust the limestone carried very little phosphorus, the assays ranging from a trace to 1.5 per cent P_2O_5, with a single sample yielding 6.28 per cent. P_2O_5.

Scheelite, Comet Vale.—In examining Mr. Jutson's specimens from the Comet Vale district scheelite was found in two distinct rocks, viz., a green coarse-grained radiating actinolite rock, and a white granitic dyke rock. Both contained a little copper carbonate and were from the same lease, viz., the Lake View G.M.L. About the same time the same scheelite was discovered by prospectors on the spot, and during the year several parcels of both varieties of ore were sent to the Coolgardie State Battery for treatment to extract the scheelite.

Coal, Wilga.—During the year coal of the Collie type (hydrous bituminous non-caking) was discovered in the Upper Collie valley at Wilga. This coal has the following composition:—

	3631E.	3677E.
Moisture	18.43	18.57
Volatile	29.20	33.88
Fixed carbon	47.13	42.60
Ash	5.24	4.95
	100.00	100.00
Calorific value, B.T.U. ..	9,253	8,717

3621E was the sample submitted by the prospector; 3677E was collected by Mr. T. Blatchford at the mine. The samples obtained so far are of no better quality than the average Collie coal.

Asbestos, Bindi Bindi, east of Moora.—Some very good asbestos has been been collected from time to time at a locality about 20 miles east of Moora. The best of it is in fine soft silky fibres of very high tensile strength and ranging in length from ¼ inch to several inches. An analysis made of a typical specimen proved the mineral species to be Anthophyllite, a mineral previously described as occurring at times in asbestiform, *i.e.,* finely fibrous, aggregates, but never, apparently, found of such excellent commercial quality as that occurring at Bindi Bindi. In the same district as the good quality asbestos there is much of such inferior quality as to be valueless. The latter is in hard, brittle, and coarsely fibrous masses, often of great length.

Beryl (hydrous silicate of beryllium and aluminium), Balingup and Toodyay.—In both these localities common beryl has been found in pegmatite veins associated with coarsely crystallised felspar (microcline) of suitable quality for pottery purposes. At Balingup the mineral is common in large masses and imperfect crystals, usually of a bluish tint, and sometimes possessing considerable depth of colour, but too much flawed to be cut into gems. At Toodyay the mineral appears to be much less plentiful; it occurs in rather small crystals of a pale greenish-yellow tint, and possessing very little translucency.

Chrysoprase, Comet Vale.—Amongst the specimens collected by Mr. J. T. Jutson and Mr. N. T. Stokes at Comet Vale were a few good specimens of this mineral, well suited for cutting into gems. The mineral occurs in discontinuous veins and nodules in a laterite overlying an altered peridotite. Its rich green colour was proved to be due to the presence of nickel silicate in small proportions.

Gahnite (aluminate of zinc), Nevoria.—This rare mineral was found to be abundant in scattered grains and parallel strings of grains of a dark green colour

in a matrix of quartz. The clean concentrated mineral had a density of 4.5, and contained 26 per cent. of zinc oxide. The same mineral has previously been observed at Greenbushes.

Repatriation.

During the year the Minister for Mines appointed Mr. C. M. Harris (Consulting Engineer), Mr. I. H. Boas (Technical School Lecturer in Chemistry), and myself to act as a Committee to facilitate the fitting out of returned soldiers as prospectors and to assist them when in the field by means of advice and practical tests of minerals. This Committee has done a large amount of most useful work without ever finding it necessary to go through the usual formalities of appointing a secretary, holding formal meetings, etc. Mr. Harris in particular deserves much credit for the large amount of time which he has devoted with enthusiasm to the instruction of would-be prospectors in the methods of detecting and testing commercially valuable minerals. Much of my own time has been devoted to examining and reporting on material collected by these men in the field.

Table showing the Work carried out in the Geological Survey Laboratory during 1917.

	Public Pay.	Public Free.	Geological Survey.	Other Departments.	Total.
Samples	95	643	247	1,081	2,065
Gold Assays	43	117	6	760	926
Silver assays	2	42	2	31	77
Copper assays ...	1	50	2	28	81
Tin assays	1	25	...	18	44
Lead assays	20	11	...	11	42
Bismuth assays ...	...	2	...	5	7
Iron assays	...	11	7	1	19
Manganese assays ...	...	7	6	...	13
Tungsten assays ...	...	21	...	33	54
Lime assays	...	7	...	2	9
Arsenic assays ...	...	2	...	2	4
Phosphoric oxide assays	...	25	23	...	48
Silica assays	...	7	24	...	31
Molybdenum assays ...	...	6	...	...	6
Carbon assays ...	...	...	...	1	1
Sulphur assays ...	...	53	97	27	177
Petroleum assays ...	...	4	...	...	4
Lithia assays	...	1	...	...	1
Titanium assays ...	...	2	...	...	2
Zinc assays	...	2	...	...	2
Nickel assays	...	2	1	...	3
Chromium assays ...	...	3	1	...	4
Potash assays	2	63	45	5	115
Sodium chloride assays	...	...	...	3	3
Proximate analyses ...	19	59	52	16	146
Complete analyses ...	1	6	15	4	26
Partial analyses ...	3	76	74	12	165
Determination ...	4	395	38	42	479
Clay Tests (Practical)	1	3	2	97	103
Calorific Value ...	...	4	1	8	13
Aluminium assays ...	...	36	17	...	53
Water analyses ...	...	...	3	...	3
Mechanical analyses ...	...	4	18	16	38
Plasticity Tests ...	...	...	...	6	6
Standardising Weights	...	...	...	6	6
Coking Experiments ...	...	...	...	19	19
Zirconium assays ...	...	1	...	1	2
Graphite Tests... ...	16	23	14	3	5
Glass Experiments ...	...	...	...	7	7
Fire Tests	...	...	3	3	6
Pigments	...	5	...	2	7
Nitrate assays ...	...	2	...	...	2
Boron assays	...	2	...	...	2
Microphotos	...	...	3	...	3
Miscellaneous	3	9	11	14	37
Totals	116	1,088	465	1,192	2,861

PETROLOGICAL WORK.

(R. A. Farquharson.)

As usual, the petrological work carried out during the past year may be conveniently summarised under the following heads:—

I.—Determinations and Reports for the Geological Survey Staff.

II.—Determinations and Reports for Mine Managers, for other Departments, for Prospectors, and for the general public.

III.—Miscellaneous.

I.—Determinations and Reports for the Geological Survey Staff.

As in previous years a considerable part of the work for the year has been the determination, description, and correlation of rocks collected by the officers in the field, discussions with the officers concerned, of the geological problems of each district, and careful consideration of the field occurrence of the rocks with the ascertained microscopic characters. The results of this work are that so far as field data and specimens can be collected, the mapping which constitutes such a large and important part of the work of the office is as accurate as possible. Much criticism has been launched of late in regard to the administration and methods of the Mines Department as a whole, outcries have been made that prospecting should be much more encouraged than it is. Be that as it may, there can be no doubt that the accurate outlining of those belts of greenstone in which experience—in other parts of the State—has shown the occurrence of gold to be possible if not probable, is of quite as much value to the prospector when the information is intelligently used as material assistance from the Government. He knows not only where to go, but what is equally important, what not to waste his time over.

In the past year, however, a much greater part of the work than hitherto has been the investigation of problems arising out of researches in economic or industrial geology by the field officers, and the nature and results of these investigations and others for mine managers fully bear out the statements in regard to the application of Petrology in Economic Geology which I made in an article for the Mining Handbook. Some details of these investigations will be given later.

The total number of sections cut and registered during the year was 393, but, in addition to these, I have myself cut 227. A general account of the Petrology of Kookynie, Niagara, and Tampa, and of Goongarrie and Comet Vale was written early in the year, and later on an abridged account of these was made for publication. The suites of rocks examined include those from:—

1.—*The Vicinity of Bulong.*

These were collected by Mr. Feldtmann in the course of his investigation of the occurrence and origin of the magnesite deposit a short distance out of Bulong. Owing to the necessity for curtailing the size of the report, few but the broad petrological features appear in the text, but the map and plans represent the considerable amount of work done both

by Mr. Feldtmann and by myself. The chief rocks noted from the locality were:—

(a.) Serpentines.—It is with these that the magnesite is associated. Some appear to have consisted largely of olivine, others of a rhombic pyroxene, with subordinate olivine.

(b.) Amphibolised gabbros or coarse dolerites, and fine-grained epidiorites.

(c.) Porphyrites.—Some of these are quartz-hornblende-porphyrites more or less zoisitised, others are biotitic quartz porphyrites probably albitic. Some of the rocks are light grey, others quite black.

(d.) Clastic Rocks.—Occurring on the margins of the lake, these are greenish-grey, in places whitish with undoubted rounded pebbles of porphyrite and a fine-grained matrix, the whole resembling in some respects a greywacke, in others an agglomerate. They are all more or less sheared.

2.—*The Hampden-Cloncurry Mines and their vicinity, Queensland.*

At the request of Mr. C. G. Gibson, a former officer of the Survey Staff, and by permission of the Government Geologist, I made an examination of about 80 rock specimens from this locality, with the object not only of determining the rocks, but of finding whether any of them were contact metamorphosed sediments. Evidence was obtained showing that some of the amphibolites were limestones which had been metamorphosed by intrusive dykes with the production of hornblende, scapolite, etc.

3.—*The Barren Range, Hamersley River, S.W.*

These specimens, collected by Mr. Blatchford, include:—

(a) White quartzites.
(b) Amphibolised dolerite or epidiorite.
(c) Coarse quartz grit or breccia (crush conglomerate?).
(d) Phyllitic slates and micaceous schists.
(e) Green opalised rock with magnesite.

The occurrence of the amphibolised dolerite probably as intrusive dykes or sills in quartzites, which are the counterpart of the Stirling Range quartzite, is of some significance, especially as the dolerite or epidiorite is similar to those of the goldfields.

4.—*Leonora, Laverton, Anaconda, etc.*:—

The determination, description, and correlation of these rocks, collected by Mr. Clarke, took up a considerable amount of time. In all, about 220 sections were cut and examined after a selection of the more important specimens had been made. Moreover, those sections in the Survey Collection of the rocks previously obtained by Messrs. Jackson and Gibson were also examined in order that the work of the two latter might be linked up accurately with that of Mr. Clarke. The general account of the Petrology of the District is in course of preparation, but the chief rock types met with may be given here. They are:—

(a) Granites, reddish, greyish-white, and dark-grey; some porphyritic, others pegmatitic, others more or less gneissic.

(b) Quartz Porphyries; some sheared, some micacised, some rhyolitic; a few carbonated and chloritised.

(c) Porphyrites. Of these, some are zoisitic hornblende porphyrites possibly of volcanic origin (*i.e.*, andesites); others are normal porphyrites with or without quartz and chlorite. Some of the latter are demonstrably dykes, but the field relations of others are uncertain.

(d) Medium to coarse-grained amphibolised and zoisitised dolerites, or epidiorites. Some of these show micro-pegmatitic intergrowths of quartz and felspar; others contain original augite; a few are saussuritised; others, again, have almost wholly lost their original structure and composition. In many of them ophitic structure is clear.

(e) Fine-grained zoisitic amphibolites, derived from fine-grained basaltic dolerites. A few of these resemble the fine-grained amphibolites at Kalgoorlie with confusedly fibrous structure, others are dark green chloritised epidiorites. Though some may be of volcanic origin, others are probably but fine-grained facies of the previous group.

(f) Carbonate-chlorite rocks. Some of these also contain quartz, others show hornblende needles and remains of felspar columns. Nearly all are sheared or schistose. Their origin is not in all cases clear, but most of them have doubtless been derived from amphibolitic or epidioritic rocks.

(g) Serpentines. Of these, a few have been derived from dunites, some from rocks closely resembling hartz burgites, and one is a tremolite-chlorite-serpentine.

(h) Amphibolites. These comprise prismatic and zoisitic fibrous facies, chloritised hornblendites similar to those at Goongarrie and perhaps more correctly included in the previous group—zoisitic epidiorites like those at Armadale, and a few well-foliated rocks.

(i) Olivine Basalt. One very fine example of this type occurs as a dyke in granite near Point Sheila, Neckersgate Range. It contains thin divergent groups of felspar needles with grains of olivine and crystals of augite. Another fresh dolerite without olivine occurs as a dyke in the Ida H. Mine.

(j) Hornblende Gabbro. This is a granular pyroxene-hornblende-felspar rock with the felspars elongated and parallel, *i.e.*, with a sort of fluxion structure.

(k) Andalusite rocks. Two types were found, one a granulated andalusite-quartz rock from the west slope of Mt. Leonora, and the other a black andalusite shale, which was not found *in situ*.

(l) Fragmental rocks; Agglomerates. These comprise a fragmental greenstone schist with rounded fragments of chloritised porphyrite; an andesite agglomerate with chloritic andesitic fragments in a carbonated matrix; and several decomposed iron-stained and clayey fragmental specimens.

A general account of the petrology of the whole district is in course of preparation for publication in Bulletin form.

5.—*The Ashburton District and Bangemall.*

These specimens were collected by Mr. Talbot. Though they have been determined and correlated, they have not yet been written up in a general account, and part of the work properly belongs to 1919 rather than to 1918. The chief rock types met with, however, may be noted here:

(a) Zoisitised and chloritised basaltic dolerites resembling some fine-grained amphibolites from Kalgoorlie.
(b) Coarse-grained fresh and partly or wholly amphibolised quartz and micropegmatitic quartz-dolerites.
(c) Quartzites, limestones, and dolomitic limestones, grits and arkoses.
(d) Rhyolitic and chloritic quartz porphyries.
(e.) Coarse-textured volcanic agglomerates composed of pale green isotropic glass with a kind of perlitic structure.
(f) Basalts and basaltic dolerites, some of which are vesicular and clearly of volcanic origin.

Work in connection with investigations in Industrial Geology by field officers includes the following:—

6.—*The determination of and notes on samples of rock and clay from Three Springs, collected by Mr. Feldtmann.*

These were made to ascertain the nature of the rocks, their mineral composition, structure, and relationships. The rocks included:—

(a) Slightly iron-stained quartzite.
(b) Pale yellowish-white grits and concretionary grits.
(c) Fine white laminated gritty clay shale and slate.

7.—*Determination and Notes on specimens from Mt. Kokeby, collected by Mr. Feldtmann with the same object.*

They comprised:—

(a) Aplitic gneiss.
(b) Coarse chloritised micropegmatitic quartz dolerite.
(c) Foliated tourmaline-quartz rock.
(d) Granitic quartz.
(e) More or less porphyritic biotite microcline granite.

8.—*Examination of rocks from Warriedar, collected by Mr. Blatchford.*

The objects were to determine the relationship between two granites, the relative age of the molybdenite and mica in the rock, and the possibility of interlamination of the molybdenite with mica, etc., which might cause and explain unexpected extraction results.

The granites are similar, except that one is finer grained than the other, and the molybdenite occurs in places between the scales of mica.

9.—*Report on a sample of limestone from the Abrolhos Islands.*

The sample was partially phosphatised limestone which consisted chiefly of calcareous algae and which contained remarkably little quartz, in contrast to our coastal limestones. Sections loaned by the University were also examined and compared with those cut from the phosphatised rock.

10.—*Report on Slate from Tenterden, collected by Mr. Blatchford.*

The examination of this slate was undertaken to determine its constituents, the state of perfection and direction of the cleavage and fissility, and, generally, the suitability of the stone for industrial purposes. It was found that, while the composition was all that could be desired, the rock split imperfectly along the bedding planes, and only in small thick uneven plates along the cleavage, which was inclined at a considerable angle to the bedding planes. The slate may, perhaps, be of use for paving slabs, but is of inferior quality for roofing purposes.

II.—Determination and Reports for Mine Managers, for other Departments, for Prospectors, and the general public.

In the Annual Report for 1917 mention was made of the increase in the number of requests for petrological information from mine managers. The year 1918 has witnessed a still greater increase in the number and variety of such requests, and the work done proves clearly that those responsible for the conduct of mining operations are becoming more and more alive to the value of an accurate knowledge of the character, origin, alteration, and relation to one another of the rocks of any mine, and the influence of these factors on the development and future of the mine. The importance of such knowledge was fully realised in Kalgoorlie after the researches of Maclaren and Thomson on the Golden Mile, and it is distinctly encouraging to find that mine managers are becoming of their own free will anxious to avail themselves of the assistance of the Geological Survey Staff. In an article on the Application of Petrology in Economic Geology, I indicated the various directions along which microscopic methods were of much service in the investigation and exploitation of ore deposits, in mining engineering, architecture, etc., and no more gratifying sign of a general awakening amongst technical officers to the value of these methods can be found than in the work done in 1917, and particularly in 1918.

The investigations carried out under this head include:—

(a) Examination of thirty-five rocks from the Youanmi Mine for the manager. These rocks were collected by Mr. Blatchford, and after a petrological report on them had been drawn up the mining geology of the mine was discussed by the manager, Mr. Blatchford, and myself until most of the difficulties in connection with the mine had been removed. Broadly, it was found that there were granite dykes intrusive into completely sericitised, sheared, and pyritised greenstones, and as the granite dykes were in places also sheared the chief difficulty was to determine what was originally greenstone and what granite. The question was of great importance, since the position of the two rocks determined the future development of the mine.

(b) Investigation of the probable origin of a rock for the Minister for Industries in connection with the possible occurrence of oil.

(c) Determination of the affinities of a rock from the Lloyd George Mine for the State Mining Engineer.

(d) Report on the value of a building stone from Dardanup.

(e) Examination of Graphite samples from Munglinup to ascertain the cause of unexpectedly low extraction results. It was found that the graphite folia were in part interlaminated with rock material (limestone), and the graphite was also in part incorporated in quartz mosaic.

(f) Examination of and verbal report on a slate from Coolgardie. This slate was in reality a highly sheared actinolitic amphibolite, and of poor quality.

(g) Determination of and report on samples from near Cue, with notes on whether the material was lode or reef, and on whether an increase in the value of the material with depth was possible.

(h) Determination of various rocks, etc., from the Hawaiian Islands for the Museum authorities.

(i) Report on rocks from the Edna May Central Mine for Mr. H. G. Stokes.

(j) Examination of Red Granite from Chidlow's Well for the Department of Works, to determine the ability of the stone to resist weathering, and its power to retain the red colour. The rock was prone to weathering, and the red colour, being due only to a stain and not being uniform, would not be permanently retained.

(k) Determination of rocks from the manager of the Ingliston Consols Mine. The rock held to be basic was the typical albite porphyry of Paddy's Flat.

(l) Determination of the original rock of the Alunite Deposit near Kanowna for the State Mining Engineer. The rock was a red iron-stained quartz-porphyry.

(m) Determination of rocks from the Edna May Deeps and Edna May Central Mines for Mr. H. G. Stokes.

In addition to the above, 138 determinations of rocks and minerals have been made for prospectors, the Mines Department, and the general public, and information has in many cases been given, both orally and in notes, about the market value of ores and possible buyers.

III.—Miscellaneous.

An appreciable amount of time and labour has been spent on the following:—

(a) Reports on samples of mica, asbestos, etc.

(b) Preparation of numerous collections of minerals for prospectors, schools, mining registrars, etc.

(c) Correction of proofs of reports.

(d) Bringing up to date the Card Catalogue of mineral specimens belonging to the Geological Survey.

(e) Bringing up to date the Register of rock sections in the Survey Collection.

(f) Ascertaining particulars of the occurrence of flint stones or possible substitutes. This inquiry was started on the request of Messrs. Strelitz Bros., for information of the occurrence in Western Australia of any pebbles that could be used to take the place of the formerly imported French and Danish flints. Various conglomerate pebbles were mentioned, but most of these, owing to shearing, were unsuitable. Quartz blows were also unsuitable owing to the irregularity of the fragments. The firm was finally referred to the Victorian Geological Survey. The flint pebbles in South Australian are apparently not hard enough.

(g) Arranging for the replenishment of our stocks of minerals of economic value from which collections are from time to time prepared for prospectors, schools, etc. Through the courtesy of various donors we have now a fair supply of scheelite, magnesite, wolfram, tinstone, graphite, etc.

(h) As opportunity was afforded, the overhaul of the rock and mineral collection in the Museum. So far as this work has gone, each specimen has been examined, and where the label on the specimen is missing, where the specimen is of little or no value, a distinctive mark has been placed opposite the registered number in the catalogue. From the extent of the overhaul already made, it is clear that a complete revision of all the specimens and labels is, in the interests of the collection, very desirable, if not necessary.

GEOLOGICAL SURVEY MUSEUM AND COLLECTION.

As is well known, one of the most essential instructional portions of the equipment of the Geological Survey is its Museum, in which the various rocks, minerals, and fossils collected by the staff in the ordinary course of its duties, or acquired by purchase or donation, are exhibited and arranged for the benefit and instruction of the general public in illustration of the reports and maps.

Some years ago it was decided, after mature consideration by the Government, that the small Geological Collection in the custody of the Western Australian Museum should be taken over and combined with that belonging to the Survey, thus introducing into Western Australia a system of administration which is only a really scientific classification of functions, with the additional merit of having had successful experience elsewhere to guide it; by such an amalgamation it was hoped that duplication of scientific effort would be reduced to a minimum. Unfortunately, by the passing of the Public Library, Museum, and Art Gallery of Western Australia Act, whereby all property other than that which was on loan became vested in trustees, the collection transferred to the Survey was handed back to the trustees, and the old unsatisfactory condition of affairs connected with the management of the National Geological Collection (fully nine-tenths of which were originally owned and collected by the Survey) was revived.

The Survey Collection housed in the Museum remains practically in the same condition as it was during the year 1917. Attention must again be drawn to the fact that the operations of the Geological Survey have been hampered and its utility very seriously impaired through the lack of proper Museum accommodation, to which attention has frequently been directed in previous Annual Reports, more especially in that for 1909, p. 9, *q.v.* The proper housing of the Survey staff, its Laboratory and Collections, forms one of the most pressing needs of the Department, and one which merits serious and final consideration at the hands of the Government.

As pointed out in 1909, the contemplated arrangement of the Survey Collections in the Geological Museum was designed to meet the requirements of four totally distinct classes of visitors to the Department, viz., (a) the general public; (b) the average student; (c) the practical man, prospectors, miners, engineers, etc., and (d) the scientific inquirer.

In such an important mining country as Western Australia, the guiding principle in the arrangement of the exhibits in the Geological Museum is designed to be the illustration of the geological structure and mineral resources, in addition to the application of geology to various industrial pursuits, as well as the more systematic treatment of the science of geology in general. In the case of the metallic ores and minerals, it is intended to exhibit typical specimens of nearly uniform size in conjunction with illustrative maps, plans, diagrams, and photographs, such being, as may be readily understood, of much greater scientific, commercial, and educational value than large trophies or bulk samples from individual mines or districts. An exhibit of this kind, to be worthy of the name, ought, of course, to fairly and efficiently represent the mineral resources within the State by giving undue prominence to no one mineral product and neglecting nothing that it is essential should be represented. The value of such an exhibit to the State will depend solely upon the exactness with which it reproduces the actual state of knowledge relating to the mineral products of Western Australia, for any exaggeration in one direction or omission in another will tend to leave an erroneous conception of the resources of the State. In all cases, care will be taken to preserve and exhibit only such specimens as are of permanent and real value.

A Western Australian economic geological exhibit should endeavour to illustrate the actual mineral and allied resources of the State—whether these resources be developed or undeveloped—giving the different products prominence in accordance with their present or prospective importance. In this way very many valuable materials which are undeveloped would be brought under the notice of specialists and others, and, as a result, would tend to receive quicker development than if they had not been placed on public view, especially at a time such as this when efforts are being made in all directions to develop minerals required in connection with many trades and industries.

The Geological Museum, if carried out on these lines, will then be, as it ought to be, primarily a collection illustrating in its widest sense the geological structure of Western Australia in its relation to the mineral industry and to geological science in general.

The additions to the Geological Survey Collection during the year 1918 amounted to 828, thus bringing the total number of rocks, minerals, and fossils registered up to 16,348.

The number of micro-sections cut during the period under review amounted to 620, thus bringing the total number of slides in the possession of the Department up to 3,870.

In pursuance of one of the educational functions of the Survey, collections from the somewhat limited stock of duplicates were made up and despatched.

Bulk samples were supplied to the School of Mines at Kalgoorlie, a small collection of minerals to the Leonora Miners' Institute, and about 20 mineral collections were made up and sent for distribution to the Returned Soldiers' Association.

Special acknowledgments must be made of the donation to the collection of:—

$\frac{1}{1635}$—Obsidianite, 606-mile, Trans. Railway, Nullabor Plains (Mrs. E. Brown).
$\frac{1}{1636}$—Spotted Hornblende Rock, Toodyay (J. Wells).
$\frac{1}{1637}$—Molybdenite in Granite, Mulgine (Coles & Coles).
$\frac{1}{1638}$—Molybdenite and Scheelite in Granite, Mt. Mulgine (A. E. Morgans).
$\frac{1}{1640}$—Siliceous Sinter, Lake Austin (J. D. Daniell).
$\frac{1}{1641}$—Pebbles, 104-miles, Trans. Railway (P. Parker).
$\frac{1}{1644}$—Bitumen, Cheynes Bay (C. J. R. Le Mesurier).
$\frac{1}{1650}$—Magnesite, Edjudina (C. H. Webb).
$\frac{1}{1676}$—Flint Pebbles, Denmark and France (Strelitz Bros.).
$\frac{1}{1700}$—Building Stone, Tuckabianna (A. Brown).
$\frac{1}{1701}$—Fossil, Gnowangerup (C. J. R. Le Mesurier).
$\frac{1}{1703}$—Auriferous Secondary Silica, Menzies (N. Stokes).
$\frac{1}{1790}$—Scheelite in Actinolitic Schist, Comet Vale (H. W. Taylor).
$\frac{1}{2249}$—Obsidianite, Kanowna (W. Wyatt).
$\frac{1}{2251}$—Alunite and Associated Rock, Mt. Walter (G. Lambert, M.L.A.).
$\frac{1}{2338}$—Molybdenite in Granite, Warriedar (Mr. Wakeham).

The resident and field officers of the staff have, during the ordinary course of their official duties, taken a number of photographs of geological mining and microscopic subjects, bringing the total number registered up to 1,659.

LIBRARY.

The Geological Survey Library was enriched during the year 1918 by 473 publications from other cognate institutions throughout the world; in addition, 98 volumes were added by purchase, and six volumes bound.

The distribution of the official publications of the Survey issued during the year amounted to 3,701, as against 3,248 of the previous year.

PUBLICATIONS.

The publications for the year have been as follows:—

Annual Progress Report for the Year 1917.

In addition, there are now in the hands of the Government Printer:—

Bulletin 77.—Sources of Industrial Potash in Western Australia: E. S. Simpson, I. H. Boas, and T. Blatchford.

The following await authority for publication:—

Bulletin 78.—The Mining Geology of Kookynie, Niagara, and Tampa, North Coolgardie Goldfield: Jno. T. Jutson.

Bulletin 79.—The Mining Geology of Comet Vale and Goongarrie, North Coolgardie Goldfield: Jno. T. Jutson.

Bulletin 80.—The Mining Centres of Quinn's and Jasper Hill, Murchison Goldfield: F. R. Feldtmann.

Bulletin 81.—The Warriedar Gold-mining Centre, Yalgoo Goldfield: F. R. Feldtmann.

Bulletin 82.—The Magnesite Deposits of Bulong: F. R. Feldtmann.

Bulletin 83.—The Geology and Mineral Resources of the North-West Division, between Latitudes 22 degrees and 28 degrees south and Longitudes 119-123 East: H. W. B. Talbot.

The following are in active preparation:—

The Western Australian Mining Handbook, containing (a) A summary of the geology of Western Australia, (b) The Economic Geology and Mineral Resources of Western Australia, (c) The Physiography of Western Australia and its relation to Prospecting and Mining, (d) Minerals of Economic Value, (e) Petrology and its application in Economic Geology, together with an account of the chief Rock-making Minerals and Rocks, (f) Relation of the Law to Prospecting and Mining Development, and (g) Glossary of some common terms used in the mining field, and Physiographical Geology: By A. Gibb Maitland and Staff.

The Artesian Water Resource of Western Australia: By A. Gibb Maitland.

The Geology and Mineral Resources of the Yalgoo Goldfield: By A. Gibb Maitland.

The South-West Division, its Geological Structure and Mineral Resources: By the late H. P. Woodward (but incomplete).

A Geological Reconnaissance of part of the Ashburton Drainage Area, with Notes on the Country southwards to Meekatharra: By H. W. B. Talbot.

The Field Geology of the Country between Latitudes 27° 30′ and 29° South and Longitudes 122° 30′ and 120° 30′ East, embracing parts of the Mount Margaret and East Murchison Goldfield, also the Geology of the Anaconda Copper Mine and neighbourhood: By E. deC. Clarke.

A. Gibb Maitland

Government Geologist.

Geological Survey Office, Perth,
1st February, 1919.

DIVISION V.

SCHOOL OF MINES OF W.A.

School of Mines,
Kalgoorlie, 31st March, 1919.

The Under Secretary for Mines.

I beg to forward, for the information of the Hon. the Minister, my report for the year 1918.

The Lecturer in Electrical Engineering, during whose long association with the School a strong department had been built up in Electrical Engineering and allied subjects, left the district in July. Arrangements were made to carry on his class work for the remainder of the year with part-time Instructors. Owing to the difficulty of securing fully qualified Lecturers to fill vacancies at the present time, it has been decided to place Electrical Engineering under the Lecturer in Physics, who is well qualified in Electrical work, and it is anticipated that with the appointment of an Assistant and the employment of part-time Instructors for special subjects, such as Engine-driving and Fitting and Turning, the work of the two departments will be conducted satisfactorily.

Notwithstanding the disturbing influence of the war and the considerable number of students who have enlisted, the enrolment at the School of Mines has been steadily increasing, and during 1918 there was a record attendance. That the increase is particularly marked in the Preparatory classes, Mathematics, Chemistry, Physics, Drawing, and Geology, augurs well for the future of the School, indicating as it does that the community is alive to the necessity of carrying the education of youths beyond the primary stage. The value of a sound technical training at the School of Mines is becoming more widely recognised every year, and there is a growing demand for additional educational facilities. To adequately deal with the anticipated increase in the number of students during 1919 it will probably be necessary to appoint an Assistant Lecturer, and the question of extra classroom accommodation will also require consideration.

During the war great difficulty has been experienced in obtaining scientific supplies, especially up-to-date instruments, the lack of which has been severely felt, but it is hoped that this disability will speedily disappear and that the Lecturers will soon be able to secure a sufficiency of much-needed equipment. During the past five years the classes have been worked as economically as possible, without sacrificing efficiency. The Staff consider that a progressive policy should now be entered upon and the operations and efficiency of the School extended to meet the requirements of the times. There is a general feeling that additional facilities should be provided in all departments of the class work in order that the instruction may keep pace with the developments which have occurred in mining and metallurgy during recent years. In connection with the greatly increased activity in the base metal industry and in the exploitation of minerals of economic importance, it is considered that the erection of an experimental metallurgical plant at the School is an urgent necessity. Such a plant would give students a training in methods of ore treatment as practised in other localities, it would supply useful information as to the possibilities of any new finds that may be made, and would be in keeping with the spirit of the times which will demand extensive research work in the future. Some details of a proposed experimental plant to meet the immediate requirements have already been supplied.

Although many of the senior scholars have gone on active service, several responsible positions have been filled by students during the year. W. Galt, who, after serving at the Front, returned to his former position as Assistant Engineer at the Sons of Gwalia, has recently been given a position with the Zinc Corporation at Broken Hill. W. Davis, who enlisted in the early part of 1918, returned from Sydney on the declaration of the Armistice and has been appointed Assistant to the Engineer at the Sons of Gwalia. T. G. Butement has been made Assistant to the Engineer at the Ivanhoe Gold Mine. C. J. McDermott has been made Assistant Surveyor at the Ivanhoe. J. Grigg has been appointed Head Surveyor to the Penang Consolidated Mines, and two other students, H. L. Ditchburn and J. Noall, have gone as Assistant Surveyors under him. Their duties will include railway and irrigation work, in addition to Mine Surveying. J. H. Lang, lately Mechanical and Electrical Engineer to the Edna May, has been transferred to a similar position on the Edna May Deeps. M. Heston has secured a good electrical position on the Zinc Corporation Mine at Broken Hill. E. E. Kurth, who held the Robert Falconer Research Scholarship during 1917 and has since been an Assistant to the Engineer at the Sons of Gwalia, has been selected to carry out special research work at the Electrolytic Zinc Company's works at Risdon, Tasmania.

Students at the Front have rendered a good account of themselves. The Honour list includes the names of approximaately 200 students, one third of whom have attained the rank of Non-commissioned Officer or higher. Several have gained distinctions, and the School mourns for others who have made the supreme sacrifice.

The year's work has been satisfactory, and there was an increase in the number of passes at the end of the year. The younger students, however, were greatly inconvenienced by having to attend the Instructional Camp for Citizen Forces at a time that interfered seriously with their class work. The original intention of the Military Authorities was to hold the camp in November, during the weeks set down for the annual examinations of the School, but

an alteration was made and the camp was held during the last few weeks of class work. Students unable to attend the final lectures of the year's course were heavily handicapped, as the weeks spent in camp allowed no opportunity for study and unfitted the students for examinations held immediately after their release from military duty. Considering the importance of education it seems a pity that the camp for the Citizen Forces is not held at a time when it will cause a minimum interruption in the class work of students attending the School of Mines. Some time in December or January, during the summer vacation or at Easter, would be far more suitable for School of Mines students than any period between May and December.

It has been a matter for regret that, of recent years, there has been little competition for the School of Mines Scholarships, of an annual value of £40, £60, and £75 respectively, which are offered for competition each year, but with the return to more normal conditions it may be expected that sufficient candidates will come forward to bring the scholarship scheme once more into full operation. Scholarship holders devote their whole time to study at the School, they form the best class of students and are afforded exceptional opportunities of laying a sound foundation for a successful career in Mining or Metallurgical Engineering.

During 1918, 551 free assays and mineral determinations were made for prospectors, of materials from Crown Lands not held under lease for mining purposes:—

	Number.
Assays for Gold and Silver	333
Assays for Copper, Lead, Tin, etc. .	75
Determinations of Rocks, Minerals, etc.	143
	551

There has been a considerable increase in the work of the Assay department. Many inquiries have been answered concerning minerals of economic value which formerly were little sought after, and the School has been able to supply a large amount of information to prospectors.

In connection with the scheme arranged between the Repatriation Department and the State Mines Department for the equipment of prospecting parties, each composed of two or three returned soldiers, a number of short courses in prospecting and in the identification of minerals of economic value were conducted at the School of Mines during the latter part of the year. Several parties of returned soldiers attended the School, and although the time they were able to devote to study was very limited and might have been extended with advantage, they gained from the Lecturers in Mining and Geology an insight into many matters of considerable value to prospectors.

Towards the end of the year the School received from Queensland and New South Wales samples comprising ores of Tungsten, Molybdenum, and Bismuth, together with parcels of concentrates and tailings from treatment plants. Thanks are due to the Mines Departments of Queensland and New South Wales for their generous donations, and also to the managers of local mines—the Transvaal, Great Victoria, Comet Vale, Wolfram King, Edna May, and Edna May Deeps—for samples of ores of arsenic, tungsten, and molybdenum. The samples form a valuable addition to the School of Mines Museum.

Thanks are due to the Assisant Director and the members of the School Staff for their cordial co-operation in the proper conduct of the work of the School.

F. B. ALLEN,
Director, School of Mines.

DIVISION VI.

OPERATIONS OF "THE INSPECTION OF MACHINERY ACT, 1904."

Office of the Chief Inspector of Machinery,
Treasury Buildings, Perth, 8th April, 1919.

Annual Report of the Chief Inspector of Machinery and Chairman of the Board of Examiners for Engine-drivers, for the Year ending 31st December, 1918, with Statistics.

The Under Secretary for Mines.

Sir,

I have the honour to submit, for the information of the Hon. the Minister for Mines, the following report on the operations of the "Inspection of Machinery Act, 1904," in the districts proclaimed thereunder, together with statistical tables for the year ending 31st December, 1918.

For easy reference I have divided the report as follows:—

(1) Inspection of boilers.
(2) Explosions and interesting defects.
(3) Inspection of Machinery.
(4) Prosecutions under the Act.
(5) Accidents to persons caused by machinery.
(6) Engine-drivers' examinations and kindred matters.
(7) General.

DIVISION I.

Inspection of Boilers.

The number of boilers useful as steam generators on the register at the end of the year was 2,993, as against 3,017 at the end of 1917, showing a decrease of 24 boilers. There were 30 new boilers registered during the year. As against this there were 24 permanently condemned, and 35 transferred beyond the jurisdiction of the Act. All of these were exported to the Eastern States.

Operations in the various districts.

The following return shows the operations in the various proclaimed districts in connection with boilers, as compared with 1917.

Return showing operations in the proclaimed districts (Boilers only) during the year ended 31st December, 1918.

	1918.	1917.
Total number of boilers registered and capable of being used as steam generators ...	2,993	3,017
New boilers registered during the year	30	24
Inspections for year—		
Thorough	1,363	1,355
Working	172	182
Boilers condemned during year—		
Temporarily	50	49
Permanently	24	20
Boilers converted into tanks, air receivers, etc., during the year	...	2
Boilers transferred beyond the jurisdiction of this Act ...	35	13
Number of Notices issued for repairs during the year ...	311	303
Number of Certificates issued (including those issued under Section 30) during the year	1,351	1,367
Number of useful boilers out of use at end of the year ...	1,592	1,705
	£ s. d.	£ s. d.
Total amount of fees for 1918 ...	3,013 2 11	...
Total amount of fees for 1917 ...	...	2,806 4 9
Total number of Inspectors ...	*7	7

* Six only for four months.

The number of thorough and working inspections was 1,363 and 172, respectively, making a total of 1,535, showing an increase of 8 thorough inspections, and decrease of 10 working inspections.

In the South-Western District 960 inspections were made, or rather over 62½ per cent. of the total number.

In the Kalgoorlie group there was an increase of 32 inspections, being 8.8 per cent. of the inspections done in the districts attended to from this centre.

In the North Coolgardie and Mount Margaret Districts there was an increase of 17 inspections or 17.7 per cent. In the East Murchison and Murchison and Yalgoo Districts there was a decrease of 4, being 5.4 per cent.

The total number of boilers out of use at the end of the year was 1,592, against 1,705 in 1917, thus showing a great improvement on last year.

The revenue from boiler inspections was £3,013 2s. 11d., as against £2,806 4s. 9d. for the previous year, showing the satisfactory increase of almost £207.

The number of boilers permanently condemned was 24, or 4 more than last year; and 35 boilers, most of them large water-tube boilers, were removed from the jurisdiction of the Act, all being exported to the Eastern States where the demand for boilers was still acute owing to war conditions.

The following table shows the number of boilers temporarily or permanently condemned as a percentage of inspections made since the inception of an Act controlling boilers:—

Number of temporary and permanently condemned Boilers per 100 *inspections made since* 1899.

Year.	Temporarily.	Permanently.
	Per cent.	Per cent.
1899	2·64	1·42
1900	2·21	·498
1901	4·34	·511
1902	5·00	·958
1903	2·43	·697
1904	3·08	·389
1905	2·84	·388
1906	3·98	·960
1907	4·36	·802
1908	3·18	·599
1909	2·89	·797
1910	4·49	1·382
1911	3·54	8·070
1912	3·93	2·471
1913	2·64	2·431
1914	2·97	2·178
1915	4·72	1·538
1916	3·97	1·456
1917	3·19	1·301
1918	3·25	1·563

DIVISION II.

Explosions and Interesting Defects.

I am pleased to again report there has been no explosion of any boiler under the jurisdiction of the Act.

A somewhat alarming occurrence took place early in the year in connection with a locomotive. This engine is of peculiar construction. The actual engine is vertical and connects to the driving wheels by means of geared wheels. The engine is secured to the *right* side of the firebox casing. Probably in order to equalise the engine strain between the two sides of the firebox casing there are a number of transverse stays across and above the top of firebox. Some years ago a few small cracks were observed where these stays passed through the left side of firebox casing, and an external covering plate was applied with four rows of stud rivets. New stays were fitted and screwed through the original plate and the covering plate, and it was thought impossible that any further trouble could occur. In March last, when engine was out in the bush with 135lbs. on pressure gauge, there was a sound of escaping steam at left side of firebox casing. The fires were damped at once, and when steam had all blown off and lagging was removed, the covering plate was found cracked through for rather more than 25in. in length along the line of transverse stays (as occurred to the original plate previously). A substantial repair was effected by applying an internal covering plate in addition to a new external one, and the boiler is again at work at a somewhat reduced pressure.

It is difficult to account for the above fracture, but obviously the engine arrangement sets up some peculiar straining action through the transverse stays to the opposite side.

Another peculiar case occurred in connection with a large Babcock and Wilcox boiler. Though not a defect, it is a case which points to the necessity of being extremely careful before entering a boiler which has been disused and left closed up for a length of time. This boiler had not been used for six months, and when stopped was simply blown down, and all joints left made.

When the inspector had it opened up for inspection, he found on passing a candle into it that it was promptly extinguished every time he inserted it. The boiler appeared to be full of carbonic acid gas. A quantity of air had to be blown through before he could safely enter the boiler.

A case of peculiarly rapid corrosion occurred at the Proprietary Coal Mine, Collie. The range of boilers consists of four, and the feed water has hitherto been drawn from the mine, and has been treated with lime. In spite of this one of the boilers suddenly developed very marked corrosion in a belt along water level. This case is only another bit of evidence that the quality of mine water, for feed purposes, in this district is absolutely unreliable. It is liable to sudden and unlooked for changes which, when they occur, act disastrously on the boilers. The company have been advised to abandon mine water and procure their supply from a water hole in the river. The corrosion referred to only extended over about three months, and yet about 100 new rivets had to be put in and some new gusset angles.

DIVISION III.

Inspection of Machinery.

The following return shows a classification of the power-driven machinery in the proclaimed districts. This year the number of groups driven by oil engines (including kerosene, petrol, and benzine engines) again takes the highest place. There are now 2,215

registered groups of such engines, as against 1910 last year, showing an increase of 305.

In spite of war time prices there is an ever-increasing demand, chiefly amongst agriculturists, for this class of small power plant.

Electrically-driven groups take second place with 1,853, showing an increase of 66. Steam-driven groups take third place with 1331, as against 1,311 last year, showing an increase of 20. Suction gas groups have increased by 10, ordinary town gas groups have decreased by 6, hydraulic groups have increased by 2, and compressed air groups have decreased by one.

Return showing classification of various sources of power-driven machinery in use or likely to be used again in proclaimed districts during the year ended 31st December, 1918.

Classification.	Totals.	
	1918.	1917.
No. of groups driven by steam engines	1,331	1,311
" " " oil engines ...	2,215	1,910
" " " ordinary gas engines	21	27
" " " suction gas engines	230	220
" " " compressed air engines	37	38
" " " electric motors...	1,853	1,787
" " " hydraulic pressure	10	8
Totals	5,697	5,301

The following table shows the number and description of all the lifts in this State:—

Passenger Lifts—	
Electrically-driven	63
Hydraulically-driven	0
Goods Lifts—	
Electrically-driven	78
Hydraulically-driven	10
Belt-driven	20
Total	171

There has been an increase of two in the number of lifts registered. This increase would almost certainly have been considerably higher if it had not been for the grave difficulty in procuring wire ropes, and the fact that the change over to alternating current in Perth is not yet completed.

The difficulty in procuring ropes has, of course, caused a good deal more anxiety and work, extra risks had to be taken, and extra visits made to counteract these risks as far as possible. Second-hand ropes from mines were made use of in some cases, and in other cases the use of ropes of a construction not approved for lift work had to be permitted. Latterly, Japanese-made wire ropes have appeared on the market; some of these are now in use. Up to the present I have no particulars as to tests, etc., but from appearances there does not appear to be any particular danger in using them under fairly constant surveillance.

During the year many lifts have been converted from direct current to alternating current, and have incidentally been reconstructed and re-organised to a very satisfactory extent. A number of collapsible gates, which have proved very unsatisfactory for lift work, have been got rid of, and additional safeguards fitted.

The following return shows the work done in connection with machinery inspections:—

Return showing operations in the proclaimed districts (Machinery only) during the year ended 31st December, 1918.

	Totals.	
	1918.	1917.
Total registrations of useful machinery	5,697	5,301
Total inspections made ...	3,464	3,366
Certificates, bearing fees ...	2,897	2,752
Certificates (steam) without fees	567	614
Notices issued "Machinery dangerous"	356	412
	£ s. d.	£ s. d.
Total amount of fees for 1918	1,152 2 0	...
Total amount of fees for 1917	...	1,079 11 7
Number of Inspectors ...	*7	7

* *See* Note on Boiler returns.

There has again been a satisfactory increase in machinery registrations. In the South-Western District the increase was 391, or from 3,741 to 4,132.

In the Kalgoorlie groups the registrations dropped from 855 to 830, showing a decrease of 25. In the remaining districts there was an increase of 30, making a total increase of 396. The total number of inspections made shows an increase of 98.

Dangerous Machinery.

Three hundred and fifty-six notices were issued ordering various guards and fences to be erected; the number of notices issued being about 10.2 per cent. of the number of inspections made.

DIVISION IV.

No prosecution in regard to boilers or machinery was instituted during the year, and only one in connection with engine-drivers (see Division VI.).

DIVISION V.

Accidents to persons caused by Machinery.

During the year there have been 75 accidents, including four which ended fatally. This shows an increase of 12 in the total number, and an increase of one fatal. There has been a marked drop in the number of accidents in the Goldfields districts, and a decided increase in the South-West district.

The following table shows the number of accidents and the percentage of these based on the total num-

ber recorded, caused by the various kinds of machinery mentioned:

No. of Accidents.	Class of Machinery.	Percentage of total accidents.
21	Circular Saws and Band Saw	28 per cent.
6	Buzzers	8 per cent.
6 (1)	Ore Treating Machinery	9·34 per cent., including one fatal.
1 (1)	Fly-wheels, Pulleys, and Shafting	2·66 per cent., including one fatal.
4 (1)	Belting	6·66 per cent., including one fatal.
6	Belt Conveyors ...	8 per cent.
1	Pumps	1·34 per cent.
1	Emery Wheels	1·34 per cent.
4	Printers' Machinery ...	5·34 per cent.
1	Chaff-cutters	1·34 per cent.
2	Passenger Lifts ...	2·66 per cent.
1 (1)	Goods Lifts	2·66 per cent., including one fatal.
17	Other sources	22·66 per cent. or about 1·33 per cent. each.
71 (4)		
Total 75		

The accidents from circular saws during the year were more numerous than since the inception of the Act, and account for 28 per cent. of the whole number. Seven of these accidents occurred at the same place—a case-making factory, where old cases are cut up and remade. The timber is mostly in short lengths, very dry and full of knots. It is almost impossible to provide efficient guards for this class of work. The factory has been rearranged and better conditions now prevail. It is only fair to say that most of the accidents were caused by absolute carelessness on the part of the injured man.

Buzzer accidents figure next highest, but I hope to see a marked reduction from this cause, as after a good deal of experimenting a guard has now been devised that, while being thoroughly efficient, does not interfere with the working of the machine. There is therefore a good chance of its being constantly used, and not thrown to one side as soon as the inspector's back is turned.

Three of the four fatal accidents occurred in connection with mining machinery, and one in connection with a goods lift in Perth. The three mining machinery accidents all occurred in connection with moving pulleys and belting. The goods lift accident was the result of a lad tampering with a lift which he had no business to be near, during lunch time, when lift was stopped.

It is a yearly source of surprise to find that so many men take such a number of entirely unnecessary risks.

DIVISION VI.

Engine-drivers' Examinations and kindred matters.

During the year four examinations were held in Perth, two in Kalgoorlie, one in Bunbury, and one in Geraldton. Examinations were advertised to be held at Southern Cross, Leonora, Mt. Magnet, and Albany, but fell through owing to the necessary number of candidates not being forthcoming.

The following table shows the certificates granted and their classifications—

Return showing total number of Engine-drivers' Certificates (all classes) granted in 1918 *and compared with* 1917.

Class of Certificate.	Number granted. 1918.	1917.
First Class Competency (including certificates issued under Regulation 27 and Section 63 of the Act)	3	6
Second Class Competency (including certificates issued under Regulation 27 and Section 63 of the Act)	18	15
Third Class Competency (including certificates issued under Regulation 27 and Section 63 of the Act)	47	33
Locomotive Competency	12	13
Traction Competency	2	2
Interim	5	4
Copies	5	8
Total	92	81

There is an increase in the number of certificates granted, the total number being 11 more than last year.

The total number of certificates granted under this Act up to 31st December, 1918, is 2,684.

The revenue from engine-drivers' fees for the year was £120 7s. 6d., as against £109 2s. 10d. for 1917.

Inquiries, Prosecutions, etc.

During the year proceedings were taken against a person named M. A. Guelpa, under Section 54 of the Act, for having acted in the capacity of an engine-driver in charge of a locomotive engine without being the holder of a proper certificate as required by the Act. The case was heard at Collie, and the defendant was fined five pounds and costs.

The Board inquired into seven cases of overwinds, and similar occurrences on mining shafts. In three of these cases the want of sufficient "head room" was a strong contributory cause of the accident. In no case did any injury to persons occur, and in one case only was there any serious damage to property.

DIVISION VII.

General.

During the year 35 second-hand boilers were transferred to the Eastern States. This was no doubt due to depletion of stocks owing to war conditions. All of these boilers were inspected by officers of this Department prior to shipping, in accordance with the arrangement made in June, 1917, and copies of reports were forwarded to intending purchasers. I am pleased to report that as far as can be ascertained the boilers in every case proved satisfactory.

The depletion of stocks of steel plates for either manufacturing or repair purposes has been the cause of many boilers which were out of use, but many of which were quite useful boilers, being cut up for the sake of their plates. The unusual conditions rendered this procedure almost a necessity, but the pratice of using old plates for repair work is most ob-

jectionable, as the identity of the plates is always lost, there is no record of age, or quality, and when a possibly very old plate is straightened, and then perhaps flanged, or otherwise severely worked it cannot be said to be reliable. As soon as fresh stocks of plates are secured steps will be taken to prevent, wherever possible, such a use of old plates.

In many cases, owing to lack of plates, repairs have been deferred, pressures reduced, and short certificates issued, thus necessitating a considerable increase of work.

Owing to the cessation of the war a number of new industries have started, and others are contemplated, whilst at the same time there is a considerable revival of some of the old industries, which had to be temporarily closed down owing to the war. As soon as shipping facilities are available a rapid revival may be looked for in the timber industry. Many of the mills are already at work overhauling their plants and getting ready for a fresh start. I anticipate a considerable improvement during the present year.

During the year, at the special request of the Director of Naval Works, this Department took on the work of inspection of all the boilers on the Naval Base floating plant, including dredges, hopper barges, etc.

During the latter end of the year under review a copy of a proposed draft Engine-drivers' Bill, prepared by the Queensland Government, was submitted to me for comment. The whole matter was laid before the Board and gone into thoroughly, and comments and suggested alterations forwarded for the Hon. the Minister's information.

Whilst this was a move in the right direction, inasmuch as it was an effort towards much needed uniformity, as far as engine-drivers are concerned, I think a Federal Act embracing the whole of the operations of an Inspection of Machinery Act would be preferable, and with a view to this I am of the opinion that the only satisfactory manner to deal with it would be by an Interstate Conference.

During last year I submitted to you a draft of a proposed new Inspection of Machinery Bill. This, owing to pressure of other business, has not yet been brought before Parliament. I trust, however, that an early opportunity will be taken to introduce the Bill as it is urgently needed; the present Act is in many respects behind the times.

Work done for other Departments.

During the year a considerable amount of advisory work has been done for other departments, and reports have been furnished.

Inspectorial Staff.

The staff remains as in 1917. One inspector was absent on sick leave and long service leave for a period of four months. No additional assistance was obtained during that time.

Clerical Staff.

The clerk in charge resigned in April, and Mr. H. W. Gibson was appointed to the position. No other change of any importance took place.

Revenue.

The total revenue from all sources during the year was £4,390 18s. 11d., made up as follows:—

	£	s.	d.
Fees for Boilers	3,013	2	11
Fees for Machinery	1,152	2	0
Fees, Engine-drivers' Certificates	120	7	6
Incidentals (being fees for special inspections, special expenses, etc.)	105	6	6
Total	£4,390	18	11

This shows an increase of £327 11s. 10d., which, considering the depressed condition of many of the industries, is more than might have been expected.

This increase is made up as follows:—

Boiler fees, £207.
Machinery inspection fees, £73.
Engine-drivers' fees, £11.
Incidentals, £36.

During the year it has been necessary to write off as bad debts nine items totalling £11 5s. The amount represents only .25 of the total revenue.

Mileage.

The total distance travelled by inspectors during the year was 46,264 miles, of which 22,327 were by rail, 23,937 by road. The distance travelled shows an increase of 6,467 miles as against 1917, with an increase of 96 in the number of inspections made. The average miles travelled per inspection were 9.25, showing an increase of 1.88 miles per inspection as against last year. This increase, though partially caused by additional work, is largely accounted for by the necessity of an unforeseen trip to the Murchison Districts.

Conclusion.

In conclusion, I wish to again tender my sincere thanks for kindly assistance rendered by the officers attached to the Crown Law, Police, and Postal Departments in various districts, in matters connected with the administration of the Act.

My staff have continued to carry out their duties efficiently, and to them also my thanks are due.

I have, etc.,

C. J. MATHEWS, M.Inst.C.E.,
Chief Inspector of Machinery and Chairman of the Board of Examiners.

DIVISION VII.

Annual Report of the Government Analyst, Chief Inspector of Explosives, and Agricultural Chemist, for 1918.

The Under Secretary for Mines, Perth.

ANNUAL REPORT FOR 1918.

I have the honour to submit for the information of the Hon. Minister for Mines my twenty-third Annual Report dealing with the work of my Department during the year 1918, which for convenience I will divide under the three main headings indicating the principal division of my duties.

GOVERNMENT ANALYST.

The amount of work carried out in the general laboratory during the year was practically the same as last year, being 1919 analyses, as against 1928 for the previous twelve months, and the work does not disclose any special departure from the ordinary routine lines of investigation, with one exception, viz., the investigations for the State Sawmills Department.

Science and Industry.—The developments in connection with the establishment of a Commonwealth Institute of Science and Industry, to which I referred in my last Annual Report, have been proceeding slowly, but have not yet arrived at finality.

During the year the Commonwealth Government introduced in the Commonwealth Parliament a Bill for the establishment of the Institute which has passed through the Senate, and is now held up for consideration by the House of Representatives at the next session of the forthcoming year.

A further step was taken in the organisation of the Institute by the appointment of Dr. F. M. Gellatly as the Chairman of the Board of Directors of the Institute contemplated under the Bill, and in August last Dr. Gellatly visited this State to inquire into matters connected with the development of industries here. Meanwhile, the Executive Committee, established in Melbourne in 1916, has continued its work supervising researches initiated under the preliminary scheme, but I regret to say that owing to pressure of departmental duties here I have been unable to take any part in their deliberations, though as far as opportunity has been allowed I have from time to time taken part in making investigations required in connection with the development of industries in this State.

Tannin Investigation.—The inquiries begun the previous year, and to which I referred in my last Annual Report, were continued up to the end of January, and formed the subject of a second progress report to the Government.

The result of the investigations carried out in this Laboratory showed that Redgum tannage, from which such great things had been expected, was rather disappointing when further inquired into.

The generally recognised method of determining the amount of tannin in tanning materials (known as the Hide Powder method) was found to be not applicable in the case of Redgum, as the hide powder evidently absorbed a large quantity of material from the tanning solution which was not really tanning material, and such results had probably led to the general misconception as to the value of this substance as a tanning agent. Further investigations showed that the amount of true tannin present was really about half that originally supposed, and that further disabilities would be encountered in its use which discouraged its commercial application—

(1.) All attempts to remove the objectionable colouring matter from the tannage produced by it were unavailing without such a loss of tannin as made the process impracticable.

(2.) All attempts to concentrate the tannin extract failed owing to the insolubility of the active ingredients, and it thus appeared that there was little prospect of producing the concentrated extracts which it was hoped would be available.

In consequence of the above results I recommended that the exploitation of Redgum kino should be abandoned, and that attention should be concentrated on the production of extracts from the barks of other of our indigenous plants which did not possess the same disabilities. Up to the present, however, my advice on this matter has not been accepted, and no further steps have been taken towards the development of an industry of this kind.

Fibres.—In consequence of representations made to me by Mr. J. L. Hinde, I drew the attention of the Hon. Minister for Industries to the desirability of making special inquiries into the character and supplies of our native fibre plants, and such an investigation had just been planned and organised when I was instructed to hand over the whole investigation to the Forestry Department. This was done, and I have not since had any official connection with the investigation.

Potash from Seaweed.—The question of examining the seaweeds which occur in large quantities on the Western Australian coast as a possible source of potash to meet the shortage occasioned by the war was referred to me for report, and I recommended the formation of a small committee to supervise such an investigation. As Mr. I. H. Boas, of the Technical School, had apparently been making some preliminary analyses on this subject I recommended that the chemical part of the investigation should be left in

his hands; this was accordingly done, and this laboratory has had no connection with the further developments of the inquiry.

Alkali Manufacture.—At the request of the Hon. Minister for Industries I visited Lake Preston in May last in order to make certain estimates of the possibilities of the contents of that lake for alkali manufacture, based upon the quantity and character of the salt solution forming the lake.

I was accompanied by Mr. J. H. M. Lefroy, District Surveyor of the Lands Department, and we made a joint report to the Hon. Minister embodying the result of our inquiries, while from time to time analyses have been made of samples submitted to me by the Industries Department in connection with the further inquiries proceeding on behalf of the Commonwealth Alkali Committee.

I have been given to understand, however, that the principal part in these inquiries has now been taken over by Professor Woolnough, of the Western Australian University.

Investigations for the State Sawmills Department.—In accordance with the arrangements anticipated in my last Annual Report, Mr. L. I. Henzell, B.Sc., a graduate of the Western Australian University, was engaged by the State Sawmills Department to conduct certain inquiries into problems connected with the powellising process as carried out at the State Sawmills at Pemberton, and he has been working for the greater part of the year on these problems.

The principal questions studied were—

(1.) The prevention of the formation of arsenical sludge during the process of powellising.

(2.) The prevention of the staining of fruit cases made from fresh cut Karri.

(3.) A method of recovering arsenic from accumulation of sludge due to previous working.

(4.) The possible utilisation of bark waste at the mills.

At the time of writing this report Mr. Henzell has just completed his investigations, and the results may be summarised as follow:—

(1.) By following methods of working the powellising vat suggested to us by observation of the methods followed by Mr. Oke, the Manager of the Railway Department's powellising works at Bunbury, it has been found possible to almost entirely prevent the formation of sludge and thus eliminate much waste of arsenic. Incidentally, this has been found to give a much greater efficiency in the vats through the diminution of incrustation on the steam batteries used in heating the solution, thus reducing greatly the time of treatment.

(2.) The experiments in connection with this have been unsuccessful. The staining is due to the large amount of acetic acid present in this wood which attacks the iron nails used in the construction of cases, and the iron salt thus formed reacting upon the tannin in the wood causes unsightly blue-black stains. No practical method of rapid treatment experimented with has proved effective, and I have come to the conclusion that the method of treatment most promising of success is the Tiemann method of seasoning in a moist atmosphere, with which experiments are being conducted by Professor Tomlinson, of the Western Australian University, on behalf of the Forestry Department, in seasoning chambers specially constructed for the purpose. Any method which leads to the elimination of this free acid will be of great industrial importance, for the attack on iron bolts, dog-spikes, nails, etc., caused by this wood is of considerable moment in connection with nearly all structural work in which this timber may be used.

(3) Owing to the success attained in the prevention of sludge in the future conduct of the powellising process the only arsenical material left for attention was that accumulated from past working of the vats. After full inquiry it was found that the quantity of arsenic contained therein did not, in view of the expense of handling and treatment, hold out any prospect of remunerative recovery; and as the price of arsenic is not likely to continue at that height which it reached during the war, I recommended that this project should be abandoned.

(4) Inquiries made indicated that a very valuable basis for an auxiliary industry in connection with the mills exists in the large quantities of karri bark removed from the tree trunks brought from the forest to the sawmills, and I have put forward to the Department such data as was available recommending further commercial inquiries with a view to establishing a plant for making a tanning extract from this waste material.

During the course of the inquiries carried out in connection with this matter I was forcibly struck with the lack of definite information as to the value of the powellising process in the preservation of timber, and the absence of standards as to the amount of arsenic required to be conveyed into the interstices of the timber in order to protect it against the ravages of white ants. In view of the large expenditure involved in this treatment it would appear desirable that searching inquiries should be made in the matter.

Mr. Henzel's engagement for this special work is now approaching its termination, and I understand that it is not intended to go further into the matter at present.

Staff.—My staff has again been subject to changes during the year, and I particularly regret the loss from amongst my assistants of Mr. V. S. Rawson, who has done most valuable agricultural work for the Department, with which he was connected for about seven years. He had made a special study of questions connected with wheat, its culture, its milling properties and its chemical characteristics, and was also a most valued assistant in connection with soil studies and agricultural matters generally. He terminated his connection with this Laboratory in order to take up a much better position offered to him by the Queensland Government, and left Western Australia towards the end of the year. His position has not yet been filled.

I should here like to point out that an officer to whom the Queensland Government are willing to offer a considerably improved position should be

worth at least as much to this Government, and indeed in view of his accumulated experience of local conditions is of more value to this State than he could be elsewhere, and it is very much to be regretted that nothing could be done to retain his services in this State.

The three officers—Messrs. Malloch, Hood, and Hill—who went to England on munition work are still absent, but word has just been received that Mr. Hill is on his way back to Australia, and it is expected that Messrs. Malloch and Hood will follow.

General Analytical Work.—The following table gives particulars of the Laboratory work of a general character carried out in the Department during the last twelve months:—

TABLE No. I.

General Analysesi

Spirits	25
Waters	265
Foodstuffs	26
Sewage	401
Criminal Investigations ..	38
Medicinal Compounds ..	16
Milks	78
Powellising	408
Gums, barks, etc.	87
Miscellaneous	122
Total	1,466

CHIEF INSPECTOR OF EXPLOSIVES.

The importation of explosives during the year shows a considerable falling-off as disclosed by the tables of importations hereto attached. These figures are published again this year for the first time since the outbreak of the war, and I have, therefore, taken the opportunity of including comparative figures for the different years during the war period.

TABLE No. II.

Explosives imported during 1918.

	Quantity.	Value.
	lbs.	£
Gelignite	1,576,000	69,039
Gelatine Dynamite	149,000	8,127
Blasting Gelatine	...	...
Dynamite	...	...
Permitted Explosives (for Coal Mines)	25,000	...
Detonators (No. .)	...	3,500
Fuse (Coils), England only ...	160,800*	4,779
Powder, Blasting	105,000	4,030
Powder, Sporting	...	...
Explosives, N.E.I.	...	193
Fireworks	...	244
	...	£89,912

* These figures do not include the fuse imported from the Eastern States.

TABLE No. III.

Comparison of Importations for the last five years.

	1914.	1915.	1916.	1917.	1918.
Nitroglycerine Compounds	108,183	129,211	183,269	93,377	77,166
Blasting Powder ...	6,359	7,239	3,123	13,339	4,030
Sporting Powder ...	119	...	...	36	189
Fuse	4,870	4,198*	4,701*	5,005*	4,779*
Fireworks	252	73	92	1	240
Detonators	4,410	4,924	4,465	7,619	3,500
N.E.I.	5,360	940	2,170	4,784	193
Totals	£129,553	£146,585	£198,726	£124,161	£90,097

* Overseas only.

The difficulties experienced in meeting the requirements of the mining industry have been considerable, owing to the low grade explosives to which we have been restricted, but it is to be hoped that with the approach of peace the supplies will shortly get back to normal again. Meanwhile it has been decided that the special permit for the use of sodium nitrate during the war period shall be considered as terminating at the end of the year 1919. All importers have been notified accordingly in order to enable them to adjust their supplies to the pre-war conditions, which it is hoped will then be reinstated.

Inertness in Explosives.—A special report summarising the experience of this Department on the above question, to which I referred last year, has now been issued and has been circulated. It is hoped that the facts therein recorded will be of value to manufacturers and will be of some assistance in directing attention to those factors which are the cause of the development of inefficiency in explosives, with a view to their future improvement in manufacture. This report also discloses the strong grounds which exist for a complete revision of our legislation on the subject of explosives control, and I am glad to say that the interest taken by the Hon. Minister in this matter is likely to lead to the consideration of a new enactment in the near future.

Owing to the quality of certain shipments which arrived during the year rather stringent measures have had to be taken in some cases, which have involved considerable labour and anxiety on the part of the Department, but the cordial co-operation of the importers has helped very much to lighten these difficulties, and has enabled us to keep the explosives actually going into consumption up to as high a standard as possible.

Throughout the history of this Department it has been worthy of note how ready importers have been to respond to the requirements of the Department when the matter has been fully explained to them and the reasonableness of its demands have been demonstrated. Testimony to this is afforded by the fact that throughout the twenty-three years during which I have had to control the explosive trade in this State it has only been necessary in one instance to take legal proceedings, as provided by the Act, in order to obtain magisterial forfeiture of the explosive concerned. That instance was due to special circumstances of a technical nature, which rendered public proceedings necessary, but in all other instances the condemnation and destruction of explosives in this State has taken place with the ready acquiescence of the owners.

I take this opportunity of recording my appreciation of the attitude of the explosives firms because, during the war period now concluded, this attitude has been particularly marked, considering the extreme commercial difficulties under which they have had to labour in the conduct of their trade.

One large shipment of explosives calls for special notice. In July last the steamship "Toromeo" arrived at Fremantle with a large consignment of explosives, consisting of 12,850 cases of gelatinous explosives—gelignite and gelatine dynamite. Extensive exudation was discovered on examining the shipment on arrival. Owing to the shortage of explosive supplies and the necessity for conservation of stocks as far as possible it was decided to undertake a very extensive re-handling of this shipment, in the course of which the majority of the consignment was examined cartridge by cartridge. The worst of the consignment was condemned and finally destroyed,

and the remainder was re-wrapped with special precautions against further exudation. A large number of men were employed and the operations extended over more than two months. The very heavy expense involved, however, was justified by the resultant saving of the greater part of the shipment which, if it had been condemned, would have seriously embarrassed the mining industry.

An interesting feature of this shipment was that the ship's magazine, in which it was enclosed, had not been constructed according to the method which had hitherto always been used in consignments to Western Australia, but a modified construction had been employed according to revised rules issued by the British Board of Trade in 1918. It was considered that this modified construction, by allowing the access of sweating in the interior of the ship into the magazine, occasioned a moist atmosphere, which was probably responsible for the exudation. Representations were accordingly made by cable to Great Britain. The next ship arriving at Fremantle had an improved form of magazine, and it is hoped that no further trouble will be experienced with future shipments.

Storage of Explosives.—On the explosive reserves throughout the State there are 75 magazines owned by private firms, and three Government magazines, the total storage capacity being 1,118 tons.

There are 60 magazines licensed for explosives, but not situated on special explosive reserves, there having been three licenses cancelled and six new licenses issued during the year.

During the year there have been issued 94 licenses for the storage and sale of explosives, and 74 for the storage and sale of fireworks.

Inspections.—There were 113 inspections of magazines and licensed premises made during the year. The following centres have been visited:—

Perth, Fremantle, Westonia, Southern Cross, Bullfinch, Coolgardie, Norseman, Esperance, Kalgoorlie, Kanowna, Broad Arrow, Comet Vale, Menzies, Kookynie, Malcolm, Morgans, Laverton, Leonora, Geraldton, Yalgoo, Magnet, Sandstone, Day Dawn, Cue, Nannine, and Meekatharra.

The prosecutions were as follow:—

TABLE No. IV.

Date.	Defendant.	Offence.	Penalty.
24-5-18	J. Tylee, Fremantle... ...	Storing explosives on unlicensed premises ...	Fined £2 ; costs, 6s.
24-5-18	J. Weedon, Fremantle ...	Storing expl sives on unlicensed premises ...	Fined, £2 ; costs, 3s.
26-9-18	P. W. Dunstan, Southern Cross	Overstocking explosives on licensed premises ...	Fined £5 ; costs £1 4s.

The following is a list of explosives destroyed during the year:—

TABLE No. V.

Date.	Locality.	Kind and Quantity.	Remarks.
21-1-18	Esperance ...	1,000lbs. Gunpowder	Owing to having absorbed moisture.
21-1-18	do. ...	15lbs. Gelignite ...	Owing to chemical deterioration.
10-5-18	Coolgardie ...	15lbs. B .Gelatine ...	Owing to bad physical condition.
13-5-18	Kalgoorlie ...	750lbs. Gelignite ...	Exudation.
21-6-18	Fremantle ...	1,000lbs. Gelignite	do.
9-7-18	Kalgoorlie ...	2,500lbs. Gelignite	do.
4-11-18	Meekatharra	10lbs. Gelignite ...	Owing to chemical deterioration.
8-11-18	Fremantle ...	775lbs. Gelignite ...	Owing to having been damaged by water.
8-11-18	do. ...	50lbs. Gel. Dyn. ...	do. do.
8-11-18	do. ...	100lbs. Gel. Dyn. ...	do. o.

The total number of tests rendered necessary to maintain proper control of explosives imported during the year, and for the supervision of stocks in magazines at various centres, is shown in the subjoined tabular statement:—

TABLE No. VI.

Heat Tests of Explosives	763
Fuse Tests	164
Miscellaneous Tests	14
Total	941

AGRICULTURAL CHEMIST.

Throughout the year this division of my duties has been given much greater interest and value through a closer co-operation with the Agricultural Department than has hitherto existed, and I am in hopes that by a continuance of this co-operation the work of the Agricultural Laboratory will be very greatly extended.

The technical work performed as Agricultural Chemist comprised the following:—

TABLE VII.

Agricultural Work.

Soils	225
Fertilisers	69
Wheats and Flours . . .	106
Waters	20
Feeding Stuffs	13
Miscellaneous	55
Total . . .	488

The most notable change effected was the amalgamation with my Department of a branch of work which had been hitherto entirely carried out in the Agricultural Department.

Owing to the retirement of Dr. F. Stoward from the post of Government Botanist and Plant Pathologist the Government instructed me to take over administrative charge of the work of this Branch as from 1st January, 1918. The work performed in this Laboratory, therefore, in connection with the Agricultural Department, comprises the following:—

(1) Examination of soils.
(2) Analyses of Fertilisers.
(3) Milling of Wheats, and analyses of wheat and wheat products.
(4) Examination of feeding stuffs.
(5) Examination of waters for irrigation and stock.

(6) Botanical and pathological, including—
  (a) Identification of plants for pastoralists, settlers, and others.
  (b) Identification of plant diseases, especially in relation to fruit and potato growing.
  (c) Investigation of poison plants.

Botanical and Pathological.—The Botanical Section has been entirely transferred to my Department where suitable and very convenient accommodation has been specially erected as an extension of my Laboratory buildings, and the herbarium and botanical laboratory are now housed under the same roof as my chemical staff. This leads to a very close and convenient interchange and co-operation of effort amongst my officers.

In the early stages of the transfer the continuity of work was somewhat interfered with through changes in the staff. After Dr. Stoward's retirement the technical part of the work was at first in the hands of Mr. F. W. Wakefield (Botanical and Pathological Assistant), assisted by a junior laboratory assistant, but in March Mr. Wakefield left the service to take a more advantageous position in private employment in New South Wales.

Pending an appointment of a permanent successor, Mr. V. S. Rawson, M.S.E.A.C., from my chemical staff (who possessed a training in Botany and pathology), very ably filled the gap and was able to keep the work of this section going satisfactorily from 15th March to 30th April.

From the latter date the scientific work has been in charge of Mr. D. A. Herbert, B.Sc. Mr. Herbert graduated with honours throughout in Botany and Plant Pathology at Melbourne University under Professor Ewart and also completed a full chemical course. He has carried out the work committed to him in a very satisfactory manner.

In giving an account of the work performed, it will be best to group my remarks under the headings of those sections into which the work is naturally divided.

BOTANICAL.

(a) *Herbarium.*—The Herbarium attached to this section has had a somewhat chequered existence. Originally collected chiefly by the late Dr. Morrison, Government Botanist, on his retirement (owing to delay in appointing a successor), it was packed in cases and stored for safe keeping at the Museum until the appointment of Dr. Stoward as Botanist in 1911.

The collection was then re-established at the Agricultural Department, but, unfortunately, it was found that a considerable number of specimens had been very seriously damaged by the depredations of insects while at the Museum, and much labour was necessary in re-arranging the collection and replacing the losses incurred.

Some of this work has already been done, and now that the collection is more suitably housed, an opportunity is afforded of completing the re-arrangement. Much labour, however, is involved in this and, with the heavy demands upon the Botanist's time, I am afraid it will be found necessary to obtain extra assistance before the Herbarium can be put upon a proper footing.

A valuable collection of plants has been permanently added to the Herbarium through the generous help of Professor Ewart, of the Melbourne University. This collection contains some 1,300 specimens, the importance of which consists in the fact that they are mostly type specimens collected by Drummond and Oldfield, submitted to Von Mueller, Bentham, and Kew, upon which Bentham's *Flora Australiensis* was based. This collection, formerly lent by Professor Ewart to assist the work of the Department, has (since Mr. Herbert's appointment) been permanently donated by him to the Herbarium.

(b) *Botanical Identifications.*—A large number of requests are received for identification of and reports upon specimens of plants submitted. These come from various sources—

(1) The Forestry Department.
(2) Farmers and pastoralists who desire to know whether plants are injurious to stock—in many cases such plants are suspected of having caused the death of animals—and information is also frequently sought as to the fodder value both of well-known plants in the settled areas and of specimens in the more remote districts being opened up for pastoral pursuits.
(3) From one or two enthusiastic helpers who collect plants in more inaccessible parts of the State and forward them as additions to the Herbarium. The assistance of Messrs. Clarke and Talbot, of the Geological Department, in this respect has been specially noteworthy.
(4) From the general public, including inquiries received through the *Sunday Times*.

An examination of the records shows that during the period under review the following examinations were made under this heading:—

Forestry Department	289
Messrs. Talbot and Clarke .	85
Sunday Times	.64
Western Mail	26
Primary Producer	4
Agricultural Department . .	118
Settlers and general public .	519
Total	1,105

Noxious Weeds—Seed Examinations.—Under the Commonwealth Quarantine Act all importations of seeds have to be examined to provide against the introduction into the Commonwealth therein of the seeds of prohibited noxious plants.

Seeds of various kinds are also submitted to the Department to determine their efficiency as indicated by their germination power.

Under the former heading 46 samples, and under the latter 92 samples, or 138 samples in all, were examined during the year.

Bulletin No. 32, issued for the information of settlers, dealing with Noxious Weeds, having become out of date, this bulletin has been entirely re-written with fresh illustrations drawn by Mr. Herbert, and with certain additions to render it more useful to settlers. This was submitted for press but its publication has been postponed.

An interesting instance of how noxious weeds may be spread far and wide has been brought to light by a communication from the Agricultural Editor of the *Western Mail,* who recently drew attention to the fact that cheap forms of advertisement issued by a well-known manufacturing firm and scattered throughout the Commonwealth had attached to them seeds of the

pernicious Bathurst Burr. It has been claimed that these seeds have had their germinating power destroyed and, as far as the examination of seeds in this State was concerned, this was found to be correct.

Wheats.—The exact identification with certainty of many varieties of wheat is not always an easy matter. At the instance of the Commissioner for the Wheat Belt (Mr. G. L. Sutton), Mr. Wakefield gave considerable study to the matter with a view to finding a solution of the problem by a system of exact measurement in combination with, and in relation to, certain clearly marked physical features.

He succeeded in evolving a method which was full of promise and this method has since been applied by Mr. Rawson to an extensive series of specimens submitted by Mr. Sutton, which go to confirm the view that, with certain slight modifications, the method can be very usefully applied to trace the identity of a variety of wheat. Fuller experience will be necessary before it can be said that the method is universally applicable, but it marks a distinct step in advance.

The measurements of 383 specimens of wheat have been made and we have now recorded in the Department the measurements for 135 distinct varieties of wheat. In addition to the above, 153 measurements of crop heights from various State farms have been made at the request of the Commissioner for the Wheat Belt.

Poison Plants.—The great prevalence of indigenous poisonous plants in this State has always made this one of the subjects demanding special attention from the Botanical Section. Nevertheless it is to be regretted that on account of the complexity of the subject our information with regard to it is not so complete or exact as could be desired. Various methods of studying these plants are available.

Dr. Stoward initiated a method of systematically studying these plants by feeding them to rats. It was intended to determine not only the relative toxicity of different species but also their seasonal variation in virulence, with a view to deciding whether at certain seasons these plants could be safely fed down by stock.

Unfortunately, so much ground requires to be covered, involving a large number of tests, that up to the present the definite conclusions arrived at by these tests are very few, and those already made require to be supplemented by many more. This work is being carried on and is being systematised with a view to procuring definite data which may be included in a special bulletin on Poison Plants now being prepared.

Meanwhile, however, it was felt that certain practical advice could be given to settlers with regard to treatment of stock, etc., and early in the year a "Circular for Information of Settlers" was prepared by Mr. Wakefield, under my instructions, summarising the information available. This circular was approved by the Minister and printed, and is now sent to any inquirer pending the preparation of the more extensive pamphlet.

The identification of plants in cases where poisoning of stock is suspected is obviously an important duty of the section and must frequently involve visits of the Botanist to the locality affected. Mr. Herbert has made visits to Beverley and Northam, and has also made an extensive tour of the Northern Goldfields, *via* Sandstone to Wiluna and thence through Leonora and the Eastern Goldfields, while further excursions have been planned to the South-Western districts, including the Karri and Jarrah forests.

The following comprises a list of the life-tests on animals which have been carried out with poison plants which have been referred to the Department during the year, some of them having come under notice for the first time:—

Stypandra glauca, or Blind Grass:

This was found to cause blindness in rats, but in no cases were the results fatal.

Eremophila Willsii (*?*) (provisionally called Fuchsia Poison):

This is a new poison plant which was found at Sturt Meadows, 40 miles north of Leonora. The foliage of this plant is identical with that of *Eremophila Willsii,* but as the plant was not flowering in July when it was collected, the specific name is not absolutely certain.

Dodonea viscosa:

This plant came from Bolgart, where it was suspected of poisoning sheep. It was fed to rats with fatal results. It was not previously recorded as a poison plant here, though used in other parts of the world as a fish poison.

Isotropis striata (Lamb Poison):

This is fatal to stock during the flowering and seeding period. It is common throughout the South-West.

Gastrolobium calycinum (York Road):

Experiments were conducted with the pods of this plant to see if they could be used as a rabbit poison, but it was found that the husk of the pod was not poisonous and added so considerably to the bulk of the ground material that the idea was impracticable.

Gastrolobium spinosum (Prickly Poison):

Similar results were obtained with the pods of prickly poison.

Gastrolobium oxylobioides:

This was found to be very deadly. It is common along the Great Southern Railway, where it is known usually as Mock York Road or Narrow Leaf. Both names are unsuitable.

Gastrolobium Brownii:

This has no common name. It is poisonous in flowering and fruiting period.

Gastrolobium bidens (Kite Leaf Poison):

This is the poison of the granite breakaways of the interior, and is generally regarded as dangerous to cud-chewing animals only (goats, camels, cattle, etc.), and not to horses and donkeys. Rats, however, proved to be an exception, as 3 grams was a fatal dose for them.

Duboisia Hopwoodii (Pituri):

This is a shrub or small tree found on the spinifex plains of the interior. Its bright green foliage looks tempting in the dry prickly spinifex and cattle eat it readily, with fatal results. The poisonous principle is identical with nicotine, and the leaves are used for chewing by the natives. They also use them for poisoning rock pools to catch kangaroos and emus.

Boerhaavia diffusa (Tar Vine):

This annual creeping herb occurs between Wiluna and Kalgoorlie, where it has probably caused deaths of cattle, especially at Mount Keith. A preliminary test, with the small amount of material obtainable, on a rat had fatal results. This plant has not hitherto been recorded as poisonous.

Saponaria vaccaria (the Cow Soapwort):
An introduced poison plant growing along the Great Southern Railway; it was found to be toxic only in large amounts.

Euphorbia eremophila, which has caused deaths in Queensland, was obtained from Georgina, *via* Geraldton.

Euphorbia Drummondii:
This plant is now definitely proved poisonous. Very conflicting accounts were given in the Eastern States. The effect on rats was to cause the head and neck to swell to an enormous extent, death occurring in about 36 hours. These symptoms have also been noticed in Queensland in sheep. The material was obtained from Kalgoorlie, where it was used for rheumatism.

Cucumis myriocarpus (the Wild Melon):
This plant was found to be poisonous to rats. Deaths of horses from this plant have been reported on the Murray, in Victoria.

Other poison plants received were: Box Poison, Berry Poison, Castor Oil, *Gastrolobium polystachyum, Gastrolobium trilobum,* and *Gastrolobium callistachys* (Rock Poison).

Amongst other matters, information was prepared by Mr. Rawson and Mr. Herbert on "Western Australian Grasses" and "Saltbushes," for the Director of Nature Study, Education Department.

PATHOLOGICAL.

Requests for assistance in determining the nature of diseases in plants and for advice as to treatment come to the Botanical Section principally through the Fruit Inspectors and Potato Inspector of the Agricultural Department, but also through settlers, Agricultural societies, and members of the general public.

The following diseases have come under notice in the crops named during the year:—

Apples.—A disease new to Western Australia has been found in cool-stored apples. This is Black Rot, due to a fungus known as *Sphaeropsis malorum. Fusicladium* or Black Spot is very common.
Pears.—*Fusicladium* is very bad in several districts.
Potatoes.—Irish Blight (*Phytophthora infestans*), Wet Rot or Bacteriosis, Scab, Eelworm, Brown Ring (*Fusarium solani*), and *Rhozoctonia.*
Apricots.—Shot Hole (*Clasterosporium*).
Peach.— do. do.
Loquat.—*Fusicladium denitricum.*
Orange.—Brown Rot, Melanose, Corky Tissue, Sooty Mould, *Exanthema, Sphaerella citri* (on leaves), Sooty Mould, *Ovularia aurantii* (a disease of stored oranges).
Lemons.—Brown Rot.
Fig.—*Phyllachora rhytismoides,* a fungus recorded for the first time in Western Australia.
Wheat.—*Ophiobolus graminis* (Take-All), Ear Cockle, Septoria, and Rust.
Beetroot.—Eelworm.
Red Gum.—*Polyporus sp.,* a shelf fungus.
Freesia.—*Heterosporium gracile.*
Lucerne.—Root fungus (*Rhizoctonia violaceae*).
Vines.—Anthracnose and Oidium.
Celery.—Celery rust (*Septoria petroselini*).
Rhubarb.—Rust (*Puccinia phragmites*).
Privet.—Rust (*Puccinia sp.*).
Cotton.—Cotton Wilt (*Neocosmopora vasinfecta*). This disease is also new to Western Australia.
Maize.—Maize rust (*Puccinia sorghi*).
Peas.—Pea Leaf Spot (*Ascochyta pisi*).
Leaf Blotch (*Clasterosporium herbarum*).
Onion.—Bacterial disease (*Macrosporium*).
Tomato.—*Septoria lycopersici,* Irish Blight, and Sleeping Sickness.
Mulberry.—Leaf Blotch.
Cabbages.—Club Root.
Passion Vines.—Eelworm.

When the above work is summarised in a statistical form as follows it is seen that this Branch has been very active during the year:—

TABLE VIII.

Botanical Identifications	733
Pathological	168
Seed Examinations	92
Wheat Measurements	536
Life Tests—Poison Plants	35
Total	1,564

The following table gives a summary of the total scientific work performed in this Laboratory and the Departments for which it was carried out:—

TABLE No. IX.

Agricultural Department	1,937
Explosives	941
State Hotels	29
Police	48
Public Works Department	331
Health Department	146
Commonwealth	5
Railways	85
Forestry	159
Water Supply Department	585
Private	100
Miscellaneous	93
Total	4,459

E. A. MANN,
Government Analyst, Agricultural Chemist, and Chief Inspector of Explosives.

WESTERN AUSTRALIA.

DEPARTMENT OF MINES.

MINING STATISTICS,

1918.

M16/19.

MINING STATISTICS TO 31st DECEMBER, 1918.

TABLE OF CONTENTS.

TABLE OF CONTENTS—*continued.*

EXPLANATIONS OF SIGNS AND ABBREVIATIONS.

Gf. Goldfield.
Mf. Mineral field.
D. District.
G.M.L. Gold Mining Lease.
M.L. Mineral Lease.
Loc. Location.
L.C. Lode Claim.
Q.C. Quartz Claim.
R.C. Reward Claim.
M.R.C. Mineral Reward Claim.
M.A. Machinery Area.
Mach. L. Machinery Lease.
P.A. Prospecting Area.
T.A. Tailings Area.
T.L. Tailings Lease.
W.R. Water Right.
S.L. Special License.

SUMMARY OF MINERAL PRODUCTS.

GOLD AND OTHER MINERALS PRODUCED DURING 1918, AND THE ESTIMATED VALUE THEREOF, TOGETHER WITH A COMPARISON FOR PREVIOUS YEARS, AND THE TOTAL PRODUCTION TO DATE.

	Description of Mineral.	1918.		1917.		1916.		1915.		Previous to 1915.		Total to date.	
		Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
			£		£		£		£		£		£
1.	Antimony ... ... (Exported) statute tons	...	...	12	258	27	580	...	...	47	860	86	1,698
2.	Arsenical Ore ... ... (Exported) do.	679	2,564	57	707	11	19	...	...	...	...	747	3,290
3.	Asbestos ... ... (Reported) do.	...	...	...	...	...	...	...	...	43	1,754	43	1,754
4.	Bismuth ... ... (Exported) do.	...	...	½	24	¼	133	1	37	9	635	11	829
5.	Coal ... ... (Reported) do.	337,039	204,319	326,550	191,822	301,526	147,823	286,666	137,859	2,956,165	1,371,733	4,207,946	2,053,556
6.	Copper { Ore ... ... (Exported) do.	1,643	24,877	966	20,878	650	14,971	737	13,768	65,380	750,863	69,376	825,357
	Copper { Ingot and Matte (Exported) do.	478	41,269	535	64,860	457	49,862	946	77,401	8,934	542,023	11,350	775,415
7.	Gadolinite ... ... (Reported) do.	...	...	...	...	...	...	...	...	1	112	1	112
8.	Gold ... (Exported and Minted) fine ounces	876,511	3,723,183	970,317	4,121 645	1,061,398	4,508,532	1,210,112	5,140,228	28,278,145	120,117,926	32,396,483	137,611,514
9.	Graphite ... ... (Exported) statute tons	5	75	18	158	21	284	...	...	7	40	51	557
10.	Ironstone ... ... (Reported) do.	...	...	...	...	...	...	...	...	57,830	36,695	57,830	36,695
11.	Lead (Ore and Concentrates) (Exported) do.	...	...	...	...	...	...	...	...	44,032	508,748	44,032	508,748
12.	Lead and Silver Lead (Ore and Concentrates) (Exported) do.	282	3,045	22	593	428	12,033	2,883	39,032	940	8,071	4,555	62,774
13.	Lead (Pig) ... ... (Exported) do.	5,489	163,880	4,661	139,940	3,523	74,930	13	302	684	13,306	14,370	392,358
14.	Limestone ... ... (Reported) do.	...	...	...	...	...	...	...	...	93,706	18,290	93,706	18,290
15.	Magnesite ... ... (Exported) do.	62	225	42	50	12	47	688	1,196	...	...	804	1,518
16.	Mica ... ... (Exported) do.	...	...	...	...	*	10	*	26	*	627	...	663
17.	Molybdenite ... ... (Exported) do.	5	97	14	158	...	...	...	...	...	...	19	255
18.	Pyritic Ore ... ... (Reported) do.	2,252	1,629	3,575	1,752	4,409	2,263	6,558	2,368	37,540	13,215	54,334	21,227
19.	Silver ... ... (Exported) fine ounces	109,830	22,711	222,075	38,339	173,012	22,258	222,159	24,295	2,808,296	333,867	3,535,372	441,470
20.	Tantalite ... ... (Exported) statute tons	...	...	17	2,513	47	9,375	...	...	*	6,129	...	18,017
21.	Tin ... ... (Exported) do.	415	76,952	383	45,288	463	49,101	429	41,391	13,006	1,168,106	14,696	1,380,838
22.	Tungsten Ore { Scheelite ... (Exported) do.	5	720	½	42	3	438	...	...	4	140	12	1,340
	Tungsten Ore { Wolfram ... (Exported) do.	¼	31	...	...	1	128	¼	25	13½	1,242	15	1,426
23.	Zinc ... ... (Exported) do	...	...	...	...	14	630	7	143	163	4,664	184	5,437
	Unenumerated ... ... (Exported)	...	...	...	...	...	...	...	78	...	6,213	...	6,291
	Total Values	...	£4,265.577	...	£4,629,027	...	£4,893,417	...	£5,478,149	...	£124,905,259	...	£144,171,429

* Weight not stated.

AUSTRALASIAN MINERAL PRODUCTION.

COMPARATIVE TABLE SHOWING THE OUTPUT OF ALL MINERAL PRODUCTS FROM THE SEVERAL STATES OF AUSTRALIA AND THE DOMINION OF NEW ZEALAND DURING 1918.

DESCRIPTION OF MINERAL.	Western Australia.		NEW SOUTH WALES.		QUEENSLAND.		VICTORIA.		TASMANIA.		SOUTH AUSTRALIA.		NEW ZEALAND.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
		£		£		£		£		£		£		£
Gold ... ... fine ounces	876,511	3,723,183	87,045	369,743	133,571	567,371	158,827	674,655	10,529	44,724	6,180	26,252	184,251	782,650
Copper ... ... statute tons	478	41,269	6,510	696,580	18,980	2,087,751	...	...	5,559	772,162	7,169	828,556	...	...
Copper Ore ... do.	1,643	24,877			...	...	...	...	444	3,944	...	...	...	...
Pyritic Ore ... do.	2,252	1,629	...	...	...	...	...	...	...	...	...	...	...	...
Lead and Silver Lead do.	5,771	166,925	316,967	5,320,011	221	6,778	...	...	7,241	127,176	503	10,161	...	...
Manganese ... ... do.	...	...	...	...	1,299	4,151	...	...	...	...	1,080	17,876	...	...
Platinum ... ... fine ounces	...	...	607	7,075	...	...	...	...	...	...	...	...	...	...
Silver ... ... do.	109,830	22,711	2,007,037	419,498	152,499	29,867	6,333	1,319	...	...	1,608	331	800,261	171,456
Tin ... ... statute tons					1,311	251,755	135	24,481	...	...	...	...	...	...
Black Tin ... do.	415	76,952	1,890	548,876	...	...	...	...	...	...	...	...	...	...
Tin Ore ... ... do.					...	...	...	...	2,256	488,798	...	...	...	...
Tantalite ... ... do.	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Scheelite ... ... do.	5	720	117	21,078	17	3,495	...	...	216	39,252	...	...	170	37,922
Wolfram ... ... do.	¼	31	136	24,552	364	61,251	4	728	155	27,239	...	...	...	...
Zinc (Spelter and Concentrates) do.	...	...	87,019	295,413	...	...	...	...	3,822	152,880	...	...	...	...
Antimony (Metal and Ore) do.	...	...	358	3,155	...	...	1,201	24,020	...	...	...	...	...	...
Bismuth (Metal and Ore) do.	...	...	31	16,406	21	588	...	...	5	1,038	...	...	...	...
Alunite ... ... do.	...	...	3,406	17,030	...	...	...	...	...	...	...	...	...	...
Coal ... ... do.	337,039	204,319	9,063,176	4,941,807	983,193	572,305	505,775	367,640	60,163	37,676	...	...	2,034,250	2,530,677
Coke ... ... do.	...	...	608,492	647,798	...	...	...	...	...	...	...	...	...	...
Shale (Oil) ... do.	...	...	32,395	39,676	...	...	...	...	...	...	...	...	...	...
Iron ... ... do.	...	...	68,072	350,000	...	...	...	...	...	...	...	...	...	...
Iron "Oxide" ... do.	...	...	2,153	2,255	...	...	...	...	...	...	...	...	...	...
Ironstone ... do.	...	...	6,322	6,388	42,782	42,901	...	...	...	...	257,029	277,279	...	...
Lime ... ... do.	...	...	25,522	45,055	...	...	...	...	...	...	...	...	...	...
Limestone ... do.	...	...	103,644	44,608	97,898	42,357	...	...	...	...	72,209	34,813	...	...
Magnesite ... ... do.	62	225	...	...	...	...	225	675	...	...	440	666	...	...
Molybdenite ... do.	5	97	93	41,850	110	48,176	6	180	...	...	...	98	...	...
Phosphate Rock ... do.	...	...	...	...	...	...	3,384	3,384	...	...	8,074	10,773	...	...
Precious Stones ... do.	...	...	...	21,804	...	16,891	...	...	...	...	...	7,175	...	...
Mica ... ... do.	...	...	...	...	...	...	...	...	...	...	...	...	...	...
N.E.I.	...	2,639	...	538,694	...	5,288	...	5,470	...	55,685	...	237,518	...	165,463
Total Values	...	£4,265,577	...	£14,419,352	...	£3,740,925	...	£1,102,552	...	£1,750,574	...	£1,451,498	...	£3,688,168

PART I.—GOLD.

TABLE I.

MONTHLY PRODUCTION OF GOLD, IN FINE OUNCES, SHOWING THE QUANTITY REPORTED TO THE MINES DEPARTMENT DURING 1918.

GOLDFIELD.	DISTRICT.	JANUARY.		FEBRUARY.		MARCH.		APRIL.		MAY.		JUNE.		JULY.	
		District.	Goldfield.	District.	Goldfield.	District.	Goldfield.	District.	Goldfield.	District.	Goldfield.	District.	Goldfield.	District.	Goldfield.
		ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.
Kimberley ...	... ...	...	...	...	...	...	...	...	...	...	...	...	11·53	...	...
Pilbara	Marble Bar ...	38·13	237·42	546·08	656·17	863·12	863·12	...	2·74	17·58	17·58	...	162·80	133·71	133·71
Do. ...	Nullagine ...	199·29		110·09		...		2·74				162·80		...	
West Pilbara ...	... ...	...	2·45	...	37·24	...	10·28	...	30·23	...	8·43	...	14·28	...	4·90
Ashburton ...	... ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Gascoyne ...	... ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Peak Hill ...	... ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
East Murchison ...	Lawlers ...	193·60	1,967·57	466·92	2,642·87	394·88	2,676·55	364·43	2,389·01	243·53	2,332·93	486·89	2,697·83	418·28	2,019·93
Do. ...	Wiluna ...	675·87		495·82		911·89		719·17		422·61		558·74		491·74	
Do. ...	Black Range	1,098·10		1,680·13		1,369·78		1,305·41		1,666·79		1,652·20		1,109·91	
Murchison ...	Cue	753·49	9,146·57	514·77	4,884·21	639·07	5,501·66	1,331·14	5,226·41	722·54	5,241·84	917·96	4,589·38	1,762·88	4,566·50
Do. ...	Meekatharra...	6,848·81		3,280·10		3,471·20		3,273·51		4,134·15		2,933·50		2,712·35	
Do. ...	Day Dawn ...	1,255·43		1,004·82		803·60		338·71		201·83		12·27		19·37	
Do. ...	Mt. Magnet ...	288·84		84·52		587·79		283·05		183·32		725·65		71·90	
Yalgoo	... ...	...	9·78	...	277·16	...	33·03	...	387·13	...	813·32	...	383·66	...	203·05
Mt. Margaret ...	Mt. Morgans...	364·27	6,831·67	945·08	7,151·91	396·12	6,858·07	165·70	6,235·78	539·71	7,518·30	566·33	7,170·49	285·58	8,173·45
Do. ...	Mt. Malcolm...	4,337·65		3,842·21		4,152·17		3,877·99		4,237·50		4,014·03		4,323·45	
Do. ...	Mt. Margaret	2,129·75		2,364·62		2,309·78		2,192·09		2,741·09		2,590·13		3,564·42	
North Coolgardie	Menzies ...	2,572·91		2,236·58		2,627·77		2,339·51		2,675·88		2,574·92		3,112·77	
Do. ...	Ularring ...	318·72	2,940·92	...	2,358·22	127·66	2,785·69	185·12	2,693·90	444·88	3,167·00	272·44	2,909·03	449·25	3,659·42
Do. ...	Niagara ...	33·19		101·45		1·84		142·61		37·63		51·21		87·32	
Do. ...	Yerilla ...	16·10		20·19		28·42		26·66		8·61		10·46		10·08	
Broad Arrow ...	... ...	...	318·57	...	435·21	...	97·12	...	202·14	...	183·89	...	31·47	...	844·14
N.E. Coolgardie ...	Kanowna ...	255·52	255·52	635·22	635·22	151·30	384·95	497·04	497·04	107·02	107·02	224·80	224·80	248·80	248·80
Do. ...	Kurnalpi ...	...		...		233·65		...		...		...		...	
East Coolgardie ...	East Coolgardie	45,410·40	45,410·40	39,937·32	39,943·98	42,996·15	43,005·75	42,485·25	42,485·25	47,145·94	47,163·27	45,691·84	45,713·19	47,248·16	47,263·47
Do. ...	Bulong ...	...		6·66		9·60		...		17·33		21·35		15·31	
Coolgardie ...	Coolgardie ...	179·62	226·46	524·11	750·89	413·82	941·49	737·42	863·72	202·92	623·93	121·24	212·99	213·66	276·91
Do. ...	Kunanalling...	46·84		226·78		527·67		126·30		421·01		91·75		63·25	
Yilgarn	... ...	...	6,452·61	...	6,318·91	...	5,691·33	...	5,171·31	...	5,076·59	...	4,981·56	...	5,500·45
Dundas	... ...	...	1,382·17	...	1,219·29	...	1,639·98	...	1,245·11	...	1,256·55	...	1,107·90	...	1,037·17
Phillips River ...	... ...	...	829·97	...	205·88	...	400·16	...	194·17	...	629·69	...	92·46	...	258·63
State generally ...		...	...	...	...	...	...	...	83·54	...	...	...	...	...	...
TOTAL	Fine Ounces ...	...	76,012·08	...	67,517·16	...	71,147·40	...	68,105·61	...	74,140·34	...	70,316·74	...	74,190·53
	Sterling Value	£322,879		£286,795		£302,215		£289,294		£314,928		£298,687		£315,141	

TABLE I.—*Monthly Production of Gold in Fine Ounces*—continued.

GOLDFIELD.	DISTRICT.	AUGUST.		SEPTEMBER.		OCTOBER.		NOVEMBER.		DECEMBER.		**Total for 1918.**	
		District.	Goldfield.	District.	Goldfield.	District.	Goldfield.	District.	Goldfield.	District.	Goldfield.	District.	Goldfield.
		ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.
Kimberley ...	... ...	...	...	...	...	...	3·55	...	...	...	...	...	15·08
Pilbara	Marble Bar ...	84·60	257·65	79·94	145·12	285·18	296·95	958·08	958·08	2·89	17·06	2,991·73	3,748·40
Do. ...	Nullagine ...	173·05		65·18		11·77		...		14·17		756·67	
West Pilbara ...	... ...	...	2·12	...	7·36	...	3·08	...	...	...	...	...	120·37
Ashburton ...	... ...	...	...	...	...	...	...	...	...	...	...	...	...
Gascoyne	... ...	...	...	...	...	...	...	...	...	...	...	...	...
Peak Hill ...	... ...	...	...	...	85·15	...	7·03	...	...	...	327·41	...	1,089·31
East Murchison ...	Lawlers	372·53	2,430·23	313·64	2,307·95	392·12	2,328·08	148·86	1,803·36	319·87	3,614·41	4,115·55	29,210·72
Do. ...	Wiluna	748·16		913·91		560·56		329·28		1,081·85		7,909·60	
Do. ...	Black Range ...	1,309·54		1,080·40		1,375·40		1,325·22		2,212·69		17,185·57	
Murchison ...	Cue	576·41	5,066·77	690·11	6,458·33	978·53	3,771·16	92·07	3,783·53	1,204·78	5,049·07	10,183·75	63,285·43
Do. ...	Meekatharra ...	4,130·39		4,346·58		2,755·44		3,004·21		3,229·62		44,119·86	
Do. ...	Day Dawn ...	21·85		33·42		...		145·64		339·89		4,176·83	
Do. ...	Mt. Magnet ...	338·12		1,388·22		37·19		541·61		274·78		4,804·99	
Yalgoo	... ...	...	449·28	...	550·19	...	444·97	...	597·55	...	248·77	...	4,397·89
Mt. Margaret ...	Mt. Morgans ...	452·84	7,799·74	397·75	6,915·15	261·98	7,978·32	477·17	5,749·74	441·50	6,964·35	5,294·03	85,346·97
Do. ...	Mt. Malcolm ...	4,311·54		3,164·15		4,138·47		2,551·02		3,418·46		46,368·64	
Do. ...	Mt. Margaret ...	3,035·36		3,353·25		3,577·87		2,721·55		3,104·39		33,684·30	
North Coolgardie...	Menzies	2,574·68	3,468·40	2,407·78	3,279·30	2,188·47	2,888·51	2,577·15	3,252·12	2,456·64	3,427·40	30,345·06	36,829·91
Do. ...	Ularring	643·06		608·09		666·85		557·95		517·80		4,791·82	
Do. ...	Niagara	247·79		1·94		...		117·02		381·81		1,203·81	
Do. ...	Yerilla	2·87		261·49		33·19		...		71·15		489·22	
Broad Arrow ...	... ...	...	534·07	...	597·04	...	185·29	...	396·56	...	300·38	...	4,125·88
N.E. Coolgardie ...	Kanowna ...	310·03	310·03	203·52	203·52	71·82	71·82	385·00	385·00	349·53	376·53	3,439·60	3,700·25
Do. ...	Kurnalpi ...	...		...		...		...		27·00		260·65	
East Coolgardie ...	East Coolgardie ...	45,258·96	45,258·96	42,445·08	42,447·24	45,366·22	45,373·21	39,258·78	39,258·78	41,485·36	41,499·86	524,729·46	524,823·36
Do. ...	Bulong	...		2·16		6·99		...		14·50		93·90	
Coolgardie ...	Coolgardie ...	962·88	1,484·49	434·93	677·32	208·32	275·16	617·11	752·25	718 33	877·14	5,334·36	7,962·75
Do. ...	Kunanalling ...	521·61		242·39		66·84		135·14		158·81		2,628·39	
Yilgarn	... ...	...	7,875·86	...	6,254·40	...	5,547·78	...	6,305·32	...	5,589·76	...	70,765·88
Dundas	... ...	...	2,143·79	...	1,385·43	...	1,460·45	...	846·75	...	1,224·85	...	15,949·44
Phillips River ...	... ...	...	211·31	...	324·27	...	609·04	...	387·91	...	335·00	...	4,478·49
State generally ...	...	...	...	...	...	...	111·89	...	...	...	...	...	195·43
TOTAL	**Fine ounces** ...	...	**77,292·70**	...	**71,637·77**	...	**71,356·29**	...	**64,476·95**	...	**69,851·99**	...	**856,045·56**
	Sterling value	**£328,319**		**£304,298**		**£303,102**		**£273,881**		**£296,712**		**£3,636,250**	

The total gold yield of the State is as shown at page 5, being the amount of gold exported and also that lodged at the Royal Mint, which total includes alluvial and other gold not reported to the Department.

TABLE II.

TOTAL YEARLY PRODUCTION OF GOLD, IN FINE OUNCES, AS REPORTED TO THE MINES DEPARTMENT, TO 31ST DECEMBER, 1918.

GOLDFIELD.	DISTRICT.	1918.		1917.		1916.		1915.		1914.		1913.	
		District.	Goldfield.	District.	Goldfield.	District.	Goldfield.	District.	Goldfield.	District.	Goldfield.	District.	Goldfield.
		ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.
Kimberley	... ...	...	15·08	...	82·25	...	161·91	...	144·34	...	453·29	...	...
Pilbara	Marble Bar ...	2,991·73		2,463·66		3,515·58		6,462·36		3,304·94		3,845·81	
Do.	Nullagine ...	756·67	3,748·40	2,943·09	5,406·75	2,366·02	5,881·60	2,079·61	8,541·97	1,872·52	5,177·46	1,752·40	5,598·21
West Pilbara ...	... ...	...	120·37	...	304·77	...	608·84	...	1,507·02	...	1,022·70	...	1,421·15
Ashburton	... ...	...	...	...	6·50	...	...	...	...	...	...	...	11·70
Gascoyne	... ...	...	...	...	...	...	14·48	...	80·85	...	3·76	...	31·45
Peak Hill	... .	...	1,089·31	...	1,743·72	...	2,389·29	...	2,823·13	...	2,602·62	...	2,765·59
East Murchison ...	Lawlers	4,115·55		4,784·50		6,579·41		6,055·13		4,324·57		4,843·05	
Do.	Wiluna*	7,909·60	29,210·72	9,523·65	32,856·56	14,472·13	46,811·44	6,746·78	58,082·36	6,936·34	70,808·46	7,501·11	87,977·47
Do.	Black Range ...	17,185·57		18,548·41		25,759·90		45,280·45		59,547·55		75,633·31	
Murchison	Cue	10,183·75		9,689·81		6,011·29		6,185·89		4,491·02		6,525·65	
Do.	Meekatharra ...	44,119·86	63,285·43	44,269·00	82,305·83	51,322·56	84,422·89	73,834·57	108,049·78	80,400·07	115,722·42	72,701·81	122,027·56
Do.	Day Dawn ...	4,176·83		23,746·93		18,134·71		19,168·14		18,926·64		27,126·72	
Do.	Mt. Magnet ...	4,804·99		4,600·09		8,954·33		8,861·18		11,904·69		15,673·38	
Yalgoo	... ...	...	4,397·89	...	5,812·74	...	8,194·69	...	8,841·88	...	6,025·92	...	8,163·47
Mt. Margaret ...	Mt. Morgans ...	5,294·03		6,314·21		8,439·99		7,463·52		4,880·95		1,255·47	
Do.	Mt. Malcolm ...	46,368·64	85,346·97	59,488·04	101,874·54	57,541·13	100,612·34	63,995·64	106,563·01	66,071·07	96,792·51	72,738·73	91,272·70
Do.	Mt. Margaret ...	33,684·30		36,072·29		34,631·22		35,103·85		25,840·49		17,278·50	
North Coolgardie ...	Menzies	30,345·06		30,725·13		36,756·35		49,096·24		53,789·52		44,227·89	
Do.	Ularring ...	4,791·82	36,829·91	1,090·35	34,795·55	2,989·66	45,146·57	2,474·10	59,513·22	5,026·09	72,188·05	7,710·48	68,526·60
Do.	Niagara	1,203·81		1,185·17		1,790·01		3,155·13		6,724·42		6,941·08	
Do.	Yerilla	489·22		1,794·90		3,610·55		4,787·75		6,648·02		9,647·15	
Broad Arrow ...	... ...	...	4,125·88	...	16,518·64	...	22,215·92	...	22,290·03	...	9,285·98	...	34,739·33
N.E. Coolgardie ...	Kanowna ...	3,439·60	3,700·25	5,912·39	5,933·17	6,392·00	6,678·02	10,077·23	10,860·98	9,560·02	10,134·10	11,133·30	12,392·88
Do.	Kurnalpi ...	260·65		20·78		286·02		783·75		574·08		1,259·58	
East Coolgardie ...	East Coolgardie...	524,729·46	524,823·36	557,874·83	557,983·37	578,183·41	579,344·34	668,913·16	670,788·24	680,494·61	682,895·41	719,323·42	719,928·72
Do.	Bulong	93·90		108·54		1,160·93		1,875·08		2,400·80		605·30	
Coolgardie	Coolgardie ...	5,334·36	7,962·75	6,980·68	10,285·68	8,768·13	13,618·32	11,990·23	18,314·77	17,009·37	20,981·45	28,407·27	31,891·49
Do.	Kunanalling ...	2,628·39		3,305·00		4,850·19		6,324·54		3,972·08		3,484·22	
Yilgarn	... ...	...	70,765·88	...	78,244·77	...	87,993·68	...	91,123·57	...	88,744·72	...	82,333·96
Dundas	... ...	...	15,949·44	...	18,419·01	...	21,594·78	...	23,884·18	...	26,590·76	...	27,039·47
Phillips River ...	... ...	...	4,478·49	...	4,734·52	...	5,418·97	...	3,816·76	...	4,665·42	...	2,788·47
†Donnybrook ...	... ...	...	...	...	...	...	...	...	...	...	...	...	...
State generally ...	...	...	195·43	...	111·41	...	618·78	...	272·59	...	144·16	...	178·60
TOTAL	**Fine Ounces** ...	...	**856,045·56**	...	**957,419·78**	...	**1,031,726·86**	...	**1,195,498·68**	...	**1,214,239·19**	...	**1,299,088·82**
	Sterling Value	**£3,636,250**		**£4,066,861**		**£4,382,497**		**£5,078,156**		**£5,157,760**		**£5,518,179**	

* Previous to 1st March, 1910, included in Lawlers District. † Abolished 4th March, 1908.

TABLE II.—*Total Yearly Production of Gold, in Fine Ounces, etc.*—continued.

GOLDFIELD.	DISTRICT.	1912.		1911.		1910.		1909.		Previous to 1909.		Total to December 31st, 1918.	
		District.	Goldfield.	District.	Goldfield.	District.	Goldfield.	District.	Goldfield.	District.	Goldfield.	District.	Goldfield.
		ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.
Kimberley	... ...	...	271·63	...	171·45	...	265·53	...	134·52	...	16,169·62	...	17,869·62
Pilbara	Marble Bar ...	3,441·44	5,999·11	2,346·74	4,608·08	2,613·40	5,369·94	2,523·16	6,764·49	89,258·77	144,172·59	122,767·59	201,268·60
Do.	Nullagine ...	2,557·67		2,261·34		2,576·54		4,241·33		54,913·82		78,501·01	
West Pilbara ...	... ...	...	1,118·20	...	983·17	...	1,483·62	...	1,539·62	...	17,477·37	...	27,586·83
Ashburton	... ...	...	38·73	...	256·33	...	247·63	...	436·32	...	7,886·03	...	8,883·24
Gascoyne	... ...	...	6·55	....	7·87	...	26·31	...	...	...	505·27	...	676·54
Peak Hill	... ...	...	1,861·64	...	1,747·01	...	4,327·02	...	7,918·79	...	222,459·08	...	251,727·20
East Murchison ...	Lawlers	7,307·72		27,193·85		45,203·50		77,542·23		714,474·13		902,423·66	
Do.	Wiluna	7,728·33	99,130·78	7,829·83	102,390·79	14,258·17	130,371·21	*	155,908·60	*	909,491·01	82,905·94	1,723,039·40
Do.	Black Range ...	84,094·73		67,367·11		70,909·54		78,366·37		195,016·88		737,709·80	
Murchison	Cue	8,993·26		11,455·56		9,576·29		21,271·13		263,436·59		357,820·24	
Do.	Meekatharra ...	50,558·20	105,372·78	54,241·79	119,653·40	50,046·60	124,351·38	50,992·21	133,105·86	280,012·06	1,847,970·90	852,498·73	2,906,268·23
Do.	Day Dawn ...	28,283·42		37,947·41		46,474·13		44,447·89		1,033,706·46		1,302,139·28	
Do.	Mt. Magnet ...	17,537·90		16,008·64		18,254·36		16,394·63		270,815·79		393,809·98	
Yalgoo	... ...	...	6,165·92	...	1,162·04	...	1,332·72	...	1,805·31	...	64,884·52	...	116,787·10
Mt. Margaret ...	Mt. Morgans ...	3,438·55		5,484·08		10,331·24		25,722·76		425,346·01		503,970·81	
Do.	Mt. Malcolm ...	34,288·81	102,969·60	92,811·29	152,474·39	97,689·68	160,281·18	90,436·33	155,864·99	832,251·50	1,666,590·07	1,553,680·86	2,820,642·30
Do.	Mt. Margaret ...	25,242·24		54,179·02		52,260·26		39,705·90		408,992·56		762,990·63	
North Coolgardie ...	Menzies	36,126·25		39,062·97		40,247·69		35,851·38		560,253·25		956,481·73	
Do.	Ularring	9,526·65	58,270·47	9,472·85	64,759·69	8,669·96	72,747·55	15,286·66	79,398·99	219,984·17	1,350,454·36	287,022·79	1,942,630·96
Do.	Niagara	6,342·67		8,423·55		12,007·07		17,061·87		436,088·25		500,923·03	
Do.	Yerilla	6,274·90		7,800·32		11,882·83		11,199·08		134,128·69		198,203·41	
Broad Arrow ...	... ...	...	13,375·43	...	7,152·73	...	15,481·88	...	17,121·70	...	305,547·45	...	467,854·97
N.E. Coolgardie ...	Kanowna ...	11,364·53	13,855·71	17,958·07	19,554·75	22,203·96	23,027·27	23,785·63	25,462·38	562,930·30	582,168·28	684,757·03	713,767·79
Do.	Kurnalpi ...	2,491·18		1,596·68		823·31		1,676·75		19,237·98		29,010·76	
East Coolgardie ...	East Coolgardie	755,368·56	756,795·14	775,050·60	776,493·74	777,893·88	778,479·54	896,900·15	899,289·27	10,004,269·81	10,153,327·26	16,939,001·89	17,100,148·39
Do.	Bulong	1,426·58		1,443·14		585·66		2,389·12		149,057·45		161,146·50	
Coolgardie	Coolgardie ...	37,246·77	42,181·59	28,982·04	33,753·71	31,928·00	37,911·04	28,382·62	34,134·90	763,002·45	924,923·89	968,031·92	1,175,959·59
Do.	Kunanalling ...	4,934·82		4,771·67		5,983·04		5,752·28		161,921·44		207,927·67	
Yilgarn	... ...	...	30,675·40	...	18,811·40	...	27,857·93	...	20,909·12	...	309,516·64	...	906,977·07
Dundas	... ...	...	25,314·35	...	28,989·86	...	29,627·34	...	29,549·27	...	347,864·64	...	594,823·10
Phillips River ...	... ...	...	4,201·36	...	5,656·54	...	8,194·90	...	6,713·52	...	33,272·92	...	83,941·87
†Donnybrook ...	... ...	...	...	...	...	...	...	...	...	...	841·76	...	841·76
State generally ...	... ...	...	240·40	...	359·99	...	847·41	...	348·09	...	4,343·84	...	7,660·70
TOTAL — Fine Ounces ...		...	1,267,844·79	...	1,338,986·94	...	1,422,231·40	...	1,576,405·74	...	18,909,867·50	...	31,069,355·26
TOTAL — Sterling Value ...		£5,385,462		£5,687,655		£6,041,254		£6,696,146		£80,324,012		£131,974,232	

* Previous to March, 1910, included in Lawlers District. † Abolished 4th March, 1908.

TABLE III

GENERAL RETURN.

RETURN SHOWING, FOR THE RESPECTIVE GOLDFIELDS AND DISTRICTS, THE AREA IN SQUARE MILES, LEASES IN FORCE, PARTICULARS OF PLANT, MEN EMPLOYED AND DIGGERS, ALLUVIAL, DOLLIED, AND SPECIMEN GOLD AND ORE TREATED, WITH GOLD AND SILVER YIELD, IN FINE OUNCES, AS REPORTED TO THE MINES DEPARTMENT FOR THE YEAR 1918.

Goldfield.	District.	Date of Proclamation of Goldfield.				Area in Square Miles.		Leases in force.		Particulars of Plant.					Average Number of Men engaged in Gold Mining.		
										Milling.		Cyaniding.			Men employed.		
		Proclamation gazetted.	To take effect from.	Latest Amendment of Boundaries gazetted.	To take effect from.	Goldfield.	District.	No.	Area in Acres.	Stamps.	Other Mills.	Leaching Vats.	Agitating Vats.	Vacuum Filters and Presses.	Above Ground.	Under Ground.	Diggers.
Kimberley	... ...	20-5-86	20-5-86	31-10-02	1-11-02	33,833	...	...	...	...	...	...	...	...	...	...	12
Pilbara	Marble Bar ...	1-10-88	1-10-88	1-3-07	1-3-07	32,696	25,809	13	115	38	...	12	...	...	8	26	9
	Nullagine ...						6,887	5	48	25	1	14	...	...	19	11	17
West Pilbara	... ...	20-9-95	1-11-95	1-3-07	1-3-07	10,843	...	2	12	40	2	...	...	...	2	2	6
Ashburton	... ...	11-12-90	11-12-90	18-10-01	14-10-01	14,230	...	...	...	...	...	...	...	...	1	2	4
Gascoyne	... ...	25-6-97	15-4-97	...	...	5,313	...	...	...	1	...	...	...	...	2	...	4
Peak Hill	... ...	19-3-97	1-4-97	13-11-14	1-12-14	23,650	...	11	87	40	2	13	3	...	10	10	3
East Murchison ...	Lawlers ...	28-6-95	28-6-95	1-11-12	1-1-13	28,746	9,379	16	193	65	2	22	...	...	24	27	1
	Wiluna ...						10,496	24	401	85	8	12	12	2	39	36	...
	Black Range						8,871	22	365	80	6	17	3	2	95	92	1
Murchison	Cue	24-9-91	24-9-91	28-11-13	1-1-14	25,474	8,593	30	378	65	4	23	1	...	73	44	4
	Meekatharra						12,250	56	713	112	23	24	23	5	171	303	13
	Day Dawn ...						896	36	377	60	8	17	17	26	27	26	2
	Mt. Magnet ...						3,735	21	189	35	3	22	...	...	42	39	...
Yalgoo	... ...	8-2-95	23-1-95	30-7-15	9-8-15	23,230	...	32	484	70	6	7	5	...	47	53	...
Mt. Margaret	Mt. Morgans	12-3-97	1-4-97	7-9-17	17-9-17	57,230	14,007	19	315	60	3	23	2	1	53	43	2
	Mt. Malcolm						3,330	64	1,265	127	21	1	12	2	185	287	3
	Mt. Margaret						39,893	47	815	70	24	21	6	3	146	163	6
North Coolgardie ...	Menzies ...	28-6-95	28-6-95	7-9-17	17-9-17	13,746	6,805	37	522	105	22	80	4	2	157	177	11
	Ularring ...						3,093	16	167	40	4	11	4	...	49	47	3
	Niagara ...						688	5	72	50	5	19	...	2	15	17	5
	Yerilla ...						3,160	4	72	30	1	11	...	...	14	13	4
Broad Arrow	... ...	17-11-96	20-11-96	8-6-06	1-7-06	1,038	...	23	507	45	18	15	1	2	79	128	31
North-East Coolgardie ...	Kanowna ...	20-3-96	15-4-96	27-3-08	1-4-08	20,604	1,094	19	268	85	4	22	...	...	29	37	8
	Kurnalpi ...						19,510	2	20	5	1	...	...	...	6	5	4
East Coolgardie ...	East Coolgardie	21-9-94	1-10-94	27-3-08	1-4-08	1,800	810	129	1,836	535	307	152	159	108	1,520	1,898	13
	Bulong ...						990	5	95	20	1	...	...	...	14	11	5
Coolgardie	Coolgardie ...	6-4-94	6-4-94	1-3-07	1-3-07	11,702	9,384	41	594	196	13	52	...	...	100	68	28
	Kunanalling						2,318	15	179	40	2	14	...	...	33	29	16
Yilgarn	... ...	1-10-88	1-10-88	28-1-16	1-2-16	17,700	...	98	1,742	197	29	80	7	5	342	502	...
Dundas	... ...	31-8-93	31-8-93	1-3-07	1-3-07	11,430	...	41	423	65	14	47	10	2	58	79	...
Phillips River	... ...	21-9-00	14-9-00	28-1-16	1-2-16	5,078	...	13	182	45	3	4	...	...	13	27	...
State generally ...	... ...	...	...	...	...	...	...	1	12	...	2	...	...	...	...	...	...
	Total	...	...	...	...	338,343	...	847	12,448	2,431	539	735	269	162	3,373	4,202	215

TABLE III.—*Return showing for the respective Goldfields and Districts, etc.*—continued.

Goldfield.	District.	1918 GOLD AND SILVER YIELD—DISTRICTS.						1918 GOLD AND SILVER YIELD—GOLDFIELDS.					
		Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Total Gold.	Silver.	Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Total Gold.	Silver.
		Fine ozs.	Fine ozs.	Tons (2,240lbs.)	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Tons (2,240lbs.)	Fine ozs.	Fine ozs.	Fine ozs.
Kimberley ...	...	...	...	...	...	...	...	15·08	...	...	...	15·08	...
Pilbara	Marble Bar ...	7·30	...	1,418·25	2,984·43	2,991·73	...	63·87	2·74	1,418·25	3,681·79	3,748·40	...
Do.	Nullagine ...	56·57	2·74	...	697·36	756·67	...						
West Pilbara ...	...	...	...	...	...	...	...	28·51	10·28	35·00	81·58	120·37	22·71
Ashburton ...	...	...	...	...	...	...	...	...	...	...	...	...	...
Gascoyne	...	...	...	...	...	...	...	...	...	...	...	...	...
Peak Hill ...	...	...	...	...	...	...	...	26·04	32·44	1,409·00	1,030·83	1,089·31	...
East Murchison ...	Lawlers ...	...	132·29	13,260·00	3,983·26	4,115·55	371·36						
Do. ...	Wiluna ...	...	...	15,982·75	7,909·60	7,909·60	...	6·53	353·10	52,632·75	28,851·09	29,210·72	511·15
Do.	Black Range	6·53	220·81	23,390·00	16,958·23	17,185·57	139·79						
Murchison ...	Cue	52·89	264·96	16,115·75	9,865·90	10,183·75	...						
Do.	Meekatharra ...	87·07	560·26	61,914·10	43,472·53	44,119·86	175·21						
Do.	Day Dawn ...	...	522·13	7,997·75	3,654·70	4,176·83	545·24	139·96	1,390·42	88,764·58	61,755·05	63,285·43	720·45
Do.	Mt. Magnet ...	...	43·07	2,736·98	4,761·92	4,804·99	...						
Yalgoo	...	...	...	...	...	...	...	...	3·97	5,626·00	4,393·92	4,397·89	...
Mt. Margaret ...	Mt. Morgans ...	18·94	35·92	9,506·99	5,239·17	5,294·03	15·94						
Do.	Mt. Malcolm ...	26·67	228·03	134,015·46	46,113·94	46,368·64	4,425·69	218·98	859·56	229,104·86	84,268·43	85,346·97	8,350·90
Do.	Mt. Margaret...	173·37	595·61	85,582·41	32,915·32	33,684·30	3,909·27						
North Coolgardie	Menzies ...	42·08	198·35	47,211·75	30,104·63	30,345·06	1,397·52						
Do.	Ularring ...	...	...	6,350·00	4,791·82	4,791·82	41·93						
Do.	Niagara ...	...	9·43	1,083·23	1,194·38	1,203·81	...	42·08	212·16	55,335·81	36,575·67	36,829·91	1,439·45
Do.	Yerilla ...	...	4·38	690·83	484·84	489·22	...						
Broad Arrow ...	...	...	...	...	...	...	...	189·85	1,079·49	5,103·49	2,856·54	4,125·88	...
N.E. Coolgardie ...	Kanowna ...	23·49	17·66	6,307·78	3,398·45	3,439·60	...	25·41	44·66	6,319·58	3,630·18	3,700·25	...
Do.	Kurnalpi ...	1·92	27·00	11·80	231·73	260·65	...						
East Coolgardie ...	East Coolgardie	122·87	198·56	1,050,880·45	524,408·03	524,729·46	106,721·28	155·03	239·54	1,050,887·10	524,428·79	524,823·36	106,721·28
Do.	Bulong ...	32·16	40·98	6·65	20·76	93·90	...						
Coolgardie ...	Coolgardie ...	112·51	244·47	6,987·39	4,977·38	5,334·36	...	123·74	247·43	10,762·55	7,591·58	7,962·75	...
Do.	Kunanalling ...	11·23	2·96	3,775·16	2,614·20	2,628·39	...						
Yilgarn	...	...	...	...	...	...	...	...	...	149,996·18	70,765·88	70,765·88	982·06
Dundas	...	...	...	...	...	...	...	...	998·45	30,924·28	14,950·99	15,949·44	...
Phillips River ...	...	...	...	...	...	...	...	...	...	3,017·83	4,478·49	4,478·49	...
State generally		...	...	...	...	...	...	...	...	...	195·43	195·43	...
Total for 1918		...	...	...	...	...	...	**1,035·08**	**5,474·24**	**1,691,337·26**	**849,536·24**	**856,045·56**	**118,748·00**

TABLE III.—*Return showing for the respective Goldfields and Districts, etc.*—continued.

Goldfield.	District.	Total Gold and Silver Yield—Districts.						Total Gold and Silver Yield—Goldfields.					
		Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Total Gold.	* Silver.	Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Total Gold.	* Silver.
		Fine ozs.	Fine ozs.	Tons (2,240lbs.)	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Tons (2,240lbs.)	Fine ozs.	Fine ozs.	Fine ozs.
Kimberley ...	...	...	...	...	...	...	...	3,742·37	...	17,597·50	14,127·25	17,869·62	...
Pilbara	Marble Bar ...	11,773·55	3,280·13	70,709·68	107,713·91	122,767·59	574·01	18,103·77	3,686·37	110,933·92	179,478·46	201,268·60	574·01
Do.	Nullagine ...	6,330·22	406·24	40,224·24	71,764·55	78,501·01	...						
West Pilbara ...	...	...	...	...	...	...	...	5,550·56	275·00	18,890·71	21,761·27	27,586·83	1,269·21
Ashburton ...	...	...	...	...	...	...	...	8,567·60	315·64	...	...	8,883·24	7,787·69
Gascoyne	...	...	...	...	...	...	...	320·20	18·51	356·70	337·83	676·54	...
Peak Hill ...	...	...	...	...	...	...	...	1,937·81	3,951·53	484,959·26	245,837·86	251,727·20	2,287·59
East Murchison ...	Lawlers ...	5,614·49	7,060·22	2,001,030·86	889,748·95	902,423·66	25,687·96	7,164·53	22,517·77	3,292,720·57	1,693,357·10	1,723,039·40	40,872·09
Do.	Wiluna ...	90·79	197·27	162,093·25	82,617·88	82,905·94	232·00						
Do. ...	Black Range ...	1,459·25	15,260·28	1,129,596·46	720,990·27	737,709·80	14,952·13						
Murchison... ...	Cue	1,079·67	4,677·36	412,763·55	352,063·21	357,820·24	400·11	15,324·52	35,577·29	4,101,944·26	2,855,366·42	2,906,268·23	175,749·32
Do.	Meekatharra ...	10,208·22	10,301·70	1,197,278·75	831,988·81	852,498·73	4,964·59						
Do.	Day Dawn ...	2,285·32	6,764·32	1,962,955·56	1,293,089·64	1,302,139·28	169,210·44						
Do.	Mt. Magnet ...	1,751·31	13,833·91	528,946·40	378,224·76	393,809·98	1,174·18						
Yalgoo	...	...	...	...	...	...	...	1,451·29	1,744·06	172,485·64	113,591·75	116,787·10	167·40
Mt. Margaret ...	Mt. Morgans ...	1,735·20	3,505·86	903,721·34	498,729·75	503,970·81	5,775·05	7,674·30	17,768·54	5,330,790·59	2,795,199·46	2,820,642·30	121,471·38
Do.	Mt. Malcolm ...	2,539·64	7,195·99	2,978,651·38	1,543,945·23	1,553,680·86	68,369·01						
Do.	Mt. Margaret...	3,399·46	7,066·69	1,448,417·87	752,524·48	762,990·63	47,327·32						
North Coolgardie	Menzies ...	1,031·59	3,098·26	1,114,210·35	952,351·88	956,481·73	18,260·45	3,774·58	13,224·39	2,515,362·85	1,925,631·99	1,942,630·96	29,586·86
Do.	Ularring ...	21·46	1,144·32	289,135·77	285,857·01	287,022·79	5,659·95						
Do.	Niagara ...	1,475·19	1,409·44	897,006·27	498,038·40	500,923·03	5,603·42						
Do.	Yerilla ...	1,246·34	7,572·37	215,010·46	189,384·70	198,203·41	63·04						
Broad Arrow ...	...	...	...	...	...	...	...	19,175·44	11,634·16	799,296·50	437,045·37	467,854·97	2,181·96
N.E. Coolgardie ...	Kanowna ...	104,377·39	10,786·14	925,551·63	569,593·50	684,757·03	2,522·12	116,366·64	15,431·95	930,644·64	581,969·20	713,767·79	2,533·34
Do.	Kurnalpi ...	11,989·25	4,645·81	5,093·01	12,375·70	29,010·76	11·22						
East Coolgardie ...	East Coolgardie	27,071·27	30,590·24	26,462,777·71	16,881,340·28	16,939,001·89	1,558,540·06	53,616·46	45,575·80	26,616,767·78	17,000,956·13	17,100,148·39	1,558,552·98
Do.	Bulong ...	26,545·09	14,985·56	153,990·07	119,615·85	161,146·50	12·92						
Coolgardie ...	Coolgardie ...	8,700·38	10,580·84	1,495,885·58	948,750·70	968,031·92	881·79	9,362·05	15,617·34	1,763,374·71	1,150,980·20	1,175,959·59	930·46
Do.	Kunanalling ...	661·67	5,036·50	267,489·13	202,229·50	207,927·67	48·67						
Yilgarn	...	...	...	...	...	...	...	89·88	1,394·70	1,959,219·79	905,492·49	906,977·07	23,795·60
Dundas	...	...	...	...	...	...	...	2,027·12	11,881·27	862,933·70	580,914·71	594,823·10	36,392·90
Phillips River ...	...	...	...	...	...	...	...	472·20	775·33	87,773·22	82,694·34	83,941·87	15,688·17
†Donnybrook ...	...	...	...	...	...	...	...	23·24	...	1,653·30	818·52	841·76	...
State generally		...	...	...	...	...	...	124·89	155·90	27·00	7,379·91	7,660·70	9,829·22
Total to 31st December, 1918 ...		...	...	...	...	...	...	**274,869·45**	**201,545·55**	**49,067,732·64**	**30,592,940·26**	**31,069,355·26**	**2,029,670·18**

* By-product in the treatment of auriferous ore except Ashburton and State generally. † Abolished 4th March, 1908.

TABLE IV.

PRODUCTION OF GOLD AND SILVER FROM ALL SOURCES, SHOWING IN FINE OUNCES THE OUTPUT AS REPORTED TO THE MINES DEPARTMENT DURING 1918, AND THE TOTAL PRODUCTION TO DATE.

Kimberley Goldfield.

MINING CENTRE.	NUMBER OF LEASE.	REGISTERED NAME OF COMPANY OR LEASE.	TOTAL FOR 1918.					TOTAL PRODUCTION.				
			Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.	Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.
			Fine ozs.	Fine ozs.	Tons (2,240lbs.)	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Tons (2,240lbs.)	Fine ozs.	Fine ozs.
Hall's Creek ...	...	Voided leases	...	...	...	...	...	...	...	423·00	477·76	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	...	94·55	62·68	...
Mt. Dockrell...	...	Voided leases	...	...	...	...	...	...	...	44·00	435·93	...
Ruby Creek...	...	Voided leases	...	...	...	...	...	...	...	12,633·50	9,435·13	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	...	151·00	127·28	...
The Brockman	...	Voided leases	...	...	...	...	...	...	...	1,352·75	1,404·40	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	...	2,462·00	1,820·33	...
The Mary ...	...	Voided leases	...	...	...	...	...	...	...	399·00	210·03	...
The Panton ...	...	Voided leases	...	...	...	...	...	...	...	34·70	138·70	...
Do. ...	...	Sundry claims	...	...	...		...	...	...	3·00	15·01	...
		From Goldfield generally :—										
		Reported by Banks and Gold Dealers	15·08	...	...	...	...	3,742·37	...	...	...	...
		Total	**15·08**	...	...	...	...	**3,742·37**	...	**17,597·50**	**14,127·25**	...

Pilbara Goldfield.

MARBLE BAR DISTRICT.

Bamboo Creek	(733)	Bamboo Queen	...	...	...	...	...	...	...	499·00	746·93	...
Do. ...	801	Bonnie Doon	...	...	122·50	72·13	...	...	...	122·50	72·13	...
Do. ...	795	Bulletin	...	...	29·50	60·50	...	...	...	35·50	65·21	...
Do. ...	707	Kitchener	...	...	354·00	794·79	...	...	...	1,965·25	4,295·81	...
Do. ...	740	Mount Prophecy	...	...	284·00	627·25	...	...	1·11	1,040·50	1,898·07	...
Do. ...	794	Perseverance	...	...	176·00	401·06	...	...	...	290·50	584·21	...
Do. ...	789	Princess May and Charlie ...	...	...	41·75	78·06	...	...	...	93·50	212·57	...
Do. ...	...	Voided leases	...	...	...	...	...	...	454·61	14,103·00	21,952·52	...
1 o. ...	...	Sundry claims	...	...	101·00	129·48	...	...	307·83	866·85	1,092·36	...
Boodalyerrie...	...	Voided leases	...	...	...	...	...	...	292·07	120·25	587·86	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	7·16	...	...	...
Breen's Find	...	Voided leases	...	...	...	...	...	...	...	14·00	66·82	...

Elsie	792	... ...	Trio	...	...	...	...	...	...	...	...	43·00	35·75	...
Do. ...		...	Voided leases	...	...	...	...	...	...	...	...	135·00	316·31	...
Do. ...		...	Sundry claims	...	...	7·50	10·59	...	...	...	...	10·25	19·81	...
Lalla Rookh ...		...	Voided leases	...	...	...	...	...	...	...	...	224·50	2,186·65	574·01
Do. ...		...	Sundry claims	...	...	...	...	...	...	...	...	6,908·00	6,806·72	...
Marble Bar ...	694	... ...	Jo Jo	...	...	107·00	121·87	...	...	...	...	2,005·00	2,181·67	...
Do. ...	790	... ...	Rufus Henry	...	...	41·00	58·76	...	...	...	...	347·50	750·78	...
Do. ...	(762)	... ...	True Blue	...	...	...	...	...	...	...	...	190·25	324·19	...
Do. ...	722	... ...	Viking	...	...	42·00	49·90	...	...	...	...	1,403·00	1,492·78	...
Do. ...		...	Voided leases	...	...	...	...	...	...	147·90	15,742·20	20,754·29	...	
Do. ...		...	Sundry claims	...	...	112·00	109·65	...	38·68	148·07	4,383·64	4,862·28	...	
North Pole ...		...	Voided leases	...	...	...	...	...	...	...	...	474·00	340·75	...
Do. ...		...	Sundry claims	...	...	...	...	...	...	...	...	50·50	69·56	...
North Shaw ...		...	Voided leases	...	...	...	...	...	7·53	...	351·45	674·72	...	
Do. ...		...	Sundry claims	...	...	...	...	...	...	567·06	...	...	...	
Sharks ...		...	Sundry claims	...	...	...	...	...	145·08	19·37	24·50	93·14	...	
Shaw River ...		...	Voided leases	...	...	...	...	...	...	...	101·00	49·63	...	
Talga Talga ...		...	Voided leases	...	...	...	...	...	...	83·83	574·50	975·98	...	
Do. ...		...	Sundry claims	...	...	...	...	...	50·26	68·99	204·65	520·25	...	
Tambourah ...		...	Voided leases	...	...	...	...	...	...	...	1,438·50	1,739·44	...	
Do. ...		...	Sundry claims	...	...	...	...	...	...	79·29	639·25	797·44	...	
Warrawoona		...	Voided leases	...	...	...	...	...	...	16·99	10,072·80	18,136·84	...	
Do. ...		...	Sundry claims	...	...	...	...	...	44·30	362·50	1,127·04	2,163·74	...	
Western Shaw		...	Voided leases	...	...	...	...	...	...	...	1,222·50	957·80	...	
Do ...		...	Sundry claims	...	...	...	...	...	12·52	67·47	...	...	...	
Wyman's Well	744	... ...	Euro	...	...	...	...	...	...	...	340·00	352·55	...	
Do. ...		...	Voided leases	...	...	...	...	...	...	33·55	115·04	493·98	...	
Do. ...		...	Sundry claims	·31	...	...	...	...	·93	16·72	355·86	592·18	...	
Yandicoogina		...	Voided leases	...	...	...	...	...	...	140·76	2,733·20	5,824·23	...	
Do. ...		...	Sundry claims	...	...	...	...	...	...	238·35	103·75	120·34	...	
			From District generally :—											
			Sundry Parcels treated at :											
			State Battery—Bamboo Creek	...	...	...	470·39	...	...	...	...	1,266·65	...	
			State Battery—Marble Bar	...	...	...	...	...	...	...	...	34·06	...	
			Various Works	...	...	...	...	...	...	...	237·95	1,204·91	...	
			Reported by Banks and Gold Dealers	6·99	...	...	...	...	11,474·25	226·50	...	...	...	
			Total	**7·30**	...	**1,418·25**	**2,984·43**	...	**11,773·55**	**3,280·13**	**70,709·68**	**107,713·91**	**574·01**	

NULLAGINE DISTRICT.

Eastern Creek	180L	... ...	Crescent	...	...	...	...	...	...	...	...	899·75	1,625·07	...
Do. ...	176L	... ...	(Doherty Reward)	...	...	...	...	...	...	...	...	142·25	171·43	...
Do. ...	176L	... ...	Doherty Reward	...	...	...	...	...	...	...	...	1,265·00	2,081·65	...
Do. ...	176L, (177L)	...	(Doherty Reward leases) ...	...	...	...	...	...	...	...	...	219·00	1,007·68	...
Do. ...	(203L)	... ...	Harp	...	...	...	...	...	...	...	...	271·00	676·66	...

TABLE IV.—*Production of Gold and Silver from all sources, etc.*—continued.

PILBARA GOLDFIELD—continued.

NULLAGINE DISTRICT—*continued.*

Mining Centre.	Number of Lease	Registered Name of Company or Lease	Total for 1918.					Total Production.				
			Alluvial	Dollied and Specimens	Ore treated.	Gold therefrom.	Silver.	Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver
			Fine ozs.	Fine ozs.	Tons (2,240lbs.)	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Tons (2,240lbs.)	Fine ozs.	Fine ozs.
Eastern Creek	182L	Morning Star	...	...	...	...	...	...	4·19	367·00	834·03	...
Do. ...	(205L)	Rose	...	...	...	...	...	...	...	157·25	150·36	...
Do. ...	178L	Shamrock	...	...	...	...	...	...	4·00	395·25	683·06	...
Do. ...	...	Voided leases	...	...	...	...	...	...	...	267·50	214·00	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	3·77	301·50	523·27	...
Elsie	...	Voided leases	...	...	...	...	...	...	...	408·25	1,323·85	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	...	24·00	27·48	...
McPhee's Creek	...	Voided leases	...	...	...	...	...	...	...	113·00	137·92	...
Middle Creek	(106L)	Barton	...	...	...	...	...	...	...	5,652·65	7,324·01	...
Do. ...	...	Voided leases	...	...	...	...	...	...	...	559·25	1,109·67	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	...	286·00	408·82	...
Mosquito Creek	...	Voided leases	...	...	...	...	...	1·07	21·42	7,259·80	12,464·00	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	166·47	2,188·94	3,116·77	...
Nullagine ...	...	Voided leases	...	...	...	...	...	...	13·96	7,453·25	11,335·12	...
Do. ...	...	Sundry claims	...	2·74	...	64·22	...	104·70	133·14	3,984·75	9,336·03	...
Twenty-Mile Sandy	195L	Billjim	...	...	...	...	...	...	...	2,458·50	2,064·92	...
Do. ...	...	Voided leases	...	...	...	...	...	...	3·20	2,635·20	5,722·07	...
Do. ...	...	Sundry claims	...	...	...	...	...	33·10	20·55	2,802·65	3,855·08	...
		From District generally :—										
		Sundry Parcels treated at :										
		Doherty's Works	...	...	...	473·51	...	...	...	...	1,177·32	...
		Fremantle Trading Coy's Works	...	...	...	...	...	...	...	...	8·29	...
		State Battery—Twenty-mile Sandy	...	...	...	159·63	...	...	...	62·00	1,744·32	...
		Various Works	...	...	...	...	...	...	...	50·50	2,641·67	...
		Reported by Banks and Gold Dealers	56·57	...	...	...	...	6,191·35	35·54	...	...	...
		Total	**56·57**	**2·74**	...	**697·36**	...	**6,330·22**	**406·24**	**40,224·24**	**71,764·55**	...

West Pilbara Goldfield.

Croydon ...	...	Voided leases	...	...	...	...	...	...	...	8·00	5·44	...
Hong Kong	...	Voided leases	...	...	...	...	...	...	...	331·00	442·45	...
Do. ...	...	Sundry claims	...	...	...	...	...	21·40	·02	9·00	3·15	...

Lower Nicol ...	...	Voided leases	...	...	...	...	...	...	1·10	653·20	402·22	...
Do. ...	...	Sundry claims	...	...	...	...	...	10·44	2·71	10·00	11·51	...
Mallina ...	...	Voided leases	...	...	...	...	...	...	...	141·60	128·44	...
Nicol ...	...	Voided leases	...	...	...	...	...	...	...	30·00	11·47	...
Pilbara ...	167	Mountain Maid	...	...	...	...	...	...	...	4·00	5·74	...
Do. ...	...	Voided leases	...	...	...	...	...	...	48·12	148·00	293·42	...
Do. ...	...	Sundry claims	...	...	...	...	...	1·11	86·24	68·00	101·06	...
Roebourne ...	M.L. 174 ...	Good Fortune	...	...	...	*1·72	*22·71	...	...	...	2·13	50·97
Do. ...	...	Voided leases	...	...	...	...	...	...	...	113·36	573·91	237·91
Do. ...	...	Sundry claims	...	...	...	...	...	...	...	108·60	93·85	96·53
Station Peak...	165	Belladonna	...	...	...	...	...	...	17·93	763·00	213·85	...
Do. ...	...	Voided leases	...	...	...	...	...	177·74	23·44	9,993·00	11,084·49	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	...	37·50	48·19	...
Towranna ...	(155)	Tauri Tom Tit	...	...	35·00	79·08	...	...	2·62	2,031·00	3,099·25	...
Do. ...	...	Voided leases	...	...	...	...	...	...	...	1,934·80	2,088·26	...
Upper Nicol ...	...	Sundry claims	...	...	...	...	...	...	...	6·50	2·57	...
Weerianna ...	...	Voided leases	...	...	...	...	...	...	...	2,436·15	3,079·81	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	...	64·00	62·90	...
Whim Creek ...	M.L. (172) ...	Cumstock	...	...	...	...	...	...	...	...	...	883·80
		From Goldfield generally :—										
		Reported by Banks and Gold Dealers	28·51	10·28	...	·78	...	5,339·87	92·82	...	7·16	...
		Total	**28·51**	**10·28**	**35·00**	**81·58**	**22·71**	**5,550·56**	**275·00**	**18,890·71**	**21,761·27**	**1,269·21**

* From Copper Ore.

Ashburton Goldfield.

Mt. Mortimer ...	...	Sundry claims	...	...	...	...	...	354·37	315·64	...	...	74·47
Uaroo ...	M.L. 43, M.L. 49	Uaroo Silver-Lead Mines, Ltd. ...	...	...	...	...	...	...	...	...	...	7,551·20
Do. ...	...	Voided leases	...	...	...	...	...	...	...	...	...	162·02
		From Goldfield generally :—										
		Reported by Banks and Gold Dealers	...	...	...	...	...	8,213·23	...	...	...	...
		Total	...	...	...	...	...	**8,567·60**	**315·64**	...	...	**7,787·69**

Gascoyne Goldfield.

Bangemall ...	(32)	Gem	...	...	...	...	...	...	...	114·00	95·33	...
Do. ...	...	Voided leases	...	...	...	...	...	...	6·22	236·70	218·49	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	12·29	6·00	24·01	...
		From Goldfield generally :—										
		Reported by Banks and Gold Dealers	...	...	...	...	...	320·20	...	...	...	...
		Total	...	...	...	...	...	**320·20**	**18·51**	**356·70**	**337·83**	...

TABLE IV.—*Production of Gold and Silver from all sources, etc.*—continued.

Peak Hill Goldfield.

Mining Centre.	Number of Lease.	Registered Name of Company or Lease.	Total for 1918.					Total Production				
			Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.	Alluvial	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.
			Fine ozs.	Fine ozs.	Tons (2,240lbs.)	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Tons (2,240lbs.)	Fine ozs.	Fine ozs.
Egerton ...	352P ...	Hibernian	...	...	186·00	56·85	...	...	...	3,857·00	1,511·37	...
Do. ...	...	Voided leases	...	...	...	...	...	...	·91	315·25	360·00	...
Do. ...	...	Sundry claims	...	...	40·00	15·63	...	...	23·51	1,093·75	506·79	...
Horseshoe ...	...	Voided leases	...	...	...	...	...	...	1,950·96	728·38	1,973·46	2·00
Do. ...	...	Sundry claims	...	...	...	...	...	...	632·37	16·05	45·14	...
Mt. Fraser ...	...	Voided leases	...	...	...	...	...	...	...	389·50	320·96	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	...	80·00	55·41	...
Peak Hill ...	459P	Atlantic	...	...	8·00	15·89	...	...	...	88·50	303·39	...
Do. ...	462P	Enterprise	...	...	43·00	54·73	...	...	...	112·00	388·48	...
Do. ...	448P	Evening Star	...	...	89·50	155·59	...	...	...	610·50	2,290·97	...
Do. ...	(364P), ([1261N])	Harder to Find	...	...	...	...	...	...	46·29	14·00	30·62	...
Do. ...	463P	Independent	...	...	12·00	37·61	...	...	...	12·00	37·61	...
Do. ...	5P, 306P ...	No. 1 North leases	...	...	746·00	418·64	...	...	...	1,719·50	1,526·49	...
Do. ...	455P	North Star	...	...	77·00	64·66	...	...	...	208·00	207·83	...
Do. ...	(461P)	Patriotic	...	...	51·00	56·19	...	...	...	250·00	402·70	...
Do. ...	(1P), (2P), (4P), 5P, (6P), (8P), (9P), (13P), (15P), (16P), (26P), (27P), (28P), (29P), (35P), (36P), (43P), (53P), (54P), (63P), (146P), (152P), (190P), (213P), (222P), (239P), (248P), (252P), (262P), (274P), 306P, (313P)	(Peak Hill Goldfield, Ltd.)	...	...	...	...	...	...	191·46	462,057·01	223,273·59	2,285·59
Do. ...	398P	Temperance	...	...	...	...	...	...	6·65	591·00	498·24	...
Do. ...	465P	Wowser	...	...	19·50	61·05	...	...	...	37·50	97·54	...
Do. ...	...	Voided leases	...	...	...	...	...	...	475·25	4,937·62	4,150·56	...
Do. ...	...	Sundry claims	...	32·44	137·00	93·99	...	...	150·73	2,847·75	2,062·90	...
Ravelstone ...	...	Voided leases	...	...	...	...	...	...	101·64	4,219·85	3,117·68	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	...	553·60	283·17	...
Wilgeena ...	...	Voided leases	...	...	...	...	...	...	23·54	128·50	146·79	...
Wilthorpe ...	...	Voided leases	...	...	...	...	...	...	...	47·00	20·93	...
		From Goldfields generally :—										
		Sundry Parcels treated at :										
		[redacted] Purcell's Works	...	...	...	...	...	...	...	...	294·58	...

State Battery, Egerton	...	...	...	...	...	...	...	...	...	...	294·87	...
State Battery, Ravelstone	...	...	...	...	...	...	...	3·05	15·00	1,315·82	...
Various Works	...	...	...	...	...	...	...	...	30·00	319·97	...
Reported by Banks and Gold Dealers	26·04	...	...	...	...	1,937·81	345·17	...	...	...
Total	**26·04**	**32·44**	**1,409·00**	**1,030·83**	...	**1,937·81**	**3,951·53**	**484,959·26**	**245,837·83**	**2,287·59**

East Murchison Goldfield.

LAWLERS DISTRICT.

NOTE.—From the 1st March, 1910, the Lawlers District was subdivided into Wiluna and Lawlers. The gold produced after that date by the mines at Wiluna will be found in the Wiluna District, and the lease numbers of both districts are shown in each case.

Bronzewing ...	...	Voided leases	...	...	...	...	...	...	...	468·00	318·03	1·94
Cork Tree ...	...	Voided leases	...	...	...	...	...	...	29·90	3,767·00	3,292·87	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	25·50	13·00	9·32	...
Kathleen Valley	382	(Yellow Aster)	...	...	...	...	...	...	...	37,605·00	27,051·42	...
Do. ...	382	(Yellow Aster)	...	...	246·00	131·86	...	...	...	1,714·00	949·04	...
Do. ...	382, 1197 ...	Yellow Aster leases	...	...	1,025·00	472·12	...	...	...	1,025·00	472·12	...
Do. ...	382	(Yellow Aster: Yellow Aster G.M. Co., N L.)	...	...	...	...	...	...	...	10,359·75	5,425·26	...
Do. ...	...	Voided leases	...	...	...	...	...	...	141·57	23,291·50	11,350·24	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	478·40	1,429·75	855·82	...
Lake Darlot ...	(626)	Filbandint	...	...	...	...	...	...	...	999·00	918·19	...
Do. ...	(648)	Monte Cristo	...	...	...	...	...	...	...	71·25	54·08	...
Do. ...	(648), (654), (852)	(Monte Cristo leases)	...	...	...	...	...	...	...	6,762·60	3,279·52	...
Do. ...	273	St. George	...	6·10	...	...	...	...	3,105·96	890·00	7,954·64	...
Do. ...	(633)	(Zangbar)	...	...	...	...	...	...	...	997·00	505·75	...
Do. ...	(633)	Zangbar	...	...	...	86·98	...	...	...	...	254·52	...
Do. ...	(633), (823) ...	(Zangbar leases)	...	...	...	...	...	...	...	20,340·00	7,664·55	...
Do. ...	...	Voided leases	...	...	...	...	...	...	1,197·12	35,096·45	28,005·72	...
Do. ...	...	Sundry claims	...	...	...	...	...	1·16	474·45	3,794·64	3,302·72	...
Lawlers ...	(1205)	Broken Hill	...	...	225·00	69·17	...	...	...	225·00	69·17	...
Do. ...	M.L. 29	Bungarra	...	...	...	...	*340·46	...	...	...	...	493·34
Do. ...	(22), (37), 58, 62, (70), (155), (156), (157), (158), (376), (377), (381), (385), (399), (426), (427), (459), (474), (500), (508), (509), (510), (511), (512), (552), (562), (563), (573), (811), (840)	(East Murchison United, Ltd.) ...	...	...	...	...	...	...	...	291,797·00	155,594·26	900·48
Do. ...	1208)	Golden Thread	...	26·57	3·00	22·31	...	...	26·57	3·00	22·31	...
Do. ...	1171	(Great Eastern)	...	...	...	...	...	...	...	927·00	337·72	...
Do. ...	1171, 1186 ...	Great Eastern leases	...	...	245·00	354·11	...	...	...	1,241·74	1,077·98	...
Do. ...	(37), 58, 62, (70), (155), (156), (157), (158), (376), (377), (381), (385), (399), (426), (427), (459), (474), (500), (508), (509), (510), (511), (512), (552), (562), (563), (573), (811), (840)	(London and Western Australian Exploration Co., Ltd.)	...	...	...	...	...	...	...	179,563·00	40,433·14	2,560·31

* Copper Ore.

TABLE IV.—*Production of Gold and S ilver from all sources, etc.*—continued.

East Murchison Goldfield—*continued.*

LAWLERS DISTRICT—*continued.*

Mining Centre.	Number of Lease.	Registered Name of Company or Lease.	Total for 1918.					Total Production.				
			Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.	Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.
			Fine ozs.	Fine ozs.	Tons (2,240lbs.)	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Tons (2,240lbs.)	Fine ozs.	Fine ozs.
Lawlers ...	1163	(May Bee)	...	...	...	...	...	...	...	4,157·00	1,270·06	...
Do. ...	1163	May Bee	...	...	1,014·00	238·21	...	...	...	1,014·00	238·21	...
Do. ...	1163, (1189) ...	(May Bee leases)	...	...	...	...	...	...	...	935·00	303·93	...
Do. ...	(22), (37), 58, 62, (70), (155), (156), (157), (158), (376), (377), (385), (459), (508), (509), (562), (563), (811), (840), (918), (1053), (1106), (1109), (1110), (1123), (1160)	(Northern Mines, Ltd.)	...	...	...	...	...	...	...	398,856·50	102,005·52	8,356·89
Do. ...	1172	Queen	...	...	676·00	701·00	30·90	...	...	2,430·50	2,756·88	115·11
Do. ...	(1204)	Selina	...	...	...	...	...	...	76·23	17·00	119·14	...
Do. ...	910 (923) ...	(Sunrise leases)	...	...	...	...	...	...	...	8,644·00	4,076·63	...
Do. ...	1188	Try It	...	...	...	...	...	...	...	936·00	264·77	...
Do. ...	58, 62, 918 ...	Waroonga G.M. Co., Ltd.	...	...	9,320·00	1,336·36	...	...	...	30,183 00	5,310 03	...
Do. ...	62, (562), (563) ...	(Waroonga South leases) ...	...	...	...	...	...	...	...	42,150·00	14,329·48	...
Do. ...	58	(Woronga: London and Western Australian Exploration Co., Ltd.)	...	...	...	...	...	...	...	2,438·50	2,755·45	...
Do. ...	...	Voided leases	...	...	...	...	...	...	584·59	284,141·98	146,947·21	1,794·21
Do. ...	...	Sundry claims	...	39·62	303·00	84·34	...	14·81	218·79	10,512·48	6,419·18	268·34
New England	...	Voided leases	...	...	...	...	...	...	57·54	899·00	720·25	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	4·32	554·50	465·23	...
Sir Samuel ...	(1175)	Bellevue North	...	...	...	...	...	...	4·45	53·75	37·46	...
Do. ...	1190	Bellevue South	...	...	...	...	...	...	...	156·00	114·46	...
Do. ...	(1192)	Isadore	...	...	58·50	22·61	...	...	...	347·50	209·17	...
Do. ...	...	Voided leases	...	...	...	...	...	...	9·04	265,031·75	138,221·54	10,225·58
Do. ...	...	Sundry claims	...	...	121·00	82·81	...	...	21·37	3,553·00	2,665·97	...
Wiluna ...	(140), ([2J]), 162, [4J], (163), ([5J]),	(Golden Age Consolidated, Ltd.) ...	...	...	...	...	...	...	...	42,521·00	19,750·45	...
Do. ...	542. [6J], 548, [7J], 550, [8J], (906), ([11J]), (930), ([13J]), (931), ([14J]), (932), ([15J]), (937), ([17J]), (938), ([18J]), (943), ([21J]), (944), ([22J]), (952), ([26J])	(Gwalia Consolidated, Ltd.)	...	...	...	...	...	...	...	210,230·32	74,536·14	69·03

Do. ...	162, [4J], (163), ([5J])	(Lake Way leases)	...	...	...	...	...	...	...	630·00	369·60	...
Do. ...	162, [4J] ...	(Lake Way: Western Australian Goldfields, Ltd.)	...	...	...	...	...	...	...	2,786·00	1,238·44	...
Do. ...	870, [10J] ...	(Moonlight)	...	...	...	...	...	...	...	1,856·00	787·66	...
Do. ...	917 [12J] ...	(Squib)	...	...	...	...	...	...	...	276·50	67·00	...
Do. ...	...	Voided leases	...	...	...	...	...	...	537·27	58,149·75	41,452·53	124·00
Do. ...	...	Sundry claims	...	...	...	...	...	5·30	...	2,841·15	1,516·76	...
		From District generally :—										
		Sundry parcels treated at :										
		Cinderella Battery	...	...	...	...	...	...	...	1,218·00	3,297·53	26·00
		Great Eastern Battery ...	...	...	...	381·02	...	...	...	...	2,189·56	...
		Lawlers Public Battery ...	...	...	...	...	...	...	...	284·00	2,730·80	...
		Parry's Cyanide Plant ...	...	...	...	...	...	...	...	...	155·36	...
		Queen Works	...	...	...	...	...	...	...	...	403·46	14·40
		State Battery—Lake Darlot...	...	...	...	...	...	...	...	315 00	1,097·09	...
		State Battery—Sir Samuel ...	...	...	23·50	·36	...	...	...	23·50	1,290·13	...
		State Battery—Wiluna ...	...	...	...	...	...	...	...	390·00	2,047·17	20·00
		Various Works	...	...	...	...	...	...	...	117·50	8,379·57	718·33
		Reported by Banks and Gold Dealers	...	...	...	...	...	5,593·22	67·15	...	5·74	...
		Total	...	132·29	13,230·00	3,983·26	371·36	5,614·49	7,060·22	2,001,0[illegible]0·[illegible]	889,7[illegible]8·95	25,687·96

WILUNA DISTRICT.

Note.—Previous to the 1st March, 1910, Wiluna formed part of the Lawlers District. The gold produced by mines at Wiluna previous to that date will be found in the Lawlers District, and the lease numbers of both districts are shown in each case.

Collavilla ...	...	Voided leases	...	...	...	...	...	...	...	1,518·00	496·28	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	...	30·00	21·47	...
Mt. Keith ...	201J	Aurora	...	...	184·00	168·90	...	...	...	1,333·50	1,018·49	...
Do. ...	(205J)	Dunbar	...	...	...	...	...	...	...	37·25	84·21	...
Do. ...	(220J)	Gem	...	...	...	...	...	...	...	32·50	13·56	...
Do. ...	207J	Miss Deal	...	...	685·50	581·66	...	...	...	1,360·00	1,319·80	...
Do. ...	...	Voided leases	...	...	...	...	...	...	8·29	3,896·50	3,294·62	...
Do. ...	...	Sundry claims	...	...	94·00	47·15	...	...	78·26	1,396·25	857·99	...
New England ...	...	Voided leases	...	...	...	...	...	...	...	952·00	309·11	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	...	115·00	100·62	...
Wiluna ...	91J, [940] ...	(Adelaide)	...	...	...	...	...	...	...	401·00	33·29	...
Do. ...	(215J)	Butcher	...	...	...	...	...	...	...	27·00	16·98	...
Do. ...	218J	Great Zig Zag	...	...	206·00	81·77	...	...	...	380·25	202·47	...
Do. ...	6J, [542], 7J, [548], 8J, [550], (11J), (13J), (14J), (15J), (17J), (18J), (21J), (22J), (24J), (25J), (26J), (39J), (161J), (163J)	(Gwalia Consolidated, Ltd.)	...	...	...	...	...	...	...	29,774·50	10,780·42	20·29
Do. ...	119J	(Happy Jack)	...	...	...	...	...	...	...	743·00	236·41	...
Do. ...	202J	Happy Jack South: Wiluna G.Ms. Ltd.			...	...	...	...	...	1,364·75	767·50	...
Do. ...	210J	Just in Time	...	...	220·50	83·60	...	...	...	1,214·25	853·75	...
Do. ...	(216J)	Killarney	...	...	...	...	...	...	...	43·50	20·42	...
Do. ...	4J, [162], (5J), ([163])	(Lake Way leases: Wiluna G.Ms., Ltd.)	...	...	...	...	...	...	...	2,044·00	975·78	...

TABLE IV.—*Production of Gold and Silver from all sources, etc.*—continued.

EAST MURCHISON GOLDFIELD—*continued.*

WILUNA DISTRICT—*continued.*

Mining Centre.	Number of Lease.	Registered Name of Company or Lease.	Total for 1918.					Total Production.				
			Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.	Alluvial	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.
			Fine ozs.	Fine ozs.	Tons (2,240lbs.)	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Tons (2,240lbs.)	Fine ozs.	Fine ozs.
Wiluna ...	10J, [870] ...	(Moonlight)	...	...	...	...	...	...	...	5,181·00	1,078·40	...
Do. ...	10J, [870], 37J, 91J, 109J, (123J)	Moonlight leases	...	...	4,073·00	1,593·14	...	...	...	23,041·00	8,762·03	...
Do. ...	6J, [542], 7J, [548], 8J, [550], (11J), (13J), (14J), (15J), (17J), (21J), (161J), (163J)	Western Machinery Co., Ltd. ...	...	...	10,158·25	5,189·79	...	...	...	40,085·25	19,401·21	...
Do. ...	12J, [917], (23J), (28J), (30J), (33J), (36J), (43J), (76J), 113J, 119J, 124J, (137J), ([1002])	Wiluna Gold Mines, Ltd.	...	...	...	...	...	...	...	23,935·25	10,412·94	...
Do. ...	...	Voided leases	...	...	...	...	...	...	27·92	16,970·00	6,887·88	...
Do. ...	...	Sundry claims	...	...	361·50	163·59	...	87·59	79·88	6,015·50	2,632·32	·33
		From District generally :—										
		Sundry parcels treated at :										
		State Battery, Mt. Keith	...	...	...	...	...	...	...	...	556·95	12·68
		State Battery, Wiluna	...	...	...	...	...	...	...	202·00	11,482·98	198·70
		Reported by Banks and Gold Dealers	...	...	...	...	...	3·20	2·92	...	...	...
		Total	...	...	**15,982·75**	**7,909·60**	...	**90·79**	**197·27**	**162,093·25**	**82,617·88**	**232·00**

BLACK RANGE DISTRICT.

Barrambie ...	...	Voided leases	...	...	...	...	...	...	...	455·50	1,862·24	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	16·01	120·00	88·21	...
Bellchambers	...	Sundry claims	...	...	...	...	...	...	...	45·00	36·62	...
Birrigrin ...	...	Voided leases	...	...	...	...	...	...	820·68	11,958·16	14,945·20	...
Do. ...	...	Sundry claims	...	...	13·50	8·24	...	...	34·52	744·50	678·89	...
Curran's Find	641B ...	Red, White, and Blue	...	...	...	109·62	...	...	24·58	6,028·00	2,133·07	...
Do. ...	...	Voided leases	...	...	...	...	...	...	107·70	164·50	71·82	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	27·20	380·50	200·83	...
Errolls' ...	862B ...	Lost Chance	...	111·34	5·00	38·10	...	...	111·34	5·00	38·10	...
Do. ...	...	Voided leases	...	...	...	...	...	14·17	18·54	67·00	388·58	...
Do. ...	...	Sundry claims	6·53	104·24	...	66·41	...	6·53	335·16	219·50	323·33	...

Hancock's ...	(382B)	(Bull Oak)	...	...	...	...	...	...	...	...	725·00	956·77	...	
Do. ...	(382B)	Bull Oak	...	...	...	...	...	...	...	8·02	60·50	39·97	...	
Do. ...	837B	Comedy King	...	...	112·00	229·91	...	...	365·90	624·00	1,225·82	...		
Do. ...	(369B), (379B), (382B), (383B)	(Comrades leases)	...	...	...	...	...	...	...	4,641·50	3,443·73	...		
Do. ...	(858B)	Mystery	...	...	41·00	55·26	...	...	...	196·00	125·35	...		
Do. ...	(369B), (379B), (382B), (383B)	(Royal Oak Mining Co., N.L.) ...	...	...	...	...	...	...	...	1,832·75	1,006·72	...		
Do. ...	...	Voided leases	...	...	...	...	...	...	6,115·92	18,481·50	20,217·14	52·08		
Do. ...	...	Sundry claims	...	5·23	122·50	141·02	...	...	119·02	1,432·50	877·64	...		
Maninga Marley	203B	Havilah	...	...	351·00	385·08	...	...	...	518·00	587·27	...		
Do. ...	203B	(Havilah)	...	...	...	...	...	...	...	1,507·50	2,315·74	...		
Do. ...	203B, (243B), (249B), (254B), (287B), (288B), (289B), (305B), (350B), (504B)	(Havilah G.M. Co., N.L.)	...	...	...	...	...	...	...	36,508·00	20,052·80	22·55		
Do. ...	203B, (243B), (287B), (289B), (350B)	(Havilah G.M. Co., N.L.)	...	...	...	...	...	...	...	6,026·00	5,029·69	...		
Do. ...	203B, (243B), (249B), (254B), (287B), (288B), (289B), (305B)	(Havilah leases)	...	...	...	...	...	...	...	2,240·00	2,432·48	...		
Do. ...	203B, (243B), (289B)	(Havilah leases: Tailings Treatment, Ltd.)	...	...	...	...	...	...	...	371·00	2,086·50	...		
Do. ...	...	Voided leases	...	...	...	...	...	...	195·20	11,977·23	14,442·35	...		
Do. ...	...	Sundry claims	...	...	...	...	...	...	158·16	853·50	669·68	...		
Montagu ...	...	Voided leases	...	...	...	...	...	...	94·39	9,133·40	7,223·46	...		
Do. ...	...	Sundry claims	...	...	...	...	...	...	45·67	794·50	471·76	...		
Nungarra ...	...	Voided leases	...	...	...	...	...	25·94	986·09	12,162·75	8,793·43	3·64		
Do. ...	...	Sundry claims	...	...	...	...	...	46·67	1,455·98	3,387·90	2,116·02	...		
Sandstone ...	4B	(Adelaide)	...	...	...	...	...	...	7·21	7,443·00	12,675·94	...		
Do. ...	4B, 5B, (11B), (17B), (26B), (70B), (140B), (150B)	(Adelaide leases)	...	...	...	...	...	...	...	21,010·00	30,255·28	...		
Do. ...	5B	(Black Range)	...	...	...	...	...	...	152·68	637·00	1,477·66	5·60		
Do. ...	4B, 5B, 255B, 332B, 562B, 850B	Black Range Consolidated Mines, N.L.	...	...	94·00	121·57	...	...	...	94·00	121·57	...		
Do. ...	4B, 5B, (9B), (11B), (17B), (26B), (70B), (140B), (150B), (256B), (494B), (509B), (620B), (627B)	(Black Range Mining Co., N.L.) ...	...	...	...	...	...	4·75	199·90	227,485·00	159,278·43	1,315·00		
Do. ...	4B, 5B, (11B), (70B), (140B)	(Black Range Pinnacles Co., N.L.) ...	...	...	...	...	...	...	...	1,228·50	1,684·82	...		
Do. ...	255B	(Black Range West G.M. Co., N.L.) ...	...	...	...	...	...	...	...	1,077·65	1,035·43	...		
Do. ...	255B, 332B, 562B, (601B)	(Black Range West G.M. Co., N.L.) ...	...	...	...	...	...	...	51·62	613·00	377·95	...		
Do. ...	4B, 5B, 255B, 332B, 562B, (601B), 850B	(Black Range West G.M. Co., N.L.) ...	...	...	13·00	14·47	...	...	...	87·50	100·67	...		
Do. ...	854B	Entente	...	...	613·00	338 ·95	...	...	10·83	1,063·00	757·85	...		
Do. ...	856B	Nancy's Reward	...	...	265·00	287·27	...	...	...	508·00	418·72	...		
Do. ...	(857B)	New Jumbo	...	...	31·00	1·85	...	...	...	31·00	1·85	...		
Do. ...	(853B)	Orsova	...	...	...	...	...	...	...	45·50	13·12	...		
Do. ...	789B	Pyx	...	...	103·00	59·59	...	...	...	952·50	745·01	13·50		
Do. ...	848B	Wanderie	...	...	...	...	...	...	...	21·00	9·45	...		
Do. ...	...	Voided leases	...	...	...	...	...	...	2,685·27	423,893·12	231,442·77	10,420·12		
Do. ...	...	Sundry claims	...	...	21·00	62·89	...	24·01	972·03	2,589·50	1,714·26	...		

TABLE IV.—*Production of Gold and Silver from all sources, etc.*—continued.

EAST MURCHISON GOLDFIELD—*continued.*

BLACK RANGE DISTRICT—*continued.*

Mining Centre	Number of Lease.	Registered Name of Company or Lease.	Total for 1918.					Total Production.				
			Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.	Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.
			Fine ozs.	Fine ozs.	Tons (2,240lbs.)	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Tons (2,240lbs.)	Fine ozs.	Fine ozs.
Youanme ...	(622B)	(Edna)	...	...	...	...	...	...	...	320·00	210·17	...
Do. ...	(526B)	(Great Western)	...	...	...	...	...	...	9·71	553·75	417·43	...
Do. ...	(564B)	(Junction)	...	...	...	...	...	...	...	975·50	668·33	...
Do. ...	(630B) ...	(Oversight)	...	...	...	...	...	...	...	132·00	37·05	...
Do. ...	(521B)	(Peru)	...	...	...	...	...	...	...	98·00	126·86	...
Do. ...	514B	United	...	...	1,006·00	418·46	...	...	11·86	14,953·50	4,162·94	...
Do. ...	(518B), (521B), (522B), (525B), (526B), (564B), (585B), (603B), (605B), (611B), (618B), (622B), (626B), (630B), (636B), (688B), (692)	Yuanmi G.Ms., Ltd.	...	..	13,860·00	8,339·08	29·40	...	...	274,001·00	128,838·09	2,947·72
Do. ...	863B, 864B, 865B, 866B	Yuanmi G.Ms., Ltd.	...	...	6,680·00	4,965·57	110·39	...	...	6,680·00	4,965·57	110·39
Do. ...	...	Voided leases	...	...	...	...	...	·36	105·35	7,429·50	1,963·52	...
Do. ...	...	Sundry claims	...	...	59·00	13·92	...	...	2·31	1,773·75	456·26	...
[redacted]		*From District generally*:—										
		Sundry parcels treated at:										
		State Battery, Black Range	...	...	...	1,176·94	...	...	...	202·00	13,702·19	59·53
		State Battery, Youanme	...	...	...	124·03	...	...	...	...	2,785·11	...
		Various Works	...	...	...	...	...	...	...	37·00	5,664·78	...
		Reported by Banks and Gold Dealers	...	...	...	...	...	1,336·82	11·43	...	...	...
		Total	**6·53**	**220·81**	**23,390·00**	**16,958·23**	**139·79**	**1,459·25**	**15,260·28**	**1,129,596·46**	**720,990·27**	**14,952·13**

Murchison Goldfield.

CUE DISTRICT.

Barrambie ...	...	Voided leases	...	...	...	...	...	...	22·49	16,903·92	14,338·52	125·60
Do. ...	...	Sundry claims	...	...	...	...	...	...	...	70·50	35·81	...
Cuddingwarra	1860	Big Bell	...	...	10,835·00	1,996·60	...	...	...	23,834·36	4,270·10	...
Do. ...	...	Voided leases	...	...	...	...	...	10·59	124·53	35,855·75	43,796·59	15·42
Do. ...	...	Sundry claims	...	29·94	11·00	71·60	...	...	41·80	498·54	969·75	...

Cue	203, 1148 ...	(Cue Consolidated G.Ms., Ltd.) ...	...	...	...	...	...	...	...	...	23,427·50	18,382·10	...
Do. ...	203	Cue No. 1	...	...	...	...	...	...	...	...	7,753·00	12,772·46	...
Do. ...	1148	(Light of Asia)	...	...	...	...	...	...	...	...	10,175·00	7,302·20	...
Do. ...	1148, (1299), (1300), (1634), (1666), (1667)	(Light of Asia leases)	...	...	...	...	...	...	...	...	14,024·00	9,078·43	...
Do. ...	1148, 1151, 1252, (1300), 1362, 1498, (1634), (1667)	Light of Asia and Queen of the May leases	...	...	3,379·00	3,209·79	...	...	...		19,600·00	15,256·14	...
Do. ...	1151, 1252, 1362, (1391), 1498, (1689)	(Queen of the May leases) ...	...	...	...	...	...	...	...		6,926·00	6,974·06	...
Do. ...	(1853)	(Vera)	...	...	...	...	...	...	...		418·00	432·64	...
Do. ...	(1853), (1855) ...	Vera leases	...	...	...	...	...	...	...		641·50	635·13	...
Do. ...	...	Voided leases	...	...	...	...	...	34·72	529·45		181,311·62	128,136·62	43·35
Do. ...	...	Sundry claims	...	19·33	...	50·36	...	20·95	393·28		14,606·59	9,386·80	...
Eelya ...	(1962)	Kangaroo	...	...	5·00	4·91	...	...	...		5·00	4·91	...
Do. ...	...	Voided leases	...	...	...	...	...	...	8·78		966·00	1,774·03	...
Do. ...	...	Sundry claims	...	...	22·50	10·34	...	...	101·86		539·65	595·13	...
Errolls ...	...	Voided leases	...	...	...	...	...	...	20·25		14,098·50	8,902·24	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	...		227·00	92·86	...
Mindoolah ...	...	Voided leases	...	...	...	...	...	3·07	...		7,935·50	4,773·33	42·97
Do. ...	...	Sundry claims	...	...	...	...	...	...	9·81		1,004·00	1,123·77	...
Reedy's Find	1932	Culculli	...	...	58·50	416·28	...	...	...		99·50	714·08	...
Do. ...	1934	Tuckanarra	...	...	13·00	85·15	...	...	...		13·00	85·15	...
Do. ...	1923	Turn of the Tide	...	...	77·00	572·40	...	...	4·00		168·50	1,825·87	...
Do. ...	1941	Wild Rabbit	...	...	41·00	72·46	...	...	...		72·00	105·64	...
Do. ...	...	Voided leases	...	...	...	...	...	...	210·65		540·00	673·20	...
Do. ...	...	Sundry claims	27·94	54·72	131·75	68·47	...	164·88	75·28		353·80	193·16	...
Tuckabianna...	1928	Blue Streak	...	...	337·00	121·09	...	...	...		509·00	234·56	...
Do. ...	(1939)	Gold Streak	...	...	19·00	7·42	...	...	...		32·00	10·55	...
Do. ...	1926	Nigel	...	...	390·00	1,336·29	...	...	...		429·00	1,518·73	...
Do. ...	1931	Tosiana	...	...	219·00	350·40	...	...	...		604·00	1,200·16	...
Do. ...	1914	Triplicate	...	...	...	...	...	...	...		439·00	167·71	...
Do. ...	1924	Triplicate North	...	...	116·00	165·13	...	...	...		116·00	165·13	...
Do. ...	(1925)	Triplicate West	...	...	15·00	6·64	...	...	...		15·00	6·64	...
Do. ...	1974	Triplicate West	...	...	29·00	14·79	...	...	...		29·00	14·79	...
Do. ...	1929	Tuckabianna North	...	...	240·00	76·78	...	...	...		272·50	110·32	...
Do. ...	...	Voided leases	...	...	...	...	...	...	146·77		2·00	43·18	...
Do. ...	...	Sundry claims	4·61	74·85	177·00	61·93	...	23·44	92·04		204·50	76·13	...
Tuckanarra ...	1337	Nemesis	...	...	...	...	...	...	619·00		2,214·00	6,077·07	...
Do. ...	...	Voided leases	...	...	...	...	...	14·65	2,095·42		15,584·10	14,405·28	172·77
Do. ...	...	Sundry claims	20·34	86·12	...	...	...	51·94	174·41		2,800·70	5,961·50	...
		From District generally:—											
		Sundry parcels treated at:											
		Cue No. 1 Works	...	...	...	56·68	...	...	...		1,870·50	6,662·61	...
		State Battery, Tuckanarra	...	...	...	210·17	...	...	...		518·50	3,002·12	...
		Triplicate Works	...	...	...	900·22	...	...	...		...	1,207·35	...
		Various Works	...	...	...	...	...	...	...		5,055·02	18,568·66	...
		Reported by Banks and Gold Dealers	...	...	...	...	...	755·43	7·54		...	...	...
		Total	**52·89**	**264·96**	**16,115·75**	**9,865·90**	**...**	**1,079·67**	**4,677·36**		**412,763·55**	**352,063·21**	**400·11**

TABLE IV.—*Production of Gold and Silver from all sources, etc.*—continued.

MURCHISON GOLDFIELD—*continued.*

MEEKATHARRA DISTRICT.

Mining Centre.	Number of Lease.	Registered Name of Company or Lease.	Total for 1918.					Total Production.				
			Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.	Alluvial	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver
			Fine ozs.	Fine ozs.	Tons (2,240lbs.)	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Tons (2,240lbs.)	Fine ozs.	Fine ozs.
Abbotts ...	(1394N)	White Horse Extended ...	...	...	...	...	...	...	26·45	19·00	11·91	...
Do. ...	...	Voided leases	...	...	...	...	...	...	...	35,165·60	37,103·60	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	...	55·60	90·87	...
Burnakura ...	...	Voided leases	...	...	...	...	...	...	3,239·43	38,480·95	30,579·03	26·90
Do. ...	...	Sundry claims	...	...	...	...	...	12·51	81·11	137·00	111·87	...
Chesterfield ...	...	Voided leases	...	...	...	...	...	29·02	409·15	6,756·26	7,445·01	·80
Do. ...	...	Sundry claims	...	...	...	...	...	...	38·83	428·60	472·64	...
Gabanintha ...	1408N	Grafton	...	...	310·00	78·18 *30·28	... *175·21	...	...	510·00	166·07	175·21
Do. ...	(1324N)	Hamburg Belle	...	...	...	...	...	...	...	790·50	437·12	...
Do. ...	(1360N)	Leviathan	...	...	...	...	...	...	...	154·00	104·17	26·39
Do. ...	...	Voided leases	...	...	...	...	...	...	16·93	20,463·50	12,730·26	549·66
Do. ...	...	Sundry claims	...	...	13·00	14·36	...	1·33	71·56	1,063·50	715·19	...
Garden Gully ...	...	Voided leases	...	...	...	...	...	26·36	74·91	29,854·06	21,435·37	1,102·59
Do. ...	...	Sundry claims	...	...	...	13·85	...	...	3·32	238·10	320·01	...
Gum Creek ...	1386N	Alma May	...	...	592·00	111·53	...	...	...	1,082·00	248·83	...
Do. ...	...	Voided leases	...	...	...	...	...	25·27	88·12	2,557·08	3,110·73	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	...	338·00	278·36	...
Holden's Find	1436N	Unlimited	...	...	21·00	20·61	...	...	...	21·00	20·61	...
Do. ...	1291N	Waterloo	...	...	2,952·00	973·07	...	...	...	5,900·00	1,880·59	...
Do. ...	...	Voided leases	...	...	...	...	...	...	14·77	1,237·25	957·74	...
Do. ...	...	Sundry claims	...	44·63	49·50	72·20	...	...	44·63	86·00	90·16	...
Jillawarra ...	...	Voided leases	...	...	...	...	...	...	1,134·68	1,499·55	2,801·53	...
Do. ...	...	Sundry claims	...	4·70	...	...	...	169·02	142·95	23·50	53·81	...
Meeka Pools...	...	Voided leases	...	...	...	...	...	...	...	111·58	82·27	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	2·84	211·72	184·83	...
Meekatharra...	(1357N)	Britannia	...	...	56·00	49·38	...	...	16·53	932·00	778·09	...
Do. ...	597N	(Commodore)	...	...	...	...	...	...	...	498·00	1,268·71	...
Do. ...	597N, 915N, 1041N, 1365N	Commodore G.M. Co., N.L.	...	...	744·00	141·34	...	...	...	40,419·00	16,069·57	3·32
Do. ...	1382N	Danube	...	...	18·00	5·74	...	...	...	48·00	14·42	...
Do. ...	477N	(Fenian)	...	...	...	...	...	...	...	8,831·75	18,289·22	...
Do. ...	477N, 814N ...	Fenian leases	...	...	22,241·00	18,306·33	...	...	...	235,329·00	204,741·72	...
Do. ...	(912N)	Globe	...	...	...	...	...	...	...	1,122·98	1,553·80	...
Do. ...	1331N	Gwalia	...	...	1,244·00	5,694·13	...	...	115·72	2,438·00	7,524·98	...
Do. ...	(1420N)	Halcyon Extended	...	4·06	14·00	15·65	...	...	4·06	14·00	15·65	...

Do. ...	1345N	Haveluck	...	...	256·00	59·58	...	...	20·04	1,931·50	644·99	...
Do. ...	555N	(Ingliston)	...	...	...	...	...	...	...	1,202·49	2,332·27	...
Do. ...	475N	(Ingliston Consols Extended) ...	...	...	...	...	...	...	...	1,536·25	4,248·25	·30
Do. ...	475, 515N, 729N, 822N	Ingliston Consols Extended leases	...	...	28,971·00	14,255·58	...	...	...	193,420·22	112,169·08	...
Do. ...	(398N)	(Ingliston Extended)	...	...	...	...	...	...	...	1,320·25	1,106·46	...
Do. ...	(398N), (437N), (462N), (529N), (539N), (847N), (881N), (1033N)	(Ingliston Extended G.Ms., Ltd.) ...	...	...	...	...	...	...	...	109,768·95	57,274·44	...
Do. ...	555N, 1239N ...	Ingliston leases	...	...	3,518·00	3,044·28	...	...	...	11,805·85	10,765·99	...
Do. ...	902N	Ingliston North	...	...	...	...	...	...	...	10·00	25·05	...
Do. ...	1202N	Ingliston Proprietary South ...	...	...	...	...	...	...	...	54·00	89·12	...
Do. ...	637N	(Ingliston South Extended) ...	...	...	...	...	...	...	...	10·00	10·60	...
Do. ...	507N	(Ingliston United)	...	...	...	...	...	...	...	293·25	147·95	...
Do. ...	507N, 637N, 931N, 933N, 964N, 1071N, 1142N, 1366N	(Lake View and Oroya Exploration, Ltd.)	...	...	...	...	...	...	...	117,650·26	45,208·20	2,448·42
Do. ...	1440N	Lone Hand	...	...	50·00	23·26	...	...	...	50·00	23·26	...
Do. ...	915N	(Macquarrie)	...	...	...	...	...	...	40·05	4,315·08	1,148·10	...
Do. ...	533N	Marmont	...	...	56·10	33·55	...	...	...	54,261·10	38,030·08	...
Do. ...	580N	(Marmont Extended)	...	...	...	...	...	...	...	43·00	38·03	...
Do. ...	580N, 888N ...	Marmont Extended leases ...	...	...	...	...	...	...	...	152·00	129·61	...
Do. ...	372N	Pioneer	...	...	20·50	6·71	...	...	38·17	6,964·18	6,325·93	...
Do. ...	507N, 637N, 931N, 933N, 964N, 1071N, 1142N, 1366N	Queenhills Gold Mines, Ltd.	...	...	12·00	12·54	...	...	...	212·00	159·06	...
Do. ...	931N	(Queen of the Hill)	...	...	...	...	...	...	...	549·00	158·59	...
Do. ...	(398N), (437N), (462N)	Western Machinery Co., Ltd. ...	...	...	33·00	23·65	...	...	...	33·00	23·65	...
Do. ...	...	Voided leases	...	...	...	...	...	3·88	269·75	38,175·95	26,977·34	3·00
Do. ...	...	Sundry claims	...	...	460·00	172·19	...	181·83	174·41	4,218·55	2,082·74	...
Munara Gully ...	...	Voided leases	...	...	...	...	...	...	...	13,167·75	6,489·65	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	11·62	80·00	40·02	...
Nannine ...	166N	Nannine	...	17·48	60·00	19·07	...	...	54·95	120·00	58·18	...
Do. ...	(16N), (25N), 166N	(Nannine leases)	...	...	...	...	...	...	8·71	23,649·60	24,385·66	127·60
Do. ...	...	Voided leases	...	...	...	...	...	34·02	361·95	68,097·02	43,048·73	39·85
Do. ...	...	Sundry claims	...	...	...	...	...	7·63	243·73	2,309·20	1,796·34	...
Quinn's ...	1430N	Nowthanna	...	...	65·00	6·75	...	...	...	65·00	6·75	...
Do. ...	...	Voided leases	...	...	...	...	...	7·30	1,186·50	18,812·16	8,868·04	90·70
Do. ...	...	Sundry claims	...	77·58	85·00	33·68	...	2·25	744·46	1,671·50	1,281·62	...
Ruby Well ...	(1261N), ([364P])	Harder to Find	...	...	...	...	...	...	...	6,885·00	3,528·12	...
Do. ...	(1368N)	Rubyanna	...	...	...	...	...	...	...	67·50	98·72	...
Do. ...	...	Voided leases	...	...	...	...	...	...	...	490·50	361·52	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	8·48	261·00	341·66	...
Stake Well ...	...	Voided leases	...	...	...	...	...	...	200·12	21,342·00	9,536·07	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	31·79	186·00	192·00	...
Star of the East	...	Voided leases	...	...	...	...	...	...	...	27,244·00	20,305·40	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	...	127·62	94·97	...
Yaloginda ...	1423N	Rocklie	...	353·93	32·50	96·33	...	...	353·93	32·50	96·33	...
Do. ...	...	Voided leases	...	...	...	...	...	...	597·91	25,711·52	13,026·52	8·68
Do. ...	...	Sundry claims	...	57·88	40·50	120·93	...	10·89	415·35	1,978·17	1,588·80	...

* Copper Ore.

TABLE IV.—*Production of Gold and Silver from all sources, etc.*—continued.

MURCHISON GOLDFIELD—*continued.*

MEEKATHARRA DISTRICT—*continued.*

Mining Centre.	Number of Lease.	Registered Name of Company or Lease.	Total for 1918.					Total Production.				
			Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.	Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.
			Fine ozs.	Fine ozs.	Tons (2,240lbs.)	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Tons (2,240lbs.)	Fine ozs.	Fine ozs.
		From District generally:—										
		Sundry Parcels treated at:										
		Connecticut Battery	...	...	...	...	...	...	...	...	173·61	...
		Ruby Well Battery	...	...	...	37·78	...	...	...	...	699·32	...
		State Battery, Meekatharra	...	...	...	...	...	...	...	14·00	10,242·65	19·00
		State Battery, Quinn's	...	...	...	...	...	...	...	...	618·79	...
		Various Works	...	...	...	...	...	...	...	172·75	4,301·81	342·17
		Reported by Banks and Gold Dealers	87·07	...	...	...	...	9,696·91	13·79	...	...	...
		Total	**87·07**	**560·26**	**61,914·10**	**43,472·53**	**175·21**	**10,208·22**	**10,301·70**	**1,197,278·75**	**831,988·81**	**4,964·59**
		DAY DAWN DISTRICT.										
Day Dawn ...	(389D)	(Crème D'or)	...	...	...	...	...	...	...	150·00	175·18	...
Do. ...	(389D), (421D), (422D)	Crème D'or leases	...	...	...	...	...	2·49	...	4,693·62	3,321·19	...
Do. ...	1D, 2D, 86D, 87D, 99D, 119D, 129D, 158D, 159D, 170D, 185D, 191D, 209D, 210D, 211D, 212D, 213D, 224D, 225D, (249D), 424D, 453D, (455D), (467D)	Great Fingall Consolidated, Ltd. ...	...	...	7,859·00	3,540·51	545·24	...	...	1,861,947·01	1,181,197·48	169,210·20
Do. ...	119D	(West Fingall, No. 6)	...	...	...	...	...	...	...	43·00	15·32	...
Do. ...	...	Voided leases	...	...	...	...	...	123·81	511·03	40,196·76	27,253·15	·24
Do. ...	...	Sundry claims	...	4·61	9·50	6·47	...	...	136·67	1,883·08	1,357·47	...
Jasper Hill ...	513D, 517D, 518D, 520D, 535D	Black Range Pinnacles Co., N.L. ...	...	...	...	33·05	...	...	...	9,158·00	3,893·26	...
Do. ...	513D	(Comet)	...	...	...	...	...	...	...	67·20	36·23	...
Do. ...	516D	Neptune	...	...	25·00	4·63	...	...	...	25·00	4·63	...
Do. ...	548D	Night Watch	...	359·41	...	...	...	...	359·41	...	...	...
Do. ...	...	Voided leases	...	...	...	...	...	4·90	781·28	6,058·55	5,040·17	...
Do. ...	...	Sundry claims	...	...	83·00	29·73	...	...	361·43	187·00	359·46	...
Lake Austin (Island)	537D	Good Luck	...	52·83	14·50	25·52	...	...	551·53	58·50	146·45	...
Do. ...	543D	Haig	...	81·70	...	...	...	...	344·48	...	...	...
Do. ...	...	Voided leases	...	...	...	...	...	590·52	672·01	29,715·87	45,240·25	...
Do. ...	...	Sundry claims	...	16·05	6·75	14·79	...	17·74	246·73	481·64	292·79	...

Mainland ...	...	Voided leases	...	...	...	...	...	·41	2,706·26	7,272·13	23,129·51	...
Do ...	...	Sundry claims	...	7·53	...	...	...	3·24	73·40	77·45	89·03	...
		From District generally :—										
		Sundry parcel treated at :										
		Various Works	...	...	...	...	...	...	16·61	940·75	1,537·30	...
		Reported by Banks and Gold Dealers	...	...	...	...	...	1,542·21	3·48	...	·77	...
		Total	...	**522·13**	**7,997·75**	**3,654·70**	**545·24**	**2,285·32**	**6,764·32**	**1,962,955·56**	**1,293,089·64**	**169,210·44**

MOUNT MAGNET DISTRICT.

Lennonville ...	964M	(Empress)	...	...	...	...	...	...	...	1,649·00	7,361·81	...
Do. ...	964M, 1078M, 1079M, (1115M), (1116M), (1117M)	Empress leases	...	...	408·00	144·26	...	...	...	4,813·00	3,154·43	...
Do. ...	1158M	Galtee Moore	...	...	22·00	37·93	...	...	...	97·50	106·54	...
Do. ...	...	Voided leases	...	...	...	...	...	...	3,196·79	133,314·98	112,492·50	458·82
Do. ...	...	Sundry claims	...	14·57	87·00	143·15	...	7·11	93·23	1,884·42	1,290·34	...
Mt. Magnet ...	(1164M)	Antares	...	...	...	1·73	...	...	...	126·50	32·10	...
Do. ...	1167M	Bell Bird	...	...	168·00	201·14	...	...	227·91	288·50	411·39	...
Do. ...	(1169M)	Early Bird	...	...	...	6·28	...	...	...	14·00	50·70	...
Do ...	(1149M)	Ethel May	...	...	...	...	...	...	...	6,634·75	1,465·97	...
Do. ...	(1144M)	Fortune of War	...	...	...	...	...	...	...	881·00	328·75	41·75
Do. ...	1155M	Gift	...	...	49·25	1,654·59	...	...	250·89	120·25	2,031·38	...
Do. ...	(1172M)	Good Luck	...	...	6·48	76·01	...	...	...	6·48	76·01	...
Do. ...	1176M	Good Luck	...	...	25·75	45·16	...	...	...	25·75	45·16	...
Do ...	1156M	Leap Year	...	...	131·75	126·29	...	...	...	354·75	390·52	...
Do. ...	1013M	Mars	...	...	...	176·37	...	...	...	8,078·15	2.032·72	...
Do. ...	1168M	Mayflower	...	...	40·00	24·95	...	...	...	202·25	103·57	...
Do. ...	1151M	Morning Star	...	9·76	155·75	266·97	...	...	9·76	766·00	553·79	...
Do. ...	445M	Neptune	...	...	110·50	45·45	...	...	927·80	2,547·31	3,008·78	...
Do. ...	1075M	New Havelock	...	...	...	222·48	...	...	...	1,271·00	627·16	...
Do. ...	1095M	Pearl	...	...	...	...	...	...	2·36	221·82	214·19	...
Do. ...	(696M)	Sirdar	...	...	...	...	...	...	...	17,852·85	6,225·14	...
Do. ...	(1131M)	Sirdar South	...	...	...	...	...	...	...	31·00	4·24	...
Do. ...	1175M	St. Patrick	...	...	92·00	132·46	...	...	...	92·00	132·46	...
Do. ...	(1159M)	Tame Cat	...	...	18·00	4·22	...	...	...	59·75	24·69	...
Do ...	1124M	Tattersalls	...	...	97·00	43·35	...	...	47·55	480·75	432·80	...
Do. ...	1165M	Trevallen	...	2·07	665·50	177·94	...	...	2·07	1,238·00	319·06	...
Do. ...	1069M	Turning Point	...	...	...	...	...	...	8·35	100·50	118·93	...
Do. ...	...	Voided leases	...	...	...	...	...	27·83	6,886·28	320,171·75	187,004·52	672·61
Do. ...	...	Sundry claims	...	3·90	650·25	289·63	...	·45	1,108·28	16,573·66	9,948·90	...
Mt. Magnet East	...	Voided leases	...	...	...	...	...	63·29	764·53	5,522·28	2,811·75	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	37·22	214·50	144·10	...
Moyagee ...	1039M	Moyagee	...	...	...	...	...	...	...	526·50	1,265·58	...
Do. ...	...	Voided leases	...	...	...	...	...	...	5·08	2,053·15	2,416·74	...
Do ...	...	Sundry claims	...	12·77	9·75	41·83	...	...	111·10	543·73	675·51	...
Paynesville ...	...	Voided leases	...	...	...	...	...	...	152·90	19·75	26·62	...
Do. ...	...	Sundry claims	...	...	...	57·33	...	...	1·46	27·75	575·43	...
Youanme ...	...	Sundry claims	...	...	...	...	...	...	...	33·00	44·58	...

TABLE IV.—*Production of Gold and Silver from all sources, etc.*—continued.

MURCHISON GOLDFIELD—*continued.*

MOUNT MAGNET DISTRICT—*continued.*

Mining Centre.	Number of Lease.	Registered Name of Company or Lease.	Total for 1918. Alluvial. Fine ozs.	Dollied and Specimens. Fine ozs.	Ore treated. Tons (2,240lbs.)	Gold therefrom. Fine ozs.	Silver. Fine ozs.	Total Production. Alluvial. Fine ozs.	Dollied and Specimens. Fine ozs.	Ore treated. Tons (2,240lbs.)	Gold therefrom. Fine ozs.	Silver. Fine ozs.
		From District generally :—										
		Sundry parcels treated at :										
		Early Bird Works	...	...	...	8·48	...	...	...	...	109·15	...
		Fremantle Trading Co's Works	...	...	...	...	...	...	...	...	143·80	...
		Morning Star Battery	...	...	...	...	...	...	...	...	863·23	...
		State Battery, Boogardie	...	...	...	833·92	...	...	...	65·01	13,440·15	...
		State Battery, Lennonville	...	...	...	...	...	...	...	18·06	6,576·77	...
		Various Works	...	...	...	...	...	...	...	25·00	9,142·80	1·00
		Reported by Banks and Gold Dealers	...	...	...	...	...	1,652·63	·35	...	...	...
		Total	...	**43·07**	**2,736·98**	**4,761·92**	...	**1,751·31**	**13,833·91**	**528,946·40**	**378,224·76**	**1,174·18**

Yalgoo Goldfield.

Adavale ...	...	Sundry claims	...	...	...	...	...	...	...	10 00	12·56	...
Bilberatha ...	...	Voided leases	...	...	...	...	...	...	...	554 00	200 07	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	2·90	...	...	...
Carlaminda ...	...	Voided leases	...	...	...	...	...	...	...	947·32	524·72	3·30
Do. ...	...	Sundry claims	...	...	...	...	...	...	...	114·00	71·96	...
Field's Find ...	(848)	Alma	...	...	...	...	...	...	...	43·00	6·27	...
Do. ...	850	Commodore	...	...	62·50	52·53	...	...	...	154·50	254·51	...
Do. ...	680	Field's Find Extended	...	...	620·00	344·25	...	...	...	2,073·50	1,803·09	...
Do. ...	845	Lliven	...	...	...	...	...	...	...	...	2·90	...
Do. ...	...	Voided leases	...	...	...	...	...	...	204·26	33,850·30	24,696·07	...
Do. ...	...	Sundry claims	...	...	82·00	34·33	...	5·77	157·03	358·75	379·37	...
Goodingnow...	681	Aster Consolidated	...	...	91·00	69·84	...	...	2·77	1,366·00	1,055·99	...
Do. ...	878	Carnation	...	...	361·00	802·01	...	...	...	361·00	802·01	...
Do. ...	(603)	Carnation	...	...	...	...	...	130·88	...	2,794·50	3,364·13	...
Do. ...	606	(Lake View)	...	...	...	...	...	...	...	163·00	185·46	...
Do ...	606	Lake View: Payne's Find Development Co., N.L.	...	...	525·00	310·58	...	...	15·58	5,680·50	5,213·34	...
Do. ...	(854)	Marguerite	...	...	...	...	...	...	...	130·00	77·32	...

Do. ...	(871)	Olive	...	...	...	...	...	...	...	...	5·11	...
Do. ...	613	Orchid	...	...	411·50	852·72	...	...	...	1,675·50	3,282·05	...
Do. ...	(875)	Point of Gold	...	...	30·00	8·39	...	...	...	30·00	8·39	...
Do. ...	849	Princess Mary	...	...	25·50	9·22	...	...	...	197·50	300·13	...
Do. ...	607	Sweet William	...	...	391·00	542·79	...	...	75·56	1,633·50	2,140·73	...
Do ...	607	(Sweet William)	...	...	...	...	...	...	2·16	4·85	81·59	...
Do. ...	607, (608), (662)	(Sweet William Consolidated Mines, N.L.)	...	...	...	...	...	...	7·68	907·46	1,564·84	...
Do. ...	...	Voided leases	...	...	...	...	...	15·82	168·98	3,288·50	2,939·10	...
Do. ...	...	Sundry claims	3·97		307·50	109·54	...	148·00	8·29	2,278·50	1,178·43	...
Gullewa ...	877	Mugga King	...	...	770·00	308·59	...	...	...	770·00	308·59	...
Do. ...	...	Voided leases	...	...	...	...	...	...	...	21,944·50	14,564·66	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	...	629·50	531·62	...
Kirkalucka ...	...	Sundry claims	...	...	...	...	...	...	...	8·80	4·01	...
Messenger's Patch	...	Voided leases	...	...	...	...	...	...	315·99	587·20	305·89	...
Do. ...	...	Sundry claims	...	...	...	...	...	463·12	315·11	438·55	273·71	...
Mt. Farmer ...	...	Voided leases	...	...	...	...	...	...	...	64 00	40·19	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	...	5 00	6·22	...
Mt. Gibson ...	...	Voided leases	...	...	...	...	...	...	...	5·00	17·67	...
Ninghan ...	722, 723	Golden Harp leases	...	...	...	...	...	...	6·44	16·00	388·07	...
Do. ...	...	Voided leases	...	...	...	...	...	...	...	10·00	1·41	...
Do. ...	...	Sundry claims...	...	...	...	...	...	...	...	5·00	17·89	...
Noongal ...	...	Voided leases	...	...	...	...	...	...	15·86	3,086·95	1,847·66	...
Do. ...	...	Sundry claims	...	...	...	...	...	11·55	64·97	286·50	198·64	...
Nyounda ...	...	Voided leases	...	...	...	...	...	...	217·63	416·00	183·91	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	4·28	18·00	21·67	...
Pinyalling ...	...	Voided leases	...	...	...	...	...	...	1·36	2,281·60	902·03	...
Do. ...	...	Sundry claims	...	...	118·00	110·43	...	...	2·59	160·50	132·57	...
Rothesay ...	(749)	British Queen	...	...	...	...	...	...	...	...	31·08	...
Do. ...	...	Voided leases	...	...	...	...	...	...	...	8,971·00	3,300·07	...
Wadgingarra	...	Voided leases	...	...	...	...	...	...	...	541·61	600·91	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	...	71·50	38·21	...
Warriedar ...	(863)	Golden Bar Extended	...	...	...	...	...	...	...	174·75	132·23	...
Do. ...	841	Highland Chief	...	...	132·75	118·37	...	...	...	477·25	303·38	...
Do. ...	(699)	Iron Clad	...	...	355·00	168·01	...	...	...	1,662·50	802·38	7·30
Do. ...	890	Iron Clads	...	...	45·50	19·73	...	...	...	45·50	19·73	...
Do. ...	(745)	Ironclad South	...	...	60·25	25·78	...	...	...	188·00	62·86	...
Do. ...	708	Mug's Luck	...	...	974·00	359·83	...	...	...	6,168·00	1,899·81	...
Do. ...	731	Porcupine	...	...	...	...	...	...	...	66·25	12·73	...
Do. ...	(739)	Porcupine South	...	...	...	...	...	...	...	81·00	16·99	...
Do. ...	(727)	Warriedar	...	...	120·75	36·37	...	...	...	798·00	262·09	...
Do. ...	...	Voided leases	...	...	...	...	...	...	...	302·00	85·80	...
Do. ...	...	Sundry claims	...	...	132·75	77·92	...	...	1·80	419·00	200·37	...
Yalgoo ...	...	Voided leases	...	...	...	...	...	...	3·23	6,314·50	9,965·18	...
Do. ...	...	Sundry claims	...	...	10·00	3·10	...	...	17·77	830·50	501·72	...
Yuin ...	712 (735) ...	(Bullrush Gold Estates, N.L.) ...	...	...	...	...	...	...	...	23,690·00	7,302·83	130·13
Do. ...	...	Voided leases	...	...	...	...	...	...	127·12	31,381·50	14,957·04	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	4·70	276·50	57·88	...

TABLE IV.—*Production of Gold and Silver from all sources, etc.*—continued.

YALGOO GOLDFIELD—*continued.*

Mining Centre.	Number of Lease.	Registered Name of Company or Lease.	Total for 1918.					Total Production.				
			Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.	Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.
			Fine ozs.	Fine ozs.	Tons (2,240lbs.)	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Tons (2,240lbs.)	Fine ozs.	Fine ozs.
		From Goldfield generally :—										
		Sundry parcels treated at :										
		Field's Find Extended Treatment Works ...	...	...	...	...	...	...	...	...	152·40	...
		Goodingnow (Payne's Find) State Battery	...	...	...	29·59	...	...	...	13·00	1,346·13	...
		Yuanmi G.Ms., Ltd. Works (Warriedar Options) ...	...	...	...	...	...	...	...	...	310·93	26·67
		Various Works	...	...	...	...	...	9·42	...	664·00	1,332·45	...
		Reported by Banks and Gold Dealers	...	...	...	...	...	666·73	...	...	...	...
		Total	...	3·97	5,626·00	4,393·92	...	1,451·29	1,744·06	172,485·64	113,591·75	167·40

Mount Margaret Goldfield.

MOUNT MORGANS DISTRICT.

NOTE.—Prior to 31st August, 1917, the mining centres of Eucalyptus, Linden, Mt. Celia, Mt. Howe, and Yundamindera were included in Yerilla District, and the output is recorded in that district. From 1st September, 1917, the output from these centres is shown in Mt. Morgans District, to which they were transferred.

Australia United	...	Voided leases	...	...	...	...	...	...	1,911·63	15,913·69	23,305·76	1·76
Do. ...	...	Sundry claims	...	35·92	5·70	15·30	...	...	393·78	799·25	2,072·62	...
Eucalyptus ...	...	Sundry claims	...	...	11·00	5·40	...	...	...	11·00	5·40	...
Federation Well	...	Voided leases	...	...	...	...	...	...	...	1,248·50	1,782·71	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	...	108·07	64·68	...
Korong ...	...	Voided leases	...	...	...	...	...	17·95	72·23	2,722·00	3,473·45	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	34·97	279·28	232·89	...
Linden ...	348F, [1035R] ...	Danube	...	...	13·50	18·51	...	...	...	36·25	33·67	...
Do. ...	340F, [871R] ...	Democrat	...	...	151·50	217·40	...	...	...	277·50	314·04	...
Do. ...	342F, [942R] ...	Great Junction	...	...	258·50	149·36	...	...	...	337·50	253·84	...
Do. ...	352F, [1049R] ...	Lady Edith	...	...	39·00	55·63	...	...	...	96·00	120·33	...
Do. ...	345F, [1005R] ...	Olympic	...	...	12·00	8·39	...	...	...	67·00	63·60	...
Do. ...	341F, [903R], 343F, [985R]	Torquay leases	...	...	1,437·04	811·96	...	...	...	1,778·42	1,045·25	·68
Do. ...	...	Sundry claims	...	...	78·00	53·02	...	...	...	322·75	203·60	...
Mt. Margaret	(339F)	Golden Cliffs	...	...	...	...	...	...	...	6·00	2·52	...
Do. ...	314F	Mt. Morven	...	...	60·00	17·67	...	...	...	2,284·00	1,490·09	...
Do. ...	...	Voided leases	...	...	...	...	...	·37	...	3,963·00	2,697·10	12·55
Do. ...	...	Sundry claims	...	...	...	...	...	16·61	44·03	365·50	281·86	...
Mt. Morgans	6F	(Lily of the Valley South : Westralia Mt. Morgans G.M. Co., Ltd.)	...	...	...	...	...	...	...	1,587·50	808·18	...

Do. ...	6F	(Lily of the Valley South : Westralia Mt. Morgans Syndicate, Ltd.)	...	...	...	...	...	...	...	3,002·00	1,022·90	...
Do. ...	325F	Millionaire	...	...	53·50	44·60	...	...	...	197·50	720·40	...
Do. ...	5F, (10F), (19F), (22F), (32F), (73F)	(Westralia Mt. Morgans G.M. Co., Ltd.)	...	...	...	...	...	...	...	575,148·00	294,758·28	5,552·63
Do. ...	7F, (20F), (21F) ...	(Westralia Mt. Morgans G.M. Co., Ltd.	...	...	...	...	...	...	...	18,261·00	8,127·69	...
Do. ...	5F, 6F, 7F, (10F), (19F), (20F), (22F), (32F), 301F	Westralia Mt. Morgans Mines, N.L. ...	...	...	6,704·00	2,716·05	...	...	...	106,815·00	25,057·75	...
Do. ...	...	Voided leases	...	...	...	...	...	...	76·56	34,127·75	20,210·28	77·86
Do. ...	...	Sundry claims	...	...	10·00	24·56	...	6·61	22·66	1,356·50	1,609·81	...
Murrin Murrin	...	Voided leases	...	...	...	...	...	10·43	222·93	127,364·72	100,606·89	29·60
Do. ...	...	Sundry claims	...	...	...	...	...	...	154·48	846·75	852·31	...
Redcastle ...	...	Voided leases	...	...	...	...	...	4·49	436·54	2,509·95	2,169·63	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	103·58	139·00	163·01	...
Yundamindera	357F	Big Stone	...	...	149·00	92·14	...	...	...	149·00	92·14	...
Do. ...	(351F), ([1048R])...	General Cadorna	...	...	16·50	16·82	...	...	...	91·00	80·12	...
Do. ...	(350F), ([1041R])...	Queen of the May	...	...	139·00	257·06	...	...	...	139·00	257·06	...
Do. ...	...	Sundry claims	...	...	242·75	73·04	...	...	...	329·25	162·22	...
		From District generally :—										
		Sundry Parcels treated at :										
		Battles Ville Battery	...	...	126·00	35·00	15·94	...	...	126·00	35·00	15·94
		Hainault Sulphide Plant, Kalgoorlie	...	...	...	...	...	...	...	127·21	83·91	...
		Mt. Morven Cyanide Works	...	...	...	...	...	...	...	...	129·48	...
		State Battery, Linden	...	...	...	627·26	...	...	...	...	1,176·11	...
		Westralia Mt. Morgan Works	...	...	...	...	...	...	...	...	153·10	...
		Various Works	...	...	...	...	...	...	...	788·50	3,010·07	84·03
		Reported by Banks and Gold Dealers	18·94	...	...	...	...	1,678·74	32·47	...	...	...
		Total	**18·94**	**35·92**	**9,506·99**	**5,239·17**	**15·94**	**1,735·20**	**3,505·86**	**903,721·34**	**498,729·75**	**5.775·05**

MOUNT MALCOLM DISTRICT.

Cardinia ...	...	Voided leases	...	...	...	...	...	...	1,568·29	1,628·24	3,550·42	...
Diorite King	1459c	King of the Hills	...	...	180·00	358·09	...	...	44·49	1,829·00	1,748·44	24·05
Do. ...	(1499c)	Life of Hope	...	...	...	...	...	...	...	34·00	58·28	...
Do. ...	...	Voided leases	...	...	...	...	...	...	774·66	32,607·53	29,653·61	...
Do. ...	...	Sundry claims	...	...	65·00	42·60	...	...	129·57	2,455·30	2,932·85	...
Dodgers Well	...	Voided leases	...	...	...	...	...	...	57·90	1,299·30	1,927·94	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	3·37	786·25	644·95	...
Leonora ...	1473c	(Auckland)	...	...	...	...	...	...	...	226·50	82·22	...
Do. ...	1473c	Auckland : Chaffer's G.M. Co. (1916), Ltd.	...	...	200·00	32·96	...	...	...	200·00	32·96	...
Do. ...	1504c	Dawn of Hope	...	...	48·00	144·75	...	...	...	48·00	144·75	...
Do. ...	198c	(Eastern)	...	...	...	...	...	...	...	302·00	321·72	...
Do. ...	1482c	Leonora Gold Blocks	...	...	475·00	144·97	...	...	10·15	5,069·00	1,919·80	...
Do. ...	(1494c)	No. 2 North Gwalia	...	...	...	1·61	...	...	...	185·50	50·74	...
Do. ...	1485c	Ping Pong	...	...	14·25	23·94	...	...	79·35	459·50	474·29	...
Do. ...	1486c	Rajah	...	5·09	28·75	111·40	...	...	96·45	127·75	557·99	...

TABLE IV.—*Production of Gold and Silver from all sources, etc.*—continued.

MT. MARGARET GOLDFIELD—*continued.*

MOUNT MALCOLM DISTRICT—*continued.*

Mining Centre.	Number of Lease.	Registered Name of Company or Lease.	Total for 1918.					Total Production.				
			Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.	Alluvial	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.
			Fine ozs.	Fine ozs.	Tons (2,240lbs.)	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Tons (2,240lbs.)	Fine ozs.	Fine ozs.
Leonora ...	190c, 198c, 207c, 352c, 353c, 380c, 446c, 447c, 450c, 476c, 489c, 490c, 504c, 523c, 741c, 742c, 807c, 809c, 811c, 812c, 813c, 814c, 980c, 981c, 1082c, 1225c, 1226c, 1227c, 1228c, 1229c, 1230c, 1231c, 1232c, 1259c, 1291c, 1292c, 1341c, 1342c, 1343c, 1344c, 1345c, 1346c, 1347c	Sons of Gwalia, Ltd.	...	...	132,493·00	44,724·99	4,425·69	...	...	2,423,149·50	1,154,609·08	66,645·02
Do. ...	198c, 1082c ...	(Sons of Gwalia South G.M. Co., N.L.	...	...	...	...	...	...	...	631·00	903·61	...
Do. ...	198c, 1082c, (1257c), (1258c), 1259c, (1284c), (1285c), (1300c), (1301c)	(Sons of Gwalia South G.Ms., Ltd.) ...	...	...	...	...	...	...	...	98,239·00	51,593·99	8·66
Do. ...	198c, 1082c, 1259c,	(Sons of Gwalia South G.Ms., Ltd.) ...	...	...	...	...	...	...	...	9,909·00	3,169·89	...
Do. ...	263c	(Trump)	...	...	...	...	...	...	...	562·50	2,393·40	...
Do. ...	263c	Trump : Gwalia Central G.Ms., Ltd. ...	...	...	300·00	279·14	...	...	...	998·00	2,746·85	...
Do. ...	263c, (774c), (793c)	(Trump leases)	...	...	...	...	...	...	...	21,794·45	16,002·07	...
Do. ...	...	Voided leases	...	...	...	...	...	...	1,661·47	131,611·50	62,127·38	10·71
Do. ...	...	Sundry claims	...	2·43	9·50	20·64	...	...	196·07	8,431·55	7,713·57	...
Malcolm ...	(1175c)	North Star : Malcolm Prospecting Co., N.L.	...	...	...	...	...	...	...	26,232·50	14,734·95	...
Do. ...	...	Voided leases	...	...	...	...	...	...	47·07	36,069·28	32,690·59	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	8·88	2,981·90	2,085·85	...
Mertondale ...	...	Voided leases	...	...	...	...	...	...	...	88,663·00	60,840·00	1,497·58
Do. ...	...	Sundry claims	...	...	1·46	88·18	...	...	55·24	1,052·46	1,488·59	...
Mt. Clifford ...	1329c	Victory No. 1	...	208·09	...	...	...	...	208·09	665·46	7,002·53	...
Do. ...	1502c	Victory No. 2	...	...	6·50	56·23	...	...	...	6·50	56·23	...
Do. ...	...	Voided leases	...	...	...	...	...	...	1,364·45	3,265·50	6,996·22	...
Do. ...	...	Sundry claims	3·14	12·42	...	...	...	12·89	253·36	749·50	1,267·66	...
Pig Well ...	1295c	(Starlight)	...	...	...	...	...	...	...	181·50	695·73	...

Do. ...	1295c, 1324c, 1461c, 1475c	Starlight G.M. Sydnicate, N.L. ...	...	...	120·00	15·18	...	...	...	271·25	170·16	...
Do. ...	1295c, 1324c ...	(Starlight leases)	...	...	...	...	...	...	...	75·50	235·87	...
Do. ...	...	Voided leases	...	...	...	...	...	...	...	12,982·07	13,538·20	63·68
Do. ...	...	Sundry claims	...	...	55·00	14·02	...	...	34·61	2,558·40	1,100·99	...
Randwick ...	1401c	Triangle	...	...	3·00	29·49	...	...	...	115·90	1,457·31	...
Do. ...	...	Voided leases	...	...	...	...	...	...	239·49	7,944·75	7,170·22	...
Do. ...	...	Sundry claims	...	...	...	16·03	...	66·57	111·18	1,282·14	944·20	...
Webster's Find	...	Voided leases	...	...	...	...	...	30·30	...	21,760·00	13,970·17	...
Do. ...	...	Sundry claims	...	...	16·00	9·72	...	36·37	15·73	1,397·80	939·58	...
Wilson's Creek	...	Voided leases	...	...	...	...	...	...	...	333·50	168·27	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	4·24	5·00	19·04	...
Wilson's Patch	...	Voided leases	...	...	...	...	...	...	99·38	26,348·10	12,475·57	1·05
Do. ...	...	Sundry claims	...	...	...	...	...	...	1·50	658·00	1,015·02	...
		From District generally:—										
		Sundry Parcels treated at:										
		Fremantle Trading Coy.'s Works	...	...	...	...	...	...	...	...	1·42	...
		King of the Hills Works	...	...	...	...	...	...	...	19·00	835·24	...
		State Battery, Leonora	...	...	...	...	...	...	...	95·50	10,370·34	98·14
		Various Works	...	...	...	...	...	...	...	352·50	6,314·48	20·12
		Reported by Banks and Gold Dealers	23·53	...	...	...	...	2,393·51	131·00	...	...	...
		Total	**26·67**	**228·03**	**134,015·46**	**46,113·94**	**4,425·69**	**2,539·64**	**7,195·99**	**2,978,651·38**	**1,543,945·23**	**68,369·01**

MOUNT MARGARET DISTRICT.

Burtville ...	2034t	General Bridges	...	...	...	...	...	...	...	58·00	43·39	...
Do. ...	1044t	Nil Desperandum	...	...	...	...	...	...	...	7,970·00	11,931·76	...
Do. ...	(2038)	Ophir: Ophir Syndicate, Ltd. ...	...	...	20·00	3·45	...	...	...	20·00	3·45	...
Do. ...	1841t	Redeemed	...	...	41·00	33·99	...	...	258·98	1,196·00	1,468·08	...
Do. ...	...	Voided leases	...	...	...	...	...	2·29	152·48	56,484·18	87,617·29	275·27
Do. ...	...	Sundry claims	...	...	35·00	11·33	...	...	54·75	3,171·14	2,844·65	...
Duketon ...	2102t	Dolorite	...	28·51	...	...	...	...	28·51	...	...	...
Do. ...	(2089t)	Famous Blue	...	...	40·00	30·80	...	...	...	40·00	30·80	...
Do. ...	(1938t)	Great Dolorite No. 1	...	145·88	...	8·56	...	3·54	1,592·96	48·00	196·37	...
Do. ...	2018t	Hemitite	...	46·72	...	...	...	...	261·95	49·50	93·93	...
Do. ...	2029t	Limonite	...	22·48	·42	9·85	...	...	294·51	·42	26·44	...
Do. ...	...	Voided leases	...	...	...	...	...	...	542·68	31,305·00	21,768·64	...
Do. ...	...	Sundry claims	...	...	...	35·48	...	...	19·00	238·50	336·53	...
Eagle's Nest...	...	Voided leases	...	...	...	...	...	...	145·34	331·00	1,215·78	...
Do. ...	...	Sundry claims	...	193·32	...	...	...	4·00	193·75	70·00	45·65	...
Erlistoun ...	...	Voided leases	...	...	...	...	...	...	11·66	27,012·07	18,461·35	...
Do. ...	...	Sundry claims	...	...	2·08	21·35	...	1,179·43	116·81	2,120·98	1,837·10	...
Euro	1984t	(Lone Star)	...	...	...	...	...	...	...	2,840·00	714·96	...
Do. ...	1984t, 1991t, 2009t, 2014t	Lone Star leases	...	...	4,657·00	893·67	...	...	...	4,752·00	910·81	...
Do. ...	...	Voided leases	...	...	...	...	...	...	65·14	83,964·25	35,957·12	...
Do. ...	...	Sundry claims	...	46·52	...	...	...	...	46·52	259·50	116·69	...

TABLE IV.—*Production of Gold and Silver from all sources, etc.*—continued.

MT. MARGARET GOLDFIELD—*continued.*

MOUNT MARGARET DISTRICT—*continued.*

Mining Centre.	Number of Lease.	Registered Name of Company or Lease.	Total for 1918.					Total Production.				
			Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.	Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.
			Fine ozs.	Fine ozs.	Tons (2,240lbs.)	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Tons (2,240lbs.)	Fine ozs.	Fine ozs.
Laverton ...	(2063T)	Allies	...	...	...	...	...	...	159·45	28·00	72·93	...
Do. ...	2058T	Augusta	...	...	92·51	47·92	...	...	...	206·01	152·36	...
Do. ...	2083T	Beria Main Reef	...	...	280·00	33·10	...	...	...	280·00	33·10	...
Do. ...	2085T	British Flag	...	...	...	...	...	...	...	31·50	12·44	...
Do. ...	2076T, 2077T ...	British Lion North leases ...	...	...	161·50	83·85	...	...	...	241·50	118·75	...
Do. ...	838T	(General Wabash)	...	...	...	...	...	...	...	100·00	288·72	...
Do. ...	2099T	Golden Circle	...	...	13·50	105·12	...	...	...	13·50	105·12	...
Do. ...	(2070T)	Golden Orbit	...	...	...	...	...	...	...	8·00	3·50	...
Do. ...	829T	(Ida H.)	...	...	...	...	...	...	...	111·00	285·13	...
Do. ...	829T, 838T, 846T, 1219T, 1310T, 1671T, 1894T	Ida H. G.M. Co., Ltd.	...	...	7,802·40	4,916·37	...	...	...	225,596·88	106,911·00	4,674·69
Do. ...	715T, 806T, 1206T, (1207T), (1483T), 1523T, 1524T, 1525T, 1542T, (1544T,) (1548T),	(Kalgoorlie & Boulder Firewood Co., Ltd.)	...	...	...	...	...	...	...	71,802·00	25,003·11	3,364·01
Do. ...	1897T	(Lady Harriet)	...	...	...	...	...	...	...	991·00	98·94	...
Do. ...	715T, 806T, 1206T, (1207T), (1483T), 1523T, 1524T, 1525T, 1542T, (1544T), (1548T)	(Lancefield G.M. Co., Ltd.)	...	...	...	...	...	...	...	102,179·78	39,402·81	...
Do. ...	715T, 806T, 1206T, (1207T), (1483T), 1523T, 1524T, 1525T, 1542T, (1544T), (1548T)	(Lancefield G.M. Co., Ltd.)	...	...	...	...	...	...	...	153,829·00	58,842·47	5,824·39
Do. ...	715T, 806T, 1206T, (1207T), (1483T), 1523T, 1524T, 1525T, 1542T, (1544T), (1548T)	(Lancefield G.M. Co., Ltd.)	...	...	...	...	...	...	...	260,749·00	103,535·54	21,612·29
Do. ...	715T, 806T, 1206T, 1523T, 1524T, 1525T, 1542T, 2050T, 2051T	Lancefield Gold Mines, Ltd.	...	...	71,157·00	26,281·30	3,909·27	...	...	194,672·00	69,955·32	11,576·67
Do. ...	2067T	Lave ton Proprietary	...	...	166·00	20·02	...	...	...	166·00	20·02	...
Do. ...	1897T, 1900T, (1948T), 1949T, (1950T), 1962T, (1974T), (1996T). (1997T)	Mary Mac G.M. Co., N.L.	...	...	785·00	145·70	...	...	...	29,528·00	6,969·07	...
Do. ...	1949T	(Pinnacles)	...	...	...	...	...	...	...	96·00	36·51	...

Do. ...	...	Voided leases	...	...	...	...	...	17·66	1,860·71	180,936·95	79,601·79	...
Do. ...	...	Sund y claims	149·02	112·18	329·00	233·46	...	195·37	1,261·49	3,980·45	3,642·50	...
Mt. Barnicoat	...	Voided leases	...	...	...	...	...	...	...	652·00	359·12	...
Do ...	...	Sundry claims	...	...	...	...	...	...	...	23·00	23·37	...
Quartz Hill ...	...	Voided leases	...	...	...	...	...	...	...	10·00	3·86	...
Red Hill ...	...	Sundry claims	...	...	...	...	...	...	...	27·00	13·76	...
		From District generally :—										
		Sundry Parcels treated at :										
		Brown Hill Consols Works, Kalgoorlie	...	...	...	...	...	...	...	...	13·70	...
		Mulga Queen Works	...	...	...	...	...	...	...	...	178·93	...
		State Battery, Burtville	...	...	...	...	...	...	...	62·00	6,437·91	...
		State Battery, Laverton	...	...	...	...	...	...	...	77·50	1,726·69	...
		Various Works	...	...	...	...	...	...	...	89·00	3,055·22	...
		Reported by Banks and Gold Dealers	24·35	...	...	...	...	1,997·17	...	...	...	...
		Total	**173·37**	**595·61**	**85,582·41**	**32,915·32**	**3,909·27**	**3,399·46**	**7,066·69**	**1,448,417·87**	**752,524·48**	**47,327·32**

North Coolgardie Goldfield.

MENZIES DISTRICT.

Comet Vale ...	(5431z), (5432z), (5434z)	(Edna May Golden Point, N.L.) ...	...	...	...	...	...	...	...	94·00	12·24	...
Do. ...	5217z	(Gladsome)	...	...	...	...	...	...	...	10,879·50	8,678·16	95·29
Do. ...	5217z, 5333z, 5380z	Gladsome leases	...	...	5,300·00	4,426·68	12·00	...	...	59,920·00	44,379·18	1,254·12
Do. ...	5300z	(Happy Jack)	...	...	...	...	...	...	...	1,363·50	776·10	...
Do. ...	5300z, 5325z ...	(Happy Jack leases)	...	...	350·00	117·62	...	...	...	7,691·50	3,922·48	...
Do. ...	5325z	(Iron King)	...	...	...	...	...	...	...	41·50	20·62	...
Do. ...	(5455z)	Lady Margaret	...	...	13·00	2·96	...	...	...	13·00	2·96	...
Do. ...	5410z	Lake View	...	...	...	...	...	...	...	234·71	87·37	...
Do. ...	5300z, 5325z, 5451z	Princess Royal G.M. Co., N.L. ...	...	...	1,050·00	283·18	...	...	...	1,050·00	386·18	...
Do. ...	5312z	(Sand King)	...	...	...	...	...	...	...	35·50	30·33	...
Do. ...	5211z	(Sand Queen)	...	...	...	...	...	...	...	3,436·75	3,639·12	2·00
Do. ...	(5208z), 5211z, 5224z, 5320z	(Sand Queen G.Ms., Ltd.)	...	...	...	...	...	...	...	6,803·50	2,949·83	...
Do. ...	5211z, 5224z, 5312z, 5320z	Sand Queen G.Ms., Ltd.	...	...	9,337·00	6,977·09	625·03	...	...	114,140·62	98,256·22	3,658·76
Do. ...	...	Voided leases	...	...	...	...	...	...	409·70	9,960·60	5,513·14	2·00
Do. ...	...	Sundry claims	...	...	...	...	...	...	31·91	614·75	423·69	...
Goongarrie ...	(5441z)	Boddington Star	...	...	...	...	...	...	...	31·00	12·60	...
Do. ...	5414z	(New Boddington)	...	...	...	...	...	...	191·83	412·70	1,785·68	...
Do. ...	5414z, (5428z), (5435z), 5430z	New Boddington Gold Mining Syndicate, Ltd.	...	...	5,000·00	1,940·20	...	...	...	11,818·00	5,238·79	...
Do. ...	...	Voided leases	...	...	...	...	...	·94	463·55	14,918·09	9,927·92	...
Do. ...	...	Sundry claims	...	194·70	27·00	147·93	...	33·72	310·43	853·25	805·44	...
Menzies ...	(5433z)	Alpha	...	...	255·00	88·82	...	...	...	490·00	189·89	...
Do. ...	5354z	Balkis	...	...	...	...	...	...	...	2,615·25	2,370·59	...
Do. ...	5440z	Crusoe North	...	...	359·00	418·10	...	...	...	966·50	892·37	...
Do. ...	(5457z)	Fish	...	...	...	...	...	...	...	28·00	50·15	...

TABLE IV.—*Production of Gold and Silver from all sources, etc.*—continued.

NORTH COOLGARDIE GOLDFIELD—*continued.*

MENZIES DISTRICT—*continued.*

Mining Centre.	Number of Lease.	Registered Name of Company or Lease.	Total for 1918.					Total Production.				
			Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.	Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.
			Fine ozs.	Fine ozs.	Tons (2,240lbs.)	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Tons (2,240lbs.)	Fine ozs.	Fine ozs.
Menzies ...	(5302z)	Lady Harriet	...	...	...	...	...	...	6·15	3,738·00	3,829·00	...
Do. ...	5423z	Lady Shenton	...	...	893·50	910·81	...	...	...	4,058·25	2,952·52	...
Do. ...	5462z	Mabel	...	...	68·50	154·73	...	...	...	118·50	213·29	...
Do. ...	4931z, 4934z, 4935z, 4936z, 5074z, 5075z, 5260z, 5261z, 5315z	Menzies Consolidated G.M., Ltd. ...	...	...	23,976·00	12,845·37	...	...	...	412,258·00	220,224·60	78·67
Do. ...	(2832z), (2844z), 3100z, (3138z), (4966z), 5392z	Menzies Mining and Exploration Corporation, Ltd.	...	...	69·75	20·09	...	...	...	26,410·00	29,963·12	...
Do. ...	5392z	(Revival)	...	...	...	...	...	...	...	22·50	5·90	...
Do. ...	2823z	Robinson Crusoe	...	...	303·00	203·04	...	...	13·24	4,667·75	2,538·46	...
Do. ...	2823z	(Robinson Crusoe: Crusoe Gold Claims, Ltd.)	...	...	...	...	...	...	...	33,135·00	32,978·74	1,038·47
Do. ...	...	Voided leases	...	...	...	...	...	45·42	1,029·65	300,291·96	350,308·73	10,224·59
Do. ...	...	Sundry claims	...	3·65	206·00	584·76	760·49	6·69	359·68	16,355·25	12,288·37	760·49
Mt. Ida ...	5250z	Forest Belle	...	...	...	15·53	...	...	...	4,809·00	4,149·01	...
Do. ...	5290z	(Unexpected South)	...	...	...	...	...	...	...	1,136·00	714·65	8·25
Do. ...	5290z, (5329z), (5381z)	(Unexpected South leases) ...	...	...	...	...	...	...	...	4,524·00	8,179·29	35·64
Do. ...	5290z, 5454z ...	Unexpected South leases ...	...	...	...	...	...	...	...	23·00	7·24	...
Do. ...	5292z	Wild Rose	...	...	...	2·74	...	...	...	1,150·79	937·33	...
Do. ...	...	Voided leases	...	...	...	...	...	...	77·07	44,306·58	52,958·33	62·74
Do. ...	...	Sundry claims	14·74	...	...	...	...	14·74	9·57	4,217·50	2,595·28	...
		From District generally :—										
		Sundry Parcels treated at:										
		Balkis Battery	...	...	...	713·27	...	...	...	50·75	3,887·82	...
		Crusoe Wedderburn Cyanide Works	...	...	...	...	...	...	...	...	1,497·89	...
		Fremantle Trading Co., Ltd., Works	...	...	...	...	...	...	...	...	212·98	...
		Lady Harriet Battery	...	...	4·00	148·71	...	...	...	236·50	2,700·03	...
		Menzies Mining and Exploration Corporation, Ltd., Works	...	...	...	...	...	...	...	639·50	732·04	...
		Mount Ida Meteor Works	...	...	...	...	...	...	...	...	1,916·49	...
		State Battery, Mt. Ida	...	...	...	...	...	...	...	1,842·25	4,484·34	...
		Various Works	...	...	...	...	...	...	...	1,807·05	21,725·38	1,039·43
		Reported by Banks and Gold Dealers	27·34	...	...	...	...	930·08	195·48	...	...	...
		Total	**42·08**	**198·35**	**47,211·75**	**30,104·63**	**1,397·52**	**1,031·59**	**3,098·26**	**1,114,210·35**	**952,351·88**	**18,260·45**

ULARRING DISTRICT.

Davyhurst ...	972U	Little Dele	...	...	3,055·00	222·45	...	...	...	6,463·00	561·45	...
Do. ...	...	Voided leases	...	...	...	...	...	2·93	138·99	146,759·73	122,330·54	5,403·14
Do. ...	...	Sundry claims	...	...	...	...	...	...	30·12	5,856·85	3,061·06	...
Diemel's Find	...	Sundry claims	...	...	...	...	...	...	7·37	102·50	119·13	...
Mulline ...	987U	Just in Time	...	...	5·50	11·70	...	...	...	5·50	11·70	...
Do. ...	139U, 235U, (555U), (670U), (671U), (679U), (732U), (862U)	(Lady Gladys G.M. Co., N.L.)	...	...	...	...	...	...	...	16,871·50	17,777·42	...
Do. ...	139U, 235U, (555U), (670U)	(Lady Gladys G.M. Co., N.L.)	...	...	...	...	...	...	...	1,220·50	512·52	...
Do. ...	139U, 235U, (555U)	(Lady Gladys leases)	...	...	...	...	...	...	170·89	7,741·00	15,025·05	...
Do. ...	139U, 235U, (555U) (670U)	Lady Gladys leases	...	...	7·25	2·40	...	...	...	980·75	478·23	...
Do. ...	324U, 600U, 730U, 969U, 970U, 974U, 975U	Riverina South G.M. Co., N.L.	...	...	2,918·00	3,764·37	41·93	...	...	3,628·00	4,552·35	227·04
Do. ...	324U, 600U, 730U ...	(Riverina South leases) ...	...	...	...	...	...	...	43·87	18,480·50	13,442·65	...
Do. ...	763U	Young Australian	...	...	64·75	124·58	...	...	...	471·00	645·44	...
Do. ...	763U	(Young Australian)	...	...	...	...	...	...	...	1,295·00	3,609·26	...
Do. ...	763U, (938U), (939U) ...	(Young Australian leases) ...	...	...	...	...	...	...	...	2,672·25	5,763·88	...
Do. ...	...	Voided leases	...	...	...	...	...	...	59·33	39,756·22	33,959·65	2·71
Do. ...	...	Sundry claims	...	...	275·75	143·94	...	...	35·53	5,552·51	4,507·45	·69
Mulwarrie ...	(919U)	Mulwarrie	...	...	...	...	...	...	...	627·50	392·15	...
Do. ...	...	Voided leases	...	...	...	...	...	...	56·84	17,770·14	25,135·44	26·37
Do. ...	...	Sundry claims	...	...	10·50	38·70	...	...	21·45	2,004·37	1,802·63	...
Ularring ...	(954U)	Cardinal	...	...	13·25	18·54	...	...	36·71	465·75	596·11	...
Do. ...	...	Voided leases	...	...	...	...	...	...	526·63	8,963·85	13,051·86	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	...	143·00	113·15	...
	From District generally :—											
	Sundry Parcels treated at :											
	Expansion Battery		...	...	...	...	...	...	...	96·50	188·65	...
	Hannans Central Battery, Kalgoorlie		...	...	...	...	...	...	...	18·40	4·66	...
	State Battery, Mulline		...	...	...	154·26	...	...	...	504·00	12,986·55	...
	State Battery, Mulwarrie		...	...	...	310·88	...	...	...	595·20	4,762·31	...
	Various Works		...	...	...	...	...	...	15·82	90·25	465·72	...
	Reported by Banks and Gold Dealers		...	...	...	...	...	18·53	·77	...	...	...
	Total		...	...	**6,350·00**	**4,791·82**	**41·93**	**21·46**	**1,144·32**	**289,135·77**	**285,857·01**	**5,659·95**

NIAGARA DISTRICT.

Desdemona ...	...	Voided leases	...	...	...	...	...	...	5·73	9,585·25	7,471·39	12·04
Do. ...	...	Sundry claims	...	...	...	...	...	...	8·99	1,331·70	634·19	...
Kookynie ...	(772G)	Carpathia	...	...	42·00	14·21	...	...	...	355·00	159·73	...
Do. ...	756G	(Cosmopolitan No. 1 : Cosmopolitan Proprietary, Ltd.)	...	...	...	...	...	...	...	578·00	793·00	...
Do. ...	756G	Cosmopolitan No. 1 : Western Machinery Co., Ltd.	...	...	155·75	107·76	...	...	...	433·34	369·98	...
Do. ...	757G	(Cosmopolitan No. 2 : Cosmopolitan Proprietary, Ltd.)	...	...	...	...	...	...	...	710·00	909·66	...

TABLE IV.—*Production of Gold and Silver from all sources, etc.*—continued.

NORTH COOLGARDIE GOLDFIELD—*continued.*

NIAGARA DISTRICT—*continued.*

Mining Centre.	Number of Lease.	Registered Name of Company or Lease.	Total for 1918.					Total Production.				
			Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.	Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.
			Fine ozs.	Fine ozs.	Tons (2,240lbs.)	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Tons (2,240lbs.)	Fine ozs.	Fine ozs.
Kookynie ...	757G	Cosmopolitan No. 2: Western Machinery Co., Ltd.	...	...	231·00	305·85	...	...	...	2,715·50	3,223·57	...
Do. ...	769G	(Two Ds)	...	...	...	...	...	...	...	100·00	14·01	...
Do. ...	769G, 770G, 771G	Two Ds leases	...	...	200·00	363·84	...	...	...	200·00	404·05	...
Do. ...	...	Voided leases	...	...	...	...	...	...	257·33	728,442·47	382,160·06	5,375·97
Do. ...	...	Sundry claims	...	9·43	7·39	22·93	...	30·59	90·14	4,670·35	4,282·96	...
Niagara ...	(775G)	Lubra Queen	...	...	20·00	1·84	...	...	...	194·00	44·60	...
Do. ...	...	Voided leases	...	...	...	...	...	...	104·54	84,278·50	51,843·37	...
Do. ...	...	Sundry claims	...	...	341·09	212·59	...	13·27	70·23	9,798·79	5,991·11	...
Tampa ...	...	Voided leases	...	...	...	...	...	...	15·66	49,271·87	22,173·80	174·24
Do. ...	...	Sundry claims	...	...	86·00	45·26	...	5·07	69·44	3,186·00	1,875·00	...
		From District generally :—										
		Sundry Parcels treated at:										
		Grafter Battery	...	...	...	...	...	...	...	82·00	407·66	...
		Lubra Queen G.M. Co., N.L., Works	...	...	...	52·83	...	...	...	...	153·47	...
		State Battery, Niagara	...	...	...	67·27	...	...	...	622·50	8,770·36	...
		Various Works	...	...	...	...	...	...	...	451·00	6,356·43	41·17
		Reported by Banks and Gold Dealers	...	...	...	...	...	1,426·26	787·38	...	...	...
		Total	...	**9·43**	**1,083·23**	**1,194·38**	...	**1,475·19**	**1,409·44**	**897,006·27**	**498,038·40**	**5,603·42**

YERILLA DISTRICT.

NOTE.—Prior to 31st August, 1917, the mining centres of Eucalyptus, Linden, Mt. Celia, Mt. Howe, and Yundamindera were included in Yerilla District, and the output is recorded in that District. From 1st September, 1917, the output from these centres is shown in Mt. Morgans District, to which they were transferred.

Edjudina ...	(1046R)	Admiral Jellico	...	...	62·00	24·38	...	...	...	171·53	98·63	...
Do. ...	1018R	Neta Extended	...	...	88·83	59·37	...	...	...	623·58	640·91	...
Do. ...	1010R, 1011R ...	Neta leases	...	...	13·00	21·87	...	...	...	407·00	340·01	...
Do. ...	1015R	Senate	...	4·38	247·50	238·39	...	...	4·38	1,220·50	1,494·26	...
Do. ...	...	Voided leases	...	...	...	...	...	...	14·06	29,477·59	38,978·59	37·79
Do. ...	...	Sundry claims	...	...	198·00	103·88	...	...	21·26	2,947·50	2,419·99	...
Eucalpytus ...	...	Voided leases	...	...	...	...	...	...	2,864·77	1,351·35	3,020·68	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	367·50	362·50	381·82	...
Linden ...	998R, [344F] ...	Bindah	...	...	...	...	...	...	...	1,462·50	531·95	...
Do. ...	871R, [340F] ...	Democrat	...	...	...	...	...	...	9·01	2,245·25	5,026·30	...
Do. ...	(1040R), ([349F])	Great Billjim	...	...	...	...	...	...	...	32·75	19·36	...
Do. ...	1024R, [346F] ...	Great Carbine	...	...	...	...	...	...	...	67·75	20·30	...
Do. ...	942R, [342F] ...	Great Junction	...	...	...	...	...	...	6·11	1,086·75	1,030·90	...

Do. ...	1005R, [345F] ...	Olympic	...	...	...	...	...	...	...	...	442·50	655·11	...
Do. ...	903R, [341F], 985R, [343F]	Torquay leases	...	...	...	...	...	...	...	...	325·68	107·45	...
Do. ...	903R, [341F], (904R), 985R, [343F], (992R)	(Westralia United Goldfields, Ltd.) ...	...	...	...	...	...	...	...	...	1,995·00	1,452·42	...
Do. ...	...	Voided leases	...	...	...	...	...	7·53	538·04	11,909·85	14,835·12	...
Do. ...	...	Sundry claims	...	...	...	...	...	77·81	35·11	6,493·25	4,798·42	...
Mt. Celia ...	...	Voided leases	...	...	...	...	...	...	...	14·00	5·39	...
Mt. Howe ...	...	Sundry claims	...	...	...	...	...	...	...	5·00	11·13	...
Mt. Remarkable	...	Voided leases	...	...	...	...	...	...	17·74	528·72	415·09	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	...	4·00	1·32	...
Pingin ...	...	Voided leases	...	...	...	...	...	...	46·99	14,637·80	10,306·68	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	99·36	3,422·35	2,297·51	...
Yarri ...	...	Voided leases	...	...	...	...	...	6·30	87·08	36,822·75	19,124·10	2·00
Do. ...	...	Sundry claims	...	...	55·50	22·47	...	...	5·31	5,307·60	2,817·94	...
Yerilla ...	...	Voided leases	...	...	...	...	...	...	3,089·51	15,619·21	12,313·06	13·93
Do. ...	...	Sundry claims	...	...	26·00	14·48	...	19·30	15·88	2,401·00	1,338·07	...
Yilgangie ...	...	Voided leases	...	...	...	...	...	...	...	218·75	295·45	...
Do. ...	...	Sundry claims	...	...	...	...	...	121·67	29·83	25·50	46·17	...
Yundamindera	(1 41R), ([350F])	Queen of the May	...	...	...	...	...	...	...	535·25	520·21	...
Do. ...	...	Voided leases	...	...	...	...	...	...	80·47	68,532·60	45,484·66	5·82
Do. ...	...	Sundry claims	...	...	...	...	...	...	85·22	3,151·25	2,740·75	...
		From District generally :—										
		Sundry Parcels treated at :										
		Battles Ville Battery	...	...	...	...	...	...	...	...	621·83	...
		Fremantle Trading Co's. Works	...	...	...	...	...	...	...	...	4·92	...
		Neta Battery	...	...	...	...	...	...	...	...	325·69	...
		State Battery, Linden	...	...	...	...	...	...	...	72·00	4,030·90	...
		State Battery, Pingin	...	...	...	...	...	...	...	125·50	1,278·16	...
		State Battery, Yarri	...	...	...	...	...	...	...	231·50	4,297·19	3·50
		State Battery, Yerilla	...	...	...	...	...	2·17	...	72·00	1,257·22	...
		Various Works	...	...	...	...	...	...	...	660·85	3,999·04	...
		Reported by Banks and Gold Dealers	...	...	...	...	...	1,011·56	154·74	...	...	...
		Total	...	**4·38**	**690·83**	**484·84**	...	**1,246·34**	**7,572·37**	**215,010·46**	**189,384·70**	**63·04**

Broad Arrow Goldfield.

Bardoc ...	1807w	Birthday	...	...	...	...	...	...	...	8·34	8·32	...
Do. ...	1827w	Revenue	...	...	7·52	8·07	...	...	...	7·52	8·07	...
Do. ...	1803w	Zoroastrian	...	116·49	...	...	...	...	928·55	12·00	310·02	...
Do. ...	(1806w)	Zoroastrian North	...	...	1·44	4·12	...	...	...	6·89	40·09	...
Do. ...	...	Voided leases	...	...	...	...	...	...	935·13	73,068·00	51,227·05	203·60
Do. ...	...	Sundry claims	43·02	37·54	143·83	136·94	...	43·02	559·27	3,023·43	2,632·85	...
Black Flag ...	...	Voided leases	...	...	...	...	...	27·81	373·99	40,332·13	24,451·48	...
Do. ...	...	Sundry claims	...	...	20·67	16·18	...	686·51	165·78	1,991·73	1,864·49	...
Broad Arrow	1820w	Dixie Regina	...	...	11·20	36·94	...	...	...	11·20	36·94	...

TABLE IV.—*Production of Gold and Silver from all sources, etc.*—continued.

BROAD ARROW GOLDFIELD—*continued.*

BROAD ARROW DISTRICT—*continued.*

Mining Centre.	Number of Lease.	Registered Name of Company or Lease.	Total for 1918.					Total Production.				
			Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.	Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.
			Fine ozs.	Fine ozs.	Tons (2,240lbs.)	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Tons (2,240lbs.)	Fine ozs.	Fine ozs.
Broad Arrow	(1790w)	Duke	...	...	19·00	11·62	...	...	...	374·00	719·62	...
Do. ...	(1808w)	Missing Link	...	...	3·00	26·04	...	...	...	3·00	26·04	...
Do. ...	1771w	North Duke	...	...	...	...	...	...	164·77	84·30	373·58	...
Do. ...	1799w	Oversight	...	414·19	40·00	117·42	...	...	1,214·31	138·00	446·45	...
Do. ...	(1794w)	Railway	...	...	...	...	...	...	...	33·00	35·12	...
Do. ...	1735w	Tara	...	463·41	...	...	...	...	2,042·63	213·90	995·15	...
Do. ...	...	Voided leases	...	...	...	...	...	54·85	2,313·89	117,314·49	96,782·10	15·85
Do. ...	...	Sundry claims	1·90	4·73	278·69	121·48	...	969·86	1,219·84	7,908·25	5,694·54	...
Carnage ...	(1795w)	Shepherd King	...	...	40·00	10·88	...	...	...	138·00	251·97	...
Paddington ...	1816w, 1819w ...	Mt. Eddy leases	...	...	298·56	134·50	...	...	...	298·56	134·50	...
Do. ...	(1801w)	Mt. Eddy United	...	...	...	...	...	...	...	303·00	84·05	...
Do. ...	...	Voided leases	...	...	...	...	...	5,557·72	257·75	174,508·02	81,979·75	18·96
Do. ...	...	Sundry claims	...	2·13	10·63	12·81	...	1,714·16	2·13	10,172·98	6,549·19	...
Siberia ...	1399w, 1424w, 1429w, 1442w, 1655w	Associated Northern Blocks (W.A.), Ltd.	...	...	954·50	287·21	...	...	...	208,556·09	71,820·32	1,664·70
Do. ...	1774w	Christmas Lone Hand	...	...	...	...	...	...	...	39·00	187·70	...
Do. ...	1811w	Dark Horse	...	...	58·55	219·61	...	...	...	73·62	750·09	...
Do. ...	1371w	Gimblet South	...	...	2,406·00	466·36	...	...	...	70,958·50	11,863·94	...
Do. ...	1399w	(Gimblet South Extended) ...	...	...	...	...	...	...	...	525·00	835·44	...
Do. ...	1399w, 1424w, 1429w, 1442w	(Gimblet South Extended leases)	...	...	...	...	...	...	...	215·00	39·98	...
Do. ...	1338w	(Gimblet West)	...	...	...	...	...	...	...	680·50	482·83	...
Do. ...	(1286w), (1403w)	(Golden leases)	...	...	...	...	...	...	374·82	205·73	538·82	...
Do. ...	1822w	Hill End	...	41·00	6·00	45·35	...	...	41·00	6·00	45·35	...
Do. ...	1289w, (1308w) ...	(Lady Evelyn leases)	...	...	...	...	...	...	25·26	5,376·25	5,267·70	...
Do. ...	(1403w)	Nuggety Hill	...	...	...	...	...	...	55·83	77·14	38·28	...
Do. ...	1736w	Pole	...	...	...	...	...	...	...	60·00	15·62	...
Do. ...	1823w	Reality	...	...	78·00	622·75	...	...	...	78·00	622·75	...
Do. ...	1375w	(Siberia Consols)	...	...	...	...	...	...	41·58	1,013·50	3,136·03	...
Do. ...	1375w	Siberia Consols	...	...	...	...	...	...	...	581·25	1,236·74	...
Do. ...	1375w, (1610w), (1720w)	(Siberia Consols G.M. Co., N.L.) ...	...	...	...	...	...	...	39·23	352·50	598·52	...
Do. ...	1336w	(Slippery Gimblet)	...	...	...	...	...	...	...	26,110·50	8,217·79	...
Do. ...	1336w, 1338w, (1419w)	Slippery Gimblet leases ...	...	...	...	...	...	...	...	4,697·00	1,774·52	...
Do. ...	...	Voided leases	...	...	...	...	...	...	317·52	23,234·43	11,627·91	...
Do. ...	...	Sundry claims	...	...	725·90	270·82	...	126·49	537·09	7,425·14	6,836·40	...
Smithfield ...	...	Voided leases	...	...	...	...	...	...	...	1,027·00	200·90	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	23·79	49·50	149·47	...

	From Goldfield generally :—											
	Sundry Parcels treated at:											
	Brown Hill Consols Works, Kalgoorlie	...	...	...	...	...	...	...	38·99	15·32	...	
	Fremantle Trading Co.'s Works	...	...	...	...	...	...	...	...	80·10	...	
	Hannans Central Works, Kalgoorlie	...	...	...	...	...	...	...	8·70	15·47	...	
	Pole Works	...	...	...	...	...	...	...	...	356·07	...	
	Regan's Carnage Battery	...	...	...	...	...	...	...	27·00	598·81	...	
	State Battery, Ora Banda	...	...	...	307·44	...	...	...	47·00	1,233·39	...	
	State Battery, Siberia	...	...	...	...	...	...	...	40·00	746·57	...	
	Zoroastrian Works	...	...	...	...	...	...	...	116·50	1,082·23	...	
	Various Works	...	...	...	...	...	2,271·17	...	16,622·68	31,760·91	278·85	
	Cement from Alluvial Claims at Paddington	...	...	...	...	...	...	...	50·94	8·72	...	
	Cement from Alluvial Claims at Siberia	...	...	...	...	...	...	...	1,052·30	209·31	...	
	Reported by Banks and Gold Dealers	144·93	...	...	...	...	7,723·85	...	...	...	...	
	Total	**189·85**	**1,079·49**	**5,103·49**	**2,856·54**	...	**19,175·44**	**11,634·16**	**799,296·50**	**437,045·37**	**2,181·96**	

North-East Coolgardie Goldfield.

KANOWNA DISTRICT.

Black Swan ...	...	Voided leases	...	...	...	...	...	...	...	160·00	141·76	...
Gambier ...	...	Voided leases	...	...	...	...	...	...	38·73	12,729·00	6·638·30	·07
Do. ...	...	Sundry claims	...	...	...	...	24·70	245·94	858·75	750·42	...	
Gindalbie ...	...	Voided leases	...	...	...	...	...	...	19·94	43,605·08	39,435·32	38·31
Do. ...	...	Sundry claims	...	...	...	...	...	...	674·82	1,017·75	1,207·80	...
Gordon ...	1385x	Pride of the Morning	...	...	1,170·00	79·95	...	...	...	1,170·00	79·95	...
Do. ...	...	Voided leases	...	...	...	...	...	...	268·25	40,607·30	11,425·99	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	54·65	630·50	577·80	...
Kanowna ...	1362x	Beck's Reward	...	...	79·00	14·97	...	...	...	714·00	348·79	...
Do. ...	(1386x)	Cocktail	...	8·20	28·00	22·67	...	...	8·20	28·00	22·67	...
Do. ...	1380x	Gentle Polly	...	...	53·00	21·80	...	...	...	53·00	21·80	...
Do. ...	1389x	Golden Valley	...	...	73·00	49·94	...	...	...	73·00	49·94	...
Do. ...	1019x	Kanowna	...	...	267·00	266·05	...	...	691·94	8,365·50	9,961·07	...
Do. ...	1299x	(Kanowna Consol)	...	...	...	...	...	...	...	713·50	129·30	...
Do. ...	1299x	(Kanowna Consol)	...	...	...	...	...	...	...	339·00	207·36	...
Do. ...	1299x, (1300x) ...	(Kanowna Consol leases) ...	...	...	...	...	...	...	6·76	312·00	261·31	...
Do. ...	1299x, 1379x ...	Kanowna Consol leases ...	...	...	1,146·00	799·21	...	...	...	1,146·00	799·21	...
Do. ...	(1353x)	Leila M.	...	...	...	...	...	...	...	100·00	81·33	...
Do. ...	18x, (19x) ...	(Lily Australis G.Ms., Ltd.) ...	...	...	...	...	...	...	...	197·00	119·18	...
Do. ...	1360x, (1361x) ...	New Moon leases	...	...	...	...	...	...	...	494·00	453·31	...
Do. ...	1384x	New Moon South	...	...	160·00	104·39	...	...	...	160·00	104·39	...
Do. ...	(3x), (14x), 15x, 18x, (19x), (60x), (81x), (938x), (974x), (1035x), (1103x), (1263x)	(North White Feather G.Ms., Ltd.) ...	...	...	...	...	...	...	...	147,974·75	74,343·01	159·19
Do. ...	(14x), 15x, 18x, (19x), (974x), (1035x), (1103x), (1263x), (1276x), (1278x)	(North White Feather G.Ms., Ltd.) ...	...	...	...	...	...	...	...	37,768·50	10,594·79	...
Do. ...	12x, 13x, (14x), 15x, 18x, (19x), (72x), 855x, (974x), (1035x), (1103x), (1263x), (1278x)	North White Feather G.Ms., Ltd. ...	...	...	2,337·00	1,118·61	...	...	...	54,217·27	24,289·76	...

TABLE IV.—*Production of Gold and Silver from all sources, etc.*—continued.

NORTH-EAST COOLGARDIE GOLDFIELD—*continued.*

KANOWNA DISTRICT—*continued.*

Mining Centre.	Number of Lease.	Registered Name of Company or Lease	Total for 1918.					Total Production.				
			Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.	Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.
			Fine ozs.	Fine ozs.	Tons (2,240lbs.)	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Tons (2,240lbs.)	Fine ozs.	Fine ozs.
Kanowna ...	1367	Victoria Extended	...	...	190·00	44·55	...	...	...	190·00	44·55	...
Do. ...	12x, 13x, (14x), 15x, 855x, (1001x), (1012x), (1103x), (1107x), (1108x), (1109x)	(White Feather Main Reefs, Ltd.) ...	...	...	...	...	...	...	...	123,327·56	82,334·52	1,675·68
Do. ...	(9x), (10x), 12x, 13x, (72x), (83x), (201x), 855x, (1001x), (1012x), (1108x), 1249x)	(White Feather Main Reefs (1906), Ltd.)	...	...	...	...	...	...	20·45	24,393·00	9,138·31	...
Do. ...	...	Voided leases	...	...	...	...	...	3·59	3,666·34	244,439·46	136,287·84	647·37
Do. ...	...	Sundry claims	...	9·46	605·00	325·76	...	88·95	1,364·75	13,633·91	6,706·55	1·50
Mulgarrie ...	(1355x)	Palm	...	...	116·00	63·12	...	...	...	958·00	743·15	...
Do. ...	...	Voided leases	...	...	...	...	...	...	1,216·63	4,885·26	2,824·33	...
Do. ...	...	Sundry claims	...	...	51·00	4·78	...	...	13·29	846·00	500·16	...
Six-Mile ...	...	Voided leases	...	...	...	...	...	...	1,595·63	559·00	767·72	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	31·44	117·50	84·79	...
	From District generally :—											
	Sundry Parcels treated at :											
	Kalgoorlie Foundry, Ltd., Works		...	...	...	...	...	...	...	...	553·56	...
	Lady Pratt Works		...	...	...	...	...	...	...	16·00	277·83	...
	Old Cement Works—Martin's		...	...	32·78	360·94	...	...	...	102·78	11,753·84	...
	Riedel and Norton's Works		...	...	...	121·71	...	...	...	642·00	2,235·77	...
	Various Works		...	...	...	...	...	25·01	...	903·10	23,131·41	...
	Totals for Leases and Quartz Claims ...		...	17·66	6,307·78	3,398·45	...	142·25	9,917·76	768,447·47	459,428·89	2,522·12
	Cement from Alluvial Claims—											
	Reported by owners		...	...	...	...	...	305·41	867·52	26,376·40	12,715·90	...
	Treated locally (not reported by owners) at :											
	Kalgoorlie Foundry, Ltd., Works		...	...	...	...	...	...	...	50·00	12·75	...
	Lady Pratt Works		...	...	...	...	...	...	...	15·00	3·18	...
	Old Cement Works—Martin's		...	...	...	...	...	...	...	10,791·00	3,527·94	...
	Riedel and Norton's Works		...	...	...	...	...	...	...	14,717·00	2,190·47	...
	Various Works		...	...	...	...	...	...	...	77,350·21	54,918·51	...
	Treated outside District (not reported by owners) ...		...	...	...	...	...	...	...	27,804·55	36,711·17	...
	Reported by Banks and Gold Dealers		23·49	...	...	...	...	103,929·73	·86	...	84·69	...
	Total		**23·49**	**17·66**	**6,307·78**	**3,398·45**	...	**104,377·39**	**10,786·14**	**925,551·63**	**569,593·50**	**2,522·12**

KURNALPI DISTRICT.

Jubilee ...	...	Voided leases	...	...	...	...	...	...	145·13	1,821·25	1,408·51	...
Do. ...	...	Sundry claims	...	...	...	...	...	18·87	...	46·00	28·91	...
Kurnalpi ...	423K	Kurnalpi Pride	...	...	11·80	231·73	...	...	578·45	11·80	231·73	...
Do. ...	...	Voided leases	...	...	...	...	...	371·18	1,785·95	2,805·31	2,245·39	6·27
Do. ...	...	Sundry claims	...	...	...	...	...	226·49	77·08	130·00	157·19	...
Mulgabbie ...	424K	John Bull	...	27·00	...	...	...	...	44·48	2·00	212·98	...
Do. ...	(312K)	Mulgabbie Perseverance ...	...	...	...	...	...	...	...	34·40	2,936·37	4·95
Do. ...	...	Voided leases	...	...	...	...	...	...	562·31	48·25	4,141·34	...
Do. ...	...	Sundry claims	...	...	...	...	...	6·50	1,432·79	137·50	820·13	...
		From District generally :—										
		Sundry Parcels treated at :										
		Various Works	...	...	...	...	...	...	...	56·50	193·15	...
		Reported by Banks and Gold Dealers	1·92	...	...	...	...	11,366·21	19·62	...	...	...
		Total	**1·92**	**27·00**	**11·80**	**231·73**	...	**11,989·25**	**4,645·81**	**5,093·01**	**12,375·70**	**11·22**

East Coolgardie Goldfield.

EAST COOLGARDIE DISTRICT.

Binduli ...	...	Voided leases	...	...	...	...	...	...	...	175·80	97·60	...
Do. ...	...	Sundry claims.	...	...	...	...	...	...	...	138·47	74·34	...
Boorara ...	4569E	Elsie May	...	...	...	...	...	...	...	420·92	317·64	...
Do. ...	4610E	Eva	...	113·28	17·00	44·39	...	...	113·28	33·50	111·03	...
Do. ...	3908E, 3910E, (3912E), (4033E), (4045E), (4327E)	(Golden Ridge G.M. Co., Ltd.) ...	...	...	362·00	494·13	...	...	...	239,600·10	132,893·92	408·36
Do. ...	4629E	Jewel	...	...	28·00	101·12	...	...	...	28·00	101·12	...
Do. ...	3908E, 3910E, 4625E	Waterfall Gold Mine leases ...	...	...	2,693·00	1,992·62	...	...	...	2,693·00	1,992·62	...
Do. ...	3908E, 3910E, (3912E), (4033E)	(Waterfall leases)	...	...	...	...	...	...	...	2,849·00	2,389·48	...
Do. ...	...	Voided leases	...	...	...	...	...	...	268·28	56,602·63	31,233·31	...
Do. ...	...	Sundry claims	...	51·16	28·00	18·24	...	·49	53·46	307·00	306·88	...
Boulder ...	392E	(Acrobat : Paringa Consolidated Mines, Ltd.)	...	...	...	...	...	...	...	10·25	37·15	...
Do. ...	392E	Acrobat Paringa Mines (1909), Ltd.	...	...	86·71	73·80	...	...	...	13,649·67	6,429·83	...
Do. ...	38E, 71E, 72E, (101E)	Associated G.Ms. of W.A., Ltd. ...	...	...	68,856·80	25,471·37	807·30	...	8·49	1,780,602·50	993,252·69	30,633·68
Do. ...	49E, (4211E) ...	Associated Northern Blocks (W.A.), Ltd.	...	...	19,491·84	22,323·08	...	...	524·18	369,340·71	454,988·71	4,844·50
Do. ...	(682E,) 902E, 923E, 986E, (1064E), 1124E, 1196E, 4075E	(Boulder Deep Levels, Ltd.) ...	...	...	...	...	...	...	...	3,043·00	1,778·10	26·71
Do. ...	902E, 923E, 986E, 1124E, 1196E, 4075E	(Boulder Deep Levels (1907), Ltd.)...	...	...	...	...	...	...	...	787·50	210·30	...
Do. ...	281E	(Brookman Bros. : Boulder G.M. Co., Ltd.)	...	...	...	...	...	...	...	8,655·00	8,417·00	...
Do. ...	(989E)	(Brown Hill Central G.Ms., Ltd.) ...	...	...	...	...	...	...	...	2,957·50	2,071·92	...
Do. ...	558E, (1175E), 3961E	Brown Hill Extended, Ltd.	...	...	...	...	...	...	...	34,746·58	45,535·84	...
Do. ...	1163E	(Cassidy's North)	...	...	...	...	...	...	...	67·00	7·95	...

TABLE IV.—*Production of Gold and Silver from all sources, etc.*—continued.

EAST COOLGARDIE GOLDFIELD—*continued.*

EAST COOLGARDIE DISTRICT—*continued.*

Mining Centre.	Number of Lease.	Registered Name of Company or Lease.	Total for 1918.					Total Production.				
			Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.	Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.
			Fine ozs.	Fine ozs.	Tons (2,240lbs.)	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Tons (2,240lbs.)	Fine ozs.	Fine ozs.
Boulder ...	24E, (888E), 949E	Central and West Boulder G.Ms., Ltd.	...	...	994·36	454·13	...	...	...	65,717·86	33,243·18	...
Do. ...	352E	(Chaffers G.M. Co., Ltd.)	...	...	...	...	...	...	...	4,256·00	1,299·03	161·50
Do. ...	352E, 873E, 4334E	(Chaffer's G.M. Co., Ltd.)	...	...	...	...	...	...	...	111,111·00	44,796·77	...
Do. ...	352E, 873E, 4334E	(Chaffer's G.M. Co. (1913), Ltd.) ...	...	...	...	...	...	...	...	13,350·00	3,334·91	129·57
Do. ...	1621E	(Croesus Proprietary G.M., Co.) ...	...	...	...	...	...	...	...	79·00	45·87	...
Do. ...	4617E	Croesus South	...	...	512·00	163·80	...	...	...	512·00	163·80	...
Do. ...	(13E), (90E), (302E), (989E)	(Croesus South G.Ms., Ltd.)	...	...	...	...	...	...	...	71,882·07	26,984·05	...
Do. ...	(13E,)(90E),(302E,) (989E)	Croesus South leases	...	...	77·79	61·55	...	...	...	2,339·95	679·18	...
Do. ...	4627E	Garvagh	...	...	69·00	156·83	...	...	...	69·00	156·83	...
Do. ...	351E, 1001E, 1002E, 1085E, 1113E, 1219E, 1326E, 1397E	Golden Horseshoe Estates Co., Ltd.	...	...	146,664·00	77,104·39	43,097·44	...	...	4,023,062·00	2,556,770·37	459,770·56
Do. ...	750E	(Golden Links Consolidated G.Ms., Ltd.)	...	...	...	...	...	...	...	10,729·00	6,096·80	...
Do. ...	2325E, 2326E ...	(Golden Link Consolidated G.Ms., Ltd.)	...	...	...	...	...	...	...	1,525·00	733·48	...
Do. ...	750E, 1621E ...	(Golden Links, Ltd.)	...	...	...	...	...	...	...	87,115·02	43,504·60	19·06
Do. ...	873E	(Great Boulder Main Reefs, Ltd.) ...	...	...	...	...	...	...	...	143,292·39	119,541·14	761·98
Do. ...	50E	Great Boulder No. 1, Ltd.	...	...	430·81	257·29	...	...	...	18,343·74	14,352·71	...
Do. ...	66E	Great Boulder Perseverance G.M., Co., Ltd.	...	...	161,139·00	48,351·58	8,419·76	...	...	3,090,437·23	1,608,544·13	156,868·85
Do. ...	16E, 51E, 61E, 102E, 280E, 1109E, 4366E	Great Boulder Proprietary G.Ms., Ltd.	...	...	152,196·00	113,322·78	27,516·04	...	...	3,063,790·00	2,770,216·36	286,326·40
Do. ...	902E, 1124E ...	(Great Boulder South G.M. Co., Ltd.)	...	...	...	...	...	...	...	437·00	122·11	...
Do. ...	3643E	(Hainault G.M., Ltd.)	...	...	...	...	...	...	...	517,345·70	184,570·02	113·30
Do. ...	6E	(Hannan's Block 45, Ltd.)	...	...	...	...	...	...	...	2,343·55	3,226·69	...
Do. ...	131E, 245E, 269E, 743E, (794E), 969E	(Hannan's Central G.Ms., Ltd.) ...	...	...	...	...	...	...	...	6,098·00	3,360·33	...
Do. ...	739E	(Hannan's Croesus G.M. Co., Ltd.) ...	...	...	...	...	...	...	...	4,256·75	4,416·90	...
Do. ...	1004E	(Hannan's North Croesus G.M. Co., Ltd.)	...	...	...	...	...	...	...	50·00	13·21	...
Do. ...	15E, 60E, 902E, 923E, 986E, 1116E, 1124E, 1196E, 4075E	(Hannan's Star Consolidated, Ltd.) ...	...	...	...	...	...	...	...	360·00	175·59	...
Do. ...	15E, 60E, 1116E...	(Hannan's Star G.M. Co., Ltd.) ...	...	...	...	...	...	...	...	85,652·75	40,438·85	2,142·59
Do. ...	15E, 60E, 1116E	(Hannan's Star, Ltd.)	...	...	...	...	...	...	...	13,470·50	4,716·66	191·22
Do. ...	4317E, 4318E, 4442E	Idaho leases	...	...	16,530·00	8,757·15	...	...	3,738·90	98,141·77	46,322·43	...

Do.	...	946E, (4370E), 4531E	Ironsides North leases	...	...	6,209·59	14,012·45	...	...	...	62,222·64	110,944·66	...
Do.	...	946E	(Ironsides North G.M. Co., N.L.) ...	...	...	...	...	...	...	...	1,348·00	807·48	...
Do.	...	31E, 1357E, 1413E, 1507E, 4399E, 4445E, 4476E	Ivanhoe Gold Corporation, Ltd. ...	...	...	186,094·00	81,392·34	21,137·93	...	...	3,558,123·00	2,234,060·14	349·880·44
Do.	...	1507E, (2899E), (3712E), (3713E)	(Ivanhoe Junction G.M. Co., N.L.) ...	...	...	...	...	...	...	...	1,764·00	121·43	...
Do.	...	6E, 131E, 245E, 269E, (301E), 739E, 743E, (794E), 969E	(Kalgoorlie Amalgamated, Ltd.) ...	...	...	...	...	...	...	...	32,589·00	8,859·95	...
Do.	...	6E, 131E, 245E, 269E, (301E), 739E, 743E, (794E), 969E	(Kalgoorlie Amalgamated (New), Ltd.)	...	...	...	...	...	...	...	27,145·00	6,265·27	...
Do.	...	6E, 131E, 245E, 269E, (301E), 739E, 743E, (794E), 969E	(Kalgoorlie Amalgamated (1909), Ltd.)	...	...	...	...	...	...	...	7,940·50	1,568·40	...
Do.	...	33E	(Kalgoorlie Bank of England G.M. Co., Ltd.)	...	...	...	...	...	...	...	11,775·50	7,080·49	...
Do.	...	73E, (74E) ...	(Kalgoorlie Mint and Iron King Gold Estates, Ltd.)	...	...	...	...	...	...	...	3,020·00	1,762·00	...
Do.	...	73E, (74E) ...	(Kalgoorlie Mint and Iron King G.Ms., Ltd.)	...	...	...	...	...	...	...	3,647·00	7,454·80	...
Do.	...	1004E	(Kalgurli Golden Eagle)	...	...	...	...	...	...	...	4,891·50	1,289·65	...
Do.	...	1004E	(Kalgurli Golden Eagle: Golden Links, Ltd.)	...	...	...	...	...	...	...	193·00	31·63	...
Do.	...	22E, 34E ...	Kalgurli G.Ms., Ltd.	...	...	51,759·48	19,715·59	...	...	...	1,597,702·73	1,027,134·50	188·24
Do.	...	15E, 25E, 32E, 60E, 352E, 873E, 902E, 923E, 986E, 1116E, 1124E, 1196E, 2325E, 2326E, 4075E, 4334E, (4432E), (4433E), (4434E), 4493E	Lake View and Star, Ltd.	...	...	112,352·19	40,348·63	2,291·32	...	...	1,400,029·03	456,519·92	45,945·99
Do.	...	25E, 32E, 2325E, 2326E	(Lake View Consols, Ltd.)	...	...	...	...	...	...	...	1,179,303·55	1,016,875·27	38,491·89
Do.	...	75E	(Lake View South G.M. (W.A.), Ltd.)	...	...	...	...	...	...	...	10,712·98	11,393·57	...
Do.	...	75E	Lake View South, Ltd.	...	...	47·79	76·06	...	...	...	17,412·34	4,539·46	...
Do.	...	33E, 35E, 975E ...	New North Boulder G.Ms., Ltd. ...	...	...	327·29	319·00	...	...	...	22,769·57	14,141·97	...
Do.	...	33E, 35E, 975E ...	(North Boulder G.M. Co., Ltd.) ...	...	...	...	...	...	...	...	33,549·15	47,532·52	...
Do.	...	33E, 35E, 975E ...	(North Boulder G.Ms., Ltd.) ...	...	...	...	...	...	...	...	4,542·50	4,256·55	·63
Do.	...	281E, 287E, 444E	(North Kalgurli Co., Ltd.)	...	...	...	...	...	43·99	...	104,116·49	60,229·47	7,202·47
Do.	...	281E, 287E, 444E	North Kalgurli (1912), Ltd.	...	...	881·07	411·90	...	...	...	24,415·68	9,576·30	...
Do.	...	73E, 410E, 448E, 532E, 578E, 698E, 944E, 1395E, (3031E), (4180E)	(Oroya Brown Hill Co., Ltd.) ...	...	...	...	...	...	...	...	1,075,862·55	1,163,881·77	61,682·30
Do.	...	6E, 73E, 131E, 169E, 245E, (301E), 410E, 448E, 532E, 578E, 698E, 739E, 743E, 750E, (794E), 944E, 969E, 1004E, 1395E, 1621E, (3031E), (4180E)	Oroya Links, Ltd.	...	...	22,679·04	25,081·31	451·79	...	...	827,236·84	298,383·67	27,299·12

TABLE IV.—*Production of Gold and Silver from all sources, etc.*—continued.

EAST COOLGARDIE GOLDFIELD—*continued.*

EAST COOLGARDIE DISTRICT—*continued.*

Mining Centre.	Number of Lease.	Registered Name of Company or Lease.	Total for 1918.					Total Production.				
			Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.	Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.
			Fine ozs.	Fine ozs.	Tons (2,240lbs.)	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Tons (2,240lbs.)	Fine ozs.	Fine ozs.
Boulder ...	392E	(Paringa Mines (1909), Ltd.) ...	...	...	...	...	...	...	...	26,890·74	12,599·54	...
Do. ...	1208E, 3612E, 3643E	South Kalgurli Consolidated, Ltd. ...	...	...	87,907·00	29,795·41	2,450·46	...	...	545,580·00	172,475·19	12,862·76
Do. ...	1208E, 3612E ...	(South Kalgurli G.Ms., Ltd.)... ...	...	...	...	...	...	...	...	826,909·00	347,222·75	17,609·67
Do. ...	4537E	Union Jack	...	...	...	...	...	...	...	110·00	41·00	...
Do. ...	...	Voided leases	...	...	...	...	...	109·90	5,780·86	66,877·97	42,157·69	...
Do. ...	...	Sundry claims	...	...	...	...	...	24·58	...	1,377·31	1,070·64	...
Feysville ...	Block 48 ...	Hampton Plains Estate, Ltd. ...	...	...	27·48	32·19	...	4,565·62	21·59	20,610·88	2,445·95	...
Do. ...	Block 50 ...	Hampton Plains Estate (1906), Ltd.	...	...	...	...	...	...	...	85·00	108·82	...
Do. ...	Block 41 ...	Hampton Properties, Ltd.	...	...	...	...	...	...	...	41·00	22·66	...
Do. ...	Block 45 ...	Hampton Properties, Ltd.	...	...	...	...	...	...	52·75	51·75	76·63	...
Do. ...	Block 50 ...	Hampton Properties, Ltd.)	...	...	...	...	...	...	...	7·26	6,348·00	3,956·22
Do. ...	Block 50 ...	Hampton Properties, Ltd.	...	14·83	48·00	25·30	...	...	106·23	671·73	579·99	...
Do. ...	...	Voided leases	...	...	...	...	...	...	22·86	305·70	111·90	...
Do. ...	...	Sundry claims	...	4·86	20·87	45·32	...	...	4·86	179·74	102·34	...
Kalgoorlie ...	4509E, 4530E, 4539E, 4551E	Adelaide Enterprise Prospecting Syndicate, N.L.	...	...	3,065·68	484·96	...	...	...	22,710·68	4,604·95	...
Do. ...	4560E	Belgravia Hill	...	...	190·00	52·16	...	...	...	403·00	99·83	...
Do. ...	796E, 1228E ...	(Bonnie Lass leases)	...	...	...	...	...	...	160·69	6,011·00	5,945·22	...
Do. ...	796E, 1228E, (3771E)	Bonnie Lass leases	...	...	439·00	187·21	...	...	...	16,058·65	8,266·59	...
Do. ...	4623E	Cassidy Hill	...	...	85·00	113·85	...	...	...	85 00	113·85	...
Do. ...	(4E)	Cassidy's Hill	...	...	...	...	...	...	4,800·89	4,549·50	6,255·29	13·90
Do. ...	(4E)	(Cassidy's Hill: Paringa Mines (1909), Ltd.)	...	...	...	...	...	...	734·99	638·50	3,079·51	...
Do. ...	4557E	Corn Cob	...	...	...	...	...	...	...	73·42	32·94	...
Do. ...	4585E	(Creswick)	...	...	...	...	...	...	...	88·00	78·65	...
Do. ...	4585E, 4597E, 4598E	Creswick leases	...	...	889·00	847·17	...	...	...	889·00	847·17	...
Do. ...	4509E	(Enterprise)	...	...	...	...	...	...	...	219·00	76·49	...
Do. ...	4609E	Fair Play	...	...	36·50	51·94	...	...	...	71·10	135·84	...
Do. ...	4539E	(Gordon)	...	...	...	...	...	...	...	64·89	14·24	...
Do. ...	(14CE), (415E), (1163E)	Hannans Consols leases ...	...	...	...	...	...	2·84	276·35	45,428·67	6,142·22	...
Do. ...	(14CE), (415E), (1163E)	(Hannans Consols, Ltd.)	...	...	...	...	...	...	...	6,584·00	3,806·65	...
Do. ...	4546E, 4547E, 4548E	Hannans Reward, Ltd.	...	...	3,707·00	1,375·38	...	...	...	24,264·00	6,639·06	...
Do. ...	796E, 1228E ...	(Hannans Reward North G.M. Co., N.L.)	...	...	...	...	...	...	16·87	334·00	247·34	...
Do. ...	4001E, 4035E, 4036E	Hidden Secret leases	...	...	...	...	...	...	105·65	10,695·95	15,290·55	43,383·29
Do. ...	4586E	Hidden Secret West	...	...	18·00	2·90	...	...	...	18·00	2·90	...

Do. ...	4628E	Kalgoorlie Star	...	...	14·95	8·83	...	...	...	14·95	8·83	...
Do. ...	4477E	Lord Nelson	...	...	223·00	117·86	...	...	123·27	2,765·64	1,358·35	...
Do. ...	(4550E)	Marian Catherine	...	...	...	...	...	...	...	286·00	54·30	...
Do. ...	(4E), (501E), (1591E), (2988E)	(Paringa Consolidated Mines, Ltd.) ...	...	...	...	...	...	...	...	216·00	157·80	...
Do. ...	(4E), (501E), (1591E), (2988E)	(Paringa Mines, Ltd.)	...	...	...	...	...	...	...	37,962·98	16,779·96	...
Do. ...	1228E	(Red White and Blue)	...	...	...	...	...	...	...	130·00	25·56	...
Do. ...	(4559E)	Rising Sun	...	...	29·00	18·30	...	...	...	131·00	82·10	...
Do. ...	4542E	Successful	...	...	...	...	...	...	...	20·00	10·12	...
Do. ...	4499E	Williamstown	...	...	264·74	277·03	...	...	...	2,369·69	939·24	...
Do. ...	...	Voided leases	...	...	...	...	...	239·64	3,260·10	748,519·90	288,126·65	619·93
Do. ...	...	Sundry claims	...	...	2,734·11	684·93	...	207·69	284·60	18,848·71	4,995·89	...
Wombola ...	(4592E)	Annie May	...	...	...	...	...	...	...	5·00	4·32	...
Do. ...	(4608E)	Black Hill	...	...	...	...	...	...	...	3·50	276·92	...
Do. ...	(4578E)	Business Risk	...	...	8·20	28·65	...	...	...	111·55	676·42	...
Do. ...	(4574E)	Creedon's Welcome	...	...	88·26	323·71	...	...	...	229·71	1,188·91	...
Do. ...	4600E	Daisy	...	...	82·35	369·12	...	...	...	134·55	636·06	...
Do. ...	4555E	Dinnie	...	...	170·85	466·73	...	...	...	233·30	941·49	...
Do. ...	(4567E)	I.V.M.	...	...	...	...	...	...	...	9·50	23·08	...
Do. ...	4582E	Jerry	...	...	17·90	175·95	...	...	...	30·90	269·60	...
Do. ...	4607E	Little Jean	...	...	10·15	52·98	...	...	...	29·15	184·61	...
Do. ...	(4561E)	Southern Cross	...	...	3·10	13·95	...	...	...	37·45	135·73	...
Do. ...	...	Voided leases	...	...	...	...	...	...	613·86	4,737·23	2,114·96	...
Do. ...	...	Sundry claims	...	...	73·55	187·30	...	...	...	600·46	342·12	...
		From District generally :—										
		Sundry claims	...	...	...	...	...	10,907·93	431·95	5,208·00	1,560·12	...
		Sundry parcels treated at :										
		Adeline Works	...	...	...	5·82	...	42·64	35·12	127·90	20,900·12	...
		Associated Northern Works	...	...	...	...	...	...	...	...	287·41	...
		Bonnie Lass leases	...	...	...	...	...	...	...	55·00	1,297·73	...
		Brown Hill Consols Works	...	...	...	·61	...	...	...	753·26	45,148·48	...
		Dunstan & Cummings Works	...	...	...	1,038·50	...	...	...	...	6,925·30	1,194·00
		Fremantle Trading Co.'s Works	...	...	...	945·80	79·29	...	...	...	7,181·77	7,107·91
		Hainault Sulphide Plant	...	...	...	677·89	402·78	...	...	35·66	1,446·81	623·40
		Hannans Central Lakeside Works (A.W.A. Slimes Plant)	...	...	...	5·84	...	...	...	58·06	4,788·43	...
		Hannans Central Works	...	...	...	4,051·61	67·17	...	...	142·80	54,875·32	67·17
		Mystery Battery	...	14·43	200·00	1,437·30	...	...	14·43	200·00	1,437·30	...
		North Kalgurli Battery	...	...	...	...	...	...	...	...	810·22	...
		Various Works	...	...	...	...	...	341·72	15·15	38,756·72	75,908·77	1,968·67
		Reported by Banks and Gold Dealers	122·87	...	...	...	...	10,584·33	9,013·32	...	4·57	...
		Total	**122·87**	**198·56**	**1,050,880·45**	**524,408·03**	**106,721·28**	**27,071·37**	**30,590·24**	**26,462,777·71**	**16,881,340·28**	**1,558,540·06**

BULONG DISTRICT.

Balagundi ...	...	Voided leases	...	...	...	...	...	...	2,408·98	1,110·68	1,473·73	12·92
Do. ...	...	Sundry claims	...	40·98	...	...	...	...	118·47	211·40	179·10	...
Bulong ...	(1110Y)	Green Lode	...	...	4·79	15·67	...	...	69·48	4·79	15·67	...
Do. ...	...	Voided leases	...	...	...	...	...	107·54	8,364·22	99,601·22	82,404·30	...
Do. ...	...	Sundry claims	...	...	1·86	5·09	...	1,648·60	987·93	6,835·96	14,495·77	...
Hogan's Find	...	Voided leases	...	...	...	...	...	...	908·82	309·50	276·51	...
Majestic ...	...	Voided leases	...	...	...	...	...	...	...	1,001·25	318·78	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	43·20	17·00	7·42	...

TABLE IV.—*Production of Gold and Silver from all sources, etc.*—continued

EAST COOLGARDIE GOLDFIELD—*continued.*

BULONG DISTRICT—*continued.*

Mining Centre.	Number of Lease.	Registered Name of Company or Lease.	Total for 1918.					Total Production.				
			Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.	Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.
			Fine ozs.	Fine ozs.	Tons (2,240lbs.)	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Tons (2,240lbs.)	Fine ozs.	Fine ozs.
Mt. Monger ...	...	Voided leases	...	...	...	...	...	...	1,862·57	1,121·35	969·69	...
Do. ...	...	Sundry claims	...	...	...	...	...	215·60	...	369·80	302·47	...
Randall's ...	...	Voided leases	...	...	...	...	...	...	60·04	31,820·04	10,645·98	...
Do. ...	...	Sundry claims	...	...	...	...	...	20·45	...	1,893·55	486·04	...
Sudden Jerk	...	Voided leases	...	...	...	...	...	...	63·91	14·25	53·67	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	...	·15	10·23	...
Taurus ...	...	Voided leases	...	...				2·06	3·70	1,678·15	760·83	...
Do. ...	...	Sundry claims	...	...	...	...	...	112·69	...	276·00	411·01	...
Woodline ...	...	Voided leases	...	...	...	...	...	...	...	792·75	610·57	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	...	39·33	61·57	...
		From District generally :—										
		Sundry claims	...	...	...	...	...	5·64	41·85	790·75	284·26	...
		Sundry parcels treated at :										
		Various Works	...	...	...	...	...	...	...	6,102·15	5,848·25	...
		Reported by Banks and Gold Dealers	32·16	...	...	...	...	24,432·51	52·39	...	...	...
		Total	**32·16**	**40·98**	**6·65**	**20·76**	...	**26,545·09**	**14,985·56**	**153,990·07**	**119,615·85**	**12·92**

Coolgardie Goldfield.

COOLGARDIE DISTRICT.

Bonnievale ...	4554	Lorna	...	8·36	46·00	38·10	...	...	8·36	300·75	254·69	...
Do. ...	4558	New Victoria	...	...	49·00	119·71	...	...	9·00	268·49	676·39	...
Do. ...	...	Voided leases	...	...	...	...	...	...	7·64	350,240·60	187,077·36	...
Do. ...	...	Sundry claims	...	...	124·50	133·09	...	...	23·54	1,805·28	1,098·19	...
Bulla Bulling	...	Voided leases	...	...	...	...	...	...	...	612·38	346·35	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	12·82	314·60	182·17	...
Burbanks ...	4484	Belgian Queen	...	6·89	36·50	70·27	...	...	134·57	271·85	437·49	...
Do. ...	(134), 135, (136), 1527, (1705), 2761, (3571), (3661), (3806), (3996), (4025), (4032)	(Burbanks Birthday Gift G.M., Ltd.)	...	...	...	...	...	...	...	132,706·00	126,351·59	...

Do. ...	(134), 135, (136), 1527, (1705), 2761, (3571), (3661), (3806), (3996), (4025), (4032)	(Burbanks Birthday G.Ms., Ltd.) ...	...	...	...	...	...	...	...	36,677·20	25,186·99	334·85
Do. ...	(134,) 135, (136), 1527, 2761, (3571), (3661)	Burbanks Birthday G.Ms., Ltd. ...	...	...	·45	451·91	...	...	...	34,967·18	21,737·41	89·38
Do. ...	4409	Burbanks Mainstay	...	...	...	...	...	...	...	1,984·00	550·27	...
Do. ...	4471	Ivanhoe Burbanks	...	...	354·50	231·91	...	...	...	1,968·25	1,336·88	...
Do. ...	4442	Ivanhoe North	...	...	...	...	...	...	...	81·75	39·27	...
Do. ...	2160	Lady Robinson	...	...	246·00	142·54	...	...	...	5,538·00	2,113·24	...
Do. ...	2160	(Lady Robinson)	...	...	...	...	...	...	...	5,315·40	3,327·12	...
Do. ...	2160, (3950), (4125)	(Lady Robinson G.M. Co., N.L.) ...	...	...	...	...	...	...	...	16,823·50	7,797·88	...
Do. ...	4469	Lord Bobs	...	...	130·00	40·47	...	...	...	665·75	156·96	...
Do. ...	...	Voided leases	...	...	...	...	...	13·36	197·04	169,417·48	110,394·74	96·83
Do. ...	...	Sundry claims	...	...	213·25	323·29	...	43·37	127·98	3,632·00	2,811·59	...
Cave Rocks ...	4568	Gold Coin	...	...	63·00	10·82	...	...	...	·63·00	10·82	...
Coolgardie ...	(4444)	Benjamin George	...	...	282·25	83·25	...	...	134·03	1,863·50	3,015·09	...
Do. ...	4577	Bird in Hand	...	...	506·50	68·32	...	...	...	576·50	79·36	...
Do. ...	4559	Cockshot	...	29·65	56·13	54·55	...	...	59·03	169·88	636·33	...
Do. ...	4555	(Dreadnought)	...	...	...	...	...	...	...	867·85	870·10	...
Do. ...	4555, 4561, 4563	Dreadnought leases	...	...	199·23	116·19	...	...	...	199·23	116·19	...
Do. ...	(4566)	Eureka	...	4·20	15·00	3·86	...	...	18·45	151·00	38·23	...
Do. ...	4567	Griffith's Gold Mine	...	...	92·00	36·49	...	...	1·70	542·00	139·11	...
Do. ...	Block 35 ...	Hampton Plains Estate, Ltd. ...	...	...	...	...	...	...	...	100·50	28·76	...
Do. ...	Block 49 ...	Hampton Plains Estate, Ltd. ...	...	...	...	...	...	...	10·94	150·00	157·31	...
Do. ...	Block 53 ...	Hampton Plains Estate, Ltd. ...	...	...	...	...	...	...	358·42	67·00	112·49	...
Do. ...	Block 59 ...	Hampton Plains Estate, Ltd. ...	...	...	164·00	100·57	...	...	4·12	7,758·25	7,072·93	...
Do. ...	(4443)	King Solomon	...	...	...	13·02	...	...	35·27	4,677·50	1,104·52	...
Do. ...	4556	Lady Carmen	...	61·43	61·00	43·28	...	...	74·83	616·00	299·58	...
Do. ...	4579	Lucky Hit	...	96·21	43·00	62·98	...	...	96·21	43·00	62·98	...
Do. ...	4435	Prosperity	...	22·49	1,589·00	432·41	...	2·52	317·21	5,328·25	2,110·32	...
Do. ...	4479	Rio Tinto	...	...	115·30	29·48	...	...	...	335·30	116·03	...
Do. ...	...	Voided leases	...	...	...	...	...	1,296·50	3,628·80	525,325·73	309,787·55	·96
Do. ...	...	Sundry leases	8·81	7·21	906·69	216·73	...	80·29	1,828·56	30,262·79	12,833·45	...
Eundynie ...	4253	(Hidden Secret North)	...	...	...	...	...	...	...	68·00	60·72	...
Do. ...	4253, 4266, (4351), (4405), (4406), (4462)	Hidden Secret North leases ...	...	...	504·00	382·51	...	...	...	28,141·00	14,182·71	...
Do. ...	...	Voided leases	...	...	...	...	...	...	...	1,473·50	644·31	1·75
Do. ...	...	Sundry claims	...	...	...	...	...	...	...	117·00	31·11	...
Gibraltar ...	(4530)	Bulla Bulling	...	...	46·00	11·06	...	...	...	412·50	222·31	...
Do. ...	4586	Carlton	...	...	18·00	5·40	...	...	...	18·00	5·40	...
Do. ...	4580	Lloyd George	...	...	165·00	158·21	...	...	...	165·00	158·21	...
Do. ...	...	Voided leases	...	...	...	...	...	...	...	541·25	378·65	...
Do. ...	...	Sundry claims	...	...	33·50	9·47	...	...	41·49	382·75	282·97	...
Gnarlbine ...	...	Voided leases	...	...	...	...	...	...	10·94	1,899·75	1,049·90	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	1·31	184·75	97·36	...
Higginsville ...	4184, (4185), (4191), (4206), (4207)	(Red Hill Westralia G.Ms., Ltd.) ...	...	...	...	...	...	...	...	16,983·00	6,848·02	127·78
Do. ...	4184	(Sons of Erin : Forwood, Down & Co., Ltd.)	...	...	...	...	...	...	...	117·00	1,000·35	...
Do. ...	4184, (4185) ...	(Sons of Erin G.M., Co., N.L.) ...	...	...	...	...	...	...	285·20	4,742·00	2,938·77	...

TABLE IV.—*Production of Gold and Silver from all sources, etc.*—continued

COOLGARDIE GOLDFIELD—*continued.*

COOLGARDIE DISTRICT—*continued.*

Mining Centre.	Number of Lease.	Registered Name of Company or Lease.	Total for 1918.					Total Production				
			Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.	Alluvial	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.
			Fine ozs.	Fine ozs.	Tons (2,240lbs.)	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Tons (2,240lbs.)	Fine ozs.	Fine ozs.
Higginsville ...	4184, (4185), (4191), (4206), (4207)	(Sons of Erin leases)	...	...	...	...	...	...	...	1,394·00	911·95	...
Do. ...	4184, 4428, (4432)	Sons of Erin leases: Forwood, Down & Co., Ltd.	...	...	475·00	92·60	...	...	...	3,606·00	2,121·82	7·01
Do. ...	...	Voided leases	...	...	...	...	...	...	2·06	5,274·00	1,020·45	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	16·52	720·90	492·89	...
Londonderry...	4545	Royal Standard	...	...	79·50	70·26	...	...	...	363·50	435·12	...
Do. ...	...	Voided leases	...	...	...	...	...	...	46·25	26,237·66	17,501·31	...
Do. ...	...	Sundry claims	...	...	190·00	129·04	...	...	6·00	1,467·60	1,318·26	...
Mungari ...	...	Voided leases	...	...	...	...	...	...	17·71	735·00	331·78	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	107·82	340·01	200·77	...
Red Hill ...	...	Voided leases	...	...	...	...	...	...	1,541·48	40,793·20	31,064·05	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	34·62	160·42	287·90	...
Ryan's Find ...	...	Voided leases	...	...	...	...	...	...	...	46·79	81·25	...
Do. ...	...	Sundry claims	...	...	27·09	152·27	...	...	·44	40·09	173·70	...
Widgiemooltha	4028	Flinders	...	...	18·00	50·57	...	...	37·86	482·60	2,527·94	...
Do. ...	...	Voided leases	...	...	...	...	...	...	763·97	8,678·28	3,656·20	·17
Do. ...	...	Sundry claims	...	8·03	138·00	74·28	...	9·21	35·61	3,113·68	1,287·75	...
		From District generally:—										
		Sundry Parcels treated at:										
		Burbanks Main Lode Works	...	...	...	...	...	2·77	...	557·50	1,261·60	114·17
		Fremantle Trading Co.'s Works	...	...	...	...	...	...	...	...	20·08	...
		Highgate Works	...	...	...	...	...	...	...	100·00	321·11	...
		Imperial Battery	...	...	...	2·60	...	...	...	...	2·60	...
		Lady Robinson Cyanide Works	...	...	...	...	...	...	...	70·00	348·28	...
		State Battery, Coolgardie	...	...	...	1,015·87	...	...	...	687·50	9,388·45	...
		Various Works	...	...	...	...	...	4·98	...	3,083·61	15,618·12	108·89
		Reported by Banks and Gold Dealers	103·70	...	...	...	...	7,247·38	543·04	...	...	...
		Total	**112·51**	**244·47**	**6,987·39**	**4,977·38**	...	**8,700·38**	**10,580·84**	**1,495,885·58**	**948.750·70**	**881·79**
		KUNANALLING DISTRICT.										
Balgarrie ...	...	Voided leases	...	...	...	...	...	10·94	75·48	5,124·25	4,805·74	1·38
Do. ...	...	Sundry claims	...	...	20·00	5·36	...	...	18·57	1,050·25	383·04	...
Carbine ...	33s	(Carbine)	...	...	...	...	...	...	10·85	2,401·00	1,164·53	...

Do. ...	33s, 710s, 711s ...	Carbine leases	...	...	2,221·86	1,124·81	...	...	677·13	35,172·36	22,430·41	...
Do. ...	866s	Never Can Tell	...	...	...	...	...	...	...	823·00	514·06	...
Do. ...	...	Voided leases	...	...	...	...	...	...	...	2,524·00	2,719·54	...
Do. ...	...	Sundry claims	...	...	18·00	24·87	...	...	...	73·00	55·69	...
Carnage ...	...	Voided leases	...	...	...	...	...	176·04	659·31	2,402·00	2,170·67	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	...	61·00	27·50	...
Cashman's (Siberia)	716s, [1289w] ...	Lady Evelyn	...	...	...	...	...	...	...	241·75	479·81	...
Do. ...	...	Voided leases	...	...	...	...	...	67·51	793·44	7,187·90	6,395·33	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	6·16	116·00	67·61	...
Chadwin ...	...	Voided leases	...	...	...	...	...	...	...	1,111·75	2,062·12	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	8·87	507·00	449·22	...
Dunnsville ...	...	Voided leases	...	...	...	...	...	...	181·12	17,407·10	7,982·23	...
Do. ...	...	Sundry claims	...	...	...	...	...	·43	89·26	293·09	265·11	...
Jourdie Hills	(369s), (661s) ...	(Jourdie Hills G.M. Co., Ltd.) ...	...	...	...	...	...	...	...	9,635·00	7,868·08	...
Do. ...	(369s), (661s) ...	(Jourdie United G.Ms., Ltd.) ...	...	...	...	...	...	...	...	1,520·00	1,027·63	...
Do. ...	(369s)	(Pride of the Jourdies) ...	...	...	...	...	...	...	...	410·74	465·47	...
Do. ...	(369s)	Pride of the Jourdies: Forwood Down & Co., Ltd.	...	...	...	10·01	...	...	...	1,219·00	2,555·69	28·45
Do. ...	...	Voided leases	...	...	...	...	...	...	18·00	15,225·00	7,484·22	...
Do. ...	...	Sundry claims	...	...	...	2·28	...	...	...	760·50	420·89	...
Kandana ...	...	Voided leases	...	...	...	...	...	...	...	465·00	68·12	...
Kintore ...	(878s)	Albury	...	...	98·00	16·19	...	...	...	193·00	32·04	...
Do. ...	...	Voided leases	...	...	...	...	...	6·66	143·66	43,981·14	31,850·66	...
Do. ...	...	Sundry claims	...	...	162·00	27·33	...	100·30	·78	1,217·70	1,150·90	...
Siberia ...	...	Voided leases	...	...	...	...	...	1·07	1,557·81	8,216·85	10,530·14	...
Do. ...	...	Sundry claims	...	...	...	...	...	30·91	...	223·00	349·86	...
25-Mile ...	696s	(Blue Bell)	...	...	...	...	...	...	8·05	697·00	429·47	...
Do. ...	727s	(Blue Bell Extended) ...	...	...	...	...	...	...	...	113·00	71·32	...
Do. ...	696s, 727s ...	Blue Bell leases	...	...	95·00	11·21	...	...	...	1,658·00	1,636·65	...
Do. ...	(877s)	Catherwood	...	...	276·00	73·03	...	...	...	418·00	98·83	...
Do. ...	(876s)	Premier	...	...	5·00	1·91	...	...	...	47·50	29·56	...
Do. ...	845s	Sadie	...	...	132·50	137·78	...	...	...	1,557·50	1,356·42	...
Do. ...	871s	Shamrock	...	2·96	155·00	105·85	...	...	2·96	266·00	175·51	...
Do. ...	645s	Star of Fremantle	...	...	...	...	...	...	...	5,275·00	3,503·31	...
Do. ...	603s	Sydney Mint	...	...	51·50	76·84	...	...	229·72	1,393·75	3,161·59	...
Do. ...	847s	Turn of the Tide	...	...	449·30	869·93	...	...	2·72	1,732·80	2,580·37	...
Do. ...	...	Voided leases	...	...	...	...	...	...	453·30	86,893·99	66,340·25	18·84
Do. ...	...	Sundry claims	...	...	91·00	53·46	...	13·22	98·21	6,122·95	3,194·99	...
		From District generally:—										
		Sundry Parcels treated at:										
		Blue Bell Battery	3·77	...	...	73·34	...	3·77	...	72·00	1,483·97	...
		Hands Across the Sea Battery	...	...	...	...	...	...	...	...	37·44	...
		Stanley Works	...	...	...	...	...	14·86	...	402·60	384·93	...
		Various Works	...	...	...	...	...	9·22	...	1,276·66	1,968·58	...
		Reported by Banks and Gold Dealers	7·46	...	...	...	...	226·74	1·10	...	...	...
		Total	**11·23**	**2·96**	**3,775·16**	**2,614·20**	...	**661·67**	**5,036·50**	**267,489·13**	**202,229·50**	**48·67**

TABLE IV.—*Production of Gold and Silver from all sources, etc.*—continued.

Yilgarn Goldfield.

Mining Centre.	Number of Lease.	Registered Name of Company or Lease.	Total for 1918.					Total Production.				
			Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.	Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.
			Fine ozs.	Fine ozs.	Tons (2,240lbs.)	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Tons (2,240lbs.)	Fine ozs.	Fine ozs.
Blackbourne...	...	Voided leases	...	...	...	...	...	...	...	1,282·50	341·37	...
Bullfinch ...	914, 915, 916, 926, 928, 942, 960	(Bullfinch leases)	...	...	...	...	...	...	...	1,027·52	10,958·88	...
Do. ...	914, 915, 916, 926, 928, 930, 942, 960	Bullfinch Proprietary (W.A.), Ltd. ...	...	...	51,436·00	14,181·10	982·06	...	...	354,188·42	134,978·39	19,351·17
Do. ...	...	Voided leases	...	...	...	...	...	...	...	360·65	364·67	...
Do. ...	...	Sundry claims	...	...	25·00	49·58	...	...	...	36·90	61·28	...
Corinthian ...	896, (934), (946)	Corinthian North G.Ms., Ltd. ...	...	...	...	...	...	...	...	131,222·00	27,795·29	...
Do. ...	...	Voided leases	...	...	...	...	...	...	...	3,286·00	1,529·54	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	...	73·50	73·29	...
Ennuin ...	...	Voided leases	...	...	...	...	...	...	...	134·56	361·34	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	...	117·00	72·12	...
Forrestonia ...	2909	Great Southern	...	...	25·00	17·46	...	...	...	77·00	58·26	...
Golden Valley	2272	Glide Away	...	...	253·00	193·72	...	...	...	1,615·00	1,770·72	...
Do. ...	2948	Greenharp, New	...	...	104·00	157·48	...	...	...	300·50	410·61	...
Do. ...	(3039)	Lake View	...	...	22·00	8·47	...	...	...	110·00	74·54	...
Do. ...	(2790)	Manxman Consols	...	...	...	...	...	...	...	71·25	102·86	...
Do. ...	2994	Radio	...	...	185·00	699·97	...	...	...	300·00	1,363·43	...
Do. ...	2739	Rosalie	...	...	...	...	...	...	...	120·75	122·27	...
Do. ...	2653	Violet	...	...	27·00	8·00	...	...	...	217·14	120·62	...
Do. ...	...	Voided leases	...	...	...	...	...	...	18·05	4,320·60	4,453·21	2·00
Do. ...	...	Sundry claims	...	...	65·15	79·14	...	...	2·75	1,859·22	1,551·22	...
Greenmount...	2787	Gold Mount	...	...	45·00	11·14	...	...	...	45·00	11·14	...
Do. ...	550	(Sunbeam)	...	...	...	...	...	14·00	...	4,472·00	1,427·25	...
Do. ...	550	Sunbeam	...	...	...	...	...	...	...	200·00	100·14	...
Do. ...	550, (565) ...	(Sunbeam leases)	...	...	...	...	...	...	...	3,191·00	816·42	...
Do. ...	536	Transvaal	...	...	...	...	...	...	...	30,233·00	7,340·62	579·78
Do. ...	536, 1358 ...	Transvaal leases	...	...	4,766·00	1,498·32	...	...	...	4,844·00	1,513·69	...
Do. ...	...	Voided leases	...	...	...	...	...	31·99	21·62	70,329·00	17,477·32	364·72
Do. ...	...	Sundry claims	...	...	15·00	5·04	...	...	4·12	647·50	268·74	...
Hope's Hill ...	2544	Colleen Bawn	...	...	21·00	150·66	...	...	...	330·20	1,442·44	...
Do. ...	...	Voided leases	...	...	...	...	...	...	56·97	129,884·85	33,899·78	1·00
Do. ...	...	Sundry claims	...	...	...	...	...	...	25·38	1,622·50	506·06	...
Kennyville ...	570	(Great Leviathan)	...	...	...	...	...	...	...	3,821·85	2,948·67	...
Do. ...	570	Great Leviathan	...	...	792·00	174·19	...	...	...	4,997·00	3,434·08	...
Do. ...	570	(Great Leviathan: Northern Blocks Syndicate, Ltd.)	...	...	...	...	...	...	...	10,705·00	2,974·64	...
Do. ...	911	Trafalgar	...	...	211·00	144·10	...	...	...	1,973·00	1,492·40	...

Do. ...	...	Voided leases	...	...	...	...	...	...	...	18·76	3,487·50	2,405·25	·09
Do. ...	...	Sundry claims	...	...	166·00	45·44	...	...	...	443·00	196·86	...	
Koolyanobbing	...	Voided leases	...	...	...	...	...	...	...	308·00	116·74	...	
Do. ...	...	Sundry claims	...	...	...	...	...	...	...	55·00	11·24	...	
Marvel Loch...	3069	Banker	...	...	205·00	196·38	...	...	...	278·00	285·76	...	
Do. ...	923	Bohemian	...	...	182·00	210·71	...	...	17·44	3,591·00	3,498·85	...	
Do. ...	1689	(Bronco)	...	...	...	...	...	...	...	217·00	22·17	...	
Do. ...	1689	Bronco : Bronco Horseshoe Proprietary Mining Co., N.L.	...	...	635·00	167·86	...	...	...	2,411·00	759·62	...	
Do. ...	719	(Great Victoria)	...	...	...	...	...	...	...	1,356·00	281·53	...	
Do. ...	719, 944, 945, 1227, 1228, 1606	Great Victoria leases	...	...	17,423·26	2,635·30	...	...	...	96,514·26	11,618·32	...	
Do. ...	(3090)	Marjorie B.	...	...	80·00	34·29	...	...	...	80·00	34·29	...	
Do. ...	852	May Queen	...	...	55·00	143·36	...	...	4·07	735·50	3,936·94	...	
Do. ...	(3030)	Never Never	...	...	1,072·00	236·60	...	...	...	2,266·00	508·01	...	
Do. ...	(3066)	Never Never East Extended ...	...	...	80·00	21·46	...	...	...	80·00	21·46	...	
Do. ...	3110	Pathfinder	...	...	45·00	10·84	...	...	...	45·00	10·84	...	
Do. ...	3115	Pathfinder East	...	...	60·00	9·43	...	...	...	60·00	9·43	...	
Do. ...	3017	Pro Patria	...	...	36·00	62·85	...	...	...	451·00	669·61	...	
Do. ...	1011	Rising Star	...	...	...	...	...	...	...	140·00	11·48	...	
Do. ...	3102	Saint Patrick	...	...	170·00	38·22	...	...	...	170·00	38·22	...	
Do. ...	2998	St. George	...	...	305·00	152·19	...	...	...	1,890·00	742·10	...	
Do. ...	3071	Ulverston	...	...	120·00	136·26	...	...	...	722·00	721·39	...	
Do. ...	3011	Victory	...	...	45·00	40·09	...	...	...	570·00	422·95	...	
Do. ...	...	Voided leases	...	...	...	...	...	...	80·78	229,246·00	80,255·87	771·03	
Do. ...	...	Sundry claims	...	...	247·00	114·50	...	7·72	68·81	6,796·49	4,076·94	...	
Mt. Jackson ...	1979	Allen's Find	...	...	...	...	...	...	...	1,641·05	837·02	...	
Do. ...	(1933)	Butcher Bird No. 1	...	...	105·00	53·85	...	...	...	2,791·50	2,038·86	...	
Do. ...	2053	Great Unknown	...	...	...	...	...	...	37·22	1,394·93	3,608·73	...	
Do. ...	...	Voided leases	...	...	...	...	...	...	77·66	31,358·55	21,191·86	2,305·28	
Do. ...	...	Sundry claims	...	...	20·50	62·00	...	4·42	25·43	1,481·75	1,062·53	...	
Mt. Rankin ...	...	Voided leases	...	...	...	...	...	3·84	5·20	496·00	122·17	...	
Do. ...	...	Sundry claims	...	...	...	...	...	...	...	170·00	54·38	...	
Parker's Range	(2978)	Gift	...	...	...	...	...	...	...	96·00	71·39	...	
Do. ...	(2656)	Golden Dream	...	...	...	...	...	...	37·10	540·25	809·83	...	
Do. ...	(3063)	King of the Range	...	...	...	...	...	...	...	12·50	28·00	...	
Do. ...	2801	Scots Greys	...	...	345·00	93·56	...	...	...	380·00	117·60	...	
Do. ...	(2546)	South Side	...	...	...	...	...	...	4·82	112·00	42·21	...	
Do. ...	724	(Spring Hill)	...	...	...	...	...	...	...	3,232·00	607·21	...	
Do. ...	724(760)	(Spring Hill leases)	...	...	...	...	...	...	...	8,910·00	2,215·59	...	
Do. ...	724, 2633 ...	Spring Hill G.M. Co., N.L.	...	...	...	21·65	...	...	...	1,215·00	144·94	...	
Do. ...	2806	Star of the Range	...	...	...	...	...	...	...	121·75	213·11	...	
Do. ...	2951	White Horseshoe	...	...	362·00	377·54	...	...	...	1,195·50	1,110·54	...	
Do. ...	...	Voided leases	...	...	...	...	...	...	63·22	12,778·75	8,832·75	...	
Do. ...	...	Sundry claims	...	...	51·00	27·38	...	...	...	1,686·75	1,086·89	...	
Southern Cross	(3010)	Central	...	...	...	...	...	...	...	178·00	63·30	...	
Do. ...	(3016)	Central Extended	...	...	...	...	...	...	...	99·00	36·88	...	
Do. ...	3082	Frances	...	...	375·00	113·32	...	...	...	721·00	238·02	...	
Do. ...	...	Voided leases	...	...	...	...	...	2·13	211·22	431,798·20	211,007·36	364·41	
Do. ...	...	Sundry claims	...	...	477·00	163·09	...	3·73	595·45	3,589·10	1,116·12	...	
Weston's ...	2769	(Battler)	...	...	...	...	...	...	...	115·00	170·64	...	
Do. ...	2180	(Edna May)	...	...	...	...	...	...	...	581·00	919·27	...	
Do. ...	2769, 3004, 3040	Edna May Battler G.M. Co., N.L. ...	...	...	242·00	481·98	...	...	...	3,616·00	3,306·78	...	
Do. ...	2291, 2585, 2615	Edna May Central G.Ms., N.L. ...	...	...	15,688·00	9,785·84	...	...	...	105,242·00	39,609·92	19·38	
Do. ...	2570, 2617, 2644	Edna May Consolidated G.M. Co., N.L.	...	...	15,927·00	6,277·49	...	...	...	21,779·00	8,860·73	...	

TABLE IV.—*Production of Gold and Silver from all sources, etc.*—continued.

YILGARN GOLDFIELD—*continued.*

Mining Centre	Number of Lease.	Registered Name of Company or Lease.	Total for 1918.					Total Production.				
			Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.	Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.
			Fine ozs.	Fine ozs.	Tons (2,240lbs.)	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Tons (2,240lbs.)	Fine ozs.	Fine ozs.
Weston's ...	2168, 2238, 2777	Edna May Deep Levels G.M. Co., N.L.	...	...	8,420·00	7,928·65	...	...	...	11,960·00	12,331·39	...
Do. ...	2180, 2605 ...	Edna May G.M. Co., N.L.	...	...	28,416·00	20,021·79	...	...	...	173,648·00	160,888·48	...
Do. ...	2775	Emma May	...	...	...	...	...	...	...	40·00	20·31	...
Do. ...	3004	(Great Battler)	...	...	...	...	...	...	...	50·50	68·86	...
Do. ...	(2086), 2087, (2635), 2841	Greenfinch Proprietary G.M., N.L. ...	...	...	262·27	99·26	...	...	...	8,447·27	3,137·81	...
Do. ...	2807	Hill End	...	...	...	...	...	...	...	194·00	136·87	...
Do. ...	3015	Kitty	...	...	...	...	...	...	...	11·00	5·07	...
Do. ...	3097	Le Trois	...	...	36·00	23·99	...	...	...	36·00	23·99	...
Do. ...	2291	(Myrtle Central)	...	...	...	...	...	...	...	751·00	243·96	...
Do. ...	2168, 2238 ...	(Myrtle Consols leases)	...	...	...	...	...	...	...	4,009·00	3,696·32	·20
Do. ...	2570	Myrtle East	...	...	...	...	...	...	...	202·00	116·12	...
Do. ...	2816	Pertha M.	...	...	310·00	230·03	...	...	...	869·00	617·15	...
Do. ...	2724	(Weston's Reward)	...	...	...	...	...	...	...	35·00	57·24	...
Do. ...	(2724), (2761) (2958)	Weston's Reward G.Ms., N.L. ...	...	...	31·00	26·48	...	...	...	504·50	451·14	...
Do. ...	...	Voided leases	...	...	...	...	...	...	4·06	287·75	203·80	...
Do. ...	...	Sundry claims	...	...	10·00	8·56	...	...	11·04	786·75	827·90	...
		From Goldfield generally :—										
		Sundry Parcels treated at :										
		Australia Battery	...	...	...	...	...	...	...	38·00	124·94	...
		Donovan's Find Battery	...	...	...	554·48	...	...	...	...	3,342·47	...
		Fremantle Trading Co.'s Works	...	...	...	...	...	...	...	21·28	592·34	33·90
		Great Victoria Cyanide Works	...	...	...	1,430·80	...	...	...	...	5,832·18	...
		Greenfinch Proprietary G.M. Works	...	...	...	93·38	...	...	...	...	2,387·29	...
		Hainault Sulphide Plant—Kalgoorlie	...	...	...	...	...	...	...	...	18·58	...
		Hope's Hill Cyanide Works	...	...	...	6·82	...	...	...	...	1,210·29	...
		Marvel Loch Mining Co., N.L.	...	...	...	408·00	...	...	...	...	4,711·07	...
		Never Never Works	...	...	...	361·50	...	...	...	...	806·50	...
		Spring Hill Works	...	...	...	125·46	...	...	...	...	453·72	...
		Sunbeam Works	...	...	...	354·83	...	...	...	8·00	6,120·17	...
		Violet Works	...	...	...	...	...	...	...	...	968·68	...
		Various Works	...	...	...	...	...	...	...	59·00	13,700·05	2·64
		Reported by Banks and Gold Dealers	...	...	...	...	...	22·05	3·53	...	...	...
		Totals	...	...	**149,996·18**	**70,765·88**	**982·06**	**89·88**	**1,394·70**	**1,959,219·79**	**905,492·49**	**23,795·60**

Dundas Goldfield.

Buldania ...	...	Voided leases	...	...	...	...	...	...	3·02	846·05	708·99	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	36·53	341·27	519·77	...
Dundas ...	...	Voided leases	...	...	...	...	...	...	...	4,543·23	2,208·48	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	385·37	182·50	143·88	...

Killaloe ...	...	Voided leases	...	...	...	...	...	...	...	...	20·65	6·88	...
Norseman ...	(987), (1113) ...	After Years leases	...	...	...	...	...	...	...	...	2,065·50	978·92	...
Do. ...	(1216)	Anzac	...	...	...	...	...	...	...	...	68·50	245·69	...
Do. ...	(1229)	Bonnie Lois	...	...	336·25	219·98	...	...	...	...	370·25	271·88	...
Do. ...	1199	Crown	...	...	187·50	168·16	...	...	27·72		949·00	1,348·09	...
Do. ...	1226	Cumberland	...	...	136·50	294·17	...	...	...		136·50	294·17	...
Do. ...	1183	Edith Eleanor	...	...	37·00	10·02	...	...	272·76		303·50	552·19	...
Do. ...	966	(Esperanza No. 2)	...	...	...	...	...	...	·96		689·00	948·88	...
Do. ...	1209	Hoffman's Gold Mines	...	...	191·50	97·15	...	...	...		519·25	466·27	...
Do. ...	1239	Iron King	...	...	203·00	37·17	...	...	...		203·00	37·17	...
Do. ...	1237	Ken and Gwen Syndicate ...	...	...	45·25	20·43	...	...	...		45·25	20·43	...
Do. ...	1231	Lake View	...	633·19	72·25	614·10	...	...	720·16		72·25	614·10	...
Do. ...	852	(Mararoa)	...	...	...	...	...	...	...		9,167·00	4,484·90	...
Do. ...	852, 912, 966, 977, 979, 980, 985, 987, (1031), 1166, (1190), (1192), 1203	Mararoa G.M. Co., N.L.	...	...	24,515·00	8,542·38	...	...	...		295,596·50	141,652·51	24,310·24
Do. ...	(1211)	New King	...	...	...	...	...	...	...		879·00	85·24	...
Do. ...	903	(O.K.)	...	...	...	...	...	...	21·23		1,147·25	1,293·01	...
Do. ...	903, 1138 ...	O.K. leases	...	...	226·25	394·28	...	...	...		1,989·25	2,285·31	...
Do. ...	1236	Point View	...	126·89	...	...	...	...	126·89		...	...	...
Do. ...	(106), (187), (587), (840), (972)	Princess Royal G.M. Co., N.L. ...	...	...	21·26	26·59	...	...	...		169,226·59	143,602·43	9,364·14
Do. ...	187	(Princess Royal South) ...	...	...	...	...	...	...	...		358·00	568·05	...
Do. ...	1092	(Sun)	...	...	...	...	...	...	142·26		655·50	737·49	...
Do. ...	1092	Sun	...	...	196·00	96·09	...	...	...		954·00	1,154·17	...
Do. ...	1092, (1125) ...	(Sun leases)	...	...	...	...	...	...	...		337·00	692·34	...
Do. ...	1210	Surprise	...	...	110·00	248·86	...	...	899·62		110·00	295·29	6·48
Do. ...	986	Vini Vidi Vici	...	...	21·00	121·65	...	...	2,482·06		351·50	916·53	...
Do. ...	1220	Victors	...	215·51	10·25	21·14	...	...	215·51		10·25	21·14	...
Do. ...	1016	(Viking Extended)	...	...	...	...	...	...	133·35		72·50	419·67	4·90
Do. ...	990	Viking No. 1	...	...	...	...	...	...	...		1,274·00	3,095·95	...
Do. ...	990, 1060 ...	(Viking No. 1 leases)	...	...	...	...	...	...	...		775·50	1,176·13	16·89
Do. ...	990, 1016, 1060, 1117, 1194	Viking No. 1 leases	...	...	3,331·00	2,854·44	...	...	...		43,093·25	38,994·41	242·83
Do. ...	1180	Viking South	...	...	58·00	214·38	...	...	...		497·00	654·42	...
Do. ...	...	Voided leases	...	...	...	...	...	4·23	4,243·72		298,690·70	194,642·15	914·97
Do. ...	...	Sundry claims	...	22·86	1,210·31	607·40	...	996·60	2,097·98		17,701·46	9,745·93	·59
Peninsula ...	...	Voided leases	...	...	...	...	...	...	17·61		7,764·00	4,705·10	...
		From Goldfield generally :—											
		Sundry Parcels treated at :											
		Lady Mary Works	...	...	15·96	16·12	...	...	...		90·25	1,071·85	...
		Mararoa Crushing and Cyaniding Works	...	...	...	...	...	...	...		232·50	2,543·56	38·75
		Rawlings, Bullen, and Rumble's Works	...	...	...	45·64	...	...	...		27·00	3,187·25	...
		State Battery—Norseman	...	...	...	300·84	...	...	...		376·00	10,575·60	885·41
		Various Works	...	...	...	...	...	...	54·52		103·00	2,947·45	607·70
		Reported by Banks and Gold Dealers	...	...	...	...	...	1,026·29	...		...	1·04	...
		Totals	...	**998·45**	**30,924·28**	**14,950·99**	...	**2,027·12**	**11,881·27**		**862,933·70**	**580,914·71**	**36,392·90**

Phillips River Goldfield.

Kundip ...	147, 179 ...	Fair Play leases	...	...	722·09	1,415·63	...	...	...		4,319·56	7,603·21	12·63
Do. ...	136, 137, 138, (139)	(Flag Gold and Copper Mining Co., Ltd.)	...	...	...	...	...	...	...		7,031·50	4,729·53	1,078·38

TABLE IV.—*Production of Gold and Silver from all sources, etc.*—continued.

PHILLIPS RIVER—*continued.*

Mining Centre.	Number of Lease.	Registered Name of Company or Lease.	Total for 1918.					Total Production.				
			Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.	Alluvial	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.
			Fine ozs.	Fine ozs.	Tons (2,240lbs.)	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Tons (2,240lbs.)	Fine ozs.	Fine ozs.
Kundip ...	136, 137, 138 ...	Flag leases	...	...	283·85 661·31	266·46 *40·28 448·05 *67·63	...	...	...	3,016·03	2,830·79	...
Do. ...	184	Gem	...	...	...	...	...	...	...	2,374·76	1,885·88	...
Do. ...	151	(Gem Consolidated)	...	...	766·52	1,082·55	...	...	...	777·50	616·30	...
Do. ...	151, 156 ...	Gem Consolidated leases ...	...	...	57·43	44·06 *7·77	...	...	...	6,049·25	5,271·22	8·00
Do. ...	M.Ls. 52, 94 ...	Harbour View Gold and Copper Co., Ltd.	...	...	...	...	...	...	...	1,264·10	1,697·24	360·11
Do. ...	M.Ls. 52, 94 ...	(Harbour View leases)	...	...	...	...	...	...	379·86	3,619·25	1,560·86	61·41
Do. ...	M.Ls. 52, 94 ...	(Harbour View leases)	...	...	192·39	189·15	...	...	...	3,403·50	2,227·62	1·88
Do. ...	98	Hillsborough	...	...	...	...	...	...	...	2,438·84	4,709·00	118·03
Do. ...	185	Mt. Iron	...	...	9·27	8·58	...	...	...	160·66	44·86	...
Do. ...	M.L. 370 ...	North Harbour View	...	...	...	...	...	...	...	9·27	16·25	...
Do. ...	M.Ls. 52, 94 ...	(Ravensthorpe G.M. Syndicate, N.L.)	...	...	322·39	515·80	...	...	...	1,124·00	433·94	164·98
Do. ...	74	Two Boys	...	...	...	...	...	...	3·90	11,157·11	8,206·44	...
Do. ...	...	Voided leases	...	...	2·58	6·03	...	113·28	172·41	16,014·80	9,274·49	1,991·82
Do. ...	...	Sundry claims	...	...	...	...	...	79·05	71·58	762·19	450·52	15·45
Mt. Desmond	M.L. 203 ...	(British Flag)	...	...	...	...	...	...	...	...	7·76	...
Do. ...	M.L. 203 ...	(British Flag: Phillips River Gold and Copper Co., Ltd.)	...	...	...	...	...	...	...	...	4·08	...
Do. ...	M.L. 208 ...	(Desmond)	...	...	...	...	...	...	...	...	·77	...
Do. ...	M.L. 208 ...	Desmond	...	...	...	*27·24	...	...	...	...	143·53	...
Do. ...	M.L. 208 ...	(Desmond: Phillips River Gold and Copper Co., Ltd.)	...	...	...	...	...	...	...	...	219·59	14·55
Do. ...	M.L. 95	Elverdton	...	...	...	*66·31	...	...	...	...	518·06	...
Do. ...	M.L. 95	(Elverdton: Phillips River Gold and Copper Co., Ltd.)	...	...	...	...	...	...	...	...	2,569·38	6,537·35
Do. ...	M.L. 95	(Elverdton: Phillips River Option Syndicate, N.L.)	...	...	...	...	...	...	...	...	9·63	...
Do. ...	M.L. 168 ...	(Elverton South: Phillips River Gold and Copper Co., Ltd.)	...	...	...	...	...	...	...	...	·94	...
Do. ...	M.L. 109 ...	(Mt. Desmond)	...	...	...	...	...	...	1·40	...	36·97	...
Do. ...	M.L. 109 ...	(Mt. Desmond: Phillips River Gold and Copper Co., Ltd.)	...	...	...	...	...	...	...	...	228·19	180·06
Do. ...	M.L. 199 ...	(P.L.P.)	...	...	...	...	...	...	...	...	13·69	7·41
Do. ...	M.L. 199 ...	(P.L.P.: Phillips River Gold and Copper Co., Ltd.)	...	...	...	...	...	...	...	...	3·14	...
Do. ...	...	Voided leases	...	...	...	...	...	...	...	9·00	129·10	152·22
Do. ...	...	Sundry claims	...	...	...	...	...	...	...	...	31·21	51·01
Mt. Purchas...	...	Voided leases	...	...	...	...	...	...	4·38	346·05	293·13	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	...	4·75	4·68	...
Ravensthorpe	M.L. (368) ...	Lady Nina	...	...	...	*10·37	...	...	...	28·77	35·66	...
Do. ...	M.L. (361) ...	Last Chance	...	...	...	*·21	...	...	...	...	4·49	...

Do. ...	M.L. 16	(Marion Martin)	...	...	...	...	...	...	...	...	...	20·09	...
Do. ...	M.L. 16	Marion Martin	...	...	...	*89·57	...	...	...	...	...	227·64	...
Do. ...	M.L. 16	(Marion Martin: Phillips River Gold and Copper Co., Ltd.)	...	...	...	...	...	...	...	...	...	275·33	205·97
Do. ...	M.L. 363 ...	Mt. Benson	...	...	...	*23·42	...	...	...	...	...	115·76	...
Do. ...	M.L. 15	(Mt. Cattlin)	...	...	...	...	...	...	·49	200·00		85·50	...
Do. ...	M.L. 15	Mt. Cattlin	...	...	...	*151·35	...	...	...	...		788·21	...
Do. ...	M.L. 15	(Mt. Cattlin: Mt. Cattlin Copper Mining Co., Ltd.)	...	...	...	...	...	...	...	...		1,496·92	52·92
Do. ...	M.L. 15	(Mt. Cattlin: Phillips River Gold and Copper Co., Ltd.)	...	...	...	...	...	...	...	...		387·33	...
Do. ...	M.L. 15	(Mt. Cattlin: Phillips River Gold and Copper Co., Ltd.)	...	...	...	...	...	...	...	...		3,077·08	3,814·45
Do. ...	M.L. 342 ...	Surprise	...	...	...	*2·74	...	...	...	...		31·53	...
Do. ...	...	Voided leases	...	...	...	...	...	...	141·31	21,687·99		18,575·72	310·73
Do. ...	...	Sundry claims	...	...	...	*15·29	...	157·82	...	1,974·34		1,157·23	20·65
West River ...	...	Voided leases	...	...	...	...	...	...	...	...		10·34	31·06
Do. ...	...	Sundry claims	...	...	...	...	...	...	...	...		2·95	3·44
	From Goldfield generally :—												
	Sundry parcels treated at:												
	Gem Battery		...	...	...	...	...	...	...	...		138·89	...
	Phillips River Smelter		...	...	...	...	...	...	...	...		385·96	493·66
	Two Boys Works		...	...	...	...	...	...	...	...		100·95	...
	Various Works		...	...	...	...	...	...	...	...		4·76	...
	Reported by Banks and Gold Dealers		...	...	...	...	...	122·05	...	...		...	...
	Total		...	...	**3,017·83**	**4,478·49**	...	**472·20**	**775·33**	**87,773·22**		**82,694·34**	**15,688·17**

† Donnybrook Goldfield.

Donnybrook...	...	Voided leases	...	...	...	...	...	23·24	...	1,613·30		816·23	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	...	40·00		2·29	...
		Total	...	...	...	...	...	**23·24**	...	**1,653·30**		**818·52**	...

State generally.

Sundry parcels treated at :—												
Fremantle Trading Co., Ltd., Fremantle	...	...	...	...	154·23	...	...	...	...		2,906·29	9,347·45
Hainault Sulphide Mill, Kalgoorlie	...	...	...	...	...	...	...	...	...		21·28	...
State Smelter, Ravensthorpe	...	...	...	...	41·20	...	...	...	...		41·20	...
Various Works	...	...	...	...	...	...	...	...	27·00		4,411·14	481·77
Sundry Specimens	...	...	...	...	...	...	...	2·87	...		...	...
Reported by Banks and Gold Dealers	...	...	...	...	...	...	124·89	153·03	...		...	...
Total	...	...	**195·43**	...	**124·89**	**155·90**	**27·00**		**7,379·91**		**9,829·22**

* From Copper Ore. † Abolished 4th March, 1908.

TOTAL OUTPUT OF GOLD BULLION ENTERED FOR EXPORT, AND RECEIVED AT THE PERTH BRANCH OF THE QUANTITY OBTAINED EACH YEAR FROM THE RESPECTIVE

Year.	KIMBERLEY.			PILBARA.			*a* WEST PILBARA.			ASHBURTON.		
	Export.	Mint.	Total.	Export.	Mint.	Total.	Export.	Mint.	Total.	Export.	Mint.	Total.
	fine ozs.	fine ozs.	fine ozs.	fine ozs.	fine ozs.	fine ozs.	fine ozs.	fine ozs.	fine ozs.	fine ozs.	fine ozs.	fine ozs.
1886	270·17	...	270·17	...	...	...	...	...	...	...	...	...
1887	4,359·37	...	4,359·37	...	...	...	...	...	...	...	...	...
1888	3,124·82	...	3,124·82	...	...	...	...	...	...	...	...	...
1889	2,204·28	...	2,204·28	9,992·63	...	9,992·63	...	...	...	...	...	...
1890	4,002·42	...	4,002·42	14,363·01	...	14,363·01	...	...	...	...	...	...
1891	2,415·07	...	2,415·07	10,623·32	...	10,623·32	...	...	...	750·31	...	750·31
1892	974·08	...	974·08	11,533·84	...	11,533·84	...	...	...	·63	...	·63
1893	1,450·77	...	1,450·77	10,465·43	...	10,465·43	...	...	...	418·43	...	418·43
1894	526·59	...	526·59	14,541·20	...	14,541·20	...	...	...	255·20	...	255·20
1895	784·27	...	784·27	17,464·65	...	17,464·65	...	...	...	483·76	...	483·76
1896	797·85	...	797·85	10,565·27	...	10,565·27	...	...	...	598·64	...	598·64
1897	495·67	...	495·67	10,695·67	...	10,695·67	...	...	...	928·75	...	928·75
1898	257·54	...	257·54	10,433·27	...	10,433·27	1,814·48	...	1,814·48	402·46	...	402·46
1899	728·52	275·94	1,004 46	17,888·69	473·96	18,362·65	1,749·39	...	1,749·39	214·26	252·10	466·36
1900	29·16	576·14	605·30	8,629·83	6,703·99	15,333·82	522·76	122·85	645·61	44·82	424·27	469·09
1901	...	601·26	601·26	36·68	10,223·75	10,260·43	78·38	357·46	435·84	7·70	50·24	57·94
1902	1·48	378·02	379·50	...	9,199·50	9,199·50	...	2,822·20	2,822·20	...	...	...
1903	...	433·71	433·71	2·26	12,049·52	12,051·78	...	5,493·23	5,493·23	...	114·67	114·67
1904	...	31·51	31·51	...	6,931·27	6,931·27	...	4,320·82	4,320·82	...	125·96	125·96
1905	...	545·95	545·95	48·33	13,353·49	13,401·82	...	1,164·92	1,164·92	...	42·05	42·05
1906	...	647·77	647·77	...	4,956·14	4,956·14	...	755·35	755·35	...	138·84	138·84
1907	...	362·06	362·06	...	4,130·48	4,130·48	...	332·30	332·30	...	41·85	41·85
1908	...	338·00	338·00	...	8,172·26	8,172·26	...	1,076·68	1,076·68	...	45·87	45·87
1909	...	168·95	168·95	...	5,529·19	5,529·19	...	1,396·22	1,396·22	...	228·16	228·16
1910	...	487·25	487·25	...	5,894·32	5,894·32	63·66	1,387·66	1,451·32	...	173·06	173·06
1911	...	148·53	148·53	...	4,874·00	4,874·00	58·00	819·35	877·35	...	270·68	270·68
1912	...	294·55	294·55	...	6,274·04	6,274·04	...	747·34	747·34	...	38·73	38·73
1913	...	266·41	266·41	...	4,207·37	4,207·37	...	1,237·85	1,237·85	...	39·26	39·26
1914	...	196·46	196·46	...	5,544·64	5,544·64	...	1,262·73	1,262·73	...	46·14	46·14
1915	...	220·94	220·94	...	7,411·06	7,411·06	·64	1,239·94	1,240·58	...	16·63	16·63
1916	...	249·58	249·58	...	6,700·93	6,700·93	...	560·79	560·79	...	31·16	31·16
1917	...	108·90	108·90	...	4,673·40	4,673·40	63·80	559·95	623·75	...	21·21	21·21
1918	...	116·34	116·34	2·35	2,951·81	2,954·16	...	267·48	267·48	...	6·29	6·29
Total	22,422·06	6,448·27	28,870·33	147,286·43	130,255·12	277,541·55	4,351·11	25,925·12	30,276·23	4,104·96	2,107·17	6,212·13

Year.	*d* YALGOO.			*c* MT. MARGARET.			*e* NORTH COOLGARDIE.			*f* BROAD ARROW.		
	Export.	Mint.	Total.	Export.	Mint.	Total.	Export.	Mint.	Total.	Export.	Mint.	Total.
	fine ozs.	fine ozs.	fine ozs.	fine ozs.	fine ozs.	fine ozs.	fine ozs.	fine ozs.	fine ozs.	fine ozs.	fine ozs.	fine ozs.
1886	...	...	...	...	...	...	...	...	...	...	...	...
1887	...	...	...	...	...	...	...	...	...	...	...	...
1888	...	...	...	...	...	...	...	...	...	...	...	...
1889	...	...	...	...	...	...	...	...	...	...	...	...
1890	...	...	...	...	...	...	...	...	...	...	...	...
1891	...	...	...	...	...	...	...	...	...	...	...	...
1892	...	...	...	...	...	...	...	...	...	...	...	...
1893	...	...	...	...	...	...	...	...	...	...	...	...
1894	...	...	...	...	...	...	...	...	...	...	...	...
1895	...	...	...	...	...	...	...	...	...	...	...	...
1896	...	...	...	...	...	...	15,351·71	...	15,351·71	...	...	...
1897	1,819·81	...	1,819·81	7,770·22	...	7,770·22	66,697·57	...	66,697·57	3,720·87	...	3,720·87
1898	3,360·44	...	3,360·44	38,706·19	...	38,706·19	63,181·09	...	63,181·09	22,035·17	...	22,035·17
1899	5,089·83	4,643·00	9,732·83	58,064·19	15,128·98	73,193·17	54,489·26	40,059·43	94,548·69	32,224·04	7,607·18	39,831·22
1900	462·55	7,918·53	8,381·08	65,998·38	60,607·45	126,605·83	15,660·11	79,340·01	95,000·12	29,955·07	12,860·80	42,815·87
1901	6·80	8,330·42	8,337·22	65,352·46	114,840·17	180,192·63	6,620·82	122,806·58	129,427·40	9,313·50	17,066·09	26,379·59
1902	483·32	4,396·91	4,880·23	61,846·01	124,306·49	186,152·50	4,064·18	156,856·06	160,920·24	2,128·49	13,665·52	15,794·01
1903	47·08	1,430·59	1,477·67	65,416·09	125,437·19	190,853·28	1,348·74	167,153·90	168,502·64	5,201·12	18,245·41	23,446·53
1904	...	2,796·23	2,796·23	63,180·89	119,889·93	183,070·82	1,614·64	139,518·37	141,133·01	318·83	20,660·78	20,979·61
1905	76·75	4,549·25	4,626·00	34,949·75	153,203·05	188,152·80	1,193·71	145,615·47	146,809·18	603·66	15,300·58	15,904·24
1906	...	4,883·17	4,883·17	21,869·88	137,022·23	158,892·11	1,140·45	107,890·76	109,031·21	1,245·75	16,841·70	18,087·45
1907	...	3,199·60	3,199·60	23,989·43	154,059·92	178,049·35	13,240·87	72,701·05	85,941·92	4,292·34	13,610·81	17,903·15
1908	...	456·43	456·43	19,324·02	147,879·90	167,203·92	6,701·28	76,700·77	83,402·05	3,613·64	7,946·35	11,559·99
1909	...	626·80	626·80	24,123·15	135,914·94	160,038·09	6,389·19	66,631·79	73,020·98	6,711·37	4,863·50	11,574·87
1910	...	725·79	725·79	28,507·31	131,976·01	160,483·32	1,889·24	60,886·71	62,775·95	...	321·40	321·40
1911	...	294·80	294·80	21,302·54	131,280·97	152,583·51	209·17	60,270·42	60,479·59	176·57	280·54	457·11
1912	...	1,169·18	1,169·18	4,835·73	101,353·79	106,189·52	53·68	49,946·08	49,999·76	...	4·33	4·33
1913	...	2,337·97	2,337·97	157·14	89,408·71	89,565·85	...	60,855·69	60,855·69	...	8,947·58	8,947·58
1914	...	1,403·35	1,403·35	184·66	103,550·71	103,735·37	...	73,943·49	73,943·49	...	3,074·74	3,074·74
1915	...	4,218·34	4,218·34	68·20	107,934·53	108,002·73	668·99	56,372·00	57,010·99	...	14,447·56	14,447·56
1916	...	4,336·27	4,336·27	642·48	111,277·58	111,920·06	...	39,714·46	39,714·46	...	6,815·74	6,815·74
1917	...	1,108·11	1,108·11	...	111,357·98	111,357·98	...	28,306·34	28,306·34	...	9,185·65	9,185·65
1918	...	878·02	878·02	...	95,186·67	95,186·67	...	30,273·00	30,273·00	...	2,493·63	2,493·63
Total	11,346·58	60,202·76	71,549·34	606,288·72	2,271,617·20	2,877,905·92	260,484·70	1,635,842·38	1,896,327·08	121,540·42	194,239·89	315,780·31

Year.	*h* DUNDAS.			*i* PHILLIPS RIVER.			¶ DONNYBROOK.			STATE GENERALLY.		
	Export.	Mint.	Total.	Export.	Mint.	Total.	Export.	Mint.	Total.	Export.	Mint.	Total.
	fine ozs.	fine ozs.	fine ozs.	fine ozs.	fine ozs.	fine ozs.	fine ozs.	fine ozs.	fine ozs.	fine ozs.	fine ozs.	fine ozs.
1886	...	...	...	...	...	...	...	...	...	...	...	...
1887	...	...	...	...	...	...	...	...	...	...	...	...
1888	...	...	...	...	...	...	...	...	...	...	...	...
1889	...	...	...	...	...	...	...	...	...	...	...	...
1890	...	...	...	...	...	...	...	...	...	...	...	...
1891	...	...	...	...	...	...	...	...	...	...	...	...
1892	...	...	...	...	...	...	...	...	...	...	...	...
1893	132·37	...	132·37	...	...	...	...	...	...	...	...	...
1894	204·31	...	204·31	...	...	...	...	...	...	...	...	...
1895	216·40	...	216·40	...	...	...	...	...	...	...	...	...
1896	3,891·77	...	3,891·77	...	...	...	...	...	...	...	...	...
1897	17,275·36	...	17,275·36	...	...	...	...	...	...	...	...	...
1898	28,655·52	...	28,655·52	...	...	...	...	...	...	...	...	...
1899	39,980·65	423·71	40,404·36	...	...	...	277·27	175·49	452·76	...	809·07	809·07
1900	8,144·72	28,254·19	36,398·91	...	...	...	...	237·56	237·56	5,644·83	1,450·08	7,094·91
1901	5,411·46	29,752·16	35,163·62	...	...	...	...	4·20	4·20	215·91	1,511·63	1,727·54
1902	4,401·31	26,714·16	31,115·47	2,946·53	4,422·56	7,369·09	4·94	57·64	62·58	7·77	2,115·52	2,123·29
1903	1,311·53	33,905·88	35,217·41	2,136·09	5,441·68	7,577·77	...	82·64	82·64	53·44	2,839·44	2,892·88
1904	1,834·03	31,347·06	33,181·09	936·76	2,047·59	2,984·35	...	...	...	·86	1,344·25	1,345·11
1905	1,324·48	27,411·31	28,735·79	2,060·46	1,458·44	3,518·90	...	...	...	70·41	1,515·58	1,585·99
1906	1,111·18	20,198·62	21,309·80	945·65	1,439·03	2,384·68	...	...	...	284·38	763·15	1,047·53
1907	...	22,830·71	22,830·71	4,043·86	1,514·90	5,558·76	...	...	...	799·48	285·47	1,084·95
1908	...	41,203·39	41,203·39	969·00	3,631·02	4,600·02	...	...	...	15·91	1,953·56	1,969·47
1909	...	35,894·72	35,894·72	4,025·81	3,605·75	7,631·56	...	...	...	46·78	455·34	502·12
1910	...	43,260·55	43,260·55	3,271·89	5,031·60	8,303·49	...	...	...	48·67	222·89	271 56
1911	...	48,361·14	48,361·14	1,374·96	4,241·05	5,616·01	...	...	...	209·03	129·01	338·04
1912	...	38,373·40	38,373·40	...	3,292·05	3,292·05	...	...	...	687·32	142·72	830·04
1913	...	27,090·46	27,090·46	...	3,515·02	3,515·02	...	...	...	385·58	230·17	615·75
1914	...	27,803·51	27,803 51	...	395 67	395·67	...	...	...	280·34	287·86	568·20
1915	...	24,148·61	24,148·61	2,011·73	263·06	2,274·79	...	...	...	188·32	318·59	506·91
1916	...	21,956·42	21,956·42	4,119·93	181·13	4,301·06	...	...	...	8,188·93	357·85	8,546·78
1917	...	19,346·27	19,346·27	2,995·76	196·24	3,192·00	...	...	...	356·72	216·30	573·02
1918	...	16,215·83	16,215·83	4,463·52	400·11	4,863·63	...	...	...	1·89	562·96	564·85
Total	113,895·09	564,492.10	678,387·19	36,301·95	41,076·90	77,378·85	282·21	557·53	839·74	17,486·57	17,511·44	34,998·01

a Prior to 1st May, 1898, included with Pilbara. *d* Prior to 1st April, 1897, included with Murchison. *c* From 1st August, 1897.
e Prior to 1st May, 1896, included with Coolgardie. *f* From 1st September, 1897. *h* Prior to 1893 included with Yilgarn.
i Prior to 1902, included in State generally. ¶ Abolished 4th March, 1908.

ROYAL MINT, FROM 1ST JANUARY, 1886, TO 31ST DECEMBER 1918, SHOWING, IN FINE OUNCES, THE GOLDFIELDS, AND THE TOTAL ANNUAL VALUE.

Year.	*b* GASCOYNE.			*c* PEAK HILL.			*c* EAST MURCHISON.			MURCHISON.		
	Export.	Mint.	Total.	Export.	Mint.	Total.	Export.	Mint.	Total.	Export.	Mint.	Total.
	fine ozs.	fine ozs.	fine ozs.	fine ozs.	fine ozs.	fine ozs.	fine ozs.	fine ozs.	fine ozs.	fine ozs.	fine ozs.	fine ozs.
1886	...	...	...	...	...	...	...	...	...	...	...	...
1887	...	...	...	...	...	...	...	...	...	...	...	...
1888	...	...	...	...	...	...	...	...	...	...	...	...
1889	...	...	...	...	...	...	...	...	...	...	...	...
1890	...	...	...	...	...	...	...	...	...	...	...	...
1891	...	...	...	...	...	...	...	...	...	1,846·83	...	1,846·83
1892	...	...	...	...	...	...	...	...	...	21,789·19	...	21,789·19
1893	...	...	...	...	...	...	...	...	...	18,974·77	...	18,974·77
1894	...	...	...	...	...	...	...	...	...	47,365·54	...	47,365·54
1895	...	...	...	...	...	...	...	...	...	58,575·66	...	58,575·66
1896	...	...	...	...	...	...	...	...	...	63,769·17	...	63,769·17
1897	...	...	...	4,571·38	...	4,571·38	8,457·34	...	8,457·34	74,154·67	...	74,154·67
1898	...	...	...	12,288·93	...	12,288·93	35,393·19	...	35,393·19	83,794·22	...	83,794·22
1899	297·96	76·63	374·59	14,064·24	14,558·64	28,622·88	33,826·08	3,361·95	37,188·03	61,586·09	22,074·71	83,660·80
1900	...	77·02	77·02	9,528·14	16,119·79	25,647·93	23,545·54	28,671·55	52,217·09	53,815·70	43,423·77	97,239·47
1901	6·59	16·82	23·41	231·85	19,352·44	19,584·29	29,780·63	40,557·07	70,337·70	92,149·56	38,996·10	131,145·66
1902	...	107·29	107·29	85·93	28,044·55	28,130·48	25,450·63	53,583·10	79,033·73	141,731·91	40,926·08	182,657·99
1903	...	30·76	30·76	203·60	29,395·32	29,598·92	21,878·06	65,334·05	87,212·11	154,012·88	54,348·53	208,361·41
1904	...	10·95	10·95	...	17,475·33	17,475·33	21,296·85	64,550·36	85,847·21	165,232·67	52,683·16	217,915·83
1905	...	21·34	21·34	125·01	13,371·75	13,496·76	1,361·68	89,249·93	90,611·61	131,656·36	92,742·05	224,398·41
1906	...	78·73	78·73	...	2,038·62	2,038·62	140·68	95,168·89	95,309·57	79,172·69	109,936·80	189,109·49
1907	...	8·44	8·44	...	5,918·75	5,918·75	2,891·66	117,735·69	120,627·35	54,811·74	115,497·50	170,309·24
1908	...	31·82	31·82	...	9,864·36	9,864·36	10,701·24	137,028·14	147,729·38	45,483·05	111,540·54	157,023·59
1909	...	7·37	7·37	...	7,322·29	7,322·29	11,599·83	136,637·67	148,237·50	24,682·47	107,167·27	131,849·74
1910	...	26·31	26·31	...	3,057·25	3,057·25	1,557·78	137,190·44	138,748·22	19,568·85	111,414·23	130,983·08
1911	...	7·87	7·87	...	134·23	134·23	11·77	96,442·87	96,454·64	13,919·70	109,444·91	123,364·61
1912	...	6·55	6·55	...	196·11	196·11	...	90,397·82	90,397·82	6,377·17	105,245·32	111,622·49
1913	...	...	...	...	258·10	258·10	195·78	80,122·11	80,317·89	5,749·47	115,694·96	121,444·43
1914	...	4·11	4·11	...	85·66	85·66	354·75	65,609·61	65,964·36	6,443·82	111,822·67	118,266·49
1915	...	65·55	65·55	·56	446·00	446·56	268·57	52,926·34	53,194·91	8,669·79	96,610·36	106,280·15
1916	...	60·53	60·53	...	155·01	155·01	902·67	30,284·85	31,187·52	6,694·02	77,369·19	84,063·21
1917	...	...	...	...	...	...	...	7,942·96	7,942·96	1,082·93	94,142·67	95,225·60
1918	...	...	...	...	...	...	...	768·08	768·08	214·23	75,478·06	75,692·29
Total	**304·55**	**638·09**	**942·64**	**41,099·64**	**167,794·20**	**208,893·84**	**229,614·73**	**1,393,563·48**	**1,623,178·21**	**1,443,825·15**	**1,686,558·88**	**3,129,884·03**

Year.	*e* NORTH-EAST COOLGARDIE.			*e* EAST COOLGARDIE.			*g* COOLGARDIE.			YILGARN.		
	Export.	Mint.	Total.	Export.	Mint.	Total.	Export.	Mint.	Total.	Export.	Mint.	Total.
	fine ozs.	fine ozs.	fine ozs.	fine ozs.	fine ozs.	fine ozs.	fine ozs.	fine ozs.	fine ozs.	fine ozs.	fine ozs.	fine ozs.
1886	...	...	...	...	...	...	...	...	...	...	...	...
1887	...	...	...	...	...	...	...	...	...	...	...	...
1888	...	...	...	...	...	...	...	...	...	...	...	...
1889	...	...	...	...	...	...	...	...	...	1,662·61	...	1,662·61
1890	...	...	...	...	...	...	...	...	...	2,036·99	...	2,036·99
1891	...	...	...	...	...	...	...	...	...	11,480·61	...	11,480·61
1892	...	...	...	...	...	...	...	...	...	18,973·91	...	18,973·91
1893	...	...	...	...	...	...	...	...	...	67,760·73	...	67,760·73
1894	...	...	...	...	...	...	94,227·58	...	94,227·58	28,178·31	...	28,178·31
1895	...	...	...	...	...	...	111,919·21	...	111,919·21	17,666·25	...	17,666·25
1896	3,679·63	...	3,679·63	76,297·42	...	76,297·42	61,848·03	...	61,848·03	14,819·20	...	14,819·20
1897	29,437·40	...	29,437·40	268,411·95	...	268,411·95	93,312·00	...	93,312·00	16,097·78	...	16,097·78
1898	112,039·58	...	112,039·58	402,847·31	...	402,847·31	113,816·75	...	113,816·75	10,463 35	...	10,463·35
1899	57,674·82	14,940·55	72,615·37	796,696·63	29,567·58	826,264·21	101,589·22	24,700·89	126,290·11	6,919·11	8,114·60	15,033·71
1900	10,400·57	36,233·90	46,634·47	600,328·29	125,105·24	725,433·53	60,988·33	46,167·62	107,155·95	688·47	25,628·83	26,317·30
1901	6,798·56	39,024·18	45,822·74	698,042·56	238,840·93	936,883·49	9,584·35	70,720·21	80,304·56	49·15	26,677·85	26,727·00
1902	549·07	46,316·67	46,865·74	460,462·26	546,964·68	1,007,426·94	2,872·61	80,887·85	83,760·46	3·31	22,232·80	22,236·11
1903	4,308·99	36,145·75	40,454·74	570,447·27	580,790·97	1,151,238·24	7,318·63	69,681·38	77,000·01	...	22,761·00	22,761·00
1904	55·09	33,262·10	33,317·19	555,016·48	584,579·88	1,139,596·36	1,100·07	61,073·11	62,173·18	28·87	29,965·37	29,994·24
1905	2,187·11	40,220·19	42,407·30	479,254·37	613,103·20	1,092,357·57	177·80	62,066·34	62,244·14	...	25,291·11	25,291·11
1906	1,590·31	30,943·82	32,534·13	454,645·84	612,546·81	1,067,192·65	103·78	60,474·81	60,578·59	...	25,570·77	25,570·77
1907	3,132·83	25,399·75	28,532·58	323,550·05	643,139·11	966,689·16	1,050·88	61,670·65	62,721·53	...	23,311·41	23,311·41
1908	925·44	23,902·44	24,827·88	267,748·62	657,936 89	925,685·51	871·76	40,982·65	41,854·41	...	20,866·10	20,866·10
1909	1,774·45	24,566·87	26,341·32	306,462·21	620,612·07	927,074·28	350·91	36,311·70	36,662·61	204·41	20,958·23	21,162·64
1910	...	19,082·01	19,082·01	179,062·94	653,211·05	832,273·99	...	38,264·02	38,264·02	...	24,049·13	24,049·13
1911	...	18,528·97	18,528·97	123,160·54	686,386·80	809,547·34	...	33,840·93	33,840·93	...	14,688·17	14,688·17
1912	194·22	14,475·38	14,669·60	71,429·00	717,356·45	788,785·45	...	42,327·65	42,327·65	...	27,439·38	27,439·38
1913	...	11,210·69	11,210·69	70,078·57	722,593·22	792,671·79	...	35,593·00	35,593·00	9,688·59	63,679·58	73,368·17
1914	...	5,210·22	5,210·22	40,393·05	677,609·26	718,002·31	...	21,957·78	21,957·78	3,798·03	81,713·56	85,511·59
1915	...	8,773·97	8,773·97	5,493·67	709,061·79	714,555·46	...	17,590·21	17,590·21	...	90,705·75	90,705·75
1916	...	1,996·06	1,996·06	6,194·14	635,425·68	641,619·82	...	12,381·82	12,381·82	...	84,800·82	84,800·82
1917	...	769·16	769·16	4,523·28	602,459·51	606,982·79	...	6,500·66	6,500·66	...	74,399·36	74,399·36
1918	...	145·91	145·91	10,216·56	560,438·18	570,654·74	...	6,727·82	6,727·82	745·57	67,956·84	68,702·41
Total	**234,748·07**	**431,148·59**	**665,896·66**	**6,770,763·01**	**11,217,729·30**	**17,988,492·31**	**661,131·91**	**829,921·10**	**1,491,053·01**	**211,265·25**	**780,810·66**	**992,075·91**

Year.	GRAND TOTAL.			
	Export.	Mint.	Total.	Value.
	fine ozs.	fine ozs.	fine ozs.	£ s. d.
1886	270·17	...	270·17	1,147 12 2¼
1887	4,359·37	...	4,359·37	18,517 8 6½
1888	3,124·82	...	3,124·82	13,273 7 10¾
1889	13,859·52	...	13,859·52	58,871 9 11½
1890	20,402·42	...	20,402·42	86,663 19 5
1891	27,116·14	...	27,116·14	115,182 0 10½
1892	53,271·65	...	53,271·65	226,238 11 8
1893	99,202·50	...	99,202·50	421,385 8 8¼
1894	185,298·73	...	185,298·73	787,098 19 6
1895	207,110·20	...	207,110·20	879,748 4 2¼
1896	251,618·69	...	251,618·69	1,068,808 5 2
1897	603,846·44	...	603,846·44	2,564,976 12 9½
1898	939,489·49	...	939,489·49	3,990,697 13 10
1899	1,283,360·25	187,244·41	1,470,604·66	6,246,731 10 7¾
1900	894,387·27	519,923·59	1,414,310·86	6,007,610 13 4½
1901	923,686·96	779,729·56	1,703,416·52	7,235,653 9 1
1902	707,039·75	1,163,997·60	1,871,037·35	7,947,661 9 7¾
1903	833,685·78	1,231,115·62	2,064,801·40	8,770,718 17 0½
1904	810,616·04	1,172,614·03	1,983,230·07	8,424,225 17 3¾
1905	655,089·88	1,300,226·00	1,955,315·88	8,305,653 18 5½
1906	562,250·59	1,232,296·01	1,794,546·60	7,622,749 8 7
1907	431,803·14	1,265,750·45	1,697,553·59	7,210,749 6 2¾
1908	356,353·96	1,291,557·17	1,647,911·13	6,999,881 10 10½
1909	386,370·58	1,208,898·83	1,595,269·41	6,776,273 14 7½
1910	233,970·34	1,236,661·68	1,470,632·02	6,246,847 15 0
1911	160,422·28	1,210,445·24	1,370,867·52	5,823,075 1 9½
1912	83,577·12	1,199,080·87	1,282,657·99	5,448,384 16 5½
1913	86,255·13	1,227,788·15	1,314,043·28	5,581,701 1 2¾
1914	51,454·65	1,181,522·17	1,232,976·82	5,237,352 12 6½
1915	17,340·47	1,192,771·23	1,210,111·70	5,140,227 15 5½
1916	26,742·17	1,034,655·87	1,061,398·04	4,508,532 5 11
1917	9,022·49	961,294·67	970,317·16	4,121,645 6 2¼
1918	15,644·12	860,867·03	876,511·15	3,723,182 14 9
TOTAL	10,938,043·11	21,458,440·18	32,396,483·29	137,611,513 19 10½

b Prior to March, 1899, included with Ashburton. *c* From 1st August, 1897. *e* Prior to 1st May, 1896, included with Coolgardie. *g* Declared 5th April, 1894, to which dated included with Yilgarn.

TABLE VI.

COMPARATIVE RETURN OF GOLD BULLION ENTERED FOR EXPORT AND RECEIVED AT THE PERTH BRANCH OF THE ROYAL MINT, DURING THE YEARS 1916, 1917, AND 1918, SHOWING IN FINE OUNCES THE QUANTITY RECORDED EACH MONTH, AND ITS VALUE.

MONTHS AND QUARTERS.	1916.				1917.				1918.			
	EXPORT.	MINT.	TOTAL.	VALUE.	EXPORT.	MINT.	TOTAL.	VALUE.	EXPORT.	MINT.	TOTAL.	VALUE.
	fine ozs.	fine ozs.	fine ozs.	£ s. d.	fine ozs.	fine ozs.	fine ozs.	£ s. d.	fine ozs.	fine ozs.	fine ozs.	£ s. d.
JANUARY	1,861·01	92,124·30	93,985·31	399,224 4 5	1,756·00	83,961·77	85,717·77	346,105 18 10½	687·00	73,703·44	74,390·44	315,990 10 8¾
FEBRUARY	2,831·61	65,138·38	67,969·99	288,718 3 3¾	1,893·97	81,810·13	83,704·10	355,552 8 4	816·00	76,987·39	77,803·39	330,487 15 10½
MARCH	5,600·04	88,393·07	93,993·11	399,257 7 0¾	428·07	76,170·86	76,598·93	325,371 11 5½	2,568·00	69,730·59	72,298·59	307,104 17 9½
1st January to 31st March ...	**10,292·66**	**245,655·75**	**255,948·41**	**1,087,199 14 9½**	**4,078·04**	**241,942·76**	**246,020·80**	**1,045,029 18 7¾**	**4,071·00**	**220,421·42**	**224,492·42**	**953,583 4 4¾**
APRIL	2,926·27	87,601·49	90,527·76	384,537 9 7½	...	82,143·56	82,143·56	348,923 13 3½	406·61	66,079·30	66,485·91	282,414 3 10¾
MAY	576·78	83,300·89	83,877·67	356,289 13 10¾	1,269·38	78,165·27	79,434·65	337,416 18 11	3,823·04	73,701·65	77,524·69	329,303 19 0¼
JUNE	2,069·83	92,612·31	94,682·14	402,184 3 4	268·67	82,600·54	82,869·21	352,006 0 7	577·67	74,904·52	75,482·19	320,627 19 3
1st January to 30th June ...	**15,865·54**	**509,170·44**	**525,035·98**	**2,230,211 1 7¾**	**5,616·09**	**484,852·13**	**490,468·22**	**2,083,376 11 5¼**	**8,878·32**	**435,106·89**	**443,985·21**	**1,885,929 6 6¾**
JULY	912·48	91,725·00	92,637·48	393,499 0 0¾	384·62	81,165·80	81,550·42	346,404 3 3¾	1,511·28	72,081·85	73,593·13	312,603 14 11
AUGUST	2,212·39	89,522·54	91,734·93	389,665 4 3½	889·66	80,181·01	81,070·67	344,366 6 4	106·74	76,156·04	76,262·78	323,943 13 11½
SEPTEMBER	3,892·46	85,978·47	89,870·93	381,747 8 11	...	81,760·81	81,760·81	347,297 16 11	964·04	74,057·80	75,021·84	318,672 10 4¾
1st January to 30th September ...	**22,882·87**	**776,396·45**	**799,279·32**	**3,395,122 14 11**	**6,890·37**	**727,959·75**	**734,850·12**	**3,121,444 18 0**	**11,460·38**	**657,402·58**	**668,862·96**	**2,841,149 5 10**
OCTOBER	958·74	82,732·46	83,691·20	355,497 12 5	...	73,900·90	73,900·90	313,911 1 4¾	...	71,438·95	71,438·95	303,453 7 5
NOVEMBER	1,015·45	87,322·27	88,337·72	375,234 15 8	...	80,641·12	80,641·12	342,541 14 1	1,444·66	70,711·35	72,156·01	306,499 4 11½
DECEMBER	1,885·11	88,204·69	90,089·80	382,677 2 11	2,132·12	78,792·90	80,925·02	343,747 12 8½	2,739·08	61,314·15	64,053·23	272,080 16 6½
Total	**26,742·17**	**1,034,655·87**	**1,061,398·04**	**4,508,532 5 11**	**9,022·49**	**961,294·67**	**970,317·16**	**4,121,645 6 2½**	**15,644·12**	**860,867·03**	**876,511·15**	**3,723,182 14 9**

TABLE VII.

MONTHLY RETURN OF GOLD, CONTAINED IN BULLION, FURNACE PRODUCTS, AND ORE, ENTERED FOR EXPORT DURING 1918.

MONTH.	UNITED KINGDOM.			VICTORIA.			NEW SOUTH WALES.			SOUTH AUSTRALIA.			TOTALS.		
	Bullion.	Furnace Products.	Ore.	Bullion.	Furnace Products.	Ore.	Bullion.	Furnace Products.	Ore.	Bullion.	Furnace Products.	Ore.	Bullion.	Furnace Products.	Ore.
1917.	Fine ozs.	Estimated fine ozs.	Estimated fine ozs.	Fine ozs.	Estimated fine ozs.	Estimated fine ozs.	Fine ozs.	Estimated fine ozs.	Estimated fine ozs.	Fine ozs.	Estimated fine ozs.	Estimated fine ozs.	Fine ozs.	Estimated fine ozs.	Estimated fine ozs.
January	...	...	...	...	...	...	...	687·00	...	...	...	...	...	**687·00**	...
February	...	...	...	...	...	...	...	816·00	...	...	...	...	...	**816·00**	...
March	...	...	...	...	...	...	...	...	...	...	2,568·00	...	...	**2,568·00**	...
April	...	...	...	...	...	...	...	...	...	...	406·61	...	...	**406·61**	...
May	...	...	...	...	...	...	...	81·17	...	...	3,741·87	...	...	**3,823·04**	...
June	...	...	...	...	...	...	...	...	...	...	577·67	...	...	**577·67**	...
July	...	...	...	...	...	...	...	836·19	...	...	675·09	...	...	**1,511·28**	...
August	...	...	...	...	...	...	...	104·85	1·89	...	...	...	...	**104·85**	**1·89**
September	...	...	...	...	...	301·10	...	662·94	...	...	...	...	...	**662·94**	**301·10**
October	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
November	...	...	...	...	219·41	...	...	1,225·25	...	...	...	...	...	**1,444·66**	...
December	...	...	...	...	...	2·35	...	2,078·03	658·70	...	...	...	...	**2,078·03**	**661·05**
TOTALS	...	...	...	...	**219·41**	**303·45**	...	**6,491·43**	**660·59**	...	**7,969·24**	...	...	**14,680·08**	**964·04**

TABLE VIII.

RETURN OF GOLD BULLION RECEIVED AT THE PERTH BRANCH OF THE ROYAL MINT FROM MAY, 1899, TO THE 31ST DECEMBER, 1918, SHOWING IN GROSS OUNCES THE QUANTITY OBTAINED FROM THE RESPECTIVE GOLDFIELDS AND OTHER COUNTRIES, AND THE ACTUAL VALUE THEREOF.

Year.	Kimberley.	Pilbara.	West Pilbara.	Ashburton.	Gascoyne.	Peak Hill.	East Murchison.	Murchison.	Yalgoo.	Mt. Margaret.	North Coolgardie.	Broad Arrow.	North-East Coolgardie.
	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.
1899	308·45	529·80	...	281·80	85·65	16,274·00	3,758·07	24,675·64	5,190·05	16,911·54	44,779·38	8,503·50	16,700·90
1900	644·02	7,493·88	137·33	474·26	86·10	18,019·08	32,049·74	48,540·12	8,851·52	67,748·45	88,688·14	14,376·10	40,503·12
1901	663·37	11,279·93	394·38	55·42	18·56	21,351·67	44,746·88	43,024·65	9,191·01	126,703·91	135,493·31	18,829·13	43,055·63
1902	439·93	10,706·03	3,284·37	...	124·86	32,637·17	62,357·98	47,628·18	5,116·94	144,663·12	182,543·06	15,903·42	53,901·58
1903	511·75	14,217·53	6,481·58	135·30	36·29	34,684·27	77,089·29	64,127·18	1,687·99	148,006·49	197,229·08	21,528·20	42,649·25
1904	37·69	8,293·58	5,170·06	150·73	13·10	20,909·99	77,237·31	63,037·71	3,345·82	143,453·51	166,939·82	24,721·53	39,799·55
1905	656·34	16,053·42	1,400·46	50·54	25·65	16,075·36	107,295·17	111,493·34	5,469·06	184,178·87	175,057·14	18,394·17	48,352·22
1906	785·23	6,007·79	915·63	168·30	95·43	2,471·21	115,363·22	133,264·79	5,919·37	166,097·63	130,784·60	20,415·43	37,509·91
1907	431·72	4,924·97	396·22	49·89	10·06	7,057·22	140,382·15	137,713·43	3,815·06	183,693·29	86,685·09	16,228·85	30,285·39
1908	400·19	9,676·11	1,292·97	54·32	37·68	11,679·58	162,243·76	132,066·00	2,625·14	175,092·47	90,815·08	9,408·64	28,300·91
1909	203·59	6,662·82	1,682·49	274·93	8·89	8,823·58	164,652·43	129,139·74	755·31	163,781·55	80,293·29	5,860·66	29,603·84
1910	586·44	7,094·46	1,670·20	208·31	31·67	3,679·72	165,123·37	134,098·94	873·58	158,847·24	73,283·66	386·84	22,967·23
1911	183·78	6,033·33	1,014·60	334·38	9·78	165·36	119,267·86	135,342·96	363·85	162,319·77	74,536·34	346·78	22,917·38
1912	361·11	7,674·55	912·60	47·77	8·09	237·96	110,585·25	128,679·43	1,410·49	124,123·10	61,018·13	5·32	17,705·86
1913	319·55	5,048·77	1,491·66	47·37	...	564·67	96,270·04	139,021·56	3,410·52	107,391·67	73,160·41	10,814·52	13,452·90
1914	238·88	6,750·56	1,538·31	56·09	5·00	104·45	79,785·02	135,990·48	1,705·85	125,937·60	89,904·49	3,727·56	6,318·12
1915	270·76	9,084·52	1,540·93	20·50	81·05	550·77	65,111·82	118,861·14	5,208·56	132,819·64	69,318·34	17,810·14	10,808·78
1916	306·92	8,265·75	692·68	38·34	74·07	190·21	37,169·30	95,071·24	5,320·33	136,731·10	48,799·86	8,415·40	2,441·68
1917	133·03	5,770·70	683·84	25·85	...	...	9,660·88	115,360·36	1,366·18	136,343·74	34,650·24	11,300·38	936·97
1918	144·31	3,643·49	339·36	7·87	...	...	949·78	93,501·94	1,090·10	118,132·80	37,572·67	3,087·67	179·83
Total ...	7,627·01	155,211·99	31,039·67	2,481·97	751·93	195,476·27	1,671,099·32	2,030,638·83	72,716·73	2,722,977·49	1,941,552·13	230,064·24	508,391·05

Year.	East Coolgardie.	Coolgardie.	Yilgarn.	Dundas.	*Phillips River.	†Donny-brook.	State generally.	TOTAL. Western Australia. Quantity.	Western Australia. Actual Value.	TOTAL. Other Countries. Quantity.	Other Countries. Actual Value.	GRAND TOTAL. Quantity.	Grand Total. Actual Value.
	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	£ s. d.	ozs.	£ s. d.	ozs.	£ s. d.
1899 ...	33,051·33	27,611·24	9,070·70	473·63	...	196·17	904·39	209,306·24	762,546 11 6	103·46	336 18 3	209,409·70	762,883 9 9
1900 ...	139,845·60	51,607·26	28,648·51	31,583·20	...	265·55	1,620·93	581,182·91	2,096,212 14 2	17·49	44 15 7	581,200·40	2,096,257 9 9
1901 ...	263,514·75	78,026·07	29,433·84	32,825·75	...	4·64	1,667·79	860,280·69	3,033,311 0 4	92·25	297 5 8	860,372·94	3,033,608 6 0
1902 ...	636,536·52	94,134·17	25,873·68	31,088·91	5,146·80	67·08	2,461·98	1,354,615·78	4,791,303 18 1	16·27	38 10 2	1,354,632·05	4,791,342 8 3
1903 ...	685,289·82	82,218·79	26,856·28	40,006·39	6,420·79	97·52	3,350·32	1,452,624·11	5,139,852 11 9	294·78	703 14 10	1,452,918·89	5,140,556 6 7
1904 ...	699,475·35	73,076·66	35,854·87	37,508·11	2,450·03	...	1,608·47	1,403,083·89	4,955,870 9 0	263·05	614 11 9	1,403,346·94	4,956,485 0 9
1905 ...	737,065·14	74,615·36	30,404·65	32,953·56	1,753·32	...	1,821·99	1,563,115·76	5,475,841 2 10	525·80	1,491 0 7	1,563,641·56	5,477,332 3 5
1906 ...	742,525·99	73,307·24	30,996·76	24,484·65	1,744·38	...	925·10	1,493,782·66	5,330,245 12 1	413·86	974 16 0	1,494,196·52	5,331,220 8 1
1907 ...	766,846·83	73,532·99	27,795·35	27,222·21	1,806·30	...	340·39	1,509,217·41	5,416,812 0 7	640·51	1,663 4 3	1,509,857·92	5,418,475 4 10
1908 ...	779,009·10	48,524·18	22,835·58	48,785·54	4,299·19	...	2,080·42	1,529,226·86	5,386,858 15 8	1,313·84	3,885 2 3	1,530,540·70	5,390,743 17 11
1909 ...	747,856·04	43,756·68	25,255·30	43,254·22	4,345·04	...	548·71	1,456,759·11	5,143,035 17 1	882·56	1,109 6 7	1,457,641·67	5,144,145 3 8
1910 ...	786,209·41	46,054·82	28,945·68	52,068·70	6,056·08	...	268·26	1,488,454·61	5,163,100 17 11	2,251·71	1,670 11 7	1,490,706·32	5,164,771 9 6
1911 ...	848,725·06	41,861·54	18,190·20	59,831·49	5,242·16	...	159·90	1,496,846·52	5,143,795 10 5	452·22	915 19 4	1,497,298·74	5,144,711 9 9
1912 ...	876,900·05	51,732·78	33,429·29	52,220·76	4,026·32	...	174·26	1,471,253·12	5,106,466 9 1	641·47	1,527 8 0	1,471,894·59	5,107,993 17 1
1913 ...	867,887·30	42,738·63	76,581·73	47,535·02	4,221·40	...	277·70	1,490,235·42	5,204,738 18 3	697·50	1,247 12 7	1,490,932·92	5,205,986 10 10
1914 ...	824,280·77	26,696·51	99,410·57	47,487·27	480·65	...	350·48	1,450,768·61	5,016,905 19 0	915·24	1,726 5 1	1,451,683·85	5,018,632 4 1
1915 ...	872,406·66	21,593·44	111,539·75	42,283·16	324·48	...	392·28	1,480,026·72	5,060,196 7 6	1,260·07	2,610 8 11	1,481,286·79	5,062,806 16 5
1916 ...	780,354·90	15,238·33	104,136·12	36,653·26	221·89	...	437·33	1,280,558·71	4,405,278 13 10	1,059·26	2,060 6 9	1,281,617·97	4,407,339 0 7
1917 ...	737,833·22	7,968·62	91,168·91	34,685·39	238·50	...	264·27	1,188,391·08	4,074,112 6 7	1,016·70	1,905 17 7	1,189,407·78	4,076,018 4 2
1918 ...	695,564·50	8,338·10	84,297·45	29,649·05	494·27	...	705·32	1,077,698·51	3,655,942 4 5	1,468·02	2,476 6 11	1,079,166·53	3,658,418 11 4
Total ...	13,521,178·34	982,633·41	940,725·22	752,600·27	49,271·60	630·96	20,360·29	25,837,428·72	90,362,428 0 1	14,326·06	27,300 2 8	25,851,754·78	90,389,728 2 9

* Prior to 1902 included in State generally.

† Abolished 4th March, 1908.

PART II.—MINERALS OTHER THAN GOLD.

TABLE IX.

GENERAL RETURN OF ORE AND MINERALS, OTHER THAN GOLD, SHOWING THE QUANTITY PRODUCED AND THE VALUE THEREOF AS REPORTED TO THE MINES DEPARTMENT FROM THE RESPECTIVE GOLDFIELDS AND MINERAL FIELDS, DURING 1918, AND PREVIOUS YEARS.

BLACK TIN.

Period.	Pilbara Goldfield—Marble Bar District.				Greenbushes Mineral Field.				Total.			
	Quantity.			Value.	Quantity.			Value.	Quantity.			Value.
	Lode.	Stream.	Total.		Lode.	Stream.	Total.		Lode.	Stream.	Total.	
	tons.	tons.	tons.	£	tons.	tons.	tons.	£	tons.	tons.	tons.	£
Previous to 1899 ...	...	75·45	75·45	4,419	...	1,590·33	1,590·33	66,108	...	1,665·78	1,665·78	70,527
1899	...	57·50	57·50	3,612	...	277·32	277·32	21,658	...	334·82	334·82	25,270
1900	...	387·87	387·87	27,174	...	435·62	435·62	29,528	...	823·49	823·49	56,702
1901	...	412·98	412·98	21,148	...	321·34	321·34	18,852	...	734·32	734·32	40,000
1902	...	216·35	216·35	15,103	...	403·21	403·21	24,680	...	619·56	619·56	39,783
1903	...	292·11	292·11	21,528	...	524·94	524·94	34,362	...	817·05	817·05	55,890
1904	...	320·86	320·86	24,355	...	533·64	533·64	34,462	...	854·50	854·50	58,817
1905	...	435·74	435·74	33,880	...	643·52	643·52	52,960	...	1,079·26	1,079·26	86,840
1906	36·59	675·06	711·65	78,449	26·18	757·10	783·28	79,195	62·77	1,432·16	1,494·93	157,644
1907	104·13	749·56	853·69	85,603	40·40	729·60	770·00	73,045	144·53	1,479·16	1,623·69	158,648
1908	31·00	372·03	403·03	30,636	13·90	562·43	576·33	41,046	44·90	934·46	979·36	71,682
1909	81·75	212·21	293·96	22,431	44·40	414·35	458·75	34,786	126·15	*628·08	*754·23	†57,335
1910	33·75	119·75	153·50	12,899	25·06	292·65	317·71	27,974	58·81	412·40	471·21	40,873
1911	27·35	121·30	148·65	16,064	27·82	383·30	411·12	44,638	55·17	504·60	559·77	60,702
1912	10·25	113·13	123·38	14,993	14·90	415·55	430·45	50,166	25·15	528·68	553·83	65,159
1913	14·15	124·95	139·10	16,506	29·06	429·42	458·48	50,954	43·21	‡557·72	‡600·93	§67,717
1914	12·35	75·05	87·40	8,168	5·32	239·22	244·54	21,145	17·67	314·27	331·94	29,313
1915	5·05	73·60	78·65	7,633	7·55	239·78	247·33	21,431	12·60	313·38	325·98	29,064
1916	6·50	146·67	153·17	15,939	9·94	271·80	281·74	27,319	16·44	418·47	434·91	43,258
1917	4·05	65·00	69·05	9,264	11·18	226·74	237·92	20,928	15·23	291·74	306·97	39,192
1918	5·70	93·80	99·50	20,984	50·52	245·28	295·80	57,653	56·22	339·08	395·30	78,637
Total	**372·62**	**5,140·97**	**5,513·59**	**490,788**	**306·23**	**9,937·14**	**10,243·37**	**841,890**	**678·85**	**15,082·98**	**15,761·83**	**1,333,053**

* Includes tons 1·52, the produce of Cue District. † Includes £118, value of tons 1·52, the produce of Cue District, ‡ Includes tons 3·20, the produce of Cue District and tons ·15 of Coolgardie District. § Includes £242, value of tons 3·20 the produce of Cue District, and £15, value of ·15 tons of Coolgardie District.

TANTALITE.

Period.	Pilbara Goldfield—Marble Bar District.				Greenbushes Mineral Field.				Total.			
	Quantity.			Value.	Quantity.			Value.	Quantity.			Value.
	Lode.	Stream.	Total.		Lode.	Stream.	Total.		Lode.	Stream.	Total.	
	tons.	tons.	tons.	£	tons.	tons.	tons.	£	tons.	tons.	tons.	£
Previous to 1899 ...	...	...	...	...	...	...	...	...	...	...	...	...
1899	...	...	...	...	...	...	...	...	...	...	...	...
1900	...	...	...	...	...	...	...	...	...	...	...	...
1901	...	...	...	...	...	...	...	...	...	...	...	...
1902	...	...	...	...	...	...	...	...	...	...	...	...
1903	...	...	...	...	...	...	...	...	...	...	...	...
1904	...	...	...	...	...	...	...	...	...	...	...	...
1905	...	70·95	70·95	8,925	...	2·34	2·34	1,590	...	73·29	73·29	10,515
1906	1·80	12·85	14·65	2,644	...	...	...	...	1·80	12·85	14·65	2,644
1907	...	...	...	...	...	...	...	...	...	...	...	...
1908	...	...	...	...	...	...	...	...	...	...	...	...
1909	·45	...	·45	113	...	·85	·85	214	·45	·85	1·30	327
1910	...	...	...	...	...	...	...	...	...	...	...	...
1911	...	...	...	...	...	...	...	...	...	...	...	...
1912	...	...	...	...	...	...	...	...	...	...	...	...
1913	...	...	...	...	...	...	...	...	...	...	...	...
1914	...	...	...	...	...	...	...	...	...	...	...	...
1915	...	...	...	...	...	...	...	...	...	...	...	...
1916	...	...	...	...	...	...	...	...	...	...	...	...
1917	...	12·50	12·50	1,782	...	...	...	...	...	12·50	12·50	1,782
1918	...	...	...	...	...	...	...	...	...	...	...	...
Total	**2·25**	**96·30**	**98·55**	**13,464**	**...**	**3·19**	**3·19**	**1,804**	**2·25**	**99·49**	**101·74**	**15,268**

Period.	PYRITIC ORE.		COPPER ORE.											
	Mt. Morgans D.		Pilbara Goldfield.				West Pilbara Gf.		Ashburton Gf.		Peak Hill Gf.		E. Murchison Gf.	
			Marble Bar D.		Nullagine D.								Lawlers D.	
	Quantity.	‖Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	tons.	£	tons.	£	tons.	£	tons.	£	tons.	£	tons.	£	tons.	£
Previous to 1899	...	...	...	...	...	...	7,018·00	55,270	...	...	...	...	...	...
1899	...	...	...	...	...	...	2,555·00	29,478	...	...	...	...	...	...
1900	...	...	...	...	...	...	1,605·00	12,139	...	...	...	...	...	...
1901	...	...	...	...	...	...	1,162·00	15,891	...	...	...	...	...	...
1902	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1903	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1904	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1905	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1906	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1907	...	...	7·77	190	...	...	3,365·50	63,548	...	...	...	...	...	...
1908	...	...	...	...	...	...	1,486·00	17,691	188·00	2,311	...	...	6·77	69
1909	...	...	...	...	...	...	7,135·50	62,447	10·75	259	...	...	...	...
1910	...	...	...	...	...	...	8,479·80	64,861	...	...	...	...	...	...
1911	9,938·92	3,529	25·10	196	5·00	120	9,082·02	69,140	...	...	...	...	...	...
1912	7,625·80	2,543	...	...	...	...	12,284·02	104,289	...	...	...	...	...	...
1913	10,216·18	3,658	...	...	...	...	12,621·73	76,878	...	...	...	...	...	...
1914	9,758·83	3,485	...	...	...	...	7,764·18	40,607	...	...	112·70	2,409	...	...
1915	6,557·62	2,368	...	...	...	...	314·75	3,546	146·00	3,744	237·58	7,618	10·93	147
1916	4,409·22	2,263	...	...	...	...	48·87	16,116	2·61	27	250·93	8,268	63·42	1,311
1917	3,575·46	1,752	...	...	...	...	783·61	13,406	3·71	67	287·84	9,683	75·00	1,523
1918	2,251·81	1,629	...	...	...	...	1,844·19	28,961	...	...	76·28	2,480	82·44	1,314
Total ...	**54,333·84**	**21,227**	**32·87**	**386**	**5·00**	**120**	**78,450·17**	**674,268**	**351·07**	**6,408**	**965·33**	**30,458**	**238·56**	**4,364**

‖ Represents the value of the sulphur only the copper contents not having been treated yet.

TABLE IX.—*Minerals other than Gold, etc.*—continued.

COPPER ORE—*continued.*

Period.	Murchison Gf.				Yalgoo Gf.		Northampton Mf.		Yandanooka Mf.		Mt. Margaret Goldfield.			
	Meekatharra D.		Day Dawn D.								Mt. Morgans District.		Mt. Margaret District.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	tons.	£	tons.	£	tons.	£	tons.	£	tons.	£	tons.	£	tons.	£
Previous to 1899	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1899	...	...	...	...	...	...	98·00	1,715	38·00	407	273·00	4,338	...	...
1900	...	...	5·15	91	...	...	...	...	...	...	4,539·00	30,718	...	...
1901	...	...	10·50	76	...	...	38·50	277	...	...	7,660·00	40,738	...	...
1902	...	...	...	...	...	...	...	...	...	...	1,954·00	6,852	...	...
1903	...	...	...	...	...	...	...	...	...	...	18,965·00	45,557	...	...
1904	...	...	...	...	...	...	...	...	...	...	500·00	900	...	...
1905	...	...	...	...	...	...	...	...	...	...	60·00	674	...	...
1906	133·50	2,816	...	...	13·91	91	...	...	...	...	4,361·05	21,934	...	...
1907	...	...	31·71	274	10·00	130	...	...	...	...	5,141·52	58,888	2·85	26
1908	...	...	...	...	9·50	97	...	...	133·55	1,482	4,404·10	20,221	...	...
1909	608·00	2,823	...	...	...	...	...	...	...	...	...	...	...	...
1910	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1911	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1912	...	...	4·80	54	...	...	...	...	...	...	...	...	...	...
1913	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1914	15·19	248	3·40	27	...	...	...	...	...	...	...	...	...	...
1915	33·70	492	...	...	4·99	95	...	...	...	...	...	...	...	...
1916	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1917	82·92	2,164	...	...	...	...	...	...	...	...	...	...	...	...
1918	78·34	1,794	...	...	...	...	...	...	...	...	...	...	...	...
Total ...	**951·65**	**10,337**	**55·56**	**522**	**38·40**	**413**	**136·50**	**1,992**	**171·55**	**1,889**	**47,857·67**	**230,820**	**2·85**	**26**

COPPER ORE—*continued.*

Period.	North Coolgardie Goldfield.		East Coolgardie Goldfield.		Phillips River Goldfield.		State generally.		Total.	
	Menzies District.		E. Coolgardie D.							
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	tons.	£	tons.	£	tons.	£	tons.	£	tons.	£
Previous to 1899	...	...	...	...	...	...	...	...	7,018·00	55,270
1899	...	...	...	...	...	...	...	...	2,964·00	35,938
1900	...	...	...	...	34·00	725	...	...	6,183·15	43,673
1901	...	...	...	...	1,089·14	12,918	...	...	9,960·14	69,900
1902	...	...	...	...	308·25	1,238	...	...	2,262·25	8,090
1903	...	...	...	...	1,561·33	10,984	...	...	20,526·33	56,541
1904	...	...	...	...	3,468·89	24,280	...	...	3,968·89	25,180
1905	...	...	...	...	2,329·04	15,592	...	...	2,389·04	16,266
1906	4·70	33	...	...	2,885·00	25,270	13·50	193	7,411·66	50,337
1907	1·42	18	...	...	10,414·57	57,273	3·08	40	18,978·42	180,387
1908	...	...	50·67	330	2,015·71	9,233	...	...	8,294·30	51,434
1909	...	...	...	...	7,330·70	29,815	...	...	15,084·95	95,344
1910	...	...	...	...	25,871·65	96,745	...	...	34,351·45	161,606
1911	...	...	...	...	13,563·68	46,862	...	...	22,675·80	116,318
1912	...	...	...	...	1,318·38	15,815	...	...	13,607·20	120,158
1913	...	...	...	...	806·95	9,737	...	...	13,428·68	86,615
1914	...	...	...	...	4,841·15	37,524	38·50	426	12,775·12	81,241
1915	...	...	...	...	3,681·03	24,093	69·58	1,263	4,498·56	40,998
1916	...	...	...	...	5,428·08	48,618	3·47	36	6,697·38	74,376
1917	...	...	...	...	5,255·57	66,868	...	...	6,488·65	93,711
1918	...	...	...	...	2,901·66	42,978	...	...	4,982·91	77,527
Total	**6·12**	**51**	**50·67**	**330**	**95,104·78**	**576,568**	**128·13**	**1,958**	**224,546·88**	**1,540,910**

Period.	IRONSTONE.								LEAD ORE.					
	W. Pilbara Gf.		E. Coolgardie Gf. / E. Coolgardie D.		State generally.		Total.		Northampton Mf.		West Pilbara Gf.		Total.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	tons.	£	tons.	£	tons.	£	tons.	£	tons.	£	tons.	£	tons.	£
Previous to 1899 ...	100·00	300	...	...	...	...	100·00	300	...	...	...	...	...	...
1899 ...	...	...	...	...	12,852·00	8,939	12,852·00	8,939	82·75	912	...	...	82·75	912
1900 ...	...	...	...	...	12,251·00	9,258	12,251·00	9,258	268·00	533	...	...	268·00	533
1901 ...	...	...	450·00	247	20,119·00	12,999	20,569·00	13,246	...	...	...	...	...	...
1902 ...	...	...	...	...	4,800·00	2,040	4,800·00	2,040	...	...	...	...	...	...
1903 ...	...	...	...	...	220·00	88	220·00	88	...	...	...	...	...	...
1904 ...	...	...	...	...	1,441·50	577	1,441·50	577	...	...	...	...	...	...
1905 ...	...	...	...	...	3,212·60	1,285	3,212·60	1,285	...	...	...	...	...	...
1906 ...	...	...	...	...	1,279·87	512	1,279·87	512	...	...	...	...	...	...
1907 ...	...	...	...	...	1,093·53	438	1,093·53	438	10·00	128	...	...	10·00	128
1908 ...	...	...	...	...	...	...	...	...	57·00	461	...	...	57·90	461
1909 ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1910 ...	...	...	...	...	† 10·50	† 12	10·50	12	185·10	1,777	...	...	185·10	1,777
1911 ...	...	...	...	...	...	...	...	...	8,194·76	17,663	...	...	8,194·76	17,663
1912 ...	...	...	...	...	...	...	...	...	11,098·50	24,412	...	...	11,098·50	24,412
1913 ...	...	...	...	...	...	...	...	...	26,589·53	50,474	...	...	26,589·53	50,474
1914 ...	...	...	...	...	...	...	...	...	15,334·62	38,351	...	...	15,344·62	38,351
1915 ...	...	...	...	...	...	...	...	...	15,678·30	29,396	...	...	15,678·30	29,396
1916 ...	...	...	...	...	...	...	...	...	34,578·34	110,872	44·00	770	34,622·34	111,642
1917 ...	...	...	...	...	...	...	...	...	46,801·97	143,925	62·57	759	46,864·54	144,684
1918 ...	...	...	...	...	...	...	...	...	47,079·68	176,330	...	...	47,079·68	176,330
Total ...	**100·00**	**300**	**450·00**	**247**	**57,280·00**	**36,148**	**57,830·00**	**36,695**	**205,958·55**	**595,234**	**106·57**	**1,529**	**206,065·12**	**596,763**

† Iron ore from Koolan Island, Yampi Sound.

TABLE IX.—*Minerals other than Gold, etc.*—continued.

Period.	Silver Lead Ore. Ashburton Gf.		Coal. Collie River Coal Mf.		Wolfram Ore. State generally.		Gadolinite. Pilbara Gf. Marble Bar D.		Asbestos. Pilbara Gf. Marble Bar D.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	tons.	£	tons.	£	tons.	£	tons.	£	tons.	£
Previous to 1899	...	...	3,508·00	1,761	...	...	...	...	...	...
1899	...	...	54,336·00	25,951	...	...	...	...	...	...
1900	...	...	118,410·10	54,835	...	...	...	...	...	...
1901	21·05	152	117,835·80	68,561	...	...	...	...	...	...
1902	35·85	277	140,883·90	86,188	...	...	...	...	...	...
1903	...	...	133,426·62	69,128	...	...	...	...	...	...
1904	...	...	138,550·04	67,174	...	...	...	...	...	...
1905	...	...	127,364·06	55,312	...	...	...	...	...	...
1906	...	...	149,755·27	57,998	...	...	...	...	...	...
1907	...	...	142,372·54	55,158	...	...	...	...	...	...
1908	727·25	6,914	175,247·92	75,694	...	...	...	...	40·00	1,600
1909	440·00	3,520	214,301·98	90,965	*5·00	90	...	...	2·83	154
1910	...	...	262,166·06	113,699	† 42·00	115	...	...	...	...
1911	...	...	249,899·15	111,154	‡ 194·00	877	...	...	...	...
1912	...	...	295,078·91	135,857	...	...	...	...	...	...
1913	125·50	1,757	313,817·96	153,614	‡ 4·64	69	1·00	112	...	...
1914	715·10	9,807	319,210·32	148,684	...	...	...	...	...	...
1915	298·96	4,429	286,666·35	137,859	** ·25	27	...	...	...	...
1916	67·83	554	301,525·97	147,823	20·00	117	...	...	...	...
1917	...	...	326,550·07	191,822	...	...	...	...	...	...
1918	237·48	3,461	337,039·24	204,319	...	...	...	...	...	...
Total	**2,669·02**	**30,871**	**4,297,946·26**	**2,053,556**	**265·89**	**1,295**	**1·00**	**112**	**42·83**	**1,754**

Period.	Limestone. Murchison Gf. Cue District.		Limestone. Yilgarn Goldfield.		Limestone. State generally.		Limestone. Total.		Diamonds. Pilbara Gf. Nullagine District.		Magnesite. East Coolgardie Goldfield. Bulong District.		Antimony. West Pilbara Goldfield.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	tons.	£	tons.	£	tons.	£	tons.	£	carats.	£	tons.	£	tons.	£
Previous to 1899	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1899	...	...	...	...	17,593·00	2,838	17,593·00	2,838	§	24	...	...	...	...
1900	...	...	269·85	273	15,657·00	3,321	15,926·85	3,594	...	...	...	...	...	...
1901	...	...	1,642·00	919	16,568·00	3,429	18,210·00	4,348	...	...	...	...	...	...
1902	...	...	535·00	340	4,545·35	1,000	5,080·35	1,340	...	...	...	...	...	...
1903	...	...	102·00	75	1,177·50	103	1,279·50	178	...	...	...	...	...	...
1904	...	...	...	...	13,397·20	1,699	13,397·20	1,699	...	...	...	...	...	...
1905	...	...	...	...	9,144·60	1,220	9,144·60	1,220	...	...	...	...	...	...
1906	...	...	...	...	9,472·28	1,691	9,472·28	1,691	...	...	...	...	...	...
1907	298·00	772	...	...	3,303·95	610	3,601·95	1,382	...	...	...	...	...	...
1908	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1909	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1910	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1911	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1912	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1913	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1914	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1915	...	...	...	...	...	...	...	...	...	...	601·50	601	...	...
1916	...	...	...	...	...	...	...	...	...	...	97·50	97	20·78	491
1917	...	...	...	...	...	...	...	...	...	...	20·50	21	...	...
1918	...	...	...	...	...	...	...	...	...	...	105·25	334	...	...
Total ...	**298·00**	**772**	**2,548·85**	**1,607**	**90,858·88**	**15,911**	**93,705·73**	**18,290**	**...**	**24**	**824·75**	**1,053**	**20·78**	**491**

* Produced within the West Kimberley Magisterial District. † Tons 22·00, value £30, the produce of West Kimberley, and tons 20·00, value £85, the produce of Cue. ‡ The produce of Cue District. § Weight unknown. ** The produce of Yalgoo Goldfield.

NOTE.—As the collection of Statistics of Minerals other than Gold commenced during 1899, the total production from the different localities can only be approximately estimated by the Customs Records, the latest available returns of which are to be found in Table XXV., pages 76–80.

TABLE X.

QUANTITY AND VALUE OF BLACK TIN REPORTED TO THE MINES DEPARTMENT DURING 1918, AND TOTALS TO DATE.

LOCALITY.	NUMBER OF LEASE, CLAIM, OR AREA.	REGISTERED NAME OF COMPANY OR LEASE.	1918. Quantity. Lode.	1918. Quantity. Stream.	1918. Quantity. Total.	1918. Value.	TOTALS TO DATE. Quantity. Lode.	TOTALS TO DATE. Quantity. Stream.	TOTALS TO DATE. Quantity. Total.	TOTALS TO DATE. Value.
			tons.	tons.	tons.	£	tons.	tons.	tons.	£
PILBARA GOLDFIELD.										
MARBLE BAR DISTRICT.										
Coolegong ...	...	Sundry claims	...	33·00	33·00	7,291	...	1,660·27	1,660·27	144,962
Mill's Find ...	...	Sundry claims	...	...	...	...	...	·85	·85	69
Moolyella ...	...	Voided leases	...	...	...	...	...	330·53	330·53	21,340
Do. ...	...	Sundry claims	...	46·00	46·00	10,048	...	2,745·51	2,745·51	256,678
Old Shaw ...	...	Voided leases	...	...	...	...	...	6·75	6·75	424
Do. ...	...	Sundry claims	...	...	...	...	...	214·04	214·04	14,525
Tabba Tabba ...	...	Sundry claims	...	13·50	13·50	2,276	...	108·27	108·27	11,717
Wodgina ...	86, 87, 95 ...	H.M. and Anchorite leases ...	...	...	...	...	...	5·00	5·00	500
Do. ...	84	(Mount Cassiterite) ...	...	...	...	...	133·52	13·85	147·37	14,184
Do. ...	84 (93), (148) ...	Mount Cassiterite leases ...	5·70	...	5·70	1,088	195·50	1·60	197·10	16,913
Do. ...	...	Voided leases	...	...	...	...	37·82	6·10	43·92	4,414
Do. ...	...	Sundry claims	...	1·30	1·30	281	5·78	48·20	53·98	5,062
		Totals	**5·70**	**93·80**	**99·50**	**20,984**	**372·62**	**5,140·97**	**5,513·59**	**490,788**
MURCHISON GOLDFIELD.										
CUE DISTRICT.										
Poona	...	Sundry claims	...	...	...	...	...	1·52	1·52	118
Cuddingwarra ...	...	Sundry claims	...	...	...	...	...	3·20	3·20	242
		Totals	...	...	...	...	...	**4·72**	**4·72**	**360**
COOLGARDIE GOLDFIELD.										
COOLGARDIE DISTRICT.										
Bulla Bulling ...	...	Sundry claims	...	...	...	...	...	·15	·15	15
		Totals	...	...	...	...	...	**·15**	**·15**	**15**
GREENBUSHES MINERAL FIELD.										
Greenbushes ...	472	(Aqua)	...	...	...	...	...	1·50	1·50	128
Do. ...	(587)	Birds' Nests	3·02	...	3·02	593	5·02	...	5·02	931
Do. ...	296	(Central)	...	...	...	...	...	100·16	100·16	9,728
Do. ...	511	Champion	...	34·35	34·35	5,436	1·60	172·45	174·05	18,757
Do. ...	583	Cornwall	6·02	...	6·02	1,235	7·20	...	7·20	1,432
Do. ...	369	Enterprise	...	·25	·25	44	·20	7·29	7·49	667
Do. ...	(577)	Ethel May	...	1·29	1·29	274	...	18·29	18·29	2,267
Do. ...	472, 497, 510...	Excelsior leases	...	19·29	19·29	3,798	...	48·94	48·94	7,422
Do. ...	510	(Excelsior Extended)	...	...	...	...	...	·05	·05	5
Do. ...	497	(Excelsior Tin Mining Co., Ltd.) ...	...	...	...	...	...	4·05	4·05	281
Do. ...	611	Gang Forward	·46	·28	·74	125	·46	·28	·74	125
Do. ...	589	Grafter	1·67	...	1·67	319	1·67	...	1·67	319
Do. ...	(35), (169), (218), (272), (287), (295), 296, (331), (375), (395), (421), (425), (428), (432), (448), (453)	Greenbushes Development Co., Ltd.	...	8·94	8·94	1,893	·35	969·83	970·18	86,723
Do. ...	608	Hamel	...	1·43	1·43	280	...	1·43	1·43	280
Do. ...	599	Homeward Bound	...	1·07	1·07	200	...	1·07	1·07	200
Do. ...	592	Jellicoe	...	·31	·31	57	...	·31	·31	57
Do. ...	515	Kapanga	4·18	...	4·18	829	22·72	·76	23·48	2,915
Do. ...	73, 271, 233 ...	King Tin leases	·91	8·64	9·55	1,947	6·52	59·77	66·29	7,554
Do. ...	271	(King Tin North)	...	...	...	...	...	1·84	1·84	117
Do. ...	605	Lost and Found	·50	...	·50	87	·50	...	·50	87
Do. ...	606	Lost and Found North ...	4·70	...	4·70	961	4·70	...	4·70	961
Do. ...	73	(Nelson)	...	...	...	...	...	22·40	22·40	1,675
Do. ...	73, 233 ...	(Nelson leases)	...	...	...	...	...	61·01	61·01	4,164
Do. ...	596	Nil Desperandum	·25	...	·25	48	·25	...	·25	48
Do. ...	504	Old Bunbury	...	2·57	2·57	490	...	37·62	37·62	3,619
Do. ...	529, 555, 571 ...	Phœnix Sluicing Co., Ltd. ...	...	...	...	...	...	58·95	58·95	5,553
Do. ...	498	Rat	...	...	...	...	...	·74	·74	84
Do. ...	588	Satin Bird	3·43	...	3·43	682	3·43	1·05	4·48	841
Do. ...	505, 519 ...	Scotia leases	...	3·78	3·78	639	...	45·62	45·62	4,353
Do. ...	580	Southern Cross	3·85	...	3·85	719	3·85	...	3·85	719
Do. ...	450, 458, 485, 486, 487, 488, 489	Stanhope United leases ...	...	70·12	70·12	14,768	...	534·80	534·80	65,150
Do. ...	600	Sunday Gift	1·72	...	1·72	327	1·72	...	1·72	327
Do. ...	529	(Three C's)	...	...	...	...	...	53·33	53·33	4,314
Do. ...	565	Turn of the Tide	...	1·69	1·69	382	...	7·87	7·87	1,064
Do. ...	(381, (435), (436), 472, (478)	(Westralian Gully Tin Co., Ltd.) ...	...	...	...	...	6·38	34·38	40·76	3,235
Do. ...	(35), (169), (195), (218), (221), (228), (272), (287), (293), (295), (299), (310), (375)	(Westralian Stanneries, Ltd.) ...	...	...	...	...	...	109·33	109·33	8,171
Do. ...	Loc. 289, 290 ...	Freehold Ground (Clarth and others)	...	...	...	...	...	318·04	318·04	28,959
Do. ...	...	Voided leases	...	...	...	...	181·93	928·93	1,110·86	94,831
Do. ...	...	Sundry claims	19·81	91·27	111·08	21,520	57·73	6,335·05	6,392·78	473,827
		Totals	**50·52**	**245·28**	**295·80**	**57,653**	**306·23**	**9,937·14**	**10,243·37**	**841,890**

TABLE XI.

QUANTITY AND VALUE OF TANTALITE REPORTED TO THE MINES DEPARTMENT DURING 1918, AND TOTALS TO DATE.

LOCALITY.	NUMBER OF LEASE, CLAIM, OR AREA.	REGISTERED NAME OF COMPANY OR LEASE.	1918. Quantity. Lode.	1918. Quantity. Stream.	1918. Quantity. Total.	1918. Value.	TOTAL TO DATE. Quantity. Lode.	TOTAL TO DATE. Quantity. Stream.	TOTAL TO DATE. Quantity. Total.	TOTAL TO DATE. Value.
			tons.	tons.	tons.	£	tons.	tons.	tons.	£
PILBARA GOLDFIELD.										
MARBLE BAR DISTRICT.										
Wodgina ...	86, 87, 95 ...	H.M. and Anchorite leases ...	...	...	...	...	2·25	44·80	47·05	7,340
Do. ...	...	Sundry claims	...	...	...	...	...	51·50	51·50	6,124
		Totals	...	...	...	...	**2·25**	**96·30**	**98·55**	**13,464**
GREENBUSHES MINERAL FIELD.										
Greenbushes ...	369	Enterprise	...	...	...	...	...	3·19	3·19	1,804
		Totals	...	...	...	...	...	**3·19**	**3·19**	**1,804**

TABLE XII.

QUANTITY AND VALUE OF PYRITIC ORE REPORTED TO THE MINES DEPARTMENT DURING 1918, AND TOTALS TO DATE.

LOCALITY.	NUMBER OF LEASE, CLAIM, OR AREA.	REGISTERED NAME OF COMPANY OR LEASE.	1918. Quantity.	1918. †Value.	TOTAL TO DATE. Quantity.	TOTAL TO DATE. †Value.
			tons.	£	tons.	£
MT. MARGARET GOLDFIELD.						
MT. MORGANS DISTRICT.						
Eulaminna ...	4F, 5F, (11F), (12F)	West Australian Copper Co., Ltd.	1,676·96	1,190	43,819·24	16,465
Murrin Murrin ...	18F	Nangeroo: Nangaroo Mines, Ltd.	574·85	439	10,514·60	4,762
		Totals	**2,251·81**	**1,629**	**54,333·84**	**21,227**

† Represents the value of the sulphur only, the copper contents not having been treated yet.

TABLE XIII.

QUANTITY AND VALUE OF COPPER ORE REPORTED TO THE MINES DEPARTMENT DURING 1918, AND TOTALS TO DATE.

LOCALITY.	NUMBER OF LEASE, CLAIM, OR AREA.	REGISTERED NAME OF COMPANY OR LEASE.	1918. Quantity. Ore.	1918. Quantity. Metallic Copper.	1918. Value.	TOTAL TO DATE. Quantity. Ore.	TOTAL TO DATE. Quantity. Metallic Copper.	TOTAL TO DATE. Value.
			tons.	tons.	£	tons.	tons.	£
PILBARA GOLDFIELD.								
MARBLE BAR DISTRICT.								
Marble Bar ...	... ...	Voided Leases	...	...	...	11·00	1·64	90
Do. ...	... ...	Sundry claims	...	...	...	4·75	·48	25
North Pole ...	... ...	Voided leases	...	...	...	9·35	1·39	81
North Shore ...	... ...	Voided leases	...	...	...	7·77	1·90	190
		Totals	...	...	...	**32·87**	**5·41**	**386**
NULLAGINE DISTRICT.								
McPhee's Creek	... ...	Voided leases	...	...	...	5·00	2·22	120
		Totals	...	...	...	**5·00**	**2·22**	**120**
WEST PILBARA GOLDFIELD.								
Croydon ...	...	Voided leases	...	...	...	604·00	108·65	7,333
Egina	...	Voided leases	...	...	...	542·00	104·15	6,643
Roebourne ...	M.L. 183 ...	(Carlow Castle: Roebourne Copper Mines, Ltd.)	...	...	...	69·00	7·80	780
Do. ...	M.L. 174 ...	Good Fortune	26·47	4·08	408	26·47	4·08	408
Do. ...	M.Ls. 174 (175)	(Good Fortune leases)	...	...	...	63·40	9·58	1,011
Do. ...	M.L. 184 ...	Good Luck	2·77	·37	38	5·21	1·01	111
Do. ...	M.L. 178 ...	Lily Blanche	...	...	...	16·98	2·97	272
Do. ...	M.L. 167 ...	(Quod Est)	...	...	...	22·43	3·49	256
Do. ...	M.Ls. 167, 183	Roebourne Copper Mines, Ltd.	17·75	3·60	360	71·25	10·85	1,090
Do. ...	M.Ls (179), (180)	Whundo leases	13·70	3·34	35	386·20	82·25	8,046
Do. ...	M.L. 144 ...	Yannery Hill Copper Mine	18·00	4·73	475	292·97	77·53	6,385
Do. ...	...	Voided leases	...	...	...	2,000·10	371·93	29,621
Do. ...	...	Sundry claims	...	...	...	77·41	13·61	800
Whim Creek ...	M.L. 34 ...	(Balla Balla Copper Mines, Ltd.)	...	...	...	2,009·00	166·33	12,036
Do. ...	M.L. 34 ...	Mons Cupri: Whim Well Copper Mines, Ltd.	...	...	...	282·50	33·75	2,979
Do. ...	Loc. 71 ...	Whim Well Cooper Mines, Ltd.	1,765·50	273·28	27,32[illegible]	71,951·25	9,236·59	596,247
Do. ...	...	Voided leases	...	...	...	30·00	5·50	250
		Totals	**1,844·19**	**289·40**	**28,961**	**78,450·17**	**10,240·07**	**674,268**

TABLE XIII.—*Quantity and Value of COPPER ORE, etc.*—continued.

LOCALITY.	NUMBER OF LEASE, CLAIM, OR AREA.	REGISTERED NAME OF COMPANY OR LEASE.	1918.			TOTALS TO DATE.		
			Quantity.		Value.	Quantity.		Value.
			Ore.	Metallic Copper.		Ore.	Metallic Copper.	
			tons.	tons.	£	tons.	tons.	£
ASHBURTON GOLDFIELD.								
Ashburton ...	...	Sundry claims	...	...	...	6·32	·79	94
Red Hill ...	...	Voided leases	...	...	...	175·50	33·85	2,126
Uaroo	M.L. 88 ...	Victoria	...	...	...	146·00	55·24	3,744
Do. ...	...	Voided leases	...	...	...	23·25	7·25	444
		Totals	...	...	...	**351·07**	**97·13**	**6,408**
PEAK HILL GOLDFIELD.								
Peak Hill ...	M.L. 35P ...	Burra Copper Mines, Ltd.	12·06	4·44	430	25·84	8·85	943
Do. ...	M.L. 41P ...	Butcher Bird	9·58	2·26	223	36·80	8·33	949
Do. ...	M.L. (46P) ...	Hard to Find	...	...	...	2·00	·81	81
Do. ...	M.Ls. 37P, 38P	Sonia and Diana leases	11·99	2·01	216	110·04	37·26	3,907
Do. ...	M.L. 9P ...	Sons of Gwalia	42·65	16·75	1,611	433·71	160·96	14,826
Do. ...	M.Ls. (29P), (30P), 31P	(Two Sisters leases)	...	...	...	64·04	30·93	1,466
Do. ...	M.L. 31P ...	Two Sisters North	...	...	...	115·76	31·40	3,594
Do. ...	...	Voided leases	...	...	...	115·11	33·88	2,855
Do. ...	...	Sundry claims	...	...	...	62·03	21·96	1,837
		Totals	**73·28**	**25·49**	**2,480**	**965·33**	**334·38**	**30,458**
EAST MURCHISON GOLDFIELD.								
LAWLERS DISTRICT.								
Kathleen Valley ...	...	Voided leases	...	...	...	6·77	1·32	69
Lawlers ...	M.L. 29 ...	Bungarra	82·44	12·15	1,314	157·44	23·85	2,837
Do. ...	...	Sundry claims	...	...	...	74·35	13·25	1,458
		Totals	**82·44**	**12·15**	**1,314**	**238·56**	**38·42**	**4,364**
MURCHISON GOLDFIELD.								
MEEKATHARRA DISTRICT.								
Gabanintha ...	G.M.L. 1408N	Grafton	66·53	13·23	1,558	66·53	13·23	1,558
Do. ...	G.M.L. (1360N)	Leviathan	11·81	2·22	236	53·50	11·20	1,201
Do. ...	...	Voided leases	...	...	...	783·72	91·92	6,245
Do. ...	...	Sundry claims	...	...	...	34·42	9·23	1,072
Holden's Find ...	...	Sundry claims	...	...	...	6·72	1·11	111
Yalogindа ...	...	Sundry claims	...	...	...	6·76	1·41	150
		Totals	**78·34**	**15·45**	**1,794**	**951·65**	**128·10**	**10,337**
DAY DAWN DISTRICT								
Day Dawn ...	... ...	Voided leases	...	...	...	26·95	5·17	305
Do. ...	... ...	Sundry claims	...	...	...	28·61	2·93	217
		Totals	...	...	...	**55·56**	**8·10**	**522**
YALGOO GOLDFIELD.								
Mount Gibson ...	... ...	Sundry claims	...	...	...	4·99	1·10	95
Twin Peaks ...	... ...	Sundry claims	...	...	...	19·50	3·49	227
Wadgingarra ...	... ...	Voided leases	...	...	...	13·91	·98	91
		Totals	...	...	...	**38·40**	**5·57**	**413**
NORTHAMPTON MINERAL FIELD.								
Geraldine ...	... ...	Voided leases	...	...	...	136·50	36·05	1,992
		Totals	...	...	...	**136·50**	**36·05**	**1,992**
YANDANOOKA MINERAL FIELD.								
Arrino	... ...	Sundry claims	...	...	...	126·05	18·48	1,386
Yandanooka ...	Freehold Gd. ...	Muggawa Copper Mines	...	...	...	7·50	1·20	96
Do. ...	... ...	Voided leases	...	...	...	38·00	7·95	407
		Totals	...	...	...	**171·55**	**27·63**	**1,889**
MOUNT MARGARET GOLDFIELD.								
MOUNT MORGANS DISTRICT.								
Eulaminna ...	[10C, 11C], 4F, 5F (12C, 37C)	(Mt. Malcolm Copper Mine)	...	...	...	13,516·00	1,001·98	70,754
Do. ...	[10C, 11C], 4F, 5F	(Mt. Malcolm Copper Mine)	...	...	...	3,839·00	418·00	17,065
Do. ...	[10C, 11C], 4F, 5F (12C, 37C)	(Murrin Copper Mines, Ltd.)	...	...	...	19,165·00	798·50	45,817
Do. ...	4F, 5F (11F) (12F)	West Australian Copper Co., Ltd.	...	...	...	9,794·05	1,976·08	80,199
Mt. Margaret ...	... ...	Voided leases	...	...	...	11·53	2·40	163
Murrin Murrin...	18F	Nangeroo: Nangaroo Mines, Ltd.	...	...	...	6·80	3·00	160
Do. ...	... ...	Voided leases	...	...	...	1,525·29	248·04	16,662
		Totals	...	...	...	**47,857·67**	**4,448·00**	**230,820**

TABLE XIII.—*Quantity and Value of COPPER ORE, etc.*—continued.

LOCALITY.	NUMBER OF LEASE, CLAIM, OR AREA.	REGISTERED NAME OF COMPANY OR LEASE.	1918. Quantity. Ore.	1918. Quantity. Metallic Copper.	1918. Value.	TOTALS TO DATE. Quantity. Ore.	TOTALS TO DATE. Quantity. Metallic Copper.	TOTALS TO DATE. Value.
			tons.	tons.	£	tons.	tons.	£
MOUNT MARGARET GOLDFIELD—*continued.*								
MOUNT MARGARET DISTRICT.								
Burtville ...	...	Voided leases	...	...	...	2·85	·29	26
		Totals	...	...	...	**2·85**	**·29**	**26**
NORTH COOLGARDIE GOLDFIELD.								
MENZIES DISTRICT.								
Goongarrie ...	...	Voided leases	...	...	...	4·70	·42	33
Do. ...	...	Sundry claims	...	...	...	1·42	·40	18
		Totals	...	...	...	**6·12**	**·82**	**51**
EAST COOLGARDIE GOLDFIELD.								
EAST COOLGARDIE DISTRICT.								
Boorara ...	...	Voided leases	...	...	...	50·67	6·22	330
		Totals	...	...	...	**50·67**	**6·22**	**330**
PHILLIPS RIVER GOLDFIELD.								
Kundip ...	G.M.Ls. 147, 179	Fair Play leases	...	30·00	3,394	130·09	119·64	10,985
Do. ...	G.M.Ls. 136, 137, 138, (139)	(Flag Gold and Copper Co., Ltd.)	...	...	...	2,107·84	144·75	8,494
Do. ...	G.M.Ls. 136, 137, 138	Flag leases	87·45	7·01	839	356·29	39·38	3,743
Do. ...	G.M.L. 184 ...	Gem	90·98	10·01	1,165	90·98	16·80	1,894
Do. ...	G.M.Ls. 151, 156	Gem Consolidated leases	...	21·13	2,449	48·00	69·39	7,715
Do. ...	M.L. 52, 94 ...	Harbour View Gold and Copper Co., Ltd. ...	15·99	1·16	139	1,168·01	88·27	8,048
Do. ...	M.Ls. 52, 94 ...	(Harbour View leases)	...	...	...	604·36	76·80	4,524
Do. ...	M.Ls. 52, 94 ...	(Harbour View leases)	...	...	...	508·27	64·66	3,642
Do. ...	G.M.L. ...	Hillsborough	...	3·42	401	692·84	43·91	3,506
Do. ...	M.L. 370 ...	North Harbour View	...	... ·04	5	13·80	·80	99
Do. ...	M.Ls. 52, 94 ...	(Ravensthorpe G.M. Syndicate, N.L.) ...	...	...	...	132·56	24·36	1,382
Do. ...	G.M.L. 74 ...	Two Boys	...	9·44	1,113	...	25·92	3,085
Do. ...	...	Voided leases	...	...	...	964·05	106·62	6,893
Do. ...	...	Sundry claims	...	·14	15	87·56	13·29	1,095
Mt. Desmond ...	M.L. 203 ...	British Flag: Phillips River Gold and Copper Co., Ltd.	...	...	...	19·90	3·64	250
Do. ...	M.L. 208 ...	Desmond	290·56	31·87	3,729	1,264·06	145·97	15,074
Do. ...	M.L. 208 ...	(Desmond: Phillips River Gold and Copper Co., Ltd.)	...	...	...	1,234·05	215·74	14,956
Do. ...	M.L. 95 ...	Elverdton	921·59	114·57	12,973	7,406·50	673·91	67,074
Do. ...	M.L. 95 ...	(Elverdton)	...	...	...	130·00	5·70	570
Do. ...	M.L. 95 ...	(Elverdton: Phillips River Gold and Copper Co., Ltd.)	...	...	...	30,574·23	2,186·64	124,252
Do. ...	M.L. 95 ...	(Elverdton: Phillips River Option Syndicate, N.L.)	...	...	...	2,946·02	401·43	22,657
Do. ...	M.L. 168 ...	Elverton South: Phillips River Gold and Copper Co., Ltd.	...	...	...	15·73	1·46	92
Do. ...	M.L. 168 ...	(Elverton South)	...	...	...	18·48	2·39	119
Do. ...	M.L. 109 ...	Mt. Desmond: Phillips River Gold and Copper Co., Ltd.	...	...	...	1,762·22	216·76	18,128
Do. ...	M.L. 109 ...	(Mt. Desmond)	...	...	...	198·87	30·77	1,640
Do. ...	M.L. 199 ...	P.L.P.: Phillips River Gold and Copper Co., Ltd.	...	...	...	17·56	1·88	121
Do. ...	M.L. 199 ...	(P.L.P.)	...	...	...	208·66	33·69	2,277
Do. ...	...	Voided leases	...	...	...	1,015·17	166·71	9,770
Do. ...	...	Sundry claims	...	...	...	98·44	18·48	1,231
Ravensthorpe ...	M.L. (368) ...	Lady Nina	9·29	·65	71	9·29	1·23	145
Do. ...	M.L. (361) ...	Last Chance	2·54	·39	48	77·39	8·80	916
Do. ...	M.L. 16 ...	Marion Martin	746·90	80·14	9,317	2,184·84	247·48	25,576
Do. ...	M.L. 16 ...	(Marion Martin)	...	...	...	865·69	130·61	6,650
Do. ...	M.L. 16 ...	(Marion Martin: Phillips River Gold and Copper Co., Ltd.)	...	...	...	2,855·36	375·44	23,506
Do. ...	M.L. 363 ...	Mount Benson	74·69	4·91	542	376·33	20·44	2,264
Do. ...	M.L. 15 ...	Mount Cattlin	459·76	34·45	3,955	2,172·66	142·09	15,242
Do. ...	M.L. 15 ...	(Mount Cattlin)	...	...	...	281·56	31·35	1,716
Do. ...	M.L. 15 ...	(Mount Cattlin: Mount Cattlin Copper Mining Co., Ltd.)	...	...	...	6,608·76	333·59	28,841
Do. ...	M.L. 15 ...	(Mount Cattlin: Phillips River Gold and Copper Co., Ltd.)	...	...	...	1,263·76	80·26	7,646
Do. ...	M.L. 15 ...	(Mount Cattlin: Phillips River Gold and Copper Co., Ltd.)	...	...	...	14,432·25	714·90	40,313
Do. ...	M.L. 342 ...	Surprise	49·07	4·96	587	867·05	154·40	11,583
Do. ...	...	Voided leases	...	...	...	6,520·64	796·45	48,022
Do. ...	...	Sundry claims	152·84	19·32	2,236	947·33	97·07	8,769
West River ...	...	Voided leases	...	...	...	44·04	7·41	414
Do. ...	...	Sundry claims	...	...	...	145·41	24·81	1,939
		From Goldfields generally	...	...	...	1,637·88	128·64	9,760
		Totals	**2,901·66**	**373·61**	**42,978**	**95,104·78**	**8,234·73**	**576,568**
STATE GENERALLY.								
	M.L. 221H ...	Yampi Sound Copper Mine	...	...	...	92·86	22·80	1,473
	...	Voided leases	...	...	...	18·30	4·30	256
	...	Sundry claims	...	...	...	16·97	2·63	229
		Totals	...	...	...	**128·13**	**29·73**	**1,958**

TABLE XIV.

QUANTITY AND VALUE OF IRONSTONE REPORTED TO THE MINES DEPARTMENT DURING 1918, AND TOTALS TO DATE.

LOCALITY.	NUMBER OF LEASE, CLAIM, OR AREA.	REGISTERED NAME OF COMPANY OR LEASE.	1918.		TOTALS TO DATE.	
			Quantity.	Value.	Quantity.	Value.
			tons.	£	tons.	£
		WEST PILBARA GOLDFIELD.				
Whim Creek ...	... ...	Voided leases	...	...	100·00	300
		Totals	...	...	**100·00**	**300**
		EAST COOLGARDIE GOLDFIELD.				
		EAST COOLGARDIE DISTRICT.				
Boulder ...	... ...	Voided leases	...	...	450·00	247
		Totals	...	...	**450·00**	**247**
		STATE GENERALLY.				
		Avon	...	...	22,223·00	16,241
		Clackline	...	...	18,253·50	8,789
		Coate's Paddock	...	...	4,712·00	3,277
		Greenbushes	...	...	7,481·00	4,629
		Koolan Island—Yampi Sound[2]	...	...	10·50	12
		Werribee	...	...	4,600·00	3,200
		Totals	...	...	**57,280·00**	**36,148**

TABLE XV.

QUANTITY AND VALUE OF LEAD ORE REPORTED TO THE MINES DEPARTMENT DURING 1918, AND TOTALS TO DATE.

LOCALITY.	NUMBER OF LEASE, CLAIM, OR AREA.	REGISTERED NAME OF COMPANY OR LEASE.	1918.			TOTALS TO DATE.		
			Lead Ore.	Metal therefrom.	Value.	Lead Ore.	Metal therefrom.	Value.
			tons.	tons.	£	tons.	tons.	£
		NORTHAMPTON MINERAL FIELD.						
Geraldine ...	Loc. 1 ...	Geraldine Mine	587·24	191·12	3,756	756·91	245·38	4,836
Do. ...	M.L. 150 ...	Surprise	2,420·98	1,307·45	30,770	2,420·98	1,307·45	30,770
Do. ...	M.L. 153 ...	Three Sisters	6·25	3·94	112	6·25	3·94	112
Do. ...	M.L. 159 ...	Welcome Lead Mine	5·74	3·59	68	5·74	3·59	68
Do. ...	... ...	Voided leases	...	...	...	57·00	41·61	461
Do. ...	... ...	Sundry claims	215·65	134·10	2,594	327·04	175·65	3,408
Narra Tarra ...	Loc. 833 ...	Narra Tarra: Fremantle Trading Co., Ltd.	26,806·40	2,884·75	84,145	71,660·05	7,971·70	233,135
Do. ...	Loc. 118, 119...	Lauder and Raven (Tributers)	66·23	37·30	637	66·23	37·30	637
Do. ...	... ...	Sundry claims	...	...	...	225·00	27·00	185
Northampton ...	Loc. 1472 ...	Baddera: Fremantle Trading Co., Ltd.	11,945·60	1,185·80	34,483	122,860·56	13,025·96	288,695
Do. ...	Loc. 436 ...	Fortune Exploration Co., N.L. ...	15·13	9·20	168	15·13	9·20	168
Do. ...	M.Ls 127, 128, 129	Kirton's leases	329·73	55·20	1,061	2,052·31	349·97	6,738
Do. ...	M.L. 142 ...	Nooka Lead Mining Co., N.L. ...	583·55	118·28	2,240	876·12	176·40	3,349
Do. ...	Loc. 1146 ...	Wheal Ellen: Fremantle Trading Co., Ltd.	3,965·78	533·51	15,487	4,011·48	538·42	15,634
Do. ...	Loc. 436 ...	(Wheal of Fortune Extended Syndicate)	110·85	31·52	644	125·82	43·13	794
Do. ...	... ...	Voided leases	...	...	...	253·88	166·84	3,408
Do. ...	... ...	Sundry claims	20·55	10·61	165	219·05	130·42	2,625
Victoria ...	... ...	Voided leases	...	...	...	19·00	12·54	212
		Totals	**47,079·68**	**6,509·37**	**176,330**	**205,958·55**	**24,266·50**	**595,234**
		WEST PILBARA GOLDFIELD.						
Roebourne ...	... ...	Sundry claims	...	...	...	2·57	1·36	39
Whim Creek ...	M.L. (172) ...	Cumstock	...	...	...	104·00	46·00	1,490
		Totals	...	...	...	**106·57**	**47·36**	**1,529**

TABLE XVI.

QUANTITY AND VALUE OF SILVER-LEAD ORE REPORTED TO THE MINES DEPARTMENT DURING 1918, AND TOTALS TO DATE.

LOCALITY.	NUMBER OF LEASE, CLAIM, OR AREA.	REGISTERED NAME OF COMPANY OR LEASE.	1918.		TOTALS TO DATE.	
			Quantity.	Value.	Quantity.	Value.
			tons.	£	tons.	£
		ASHBURTON GOLDFIELD.				
Ashburton ...	... ...	Voided leases	...	...	56·90	429
Do. ...	... ...	Sundry claims	...	...	2·83	40
Uaroo	M.Ls. 43, 49, 84	Uaroo Silver Lead Mines, Ltd.	237·48	3,461	2,609·29	30,402
		Totals	**237·48**	**3,461**	**2,669·02**	**30,871**

TABLE XVII.

QUANTITY AND VALUE OF COAL REPORTED TO THE MINES DEPARTMENT DURING 1918, AND TOTALS TO DATE.

LOCALITY.	NUMBER OF LEASE, CLAIM, OR AREA.	REGISTERED NAME OF COMPANY OR LEASE.	1918.		TOTALS TO DATE.	
			Quantity.	Value.	Quantity.	Value.
			tons.	£	tons.	£
		COLLIE RIVER MINERAL FIELD.				
Collie	197, etc. ...	Cardiff Coal Mining Co., Ltd.	75,512·00	43,377	798,705·33	359,618
Do. ...	151, etc. ...	(Collie Boulder Coal Co., Ltd.)	...	...	71,512·70	26,139
Do. ...	244, etc. ...	Collie Co-operative Collieries, Ltd.	58,171·20	35,925	878,145·30	446,644
Do. ...	88 (part of) ...	(Collie Proprietary Coalfields of W.A., Ltd.)	...	...	477,781·55	242,918
Do. ...	85–100 ...	(Collie Proprietary Coalfields of W.A., Ltd.)	...	...	580,392·15	289,246
Do. ...	260–6, 271 ...	Premier Coal Mining Co., Ltd.	21,418·10	12,971	124,242·23	61,616
Do. ...	151, etc. ...	(Scottish Co-operative Collieries, Co., Ltd.)	...	...	430,796·95	171,303
Do. ...	151, etc. ...	Scottish Collieries, Ltd.	1,638·31	809	1,638·31	809
Do. ...	88 (part of) ...	The Proprietary Coal Mines of W.A., Ltd.	...	...	109·00	54
Do. ...	85–100, 567 ...	The Proprietary Coal Mines of W.A., Ltd.	119,576·58	74,151	482,361·42	264,608
Do. ...	250, etc. ...	Westralian Coal Mining Co., Ltd.	60,723·05	37,086	336,691·47	177,671
Do. ...	... ...	Voided leases	...	...	25,569·85	12,930
		Totals	**337,039·24**	**204,319**	**4,207,946·26**	**2,053,556**

TABLE XVIII.

QUANTITY AND VALUE OF LIMESTONE REPORTED TO THE MINES DEPARTMENT DURING 1918, AND TOTALS TO DATE.

LOCALITY.	NUMBER OF LEASE, CLAIM, OR AREA.	REGISTERED NAME OF COMPANY OR LEASE.	1918.		TOTALS TO DATE.	
			Quantity.	Value.	Quantity.	Value
			tons.	£	tons.	£
		MURCHISON GOLDFIELD.				
		CUE DISTRICT.				
Cuddingwarra ...	... ...	Voided leases	...	...	298·00	772
		Totals	...	...	**298·00**	**772**
		YILGARN GOLDFIELD.				
Southern Cross	... ...	Voided leases	...	...	2,548·85	1,607
		Totals	...	...	**2,548·85**	**1,607**
		STATE GENERALLY.				
Fremantle ...	... ...	... ...	...	...	90,858·88	15,911
		Totals	...	...	**90,858·88**	**15,911**

TABLE XIX.

QUANTITY AND VALUE OF ASBESTOS REPORTED TO THE MINES DEPARTMENT DURING 1918, AND TOTALS TO DATE.

LOCALITY.	NUMBER OF LEASE, CLAIM, OR AREA.	REGISTERED NAME OF COMPANY OR LEASE.	1918.		TOTALS TO DATE.	
			Quantity.	Value.	Quantity.	Value.
			tons.	£	tons.	£
		PILBARA GOLDFIELD.				
		MARBLE BAR DISTRICT.				
Soansville ...	... ...	Voided leases	...	...	42·83	1,754
		Totals	...	...	**42·83**	**1,754**

TABLE XX.

QUANTITY AND VALUE OF GADOLINITE REPORTED TO THE MINES DEPARTMENT DURING 1918, AND TOTALS TO DATE.

LOCALITY.	NUMBER OF LEASE, CLAIM, OR AREA.	REGISTERED NAME OF COMPANY OR LEASE.	1918.		TOTALS TO DATE.	
			Quantity.	Value.	Quantity.	Value.
			tons.	£	tons.	£
		PILBARA GOLDFIELD.				
		MARBLE BAR DISTRICT.				
Cooglegong ...	(M.L. 254) ...	Iverna	...	...	1·00	112
		Totals	...	...	**1·00**	**112**

TABLE XXI.

QUANTITY AND VALUE OF TUNGSTEN ORES REPORTED TO THE MINES DEPARTMENT DURING 1918, AND TOTALS TO DATE.

WOLFRAM.

LOCALITY.	NUMBER OF LEASE, CLAIM, OR AREA.	REGISTERED NAME OF COMPANY OR LEASE.	1918.			TOTALS TO DATE.		
			Ore.	Metallic contents.	Value.	Ore.	Metallic contents.	Value.
			tons.	tons.	£	tons.	tons.	£
MURCHISON GOLDFIELD.								
CUE DISTRICT.								
Callie Spring ...	... ...	Voided leases	...	...	...	194·00	6·11	877
Do. ...	... ...	Sundry claims	...	...	...	44·64	2·30	271
		Totals	...	...	...	**238·64**	**8·41**	**1,148**
YALGOO GOLDFIELD.								
Yalgoo	M.L. (36) ...	Yandanoo King North	...	...	...	·25	·12	27
		Totals	...	...	...	**·25**	**·12**	**27**
STATE GENERALLY.								
Derby	(146H) ...	Taylor's Wolfram Reward ...	...	...	...	27·00	2·00	120
		Totals	...	...	...	**27·00**	**2·00**	**120**

TABLE XXII.

QUANTITY AND VALUE OF MAGNESITE REPORTED TO THE MINES DEPARTMENT DURING 1918, AND TOTALS TO DATE.

LOCALITY.	NUMBER OF LEASE, CLAIM, OR AREA.	REGISTERED NAME OF COMPANY OR LEASE.	1918.		TOTALS TO DATE.	
			Quantity.	Value.	Quantity.	Value.
			tons.	£	tons.	£
EAST COOLGARDIE GOLDFIELD.						
BULONG DISTRICT.						
Bulong	... ...	Sundry claims	105·25	334	824·75	1,053
		Totals	**105·25**	**334**	**824·75**	**1,053**

TABLE XXIII.

QUANTITY AND VALUE OF DIAMONDS REPORTED TO THE MINES DEPARTMENT DURING 1918, AND TOTALS TO DATE.

LOCALITY.	NUMBER OF LEASE, CLAIM, OR AREA.	REGISTERED NAME OF COMPANY OR LEASE.	1918.		TOTALS TO DATE.	
			Quantity.	Value.	Quantity.	Value.
			carats.	£	carats.	£
		PILBARA GOLDFIELD.				
		NULLAGINE DISTRICT.				
Nullagine ...	M.R.C. 6L ...	(Morgans, A. E.)	...	...	...	24
		Totals	...	...	...	24

TABLE XXIV.

QUANTITY AND VALUE OF ANTIMONY REPORTED TO THE MINES DEPARTMENT DURING 1918, AND TOTALS TO DATE

LOCALITY.	NUMBER OF LEASE, CLAIM, OR AREA.	REGISTERED NAME OF COMPANY OR LEASE.	1918.			TOTALS TO DATE.		
			Ore.	Metallic contents.	Value.	Ore.	Metallic contents.	Value.
			tons.	tons.	£	tons.	tons.	£
		WEST PILBARA GOLDFIELD.						
Balla Balla ...	M.L. (185) ...	Star	...	...	...	20·78	11·58	491
		Totals	...	...	...	**20·78**	**11·58**	**491**

TABLE

RETURN OF ORE AND MATERIALS OTHER THAN GOLD

YEAR.	COPPER.												
	COPPER ORE.										COPPER INGOT, MATTE, ETC.		Total Value of Copper Exported.
	West Pilbara Gf.		Northampton Mf.		Phillips River Gf.		State generally.		Total.		State generally.		
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	
	tons.	£	tons.	£	tons.	£	tons.	£	tons.	£	tons.	£	£
1850 ...	...	...	...	...	...	...	...	...	...	...	...	...	...
1 ...	...	...	...	...	...	...	...	...	...	...	...	...	...
2 ...	...	...	...	...	...	...	...	...	...	...	...	...	...
3 ...	...	...	[2]†	7	...	...	...	...	...	7	...	...	7
4 ...	...	...	...	...	...	...	...	...	...	...	...	...	...
5 ...	...	...	2	26	...	...	...	...	2	26	...	...	26
6 ...	...	...	57	1,018	...	...	...	...	57	1,018	...	...	1,018
7 ...	...	...	80	1,920	...	...	...	...	80	1,920	...	...	1,920
8 ...	...	...	433	9,531	...	...	...	...	433	9,531	...	...	9,531
9 ...	...	...	941	14,122	...	...	...	...	941	14,122	...	...	14,122
1860 ...	...	...	517	8,021	...	...	...	...	517	8,021	...	...	8,021
1 ...	...	...	409	6,339	...	...	...	...	409	6,339	...	...	6,339
2 ...	...	...	783	12,536	...	...	...	...	783	12,536	...	...	12,536
3 ...	...	...	763	12,208	...	...	...	...	763	12,208	...	...	12,208
4 ...	...	...	1,076	17,216	...	...	...	...	1,076	17,216	...	...	17,216
5 ...	...	...	886	13,290	...	...	...	...	886	13,290	...	...	13,290
6 ...	...	...	557	8,362	...	...	...	...	557	8,362	...	...	8,362
7 ...	...	...	337	5,055	...	...	...	...	337	5,055	...	...	5,055
8 ...	...	...	83	1,245	...	...	...	...	83	1,245	...	...	1,245
9 ...	...	...	155	2,325	...	...	...	...	155	2,325	...	...	2,325
1870 ...	...	...	6	90	...	...	...	...	6	90	...	...	90
1 ...	...	...	...	...	...	...	...	...	...	...	...	...	...
2 ...	...	...	...	...	...	...	...	...	...	...	...	...	...
3 ...	...	...	56	848	...	...	...	...	56	848	...	...	848
4 ...	...	...	67	998	...	...	...	...	67	998	...	...	998
5 ...	...	...	205	3,071	...	...	...	...	205	3,071	...	...	3,071
6 ...	...	...	279	4,185	...	...	...	...	279	4,185	...	...	4,185
7 ...	...	...	54	803	...	...	...	...	54	803	...	...	803
8 ...	...	...	9	135	...	...	...	...	9	135	...	...	135
9 ...	...	...	...	...	...	...	...	...	...	...	...	...	...
1880 ...	...	...	8	120	...	...	...	...	8	120	...	...	120
1 ...	...	...	...	...	...	...	...	...	...	...	...	...	...
2 ...	...	...	2	23	...	...	...	...	2	23	...	...	23
3 ...	...	...	5	75	...	...	...	...	5	75	...	...	75
4 ...	...	...	118	1,770	...	...	...	...	118	1,770	...	...	1,770
5 ...	...	...	120	1,793	...	...	...	...	120	1,793	...	...	1,793
6 ...	...	...	249	3,735	...	...	...	...	249	3,735	...	...	3,735
7 ...	...	...	23	345	...	...	...	...	23	345	...	...	345
8 ...	...	...	88	1,488	...	...	...	...	88	1,488	...	...	1,488
9 ...	...	...	112	1,904	...	...	...	...	112	1,904	...	...	1,904
1890 ...	...	...	8	136	...	...	...	...	8	136	...	...	136
1 ...	263	4,462	...	...	...	...	...	...	263	4,462	...	...	4,462
2 ...	[1]† 412	6,319	155	2,377	...	...	...	...	567	8,696	...	...	8,696
3 ...	50	606	...	...	...	...	...	...	50	606	...	...	606
4 ...	...	...	...	...	...	...	...	...	...	...	...	...	...
5 ...	802	12,832	24	120	...	...	...	...	826	12,952	...	...	12,952
6 ...	6	100	...	...	...	...	...	...	6	100	...	...	100
7 ...	65	731	21	302	...	...	...	...	86	1,033	...	...	1,033
8 ...	281	3,334	75	932	...	...	...	...	356	4,266	...	...	4,266
9 ...	1,404	31,979	587	9,473	...	...	...	...	1,991	41,452	...	...	41,452
1900 ...	544	10,696	...	...	105	2,411	197	3,355	846	16,462	249	17,475	33,937
1 ...	1,058	26,464	1	10	1,205	22,107	397	6,322	2,661	54,903	880	55,866	110,769
2 ...	68	1,698	20	330	162	2,469	33	489	283	4,986	175	7,918	12,904
3 ...	4	180	25	460	302	3,538	15	349	346	4,527	1,075	33,288	37,815
4 ...	50	500	...	...	11	154	310	3,378	371	4,032	102	3,827	7,859
5 ...	...	...	...	...	80	2,808	713	8,576	793	11,384	794	53,867	65,251
6 ...	112	323	...	...	...	...	224	2,930	336	6,162	343	30,367	36,529
7 ...	...	...	...	...	...	...	3,727	61,493	3,727	61,493	1,602	141,883	203,376
8 ...	...	...	...	...	...	...	2,503	29,272	2,503	29,272	479	27,819	57,091
9 ...	...	...	...	...	...	...	6,959	59,541	6,959	59,541	833	45,100	104,641
1910 ...	...	...	...	...	...	...	6,309	27,271	6,309	27,271	1,281	68,657	95,928
1911 ...	...	...	...	...	...	...	9,825	33,709	9,825	33,709	828	44,409	78,118
1912 ...	...	...	...	...	...	...	9,536	58,688	9,536	58,688	28	1,136	59,824
1913 ...	...	...	...	...	...	...	4,339	136,472	4,339	136,472	82	5,891	142,363
1914 ...	...	...	...	...	...	...	3,913	33,654	3,913	33,654	183	4,520	38,174
1915 ...	...	...	...	...	...	...	737	13,768	737	13,768	946	77,401	91,169
1916 ...	...	...	...	...	...	...	650	14,971	650	14,971	457	49,862	64,833
1917 ...	...	...	...	...	...	...	966	20,878	966	20,878	535	64,860	85,738
1918 ...	...	...	...	...	...	...	1,643	24,877	1,643	24,877	478	41,269	66,146
Total	...	...	...	...	...	...	...	...	**69,376**	**825,357**	**11,350**	**775,415**	**1,600,772**

[1]†*See* Woodward's Mining Handbook, Perth: By Authority, 1895; page 123.

XXV.

ENTERED FOR EXPORT FROM 1850 TO 1918, INCLUSIVE.

TIN.											
BLACK TIN (Dressed Tin).								TIN INGOT (White tin).		Total Value of Tin Exported.	YEAR.
Pilbara Gf.		Greenbushes Mf.		[3]†State generally.		Total.		Greenbushes Mf.			
Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.		
tons.	£	tons.	£	tons.	£	tons.	£	tons.	£	£	
...	...	...	...	...	...	...	...	...	...	...	1850
...	...	...	...	...	...	...	...	...	...	...	1
...	...	...	...	...	...	...	...	...	...	...	2
...	...	...	...	...	...	...	...	...	...	...	3
...	...	...	...	...	...	...	...	...	...	...	4
...	...	...	...	...	...	...	...	...	...	...	5
...	...	...	...	...	...	...	...	...	...	...	6
...	...	...	...	...	...	...	...	...	...	...	7
...	...	...	...	...	...	...	...	...	...	...	8
...	...	...	...	...	...	...	...	...	...	...	9
...	...	...	...	...	...	...	...	...	...	...	1860
...	...	...	...	...	...	...	...	...	...	...	1
...	...	...	...	...	...	...	...	...	...	...	2
...	...	...	...	...	...	...	...	...	...	...	3
...	...	...	...	...	...	...	...	...	...	...	4
...	...	...	...	...	...	...	...	...	...	...	5
...	...	...	...	...	...	...	...	...	...	...	6
...	...	...	...	...	...	...	...	...	...	...	7
...	...	...	...	...	...	...	...	...	...	...	8
...	...	...	...	...	...	...	...	...	...	...	9
...	...	...	...	...	...	...	...	...	...	...	1870
...	...	...	...	...	...	...	...	...	...	...	1
...	...	...	...	...	...	...	...	...	...	...	2
...	...	...	...	...	...	...	...	...	...	...	3
...	...	...	...	...	...	...	...	...	...	...	4
...	...	...	...	...	...	...	...	...	...	...	5
...	...	...	...	...	...	...	...	...	...	...	6
...	...	...	...	...	...	...	...	...	...	...	7
...	...	...	...	...	...	...	...	...	...	...	8
...	...	...	...	...	...	...	...	...	...	...	9
...	...	...	...	...	...	...	...	...	...	...	1880
...	...	...	...	...	...	...	...	...	...	...	1
...	...	...	...	...	...	...	...	...	...	...	2
...	...	...	...	...	...	...	...	...	...	...	3
...	...	...	...	...	...	...	...	...	...	...	4
...	...	...	...	...	...	...	...	...	...	...	5
...	...	...	...	...	...	...	...	...	...	...	6
...	...	...	...	...	...	...	...	...	...	...	7
...	...	...	...	...	...	...	...	...	...	...	8
...	...	5	300	...	...	5	300	...	...	300	9
...	...	68	5,400	...	...	68	5,400	...	...	5,400	1890
...	...	204	10,200	...	...	204	10,200	...	...	10,200	1
...	...	265	13,843	...	...	265	13,843	...	...	13,843	2
57	3,470	171	7,664	...	...	228	11,134	...	...	11,134	3
19	949	371	14,325	...	...	390	15,274	...	...	15,274	4
...	...	277	9,703	...	...	277	9,703	...	...	9,703	5
...	...	137	4,338	...	...	137	4,338	...	...	4,338	6
...	...	96	3,275	...	...	96	3,275	...	...	3,275	7
...	...	68	2,760	...	...	68	2,760	...	...	2,760	8
30	2,025	278	21,138	...	...	308	23,163	...	...	23,163	9
368	30,146	102	8,032	...	...	470	38,178	142	18,872	57,050	1900
439	34,600	68	4,895	...	...	507	39,495	97	12,607	52,102	1
248	19,698	31	2,870	...	...	279	22,568	141	16,830	39,398	2
267	20,988	25	1,868	...	...	292	22,856	235	29,277	52,133	3
64	4,932	24	1,389	379	20,797	467	27,118	129	16,155	43,273	4
188	16,853	119	8,177	666	51,748	973	76,778	[2]†	1	76,779	5
329	28,375	444	46,254	624	64,005	1,397	138,634	45	8,746	147,380	6
...	...	...	...	1,424	151,414	1,424	151,414	78	14,725	166,139	7
...	...	...	...	1,093	83,294	1,093	83,594	[2]†	1	83,595	8
...	...	...	...	698	62,989	698	62,989	...	...	62,989	9
...	...	...	...	500	45,129	500	45,129	...	...	45,129	1910
...	...	...	...	495	55,220	495	55,220	...	...	55,220	1911
...	...	...	...	651	79,738	651	79,738	...	...	79,738	1912
...	...	...	...	484	72,142	484	72,142	...	...	72,142	1913
...	...	...	...	363	35,649	363	35,649	...	...	35,649	1914
...	...	...	...	429	41,391	429	41,391	...	...	41,391	1915
...	...	...	...	463	49,101	463	49,101	...	...	49,101	1916
...	...	...	...	383	45,288	383	45,288	...	...	45,288	1917
...	...	...	...	415	76,952	415	76,952	...	...	76,952	1918
...	...	...	...	...	...	13,829	1,263,624	867	117,214	1,380,838	Total

[2]†Weight not stated. [3]†Probably the produce of Pilbara Goldfield and Greenbushes Mineral Field.

TABLE XXV.—*Return of Ore and Minerals other than Gold*

Year.	Silver.		‡ Lead.		‡ Lead and Silver-Lead.		Pig Lead.		Zinc Ingots and Concentrates.	
	State generally.		Northampton Mf.		State generally.		State generally.		State generally.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	ozs.	£	tons.	£	tons.	£	tons.	£	tons.	£
1850	...	...	5	55	...	...	...	...	...	...
1	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...
3	...	...	[2]†	4	...	...	55	1,200	...	...
4	...	...	...	...	...	...	122	2,440	...	...
5	...	...	25	250	...	...	134	2,675	...	...
6	...	...	...	...	...	...	60	1,200	...	...
7	...	...	...	...	...	...	120	2,410	...	...
8	...	...	...	...	...	...	61	1,220	...	...
9	...	...	13	135	...	...	25	495	...	...
1860	...	...	98	985	...	...	...	...	...	...
1	...	...	79	790	...	...	...	...	...	...
2	...	...	9	90	...	...	...	...	...	...
3	...	...	230	2,300	...	...	...	...	...	...
4	...	...	80	800	...	...	...	...	...	...
5	...	...	703	8,436	...	...	...	...	...	...
6	...	...	273	3,282	...	...	...	...	...	...
7	...	...	902	10,824	...	...	[4]†3	50	...	...
8	...	...	1,100	13,206	...	...	...	...	...	...
9	...	...	699	8,394	...	...	...	...	...	...
1870	...	...	1,209	14,514	...	...	...	...	...	...
1	...	...	420	5,040	...	...	...	...	...	...
2	...	...	364	4,368	...	...	...	...	...	...
3	...	...	965	11,586	...	...	...	...	...	...
4	...	...	2,144	25,725	...	...	...	...	...	...
5	...	...	2,289	27,468	...	...	4	89	...	...
6	...	...	2,192	26,298	...	...	[4]†7	155	...	...
7	...	...	3,956	47,466	...	...	[4]†1	15	...	...
8	...	...	3,618	43,410	...	...	...	...	...	...
9	...	...	2,775	33,300	...	...	...	...	...	...
1880	...	...	1,921	15,368	...	...	[4]†5	89	...	...
1	...	...	1,401	11,204	...	...	[4]†1	20	...	...
2	...	...	1,794	14,348	...	...	...	...	...	...
3	...	...	1,038	7,266	...	...	...	...	...	...
4	...	...	696	4,872	...	...	...	...	...	...
5	...	...	465	3,255	...	...	...	...	...	...
6	...	...	611	4,277	...	...	...	...	...	...
7	...	...	471	4,710	...	...	[4]†6	120	...	...
8	...	...	532	5,320	...	...	[4]†2	40	...	...
9	...	...	250	2,500	...	...	...	...	...	...
1890	...	...	214	2,135	...	...	...	...	...	...
1	...	...	25	250	...	...	...	...	...	...
2	...	...	30	150	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...
7	...	...	[2]†	4	...	...	[4]†1	11	...	...
8	...	...	5	33	...	...	...	...	...	...
9	...	...	16	96	...	...	77	1,077	...	...
1900	28,749	3,594	27	242	...	...	...	...	...	...
1	60,869	7,609	...	...	...	...	...	...	...	...
2	83,293	9,190	...	...	...	...	...	...	...	...
3	168,113	19,153	...	...	...	...	...	...	...	...
4	399,190	45,912	...	...	...	...	...	...	...	...
5	359,744	44,278	...	...	...	...	...	...	...	...
6	282,145	37,612	...	...	...	...	...	...	...	...
7	189,265	25,382	...	...	211	1,866	...	...	73	3,390
8	168,455	18,877	...	...	518	5,006	...	...	11	98
9	176,843	18,778	...	...	211	1,199	...	...	19	244
1910	176,139	18,777	248	1,433	...	...	...	...	12	147
1911	169,043	18,333	679 870	6,682 8,320	...	...	...	...	12	189
1912	165,371	19,725	1,868	22,270	...	...	...	...	14	217
1913	188,020	23,420	3,169	59,002	...	...	...	...	...	...
1914	193,057	23,227	3,554	46,285	...	...	...	...	22	379
1915	222,159	24,295	...	...	2,883	39,032	13	302	7	143
1916	173,012	22,258	...	...	428	12,033	3,523	74,930	14	630
1917	222,075	38,339	...	...	22	593	4,661	139,940	...	...
1918	109,830	22,711	...	...	282	3,045	5,489	163,880	...	...
Total	**3,535,372**	**441,470**	**44,032**	**508,748**	**4,555**	**62,774**	**14,370**	**392,358**	**184**	**5,437**

[2] Weight not stated.

entered for EXPORT from 1850 to 1918, inclusive—continued.

Tungsten Ore.				Arsenical Ore.		Tantalite.		Non-Metallic Minerals.				Year.
Wolfram.		Scheelite.						Graphite.		Magnesite.		
State generally.		State generally.		State generally.		State generally.		State generally.		State generally.		
Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	
tons.	£	tons.	£	tons.	£	tons.	£	tons.	£	tons.	£	
...	...	...	...	...	...	...	...	...	...	...	...	1850
...	...	...	...	...	...	...	...	...	...	...	...	1
...	...	...	...	...	...	...	...	...	...	...	...	2
...	...	...	...	...	...	...	...	...	...	...	...	3
...	...	...	...	...	...	...	...	...	...	...	...	4
...	...	...	...	...	...	...	...	...	...	...	...	5
...	...	...	...	...	...	...	...	...	...	...	...	6
...	...	...	...	...	...	...	...	...	...	...	...	7
...	...	...	...	...	...	...	...	...	...	...	...	8
...	...	...	...	...	...	...	...	...	...	...	...	9
...	...	...	...	...	...	...	...	...	...	...	...	1860
...	...	...	...	...	...	...	...	...	...	...	...	1
...	...	...	...	...	...	...	...	...	...	...	...	2
...	...	...	...	...	...	...	...	...	...	...	...	3
...	...	...	...	...	...	...	...	...	...	...	...	4
...	...	...	...	...	...	...	...	...	...	...	...	5
...	...	...	...	...	...	...	...	...	...	...	...	6
...	...	...	...	...	...	...	...	...	...	...	...	7
...	...	...	...	...	...	...	...	...	...	...	...	8
...	...	...	...	...	...	...	...	...	...	...	...	9
...	...	...	...	...	...	...	...	...	...	...	...	1870
...	...	...	...	...	...	...	...	...	...	...	...	1
...	...	...	...	...	...	...	...	...	...	...	...	2
...	...	...	...	...	...	...	...	...	...	...	...	3
...	...	...	...	...	...	...	...	...	...	...	...	4
...	...	...	...	...	...	...	...	...	...	...	...	5
...	...	...	...	...	...	...	...	...	...	...	...	6
...	...	...	...	...	...	...	...	...	...	...	...	7
...	...	...	...	...	...	...	...	...	...	...	...	8
...	...	...	...	...	...	...	...	...	...	...	...	9
...	...	...	...	...	...	...	...	...	...	...	...	1880
...	...	...	...	...	...	...	...	...	...	...	...	1
...	...	...	...	...	...	...	...	...	...	...	...	2
...	...	...	...	...	...	...	...	...	...	...	...	3
...	...	...	...	...	...	...	...	...	...	...	...	4
...	...	...	...	...	...	...	...	...	...	...	...	5
...	...	...	...	...	...	...	...	...	...	...	...	6
...	...	...	...	...	...	...	...	...	...	...	...	7
...	...	...	...	...	...	...	...	...	...	...	...	8
...	...	...	...	...	...	...	...	...	...	...	...	9
...	...	...	...	...	...	...	...	...	...	...	...	1890
...	...	...	...	...	...	...	...	...	...	...	...	1
...	...	...	...	...	...	...	...	...	...	...	...	2
...	...	...	...	...	...	...	...	...	...	...	...	3
...	...	...	...	...	...	...	...	...	...	...	...	4
...	...	...	...	...	...	...	...	...	...	...	...	5
...	...	...	...	...	...	...	...	...	...	...	...	6
...	...	...	...	...	...	...	...	...	...	...	...	7
...	...	...	...	...	...	...	...	...	...	...	...	8
...	...	...	...	...	...	...	...	...	...	...	...	9
...	...	...	...	...	...	...	...	...	...	...	...	1900
...	...	...	...	...	...	...	...	...	...	...	...	1
...	...	...	...	...	...	...	...	...	...	...	...	2
...	...	...	...	...	...	...	...	...	...	...	...	3
...	...	...	...	...	...	...	...	...	...	...	...	4
...	...	...	...	...	...	18	5,729	...	...	...	...	5
...	...	...	...	...	...	...	...	...	...	...	...	6
...	...	4	140	...	...	...	...	...	...	...	...	7
...	...	...	...	...	...	2†	400	...	...	...	...	8
1	100	...	...	...	...	...	...	...	...	...	...	9
2	190	...	...	...	...	...	...	...	...	...	...	1910
9	826	...	...	...	...	...	...	...	...	...	...	1911
...	...	...	...	...	...	...	...	...	...	...	...	1912
1	86	...	...	...	...	...	...	...	...	...	...	1913
½	40	...	...	...	...	...	...	7	40	...	...	1914
¼	25	...	...	...	...	...	...	...	...	688	1,196	1915
1	128	3	438	11	19	47	9,375	21	284	12	47	1916
...	...	½	42	57	707	17	2,513	18	158	42	50	1917
¼	31	5	720	679	2,564	...	...	5	75	62	225	1918
15	**1,426**	**12**	**1,340**	**747**	**3,290**	**...**	**18,017**	**51**	**557**	**8^4**	**1,518**	**Total**

† Estimated. ‡ Ore and Concentrates.

TABLE XXV.—*Return of Ore and Minerals other than Gold entered for EXPORT from 1850 to 1918, inclusive*—continued.

Year.	Non-Metallic Minerals—*continued.*						Minerals not Elsewhere Included.		Total Value of Minerals other than Gold, exported to Date.	Year.
	Asbestos.		Coal.		Mica.					
	State generally.		Collie River Coal Mf.		State generally.					
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.		
	tons.	£	tons.	£	tons.	£	tons.	£	£	
1850	...	...	...	...	...	...	...	...	55	1850
1	...	...	...	...	...	...	...	...	...	1
2	...	...	...	...	...	...	...	...	...	2
3	...	...	...	...	...	...	...	...	1,211	3
4	...	...	...	...	...	...	...	...	2,440	4
5	...	...	...	...	...	...	...	...	2,951	5
6	...	...	...	...	...	...	...	...	2,218	6
7	...	...	...	...	...	...	...	...	4,330	7
8	...	...	...	...	...	...	...	...	10,751	8
9	...	...	...	...	...	...	...	...	14,752	9
1860	...	...	...	...	...	...	...	...	9,006	1860
1	...	...	...	...	...	...	...	...	7,129	1
2	...	...	...	...	...	...	...	...	12,626	2
3	...	...	...	...	...	...	...	...	14,508	3
4	...	...	...	...	...	...	...	...	18,016	4
5	...	...	...	...	...	...	...	...	21,726	5
6	...	...	...	...	...	...	...	...	11,644	6
7	...	...	...	...	...	...	...	...	15,929	7
8	...	...	...	...	...	...	...	...	14,451	8
9	...	...	...	...	...	...	...	...	10,719	9
1870	...	...	...	...	...	...	...	...	14,604	1870
1	...	...	...	...	...	...	...	...	5,040	1
2	...	...	...	...	...	...	...	...	4,368	2
3	...	...	...	...	...	...	...	...	12,434	3
4	...	...	...	...	...	...	...	...	26,723	4
5	...	...	...	...	...	...	...	...	30,628	5
6	...	...	...	...	...	...	...	...	30,638	6
7	...	...	...	...	...	...	...	...	48,284	7
8	...	...	...	...	...	...	...	...	43,545	8
9	...	...	...	...	...	...	...	...	33,300	9
1880	...	...	...	...	...	...	...	...	15,577	1880
1	...	...	...	...	...	...	...	...	11,224	1
2	...	...	...	...	...	...	...	...	14,371	2
3	...	...	...	...	...	...	...	...	7,341	3
4	...	...	...	...	...	...	...	...	6,642	4
5	...	...	...	...	...	...	...	...	5,048	5
6	...	...	...	...	...	...	...	...	8,012	6
7	...	...	...	...	...	...	...	...	5,175	7
8	...	...	...	...	...	...	...	...	6,848	8
9	...	...	...	...	...	...	...	...	4,704	9
1890	...	...	...	...	...	...	...	...	7,671	1890
1	...	...	...	...	...	...	...	...	14,912	1
2	...	...	...	...	[2]†	25	...	...	22,714	2
3	...	...	...	...	[2]†	4	...	...	11,744	3
4	...	...	...	...	...	...	...	...	15,274	4
5	...	...	...	...	[2]†	3	...	...	22,658	5
6	...	...	...	...	...	...	...	...	4,438	6
7	...	...	...	...	[2]†	209	...	...	4,532	7
8	...	...	1	1	...	...	...	...	7,060	8
9	[2]†	1	798	772	[2]†	50	...	...	66,611	9
1900	...	...	355	350	[2]†	3	5	85	95,261	1900
1	...	...	971	969	...	...	...	4	171,453	1
2	...	...	12	12	...	...	[6]† 3	47	61,551	2
3	[5]†	10	110	127	...	...	[7]† 22	230	109,468	3
4	...	...	11	7	...	...	7	81	97,132	4
5	...	...	108	87	...	...	62	127	192,251	5
6	...	...	86	65	...	...	10	1,035	222,621	6
7	...	...	26 *1,447	28 1,138	...	...	[8]† 96	1,447	402,906	7
8	[2]†	1,242	13 *9,612	11 7,747	[2]†	10	42	2,750	176,827	8
9	...	...	353 *85,647	183 93,781	...	...	[9]† 263	735	282,650	9
1910	...	...	3 *48,876	2 38,400	...	...	½	100	230,106	1910
1911	...	...	* 40,063	29,344	...	...	[10]† 14	407	197,439	1911
1912	...	...	6 *42,602	6 30,721	...	...	[11]†	8	212,509	1912
1913	...	...	*54,228	39,125	...	...	5	17	336,155	1913
1914	...	...	*54,416	38,244	4	323	[12]† 9	635	182,996	1914
1915	...	...	1,667 *26,167	1,513 19,288	[2]†	26	[13]†	115	218,495	1915
1916	...	...	2,447 *37,590	1,857 28,387	[2]†	10	[14]†	713	265,043	1916
1917	...	...	*31,951	29,359	...	...	[15]†	440	343,167	1917
1918	1	25	*23,238	24,424	...	...	[16]† 5	97	360,895	1918
Total	...	**1,278**	**462,804**	**385,948**	...	**663**	...	**9,073**	**4,815,507**	**Total**

* Bunker Coal. [2]† Weight not stated. [5]† 4 cwts. [7]† Antimony ore. [6]† Includes Cobalt ore, 2 tons, valued at £41 : Plumbago ore, 1 ton, valued at £6. [12]† Bismuth. [10]† Molybdenite.

[8]† Includes—

Antimony ore, 25 tons	=	£630
N.E.I., 71 tons ...	=	817
Total ...	...	£1,447

[10]† Includes—

Iron ore, 9 tons ...	=	£7
Ores, N.E.I., 5 tons	=	400
Total ...	...	£407

[13]† Includes—

Bismuth, 1 ton ...	=	£37
Fireclay, 12 tons	=	75
Manganese, 3 cwt.	=	3
Total ...	...	£115

[16]† Includes—

Antimony, 12 tons	=	£258
Bismuth, 9cwt. ...	=	24
Molybdenite, 14 tons	=	158
Total ...	...	£440

[9]† Includes—

Other Concentrates, 29 tons	=	£108
N.E.I., 234 tons	=	£627
Total ...	...	£735

[11]† Includes—

Manganese, 2 tons	=	£4
N.E.I.	=	4
Total ...	...	£8

[14]† Includes—

Antimony, 27 tons	=	£580
Bismuth, 4 cwt. ...	=	133
Total ...	...	£713

PART III.—ALL MINES.

TABLE XXVI.

MILLING AND CYANIDING PLANTS ERECTED IN THE RESPECTIVE GOLDFIELDS, DISTRICTS, AND MINERAL FIELDS ON THE 31ST DECEMBER, 1918, AND THE TOTAL VALUE OF MINING MACHINERY.

Mining Centre and Lease or Area.	Name of Mine, Company, or Works.	Milling.									Cyaniding.			Value of all Mining Machinery.
		Batteries.	Other Mills.											
		Number of Heads of Stampers.	Prospecting Mills.	Ball Mills.	Griffin Mills.	Huntington Mills.	Pudders.	Other Crushers.	Flint Mills.	Grinding Pans.	Leaching Vats.	Agitating Vats.	Vacuum Filters and Presses.	
	PILBARA GOLDFIELD.													
	MARBLE BAR DISTRICT.													
Bamboo Creek. 795	Bulletin	10	...	...	...	...	...	...	...	...	4	...	...	...
⋀ *Elsie.* 792	State Battery, Bamboo Creek	5	...	...	...	...	...	...	...	...	5	...	...	...
Lalla Rookh. R.C. 112.	Trio	3	...	...	...	...	...	...	...	...	...	...	...	...
Marble Bar. 694	Lalla Rookh G.M.	10	...	...	...	...	...	...	...	...	3	...	...	...
⋀	Jo Jo G.M.	5	...	...	...	...	...	...	...	...	...	...	...	...
	State Battery, Marble Bar	5	...	...	...	...	...	...	...	...	...	...	...	...
	Total	**38**	...	...	...	...	...	...	...	...	**12**	...	...	**£8,164**
	NULLAGINE DISTRICT.													
Eastern Creek. M.A. 11L.	Doherty's Works	10	...	...	...	...	...	...	...	...	4	...	...	...
Middle Creek. 212L	Barton	10	...	...	...	...	...	...	...	1	6	...	...	...
20-*Mile Sandy.* ⋀	State Battery, 20-Mile Sandy	5	...	...	...	...	...	...	...	...	4	...	...	...
	Total	**25**	...	...	...	...	...	...	...	1	14	...	...	£30,478
	WEST PILBARA GOLDFIELD.													
Station Peak. 165	Belladonna	20	...	...	...	...	...	...	...	1	...	...	...	...
Towranna. (155)	Tauri Tom Tit	10	...	...	...	...	...	...	...	1	...	...	...	...
Weerianna. (M.A. 12.)	Porteminna Battery	10	...	...	...	...	...	...	...	...	...	...	...	...
	Total	**40**	...	...	...	...	...	...	...	2	...	...	...	**£2,550**
	GASCOYNE GOLDFIELD.													
Bangemall. (32)	Gem	1	...	...	...	...	...	...	...	...	...	...	...	...
	Total	**1**	...	...	...	...	...	...	...	...	...	...	...	**£1,100**
	PEAK HILL GOLDFIELD.													
Peak Hill. (1P, etc.)	(Peak Hill Goldfields, Ltd.)	30	...	...	...	...	...	2	...	...	8	3	...	...
⋀	State Battery, Mt. Egerton	5	...	...	...	...	...	...	...	...	...	...	...	...
⋀	State Battery, Ravelstone	5	...	...	...	...	...	...	...	...	...	...	...	...
⋀	Purcell's Works	...	...	...	...	...	...	...	...	...	5	...	...	...
	Total	**40**	...	...	...	...	...	**2**	...	...	**13**	**3**	...	**£7,122**
	EAST MURCHISON GOLDFIELD.													
	LAWLERS DISTRICT.													
Kathleen Valley. 382	Yellow Aster	10	...	...	...	...	...	...	...	...	4	...	...	...
Lake Darlot. T. Lic. 138H	Murle & Dowson's Cyanide Works	...	...	...	...	...	...	...	...	...	5	...	...	...
(633, etc.)	Zangbar	10	...	...	...	...	...	...	...	...	...	...	...	...
⋀ *Lawlers.*	State Battery, Lake Darlot	10	...	...	...	...	...	...	...	...	...	...	...	...
1171	Great Eastern	5	...	...	...	...	...	...	...	...	6	...	...	...
1172	Queen Battery	5	...	...	...	...	...	...	...	...	5	...	...	...
910	Sunrise	5	...	...	...	...	...	1	...	...	2	...	...	...
1188	Try It	5	...	...	...	...	...	...	...	...	...	...	...	...
58, etc.	Waroonga G.M. Co., Ltd.	10	...	...	...	...	...	1	...	...	...	...	...	...
Sir Samuel. ⋀	State Battery, Sir Samuel	5	...	...	...	...	...	...	...	...	...	...	...	...
	Total	**65**	...	...	...	...	...	**2**	...	...	**22**	...	...	**£13,644**
	WILUNA DISTRICT.													
Collavilla. (71J)	May Queen Reward	5	...	...	...	...	...	...	...	...	...	...	...	...
Mt. Keith. ⋀ *Wiluna.*	State Batery, Mt. Keith	5	...	...	...	...	...	...	...	...	3	...	...	...
M.A. 57J	Christensen's Battery	...	1	...	...	...	...	...	...	...	...	...	...	...
10J	Moonlight	10	...	...	...	...	...	...	...	2	...	6	1	...
6J, etc.	Western Machinery Co., Ltd.	30	...	...	...	...	...	...	...	...	...	...	...	...
12J, etc.	Wiluna G.Ms., Ltd.	25	...	...	...	...	...	1	...	3	9	3	...	...
⋀	State Battery, Wiluna	10	...	...	...	...	...	...	1	...	...	3	1	...
	Total	**85**	1	...	...	...	...	1	1	5	12	12	2	£52,191

TABLE XXVI.—*Milling and Cyaniding Plants erected in the respective Goldfields, Districts, etc.*—continued.

Mining Centre and Lease or Area.	Name of Mine, Company, or Works.	Milling.								Cyanidin			Value of all Mining Machinery.
		Batteries.	Other Mills.										
		Number of Heads of Stampers.	Prospecting Mills.	Ball Mills.	Griffin Mills.	Huntington Mills.	Puddlers.	Other Crushers.	Flint Mills.	Grinding Pans.	Leaching Vats.	Agitating Vats.	Vacuum Filters and Presses.	
	EAST MURCHISON GOLDFIELD—*contd.*													
	BLACK RANGE DISTRICT.													
Birrigrin.														
M.A. 10B	Pelerin	5	...	...	...	...	...	...	...	...	...	...	...	...
M.A. 8B	Reply Works	5	...	...	...	...	...	...	...	...	4	...	...	...
Curran's Find.														
641B	Red White and Blue	5	...	...	...	...	...	...	...	...	...	...	...	...
Maninga Marley.														
203B	Havilah	10	...	...	...	...	...	...	...	...	...	...	...	...
Sandstone.														
M.A. 13B.	Yuanmi G.Ms., Ltd.	20	...	...	...	...	...	...	1	1	...	...	2	...
⋀	State Battery, Black Range	10	...	...	...	...	...	...	...	...	5	...	...	...
Youanme.														
518, etc.	Yuanmi G.Ms., Ltd.	20	...	1	...	...	...	...	1	2	6	3	...	...
⋀	State Battery, Youanme	5	...	...	...	...	...	...	...	...	2	...	...	...
	Total	**80**	...	**1**	...	...	...	...	**2**	**3**	**17**	**3**	**2**	**£100,418**
	MURCHISON GOLDFIELD.													
	CUE DISTRICT.													
Cuddingwarra.														
1860	Big Bell	10	...	...	...	...	...	...	...	1	12	1	...	...
(595)	Victory United	10	...	...	...	...	...	...	...	...	5	...	...	...
T.A. 26	Wright's Works	...	...	...	...	...	...	...	...	...	2	...	...	...
Cue.														
(1833)	Agamemnon	5	...	...	...	...	...	...	...	...	...	...	...	...
203, etc.	Cue No. 1	20	...	...	...	...	...	1	...	...	4	...	...	...
(1020)	Gem of Cue Extended	15	...	...	...	...	...	...	...	...	...	...	...	...
1148, etc.	Light of Asia	...	...	...	...	...	...	2	...	...	...	...	...	...
Tuckabiana.														
1914	Triplicate	5	...	...	...	...	...	...	...	...	...	...	...	...
	Total	**65**	...	...	...	...	...	**3**	...	**1**	**23**	**1**	...	**£40,955**
	MEEKATHARRA DISTRICT.													
Gabanintha.														
(1324N)	Hamburg Belle	5	...	...	...	...	...	...	...	...	3	...	...	...
Garden Gully.														
M.A. 16N	Kyarra G.M. Co., N.L.	10	...	...	...	...	...	...	...	...	...	6	1	...
Gum Creek.														
1386N	Alma May	5	...	...	...	...	...	...	...	...	...	...	...	...
Meekatharra.														
597N, etc.	New Commodore G.M. Co., N.L.	10	...	...	...	...	1	2	...	...	4	4	1	...
477N, etc.	Fenian leases	15	...	...	...	...	...	3	...	7	...	8	1	...
555N	Ingliston	10	...	...	...	...	...	...	...	...	...	...	...	...
475N	Ingliston Consols Extended	15	...	...	...	...	...	1	...	...	6	...	...	...
(398N), etc.	Ingliston Extended G.Ms., Ltd.	10	...	...	...	...	...	2	...	1	2	2	1	...
507N, etc.	Queenhills G.Ms., Ltd.	2	...	...	...	...	...	...	2	2	...	3	1	...
⋀	State Battery, Meekatharra	5	...	...	...	...	...	...	...	...	5	...	...	...
Nannine.														
166N, etc.	Nannine leases	10	...	...	...	...	...	...	...	2	...	...	...	...
Quinn's.														
⋀	State Battery, Quinn's	5	...	...	...	...	...	...	...	...	...	...	...	...
Ruby Well.														
(1261N)	Harder to Find	5	...	...	...	...	...	...	...	...	4	...	...	...
1291N	Waterloo	5	...	...	...	...	...	...	...	...	...	...	...	...
	Total	**112**	...	...	...	...	**1**	**8**	**2**	**12**	**24**	**23**	**5**	**£129,062**
	DAY DAWN DISTRICT.													
Day Dawn.														
1D, etc.	Great Fingall Consolidated, Ltd.	40	...	...	...	...	...	4	...	...	17	11	2	...
(138D)	Murchison Associated	10	...	...	...	...	...	...	...	...	...	...	...	...
Webb's Patch.														
513D	Black Range Pinnacles Co., N.L.	10	...	...	...	...	...	...	...	4	...	6	24	...
	Total	**60**	...	...	...	...	...	**4**	...	**4**	**17**	**17**	**26**	**£161,210**
	MT. MAGNET DISTRICT.													
Boogardie.														
(696M)	Sirdar	...	...	...	...	...	...	...	...	...	3	...	...	...
⋀	State Battery, Boogardie	5	...	...	...	...	...	...	...	...	5	...	...	...
Lennonville.														
964M, etc.	Empress leases	5	...	...	...	...	...	1	...	...	...	...	...	...
⋀	State Battery, Lennonville	10	...	...	...	...	...	...	...	...	...	...	...	...
Mt. Magnet.														
M.A. 6M	Great Boulder No. 1, Ltd.	10	...	...	...	...	...	...	...	...	...	...	...	...
1013M	Mars	...	...	1	...	...	...	...	...	...	7	...	...	...
1075M	New Havelock	5	...	...	...	...	...	...	...	...	4	...	...	...
1095M	Pearl	...	1	...	...	...	...	...	...	...	...	...	...	...
Paynesville.														
T.A. 9M	Paynesville Cyanide Works	...	...	...	...	...	...	...	...	...	3	...	...	...
	Total	**35**	**1**	**1**	...	...	...	**1**	...	...	**22**	...	...	**£18,195**

TABLE XXVI.—*Milling and Cyaniding Plants erected in the respective Goldfields, Districts, etc.*—continued.

Mining Centre and Lease or Area.	Name of Mine, Company, or Works.	Milling.									Cyaniding.			Value of all Mining Machinery.
		Batteries.	Other Mills.											
		Number of Heads of Stampers.	Prospecting Mills.	Ball Mills.	Griffin Mills.	Huntington Mills.	Puddlers.	Other Crushers.	Flint Mills.	Grinding Pans.	Leaching Vats.	Agitating Vats.	Vacuum Filters and Presses.	
	YALGOO GOLDFIELD.													
Field's Find. 680 *Gullewa.* 877 *Noongal.* M.A. 18 *Mt. Gibson.* 722 *Payne's Find.* ⋀ *Warriedar.* 708 ⋀ *Yalgoo.* M.A. 17 *Yuin.* 712, etc.	Field's Find Extended	10	...	...	...	...	...	1	...	...	...	...	...	...
	Mugga King	5	...	...	...	...	...	...	...	...	...	...	...	...
	Melville Battery	5	...	...	...	...	...	...	...	...	...	...	...	...
	Mt. Gibson Crushing Co.	5	...	...	...	...	...	...	...	...	...	...	...	...
	State Battery, Payne's Find	5	...	...	...	...	...	...	...	...	3	...	...	...
	Mug's Luck	10	...	...	...	...	...	...	...	...	4	5	...	...
	State Battery, Warriedar	5	...	...	...	...	...	...	...	...	...	...	...	...
	Ivanhoe Works	5	...	...	...	...	...	...	...	...	...	...	...	...
	Bullrush Gold Estates, N.L.	20	...	...	...	...	...	...	...	5	...	...	...	...
	Total	**70**	...	...	...	...	...	**1**	...	**5**	**7**	**5**	...	**£27,028**
	MT. MARGARET GOLDFIELD.													
	MT. MORGANS DISTRICT.													
Linden. 341F [904R] ⋀ *Mt. Margaret.* 314F *Mt. Morgans.* 5F, etc. 325F *Murrin Murrin.* (194F) *Yundamindera.* M.A. 9F	Devon	5	...	...	...	...	...	...	...	...	...	...	...	...
	State Battery, Linden	10	...	...	...	...	...	...	...	...	6	...	...	...
	Mt. Morven	5	...	...	...	...	...	...	...	...	3	...	...	...
	Westralia Mt. Morgans Mines, N.L.	10	...	...	...	...	...	...	...	3	...	2	1	...
	Millionaire Works	5	...	...	...	...	...	...	...	...	...	...	...	...
	Hills Proprietary	20	...	...	...	...	...	...	...	...	9	...	...	...
	Battles Ville Battery	5	...	...	...	...	...	...	...	...	5	...	...	...
	Total	**60**	...	...	...	...	...	...	...	**3**	**23**	**2**	**1**	**£13,860**
	MT. MALCOLM DISTRICT.													
Leonora. (1473C) 263C 1482C 190C, etc. 198C, etc. ⋀ *Mt. Clifford.* 1329C *Mt. Malcolm.* (1175C) (1470C) *Pig Well.* 1295C, etc. *Wilson's Patch.* 1496	Chaffers G.M. Co., (1916), Ltd.	5	...	...	...	...	...	1	...	...	...	...	...	...
	Gwalia Central G.Ms., Ltd.	5	...	...	...	...	...	...	...	...	...	...	...	...
	Leonora Gold Blocks, N.L.	10	...	...	...	...	...	2	...	3	1	4	...	...
	Sons of Gwalia, Ltd.	50	...	...	...	...	...	...	4	10	...	8	2	...
	Sons of Gwalia South G.Ms., Ltd.	10	...	...	...	...	...	...	...	...	...	...	...	...
	State Battery, Leonora	10	...	...	...	...	...	...	...	...	...	...	...	...
	Victory No. 1	5	...	...	...	...	...	...	...	...	...	...	...	...
	North Star : Malcolm Prospecting Co., N.L. ...	10	...	...	...	...	...	...	...	...	...	...	...	...
	Never Tire	2	...	...	...	...	...	...	...	...	...	...	...	...
	Starlight G.M. Syndicate, N.L.	10	...	...	...	...	...	1	...	...	...	...	...	...
	Great Western	10	...	...	...	...	...	...	...	...	...	...	...	...
	Total	**127**	...	...	...	...	...	**4**	**4**	**13**	**1**	**12**	**2**	**£248,582**
	MT. MARGARET DISTRICT.													
Burtville. 1044T ⋀ *Erlistoun.* M.A. 18T (1990T) M.A. 20T *Euro.* 1984T *Laverton.* 2083T 829T, etc. 715T, etc. (189T) ⋀	Nil Desperandum	...	...	1	...	...	...	...	...	1	...	...	...	...
	State Battery, Burtville	10	...	...	...	...	...	...	...	...	...	...	...	...
	Little Doris	5	...	...	...	...	...	...	...	...	...	...	...	...
	Mulga Queen Consols	10	...	...	...	...	...	...	...	...	4	...	...	...
	Westralia Tasmania	5	...	...	...	...	...	...	...	...	4	...	...	...
	Lone Star	10	...	...	...	...	...	...	...	...	6	...	...	...
	Beria Main Reef	...	...	...	...	1	...	...	...	...	...	...	...	...
	Ida H. G.M. Co., Ltd.	10	...	...	...	...	...	1	...	2	...	...	...	...
	Lancefield G.Ms., Ltd.	...	...	5	...	...	...	1	...	8	...	6	3	...
	Mary Mac G.M. Co., N.L.	10	...	...	...	...	...	...	...	4	4	...	...	...
	State Battery, Laverton	10	...	...	...	...	...	...	...	...	3	...	...	...
	Total	**70**	...	**6**	...	**1**	...	**2**	...	**15**	**21**	**6**	**3**	**£48,717**
	NORTH COOLGARDIE GOLDFIELD.													
	MENZIES DISTRICT.													
Comet Vale. 5217Z 5300Z 5211Z, etc. *Goongarrie.* 5414Z *Menzies.* (5354Z) (5420Z) M.A. 60Z (4895Z) 4931Z, etc. 3100Z, etc. T.A. 47Z *Mt. Ida.* M.A. 34Z ⋀	Gladsome	10	...	...	...	...	...	...	...	2	14	...	...	...
	Happy Jack	...	...	...	...	1	...	...	...	...	...	...	...	...
	Sand Queen G.Ms., Ltd.	20	...	...	...	...	...	2	...	5	12	...	...	...
	New Boddington	10	...	...	...	...	...	...	...	...	...	...	...	...
	Balkis	5	...	...	...	...	...	...	...	1	4	...	...	...
	Goodenough	5	...	...	...	...	...	...	...	...	...	...	...	...
	Lady Harriett Battery	5	...	...	...	...	...	...	...	...	4	...	...	...
	Mararoa	10	...	...	...	...	...	...	...	1	7	...	...	...
	Menzies Consolidated G.Ms., Ltd.	20	...	...	...	...	...	...	...	9	15	4	1	...
	Menzies Mining and Exploration Corp., Ltd.	10	...	...	...	...	...	...	...	...	8	...	1	...
	Gidney's Works	...	...	...	...	...	...	...	...	...	14	...	...	...
	Mt. Ida Meteor	5	...	...	...	...	...	...	...	1	2	...	...	...
	State Battery, Mt. Ida	5	...	...	...	...	...	...	...	...	...	...	...	...
	Total	**105**	...	...	...	**1**	...	**2**	...	**19**	**80**	**4**	**2**	**£55,648**

TABLE XXVI.—*Milling and Cyaniding Plants erected in the respective Goldfields, Districts, etc.*—continued.

Mining Centre and Lease or Area.	Name of Mine, Company, or Works.	Milling.									Cyaniding.			Value of all Mining Machinery.
		Batteries.	Other Mills.											
		Number of Heads of Stampers.	Prospecting Mills.	Ball Mills.	Griffin Mills.	Huntington Mills.	Puddlers.	Other Crushers.	Flint Mills.	Grinding Pans.	Leaching Vats.	Agitating Vats.	Vacuum Filters and Presses.	
	NORTH COOLGARDIE GOLDFIELD.													
	ULARRING DISTRICT.													
Davyhurst. (438U) *Mulline* 324U, etc. ⋀ *Mulwarrie.* ⋀	Waihi	10	...	....	...	...	...	...	...	...	...	...	...	...
	Riverina South	10	...	....	...	...	...	1	1	2	...	4	...	...
	State Battery, Mulline	10	...	...	...	...	...	...	...	...	5	...	...	...
	State Battery, Mulwarrie	10	...	...	...	...	...	...	...	...	6	...	...	...
	Total	40	...	...	...	...	...	1	1	2	11	4	...	£31,000
	NIAGARA DISTRICT.													
Kookynie. 769G *Niagara.* M.A., 35G (734G) (419G) T.L., 108H ⋀ *Tampa.* (753G) M.A., 59G	Two D's	...	...	1	...	...	...	1	...	...	2	...	...	...
	Eagle Hawk Heather	10	...	...	...	...	...	...	...	...	...	...	...	...
	Lubra Queen	5	...	...	...	...	...	...	...	...	...	...	...	...
	Orion Mines, Ltd.	10	...	...	...	...	...	...	...	1	6	...	...	...
	Bright's Cyanide Works	...	...	...	...	...	...	...	...	...	3	...	...	...
	State Battery, Niagara	10	...	....	...	...	...	...	...	...	6	...	...	...
	Golden Butterfly G.M. Co., N.L.	10	...	...	...	...	...	...	...	1	1	...	2	...
	Grafter	5	...	...	...	...	...	...	...	1	2	...	...	...
	Total	50	...	1	...	...	...	1	...	3	19	...	2	£6,761
	YERILLA DISTRICT.													
Edjudina. 1011K *Pinjin.* ⋀ *Yarri.* ⋀ *Yerilla.* ⋀	Neta	10	...	...	...	...	...	1	...	...	3	...	...	...
	State Battery, Pinjin	5	...	...	...	...	...	...	...	...	...	...	...	...
	State Battery, Yarri	10	...	...	...	...	...	...	...	...	5	...	...	...
	State Battery, Yerilla	5	...	...	...	...	...	...	...	...	3	...	...	...
	Total	30	...	...	...	...	...	1	...	...	11	...	...	£4,219
	BROAD ARROW GOLDFIELD.													
Bardoc. (1743W) *Carnage.* M.A., 22W *Paddington.* (1733W) *Siberia.* 1399W 1371W 1289W 1736W ⋀ ⋀	Zoroastrian	5	...	...	...	...	...	1	...	...	...	...	...	...
	Regan's Carnage Battery	10	...	...	...	...	...	...	...	...	...	...	...	...
	Mount Eddy	...	...	...	...	1	...	...	...	...	...	...	...	...
	Associated Northern Blocks (W.A.), Ltd. ...	...	...	1	...	2	3	...	...	10	7	...	2	...
	Gimblet South	10	...	...	...	...	...	...	...	...	...	...	...	...
	Lady Evelyn	5	...	...	...	...	...	...	...	...	...	...	...	...
	Pole Battery	5	...	...	...	...	...	...	...	...	3	1	...	...
	State Battery, Ora Banda	5	...	...	...	...	...	...	...	...	5	...	...	...
	State Battery, Siberia	5	...	...	...	...	...	...	...	...	...	...	...	...
	Total	45	...	1	...	3	3	1	...	10	15	1	2	£65,411
	NORTH-EAST COOLGARDIE GOLDFIELD.													
	KANOWNA DISTRICT.													
Gordon. 1385X (891X) *Kanowna.* M.A., 19X M.A., 56X Q.C., 57X M.A., 58X	Pride of the Morning	...	...	...	...	1	...	...	...	...	...	...	...	...
	Sirdar	10	...	...	...	...	...	...	...	...	8	...	...	...
	Martin's Works	15	...	...	...	...	...	1	...	...	8	...	...	...
	North White Feather G.Ms., Ltd.	40	...	...	...	...	...	...	...	1	...	...	...	...
	Riedel & Norton's Works	10	...	...	...	...	...	...	...	1	6	...	...	...
	Lady Pratt	10	...	...	...	...	...	...	...	...	...	...	...	...
	Total	85	...	...	...	1	...	1	...	2	22	...	...	£11,333
	KURNALPI DISTRICT.													
Kurnalpi. M.A., 2K *Mulgabbie.* M.A., 1K	Success	5	...	...	...	...	...	...	...	...	...	...	...	...
	Simmon's Battery	...	1	...	...	...	...	...	...	...	...	...	...	...
	Total	5	1	...	...	...	...	...	...	...	...	...	...	£150

TABLE XXVI.—*Milling and Cyaniding Plants erected in the respective Goldfields, Districts, etc.*—continued.

Mining Centre and Lease or Area.	Name of Mine, Company, or Works.	Milling.									Cyaniding.			Value of all Mining Machinery.
		Batteries.	Other Mills.											
		Number of Heads of Stampers.	Prospecting Mills.	Ball Mills.	Griffin Mills.	Huntington Mills.	Pudlers.	Other Crushers.	Flint Mills.	Grinding Pans.	Leaching Vats.	Agitating Vats.	Vacuum Filters and Presses.	
	EAST COOLGARDIE GOLDFIELD.													
	EAST COOLGARDIE DISTRICT.													
Boorara.														
3908E, etc.	Golden Ridge G.M. Co., Ltd.	20	...	...	...	...	...	1	...	...	6	...	...	...
Boulder.														
38E, etc.	Associated G.Ms., of W.A., Ltd.	...	...	9	...	...	...	1	...	20	...	6	7	...
49E, etc.	Associated Northern Blocks (W.A.), Ltd. ...	...	...	...	...	1	...	...	...	...	4	...	...	...
351E, etc.	Golden Horseshoe Estates Co., Ltd.	140	...	1	...	...	3	6	15	24	20	22	20	...
50E	Great Boulder No. 1, Ltd.	10	...	...	...	...	...	...	...	1	...	...	...	...
66E	Great Boulder Perseverance G.M. Co., Ltd. ...	...	...	8	...	...	...	4	2	17	...	24	13	...
M.A., 59E	Great Boulder Proprietary G.Ms., Ltd. ...	...	1	4	13	...	...	9	...	20	...	23	14	...
3643E	Hainault Sulphide Plant	...	...	2	...	...	...	...	...	...	...	...	...	...
M.A., 7E	Hannans Central Battery	20	...	...	...	...	...	3	1	...	8	4	2	...
4317E	Idaho	10	...	...	...	...	...	1	...	1	6	...	...	...
946E	Ironsides North	10	...	...	...	...	...	...	...	1	6	...	...	...
31E, etc.	Ivanhoe Gold Corporation, Ltd.	100	...	...	...	...	...	9	2	25	32	13	9	...
22E, etc.	Kalgurli G.Ms., Ltd.	...	...	9	...	...	...	7	...	17	...	16	9	...
15E, etc.	Lake View and Star, Ltd.	75	...	1	...	...	...	7	8	21	...	27	17	...
281E, etc.	North Kalgurli (1912), Ltd.	20	...	...	...	...	...	...	...	...	9	3	1	...
6E, etc.	Oroya Links, Ltd.	55	...	2	...	...	...	...	5	3	4	3	5	...
1208E, etc.	South Kalgurli Consolidated, Ltd.	40	...	4	...	...	...	2	...	15	34	11	10	...
Kalgoorlie.														
796E	Bonnie Lass (Raven Battery)	10	...	...	...	...	...	...	...	...	5	...	...	...
M.A., 5E	Brown Hill Consols, Ltd.	20	...	...	...	...	...	...	...	...	...	...	...	...
4623E	Cassidy Hill	...	...	...	...	1	...	...	...	...	3	...	...	...
4545E	Creswick Battery	...	...	...	...	1	...	...	...	...	...	...	...	...
M.A., 64E	Dunstan & Cumming's Plant	...	...	...	...	...	...	1	...	...	12	...	1	...
4546E, etc.	Hannan's Reward, Ltd.	5	...	...	...	1	...	1	...	...	3	...	...	...
L.C., 353E	Lone Hand Works	...	...	...	...	1	...	...	...	1	...	7	...	...
	Total	**585**	**1**	**40**	**13**	**5**	**3**	**46**	**33**	**166**	**152**	**159**	**108**	**£1,386,849**
	BULONG DISTRICT.													
Randalls.														
M.A., 68Y	Hardcastle	20	1	...	...	...	...	...	...	...	...	...	...	...
	Total	**20**	**1**	...	...	...	...	...	...	...	...	...	...	**£8,000**
	COOLGARDIE GOLDFIELD.													
	COOLGARDIE DISTRICT.													
Bonnievale.														
(144)	Westralia and East Extension Mines, Ltd. ...	40	...	...	...	...	...	2	...	...	...	...	...	...
Burbanks.														
(134), etc.	Burbanks Birthday G.Ms., Ltd.	60	...	...	...	...	...	1	...	...	9	...	...	...
M.A., 77	Burbanks Main Lode (1904), Ltd.	20	...	...	...	...	...	...	...	...	12	...	...	...
2160	Lady Robinson G.M. Co., N.L.	10	...	...	...	...	...	...	...	...	8	...	...	...
4469	Lord Bobs	...	...	...	...	1	...	...	...	...	...	...	...	...
Coolgardie.														
(3918)	Coolgardie Redemption	10	...	...	...	...	...	...	...	...	...	...	...	...
M.A., 11	New Bayley's Mines, Ltd.	10	...	...	...	...	...	...	...	...	6	...	...	...
	State Battery, Coolgardie	10	...	...	...	...	...	2	...	...	6	...	...	...
Eundynie.														
4253	Hidden Secret North	10	...	...	...	...	...	...	...	...	6	...	...	...
Gibraltar.														
(4418)	Reform	5	...	...	...	...	...	...	...	...	3	...	...	...
Higginsville.														
4184	Sons of Erin	10	...	...	...	...	...		...	...	...	...	...	...
Red Hill.														
(4331)	Edquist	...	...	...	...	...	...	...	...	6	...	...	...	...
Widgiemooltha.														
M.A., 63	Highgate Battery	3	...	...	...	...	...	...	...	1	...	...	...	...
7497	Imperial Battery	5	...	...	...	...	...	...	...	...	...	...	...	...
(3906)	Yorkshire Lass	3	...	...	...	...	...	...	...	...	2	...	...	...
	Total	**196**	...	...	...	**1**	...	**5**	...	**7**	**52**	...	...	**£33,916**
	KUNANALLING DISTRICT.													
Balgarrie.														
M.A., 138	Stanley Battery	5	...	...	...	...	...	...	...	...	3	...	...	...
Carbine.														
338	Carbine	10	...	...	...	...	...	...	...	2	...	...	...	...
25-Mile.														
6968	Blue Bell	5	...	...	...	...	...	...	...	...	7	...	...	...
8718	Shamrock	5	...	...	...	...	...	...	...	...	4	...	...	...
(6458)	Star of Fremantle	10	...	...	...	...	...	...	...	...	...	...	...	...
(8468)	Swallow	5	...	...	...	...	...	...	...	...	...	...	...	...
	Total	**40**	...	...	...	...	...	...	...	**2**	**14**	...	...	**£7,800**

TABLE XXVI.—*Milling and Cyaniding Plants erected in the respective Goldfields, Districts, etc.*—continued.

Mining Centre and Lease or Area.	Name of Mine, Company, or Works.	Milling.									Cyaniding.			Value of all Mining Machinery.
		Batteries.	Other Mills.											
		Number of Heads of Stampers.	Prospecting Mills.	Ball Mills.	Griffin Mills.	Huntington Mills.	Puddlers.	Other Crushers.	Flint Mills.	Grinding Pans.	Leaching Vats.	Agitating Vats.	Vacuum Filters and Presses.	
	YILGARN GOLDFIELD.													
Bullfinch. 914, etc.	Bullfinch Proprietary (W.A.), Ltd.	20	...	...	...	...	...	...	2	2	...	4	3	...
Corinthian. 896, etc.	Corinthian North G.Ms., Ltd.	20	...	2	...	...	...	...	2	2	...	...	...	...
Golden Valley. 2272	Glide Away	5	...	...	...	...	...	...	...	1	4	...	...	...
Greenmount. 550	Sunbeam	5	...	...	...	...	...	...	...	1	7	...	...	...
536	Transvaal	20	...	...	...	...	...	1	...	...	...	...	...	...
Hope's Hill. M.A., 21	Lakeside Battery	10	...	...	...	...	...	...	...	1	6	...	...	...
Kennyville. 570	Great Leviathan	5	...	...	...	...	...	...	...	...	...	...	...	...
Marvel Loch. (768)	Donovan's Find Battery	5	...	...	...	...	...	...	...	...	13	...	...	...
719, etc.	Great Victoria	10	...	...	...	...	...	...	...	2	10	...	...	...
M.A., 19	Marvel Loch Cyanide Works	...	...	...	...	...	...	...	...	...	10	...	...	...
M.A., 16	Mountain Queen, Ltd.	2	...	...	...	...	...	...	...	3	...	...	1	...
M.A., 18	Never Never Works	10	...	...	...	...	...	...	...	...	3	...	...	...
Mt. Jackson. (1933)	Butcher Bird No. 1	5	...	...	...	...	...	...	...	...	...	...	...	...
Parker's Range. (508)	Australia	5	...	...	...	...	...	...	...	...	5	...	...	...
2801	Scots Greys	5	...	...	...	...	...	...	...	...	...	...	...	...
724	Spring Hill G.M. Co., N.L.	10	...	...	...	...	...	...	...	1	3	...	...	...
Southern Cross. 2787	Mt. Rankin Gold Mines, N.L.	10	...	...	...	...	...	...	...	2	...	...	...	...
Westons. 2679	Edna May Battler G.M. Co., N.L.	5	...	...	...	...	...	...	...	...	4	...	1	...
2291	Edna May Central G.Ms., N.L.	10	...	...	...	...	...	...	...	2	8	...	...	...
2570	Edna May Consolidated G.M. Co., N.L. ...	10	...	...	...	...	...	1	...	1	...	...	...	...
2168	Edna May Deep Levels G.M. Co., N.L. ...	10	...	...	...	...	...	...	...	...	...	...	...	...
2180	Edna May G.M. Co., N.L.	10	...	...	...	...	...	...	...	2	7	3	...	...
2087	Greenfinch Proprietary G.M., N.L.	5	...	...	...	...	...	...	...	1	...	...	...	...
	Total	**197**	...	**2**	...	...	...	**2**	**4**	**21**	**80**	**7**	**5**	**£211,893**
	DUNDAS GOLDFIELD.													
Norseman. (938), etc.	Hampton Uruguay, Ltd.	10	...	...	...	...	...	...	...	4	12	4	1	...
M.A., 31	Mararoa G.M. Co., N.L.	20	...	...	...	...	...	2	...	3	17	4	1	...
(1021)	Princess Royal North	10	...	...	...	...	...	...	...	2	2	2	...	...
M.A., 18	Rawling's, Bullen, and Rumble	10	...	...	...	...	...	3	...	...	4	...	...	...
990	Viking No. 1 Syndicate	10	...	...	...	...	...	...	...	...	6	...	...	...
	State Battery, Norseman	5	...	...	...	...	...	...	...	...	6	...	...	...
	Total	**65**	...	...	...	...	...	**5**	...	**9**	**47**	**10**	**2**	**£25,100**
	PHILLIPS RIVER GOLDFIELD.													
Kundip. 136, etc.	Flag Leases	5	...	...	...	...	...	...	...	...	...	...	...	...
M.A., 6	Gem	5	...	...	...	...	...	...	...	...	4	...	...	...
151, etc.	Gem Consolidated	5	...	...	...	...	...	...	...	...	...	...	...	...
M.L., 52	Harbour View Gold and Copper Co., Ltd. ...	10	...	...	...	...	...	...	...	...	...	...	...	...
74	Two Boys	10	...	...	...	...	...	...	...	...	...	...	...	...
Mt. Purchas. M.A., 18	Mount Purchas Prospecting Plant	...	1	...	...	...	...	...	...	...	...	...	...	...
Ravensthorpe. (153)	Maori Queen	...	1	...	...	...	...	1	...	...	...	...	...	...
M.A., 4	Ravensthorpe Battery Co., Ltd.	10	...	...	...	...	...	...	...	...	...	...	...	...
	Total	**45**	**2**	...	...	...	...	**1**	...	...	**4**	...	...	**£10,600**
	State generally	...	...	**1**	...	...	...	**1**	...	...	...	...	...	...
	Total	...	...	**1**	...	...	...	**1**	...	...	...	...	...	**£30,000**

TABLE XXVI.—*Milling and Cyaniding Plants erected in the respective Goldfields, Districts, etc.*—continued.

GOLDFIELD.	DISTRICT.	MILLING. Batteries. Number of Heads of Stampers.	MILLING. Other Mills. Prospecting Mills.	Ball Mills.	Griffin Mills.	Huntington Mills.	Puddlers.	Other Crushers.	Flint Mills.	Grinding Pans.	CYANIDING. Leaching Vats.	Agitating Vats.	Vacuum Filters and Presses.	Total Value of all Mining Machinery.
	GOLD MINING.													£
KIMBERLEY	...	...	...	...	...	...	...	...	...	...	...	...	...	...
PILBARA	Marble Bar	38	...	...	...	...	...	...	...	...	12	...	...	8,164
	Nullagine	25	...	...	...	...	...	...	...	1	14	...	...	30,478
WEST PILBARA	...	40	...	...	...	...	...	...	...	2	...	...	...	2,550
ASHBURTON	...	...	...	...	...	...	...	...	...	...	...	...	...	...
GASCOYNE	...	1	...	...	...	...	...	...	...	...	...	...	...	1,100
PEAK HILL	...	40	...	...	...	...	...	2	...	...	13	3	...	7,122
EAST MURCHISON	Lawlers	65	...	...	...	...	...	2	...	...	22	...	...	13,644
	Wiluna	85	1	...	...	...	...	1	1	5	12	12	2	52,191
	Black Range	80	...	1	...	...	...	...	2	3	17	3	2	100,418
	Cue	65	...	...	...	...	...	3	...	1	23	1	...	40,955
MURCHISON	Meekatharra	112	...	...	...	...	1	8	2	12	24	23	5	129,062
	Day Dawn	60	...	...	...	...	...	4	...	4	17	17	26	161,210
	Mt. Magnet	35	1	1	...	...	...	1	...	...	22	...	...	18,195
YALGOO	...	70	...	...	...	...	...	1	...	5	7	5	...	27,028
MT. MARGARET	Mt. Morgans	60	...	...	...	...	...	...	...	3	23	2	1	13,860
	Mt. Malcolm	127	...	...	...	...	...	4	4	13	1	12	2	248,582
	Mt. Margaret	70	...	6	...	1	...	2	...	15	21	6	3	48,717
	Menzies	105	...	...	...	1	...	2	...	19	80	4	2	55,648
NORTH COOLGARDIE	Ularring	40	...	...	...	...	...	1	1	2	11	4	...	31,000
	Niagara	50	...	1	...	...	...	1	...	3	19	...	2	6,761
	Yerilla	30	...	...	...	...	...	1	...	...	11	...	...	4,219
BROAD ARROW	...	45	...	1	...	3	3	1	...	10	15	1	2	65,411
N.E. COOLGARDIE	Kanowna	85	...	...	...	1	...	1	...	2	22	...	...	11,333
	Kurnalpi	5	1	...	...	...	...	...	...	...	...	...	...	150
EAST COOLGARDIE	East Coolgardie	535	1	40	13	5	3	46	33	166	152	159	108	1,366,849
	Bulong	20	1	...	...	...	...	...	...	...	...	...	...	8,000
COOLGARDIE	Coolgardie	196	...	...	...	1	...	5	...	7	52	...	...	33,916
	Kunanalling	40	...	...	...	...	...	...	...	2	14	...	...	7,300
YILGARN	...	197	...	2	...	...	...	2	4	21	80	7	5	211,893
DUNDAS	...	65	...	...	...	...	...	5	...	9	47	10	2	25,100
PHILLIPS RIVER	...	45	2	...	...	...	...	1	...	...	4	...	...	10,600
STATE GENERALLY	...	...	...	1	...	...	...	1	...	...	...	...	...	30,000
	Total Gold Mining Machinery ...	**2,431**	**7**	**53**	**13**	**12**	**7**	**95**	**47**	**305**	**735**	**269**	**162**	**2,771,456**
	LEAD MINING.													
NORTHAMPTON, M.F.	...	...	...	...	...	...	...	6	...	...	...	...	...	28,500
	Total, Lead Mining Machinery ...	...	...	...	...	...	...	**6**	...	...	...	...	...	**28,500**
	TIN MINING.													
PILBARA	Marble Bar	...	...	...	...	1	...	2	...	...	...	...	...	25,300
GREENBUSHES TINFIELD	...	5	...	...	1	...	1	6	...	...	...	...	...	27,155
	Total, Tin Mining Machinery ...	**5**	...	...	**1**	**1**	**1**	**8**	...	...	...	...	...	**52,455**
	COPPER MINING.													
PHILLIPS RIVER	...	...	...	...	...	...	...	12	...	...	...	...	...	76,751
WEST PILBARA	...	...	...	...	...	...	...	...	...	...	...	...	...	73,460
MT. MARGARET	Mt. Morgans	...	...	...	...	...	...	...	...	...	...	...	...	2,500
	Total, Copper Mining Machinery ...	...	...	...	...	...	...	**12**	...	...	...	...	...	**152,711**
	COAL MINING.													
COLLIE RIVER COALFIELD	...	...	...	...	...	...	...	...	...	...	...	...	...	67,651
	Total, Coal Mining Machinery ...	...	...	...	...	...	...	...	...	...	...	...	...	**67,651**
Total, Machinery other than Gold Mining		**5**	...	...	**1**	**1**	**1**	**26**	...	...	...	...	...	**301,317**
Total all Mining Machinery		**2,436**	**7**	**53**	**14**	**13**	**8**	**121**	**47**	**305**	**735**	**269**	**162**	**£3,072,773**

APPENDIX.

ROYAL MINT, PERTH BRANCH.

Subject to the Regulations, any person may deposit gold at the Mint in his own name. Those who cannot attend personally for the purpose may send the gold by an agent, under Police escort, or by Post.

A circular can be obtained from the Deputy Master of the Mint giving all necessary information for intending depositors, conditions of the Escort Service, Coining Regulations, etc., etc.

An Escort Service is provided by the Police Department for parcels of all sizes. The consignor pays for the carriage by coach or train, but the escort charges may be collected by the Mint.

Forms for use in connection with gold sent to the Mint by post or under Police escort can be obtained at the Mint.

Charges for Assaying, Refining, and Coinage.

Gross Weight of Deposit in ounces.	Mint Charge.	Gross Weight of Deposit in ounces.	Mint Charge.	Gross Weight of Deposit in ounces.	Mint Charge.
Up to and including—	£ s. d.	Up to and including—	£ s. d.	Up to and including—	£ s. d.
24	0 5 0	400	4 3 4	1,300	10 4 2
30	0 6 3	410	4 5 5	1,400	10 16 8
40	0 8 4	420	4 7 6	1,500	11 9 2
50	0 10 5	430	4 9 7	1,600	12 1 8
60	0 12 6	440	4 11 8	1,700	12 14 2
70	0 14 7	450	4 13 9	1,800	13 6 8
80	0 16 8	460	4 15 10	1,900	13 19 2
90	0 18 9	470	4 17 11	2,000	14 11 8
100	1 0 10	480	5 0 0	2,100	15 4 2
110	1 2 11	490	5 2 1	2,200	15 16 8
120	1 5 0	500	5 4 2	2,300	16 9 2
130	1 7 1	520	5 6 8	2,400	17 1 8
140	1 9 2	540	5 9 2	2,500	17 14 2
150	1 11 3	560	5 11 8	2,600	18 6 8
160	1 13 4	580	5 14 2	2,700	18 19 2
170	1 15 5	600	5 16 8	2,800	19 11 8
180	1 17 6	620	5 19 2	2,900	20 4 2
190	1 19 7	640	6 1 8	3,000	20 16 8
200	2 1 8	660	6 4 2	3,100	21 9 2
210	2 3 9	680	6 6 8	3,200	22 1 8
220	2 5 10	700	6 9 2	3,300	22 14 2
230	2 7 11	720	6 11 8	3,400	23 6 8
240	2 10 0	740	6 14 2	3,500	23 19 2
250	2 12 1	760	6 16 8	3,600	24 11 8
260	2 14 2	780	6 19 2	3,700	25 4 2
270	2 16 3	800	7 1 8	3,800	25 16 8
280	2 18 4	820	7 4 2	3,900	26 9 2
290	3 0 5	840	7 6 8	4,000	27 1 8
300	3 2 6	860	7 9 2	4,100	27 14 2
310	3 4 7	880	7 11 8	4,200	28 6 8
320	3 6 8	900	7 14 2	4,300	28 19 2
330	3 8 9	920	7 16 8	4,400	29 11 8
340	3 10 10	940	7 19 2	4,500	30 4 2
350	3 12 11	960	8 1 8	4,600	30 16 8
360	3 15 0	980	8 4 2	4,700	31 9 2
370	3 17 1	1,000	8 6 8	4,800	32 1 8
380	3 19 2	1,100	8 19 2	4,900	32 14 2
390	4 1 3	1,200	9 11 8	5,000	33 6 8

For every additional 100ozs. the charge is increased by 12s. 6d.

NOTE.—Additional charges (*see* Regulation No. 6) are collected when base metals in a deposit exceed 2 per cent. of its weight.

The following table illustrates the operation of these charges in case of gold of the value of £3 17s. 10½d. an ounce:—

Weight of Deposit.	Rate of Charge per ounce.	Amount of Charge.	Net Value of Deposit.
ozs.	d.	£ s. d.	£ s. d.
50	2.5	0 10 5	194 3 4
100	2.5	1 0 10	388 6 8
600	2.3	5 16 8	2,330 8 4
1,000	2.0	8 6 8	3,885 8 4
5,000	1.6	33 6 8	19,435 8 4
10,000	1.55	64 11 8	38,872 18 4

NOTE.—A proportion of silver in deposits of gold is paid for by the Mint as follows:—

In deposits under 1,000ozs. gross: all silver in excess of 8 per cent. of the weight of the deposit after melting.
" from 1,000 " to 5,000 " " 6 " " " " "
" " 5,000 " " 10,000 " " 5 " " " " "
" " 10,000 " upwards " " 4 " " " " "

The rate at which payment for silver is made is liable to fluctuation.

GOLD ESCORT SERVICE.

RATES.

Actual Cost, plus 20 per cent.

RATES FOR CARRIAGE OF GOLD ON GOVERNMENT RAILWAYS.

	Distance not over—							
	25 miles.	50 miles.	100 miles.	150 miles.	200 miles.	250 miles.	300 miles.	350 miles.
Gold dust and bullion per 100ozs.	s. d. 1 0	s. d. 2 0	s. d. 3 0	s. d. 3 9	s. d. 4 6	s. d. 5 0	s. d. 5 6	s. d. 6 0

6d. per 100ozs. for every additional 50 miles, or part thereof.

NOTE.—A special reduction of 25 per cent. is made for all gold dust or bullion consigned to the Perth Mint.

To find the value per ounce of gold sent from a mine to the Mint.—Divide the standard gold by the weight before melting, and multiply the result by £3 17s. 10½d. For instance, supposing the Mint return to show:—

	Ozs.
Weight before melting	47.41
Standard gold	38.19

The calculation would be as follows:—

4741)3819.0(.805
3792.8
26200
23705
2495

.805 × £3 17s. 10½d. =
.805 × £3.894
.805
19470
311520
£3.134(670)
20
s. 2.680
12
d. 8.160 = £3 2s. 8d., value per ounce of gold as produced from the mine.

By Authority: FRED. WM. SIMPSON, Government Printer, Perth.