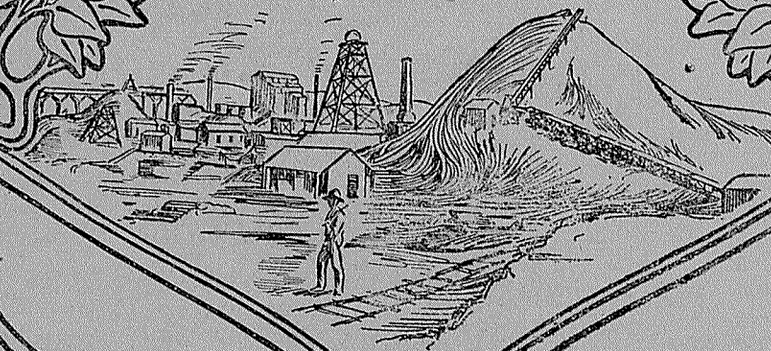
REPORT
OF THE
DEPARTMENT OF MINES
FOR THE YEAR
WESTERN · 1925. · AUSTRALIA



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

1926.

WESTERN AUSTRALIA.

REPORT

OF THE

DEPARTMENT OF MINES

FOR THE YEAR

1925.

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

[THIRD SESSION OF THE TWELFTH PARLIAMENT.]

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1926

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ANNUAL REPORT OF THE DEPARTMENT OF MINES, WESTERN AUSTRALIA, 1925.

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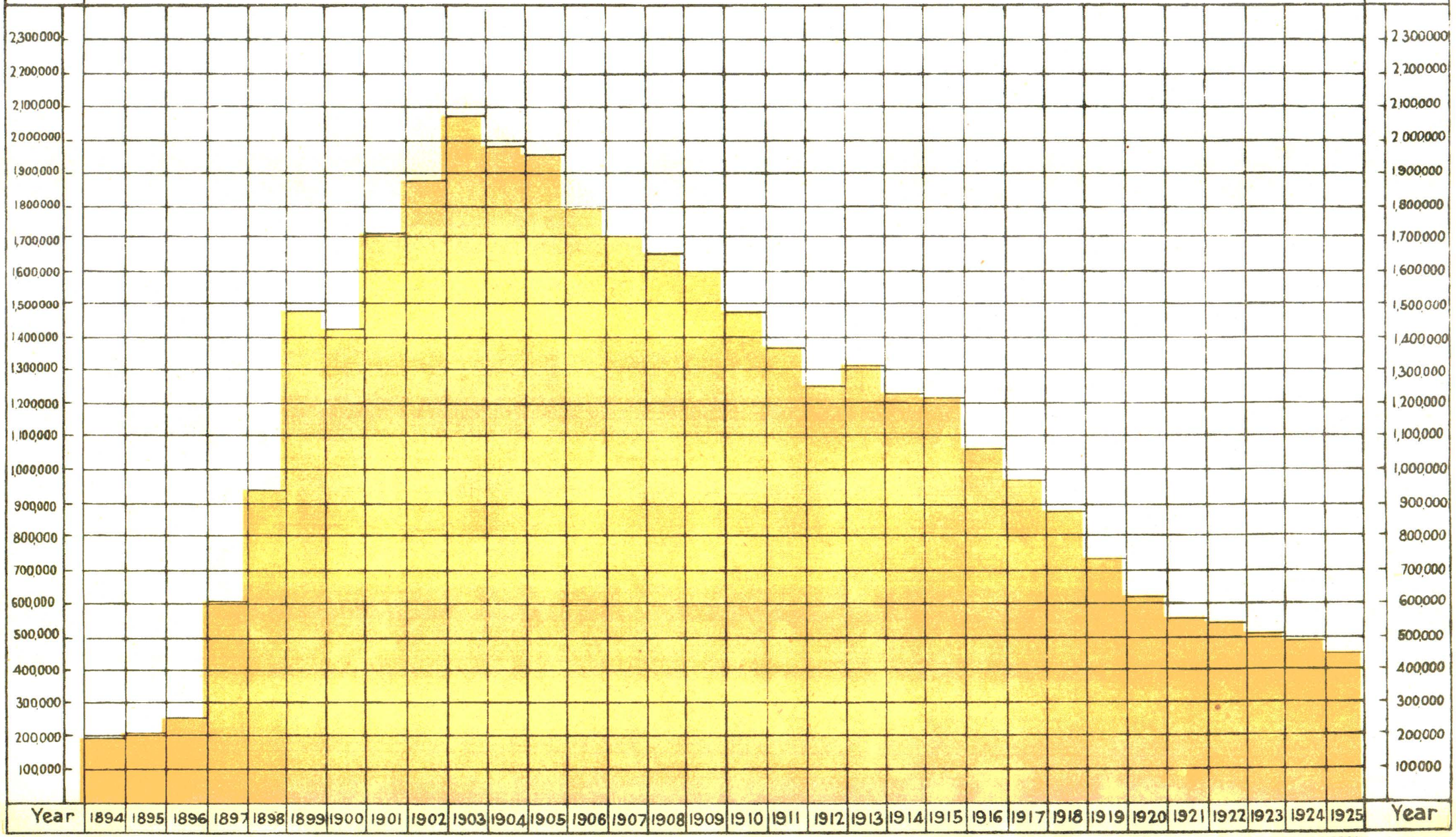
of Gold output showing the amount in fine ounces of Gold exported & received at the Perth Mint from the Year 1894 onwards



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STATE OF WESTERN AUSTRALIA.

Report of the Department of Mines for the State of Western Australia, for the Year 1925.

To the Hon. the Minister for Mines.

Sir,—

I have the honour to submit the Annual Report of the Department for the year 1925, 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, 1926.

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 1925 was £2,393,890, being £187,272 less than that for the previous year. Copper ore exported showed a decrease of 1,594 tons. Coal showed an increase, also Tin, but Silver and Lead smaller tonnages.

The value of the Gold yield was £1,874,320, being 78.25 per cent. of the total output.

The value of the Coal output was £363,203, Copper £18,200, Silver £11,661, and Tin £15,392.

The dividends paid by mining companies amounted to £54,109, and in the preceding year £124,771; a decrease of £70,662.

The total dividends paid to the end of 1925 amounted to £28,559,586. To the same date the total mineral production was £164,306,841, and the total gold production £154,070,123.

GOLD.

The gold yield again shows a decline, being 43,783 fine ounces less than in 1924, which was 19,476 fine ounces less than in 1923.

The average value per ton of ore treated in the State as a whole has fallen from 49.24 shillings in 1924 to 45.84 shillings in 1925; and in the East Coolgardie Goldfield, which produced over 70 per cent. of the State's reported yield, it fell from 48.47 shillings to 46.04 shillings.

Comparing the tonnage of ore treated in 1924 and 1925, there was an increase of 16,538 tons in the latter year, during which 800,298 tons were treated.

There were increases in Yilgarn, Murchison, Coolgardie, Broad Arrow, Mt. Margaret and Yalgoo of 18,730, 12,770, 8,828, 8,605, 7,946, and 275 tons respectively. All the others treated less tonnage, the largest decreases being in East Coolgardie, North Coolgardie, Dundas and North-East Coolgardie of 24,952, 10,949, 1,688 and 1,032 tons respectively. No definite figures regarding working costs can be got, but there has not been any improvement.

There were increases in the productions from Ashburton, Broad Arrow, Coolgardie, East Murchison, Kimberley, Murchison, North-East Coolgardie, Pilbara and Yilgarn, the others reported decreases.

The acreage held under mining leases for all minerals is 52,802 acres, being a decrease of 4,209 acres when compared with 1924. The area leased for gold mining is lesser by 1,614 acres, and for other minerals by 2,595 acres.

The area held under prospecting areas is 34,419 acres, including 25,000 acres for coal. This is an increase of 17,269 acres on the area held in 1924.

The number of men engaged in all classes of mining was 6,011, a decrease of 278 on the number employed in 1924. The number of men engaged in mining for minerals other than gold increased by 9, due to larger numbers being employed in lead mining, and this offset the falling-off in the numbers for copper mining amounting to 76. In mining for other minerals the figures were practically the same as in 1924.

In gold mining there was a decrease of 287.

The average value of gold produced per man employed on gold mines was £376.77 in 1924, and £376.60 in 1925.

The average tonnage raised per man was 164.33 tons, and in the previous year 153.02 tons.

In the East Murchison field there was a small increase.

The Black Range District had a small improvement in output, and operations were practically confined to Sandstone.

In the Lawlers District very little mining was in evidence, but there were small outputs from the Lawlers, Mt. Sir Samuel and Kathleen Valley centres.

In the Wiluna District there was an increase. At Wiluna active development by a group of investors is in progress and results are very encouraging. If success attends their efforts a big revival at this centre will result.

At Cole's Find progress has been excellent and a large amount of prospecting is being done.

At Mt. Hilda, formerly known as Mt. Vernon, where a new find was reported last year, a good deal of work is being carried out and arrangements made for the erection of a crushing plant on one of the mines. Until more development has been done the probable value of this centre cannot be gauged.

The Murchison field had an increase.

In the Meekatharra District there was an improvement, mainly the result of increased operations on the Ingliston Consols Extended Mine.

In the outlying centres mining was quiet.

In the Cue district there was a small increase. The "Monte Carlo" Lease has not developed up to expectations. The Mararoa Company is actively developing its property at Reedy's, being financially helped to this end by the Government.

The Day Dawn District was the only one which did not show an improvement, and as hitherto the principal production was from the Old Fingall Mine.

In the Mt. Magnet District there was much activity and an improved output. Prospectors at Mt. Magnet and also one at Paynesville had some very rich returns.

A 5-head mill was erected on a lease known as "Hill 60," and began crushing in December. At Moyagee the Government financially assisted a party in the work of unwatering the old mine, and they have reported the discovery of good ore.

The Mt. Margaret field had a decrease of 1,855 fine ounces. In the Mt. Margaret District there was a falling off, and only a small amount of prospecting was in evidence. The same was the case in the Mt. Morgans District, the only productions being from the Westralia Mt. Morgans, the Torquay leases at Linden, and the Linden State Battery.

In the Mt. Malcolm District the yield was practically maintained due to a continuance of operations on the Sons of Gwalia Mine. A few prospectors were at work, but no discovery of note reported.

The Coolgardie field had a small increase of 66 fine ounces.

In the Kunanalling District the output was well maintained and there was little change.

At Gibraltar the outlook is not promising, the hopes of raising further capital for the Lloyd George Mine not having been realised, and it is now let on tribute.

In the Widgiemooltha, Burbanks, and other centres, and around Coolgardie, only a small amount of prospecting was going on.

At St. Ives a number of mines were working, and on the Reward Mine the newly erected plant was crushing for the greater part of the year.

The North Coolgardie field has a decrease consequent on the continued falling output from the Menzies Consolidated Mine at Yunndaga in the Menzies District.

At Comet Vale the Gladsome and Sand Queen Mines were unwatered, but the option held over them was abandoned and they are at present unworked.

At Goongarrie and Mount Ida a little prospecting was being done. The Ularring, Niagara, and Yerilla districts remained stagnant.

The North-East Coolgardie Goldfield had a small increase and there was no change in the outlook.

The Broad Arrow field had an increase of 5,581 fine ounces due to an improved output from the Associated Northern Company's Mine at Ora Banda.

A rush at Bardoc resulted in a good deal of ground being prospected, and some encouraging returns were obtained. Elsewhere the field was quiet.

In the East Coolgardie Goldfield the number of men engaged in mining was 2,723, and 1924, 2,883; a decrease of 160. This goldfield gave employment to 54 per cent. of the number of men engaged in gold mining, and the reported production during the year was 305,769 fine ounces, over 70 per cent. of the total reported yield.

The tonnage treated was 563,311 tons, being 24,952 tons less than in 1924. The yield showed a decrease of 30,330 fine ounces, due to reduced outputs from several of the mines. The average grade of the ore per ton fell from 48.47 shillings in 1924 to 46.04 shillings in 1925.

In the Yilgarn field there was an increase of 4,846 fine ounces, due to an increased output from the Great Victoria Mine at Burbidge, where active operations are being carried out.

At Manxman and Glenelg Hills mining was active, and at the former centre many mines were producing. A good deal of prospecting was being done throughout this field.

In the Dundas field there was a small decrease and little change excepting that the mine formerly owned by the Mararoa Company has been acquired by new lessees who are now erecting plant and have great faith in its possibilities.

The Phillips River field had a decrease, and the output of gold was insignificant. Copper mining was also moribund, none being produced. The company operating the flotation plant referred to last year, although very sanguine, has not yet attained success. The low price ruling for copper is also a retarding factor.

In the Northern goldfields, Kimberley, West Kimberley, West Pilbarra, Ashburton, and Gascoyne there was no change.

In the Pilbara field there was a small increase, but no material improvement in any of the gold mines.

TIN.

The quantity of Tin exported was 108 tons, valued at £15,392, an increase in tonnage of 21 tons, and in value of £3,384.

The Greenbushes Tinfield produced 55.27 tons, valued at £8,764, an increase in tonnage of 2.71 tons, and in value of £1,295; the Pilbara field 23.96 tons, valued at £3,609, a decrease in tonnage of 4.59 tons, and in value of £439. None was produced in any other field.

TANTALITE.

The production of 6.25 tons, valued at £750, was reported from Wodgina, in the Pilbara field. The uncertain market for this mineral has militated against the active working of the deposits, which are understood to be good. It is stated that a market for some time has been secured.

COPPER.

The value of the copper exported was £18,200, being £22,476 less than in 1924.

No ore was reported from the West Pilbara or Phillips River fields.

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 1925.

FIG. 1.

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

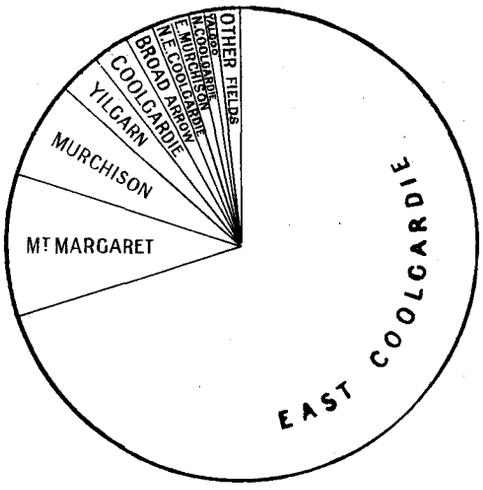


FIG. 2.

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

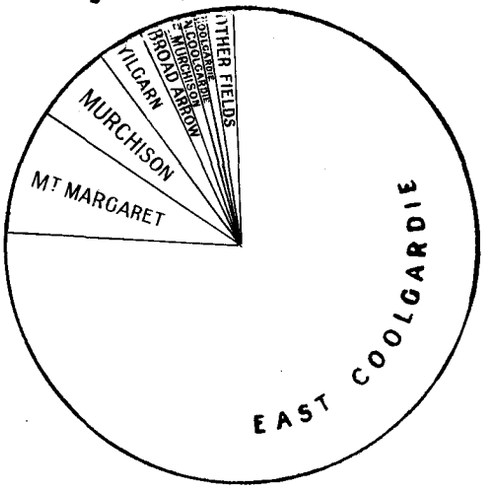


FIG. 3.

Value of Gold and other Minerals.

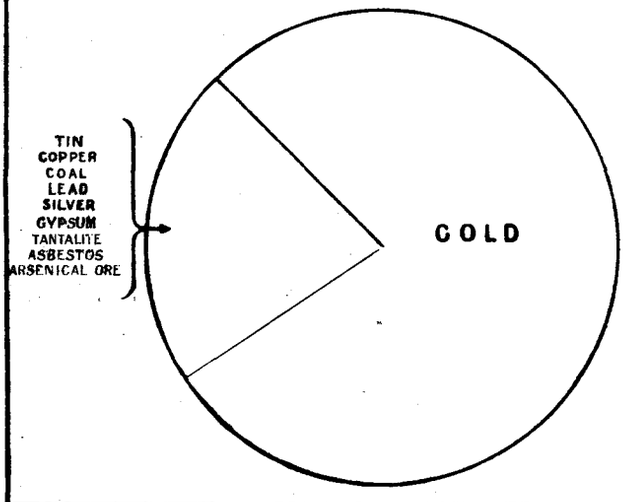


FIG. 4.

Value of Minerals other than Gold.

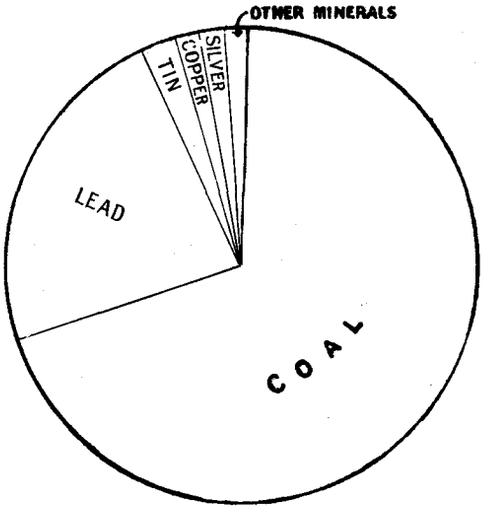


FIG. 5.

Areas of Land leased for Goldmining on various Goldfields.

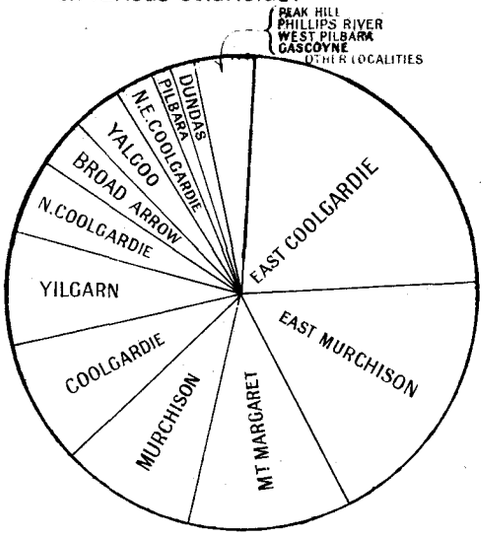
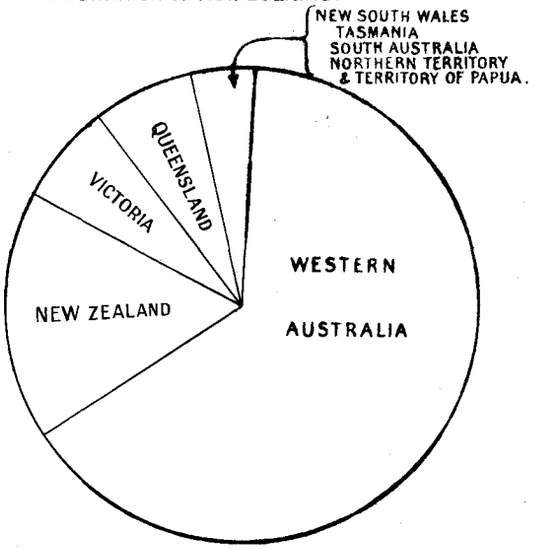


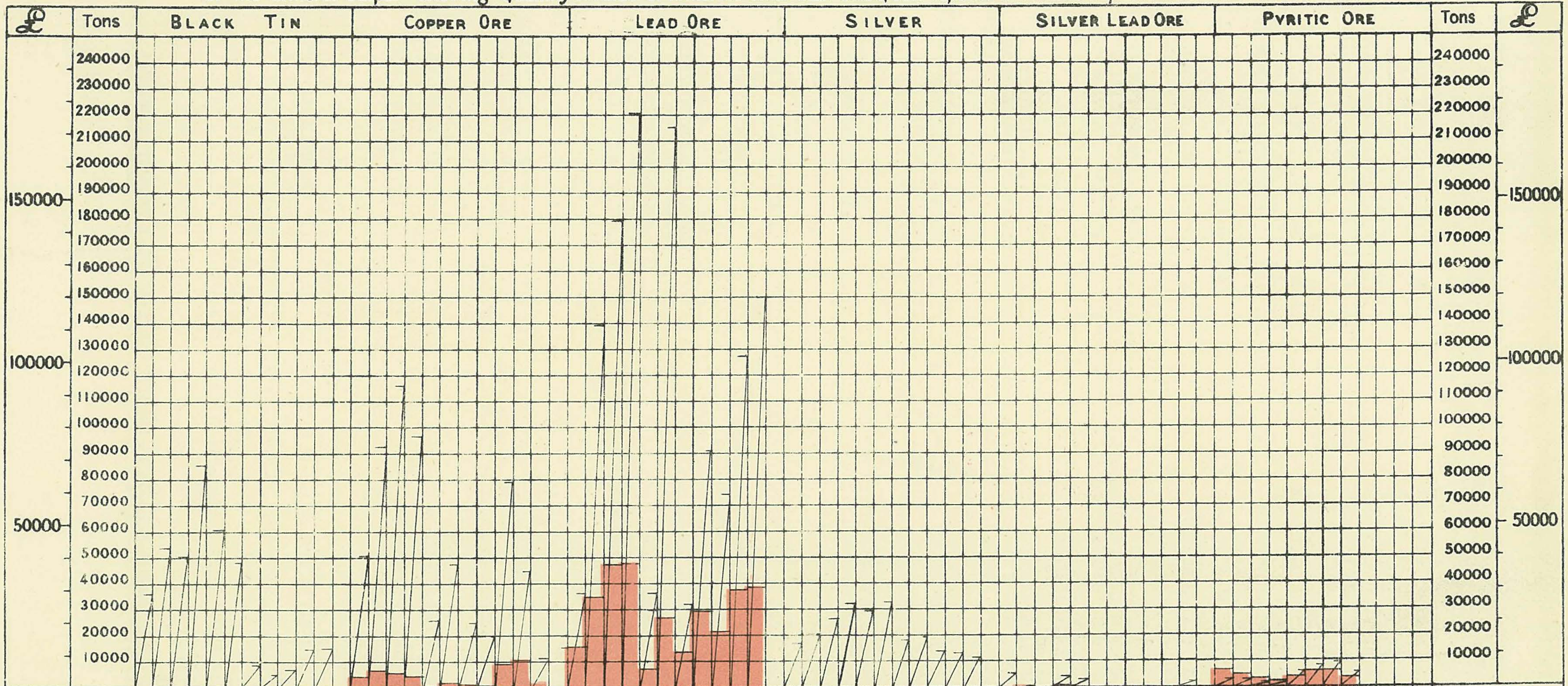
FIG. 6.

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 Dep^t from the Year 1915 onwards



Mineral		1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926
Black Tin	Value £	29064	43258	33192	78637	40830	38865	7238	3839	5984	11517	12373	
Black Tin	Quantity Tons	339	435	307	395	281	232	67	41	52	81	79	
Copper Ore	Value £	40998	74376	93711	77527	21530	37945	20162	16133	63184	36011	8952	
Copper Ore	Quantity Tons	4499	6697	6489	4983	1277	1962	1150	1195	9873	10755	2470	
Lead Ore	Value £	29396	111642	144684	176330	29841	172483	25649	72338	59194	101219	119299	
Lead Ore	Quantity Tons	15678	34622	46865	47080	7386	27716	10330	29603	21635	36750	37866	
Silver	Value £	13793	16714	22872	25442	24023	26230	14770	15172	10930	10135	8736	
Silver	Quantity	130120 Ozs	118677 Ozs	124191 Ozs	118748 Ozs	93142 Ozs	95744 Ozs	89140 Ozs	98050 Ozs	76124 Ozs	66341 Ozs	60529 Ozs	
Silver Lead Ore	Value £	4429	554	NIL	3461	3116	NIL	NIL	NIL	NIL	NIL	1898	
Silver Lead Ore	Quantity Tons	299	68	NIL	237	215	NIL	NIL	NIL	NIL	NIL	81	
Pyritic Ore	Value £	2368	2263	1752	1629	4919	7276	7871	4203	NIL	NIL	NIL	
Pyritic Ore	Quantity Tons	6558	4409	3575	2252	4136	6020	6116	3441	NIL	NIL	NIL	

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

Minerals not shown above.

Asbestos 74 Tons. Value £2206.
Gypsum 4237 " " £5278.
Manganese 59 " " £294.
Also reported in the year 1924.

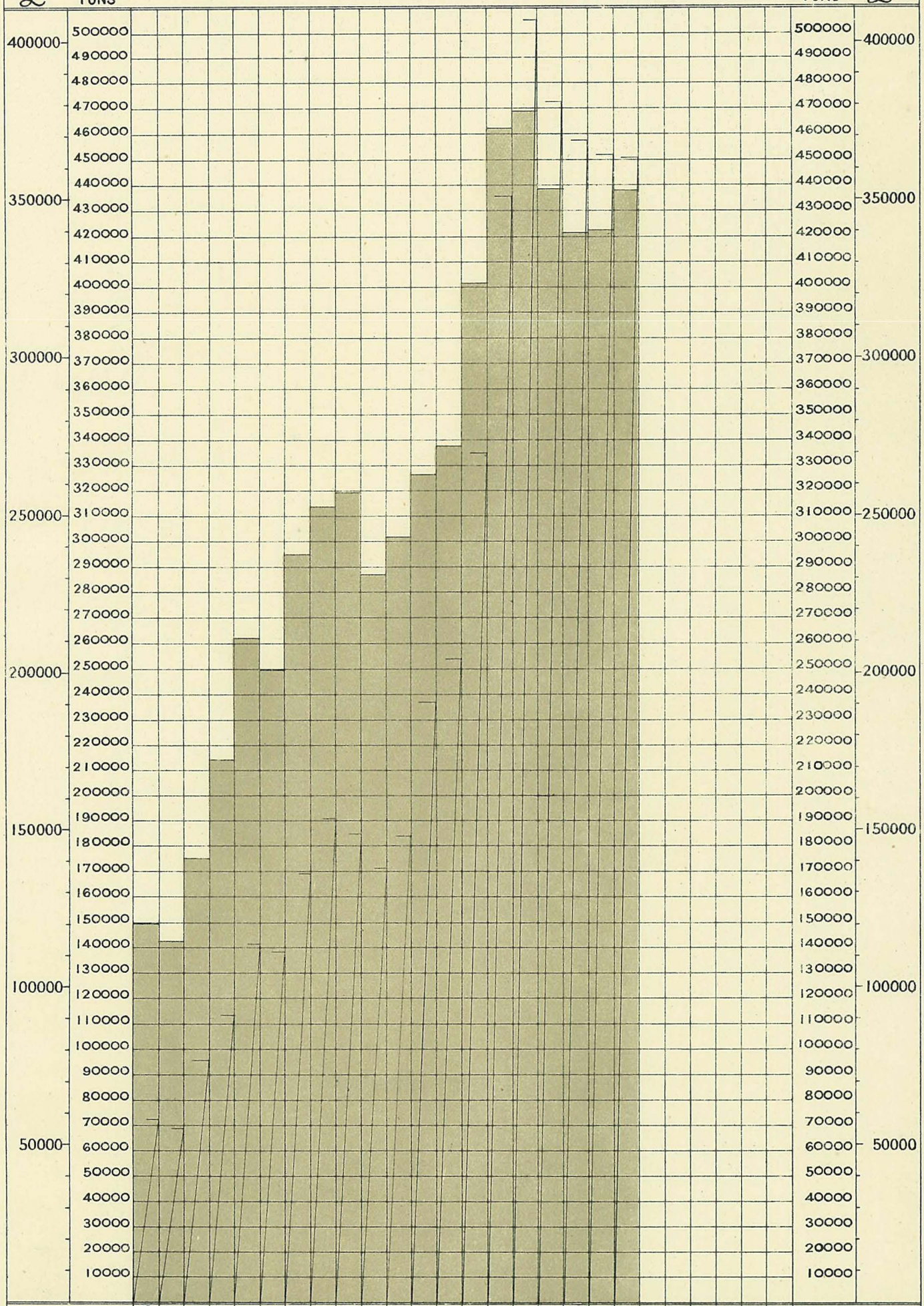
Previous to 1915 the Quantity & Value of various Minerals reported amounted to ..

Black Tin ..	14299 Tons	£1,142,902
Copper	201879 "	1,254,298
Ironstone ...	57820 "	36,695
Lead	61820 "	134,711
Asbestos	43 "	1,754
Silver Lead ...	2064 Tons	£22,427
Tantalite	89 "	13,486
Limestone	93706 "	18,290
Silver	1,537,935 Ozs.	180,846
	Total.....	£2,805,409

1925.

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	1919	1920	1921	1922	1923	1924	1925
Value	£	57998	55158	75694	90965	113699	111154	135857	153614	148684	137589	147823	191822	204319	270355	350346	407117	381555	368949	363255	363203
Quantity	Tons	149765	142373	175248	214302	262166	249890	295079	313818	319210	286666	301526	326550	337039	401713	462021	468 817	438443	420714	421864	437461

1925.

In the Northampton field the production was 2,469.72 tons, valued at £8,952, a decrease on the preceding year in tonnage of 8,202.28 tons, and in value of £26,003. This was produced by the Narra Tarra Mine, at Protheroe.

The number of men engaged in copper mining was 34, and in 1924, 110.

COAL.

The output of Coal was 437,461 tons, being 15,597 tons more than in 1924.

There were five (5) collieries producing, all situated at Collie.

No work was done on the known deposits at Wilga.

At Irwin River very little work was carried out, but the Government intend to do some boring at Eradu early next year.

The number of men employed, 677, is greater by 4 than in 1924; and the output per man was, in 1924, 627 tons, and in 1925, 646 tons.

OIL.

Boring operations were continued on the area known as "Freney's," in the north of the State, and the results, although not conclusive, were encouraging.

It is intended to continue the work, and financial assistance will probably be extended by the Commonwealth Government as the result of a recommendation by an expert sent by it to report on the possibility of oil being located in the State.

No boring for oil is being done on any other oil prospecting areas held.

ASBESTOS.

In the Pilbara field 50 tons, valued at £1,619, were produced, a decrease on the preceding year in tonnage of 23.58 tons, and in value of £587. In the West Pilbara field a small amount, valued at £22, was raised.

The deposits at Lionel, in the Nullagine district of the Pilbara field, are considered good, and the Government has rendered financial help towards their proper development.

OTHER MINERALS.

The quantity of silver obtained as a by-product and exported was 81,226 ounces, valued at £11,661; and in the preceding year 89,146 ounces, valued at £13,409, a decrease of 7,920 ounces and £1,748.

Arsenical ore valued at £1,045 was exported, also 4,664 tons of lead and silver lead valued at £103,300, a decrease in tonnage of 190 tons, but increase in value of £20,205; also 3,060 tons of Gypsum valued at £4,118 were reported, a decrease in tonnage of 1,177 tons, and in value of £1,160.

MINING GENERALLY.

The State of New South Wales had an increase of 737 fine ounces, but Victoria, Queensland, South Australia and Tasmania all recorded decreases. The Territory of Papua had an increase of 3,069 fine ounces, and the Northern Territory an increase of 220 fine ounces. New Zealand reported a decrease.

The Western Australian production was 65.28 per cent, of the total for Australasia, and in the preceding year 60.40 per cent.

It is regrettable that the falling-off in the gold output continues, the chief causes for which are the cost of production and the poorer grade of ore. The position has caused the Government grave concern, and every effort is being made to devise some means to remedy it.

The Royal Commissioner appointed to investigate and advise how best to assist in placing it on a more satisfactory footing submitted his report in June. It now remains for the mine owners to indicate to what extent they are prepared to carry out his suggestions, they having the assurance of the Government that every possible assistance will be extended to them in the matter.

Certain it is that if the fall in gold production be not arrested, it will not be for lack of attention and sympathetic consideration on the part of the Government.

In mining for base metals the low prices ruling for some have prevented any advances, but the outputs of Lead and Tin considerably appreciated.

The assistance to prospectors by way of sustenance, explosives, loans of equipment, and transport facilities was continued. The Board controlling this activity recommended approval of 166 applications representing 266 men, and 112 applications for extensions. All were granted, and the expenditure amounted to £5,818 13s. 1d. Drought conditions persisted during the early part of the year, the whole of the goldfields suffering to a more or less severe extent. This prevented prospecting in localities distant from permanent water supplies. Assisted prospectors reported during the year the recovery of gold aggregating in value £5,000.

The area under prospecting areas for gold and minerals apart from Coal, viz., 9,419 acres, is less than in 1924 by 1,699 acres, but indicates a fair amount of prospecting is being done.

The expenditure incurred in rendering assistance to mine owners and the industry generally under the provisions of the Mining Development Act totalled £81,703 14s. 3d. Details relative to most of this expenditure are given in the report of the State Mining Engineer, Division II. of this report. In addition, guarantees were given to Banks on behalf of several Mining Companies, the liability of the Government at the close of the year in respect to these being £44,500.

PART II.—MINERALS RAISED.

TABLE 1.

Quantity and Value of all the Minerals produced during 1924 and 1925.

Description of Minerals.	1924.		1925.		Increase or Decrease for Year compared with 1924.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value
		£		£		£
1. Arsenical ore (exported), statute tons	*	777	*	1,045	...	+ 268
2. Asbestos (reported), statute tons	74	2,206	51	1,641	— 23	— 565
3. Coal (raised), statute tons	421,864	363,255	437,461	363,203	+ 15,597	— 52
4. Copper { Ore (exported), statute tons	2,795	40,676	1,201	18,200	— 1,594	— 22,476
4. Copper { Ingot, Matte, etc. (exported), statute tons	...	...	...	...	...	...
5. Gold (exported and minted), fine ounces	485,035	2,060,298	441,252	1,874,320	— 43,783	— 185,978
6. Gypsum (reported), statute tons	4,237	5,278	3,060	4,118	— 1,177	— 1,160
7. Lead and Silver Lead (exported), statute tons ...	4,854	83,095	4,664	103,300	— 190	+ 20,205
8. Manganese (exported), statute tons	20	160	...	...	— 20	— 160
9. Silver (exported), fine ounces	89,146	13,409	81,226	11,661	— 7,920	— 1,748
10. Tantalite, (exported) statute tons	...	...	5	1,010	+ 5	+ 1,010
11. Tin (exported), statute tons	87	12,008	108	15,392	+ 21	+ 3,384
Total Values	...	2,581,162	...	2,393,890	...	— 187,272

* Contained in Gold ore.

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	10,878,153	6,842,621	62·92
1917	9,323,229	5,022,694	53·87
1918	6,931,834	2,102,923	30·34
1919	14,279,240	6,236,585	43·67
1920	15,149,323	3,096,849	20·44
1921	10,331,405	1,373,810	13·30
1922	11,848,025	2,875,402	24·27
1923	11,999,500	3,259,476	27·16
1924	13,808,910	1,424,319	13·24
1925	13,642,852	*173,126	*1·27
Total since 1900 ...	256,017,120	129,093,882	50·42

* The Mineral Exports for 1925 were abnormally low, for the reason that the movement of fine gold bars and gold specie was restricted during the year, probably due to the uncertainty in the London-Australian exchange position, also to the restoration of the gold standard and the opportunity afforded Banks to replenish depleted stocks. The Exports of Minerals other than gold was approximately the same as in the previous year.

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.					
	1924.	1925.	Percentage for each Goldfield.		Average Value of Gold per ton of Ore treated.	
			1924.	1925.	1924.	1925.
	fine ozs.	fine ozs.			shillings	shillings.
1. Kimberley	13	29	·01	·01	...	...
2. West Kimberley	...	...	...	...	...	...
3. Pilbara	2,134	2,502	·46	·57	92·54	149·19
4. West Pilbara	76	35	·02	·01	163·00	...
5. Ashburton	3	11	·01	·01	...	...
6. Gascoyne	3	3	·01	·01	...	...
7. Peak Hill	2,113	1,636	·46	·37	126·53	168·82
8. East Murchison	4,897	5,399	1·07	1·24	67·98	86·93
9. Murchison	24,425	29,439	5·33	6·77	50·07	46·29
10. Yalgoo	5,611	2,828	1·22	·65	100·42	47·85
11. Mt. Margaret	43,705	41,850	9·54	9·63	39·27	34·68
12. North Coolgardie	9,509	4,550	2·07	1·05	54·75	102·94
13. Broad Arrow	2,661	8,242	·58	1·89	154·25	69·94
14. North-East Coolgardie	4,691	5,898	1·02	1·36	50·10	73·55
15. East Coolgardie	336,099	305,769	73·35	70·37	48·47	46·04
16. Coolgardie	10,243	10,309	2·23	2·37	90·81	48·95
17. Yilgarn	8,451	13,297	1·84	3·06	56·39	35·87
18. Dundas	3,429	2,601	·75	·60	100·98	184·83
19. Phillips River	145	27	·03	·01	82·67	37·29
State generally	...	108	...	·02	...	...
Totals and averages	458,208	434,533	100·00	100·00	49·24	45·84

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 to the Department are used.

TABLE 4.

Number of Gold-producing Mines in the several Goldfields and Districts during 1924 *and* 1925.

Goldfield.	District.	1924		1925.		Increase or Decrease.
		District.	Goldfield.	District.	Goldfield.	
Kimberley	... ...	...	...	...	...	...
West Kimberley	... ...	...	...	...	...	...
Pilbara	Marble Bar	14	15	10	10	— 5
	Nullagine	1		...		
West Pilbara	... ...	...	1	...	...	— 1
Ashburton	... ...	...	...	...	...	...
Gascoyne	... ...	...	...	...	...	...
Peak Hill	... ...	...	6	...	4	— 2
East Murchison	Lawlers	6	19	6	26	+ 7
	Wiluna	8		13		
	Black Range	5		7		
	Cue	4		4		
Murchison	Meekatharra	11	31	13	32	+ 1
	Day Dawn	7		5		
	Mt. Magnet	9		10		
Yalgoo	... ...	...	9	...	9	...
Mt. Margaret	Mt. Morgans	5	14	2	11	— 3
	Mt. Malcolm	7		4		
	Mt. Margaret	2		5		
	Menzies	7		5		
North Coolgardie	Ularring	1	12	...	9	— 3
	Niagara	1		2		
	Yerilla	3		2		
Broad Arrow	... ...	...	10	...	10	...
North-East Coolgardie ...	Kanowna	7	8	6	6	— 2
	Kurnalpi	1		...		
East Coolgardie	East Coolgardie ...	49	53	47	49	— 4
	Bulong	4		2		
Coolgardie	Coolgardie	22	31	18	26	— 5
	Kunanalling	9		8		
Yilgarn	... ...	...	23	...	25	+ 2
Dundas	... ...	...	9	...	6	— 3
Phillips River	... ...	...	1	...	1	...
State generally	... ...	...	...	...	...	...
	Totals	...	242	...	224	— 18

TABLE 5.

Gold Yield from Registered Gold Mining Companies and Gold Mining Leases for the Years 1922, 1923, 1924, *and* 1925.

Goldfield.	Registered Companies producing over 12,000 ozs.								Registered Companies producing under 12,000 ozs.								Leases, exclusive of Sundry Claims and Treatment.							
	1922.		1923.		1924.		1925.		1922.		1923.		1924.		1925		1922.		1923.		1924.		1925.	
	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	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
West Kimberley ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Pilbara	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	14	2,220	14	1,602	15	1,532	10	1,759
West Pilbara	...	...	...	...	...	...	...	...	...	...	...	...	1	15	...	...	...	...	...	...	...	...	...	...
Ashburton	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Gascoyne	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Peak Hill	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	7	1,740	5	558	6	936	4	552
East Murchison	...	...	...	...	...	...	...	...	5	6,483	6	6,494	5	1,237	3	379	17	2,599	15	1,356	14	1,295	23	2,655
Murchison	...	...	...	...	...	...	...	...	2	1,917	3	425	3	324	1	209	41	29,423	41	23,436	28	19,674	31	24,634
Yalgoo	...	...	...	...	...	...	...	...	2	3,980	3	5,265	2	4,368	2	924	14	12,040	15	1,446	7	847	7	1,092
Mt. Margaret	1	14,890	1	18,533	1	35,371	1	35,057	4	1,999	3	4,037	2	5,214	2	4,791	24	7,863	20	2,636	11	2,378	8	1,009
N. Coolgardie	...	...	...	...	...	...	...	...	2	10,318	2	8,038	1	5,981	1	2,638	17	1,215	11	2,036	11	1,364	8	1,003
Broad Arrow	...	...	...	...	...	...	...	...	1	92	1	55	...	...	1	6,416	9	2,451	12	1,574	10	1,691	9	1,005
N.E. Coolgardie	...	...	...	...	...	...	...	...	2	1,655	2	2,740	2	2,401	2	3,829	10	1,917	9	1,416	6	2,059	4	1,796
E. Coolgardie	8	343,664	8	334,664	9	306,476	7	280,033	12	13,148	10	14,000	10	12,967	9	12,540	39	11,334	30	13,614	34	11,083	33	8,884
Coolgardie	...	...	...	...	...	...	...	...	1	2,897	3	6,886	2	2,694	3	4,244	37	10,068	27	4,274	29	3,764	23	3,695
Yilgarn	...	...	...	...	...	...	...	...	9	8,239	6	2,477	6	3,163	4	7,580	29	2,830	18	4,328	17	4,496	21	4,922
Dundas	...	...	...	...	...	...	...	...	1	4,150	1	3,789	1	2,014	1	669	11	2,119	11	1,811	8	1,178	5	1,084
Phillips River	...	...	...	...	...	...	...	...	1	12	1	9	...	...	...	...	4	587	2	317	1	96	1	12
State generally	...	...	...	...	...	...	...	...	1	7,929	1	32	...	...	...	...	...	...	...	...	...	...	...	...
Total	9	358,554	9	353,197	10	341,847	8	315,090	43	62,819	42	54,247	35	40,378	29	44,219	273	88,415	230	60,404	197	52,393	187	54,102

TABLE 6.

Increase or Decrease in Output of certain producing Gold Mines in 1925 as compared with 1924.

Goldfield.	District.	Name of Mine.	Gold Production.		Increase or Decrease for Year compared with 1924.
			1924.	1925.	
			fine ozs.	fine ozs.	fine ozs.
Pilbara	Marble Bar ...	1. Homeward Bound East	70·40	110·35	+ 39·95
		2. Kitchener	389·00	398·30	+ 9·30
		3. Outward Bound	74·58	341·74	+ 267·16
		4. Prince Charlie	154·87	408·30	+ 253·43
Peak Hill ...	... ...	5. Evening Star	286·48	179·43	— 107·05
		6. No. 1 North leases	420·75	204·61	— 216·14
East Murchison	Lawlers ...	7. Waroonga G.M. Co., Ltd.	949·27	...	— 949·27
		8. Yellow Aster leases	506·89	244·60	— 262·29
	Wiluna ...	9. Black Adder	103·00	364·90	+ 261·90
		10. Neb	...	257·16	+ 257·16
		11. Toscana	...	424·03	+ 424·03
Murchison ...	Cue	12. Emu North	22·15	1,056·16	+ 1,034·01
		13. Monte Carlo Bank	1,095·88	70·33	— 1,025·55
	Meekatharra ...	14. Empire	242·88	493·57	+ 250·69
		15. Fenian leases	22·39	313·66	+ 291·27
		16. Ingliston Consols Extended leases	15,676·25	19,606·58	+ 3,930·33
		17. Ingliston	353·35	86·04	— 267·31
		18. Marmont	214·08	194·40	— 19·68
	Mt. Magnet ...	19. Neptune	193·68	48·05	— 145·63
		20. Revenue	...	591·14	+ 591·14
Yalgoo	... ...	21. Brown's Reward	...	600·19	+ 600·19
		22. Brilliant G.M. Co., N.L.	199·14	546·78	+ 347·64
		23. Carnation	136·75	15·50	— 121·25
		24. Lake View Payne's Find Development Co., N.L.	355·93	377·54	+ 21·61
		25. Sweet William	491·56	210·43	— 281·13
Mt. Margaret ...	Mt. Morgans ...	26. Torquay leases	58·10	516·07	+ 457·97
		27. Westralia Mt. Morgans Mines, N.L.	3,603·75	3,791·40	+ 187·65
	Mt. Malcolm ...	28. Sons of Gwalia, Ltd.	35,371·40	35,057·19	— 314·21
	Mt. Margaret...	29. Lancefield G.M.'s, Ltd.	1,610·64	999·30	— 611·34
		30. Nil Desperandum	211·75	232·13	+ 20·38
North Coolgardie	Menzies ...	31. Crusoe	52·70	585·71	+ 533·01
		32. Menzies Consolidated G.Ms., Ltd.	5,980·65	2,638·17	— 3,342·48
	Yerilla ...	33. Redbrook G.M.	84·44	50·11	— 34·33
Broad Arrow ...	... ...	34. Associated Northern Blocks (W.A.), Ltd. ...	...	6,416·16	+ 6,416·16
		35. Orinda	185·65	344·33	+ 158·68
		36. Oversight	306·99	76·21	— 230·78
North-East Coolgardie	Kanowna ...	37. Golden Valley	608·67	1,287·48	+ 678·81
		38. Orion Gold Mines, Ltd.	896·12	60·50	— 835·62
		39. Kanowna Red Hill G.M. Co., N.L.	2,160·66	3,768·06	+ 1,607·40
		40. Pride of the Morning	193·45	439·43	+ 245·98
East Coolgardie	East Coolgardie	41. Associated Gold Mines of W.A., Ltd. ...	22,649·33	26,889·34	+ 4,240·01
		42. Associated Northern Blocks (W.A.), Ltd. ...	3,126·01	1,818·69	— 1,307·32
		43. Boulder Perseverance, Ltd.	45,130·26	37,135·51	— 7,994·75
		44. Golden Hope G.Ms., N.L.	3,174·03	3,733·61	+ 559·58
		45. Golden Horseshoe Estates Co., Ltd.	57,310·51	43,234·30	— 14,076·21
		46. Great Boulder Proprietary G.Ms., Ltd. ...	61,379·10	55,300·29	— 6,078·81
		47. Great Boulder Proprietary G.Ms., Ltd. (North End)	1,280·52	3,036·87	+ 1,756·35
		48. Great Hope	1,983·33	1,901·93	— 81·40
		49. Great Hope North	563·17	424·30	— 138·87
		50. Hopeful	1,990·54	2,206·66	+ 216·12
		51. Lake View and Star, Ltd.	39,283·48	52,880·35	+ 13,596·87
		52. North Kalgoorlie (1912), Ltd.	1,310·18	1,006·52	— 303·66
		53. Oroya Links, Ltd.	18,018·87	17,887·61	— 131·06
		54. Pernatty Central Copper Mining Co., N.L. ...	18·90	637·12	+ 618·22
		55. South Kalgurli Consolidated, Ltd.	37,097·88	46,705·35	+ 9,607·47
		56. Surprise North	856·70	3,151·40	+ 2,294·70
	Bulong ...	57. Sweet Nell	62·13	547·16	+ 485·03
Coolgardie ...	Coolgardie ...	58. Brennan's Idough	341·62	346·97	+ 5·35
		59. Coo-ee	373·09	30·58	— 342·51
		60. Ives' Reward Gold Mines, N.L.	...	2,888·17	+ 2,888·17
		61. Lloyd George	2,596·12	1,222·83	— 1,373·29
	Kunanalling ...	62. Carbine leases	1,109·73	1,460·57	+ 350·84
		63. Turn of the Tide	193·09	252·44	+ 59·35
Yilgarn ...	... ...	64. Banker: Golden Butterfly G.M. Co., N.L. ...	472·46	389·87	— 82·59
		65. Great Victoria Gold Mines, N.L.	1,784·22	6,808·13	+ 5,023·91
		66. Radio	1,838·92	2,566·02	+ 727·10
		67. Radio Deeps	243·54	659·85	+ 416·31
		68. Spring Hill G.M. Co., N.L.	429·19	86·57	— 342·62
		69. White Horseshoe	510·00	291·41	— 218·59
Dundas ...	... ...	70. Great Boulder Proprietary G.Ms., Ltd. ...	2,013·82	668·61	— 1,345·21
		71. Viking No. 1	364·37	606·79	+ 242·42

TABLE 7.

Averages of Gold Ore raised and treated, and Gold produced therefrom, per man employed on the several Goldfields of the State, during 1924 *and* 1925.

Goldfield.	1924.				1925.			
	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. West Kimberley	...	...	...	...	...	...	...	...
3. Pilbara	38·14	23·71	41·53	25·82	**40·01**	**24·74**	**70·31**	**43·46**
4. West Pilbara	21·00	10·50	40·64	20·32	...	...	...	...
5. Ashburton	...	...	...	...	...	...	...	...
6. Gascoyne	...	...	...	...	...	...	...	...
7. Peak Hill	123·73	48·61	184·37	72·43	**102·84**	**30·47**	**204·46**	**60·58**
8. East Murchison	76·21	33·50	60·99	26·81	**64·27**	**28·72**	**65·78**	**29·40**
9. Murchison	215·65	107·83	127·12	63·56	**243·21**	**131·81**	**132·52**	**71·82**
10. Yalgoo	86·24	43·92	101·94	51·92	**91·25**	**46·04**	**51·41**	**25·94**
11. Mt. Margaret	438·89	206·48	202·87	95·44	**439·09**	**214·03**	**179·29**	**87·39**
12. North Coolgardie	186·91	82·83	120·46	53·39	**103·72**	**34·91**	**125·69**	**42·30**
13. Broad Arrow	23·31	10·71	42·33	19·45	**153·03**	**70·46**	**126·00**	**58·01**
14. North-East Coolgardie ...	175·55	97·77	103·53	57·66	**159·34**	**74·36**	**137·97**	**64·39**
15. East Coolgardie	371·85	206·26	212·14	117·68	**381·65**	**209·25**	**206·85**	**113·41**
16. Coolgardie	41·79	22·48	44·67	24·03	**96·88**	**51·99**	**55·83**	**29·96**
17. Yilgarn	149·64	74·38	99·33	49·38	**436·79**	**192·94**	**184·46**	**81·48**
18. Dundas	44·75	25·80	53·19	30·67	**28·01**	**13·84**	**60·93**	**30·10**
19. Phillips River	29·89	13·59	29·00	13·18	**20·67**	**5·64**	**9·07**	**2·47**
Total Averages	289·10	153·02	167·58	88·70	**314·95**	**164·33**	**169·92**	**88·66**

The average value of gold produced per man above and under ground was £376·77 in 1924 and £376·60 in 1925. The average tonnage of ore raised shows an increase from 153·02 tons to 164·33 tons. The average tonnage raised per man is highest in the Mount Margaret Goldfield, *viz.*, 214·03 tons, average value £371·21, the next being East Coolgardie Goldfield with 209·25 tons, average value £481·74.

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 1925.

State.	Output of Gold.	Value.	Percentage of total Output of Australasia.
	Fine ozs.	£	
1. Western Australia	441,252	1,874,320	65·28
2. Victoria	47,296	200,958	7·00
3. Queensland	46,406	197,118	6·87
4. New South Wales	19,422	82,498	2·87
5. Tasmania...	3,524	15,041	·52
6. South Australia	832	3,535	·12
7. Northern Territory	445	1,890	·07
8. Territory of Papua	5,672	24,094	·84
9. New Zealand	111,061	471,759	16·43
Total	675,910	2,871,213	100·00

TABLE 9.

Dividends paid by Western Australian Gold Mining Companies during 1925 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 1925.		Grand Total paid to end of 1925.
						No.	Total Amount.	
		£		£ s. d.	£ s. d.		£	£
Peak Hill ...	Various Companies ...	...	...	...	...	...	...	160,666
East Murchison...	Various Companies ...	...	...	...	...	...	...	437,968
Murchison ...	Various Companies ...	...	...	...	...	...	...	1,992,670
Mt. Margaret ...	Various Companies ...	...	...	...	...	...	...	1,504,701
North Coolgardie	Various Companies ...	...	...	...	...	...	...	575,032
North-East Coolgardie	Kanowna Red Hill G.M. Co., N.L.	100,000	91,782	1 0 0	0 5 0	2	4,589	6,883
Do. ...	Other Companies	...	...	...	...	...	...	82,971
East Coolgardie...	Boulder Perseverance, Ltd. ...	125,000	2,130,266	0 1 0	0 1 0	1	18,270	1,497,071
Do. ...	South Kalgurli Consolidated, Ltd.	150,000	250,007	0 10 0	0 10 0	2	31,250	346,251
Do. ...	Other Companies	...	...	...	...	...	...	20,880,054
Coolgardie ...	Various Companies ...	...	...	...	...	...	...	339,495
Yilgarn	Various Companies ...	...	...	...	...	...	...	513,199
Dundas	Various Companies ...	...	...	...	...	...	...	222,625
	Total Dividends paid during 1925	...	...	...	...	...	54,109	...
	Total Dividends paid to end of 1925	...	...	...	...	...	...	28,559,586

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.
	£	£	%	£	%
Previous to 1916	125,258,154	25,494,386	20·35	...	...
1916	4,508,532	632,883	14·04	3,518,531	17·90
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
1919	3,118,113	338,244	10·85	2,337,433	14·23
1920	2,624,427	384,083	14·63	2,212,711	17·36
1921	2,352,098	306,958	13·05	1,787,721	17·17
1922	2,286,325	191,251	8·36	1,789,879	10·69
1923	2,143,028	73,750	3·44	1,730,712	4·26
1924	2,060,298	124,771	6·06	1,623,588	7·68
1925	1,874,320	54,109	2·89	1,526,248	3·55
Total ...	154,070,123	28,559,586	18·54	*22,751,684	*13·47

* Last ten years only.

TABLE 11.

Quantity and Value of Minerals, other than Gold and Coal, reported to the Mines Department during 1925.

Goldfield, District, or Mineral Field.	1925.		Increase or Decrease for Year compared with 1924.	
	Quantity.	Value.	Quantity.	Value.
	tons.	£	tons.	£
BLACK TIN.				
Pilbara Goldfield (Marble Bar District)	23·96	3,609	— 4·59	— 439
Greenbushes Mineral Field	55·27	8,764	+ 2·71	+ 1,295
Total	79·23	12,373	— 1·88	+ 856
TANTALITE.				
Pilbara Goldfield (Marble Bar District)	6·25	750	+ 6·25	+ 750
COPPER ORE.				
West Pilbara Goldfield	...	...	— 79·00	— 1,012
Northampton Mineral Field	2,469·72	8,952	— 8,202·28	— 26,003
Phillips River Goldfield	...	...	— 3·69	— 44
Total	2,469·72	8,952	— 8,284·97	— 27,059
LEAD ORE.				
Northampton Mineral Field	37,865·99	119,299	+ 1,115·99	+ 18,080
SILVER-LEAD ORE.				
Ashburton Goldfield	30·00	630	+ 30·00	+ 360
Pilbara Goldfield (Marble Bar District)	51·00	1,268	+ 51·00	+ 1,268
Total	81·00	1,898	+ 81·00	+ 1,898
ASBESTOS.				
Pilbara Goldfield (Nullagine District)	50·00	1,619	— 23·58	— 587
West Pilbara Goldfield	·74	22	+ ·74	+ 22
	50·74	1,641	— 22·84	— 565
GYPSUM.				
State generally	3,059·95	4,118	— 1,177·05	— 1,160
MANGANESE.				
Peak Hill Goldfield	...	...	— 58·63	— 294

The output of black tin shows a decrease in tonnage of 1.88 tons, but an increase in value of £856. The production of tantalite was 6.25 tons, valued at £750, there being none in the previous year. In copper ore there were decreases in tonnage of 8,284.97 tons and in value of £27,059. Lead ore shows increases in tonnage of 1,115.99 tons and in value of £18,080, and the production of silver-lead ore was 81.00 tons of a value of £1,898, not any being reported in the previous year. The quantity of asbestos decreased by 22.84 tons and the value by £565. Gypsum shows a decrease in tonnage of 1,177.05 tons and in value of £1,160. There was not any manganese produced, the output the previous year being 58.63 tons valued at £294.

The production of tin was again confined to Pilbara and Greenbushes fields, and tantalite came from Pilbara goldfield. Copper and lead ore came from Northampton mineral field, while silver-lead ore was produced from Ashburton and Pilbara goldfield. Asbestos came from Pilbara and West Pilbara goldfields, and gypsum from the State generally.

TABLE 12.

Quantity of Coal raised during 1924 and 1925, 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	1924	421,864	363,255	155	518	814	627
	1925	437,461	363,203	154	523	836	646

The number of men employed at collieries has increased by 4, and the output has increased by 15,597 tons, but the value decreased £52.

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, 1924 and 1925.

Description of Leases.	1924.		1925.	
	No.	Acreage.	No.	Acreage.
Gold mining leases on Crown land	560	9,009	468	7,371
" " " private property	...	...	1	24
Mineral leases on Crown land	246	47,645	236	45,088
" " private property	11	357	10	319
	817	57,011	715	52,802

The total number of leases held for mining purposes decreased by 102 and the area by 4,209 acres, as compared with the year 1924. The number of leases for gold mining decreased by 91 and the area by 1,614 acres. The number of mineral leases decreased by 11 and the area by 2,595 acres.

TABLE 14.

Number and Acreage of Gold Mining Leases in force each year for the Five Years ending the 31st December, 1925.

Goldfield.		District.		1921.		1922.		1923.		1924.		1925.		Percentage of Total Acreage.		Increase or Decrease in Acreage for 1925 compared with 1924.		Goldfield.
Name.	Proclaimed.	Name.	Pro-claimed.	Leases.	Acreage.	Leases.	Acreage.	Leases.	Acreage.	Leases.	Acreage.	Leases.	Acreage.	1924.	1925.	Increase	Decrease	
West Kimberley ...	19-3-20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	West Kimberley.
Kimberley ...	20-5-86	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	Kimberley.
Yilgarn	1-10-88	...	...	65	1,080	60	1,032	45	788	40	665	34	544	7·38	7·69	...	97	Yilgarn.
		(Private Property)	...	...	...	...	...	...	...	...	...	1	24					
Pilbara	1-10-88	Marble Bar ...	6-11-96	14	126	30	435	29	403	17	167	10	85	2·19	1·56	...	82	Pilbara.
		Nullagine ...	6-11-96	3	24	1	12	3	36	3	30	3	30					
Ashburton ...	11-12-90	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	Ashburton.
Murchison... ...	24-9-91	Cue	7-12-94	22	248	18	226	10	105	11	149	14	198	8·53	9·71	...	51	Murchison.
		Meekatharra ...	7-12-94	40	581	48	770	32	501	28	449	22	356					
		Day Dawn ...	10-1-96	8	82	15	228	11	122	9	79	7	73					
		Mount Magnet ...	7-12-94	14	138	21	210	18	191	11	92	10	91					
Dundas	31-8-93	...	...	23	284	22	253	14	159	13	147	8	108	1·63	1·47	...	39	Dundas.
Coolgardie ...	6-4-94	Coolgardie ...	7-12-94	57	1,029	50	865	54	965	33	521	30	474	7·56	8·21	...	74	Coolgardie.
		Kunanalling ...	1-9-97	12	143	11	130	12	140	12	160	10	133					
East Coolgardie ...	1-10-94	East Coolgardie	7-12-94	233	4,112	135	2,134	121	1,872	123	1,847	112	1,673	21·00	23·57	...	150	East Coolgardie.
		Bulong	15-4-96	...	...	13	302	30	629	2	45	3	69					
Yalgoo	23-1-95	...	...	15	259	45	753	29	520	18	285	16	239	3·16	3·23	...	46	Yalgoo.
North Coolgardie	28-6-95	Menzies	15-4-96	16	293	18	298	19	304	20	330	19	295	6·13	4·90	...	189	North Coolgardie.
		Ularring	15-4-96	13	161	13	161	5	88	3	56	...	...					
		Yerilla	15-4-96	9	138	6	81	5	75	10	149	3	51					
		Niagara	1-4-97	2	36	3	48	2	36	2	17	2	17					
East Murchison ...	28-6-95	Lawlers	1-7-04	14	213	13	212	11	174	16	248	12	178	23·56	18·00	...	792	East Murchison.
		Black Range ...	1-7-04	16	292	15	270	36	664	8	165	5	86					
		Wiluna	1-3-10	22	408	16	294	22	419	80	1,710	51	1,067					
North-East Coolgardie	15-4-96	Kanowna ...	15-4-96	19	315	20	276	17	251	16	256	13	165	2·84	2·55	...	67	N.E. Coolgardie.
		Kurnalpi ...	15-4-96	6	40	4	23	2	17	...	...	1	24					
Broad Arrow ...	20-11-96	...	...	21	314	26	401	22	341	16	257	16	274	2·85	3·70	17	...	Broad Arrow.
Peak Hill ...	1-4-97	...	...	14	116	7	69	13	142	6	32	8	42	·36	·56	10	...	Peak Hill.
Mount Margaret	1-4-97	Mount Margaret	1-4-97	20	348	20	364	40	924	12	254	9	182	11·49	11·24	...	204	Mount Margaret.
		Mount Malcolm...	1-4-97	32	668	30	627	31	617	29	595	25	547					
		Mount Morgans...	2-4-02	16	259	15	241	14	250	11	186	6	102					
West Pilbara ...	1-11-95	...	...	1	6	2	12	1	6	1	6	1	6	·07	·08	...	...	West Pilbara.
Phillips River ...	14-9-00	...	...	8	118	9	108	6	88	6	88	7	94	·98	1·27	6	...	Phillips River.
Other Localities ...	...	...	...	...	...	...	...	...	...	...	...	9	156	...	2·10	156	...	Other Localities.
Gascoyne	15-4-97	...	...	...	...	2	12	2	12	4	24	2	12	·27	·16	...	12	Gascoyne.
Totals ...	... ...	... ...	...	735	11,831	688	10,847	656	10,839	560	9,009	469	7,395	100·00	100·00	189	1,803	

Decrease for the Year 1925: Leases, 91, acres, 1,614. The largest percentage of the area leased for gold mining purposes is in the respective order: East Coolgardie, 23·57; East Murchison, 18·00; Mt. Margaret, 11·24; Murchison, 9·71; Coolgardie, 8·21; Yilgarn, 7·69; North Coolgardie, 4·90.

Table 15

Number and Acreage of Mineral Leases in force 31st December each year, for the Five Years ending 31st December, 1925.

Mining District.		Sub-District.		1921.		1922.		1923.		1924.		1925.		Increase or Decrease in Acreage for 1925, compared with 1924.		Mining District.
Name.	Proclaimed.	Name.	Proclaimed.	Leases.	Acreage.	Leases.	Acreage.	Leases.	Acreage.	Leases.	Acreage.	Leases.	Acreage	Increase.	Decrease	
Ashburton	11–12–90	...	...	1	10	3	30	1	48	3	87	1	15	...	72	Ashburton.
Murchison	24–9–91	Cue	7–12–94	2	63	3	90	...	...	...	...	...	...	...	...	Murchison.
		Meekatharra ...	7–12–94	...	...	...	...	...	...	...	...	...	...			
		Day Dawn ...	10–1–96	1	48	...	...	...	...	...	...	...	...			
		Mt. Magnet ...	7–12–94	...	...	...	...	...	...	...	...	...	...			
Greenbushes ...	7–4–92	...	...	18	287	18	282	7	146	6	107	5	97	...	10	Greenbushes.
Pilbara	16–6–92	Marble Bar ...	16–6–92	15	415	13	367	10	271	14	447	16	509	53	...	Pilbara.
		Nullagine ...	6–11–96	14	175	12	125	4	34	4	30	3	21			
Yalgoo	23–1–95	...	...	10	238	3	132	2	96	2	96	...	...	...	96	Yalgoo.
Yilgarn	22–3–95	...	...	1	48	1	48	...	...	1	10	...	...	...	10	Yilgarn.
Coolgardie	22–3–95	Coolgardie ...	22–3–95	3	76	5	112	2	28	2	28	2	28	...	...	Coolgardie.
		Kunanalling ...	1–9–97	...	...	...	...	...	...	...	...	...	...			
East Coolgardie ...	22–3–95	East Coolgardie	22–3–95	1	1	1	1	...	...	1	1	1	1	...	...	East Coolgardie.
		Bulong	15–4–96	...	...	...	...	...	...	...	...	...	...			
East Murchison ...	28–6–95	Lawlers	17–4–04	...	...	...	...	...	...	...	...	...	...	...	...	East Murchison.
		Black Range ...	1–7–04	1	6	1	6	...	...	...	...	...	...			
		Wiluna	1–3–10	...	...	...	...	...	...	...	...	...	...			
North Coolgardie ...	16–8–95	Menzies	15–4–96	1	48	1	48	1	48	...	...	...	...	...	...	North Coolgardie.
		Ularring	15–4–96	...	...	...	...	...	...	...	...	...	...			
		Yerilla	15–4–96	...	...	...	...	...	...	...	...	...	...			
		Niagara	1–3–97	...	...	...	...	...	...	...	...	...	...			
West Pilbara ...	1–11–95	...	...	21	798	18	710	22	826	21	778	14	588	...	190	West Pilbara.
Dundas	27–12–95	...	...	...	...	...	...	...	...	...	...	2	36	36	...	Dundas.
Collie	21–2–96	...	...	117	35,621	127	38,671	135	41,108	125	38,059	117	35,619	...	2,440	Collie.
North-East Coolgardie	15–4–96	Kanowna ...	15–4–96	3	47	1	10	1	10	1	10	2	106	96	...	North-East Coolgardie.
		Kurnalpi ...	15–4–96	...	...	...	...	...	...	...	...	...	...			
Broad Arrow ...	20–11–96	...	...	...	...	...	...	...	...	...	...	...	...	...	...	Broad Arrow.
Northampton ...	1–1–97	...	...	14	286	12	250	12	238	13	278	19	387	169	...	Northampton.
		(Private Property)	...	4	167	4	167	4	167	5	191	8	251			
Peak Hill	1–4–97	...	...	8	261	5	216	1	48	...	...	...	...	...	...	Peak Hill.
Mt. Margaret ...	1–4–97	Mt. Margaret ...	1–4–97	...	...	...	...	...	...	...	...	...	...	...	...	Mt. Margaret.
		Mt. Malcolm ...	1–4–97	...	...	...	...	...	...	...	...	...	...			
		Mt. Morgans ...	2–4–02	3	69	3	69	3	69	...	...	...	...			
Gascoyne	15–4–97	...	...	...	...	...	...	...	...	1	48	...	...	...	48	Gascoyne.
Phillips River ...	1–7–99	...	...	16	446	15	485	17	520	17	398	19	373	...	25	Phillips River.
Other localities ...	...	...	...	15	2,151	13	3,016	20	5,114	25	6,820	25	6,860	...	58	Other localities.
		(Private Property)	...	7	204	7	204	6	212	6	166	2	68			
West Kimberley ...	19–3–20	...	...	10	440	10	448	10	448	10	448	10	448	...	...	West Kimberley.
Totals ...	...	...	...	286	41,905	276	45,487	258	49,431	257	48,002	246	45,407	354	2,949	

In the Collie Mineral Field the largest area is held, viz.: 35,619 acres, worked entirely for coal; thus follow Northampton, 638 acres, for lead, copper and coal; West Pilbara, 588 acres, for copper, lead and silver, asbestos, antimony; Pilbara, 530 acres, for tin, tantalite, asbestos, lead, vanadium, silver and lead; West Kimberley, 448 acres, for iron; Phillips River, 373 acres, for iron, copper, manganese.

TABLE 16.

Number and Acreage of Mineral Leases in force on 31st December, 1925, showing Minerals for which they are worked.

Goldfield or Mineral Field.	District.	Mineral.																			
		Coal		Tin.		Copper.		Iron.		Antimony.		Ochre.		Silver and Lead.		Asbestos.		Vanadium.		Clay.	
		Leases.	Acres.	Leases.	Acres.	Leases.	Acres.	Leases.	Acres.	Leases.	Acres.	Leases.	Acres.	Leases.	Acres.	Leases.	Acres.	Leases.	Acres.	Leases.	Acres.
Pilbara	Marble Bar	...	...	6	155	...	...	...	...	...	...	...	...	...	...	1	48	1	48	...	...
	Nullagine	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	21	...	...	...	...
West Pilbara	... ...	...	...	...	...	8	368	...	...	1	48	...	...	1	24	4	148	...	...	...	...
Ashburton	... ...	...	...	...	...	...	...	...	...	...	...	...	...	1	15	...	...	...	...	...	...
Dundas	... ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
East Coolgardie	... ...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...
Coolgardie	... ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
North-East Coolgardie ...	Kanowna	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Phillips River	... ...	...	...	...	...	17	315	1	10	...	...	...	...	...	...	...	...	...	...	...	...
Collie	... ...	117	35,619	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Greenbushes	... ...	...	...	5	97	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Northampton	... ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	(Private Property) ...	1	100	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Outside Proclaimed Fields	... ...	21	6,720	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	(Private Property) ...	...	...	...	...	...	...	1	48	...	...	...	...	...	...	...	...	...	...	1	20
West Kimberley	... ...	...	...	...	...	...	...	10	448	...	...	...	...	...	...	...	...	...	...	...	...
	Totals	139	42,439	11	252	25	683	12	506	1	48	1	1	2	39	8	217	1	48	1	20

Goldfield or Mineral Field.	District.	Mineral.												Total.	
		Alunite.		Tantalite.		Lead.		Gypsum.		Graphite.		Mica.		Manganese.			
		Leases.	Acres.	Leases.	Acres.	Leases.	Acres.	Leases.	Acres.	Leases.	Acres.	Leases.	Acres.	Leases.	Acres.	Leases.	Acres.
Pilbara	Marble Bar	...	...	2	20	6	238	...	...	...	...	...	...	...	...	16	509
	Nullagine	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	21
West Pilbara	... ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	14	588
Ashburton	... ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	15
Dundas	... ...	...	...	...	...	...	...	2	36	...	...	...	...	...	...	2	36
East Coolgardie	... ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1
Coolgardie	... ...	...	...	...	...	...	...	...	...	...	...	2	28	...	...	2	28
North-East Coolgardie ...	Kanowna	1	10	...	...	...	...	1	96	...	...	...	...	...	...	2	106
Phillips River	... ...	...	...	...	...	...	...	...	...	...	...	...	...	1	48	19	373
Collie	... ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	117	35,619
Greenbushes	... ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	97
Northampton	... ...	...	...	...	...	19	387	...	...	...	...	...	...	...	...	19	387
	(Private Property) ...	...	...	...	...	7	151	...	...	...	...	...	...	...	...	8	251
Outside Proclaimed Fields	... ...	...	...	...	...	...	...	1	40	1	42	1	10	1	48	25	6,860
	(Private Property) ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	68
West Kimberley ...	... ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	10	448
	Totals	1	10	2	20	32	776	4	172	1	42	3	38	2	96	246	45,407

TABLE 17.

Number and Acreage of Miscellaneous Leases in force on 31st December, 1925.

Goldfield.	District.	Leases.										Total.	
		Tailings.		Tramway.		Water.		Machinery.		Residence.			
		No.	Acres.	No.	Acres.	No.	Acres.	No.	Acres.	No.	Acres.	No.	Acres.
West Pilbara	... ...	...	...	2	25	...	...	...	...	...	...	2	25
East Murchison	Black Range	...	...	...	...	...	...	...	...	1	2	1	2
Murchison	Day Dawn	...	...	...	...	...	...	...	...	1	1	1	1
North Coolgardie	Menzies	2	15	...	...	1	5	...	...	...	...	3	20
East Coolgardie	... ...	12	245	...	...	...	...	2	16	...	...	14	261
Coolgardie	... ...	1	7	...	...	1	13	...	...	...	...	2	20
Phillips River	... ...	...	...	3	7	...	...	1	10	...	...	4	17
	Total	15	267	5	32	2	18	3	26	2	3	27	346

TABLE 18.

Claims and Authorised Holdings, under "The Mining Act, 1904," and Regulations, existing on 31st December, 1924 and 1925.

Goldfield or Mineral Field.	District.	Prospecting Areas.				Water Rights.				Lode Claims.		Alluvial Claims.		Mineral Claims.		Dredging Claims.		Residence Areas.		Business Areas.		Machinery Areas.		Tailings Areas.		Garden Areas.		Washing Areas.		Quarrying Areas.	
		Number.		Acreage.		Number.		Acreage.																							
		1924.	1925.	1924.	1925.	1924.	1925.	1924.	1925.	1924.	1925.	1924.	1925.	1924.	1925.	1924.	1925.	1924.	1925.	1924.	1925.	1924.	1925.	1924.	1925.	1924.	1925.	1924.	1925
West Kimberley ...	... ...	5	...	240	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Northampton ...	... ...	9	16	121	303	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Pilbara	Marble Bar ...	30	29	1,072	733	3	2	4	2	...	...	2	2	...	...	1	1	1	1	5	6	3	3	1	...	5	5	...	...	...	...
Do.	Nullagine ...	5	8	52	78	4	3	4	3	4	4	...	...	5	5	...	...	3	3	...	...	1	1	...	...	3	3	...	...	...	...
West Pilbara ...	... ...	2	3	48	66	1	...	5	...	2	2	...	...	1	...	...	...	6	6	12	12	1	1	...	...	3	3	...	...	...	1
Ashburton	... ...	...	1	...	10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...
Peak Hill	... ...	11	7	105	96	1	1	10	10	...	...	...	...	5	5	...	...	1	1	...	...	...	...	3	3	...	...	...	...	...	...
East Murchison ...	Lawlers	10	3	207	46	6	6	10	9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	9	9	3	3	...	...	...	...
Do.	Wiluna	95	36	2,046	557	7	7	13	13	...	...	...	...	...	...	...	...	...	...	3	...	5	4	1	1	3	3	...	...	...	...
Do.	Black Range ...	10	9	110	138	...	...	...	...	1	1	1	1	...	...	...	...	34	34	...	...	1	1	...	...	1	1	...	...	...	...
Murchison	Cue	22	23	284	316	4	4	18	19	...	...	...	...	...	...	...	...	5	5	...	...	...	...	...	...	1	1	...	...	...	...
Do.	Meekatharra ...	24	23	366	369	1	1	10	10	...	...	...	...	...	...	...	...	4	4	3	3	1	1	1	1	1	1	...	...	...	...
Do.	Day Dawn ...	5	2	58	17	3	3	4	4	...	...	...	...	...	...	...	...	2	7	...	...	1	1	1	1	1	...	...	...	...	...
Do.	Mt. Magnet ...	27	32	350	418	1	1	1	1	...	...	...	...	...	...	...	...	...	...	1	1	...	1	...	...	5	5	...	...	...	...
Yalgoo	... ...	31	22	568	351	1	1	4	1	...	...	...	...	...	...	...	...	3	3	13	10	2	2	1	...	...	...	...	...	...	...
Mt. Margaret ...	Mt. Morgans ...	5	8	100	136	6	...	11	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	1	...	...	...	...	...	...	...
Do.	Mt. Malcolm ...	16	8	261	123	19	19	174	173	...	...	...	...	...	...	...	...	...	...	4	4	1	1	1	1	14	13	...	...	...	...
Do.	Mt. Margaret ...	11	17	210	311	12	1	16	1	...	...	...	...	...	...	...	...	4	...	2	...	...	...	...	1	5	...	...	...	...	...
North Coolgardie ...	Menzies	11	10	156	186	3	3	15	10	...	...	...	...	...	...	...	...	3	3	4	4	1	1	3	3	6	6	...	...	...	...
Do.	Ularring	2	1	36	18	6	6	6	6	...	...	...	...	...	...	...	...	1	...	3	...	1	...	...	...	...	...	...	...	...	...
Do.	Niagara	3	4	58	66	1	1	1	1	...	...	...	...	...	...	...	...	...	...	...	...	1	1	2	2	...	...	...	...	...	...
Do.	Yerilla	2	7	30	111	4	4	7	7	...	...	...	...	...	...	...	...	...	...	2	2	...	...	...	...	1	1	...	...	...	...
Broad Arrow ...	... ...	16	27	273	534	8	6	22	20	6	...	7	1	...	...	...	...	...	...	4	4	1	1	1	1	...	...	...	...	...	...
N.E. Coolgardie ...	Kanowna ...	10	7	195	126	1	1	3	3	...	...	...	...	2	3	...	...	...	...	...	...	3	3	1	1	4	4	...	...	...	...
Do.	Kurnalpi ...	1	19	12	426	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...
East Coolgardie ...	... ...	92	69	1,464	1,203	7	6	25	24	1	1	1	...	...	...	...	...	...	...	...	...	1	2	6	11	21	19	...	...	...	...
Do.	Bulong	9	17	199	378	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Coolgardie	... ...	48	32	834	446	10	9	45	39	...	...	1	1	...	...	...	...	2	2	6	3	1	2	2	2	1	...	...	...	...	...
Do.	Kunanalling ...	10	17	178	287	6	6	40	40	...	...	...	...	...	...	...	...	1	1	2	2	...	...	...	1	...	...	...	...	...	...
Yilgarn	... ...	34	52	711	982	2	2	3	3	...	...	...	...	...	...	...	...	27	19	12	13	1	1	1	1	...	1	...	...	...	...
Dundas	... ...	7	7	107	84	4	3	7	6	...	...	...	...	...	...	...	...	...	...	...	...	2	2	...	...	1	...	...	...	...	...
Phillips River ...	... ...	2	5	21	76	1	1	1	1	...	...	...	...	...	...	...	...	...	...	...	...	2	1	2	1	3	3	...	...	...	...
Collie	... ...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Greenbushes ...	... ...	1	1	10	10	5	9	15	19	...	...	11	7	...	...	7	9	1	19	...	...	1	1	...	...	16	13	...	...	...	...
Gascoyne	... ...	3	4	72	120	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	...	...	...	...	...	...	...	...	...
Outside Proclaimed Fields	... ...	17	18	6,596	25,298	...	...	...	...	...	...	...	...	10	11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Totals ...		586	544	17,150	34,419	127	106	474	425	14	8	23	12	25	26	8	10	98	109	77	66	34	32	37	40	101	85	...	...	...	1
Increase or Decrease for 1925 compared with 1924		—42		+17,269		—21		—49		—6		—11		+1		+2		+11		—11		—2		+3		—16		...		+1	

For the year 1924 the number of prospecting areas held was 586, the total acreage being 17,150, which included 4 areas of 6,062 acres for coal.
For the year 1925 the number held is 544 of a total acreage of 34,419, including 9 areas of 25,000 acres for coal.

Table 19.

Miners' Rights issued during 1924 and 1925.

Place of Issue.	Miners' Rights.		Place of Issue.	Miners' Rights	
	1924.	1925.		1924.	1925
Albany	2	3	Narrogin	4	...
Boulder	35	30	Norseman	28	32
Bridgetown	...	2	Northampton	34	63
Broome	26	5	Northam	6	5
Bunbury	...	5	Nullagine	19	34
Busselton	21	17	Onslow	27	18
Carnarvon	39	21	Ora Banda	35	20
Collie	2	1	Payne's Find	12	7
Coolgardie	137	130	Peak Hill	24	21
Cue	111	93	Perth	255	233
Derby	14	18	Port Hedland	9	16
Geraldton	17	28	Ravensthorpe	27	15
Greenbushes	57	64	Roebourne	37	47
Hall's Creek	21	25	Sandstone	25	24
Kalgoorlie	648	583	Southern Cross	103	188
Laverton	89	93	St. Ives	22	...
Lawlers	97	56	Wagin	13	1
Leonora	100	84	Westonia	17	45
Marble Bar	83	106	Wiluna	78	76
Marvel Loch	14	12	Wyndham	14	3
Meekatharra	145	161	Yalgoo	48	60
Menzies	80	82	Yarri	2	...
Mount Magnet	102	132	York	2	8
Mullewa	4	3	Youanmi	17	8
			Total	2,702	2,678

Table 20.

Number and Acreage of Miners' Homestead Leases in force on 31st December, 1924 and 1925.

Goldfield.	District.	1924.		1925.		Increase.		Decrease.	
		Leases.	Acreage.	Leases.	Acreage.	Leases.	Acreage.	Leases.	Acreage.
West Pilbara	... ...	...	...	...	...	...	...	...	...
Greenbushes	... ...	6	522	6	522	...	...	...	...
Pilbara	Marble Bar ...	...	...	...	...	...	...	...	...
	Nullagine	...	...	...	...	...	...	...	...
Dundas	... ...	25	1,319	21	779	...	...	4	540
Broad Arrow	... ...	3	44	2	24	...	...	1	20
Yilgarn	... ...	11	370	13	410	2	40	...	...
Mt. Margaret ...	Mt. Malcolm ...	5	1,239	6	1,250	...	...	...	9
	Mt. Margaret ...	12	341	11	321				
Murchison ...	Cue	4	1,204	4	1,204	...	...	...	...
	Day Dawn ...	2	25	2	25				
	Meekatharra ...	11	1,675	11	1,675				
	Mt. Magnet ...	1	236	1	236				
Yalgoo	... ...	5	1,204	5	1,204	...	...	...	...
Coolgardie ...	Coolgardie	24	1,031	22	991	...	...	2	40
	Kunanalling ...	3	530	3	530				
East Coolgardie ...	... ...	90	2,746	82	2,601	...	...	8	145
Phillips River	... ...	126	17,549	124	17,401	...	...	2	148
Peak Hill	... ...	4	247	5	547	1	300	...	...
North-East Coolgardie ...	Kanowna	14	742	12	702	...	...	2	40
North Coolgardie	Menzies	5	690	5	690	...	...	...	...
	Yerilla	1	10	1	10				
	Niagara	1	20	1	20				
	Ularring	1	20	1	20				
East Murchison...	Lawlers	6	1,115	6	1,115	1	30	...	...
	Black Range ...	1	307	1	307				
	Wiluna	3	39	4	69				
	Total ...	364	33,225	349	32,653	4	370	19	942

As compared with the Year 1924, the number of leases held has decreased by 15 and the area by 572 acres.

PART IV.—MEN EMPLOYED.

TABLE 21.

Average number of Men engaged in Mining during 1924 and 1925.

Goldfield.	District.	Reef or Lode.		Alluvial.		Total.	
		1924.	1925.	1924.	1925.	1924.	1925.
1. Kimberley	...	...	...	5	5	5	5
2. West Kimberley	...	...	...	...	...	...	...
3. Pilbara	Marble Bar	56	40	12	14	68	54
	Nullagine	18	15	24	17	42	32
4. West Pilbara	...	2	2	2	2	4	4
5. Ashburton	...	...	...	2	2	2	2
6. Gascoyne	...	...	...	2	2	2	2
7. Peak Hill	...	28	27	7	6	35	33
8. East Murchison	Lawlers	51	30	...	2	51	32
	Wiluna	61	86	...	...	61	86
	Black Range	70	63	2	2	72	65
9. Murchison	Cue	57	56	1	1	58	57
	Meekatharra	198	227	23	18	221	245
	Day Dawn	31	32	2	...	33	32
	Mt. Magnet	76	78	3	4	79	82
10. Yalgoo	...	108	109	2	2	110	111
11. Mt. Margaret	Mt. Morgans	65	71	...	...	65	71
	Mt. Malcolm	342	366	...	...	342	366
	Mt. Margaret	50	41	...	...	50	41
12. North Coolgardie	Menzies	126	70	...	...	126	70
	Ularring	11	4	...	...	11	4
	Niagara	12	12	...	...	12	12
	Yerilla	27	18	...	...	27	18
13. Broad Arrow	...	111	139	7	6	118	145
14. North-East Coolgardie	Kanowna	71	68	2	2	73	70
	Kurnalpi	8	22	...	2	8	24
15. East Coolgardie	East Coolgardie	2,815	2,652	26	27	2,841	2,679
	Bulong	37	40	5	4	42	44
16. Coolgardie	Coolgardie	336	273	32	20	368	293
	Kunanalling	60	68	1	...	61	68
17. Yilgarn	...	171	163	...	...	171	163
18. Dundas	...	111	85	13	...	124	85
19. Phillips River	...	11	11	1	1	12	12
State generally	...	2	2	...	...	2	2
Total—Gold Mining	...	5,122	4,870	174	139	5,296	5,009
MINERALS OTHER THAN GOLD.							
Tantalite	Marble Bar	...	3	...	...	...	3
Tin	Greenbushes	23	30	...	...	23	30
	Marble Bar	3	6	14	*19	17	25
	West Pilbara	35	...	...	...	35	...
Copper	Phillips River	23	22	...	...	23	22
	Northampton	52	12	...	...	52	12
Lead Ore	Northampton	141	198	...	...	141	198
Coal	Collie River	673	677	...	...	673	677
Asbestos	Nullagine	16	14	...	...	16	14
Gypsum	State Generally	13	15	...	...	13	15
Silver-Lead Ore	Ashburton	...	2	...	...	...	2
	Marble Bar	...	4	...	...	...	4
Total—Other Minerals	...	979	983	14	19	993	1,002
GRAND TOTAL	...	6,101	5,853	188	158	6,289	6,011

*Classified elsewhere as employed at mines.

TABLE 22.

Average Number of Men employed at Mines during 1925.

Mineral.	Above ground.	Under ground.	Total.	Percentage of total men employed.	Increase or decrease compared with 1924.
Asbestos	7	7	14	·24	— 2
Coal	154	523	677	11·53	+ 4
Copper	22	12	34	·58	— 76
Gold	2,329	2,541	4,870	82·94	— 252
Gypsum	14	1	15	·25	+ 2
Lead	54	144	198	3·37	+ 57
Silver-Lead Ore	4	2	6	·10	+ 6
Tantalite...	3	...	3	·05	+ 3
Tin	*54	1	55	·94	+ 15
Total	2,641	3,231	5,872	100·00	— 243

*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 1925, 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 1924.	Percentage of total men employed.	
					1924.	1925.
1. Kimberley	...	...	...	...	...	...
2. West Kimberley	...	...	...	...	...	...
3. Pilbara	21	34	55	— 19	1·44	1·13
4. West Pilbara	1	1	2	...	·04	·04
5. Ashburton	...	...	...	...	...	...
6. Gascoyne	...	...	...	...	...	...
7. Peak Hill	19	8	27	— 1	·55	·55
8. East Murchison	99	80	179	— 3	3·55	3·68
9. Murchison...	180	213	393	+ 31	7·07	8·07
10. Yalgoo	54	55	109	+ 1	2·11	2·24
11. Mt. Margaret	245	233	478	+ 21	8·92	9·81
12. North Coolgardie	69	35	104	— 72	3·43	2·14
13. Broad Arrow	75	64	139	+ 28	2·17	2·85
14. North-East Coolgardie	48	42	90	+ 11	1·54	1·85
15. East Coolgardie	1,216	1,476	2,692	— 160	55·68	55·28
16. Coolgardie	158	183	341	— 55	7·73	7·00
17. Yilgarn	91	72	163	— 8	3·34	3·35
18. Dundas	43	42	85	— 26	2·17	1·74
19. Phillips River	8	3	11	...	·22	·23
State generally	2	...	2	...	·04	·04
Total	2,329	2,541	4,870	— 252	100·00	100·00

TABLE 24.

Alluvial Gold Workers.

Goldfield.	1924.	1925.	Increase or Decrease compared with 1924.
1. Kimberley	5	5	...
2. West Kimberley	...	...	...
3. Pilbara	36	31	— 5
4. West Pilbara	2	2	...
5. Ashburton	2	2	...
6. Gascoyne	2	2	...
7. Peak Hill	7	6	— 1
8. East Murchison	2	4	+ 2
9. Murchison	29	23	— 6
10. Yalgoo	2	2	...
11. Mt. Margaret	...	...	...
12. North Coolgardie	...	...	...
13. Broad Arrow	7	6	— 1
14. North-East Coolgardie	2	4	+ 2
15. East Coolgardie	31	31	...
16. Coolgardie	33	20	— 13
17. Yilgarn	...	...	...
18. Dundas	13	...	— 13
19. Phillips River	1	1	...
Total	174	139	— 35

TABLE 25.

Table showing Rate of Wages Payable in the Mining Industry at the 31st December, 1925.

Class of Employee.	Yilgarn, Coolgardie, Broad Arrow, Dundas, E. Coolgardie, N.E. Coolgardie, N. Coolgardie, Mt. Margaret, and East Murchison Goldfields, except Black Range District.	Meekatharra and Youanmi Districts.	Cue and Day Dawn Districts.	Northampton†
	Rate per Shift. s. d.	Rate per Shift. s. d.	Rate per Shift. s. d.	Rate per Shift s. d.
Rock Drill Men in Shafts	17 8	18 10	18 1	...
Rock Drill Men in Rises	17 2	18 4	17 7	...
Rock Drill Men in Winzes	16 10	18 0	17 3	...
Rock Drill Men in other places	16 6	17 8	16 11	...
Hand Miners in Shafts	16 10	18 0	17 3	15 10
Hand Miners in Rises	16 4	17 6	16 9	15 4
Hand Miners in Winzes	16 0	17 2	16 5	15 0
Hand Miners in other places	15 8	16 10	16 1	14 8
Shaft Timbermen	17 8	18 0	17 3	16 8
Timbermen	16 10	18 0	17 3	15 10
Mullockers, Truckers, Shovellers, etc.	14 10	16 0	15 3	13 10
Bracemen, Platmen, and Shipmen	15 10	16 6	15 9	14 10
Man in charge Explosives Magazine	16 4	...	...	...
Platelayer (Underground)	15 10	...	...	...
Scalers (Underground)	16 10	...	...	...
Sampler	16 0	...	...	...
Rock Breaker—Crackermen	15 4	16 6	15 9	14 4
Battery Feeders and Mill Hands	14 4	16 0	15 3	...
Battery—Repairers, etc.	15 10	...	...	...
Mechanics' Labourer	14 10	16 0	15 3	13 10
Iron Furnacemen	16 4	...	...	...
Castings Dresser	14 10	...	...	...
Pitman and Pumpman	16 10	...	...	15 10
Fireman, Leading	16 4	...	...	...
Fireman, Steam or Roaster	15 4	...	...	14 4
Wood Trimmer	14 10	...	...	13 10
Pumpman on the Surface	15 10	...	...	14 10
Greaser, Cleaner, and Oiler	15 4	...	...	...
Motorman	16 2	...	...	...
Ball Mill Hand	15 4	...	...	...
Mill Hands	...	...	...	13 4
Boiler Cleaners	16 10	...	...	15 10
Filterpress Filler	16 2	18 0	17 3	...
Cyanide and Filterpress Men	15 4	16 6	15 9	...
Amalgamator	16 0	...	...	...
Wilfley Tablemen	14 8	...	...	...
Grinding Panman	14 10	...	...	...
Vacuum Plant Hands (Top)	16 4	18 0	17 3	...
Vacuum Plant Hands (Bottom)	15 0	16 6	15 9	...
Timber Dresser, Sawyer, etc.	16 2	...	...	...
Jigman	...	...	...	14 1
Tool Sharpeners	16 4	18 0	17 3	15 4
Holman Hoist (aboveground)	16 2	...	...	15 2
Holman Hoist (underground)	16 8	...	...	15 8
Blacksmith's Striker	14 10	16 4	15 7	13 10
Platelayer on Surface	15 4	...	...	...
Roper and Rigger	16 4	17 6	16 9	15 4
Sailor Gang Men	14 10	...	...	13 10
Conveyor Belt Men	14 4	...	...	13 4
Horse-driver	14 4	16 0	15 3	13 4
Sanitary Man	17 8	...	...	...
Watchman	15 10	...	...	...
Smelter (Gold Room)	16 0	...	...	...
General Labourer	14 4	16 0	15 3	13 4
Sand Shovellers, Surface residues	...	...	...	13 4
Popper Machine Man	16 6	...	...	...
Pipe Fitter	16 8	...	...	...
Tailings Dam Man	14 4	...	...	...
Diamond Drillers	17 0	...	...	...
Diamond Drillers' Assistant	15 0	...	...	...
Spotters	16 2	...	...	...
*Winding Engine-drivers	18 0			
Winch-drivers	17 0			
Other Engine-drivers	16 6 to 17 6	As column 1 with Special District Allowance.		
Locomotive-drivers	17 6			

Forty-eight hours on surface and forty-four hours underground (including crib time) constitute a week's work.

*6d. per day extra if they raise or lower human beings.

†District Allowance, Northampton—All workers at Surprise Mine paid 1s. per day extra.

District Allowances.—In addition to the wages as per Column 1, the following allowances are paid to workers in the Districts enumerated hereunder, except those portions situated within a radius of five miles of Kalgoorlie, Coolgardie, and Southern Cross:—

First District—Lying South of Kalgoorlie and comprised within lines starting from Kalgoorlie, thence W.S.W. to Woolgangie, then S.E. to Dundas, then N.E. to a point 10 miles East of Karonie, on the Trans-Australian line, and thence back to Kalgoorlie:

1s. per shift extra for those mines within five miles of the railway and 1s. 6d. per shift for those outside.

Second District—Starting from Kalgoorlie, W.S.W. to Woolgangie, thence N.N.W. to the intersection of the 120 E. meridian with the 30 S. parallel of latitude, thence N.E. by E. to Kookynie, thence back to the point 10 miles East of Karonie on the Trans-Australian line, and thence back to Kalgoorlie:

1s. 3d. per shift extra for those mines within five miles of the railway and 1s. 6d. per shift for those outside.

Third District—Starting from and including Kookynie, then N. by W. to Kurrajong, thence N.E. to Stone's Soak, thence S.E. to and including Burtville, thence S.W. through Pindinnie to Kookynie:

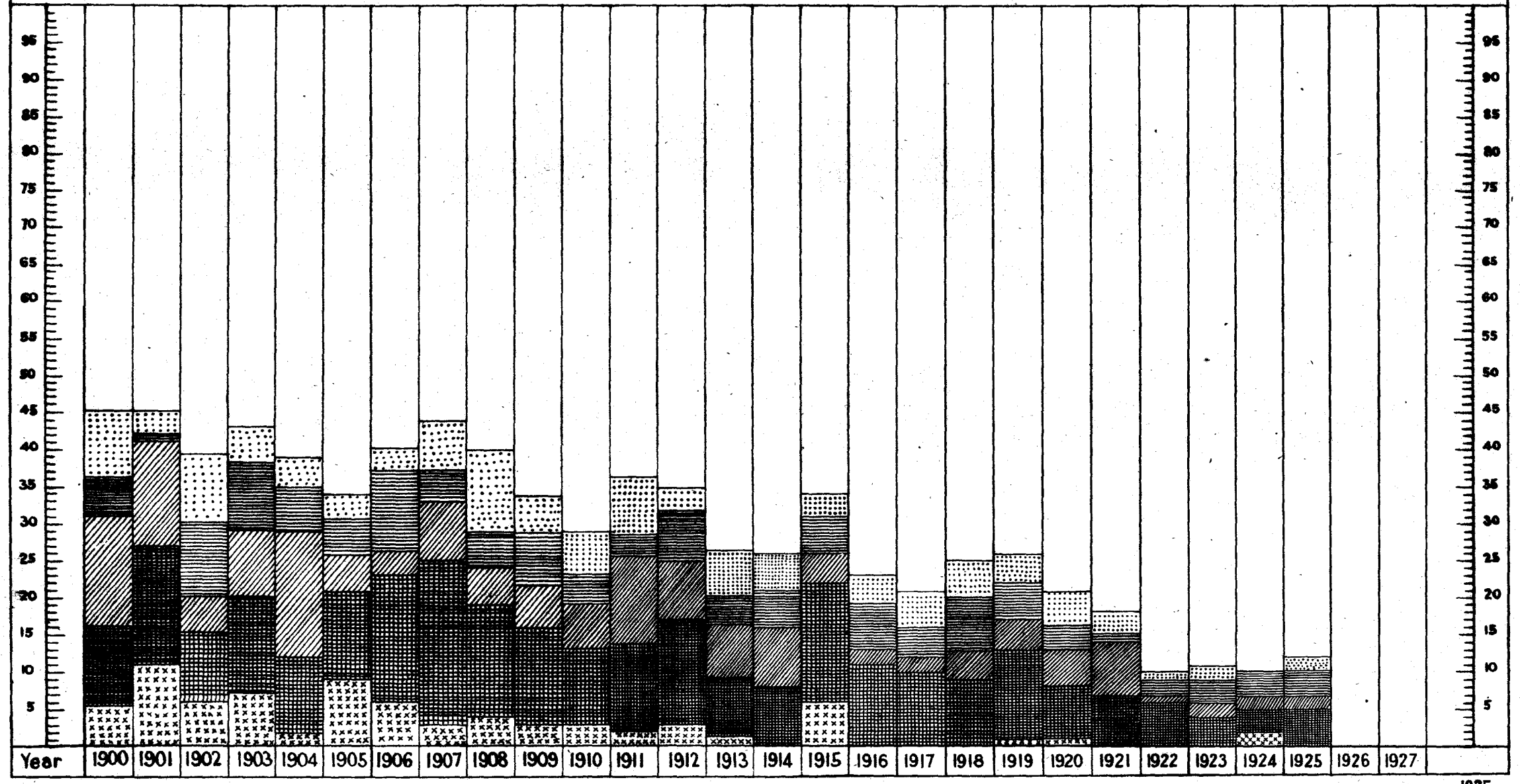
1s. 6d. per shift extra for those mines within five miles of the railway and 1s. 9d. per shift for those outside.

Fourth District—Surrounding Southern Cross within a radius of 30 miles:

1s. per shift extra.

Fifth District—Comprising all mines not within foregoing boundaries, but within area comprised in Goldfields enumerated at head of Column 1.

DIAGRAM SHEWING THE NUMBER OF DEATHS FROM ACCIDENTS ARRANGED IN FIVE CLASSES, IN THE MINES OF WESTERN AUSTRALIA DURING THE YEARS 1900 AND ONWARDS



1925.

EXPLOSIONS

FALLS OF GROUND

IN SHAFTS

MISCELLANEOUS UNDERGROUND

ON SURFACE INCLUDING MACHINERY

PART V.—ACCIDENTS.

TABLE No. 26.

MEN EMPLOYED IN MINES KILLED AND INJURED IN MINING ACCIDENTS DURING 1924 AND 1925.

A.—*According to Locality of Accident.*

Goldfield.	Killed.		Injured.		Total Killed and Injured.	
	1924.	1925.	1924.	1925.	1924.	1925.
1. Kimberley	...	...	...	...	...	...
2. West Kimberley	...	...	...	...	...	...
3. Pilbara	...	...	...	...	...	...
4. West Pilbara	...	...	...	...	...	...
5. Ashburton	...	...	...	...	...	...
6. Gascoyne	...	...	...	...	...	...
7. Peak Hill	...	...	...	...	...	...
8. East Murchison	...	2	1	....	1	2
9. Murchison	1	...	15	21	16	21
10. Yalgoo	...	...	...	...	...	...
11. Mt. Margaret	1	2	9	41	10	43
12. North Coolgardie	...	...	1	1	1	1
13. N.E. Coolgardie	...	...	...	...	...	...
14. Broad Arrow	...	...	...	...	...	...
15. East Coolgardie	5	8	131	237	136	245
16. Coolgardie	...	...	2	3	2	3
17. Yilgarn	...	...	1	...	1	...
18. Dundas	...	...	...	1	...	1
19. Phillips River	...	...	...	...	...	...
MINING DISTRICTS—						
Northampton	2	...	...	1	2	1
Yandanooka	...	...	...	...	...	...
Greenbushes	...	...	...	...	...	...
Collie	1	...	70	78	71	78
Swan	...	...	1	...	1	...
Kendenup	...	...	...	...	...	...
Roelands	...	...	...	...	...	...
Total	10	12	231	383	241	395

From the above table, it will be seen that the total number of fatal accidents for the year 1925 was 12, as against 10 for 1924. The number injured shows an increase of 152 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.*

	1924.		1925.		Comparison with 1924.	
	Fatal.	Serious.	Fatal.	Serious.	Fatal.	Serious.
1. Explosives	2	3	...	1	— 2	— 2
2. Falls of Ground	3	21	5	21	+ 2	...
3. In Shafts	2	5	2	1	...	— 4
4. Miscellaneous Underground	3	147	3	262	...	+ 115
5. Surface	...	55	2	98	+ 2	+ 43
Total	10	231	12	383	+ 2	+ 152

The fatal accidents (12) occurred in gold mines.

The death rate per 1,000 men employed in gold mines was 2.46 as against 1.59 in 1924.

TABLE No. 27.

Deaths from Accidents of Persons employed at Mines during 1924 and 1925.

	1924.						1925.					
	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	...	1·93	1·49	...	...	...	...	...	...
Men employed	(155)	(518)	(673)	...	...	...	(154)	(523)	(677)	...	...	...
Gold Mines	...	7	7	...	2·58	1·32	2	10	12	·81	3·94	2·40
Men employed	(2,585)	(2,711)	(5,296)	...	...	...	(2,468)	(2,541)	(5,009)	...	...	...
Other Mines	...	2	2	...	12·05	6·25	...	...	...	...	...	...
Men employed	(154)	(166)	(320)	...	...	...	(158)	(167)	(325)	...	...	...
Total for all mines ...	...	10	10	...	2·94	1·59	2	10	12	·72	3·10	2·00
Total number of men employed	(2,894)	(3,395)	(6,289)	...	...	...	(2,780)	(3,231)	(6,011)	...	...	...

TABLE No. 28.

Deaths from Accidents of Persons employed at Quarries during 1924 and 1925.

Mining District.	Number of Persons employed.				Number of Persons killed.				Death Rate per 1,000 men employed.			
	Above Ground.		Total.		Above Ground.		Total.		Above Ground.		Total.	
	1924.	1925.	1924.	1925.	1924.	1925.	1924.	1925.	1924.	1925.	1924.	1925.
Swan ...	321	307	321	307	...	...	...	...	..	...	...	...
Roelands ...	16	...	16	...	...	...	...	...	...	...	...	...
Total ...	337	307	337	307	...	...	...	...		...	...	...

TABLE No. 29.

Deaths from Accidents of Persons Employed in Gold Mines during 1925, and the Death Rate per 1,000 Men Employed and per 1,000 tons of Gold Ore raised during 1924 and 1925. (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.	
	1925.			1925.			1924.		
	Above Ground.	Under Ground.	Total.	Above Ground.	Under Ground.	Total.	Total.	1925.	1924.
1. Kimberley	...	...	...	...	...	...	...	...	...
2. West Kimberley	...	...	...	...	...	...	...	...	...
3. Pilbara	...	...	...	...	...	...	...	...	...
4. West Pilbara	...	...	...	...	...	...	...	...	...
5. Ashburton	...	...	...	...	...	...	...	...	...
6. Gascoyne	...	...	...	...	...	...	...	...	...
7. Peak Hill	...	...	...	...	...	...	...	...	...
8. East Murchison	...	2	2	...	25·00	11·17	...	·389	...
9. Yalgoo	...	...	...	...	...	...	...	...	...
10. Mt. Margaret	1	1	2	4·08	4·29	4·18	2·19	·020	·011
11. North Coolgardie ...	...	...	...	...	...	...	...	...	...
12. North-East Coolgardie ...	...	...	...	...	...	...	...	...	...
13. East Coolgardie	1	7	8	·82	4·74	2·97	1·75	·014	·008
14. Broad Arrow	...	...	...	...	...	...	...	...	...
15. Coolgardie	...	...	...	...	...	...	...	...	...
16. Murchison	...	...	...	...	...	...	2·76	...	·026
17. Yilgarn	...	...	.	...	...	...	...	...	...
18. Dundas	...	...	...	...	...	...	...	...	...
19. Phillips River	...	...	...	...	...	...	...	...	...
Total	2	10	12	·86	3·94	2·46	1·37	·015	·009

The number of deaths per 1,000 men employed shows an increase from 1·37 in 1924, to 2·46 in 1925, and that per 1,000 tons of gold ore raised shows an increase, being ·015 as against ·009 for the preceding year.

PART VI.—STATE AID TO MINING.

The number of State batteries existing at the end of the year was 29.

From inception to the end of 1925 gold and tin to the value of £5,950,837 have been recovered from the State plants: 1,419,875 tons of auriferous ore have been treated, and have produced £4,847,128 by amalgamation, £741,654 by cyanidation, £265,266 worth by slimes treatment, £9,353 worth from residues, and 80,728 tons of tin ore produced tin to the value of £92,864, and in addition a sum of £572 has been recovered from residues.

During the year the gold ore treated was 18,093 tons for 19,300.68 ounces bullion.

The working expenditure for all plants for the year totalled £28,887 11s. 3d., and the revenue £21,302 17s. 10d., which shows a loss of £7,584 13s. 5d. on the year's operations.

The capital expenditure since the inception of the scheme has been £403,221 10s. 1d.; £311,240 8s. 5d. from General Loan Fund and £91,981 1s. 8d. from Consolidated Revenue.

The cost of administration for the year was £3,006 2s. 10d., as against £3,340 9s. 8d. for 1924.

The working expenditure from inception to the end of the year exceeds the revenue by £141,942 15s. 5d.

GEOLOGICAL SURVEY.

The field operations of the Survey during the year 1925 have been even more restricted than in previous years, owing to the limited number of the staff and the usual routine work of the office has been performed by a reduced personnel. The field operations included:—

1. A partial examination of the geological features of the North end of Kalgoorlie.
2. Examination of Allunite Deposits at Lake Brown.
3. Inspection and report on the Gypsum Deposits of Baandee.
4. A preliminary investigation into the Peat occurrences of the Coastal Plan in the Metropolitan Area.

ASSISTANCE UNDER MINING DEVELOPMENT ACT, 1902.

The following statement shows the sums advanced during the year, 1925, under "The Mining Development Act":—

	£	s.	d.
Advanced in aid of mining work and equipment of mines with machinery	22,588	8	9
Subsidies on stone crushed for the public	133	5	3
Providing means of transport and equipment to prospectors	5,640	4	5
	£28,361	18	5

In addition to the above, the vote was charged with £49,134 18s. 5d., rebates made to Goldfields Water Supply Branch, consequent upon reduction of the price of water on the Eastern Goldfields. This arrangement dated from 1st July, 1923. Other assistance granted from the Vote during the year on various matters totalled £4,206 17s. 5d.

The subsidies paid on stone crushed for the public amounted to £133 5s. 3d., and are subsidies paid to owners of plants crushing for the public, the conditions being that they crush at fixed rates. The ore crushed during the year at these plants totalled 1,515 tons.

The receipts under the Mining Development Act, exclusive of interest payments, amounted to £3,574 9s. 6d., and included:—

	£	s.	d.
Refund of advances ..	2,415	10	7
Sale of securities ..	322	8	8
Miscellaneous refunds ..	836	10	3
	£3,574	9	6

The mining industry has been further assisted by way of guarantees by the Government to banks on behalf of various companies, and at the end of 1925 the liability of the Government in respect of these guarantees was £44,500.

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

ASHBURTON GOLDFIELD.

Eleven (11) fine ounces of gold were reported, and in the preceding year three (3) fine ounces.

Thirty (30) tons of silver lead ore, valued at £630, were also reported.

There is very little mining being carried on on this field.

BROAD ARROW GOLDFIELD.

The output of gold was 8,242 fine ounces, and in the preceding year 2,661 fine ounces, an increase of 5,581 fine ounces.

This is accounted for by the output from the Associated Northern Company's mine at Ora Banda. A mild rush at Bardoc was the cause of considerable ground being taken up. The original prospectors had some fair returns, and prospects on some of the other blocks justify further development work.

Prospecting in the other centres of the field was active, and some good returns were reported.

COLLIE COAL FIELD.

The output of coal for the year was 437,461 tons, and in the preceding year 421,864 tons, an increase of 15,597 tons.

Five (5) collieries were producing, viz.: The Proprietary, Co-operative, Cardiff, Westralia, and Premier. All were working full time excepting for a short period when a cessation was caused through industrial trouble.

The question of the erection of a power plant for furnishing power to districts remote from Collie is

receiving consideration, and if the intention is accomplished it will add to the prosperity of the district, which is already considerable.

COOLGARDIE GOLDFIELD.

The output of gold was 10,309 fine ounces, and in the preceding year 10,240 fine ounces, an increase of 66 fine ounces.

In the Kunanalling district the existing mines were regular and consistent producers, and there was little change.

At Gibraltar the Lloyd George Mine was worked by tributers, and the future outlook is not promising, the possibility of further capital being invested in it being very remote.

In the Widigiemooltha, Burbanks and other centres, and the immediate vicinity of Coolgardie only a limited amount of prospecting was in evidence. At St. Ives a few mines were working, and on the Ives Reward the newly erected battery was crushing for the greater part of the year. This centre, however, has not yet come up to expectations.

DUNDAS GOLDFIELD.

The output of gold was 2,601 fine ounces, and in the preceding year 3,429 fine ounces, a decrease of 828 fine ounces.

The lease formerly held by the Mararoa Company has been acquired by a party who are busily engaged erecting plant, which is evidence of a belief in its possibilities. Elsewhere there has been no improvement in this field.

EAST COOLGARDIE GOLDFIELD.

The output of gold was 305,769 fine ounces, and in the preceding year 336,099 fine ounces, a decrease of 30,330 fine ounces.

The majority of the large mines continued their normal operations, but in several instances a falling-off in output was recorded. Most of the companies operating on this field are having a difficult struggle, and unless radical changes are effected the outlook is far from promising.

The new find at Mt. Hunt reported last year resulted in nothing of permanence being discovered.

The North End continues to be well prospected, and the Government proposes to assist by carrying out some diamond drilling as soon as possible.

At Mt. Monger, in the Bulong district, a fair quantity of gold was won, and several prospectors had good returns.

EAST MURCHISON GOLDFIELD.

The output of gold was 5,399 fine ounces, and in the preceding year 4,897 fine ounces, an increase of 502 fine ounces.

In the Black Range district there was a small increase in output, the principal operations being at Sandstone. All the other centres remained exceedingly quiet.

In the Lawlers district very little mining was carried on, but there were small outputs from the Lawlers, Mt. Sir Samuel, and Kathleen Valley centres.

In the Wiluna district an increase was reported. At Wiluna active operations are being carried out on the leases held by some English investors, and if developments are satisfactory a great revival in mining at this centre should result.

At Cole's Find progress has been satisfactory and a large amount of prospecting carried out.

At Mt. Hilda, the district where the new find reported last year is situated, a good deal of work has been accomplished, and arrangements for the erection of a battery on one of the leases are in hand.

Until more development has been done it is not possible to gauge the probable value of this centre.

GASCOYNE GOLDFIELD.

Three (3) fine ounces were reported from this field, an identical amount to that reported last year, and presumably got by fossickers. No mining is being done.

GREENBUSHES MINERAL FIELD.

The output of Black Tin was 55.27 tons, valued at £8,764, and in the preceding year 52.56 tons, valued at £7,469, an increase in tonnage of 2.71 tons and in value of £1,295.

Continuous work was carried out by most of the dredges.

A movement is on foot by a local syndicate, to which assistance by the Government has been promised, to further exploit the lode in the old Cornwall mine. It is hoped to commence operations early in the new year, which, if successful, will mean much to the district.

KIMBERLEY GOLDFIELD.

Twenty-nine (29) ounces of fine gold were reported, and in the preceding year thirteen (13) fine ounces. Apart from a small amount of prospecting, very little mining was done on this field.

MOUNT MARGARET GOLDFIELD.

The output of gold was 41,850 fine ounces, and in the preceding year 43,705 fine ounces, a decrease of 1,855 fine ounces.

In the Mt. Margaret district there was a decrease, and although a small amount of prospecting was in evidence at the various centres no improvement was noticeable.

In the Mt. Morgans district there was also a decrease, the only production being from the Westralia, Mt. Morgans, the Torquay leases at Linden, and the Linden State Battery. The district was exceedingly quiet.

In the Mt. Malcolm district the production was practically the same as the previous year, consequent on the continuance of operations at the Sons of Gwalia Mine, the principal producer. Prospecting parties were at work in various centres, but results were not encouraging.

MURCHISON GOLDFIELD.

The output of gold was 29,439 fine ounces, and in the preceding year 24,425 fine ounces, an increase of 5,014 fine ounces.

In the Meekatharra district there was an improvement, mainly consequent on increased operations on the Ingliston Consols Extended Mine. In the outlying centres mining was very quiet.

In the Cue district this was also the case, although the output showed a small increase.

The Monte Carlo lease, referred to last year, has not developed up to expectations.

The Mararoa Company is actively developing its property at Reidy's, towards which it has been

assisted by the Government. The outlook is promising.

The Day Dawn district was the only one which failed to show an improved output, as previously the principal production was from the old Fingall Mine.

In the Mt. Magnet district there was an increase and a good deal of activity was evidenced.

Several rich returns were got by prospectors at Mt. Magnet also one at Paynesville. A 5-head mill was erected on a lease known as "Hill 60" and commenced crushing in December. At Moyagee the old mine has been unwatered with Government assistance and the discovery of rich ore reported.

NORTHAMPTON MINERAL FIELD.

The output of lead ore was 37,865.99 tons, valued at £119,299; and in the preceding year 36,750 tons, valued at £101,219; an increase in tonnage of 1,115.99 tons, and in value of £18,080. Copper ore to the extent of 2,469.72 tons, valued at £8,952, was also produced, and in the preceding year 10,672 tons valued at £34,955; a decrease in tonnage of 8,202.28 tons, and in value of £26,003.

Throughout the field, mining operations were active the price of lead being good. If this is maintained the prospects are excellent as large deposits are known to exist.

A new mine known as the "Two Boys," situated at Galena, has been acquired under option by a syndicate which is engaged in opening it up and developments are most encouraging.

The principal producers of lead were the "Surprise" Mine at Galena, and the "Narra Tarra" at Protheroe, the latter also of copper.

NORTH COOLGARDIE GOLDFIELD.

The output of gold was 4,550 fine ounces, and in the preceding year 9,509 fine ounces; a decrease of 4,959 fine ounces. The Menzies district was responsible for nearly all the shortage attributable to the greatly reduced output from the Menzies Consolidated Mine at Yunndaga.

At Comet Vale the Gladsome and Sand Queen Mines were successfully unwatered, but operations ceased in September, since when they have been idle.

At Goongarrie and Mt. Ida a small amount of prospecting was going on.

In the Ularring, Niagara and Yerilla districts mining was exceedingly quiet.

NORTH-EAST COOLGARDIE GOLDFIELD.

The output of gold was 5,898 fine ounces, and in the preceding year 4,691 fine ounces, an increase of 1,207 fine ounces. There was little change during the year. The chief producers were the "Kanowna Red Hill," "Golden Valley," and "Pride of the Morning" Mines.

In the Kurnalpi district a small rush occurred but nothing permanent was discovered.

PEAK HILL GOLDFIELD.

The output of gold was 1,636 fine ounces, and in the preceding year 2,113 fine ounces; a decrease of 477 fine ounces.

There was very little change and no noteworthy developments. A company has been formed for the purpose of working the huge manganese deposits at Horseshoe, and in a few months work should be in full swing.

PHILLIPS RIVER GOLDFIELD.

The output of gold was 27 fine ounces, and in the preceding year 145 fine ounces; a decrease of 118 fine ounces. No copper was produced. Gold mining is at a standstill and the position in regard to copper is much the same at the moment.

The producers are awaiting the results of the efforts by the Copper Separation Company to show that they can treat the ores of the district profitably, even at the present low price ruling for copper. If success is attained by the company, which is being assisted financially by the Government, it will mean a return to prosperity for this field.

PILBARA GOLDFIELD.

The output of gold was 2,502 fine ounces and in the preceding year 2,134 fine ounces; an increase of 368 fine ounces.

Black Tin to the amount of 23.96 tons, valued at £3,609, was produced, and in the preceding year 28.55 tons, valued at £4,048; a decrease in tonnage of 4.59 tons and in value of £439.

Asbestos to the amount of 50 tons, valued at £1,619, was raised, and in the preceding year 73.58 tons, valued at £2,206; a decrease in tonnage of 23.58 tons and in value of £587; also 6.25 tons of Tantalite, valued at £750, and 51 tons of Silver-Lead Ore, valued at £1,268, were reported, but none of either in the preceding year.

In gold and tin mining there was practically no change.

At Wodgina mining for Tantalite was resumed after a lapse of many years.

Asbestos mining is confined to the Lionel centre of the Nullagine district and steady work was in progress.

At Braeside centre considerable attention is being focussed on the silver lead deposits, and there is evidence that several of the holders of mines there are earnestly endeavouring to develop them.

WEST PILBARA GOLDFIELD.

The output of gold was 35 fine ounces and in the preceding year 76 fine ounces; a decrease of 41 fine ounces.

No copper was reported, but asbestos to the value of £22 was raised.

Mining in this field is at a standstill, largely consequent on the low price ruling for copper.

WEST KIMBERLEY GOLDFIELD.

There was no gold reported from this field. Boring for oil will be continued and the company carrying out operations expect to be assisted by the Federal Government, the Geologist sent by that Government to inspect having recommended the continuance of boring. The iron deposits at Yampi are still unworked.

YALGOO GOLDFIELD.

The output of gold was 2,828 fine ounces, and in the preceding year 5,611 fine ounces; a decrease of 2,783 fine ounces.

Mining generally was quiet throughout the field, no new finds were reported.

Work has ben continued on the Gnow's Nest Mine assisted financially by the Government.

At Field's Find the erection of a battery on Brown's Reward leases was completed and crushing commenced in July. At the various other centres a good deal of prospecting was being done.

YILGARN GOLDFIELD.

The output of gold was 13,297 fine ounces and in the preceding year 8,451 fine ounces; an increase of 4,846 fine ounces.

This is attributable to an increased output from the Great Victoria Mine at Burbidge which is being vigorously worked.

Increased activity was noticeable principally at Glenelg Hills and Manxman. At the latter centre several mines were producers. Throughout the field there was a good deal of prospecting.

TABLE 30.

Value of Mining Machinery and Number of Stamps and other Mills erected on the 31st December, 1925, compared with the previous Year.

Goldfield	District.	Value of Mining Machinery.		Batteries, Number of Stamps.		Mills.															
						1924.								1925.							
		1924.	1925.	1924.	1925.	Prospecting.	Ball.	Griffin.	Huntington.	Puddlers.	Other Crushers.	Flint.	Grinding Pans.	Prospecting.	Ball.	Griffin	Huntington.	Puddlers.	Other Crushers.	Flint.	Grinding Pans.
		£	£																		
1. Kimberley	... ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2. West Kimberley	... ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3. Pilbara	Marble Bar	17,838	13,630	50	50	...	...	...	1	...	...	...	1	...	...	...	1	...	...	...	3
	Nullagine	2,992	2,692	28	28	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	1
4. West Pilbara	... ...	2,231	2,090	10	10	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...
5. Ashburton	... ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6. Gascoyne	... ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7. Peak Hill	... ...	2,878	2,651	10	10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8. East Murchison ...	Lawlers	19,647	15,466	40	30	...	...	...	...	...	...	...	2	...	...	...	...	...	2	...	2
	Wiluna	20,353	15,964	60	18	...	...	...	...	...	...	1	4	...	...	...	...	...	...	...	...
	Black Range	78,950	77,650	50	45	...	1	...	...	...	...	1	2	...	1	...	...	...	...	1	2
	Cue	20,304	23,588	50	50	...	...	...	...	...	...	1	1	...	...	...	...	...	...	1	1
9. Murchison	Meekatharra	46,500	40,826	70	70	...	...	...	...	...	...	...	9	...	...	...	...	...	...	...	9
	Day Dawn	3,250	2,900	10	13	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1
	Mt. Magnet	6,288	6,549	25	25	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	2
10. Yalgoo	... ...	24,561	23,646	35	30	1	...	...	...	...	1	...	2	2	...	...	...	...	1	...	2
11. Mt. Margaret	Mt. Morgans	8,323	7,223	35	30	...	...	...	...	...	...	3	...	...	...	...	...	...	...	...	3
	Mt. Malcolm	266,792	283,453	85	75	...	...	...	...	...	...	4	...	...	...	...	...	...	...	4	...
	Mt. Margaret	4,373	6,317	25	30	...	...	...	...	...	...	...	5	...	...	...	...	...	...	...	5
	Menzies	15,779	14,918	55	55	...	...	...	...	...	...	...	12	...	...	...	...	...	...	...	12
12. North Coolgardie ...	Ularring	2,427	2,289	20	20	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1
	Niagara	2,772	2,199	15	15	...	1	...	...	...	...	...	4	...	1	...	...	...	...	...	3
	Yerilla	4,890	4,350	20	20	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1
13. Broad Arrow	... ...	63,413	63,968	35	35	...	1	...	2	3	...	...	10	...	1	...	2	3	...	...	10
14. North-East Coolgardie	Kanowna	7,800	7,600	50	50	...	...	...	1	...	...	...	2	...	...	...	1	...	...	...	...
	Kurnalpi	200	200	5	5	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...
15. East Coolgardie ...	East Coolgardie ...	633,388	692,737	280	305	1	42	6	3	8	22	23	121	1	44	...	3	6	19	25	100
	Bulong	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16. Coolgardie	Coolgardie	44,151	30,095	68	58	...	...	...	...	...	1	...	5	...	...	...	1	...	...	...	5
	Kunanalling	7,750	6,750	30	25	...	...	...	...	...	...	...	3	1	...	...	...	...	...	...	3
17. Yilgarn	... ...	55,821	52,410	130	120	...	...	...	2	...	...	3	9	...	...	...	1	...	...	3	9
18. Dundas	... ...	9,833	2,823	17	15	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	...
19. Phillips River	... ...	5,795	2,365	35	35	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
State Generally	... ...	30,100	30,100	...	...	...	1	...	...	...	1	...	...	...	1	...	...	...	1	...	...
Total, Gold-extracting Machinery		1,409,399	1,437,449	1,343	1,272	4	46	6	9	11	25	36	202	6	48	...	9	9	23	34	175
Total, Machinery, other than Gold-extracting ...		355,731	313,138	...	...	...	5	...	1	1	28	4	3	...	5	...	...	...	30	4	1
TOTAL, MINING MACHINERY		1,765,130	1,750,587	1,343	1,272	4	51	6	10	12	53	40	205	6	53	...	9	9	53	38	176

PART VIII.—EXISTING LEGISLATION.

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

1. The Mining Act, 1904.
2. Mining Act Amendment Act, 1919.
3. Mining Act Amendment Act, 1920.
4. Mining Act Amendment Act, 1921.
5. Mining Act Amendment Act, 1923.
6. Sluicing and Dredging for Gold Act, 1899.
7. Mines Regulation Act, 1906.
8. Mines Regulation Amendment Act, 1915.
9. Coal Mines Regulation Act, 1902.
10. Coal Mines Regulation Act, 1915.
11. Mining Development Act, 1902.
12. Mining Development Amendment Act, 1924.
13. Mines and Machinery Inspection Act, 1911.
14. Gold Buyers Act, 1921.
15. Miners' Phthisis Act, 1922.
16. Miners' Phthisis Amendment Act, 1925.

The following alterations, etc., regarding Regulations were gazetted under the *Mining Act*, 1904:—

Amendment of Regulation 214a.
Amendment of Regulation 25f.
Amendment of Regulations 90, 90a, 90b.

Mines Regulation Act, 1906:—
Amendment of Clause 4, Division 2 of Regulation 15.

Mining Development Act, 1902:—
Amendment of Regulations relating to ore crushed and tailings purchased at the State batteries.

Coal Mines Regulation Act, 1902:—
Amendment of Regulation 24 under Part I.

Miners' Phthisis Act, 1922:—
General Regulations 1-7 and Forms of the Schedule A, B, C, D, E, F.

PART IX.—INSPECTION OF MACHINERY.

The Chief Inspector of Machinery reports that the number of useful boilers at the end of the year toalled 3,261, as against 3,199 total for the preceding year, showing an increase, after all adjustments, of 62 boilers.

Of the total 3,261 useful boilers 1,803 were out of use at the end of the year; 1,600 thorough and 150 working inspections were made, and 1,589 certificates were issued.

Permanent condemnations totalled 12, and temporary condemnations 92. There were no conversions, and 9 boilers were transferred beyond the jurisdiction of the Act.

The total number of machinery plants in use was 6,104 against 5,563 for previous year, showing an increase of 541.

Inspections made total 4,863, and 4,863 certificates were granted.

240 applications for engine-drivers' and boiler attendants' certificates were received and dealt with, and 189 certificates, all classes, were granted as follows:—

Winding Competency (including certificates issued under Regulation 40 and Section 60)	4
First Class Competency (including certificates issued under Regulations 40 and 45, and Sections 60 and 63)	9
Second Class Competency (including certificates issued under Regulation 40 and Section 60)	15
Third Class Competency (including certificates issued under Regulation 45 and Section 63)	37
Locomotive Competency	18
Traction Competency	9
Internal Combustion Competency	11
Crane and Hoist Competency	14
Boiler Attendant's Competency	48
Interim	2
Copies	10
Transfers	12
Total	189

Total mileage travelled was 42,461 miles, of which 14,552 were by rail, 27,933 by road, and 6 by water.

PART X.—SCHOOL OF MINES.

During this, the twenty-second year of the School's existence, the position was well maintained.

The attendance was slightly smaller than in the preceding year, largely consequent on the unsettled condition of mining and the difficulty experienced by students in securing suitable employment.

The students and staff did good work, and the examination results were satisfactory.

Details will be found in the report of the Director, published as Division V. of this report.

The system of free assays for prospectors was continued, a total of 297 assays and mineral determinations having been made.

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 responsible officers, published as Divisions II. to VIII. of this report.

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

I have, etc.,
M. J. CALANCHINI,
Under Secretary for Mines.

Department of Mines,
Perth, 31st March, 1926.

DIVISION II.

Report of the State Mining Engineer for the Year 1925.

Office of the State Mining Engineer,
Perth, 31st January, 1926.

The Under Secretary for Mines, Perth.

Sir,—

I have the honour to submit, for the information of the Hon. the Minister, my Annual Report for the year 1925:—

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

There was no change in the personnel of the Inspection Staff during the year. Mr. McVee, Inspector of Mines, Collie, resumed duty in February, after completing his long service leave.

Workmen's Inspectors of Mines.—No elections for Workmen's Inspectors of Mines were held during the year.

REPORTS OF INSPECTORS OF MINES.

Report of Mr. W. F. Greenard, Inspector of Mines, Kalgoorlie.

I have the honour to submit my Annual Report for the information of the Hon. the Minister for Mines on the working of the Mines Regulation Act and Amendments thereto on the East Coolgardie, North East Coolgardie, North Coolgardie, Coolgardie, Broad Arrow and Dundas Goldfields.

A systematic routine inspection of all working mines on the above Goldfields has been maintained throughout the year. The ventilation has been in charge of one inspector, who devotes his whole time to it. The dust on surface and underground has received the attention of five inspectors, who have continued every effort to minimise the dust evil. The dust underground can be effectively controlled, but in dry mills there are many difficulties. Shrink stopes are also difficult; not from the dust during drawing off operations, but from sand blasting, which creates both smoke and dust. So far there is only one remedy, viz., regulating firing to fixed periods, when no one is employed in the travel of the smoke and dust.

The storage of dynamite and detonators has been constantly under supervision, and canisters for holding dynamite to be taken into the workings have been supplied in every mine.

Cages, ropes, and safety hooks are tested in accord with the regulations, and records entered in the book kept for that purpose.

The sanitation of both surface and underground workings has been kept in good order.

During the year there has been a good deal of creeping in the workings, more particularly in the western belt; but stress is beginning to be noticeable on the east belt. The South Kalgurli, Kalgurli, Perseverance and Lake View are all showing indications of the extensive mining done. The lower workings show a good deal of side pressure, necessitating a renewal of set-timber in levels very frequently.

All accidents have been carefully investigated and reports made. The number of accidents occurring during the year was:—Fatal, 8. Serious, 237.

Mining Generally.

The *Great Boulder Proprietary* and *Golden Horseshoe Estates* have continued to deplete their pay ore. A good deal of development has been done in these mines for the year without opening any quantity of pay ore. Very little sinking has been done. All the levels are very considerably depleted, making mining costly.

The *Lake View and Star, Ivanhoe* and *Chaffers* have done considerable development, but no sinking.

The *South Kalgurli* have sunk during the year 100ft., making their main hauling shaft 1,950ft., and a very considerable amount of driving on ore deposit has been done. So far, on the year's development, the rich shoot found at the 16 and 17 levels has not been found at lower levels. To find this rich shoot is very important, as on the high grade ore the low grade ore (of which the mine has considerable reserves) depends for profitable working.

The *Associated* and *Perseverance Mines* (entirely shrink stope mines). Considerable development has been done, but no sinking. Without sinking and exploiting the lower levels the high grade pay ore must eventually become exhausted.

The *Oroya Links Group* have done considerable development above the 1,000ft. levels, and some high grade ore has been won, but no great quantity of reserves is in evidence.

Above the 1,000ft. in *Eclipse Lease* a good deal of low grade ore is being worked. This is being sweetened from small patches of high-grade ore, located in old Kalgurli Mine. The values given by management of Eclipse are 36s., and the returns for several months from Kalgurli Mine average between 50s. and 60s. per ton.

The *Hannans North* is being worked by the Great Boulder Proprietary. No sinking has been done other than winzing, and the outlook is anything but reassuring; unless the main shaft is sunk, the end is inevitable.

A good many prospectors have been working on the North End with varying results. So far no great quantity of pay ore is available to work.

At Ora Banda the *Associated Northern* (*Gimlet Leases*) have sunk their main shaft 200ft. to the 700 ft. level, and are now engaged in developing the ore deposit.

Mining generally is depressed. A large amount of money has been expended by the Government under the Mining Development Act. So far there is no development of value from this expenditure.

Report of Mr. E. J. Gourley, Inspector of Mines, Kalgoorlie.

I have the honor to submit to you my Annual Report for the year ending 31st December, 1925.

Inspections of Mines have been made in the following districts:—

Kalgoorlie District—South Kalgurli 5, Perseverance 6, Great Boulder 3, Chaffers 3, Associated 3, North End Mines 6, Ivanhoe 2, Horseshoe 4, Lake View 3, Kalgurli 4, Hannans Reward 2, South End Mines 2, Lake View South 2, Dry Mills 3, Paringa 1, Croesus Proprietary 3, Oroya North Blocks 3, Brown Hill 2, Enterprise 2, Mt. Monger District 6, Bulong 6, Menzies District (including Comet Vale) 12, Lloyd George 7, Coolgardie 6, Hampton Plains 2, Pinjin 1, Norseman 3, Widgiemooltha 4, Mt. Juglah 3, Randalls New Find 2, Waverley 5, Ora Banda 5, Ives 4, Kunanalling 4, Peter's Farm 2, Boulder Alluvial 2.

DEVELOPMENT WORK IN KALGOORLIE AND BOULDER MINES.

Oroya-Brown Hill Group.

The Eclipse or Croesus Proprietary Mine.—At the 1,000ft level north about 100ft. of stripping has been done on the footwall side of the level, with payable results, over a width of 10ft., and this level has been straightened up and heavy timbers put in. Stoping is in progress over an average width of 15ft. on the rill stope method. The 900ft. level is now being extended to try to pick up the run of ore cut in the 1,000ft. level, but so far the results have not been payable, although the lode formation is in the face. On my last inspection, crosscuts to find the walls of this lode were being put out with the hope of striking better values. The stopes over 1,000ft., 900ft., 700ft., 500ft., and 400ft. are being worked on ore which averages 8ft. in width and worth 36s. per ton. Development: Driving, 51ft.; crosscutting, 44½ft. Total, 95½ft.

Brown Hill Mine.—Two parties of tributers are at work. One party over the 500ft. level are on good values in telluride veins in blocks or pillars left in the old workings of the rich shoot, and another party running the filling and caved in ore from the old stopes over the No. 2 level. This ore is on the low grade side, but the party are making more than wages and the ore is useful at the Kalgurli Mill, being oxidised, to help in the extraction at the sulphide mill on the Kalgurli Mine.

A unit of 10 stamps has also been put into use from the old mill on this mine with a tube mill and a flotation plant. This plant is treating about 25 tons a day of sulphide ore from the C.P. shaft, and Mr. Fitzgerald informs me that the experiment is very successful in saving the concentrates, and no difficulty has been met with in roasting and obtaining a good extraction.

Oroya North Blocks.—During the year the shaft has been cleaned out to the 1,100ft. level and repaired by a party of assisted tributers, but the results from ore broken at and above this level were not payable and work was abandoned. However, three parties are still at work from the 500ft., 300ft. and 100ft. levels, making good wages. Water coming through from the Brown Hill Extended (now abandoned) has been passing through the Brown Hill and Iron Duke Mines into these workings for years and has been bailed from this mine, but during the last two months the water has been allowed to rise and flow into the Associated Mine, on the 1,200ft. level. However, an agreement has now been entered into by the Associated, Northern Associated, Lake View and Perseverance managers to pay the Oroya Links Company £45 per month, and this company will continue bailing from the Oroya North Blocks shaft. Development: Crosscutting, nil; driving, nil; sinking, nil.

Kalgurli Mine.—A considerable amount of development work has, you will note, been done on 800ft. level, both by bores, crosscuts and drives, but this level has been rather disappointing. However, the development work on the 400ft. and 300ft. levels has opened up a good block of ore north of the shaft and this is now being prepared for stoping. Tributers at and above the 100ft. level are on rich values, while in other parts of the mine, down to 1,900ft., tributers are mining blocks and pillars with varying results. This group of mines appears to me to have good reserves of pay ore, but the treatment plant does not handle sufficient tonnage to show much profit. Development: Crosscutting. 209ft.; driving, 627 ft.; sinking, 36 ft.; rising, 131½ft. Total, 1,003½ft. Total, 1924, 2,314ft.

Associated Northern Mine.—The Iron Duke leases are still in the hands of a few parties of tributers, but while they are making decent wages following small veins in the footwall of the main shoot, no tonnage of any consequence is being won from this part of the mine or from the shallow workings around the surface. Development, nil.

Enterprise Mine (*late Boulder No.* 1.)—The local syndicate has been steadily developing this mine from the 375ft. level and taking out regular crushings worth 40s. per ton, and it is now proposed to form a new hauling way by sinking and rising through to the surface over the internal shaft or winze from the 175ft. level. Six men are employed. Development: Crosscutting, nil; driving, 90ft.; winzing, 91ft. Total, 181ft. Development, 1924, nil.

South Kalgurli Mine.—During the year an average of 10 water Leyner drills have been developing in different parts of the mine, from the 500ft. level down to 1,800ft. Some good bodies of ore have been opened up on the 1,100ft. level, Mortys shaft workings, and at 700ft. and 800ft. levels. From the 1,450ft. and 1,700ft. levels, main shaft, good grade ore has been developed, but at the 1,800ft. values are low. The main shaft has been sunk to the 1,950ft. and the sump or well hole is now being completed before opening out.

Improvements have been made in the surface plant, and steam, except for the winders, has been replaced with electricity. The hauling skips have been enlarged, and double-deck cages put in and a hinged door has been fastened on the surface gates, which is placed over the shaft when the cages or skips are

being changed, so that it is impossible for anyone to fall down the shaft during the operations.

A new Edwards furnace has been erected and the monthly tonnage increased. The rich deposit of ore at 1,600ft. and 1,700ft. is used to keep an even grade value. It does not require much of this ore, so that the rich places are being depleted very slowly. Development: Driving, 2,122ft.; rising, 44ft.; crosscutting, 516ft.; winzing, 444ft.; sinking, 143ft. Total, 3,269ft.

Associated Mine.—This mine has been doing a considerable amount of prospecting on the 200, 300, 1.500 and 1,600ft. levels, but the results have not been good, being chiefly low grade ore, and the lenses or makes of ore opened up have been short and narrow. The mill is kept going, but little or no profit has been shown, although the mine appears to be most economically managed. Development: Crosscutting, 367ft.; driving, 1,325ft.; sinking, 364ft.; diamond drilling, 1,502ft. Total, 3,558ft. Total 1924, 1,969ft.

Perseverance Mine.—During the year a considerable number of tribute parties have pulled out of their blocks, some being worked out, others not payable, and in some instances the company has terminated their agreements with the usual six months' notice. However, as an offset to this the company has put a number of these men on wages or contract from the 1,900ft. level, up to the 100ft., and at the present time the ore being mined is about 60 per cent. by the company and 40 per cent. by tributers. The yield has fallen off considerably on account of a number of the rich blocks worked by tributers in the past becoming worked out. Sand filling from the surface into a number of open shrink stopes down to the 500ft. level has been done, so that at the present time the mine is in good working order, and I had only to complain in one or two instances about the heights of the backs. Development: Driving, 1,981ft.; sinking, nil; crosscutting, 609½ft.; winzing, 416½ft.; rising, 29ft. Total, 3,036ft. Total 1924, 2,401½ft.

Great Boulder Mine.—The development work on this mine has been done chiefly in the upper levels, that is, from the 1,100ft. level, Lane's shaft, and from the main shaft on the lodes which were passed through in the early days, but to some extent neglected when opening up the main lode. Now that the stopes from the 2,400 level upwards have been beaten out completely in a number of the levels, and the remaining backs come to the stage of a crushed pie-crust, attention has been turned to the parallel lodes in the upper levels, and from these coniderable tonnage is being won, but the values are lower and the ore being mined from the old main stopes, while keeping a fairly even grade, is very difficult to mine owing to pressure from the walls. Therefore mining costs are high. From Hamilton shaft a good quantity of ore is being drawn off from the shrink stopes from the 1,800ft. level up to 1,000ft., but little development work has been done and the shrink stope over the 1,200ft. level is the main working place in the mine at present.

A new shaft has been sunk to a depth of 274½ft. west and opposite the Perseverance main shaft, and equipped with head gear and a winder. This was sunk to cut what is known as the Telegraph lode, from which Schwan and Party, tributers, had worked a shoot of ore which outcropped on the Perseverance Mine and gave payable values to a depth of 250ft. on the underlie into the Boulder ground. This body of ore looked well on the bottom and worth while sinking a shaft to cut, but, unfortunately, when intersected by a straight shaft and crosscut, values have not come up to expectations and a winze is now being sunk on the lode to hole through to the workings from the new shaft.

Hannans North Mine.—This mine has worked continuously, stoping out the backs previously developed and carting the ore in drays to the Great Boulder Mine for treatment. Some diamond drilling has been done in the south end of the 600ft. level, but no values have been struck. The stopes are getting depleted, but the values shown on the assay plan along the bottom level certainly warrant the shaft being sunk another 200ft. The manager of this mine has been transferred from the O.K. Mine, Norseman, and practically all the old employees as well. The Great Boulder Company have abandoned the mine at Norseman and shifted all the machinery to Kalgoorlie. Development work on these two mines: Shaft sinking, 274½ft.; driving, 1,458ft.; crosscutting, 215ft.; winzing, 381½ft.; rising, 482½ft.; diamond drilling, 978½ft. Total, 3,790ft. Total 1924, 1,631ft.

Golden Horseshoe Mine.—This mine has been in a very difficult position for the best part of the year on account of low values, chiefly caused by the faulty nature of the different lodes in the bottom levels of the mine, but within the last three months some good values have been met with by boring on the 2,600ft. and 2,900ft. levels. They are now out after these values by crosscutting, and, should they be confirmed, the old mine will have a new and long lease of life. Development: Driving, 1,059½ft.; crosscutting, 280½ft.; winzing, 473½ft.; rising, 72ft.; diamond drilling, 834ft. Total, 2,719½ft. Previous year, 1,982½ft.

Lake View and Star Group.—Early in the year the breaking of ore in the Ivanhoe Mine was resumed from the 600ft. level down through to the 2,400ft., but from this level to 3,000ft. no ore of any consequence has been mined. However, they have opened up a good length of ore at this level and are now stoping it out. The lode is rather difficult to mine, for it bursts and falls in big jomes or flakes without giving any warning.

We have had several discussions among the inspectors as to the best and safest method of working this stope, but as the manager insists on shrinking, on the grounds that the values are too low and the sand filling too expensive to put into the stope, I do not see any way out of it, for under the Mines Regulation Act we cannot dictate as to the methods of working a mine, much as I would like to see shrink stoping done away with. The stope is isolated, therefore the bursts cannot be caused by pressure from old workings, but is entirely due to the nature of the ore, for up to date there is not sufficient area of walls exposed to give pressure. Development: Driving, 77ft.; crosscutting, 47ft.; winzing, 155ft.; shaft sinking, 327ft. Total, 606ft.

Lake View Mine.—The workings of this mine from the surface open-cut down to No. 5 level are, with the exception of one stope, in the hands of tributers taking out pillars and cross veins on the main lode,

the company doing all their mining from the 1,000ft. down through to 2,300ft. level, from which a large tonnage is being won, especially from what is known as the Hat Stope over the 2,100ft. level. Development: Driving, 1,171ft.; crosscutting, 266ft.; winzing, 97ft.; shaft sinking, nil. Total, 1,534ft.

Chaffer's Mine.—The workings down to the 400ft. are on tribute, and no work is going on below that level, but the shaft is being unwatered and repaired.

Star Mine.—Several parties of tributers are working in the oxidised ground down to 100ft. level, and a more powerful winding engine, which came from the Great Fingall Mine, is being erected.

Idaho Mine.—This mine is held by four men who have worked it continuously, obtaining rich contacts occasionally but little crushing dirt.

Paringa Mine.—The Paringa Mine is under exemption, but two tribute parties are working.

North Kalgurli Mine.—Five tribute parties are at work from surface down to 150ft. on the Eastern lode, but no mining is being done from the main shaft. The South Kalgurli Company are keeping the water down to prevent it flowing into their workings.

Menzies.

On account of the subsidies granted to Menzies Consolidated, Lady Shenton, Warrior and the Sand Queen, frequent visits have had to be made to this district.

The *Menzies Consolidated* ceased operations underground during the year, and, although keeping water down, they are only treating accumulated concentrates. A new furnace has been erected and is at work, but results so far are not satisfactory.

The *Lady Shenton* Syndicate completed two bores from the bottom level. No. 1 157ft. 6in., No. 2 60ft. From the assays of the core there appears to be 4ft. of ore worth 13 dwts. 19grs. between 61ft. 7in. to 80ft. 7in. in No. 1 Bore, but no values in No. 2 Bore. On my last visit to Menzies I met the secretary and two of the directors, who informed me that they are now trying to raise money to sink a winze to confirm the values in the No. 1 Bore.

The *Warrior* Mine is owned by the Sawyer Bros., who have holed through to the level, and have now a direct hauling way and are on payable values. R. Duckworth, who has a lease on the Crusoe Mine, has obtained some very rich ore during the year in shallow workings, and he informs me the values are still going down, but the vein is very small.

At Mt. Ida, Balmer and party (four men) are working the *Unexpected South*. The ground is very hard, but with their own mill they are making a living. Only two other prospectors are at work in this district.

Comet Vale.

Owing to want of funds the Bullfinch Company had to abandon their option on the *Sand Queen* and *Gladsome* Mines. This is to be regretted, after all the difficulties and expense, seeing that the water was out to within 30ft. of the bottom. The mines are now under exemption.

P. Maher crushes occasional parcels from the *Lake View* Mine, but his returns do not appear payable. Four other prospectors are the extent of the men employed at present.

Broad Arrow.

Mr. Barratt, who owns the *Tara* and *Oversight* Leases, is following contact veins at the 150ft. level, and he has obtained some rich patches during the year.

Several parties of assisted prospectors have been in this district, but with no success.

Paddington.

An Adelaide syndicate has an option over *Lacey and Hawk's Mine,* North of the Paddington Consols. They sunk the shaft 30ft. below the 100ft. level, but the water was too heavy to handle with a whip, and they have now resumed driving and crosscutting on the lode at the 100ft. level, which averages 20ft. in width but low grade, viz., 4 dwts. so far. However, one of the syndicate says they are satisfied to go on for some time as long as they get good work done. There are no other prospectors in this place.

Ora Banda.

The *Associated Northern Company's Gimlet* Mine ceased milling operations about three months ago pending a report from a mining engineer. This was obtained from Mr. Vail, of the Lake View Mine, and the shaft is now being sunk a further depth of 200 feet and good progress is being made, the ground being much easier than it was in the upper levels.

There are a good many prospecting parties scattered about the district, but the returns from the State Mill are not very high.

The Lady Evelyn reef was unpayable when driven on at the 500ft. level. They finished cyaniding the residues, and obtained six months' exemption which will expire this month. The owners now propose to prospect the ground south of the main shaft at a depth of 130 feet.

Waverley.

Two assisted men sunk a new shaft on the deep lead and obtained four or five ounces of gold, but the gold was too scattered in the wash, and proved unpayable. Still they are not satisfied, and do further work between small orders for sandalwood.

This applies to six other parties of prospectors, including the Christie Brothers, who have a Bligh dry dredge which they have not worked successfully up to date.

Carbine.

Messrs. *Crawford and Pimley* have done considerable development work looking for a continuation of the lost rich shoot, but have not picked it up. They have 20 men employed, and combine mining with cattle raising.

Kunanalling.

All the mines in this district are owned by working miners with the exception of Mr. Pearce, on the Star of Fremantle, who employs four wages men on the Belle May Lease. The veins are small but five parties are on good dirt, the contacts in places being very rich. The field employs about 60 men, yet the assisted parties have had no good returns.

Gibraltar.

Messrs. *Clayton and Young,* owners of the Lloyd George South Mine, have been breaking out parcels from about the 110ft. level, which they crush at their own mill on the Reform Lease. These parcels vary in value, and are just about payable. They are now cyaniding their residues.

Lloyd-George G.M.—A tribute party during the year obtained some good returns around the old workings from near the surface to 130 feet, and then pulled out; another party then went into it, but have only obtained two or three small parcels which barely paid them, and they stopped work. The development work subsidised by the Government at the 200ft. and 150ft. levels proved failures, and on my last inspection I could not see any chance for the mine. Cyaniding of the tributers' residues is in progress.

Norseman.

Mr. Nicolson has purchased the old Mararoa Mine from the party of working miners (a cash transaction), and is busy erecting a ten-stamp mill to be driven by a gas engine; also an air compressor and winding engine on the main shaft. He is making a very substantial job of it, and is confident of making it a success.

The O.K. Mine has been taken up again, and head gear, boiler and winch have been erected. I doubt whether the venture will be a success, for while values are high the reef is too small and hard.

The returns from the State battery from ore broken by parties of miners from the Cumberland, Viking, Hoffman's, and Oversight have been good, and Norseman is easily the most prosperous of the outside mining districts.

Widgiemooltha.—Kingswood and party are opencutting a lode formation at Mt. Morgan, putting through regular crushings at their own mill. The ore is low grade but payable, and they appear to have a good quantity in sight.

Mendes and Bryant's last crushing returned 34 dwts. over the plates, but the vein is small and ground hard with refractory sulphides coming in on the bottom.

Other prospectors in this district have not discovered anything of value.

Mt. Monger.

Three parties of miners have been doing well, working leaders in Creedon's paddock.

The Mt. Monger Proprietary ceased operations on taking out of small pillars and veins from above the 150ft. level, and completing the cyaniding of the tailings. The plant and lease have been purchased by Hunt Brothers, who have let the mine to a party of tributers.

McCahon's Mine.—McCahon is crushing for the public and cyaniding the residues, and also driving at the No. 3 level to pick up the rich shoot worked to the 235ft. intermediate, which is supposed to continue down with a strong Southerly pitch.

Mt. Magnetic.—Hunt Brothers have erected a five-stamp mill on the Sweet Nell Mine, but the reserves of ore appeared to me to be very limited above water level, which is 35ft. in depth.

Bulong.

The majority of prospectors in this district have been assisted by the Prospecting Board. Nyborg and party, at Taurus, discovered a rich contact and paid the sustenance granted. All other assisted parties have not been successful. The Frost Brothers and Jones and party are on gold, but only small contact veins.

Golden Ridge.

Steadman and McFarlane obtained a rich patch on the Old Elsie May Lease, and paid back their sustenance.

I visited a new find about 14 miles North of the 50-mile peg on the Trans. Line, Randall's Siding. Gessner and Huffa applied for a reward claim and many areas were pegged, but the find was disappointing and is now deserted.

Kanowna.

The Red Hill Company, which employs an average of 22 men, has been breaking ore from the bottom workings during the year, and a sixpenny dividend has been paid. The ore body, consisting of quartz veins in porphyry country is very rich in places, and appears to be going down in a north-east direction, following a greenstone fault. Sinking and stoping is carried on simultaneously and the ore is hand-picked twice, the rough mullock being used for filling below and the fine mullock picked out on the surface.

They have no power plant, but obtain compressed air from the North White Feather Mine, and crush the ore at Martin's battery which they have leased. As no development work is done, it is impossible to form any opinion ahead of the drills, but the ore veins are going out into new ground, and this mine may last for years.

The famous Doyle's leader was picked up during the year, and it carried coarse gold in places, but nothing like as rich as the manager expected. It is still being followed.

The *White Feather Main Reef Company* are sinking a new shaft to 200 feet to try to cut the Reward reef, and Mr. Willmott is crosscutting at 400 feet and driving on the reef in the old Ballarat Mine. He employs 12 men.

St. Ives.

This district is very quiet at present.

I have paid attention to the condition of the ropes and safety appliances on cages and skips and also the shaft timbers on the mines, and on the whole have found them in very good order.

In conclusion, owing to a variety of circumstances chiefly the want of sufficient working capital, the outlook for 1926 does not look bright for mining.

Report of Mr. Wm. Phoenix, Inspector of Mines, Kalgoorlie.

I have the honour to submit my Annual Report for the year ending 31st December, 1925.

Ventilation.—During the past year special attention has been given to the direction of the air courses, doors and stoppings, air volume and temperatures.

A general survey of these mines was made during the past year and results show that the volume of air circulating to various parts of the workings has been maintained.

The intake air volume into each mine is as follows:—

Associated Gold Mine	31,600	cub. ft. per min.
Perseverance	61,250	do.
South Kalgurli ..	30,000	do.
Great Boulder	43,065	do.
Horseshoe	51,600	do.
Lake View and Star Ltd.—		
Ivanhoe Mine ..	72,400	do.
Lake View Mine ..	25,000	do.
Chaffer's Mine ..	15,000	do.
Star Mine	10,000	do.
Oroya Links Ltd.—		
Kalgurli Mine ..	16,000	do.
North Block	16,000	do.
Eclipse Mine ..	14,000	do.
	385,915	do.

The return air volume shows about 400,000 cub. feet per minute. The figures compare and show an advantage over those taken in 1920, and that the total quantity has increased. It will be seen that this volume of air is directed through the mines, while the number of men employed is very much less.

Tests have been made in some cases of the return air for CO_2, which show that the percentage is low. The object has been to obtain pure air as well as volume. If the percentage of CO_2 can be kept low it ensures that the air is efficient. The large volume of air also greatly assists in combating the dust evil. There is still much to be done to lessen and ascertain the extent to which the mine workers are affected. There is an endeavour to improve unhealthy conditions.

Temperatures and Sanitation.—During the year temperatures have been taken in every working face, including shafts, levels, stopes, drives and isolated sections of the mines. In no place were the temperatures seriously unpleasant. About 900 temperatures were taken during the year.

The sanitation question always requires close attention. The pan system is in good working order. The receptacles at crib places are provided. Complaints arise which are attended to immediately. Good drinking water, in suitable cans, is conveyed to the working districts from the supply at plats.

Dust.—Towards the middle of the year a special dust survey of the mines was made and 1,595 dust spots were collected and the particles examined and counted with the aid of a microscope.

The total results are as follows:—

Lake View Mines Ltd.—

Underground—66 per cent. under 300 particles per c.c.
22 per cent. between 300 and 500 particles per c.c.
12 per cent. over 500 particles per c.c.

Dry crushing plant—69 per cent under 300 particles per c.c.
11 per cent. between 300 and 500 particles per c.c.
20 per cent. over 500 particles per c.c.

Associated Gold Mines—

Underground—73 per cent. under 300 particles per c.c.
Nil between 300 and 500 particles per c.c.
27 per cent. over 500 particles per c.c.

Dry crushing plant—41 per cent. under 300 particles per c.c.
Nil between 300 and 500 particles per c.c.
59 per cent. over 500 particles per c.c.

South Kalgurli Gold Mine—

Underground— 50 per cent. under 300 particles per c.c.
11 per cent. between 300 and 500 particles per c.c.
39 per cent. over 500 particles per c.c.

Dry crushing plant—81 per cent. under 300 particles per c.c.
5 per cent. between 300 and 500 particles per c.c.
14 per cent. over 500 particles per c.c.

Oroya Links Mines—

Underground—52 per cent. under 300 particles per c.c.
18 per cent. between 300 and 500 particles per c.c.
30 per cent. over 500 particles per c.c.

Dry crushing plant—66.6 per cent. under 300 particles per c.c.
33.3 per cent. between 300 and 500 particles per c.c.
Nil over 500 particles per c.c.

Perseverance G.M.—

Underground—62 per cent. under 300 particles per c.c.
8 per cent. between 300 and 500 particles per c.c.
32 per cent. over 500 particles per c.c.

Dry crushing plant—100 per cent. under 300 particles per c.c.

Great Boulder G.M.—

Underground—60 per cent. under 300 particles per c.c.
17 per cent. between 300 and 500 particles per c.c.
23 per cent. over 500 particles per c.c.

Dry crushing plant—63 per cent. under 300 particles per c.c.
29 per cent. between 300 and 500 particles per c.c.
8 per cent. over 500 particles per c.c.

Golden Horseshoe Mine—

Underground—55 per cent. under 300 particles per c.c.
20 per cent. between 300 and 500 particles per c.c.
25 per cent. over 500 particles per c.c.

The 1,595 dust samples are made up as follows:—

Lake View Ltd. Mines	336	samples.
Great Boulder Mine	348	„
Golden Horseshoe Mine	180	„
Oroya Links Mine	120	„
Perseverance Mine	282	„
South Kalgurli Mine	180	„
Associated Mine	104	„
Golden Hope Mine	24	„
Ives' Reward Mine	21	„
	1,595	

The average for the 1,595 samples taken "Underground" was 370 particles per cubic centimetre of air and 64 per cent. of the samples were under 300 particles per cubic centimetre; 14 per cent. from 300 to 500 particles and 21 per cent. over 500 particles.

The average for the six dry mills was 305 particles per cubic centimetre of air, and 64.43 per cent. of the samples were under 300 particles per c.c.; 12.05 per cent. from 300 to 500 particles and 23.52 per cent. over 500 particles.

They are as follow:—

Dry Mills—

Associated plant	=	598	particles per c.c.
Perseverance Plant	=	105	„
Great Boulder Plant	=	262	„
South Kalgurli Plant	=	352	„
Oroya Links Plant	=	210	„
Lake View Plant	=	300	„
		1,827	„

Average = 305 particles per c.c.

Underground Workings—

Golden Horseshoe	=	330	particles per c.c.
Great Boulder ..	=	340	„
Perseverance ..	=	490	„
Oroya Links ..	=	428	„
South Kalgurli ..	=	460	„
Associated ..	=	262	„
Lake View ..	=	281	„
		2,591	„

Average = 370 particles per c.c.

The above results indicate that care and attention must be paid to the question of dust prevention. The average reflects a good indication of the general dust conditions of these mines and dry mills.

It is a pity the Chamber of Mines does not establish its own dust sampling department. Much good would result.

The future objective must be "Water and Ventilation." Water, if used in an atomiser or spray, assists in removing dust from the air, and in view of the fine state of divisions of the dust it has become necessary to treat it as a gas and endeavour to remove it from the air of the mine by ventilation. There should be more stringent regulations dealing with dust prevention.

We must consider the volume of air necessary to be delivered at working places to dilute dust and maintain comfortable conditions from a cooling standpoint.

Several visits were made to test apparatus designed to improve the quantity of air into dead ends. These isolated sections must be efficiently swept with reasonably dust-free air to bring the number of particles below 200 per c.c.

Tests were also made with and without an additional spray while collaring.

Type of Machine.	No. of samples.	Particles per c.c.
Water Leyner Machine	6	900

Collaring without an additional water spray.

Type of Machine.	No. of samples.	Particles per c.c.
Water Leyner Machine	6	400

Collaring with an additional water spray.

A reduction of 56 per cent. This shows the necessity for an additional spray while collaring.

The general atmosphere underground when no firing takes place is fairly good. The following are the results of 333 samples taken in moving air currents, and show that out of 33 samples collected, the average number of particles per cubic centimetre of air was only 123. These figures are interesting and must be regarded as of the greatest value in combating the tendency to phthisis.

If the Chamber of Mines had a Dust Inspector who paid "surprise" visits the high dust results would be reported to the Mine Manager and the State Mining Engineer. This would have an excellent effect in encouraging the taking of every possible precaution by the underground officials and the miners for the prevention of dust.

In conclusion I find if the cooling conditions are poor and air movements sluggish, the dust returns are apt to be high because dust which may take only a few minutes to rise is not dissipated owing to lack of air movement, and after a few minutes dry collaring I get high counts hours after, and as time goes on it does not seem to get much lower than 700 or 800 particles per cubic centimetre of air. On the other hand a good current will clear the atmosphere immediately and high counts are reduced very quickly.

I have been engaged on other duties and have not had an opportunity of visiting many mines outside of Kalgoorlie districts.

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

I have the honour to report on work done in the mines in the Peak Hill, Murchison and Yalgoo Goldfields, the Black Range District of the East Murchison Goldfield and Northampton Mineral Field for year ended 31st December, 1925.

Similarly to the previous year, prospectors have been hampered by the scarcity of water away from wells, and the radius of their operations was mostly limited to places that have been more or less prospected before. The rainfall for the year in this district would indicate a favourable season and was higher than the average, but during the first three months 1,041 points fell, and during the next nine months, 382 points.

Mt. Maitland.

Prospectors at this place have been working on leaders carrying high values in lenses, but owing to the hardness of the country rock and the distances from a mill (78 miles to Meekatharra), it is not likely that anything more than fossicking for rich shoots will be done.

During the latter part of the year Dunlop and Kilroe brought in 23 tons from Mt. Padbury, which returned 21.44 ozs. from plates.

A parcel of 8.75 tons from Mt. Fraser returned 10.65 ozs.

From Murphy's Well, twelve miles from Peak Hill, Burleigh and Kemp crushed 123.75 tons for 64.09 ozs., and from the same district W. Madden crushed 20 tons for 18.72 ozs. of gold. Various parties have been getting fair returns throughout the year and a total of 647.25 tons returned 667.95 ozs. from the plates, showing the average to be well over one ounce per ton.

In the country, along the Murchison River, from Mt. Maitland to Mt. Gould, prospectors have reported during a number of years encouraging prospects of gold, which shows there is a line of auriferous country from Peak Hill to Mt. Gould. From Mt. Gould across the Gascoyne River and on to Mt. Augustus, there is a change in the country in which lead ore, containing in most cases a small percentage of silver, has been found. During the year, the Manager of the Mt. Augustus Station reported that some blacks had pointed out to him a large floater of galena which he could just lift from the ground, but a prospector put on at the place was unable to locate any lode or reef. It seems possible that any lode there may carry the lead as a carbonate or other form.

Several years ago, a prospector named D. Lambie, reported silver lead ore from a hill of marble, rising out of country on the side of the Kurabuka Creek about twenty miles north of Mt. Augustus.

The immense area of country between the Murchison and Ashburton Rivers, from Bangemall to Mundi-Windi, in which various commercial metals have been found, shows there is need for systematic search.

Meekatharra District.

The Ingliston Consols Extended G.M., which now includes the ground held formerly by the Fenian G.M. Co., is being worked as one mine with two mills.

On the Consols Mine there are now in use for mill treatment fifteen stampers and two wheeler pans, three Wilfley tables and six Curvilinear, and on the late Fenian fifteen stampers, three wheeler pans, two Wilfley tables, and six Curvilinear tables. An average of 129 men have been engaged throughout the year and 43,317 tons were treated for a return of £83,283. The deepest level in the mine is 1,100ft. and during the year this has been extended north 254ft., the ore body for the whole distance averaging 12ft. and the manager reports carrying payable values.

The men employed show an increase of 13 and the tonnage yield an increase of 17,046 tons and £27,805. The present depth of shaft is 1,140ft., and preparations are being made to start sinking a further 200ft. When sinking is complete, more powerful winding and pit head appliance will be installed. The work outlined show the owners have continued confidence in the future of the mine.

Ingliston United, adjoining the Consols, has been worked by two men and a crushing of 74 tons during November returned 150.08 ozs.; assay shows 9 dwts. per ton in sand.

Ingliston G.M.—This is being worked by J. T. Butler, who crushed during December last, 133¼ tons for 208.61 fine ozs., an average of 1oz. 13dwts. 6 grs.

Haveluck North.—This ground is held by T. O'Leary, who put through during December, 25 tons for 47.29 ozs. and G. Lyons (*Haveluck*) 53 tons for 123.90 ozs.

The mines to the south end of line had some high grade stone crushed during November and December. The *Marmont* 67¾ tons for 146.24 fine ozs.

Gwalia Extended.—86 tons 250.23 ozs.

Empire.—53½ tons for 154.15 ozs.

Taking the Meekatharra small crushings for November and December, they show a decided improvement, a total tonnage of 639.75 returned 1,223.41 ozs. from the plates, which is practically 2 ozs. average, without taking into consideration the gold left in tailings to be extracted by cyanide treatment later.

Holden's Find.

On the *Waterloo G.M.* operations have again started and the management is now engaged in erecting a new treatment plant.

Mistletoe.

A parcel of 41 tons carted into Meekatharra Mill returned 50.45 ozs. This was treated during December. I was informed that 500 tons of stone now on the dump would be carted in for treatment at an early date.

Culculli.

Mining was at a standstill at this place during the earlier part of the year, but towards the latter end two parties started work and 32 tons have been carted in and milled for a return of 221.36 ozs. of gold from the plates.

The previous records show a tonnage of 960 tons for a yield of 4,047.87 ozs. over the plates, which goes to show the ore has been consistently high grade from the start.

Reedy's.

The only work done in the way of mining during the year has been in and on the *Emu Mine.* A shaft was sunk at what is known as "Sorensen's" and a pipe line, a distance of two miles, now connects the mine with water shaft. During the latter end of the year, a five-head mill on the mine had been engaged on the ore taken from development work, the whole of which has been crushed, but there is a large amount of the sands to be treated. The sands usually carry the higher percentage of gold, and when the result from these is known the Manager will know to a nicety the value of the ore in the blocks ready to stope out.

Tuckanarra.

There are a large number of ironstone lodes in this district, from which the owners of the mill at Tuckanarra have taken bulk samples, but in each case the ore has been too low grade to pay. The prospectors are always on the search for contacts. Two prospectors obtained 93.22 ozs. from 10 tons of ore over the plates.

Weld Range.

A prospector brought in 10 tons, which returned 18.32 ozs. over the plates. From time to time small tonnage of high grade ore is brought in from this place and in each instance the shoot of ore has been short.

Cue.

Mining at this place has been very quiet and the shoot of ore in the *Monte Carlo Mine,* which at first promised to be very good, could not be traced downward.

Miners working a show, known as the Primrose, milled 210.5 tons for 208.88 ozs. from the plates.

Day Dawn.

The South Fingall, which now holds the ground worked formerly by the Great Fingall Consolidated, met with a number of difficulties in the early part of the year, the chief of which was that they were unable to handle the quantity of ore necessary to show a profit, finally the owners decided to close down until they erected a treatment plant on the mine. I am informed that a ten-head mill has been purchased and a cyanide plant is in course of erection.

Cuddingwarra.

At the end of last year, Mr. H. H. Carlyon picked up a slug of gold 4 ozs. in weight and since then has been prospecting the place generally and although getting excellent loams, has not been successful in tracing the gold to the reefs or lodes.

Curtis and Carlson are working about a quarter of a mile from Carlyon's, and are also obtaining excellent loams, but the deep overburden where they are is a handicap to following the loams.

Lake Austin and Mainland.

Mainland Consols G.M.—This mine has been unwatered and the owners are driving to try to pick up the continuation of a shoot of ore worked by Daniel Bros., and who were prevented from going deeper owing to water and not having machinery to cope with it. Already 40.19 ozs. have been dollied, but it is expected to take several weeks more to reach their objective. Later, they have in view the picking up of Daley's shoot, which was remarkably rich nearer the surface.

A gas engine has been erected against the main shaft and connected with a pump in main shaft. The gas engine also supplies power to work a friction winch and a three-head stamper mill.

At Lake Austin, a number of prospectors have been working throughout the year, but they have not obtained any results worth recording.

Moyagee.

The Moyagee Mine is being unwatered by Messrs. Cairns and Heydon. The last party to work this show stoped the ore above the 130ft. level, and a block of about 80ft. by 40ft., by what I saw of it, I should estimate the width of reef as varying from 2ft. to 4ft. The ore taken out averaged 2ozs. 16 dwts.

The former party thought the inflow of water would be too heavy to sink deeper and that a large pump would be required, but indications at present do not confirm that view.

Early in January, 1926, I visited the mine and saw rich stone in the reef at bottom of shaft.

Mt. Magnet.

I am pleased to be able to report a considerable improvement in the returns from the various small shows around this place and the last two months returns will about constitute a record for the small prospector shows. A total of 487.50 tons were milled for a gold return from this and dollied, of 2,264.25 ozs.

The outstanding returns were *Revenue* 33.75 tons for 288.61 ozs. fine. Prospecting Area 1065—46.20 tons for 230.21 ozs. Prospecting Area 1013, 21.31 tons for 676.69 ozs.; Prospecting Area 1091, 54 tons for 83.18 ozs. This last mentioned crushing was taken out in sinking a shaft 30ft. deep, the whole shaft being in lode material and everything taken out was sent to the mill. The ground adjoins the old Morning Star Mine and the material crushed is similar to that worked in the open cut in that mine.

On Messrs. Hough, Pearsall and Clark's show a five-head heavy stamp mill has been erected and a suction gas engine to supply the necessary power to drive them. It will be early in 1926 before they can get going properly.

In the mine there is a large ironstone lode and the ore broken by the owners has been remarkably regular in grade.

Paynesville.

The Elsie G.M. has been worked by two men and during November 278.51 fine ounces was dollied out of the reef being broken. The remainder of the ore goes to the dump, which has been accumulating ever since the mine opened.

Prospector Lewis brought in during December, 18.75 tons which returned 38.98 ozs. of gold, but there was also 35.62 ozs. dollied, making a total of 74.60 ozs. During November four small crushings totalling 16.5 tons returned 29.18 ozs. and 11.80 ozs. was dollied.

Sandstone.

The November returns show a total crushing of 476.55 tons for a yield of 831.21ozs. from the plates, which, together with gold left in the sands, would make an average of about two ounces per ton of ore.

The *Oroya East Mine* produced 67.50 tons of the above for 130.67 ozs., and the *Nous Verrons* 112.50 tons for 105.22ozs.

The *Havilah G.M.* had just reached the producing stage when, owing to an unfortunate accident, causing the death of the owner, operations ceased.

Barrambie.

Two prospectors have been working five miles east of this place throughout the year on a small rich leader, which they have followed down to water level. From 17 tons of ore and dollying stone they have obtained 296.49ozs.

Payne's Find.

At this place mining is very quiet at present. As the mines are getting deeper and the rock harder, it has had a very discouraging effect, although the average grade of ore milled has been high.

Field's Find.

A five-head mill has been erected on the *Field's Find* Mine and has been engaged on ore from the *Brown's Reward* Leases. During November and December 806 tons were milled for 228.59 fine ounces.

Warriedar and Rothsay.

In these districts there were ten prospectors engaged at the end of November last, when I visited the places. At Rothsay, two were engaged in carting ore to Warriedar State Mill. This parcel was taken from the Old Rothsay Mine and 124 tons returned 70.85 ozs. fine gold.

Generally, the ore in the reefs in this district make in lenses and is hard to follow.

Gnow's Nest.

The *Brilliant G.M.*, which completed the sinking of their shaft during the first part of the year, has since then cut the reef at No. 4 level.

The prospects at the time of my visit (November 26th), seemed very good, the reef being about 10ft. wide and the crushing of 294 tons for that month returned 235.48ozs. of fine gold. During December 210

tons were treated for 159.22 fine ounces. These crushings prove the ore at that place to be high grade but it is quite clear that the way second-hand machinery has been placed on the mine has been the cause of considerable trouble and expense.

Noongal.

The Nevill Bros., working on a show known as the *"Revival,"* crushed 162 tons during the last two months of the year for a yield of 62.80 fine ounces.

Warda Warra.

This place is situated about half-way between Noongal and Cue and near the Rabbit Proof fence.

A small prospecting mill was erected during the year and a parcel of 36 tons gave a return of 17.79 fine ounces.

Northampton Mineral Field.

The area of country in which lead has been found and at present being worked in places, is from the Geraldton-Meekatharra railway to North of the Murchison River, and it is only lately since the advance in the price of lead that attention is being directed to the large extent of country. Lady Samson Mine is situated about six miles from Northern Gully, is being opened again, after being closed for a considerable time. High grade ore is said to have been worked but the low prices for lead then discouraged the owners at that time. With the increase of value of lead, it is expected this will be a highly payable proposition. The lode is wide and seems to be similar to lodes in some other mines I have seen, the lenses or gashes of galena of high grade making within the walls of lode matter.

A small shaft put down years ago has just been cleaned out and cut down to 100ft. in depth. The manager reports the lode was cut at 25ft. down and bunches of galena were found down to 95ft. depth and from there down a well hole was sunk to drain the incoming water, which is estimated at 1,500 gallons daily.

Narra Tarra.—This mine covers an area of 912 acres, 900 acres of which is freehold. The main shaft is 564ft. deep and the bottom level 550ft. The estimated gallons of water bailed daily is 60,000, which is practically fresh and is used for boilers and milling. The property is traversed by three lodes, known as Western, Middle and Eastern lodes. The former is the main lode and has produced lead and copper to a total realised value of £474,575.

Lead is replaced by copper in the lode at a distance of 400ft. from the main shaft.

The Eastern lode can be traced from the surface for over a distance of half a mile, is of considerable promise, and is now being actively developed.

The treatment plant consists of gas engine 110 h.p., Power Gas Corporation, Eng.; Ore Breaker No. 3 Gates, capacity 20 tons per hour. Cornish Rolls, 24in. by 10in., May Bros., Gawler (S.A.), capacity 25 tons per hour.

Sieving: Two conical trommels, covered with No. 7 mesh wove wire screening, Jig. 30in. compound, May Bros., Gawler, S.A. Tables—3 Wilfleys.

The flow sheet is as follows:—The ore from underground is tipped to a Grizzley, spaced to 1in.; the fines through this fall into a 14in. conveyor belt. The rough ore after passing through the Gates' crusher, set to 2½in., falls on to the same belt and is elevated to a storage bin, from where it is drawn by a 14in. conveyor belt to the rolls. The product from the rolls gravitates into the boot of a 12in. bucket elevator, and is elevated to the top of a bin and discharges into the trommels, the undersize going into the bin and the oversize on to a belt which conveys it back to the rolls. The fine ore discharges from the bottom of the bin on to a 14in. conveyor belt, which conveys it to the jig. The product from the first and second hutches of the jigs is concentrates, the third and fourth hutches, middlings and the fifth hutches and overflow, tailings.

The middlings are passed over two Wilfley tables and the middlings from these, over a third table.

The concentrates from the jig and Wilfleys are carted to the railway for realisation.

The tailings from the jig and Wilfleys are elevated to the dump by a 12in. bucket elevator.

Both copper and lead ores are treated through the same plant, in separate runs, and the average value of tailings is given as 0.4 per cent. lead and 0.5 per cent. copper.

Wheat Ellen, at Northampton, is owned by the same company as the Narra Tarra, and ceased work at the end of the year, but is expected to restart at an early date.

Spring Vale Mine is situated about two miles from Ajana, the present end of the railway line. A shaft has been sunk 109 ft.—9ft. being used a sump. A level at 100ft. has been driven on lode over 100ft. Twenty men were engaged on and in the mine at the time of my last visit, and the output of lead about 10 tons per week. The treatment consists of putting the fines through an ordinary cradle and sluice box. The material put into the dump is said to contain from 8 per cent. to 10 per cent. galena. This, with present value of lead, means from 50s. to 60s. per ton.

Block 7.—There were seven men employed on this mine when I visited it early in December. The main shaft is down 100ft. and stoping is carried on, on the rill system above that depth.

There is a large amount of zinc on one wall of the lode, but by careful working it is kept separate from the lead. The best part of the lead is picked out and bagged, and the remainder is put through a cracker, then through a cradle, followed by a sluice box. I was informed the weekly output is about five tons of galena per week.

Surprise Lead Mine consists of five leases, totalling 140 acres. The main shaft is down 310ft. and the deepest level is at 300ft.; a winze below that level is 45ft. The incoming water amounts to 23,000 gallons daily.

During the year the ore treated totalled 25,452 tons, of which 19,606 tons were drawn from the Surprise group, and 5,585 tons from the Three Sisters, which has been worked by the Surprise Mine as a tribute.

Lead concentrates won for the period totalled 3,268 tons of an estimated gross value of £79,389.

The treatment plant consists of:—

1 140 h.p. Crossley Gas Engine.
1 Sentinel Compressor—300 cub. ft. capacity.
1 Blake Jaw Rock Breaker, 8 tons per hour capacity.
2 Crushing Rolls, 24in. by 12in.; capacity 3 tons per hour each. Hoskins & Co., Perth.

2 Trommels.
1 Cone Classifer.
3 May Bros. Single Acting 4-hutch Jigs—2 only in use.
2 Wilfley Tables.
1 Curvilinear Table.

Three Sisters is being worked from a shaft 100ft. deep and a crosscut connects this with a large lode carrying a high percentage of galena, which was being stoped. The ore is carried to the Surprise Mill by motor trucks.

Two Boys, adjoining the Surprise, is being opened up by an underlie shaft to get under the ore body.

I was informed that it was intended to open cut the lode and drop the material into a bin from where it can be handled cheaply.

A tramway was being laid from the shaft to the Surprise Mill.

At *Mary Springs* a new main shaft had been started 9ft. by 3ft. 6in. and was down 20ft., and preparations were being made to erect poppet heads, which were on the ground.

There are seven other parties working in the Galena district, but neither of these has any treatment plant, and up to the present have only been able to send away galena rich enough to be hand-picked.

Report by Mr. A. W. Winzar, Inspector of Mines, Leonora.

I have the honour to submit my annual report for the year 1925 on the East Murchison, Mt. Margaret and North Coolgardie Goldfields.

No new finds were located during the year and mining generally was very quiet. The most important developments were at Wiluna and Corboy's Find.

At *Wiluna* the company testing the lodes on the old Violet leases, sunk their new shaft to 300ft. and crosscut west, cutting a lode 40ft. wide, giving an average assay value of 39s. 6d. per short ton; tests on the ore give a good extraction. Developments marked out for the future include driving off the crosscut, unwatering the south and central shafts, and opening up the old lodes.

At *Corboy's Find* some excellent results were obtained; though the lodes and reefs are rich, they are small and have not been tested below 50ft. owing to the excessive flow of water.

Prospecting was quiet and the season was dry and though we had very good rains early in the year, the latter part was dry and very hot.

At *Diorite,* near Wiluna, Messrs. Mossman and McKenzie opened up a nice run of ore next to the Brilliant mine and got rich returns, they appear to have quite a good show. The lode is in lenses, pitching at a flat angle, the length of the pipes would be 25ft.; altogether they have four pipes opened up and will probably locate others.

At the old *Ida H.,* near Laverton, Messrs. Meugens got on a patch which gave 102 ounces from 7.50 tons, and they are now trying to locate more.

On the old *King of Creation* Mr. Raven has erected a 5-head battery with the frames for an additional 5-head; his prospects appear bright. He has broken some 200 tons underground, which give very good pan results.

At *Lawlers* the owners of the *Vivien* are erecting a 5-head mill and gas producer plant, and expect to start crushing early in the new year.

The prospects for 1926 are good and better results can be looked for.

I regret to have to report three fatal accidents. One due to a man falling with a ladder down an old shaft at Kathleen Valley, one due to tetanus following a crushed toe, and the third due to a man getting into contact with a live wire.

The working conditions of the mines are satisfactory and efforts are being made to further improve them.

All gold figures in this report are in fine ounces.

Mt. Malcolm District.

Sons of Gwalia Mine was worked continuously during the year and treated 88,235 tons of ore for 31,983.65 ounces and retreated 37,588.19 tons of old residues for 3,073.54 ounces.

No development was done in the lower levels, the mine drawing on the reserves.

Further additions were made to the plant, including two new 4-cylinder Premier gas engines, one coupled to an Alley McLellan Air Compressor, and the other to an electric alternating set; these two engines are giving satisfaction. Two Babcock and Wilcox boilers were added to the steam plant.

The State Battery had only one run for the year and the small amount of 218 tons was treated for 192 ounces.

A few men are engaged in and around Leonora, but their prospects are not encouraging.

Laverton District.

At the *King of Creation* Mr. Raven has his 5-head mill about ready and will make a start early in the new year. The plant will be driven by a 60 h.p. Rushton Hornsby gas engine; this engine is new and is a fine specimen of British workmanship. Provision is made for another 5-head of stamps, the frame work being for 10 stamps. The standards are sunk the same as the mortar blocks, and the whole bolted right through and concreted in. The old dumps will be put through first, and later on underground work will be started.

On the *Lancefield* the only work doing is the treatment of residues, which appears to be paying.

At the *Beria Main Reef* a crushing of 46 tons yielded 21 ounces. The water level has risen with the filling of the old Lancefield and retards operations.

No new developments occurred at Burtville, and the only returns were from the Nil Desperandum lease, 287 tons yielding 232 ounces.

A crushing from the Reward leases at Mt. Shenton returned 26 ounces from 15 tons, no mining work was done there during the year.

Mt. Morgans District.

The Westralia Mt. Morgans Co. worked continuously during the year and treated 12,720 tons for 3,791 ounces, practically all this ore came from the 300ft. level up; no prospecting was done around Morgans, and there was no one at the Margaret centre towards the end of the year.

The *Devon* mine at *Linden* worked for part of the year, no development work was done underground. This mine is to be given another trial; the winze below the 100ft. level is to be taken through to the surface and will be the main shaft. A little work was done on the old *Democrat* mine.

Niagara and Yerilla Districts.

From around Kookynie 37.5 tons were crushed for 95 ounces, four parcels were included in the crushings, whilst from Tampa 79.62 ounces were ob-

tained from "*Hill* 60," owned by Mr. Parker. No work was done at Yerilla.

At Edjudina, Mr. Thomas had a crushing of 46 tons for 67 ounces. Very little was done at Yarri. From the *Redbrook* 80 tons returned 50 ounces.

Lawlers District.

The only work doing in Lawlers is on the *Vivien Gem.* A 5-head battery has been erected and a gas plant installed, crushing will start early in the new year.

Mr. Branson is still treating residues on the Great Eastern with satisfactory results.

At *Mt. Sir Samuel* the Messrs. Maund have worked their holdings continuously and successfully. They have a lease of the State battery and have the plant working well and crushed altogether 719 tons of ore, which includes public crushing. Their development work consisted of 72ft. in the *Vanguard* and 323ft. in the *Westralia,* all the ore from this work was treated and there appears to be a considerable amount in sight.

No mining was done at the Yellow Aster, work being confined to cyaniding from which 245 ounces were obtained.

Wiluna District.

In this district mining was more brisk than usual; good returns were obtained from *Cole's Find, Diorite, Corboy's Find,* and from *Wiluna* centre.

At *Cole's Find* the *Black Adder* crushed 242 tons for 365 ounces. They are now down below water and have a small pumping plant consisting of a Cooper Benzine engine and pump. This little outfit keeps the water down without much effort.

The *Cromarty Hope* crushed 185 tons for 97 ounces. This lease is also being equipped with a winch and boiler, there is a nice body of ore of good value going underfoot at water level.

A new lode was opened up about two miles south of Cole's and two payable crushings obtained, but the prospects were not encouraging on my last visit. Altogether 600 tons were carted to Wiluna and yielded 544 ounces.

At *Diorite* several holdings are being worked at a profit.

Mossman and McKenzie have two shafts down on the *Brilliant North,* one 70ft. from which 58 tons yielded 160.60 ounces over the plates. They have two lenses, from which their crushings were obtained and they appear to be going underfoot; they have started another shaft 165ft. south and have good ore showing in it.

On the *Brilliant* a shaft is being sunk near Mossman's boundary, to try and locate the same run of ore as in the North lease.

At *Corboy's Find* a very promising centre has been opened up. 411 tons were crushed for 622 ounces.

Guazzelli and party have erected a 3-head mill from the Bronzewing, and will crush their own stone. The reef is small and rich, the total gold produced from their *Toscana* lease being 424 ounces from 109 tons.

About three-quarters of a mile east, C. Pola is working a promising reef, from which he had a payable crushings. Further North is *Corboy's Reward,* a crushing of 108 tons yielded 76.8 ounces, these workings are in granite country, near the contact with the greenstone. Development work is being carried out and a fair amount of payable stone is in sight.

On *Corboy's North* an interest has been secured by Messrs. McHugh and Phyland, and a 5-head stamp mill is being erected and will be ready to crush in March; a good supply of water has been struck in the shaft and there appears a lot of good stone in sight. 100 tons from this lease yielded 82.6 ounces.

Messrs. *Pearce and Williardt* have done a considerable amount of development on their two leases. Two shafts have been sunk to water level and a fair amount of driving ; the stone exposed gives very good assays, though not showing much by panning. They have some 300 tons of ore raised awaiting an opportunity to get it treated. Development on these leases is retarded by the heavy water flowing at 50ft. in depth.

There are several other holdings being worked with encouraging prospects.

In the Wiluna centre, 1,294 tons were crushed for 645 ounces from prospectors' holdings alone.

In the *Wiluna Consols,* a new shaft was started and sunk 300ft.; a lode was exposed in a crosscut west, which gave satisfactory assays, development work then ceased and the shaft kept unwatered; work will be resumed in the coming year and there is promise of a big mine being eventually opened up.

On the *Mararoa* lease north, two drill holes were put down locating lodes containing values and some boring was also done by the *Emu* Company on leases to the south.

Several small holdings were worked and fair returns obtained; from the *Neb,* Bennett crushed 755 tons for 257 ounces. The *W.A.,* Gayford and party, 85 tons for 82 ounces.

Report of Mr. H. P. Rockett, Inspector of Mines, Southern Cross.

I present to you my Annual Report on the Yilgarn Goldfield, Phillips River Goldfield, Greenbushes Mineral Field, etc.

In August the Yalgoo Goldfield and the Northampton Mineral Field were transferred to the Inspector of Mines, Cue, and no report on these fields is submitted herewith.

The Mines Regulation Act.—The mines and quarries in my districts were inspected as frequently as possible. No breaches of the Act are recorded, except the failure of the quarry managers in the Swan Mining District to lay the dust caused by their rock-crushing operations. The mill at each of the quarries is very dusty, the worst being the mill at the Boya quarry. After the water was laid on to this mill, fine atomisers were introduced for spraying the rock as it was being crushed, with good results, but as a considerable percentage of the visible dust still escapes, it is fairly certain that a still greater percentage of the invisible dust, the fine particles of which are so injurious to the health of workmen in the vicinity, is allowed to escape, so that it is doubtful if incomplete wetting of the rock is of very much use in arresting the finer particles of dust. I do not know of any really efficient method of preventing dust from rock-crushing except by "wet" crushing.

The underground working places in the mines in my districts are well ventilated and free from dust.

Accidents:—No fatal and no serious accidents were reported during the year.

Prosecutions:—There were no prosecutions during the year.

Yield:—I am very pleased to be able to report a greatly increased gold yield from the Yilgarn Goldfield, the figures are:—

	ounces.
1925	13,297
1924	8,451
Increase ..	4,846

It seems likely that a similar, or possibly increased output will result from the operations of the current year.

The mining returns for the *Phillips River Goldfield* are not available at this office, but mining was much neglected in that field, and I regret to say there does not seem very much prospect of a materially increased output in the current year or the near future.

The Minerals Recovery Co. worked on a small scale, experimenting with their process on the copper-gold ores at Ravensthorpe, but up to the time of writing, their results have been disappointing.

Prospecting:—During the year there was a good deal of prospecting about the older finds, while newer and less accessible localities, such as Bremer Range, Hatter's Hill, Glenelg Hills, and the 126-mile, north from Burracoppin, on the No. 1 Rabbit-proof fence, received some attention. In December, gold was reported from the Rabbit Fence Find. At present very little is known of the locality, and I have not yet had an opportunity of visiting it. *Bremer Range* should be very well worth more attention by prospectors. It is situated about 105 miles by the track from Norseman, from which it lies a little south of west, and about 80 miles north of Fanny Cove. Being only 80 miles or so from the south coast, it should have a very good climate and the normal rainfall is probably greatly in excess of that of the other gold fields. The best track is from Forrestonia, from which it lies some 75 miles a little north of East. From now till November, it should be possible to explore this country without any danger from shortage of water, but during the summer months the water difficulty is very real.

An alluvial patch was worked some nine miles south from Maggie Haye Hill, and I would recommend any prospectors in that locality to examine well the country to the south-east of the alluvial patch. There is some very fine agricultural land in this neighbourhood and the rainfall is probably equal to that at Grass Patch.

Glenely Hills has received the constant attention of a dozen prospectors throughout the year, but the returns to date are not what were expected. Like Bremer Range, there is a shortage of water here during the summer months. Messrs. *Hollow and Heaton,* the prospectors of the field, obtained 9¾ ounces by dollying. They are working a rich, narrow reef, from which they hope to obtain a profitable return this year. *Davidson and party* have sunk and driven more than a hundred feet on their claim and have opened a lode 8 feet wide in places, but of too low value to pay for transport to Coolgardie, the nearest battery, or for dollying. Other parties have sunk shafts to 50 feet or less, but have not opened any considerable body of ore. Early in the year, after being driven out of Bremer Range through scarcity of water. Messrs. *Alf. Kavs and party* took up a claim at Hatter's Hill, about 30 miles south from Forrestonia and 80 miles Northeast from Ravensthorpe. He has erected a light 3-head mill 2½ miles southeast from the Government tank, and is now treating ore from this locality. His returns are not to hand. Mr. S. J. De Lany, another well known prospector, is also giving this district his attention. Here, also is a large area of good agricultural land, which certainly has a much heavier rainfall than the country a few miles farther north. Forrestonia itself is deserted.

Messrs. Polson Bros. continued to work the *Scots Greys* mine with but little success, their output being only 110 tons, yielding 31.51 ounces. Geologically, this mine is very similar to the *Great Victoria* mine, and may have a surface deposit of gold-bearing laterite. Mr. Kearns is working the *Star of the East,* but his returns are very low. Messrs. Simpson & Co. continue to work the *White Horseshoe* and raised 373 tons, carrying 291 ounces. In the past, this mine has been a good producer. Unfortunately, this year's returns are below the profitable line. The owners intend to keep going for a little longer in the hope of striking an improvement in the grade of ore. I am of the opinion that this mine needs a more vigorous policy of development and that it will return to the ranks of the dividend payers in the not very distant future.

At the *Gordon Highlander* Mr. W. Patterson, jun., drove 100 feet north at the 110ft. level but did not find payable ore. 86½ ounces were obtained at the Spring Hill battery by cyanide. The *Golden Butterfly Co.'s Banker Lease* yielded 389 ozs. from 232 tons. The late tributers, Messrs. Hatt and Party, have given up the property and it is said to be under option of purchase to certain members of the Great Victoria Co. I understand that the shaft is to be repaired and unwatered and the old workings carefully sampled. In November, 1924, Mr. A. Faul took charge of the *Great Victoria Mine* at Burbidge and, after rearranging a section of the plant, crushed in 1925 over 25,900 tons which yielded 6,808 ozs., or under 22s. per ton, and made a good profit. It is expected that the heavy initial expenses, amounting to some £16,000, will be paid off by June at the latest. The ground being worked is a surface deposit of laterite extending to 8ft. deep in places and known to cover five acres. In December last this company purchased the Nevoria lease No. 3307, which contributed 239 tons, worth 82ozs., to the total from the Great Victoria. The Marvel Loch district is very quiet. *The Bohemian Mine,* which in the past yielded 4,670ozs. obtained from 4,877 tons, this year produced only 28½ozs. Owing to complicated faulting of the lode resulting from intrusions of pegmatite dykes the lode in this mine is very difficult to follow, and for a time work on the lease ceased. Recently Mr. Harold Mackey has taken it in hand. The *Salvation Mine* worked by Messrs. Tuckey, Murchison, and Party is now down about 200 feet. The shoot is not very long but the grade is good, 322 tons giving 499ozs. There are nine or ten prospectors at work in this district, all employed examining old workings, and it may happen that some good yields will result from their sampling. *The May Queen,* which in the past produced over a thousand tons of nearly 5oz. ore (1,073 tons, 4,734 ozs.) was not worked underground this year. The 5-head mill of the Edna May Battler was in commission for a time, crushing 255 tons yielding 85 ozs., from the Great Leviathan, and 114 tons, yielding 33.65 fine ozs., from the Trafalgar, formerly one of the Battler leases. At Southern

Cross a little prospecting along the Frazer's line was done without payable return. Early in the year a party found some rich "floaters" in the neighbourhood of Hope's Hill, and for a week or two there was a good deal of prospecting done in that locality. A find of a few "floaters" near Turkey Hill about 12 miles north of Southern Cross and 2½ to 3 miles east from the old Mt. Jackson track, was the cause of a small "rush" to that vicinity, but the show did not warrant the granting of a reward claim. The *Colleen Bawn* produced 10 tons of 9oz. stone: 10 tons, 9½ ozs. 296 ozs. were obtained from 241 tons from the *Bullfinch* lease. At Manxman a mild local boom occurred when an Adelaide company took an option of purchase over the *Radio Mine* for, it was said, £40,000. The main shaft of the mine was deepened 100 feet and between 700 and 800 feet of boring with a diamond drill was done from the Radio Deeps lease to cut the Radio lode on the underlay at about 350 feet vertically from the surface. As the company did not exercise the option it would appear that the indicated value of the lode at depth was not up to requirements. For a few months there was a good deal of local mining activity; the most notable returns were that of the *Radio Deeps* (late Glideaway), with 659 ozs. from 223 tons, and that from the *O.K.*, 71 ozs. from 140 tons. North of Manxman a little prospecting was done at *Marie's Find,* Golden Valley, Ennuin, and at Mt. Jackson, resulting in the recovery of only small quantities of gold. The once prosperous Westonia field is now in the hands of prospectors. The only crushing recorded for the year was that from the *Royal Flush,* from which 100 tons of 18dwt. (79 ozs.) ore were raised. For a number of years this little show was a constant producer, but in September, 1924, it was judged to be worked out down to the 78ft. level, at which depth the lode was cut through by a granite dyke of unknown thickness. In the past very few attempts have been made to sink through these intrusive dykes owing to their extreme hardness and the consequent high cost of the work, but in October *McLennon and Party* commenced sinking and holed through the dyke after four months' work. The intrusion was found to be 22 feet thick. Immediately under the dyke the lode was found to be going down 3ft. 6in. wide and apparently as valuable as ever. A very much increased output is expected from the mine in the current year. Mr. Rose Grant had charge of some development work for the *Greenfinch Company* and did some prospecting in several localities.

Greenbushes Mineral Field.

The output from this field, compared with that for 1924, was as follows:—

1924	.. .. ..	52.56 tons.
1925	.. .. ..	55.27 „

The alleged comparative failure of the autumn rains is said to be the cause, in part, for the smallness of the output, but it appeared to me that much valuable time was lost, and much might have been saved, in the case of the more profitable claims at any rate, by employing extra assistance when moving up the barges to new sites instead of the claim-owners, who in most cases do not number more than three men, doing the whole of the work themselves. The average price of tin was sufficiently high to render fairly low-grade wash payable, and it is rather surprising that there are not more men employed tin mining. A local syndicate is trying to arrange to reopen the *Cornwall* mine. At the end of the year there were still some financial matters to adjust and I have not yet heard of work in the mine having been commenced.

Gold produced in the Yilgarn Goldfield in 1925.

Mine.	Tons.	Ozs. fine gold.
Banker	232	390
Bullfinch	241	296
Great Victoria	25,926	6,808
Radio	852	2,566
Bohemia	82	28
Colleen Bawn	10	91
Edna May Deeps	..	10
Frasers	25	12
Great Leviathan	255	85
Howlett's Battery	..	155
Hollow & Heaton's Reward ..	..	9
Myrtle Central	25	50
May Queen	..	8
New Radio	25	51
O.K.	140	71
Radio Deeps	223	660
Radio North	9	7
Royal Flush	100	80
Resurrection	11	31
Sweet Alice	27	18
Scots Grey	110	32
Salvation	322	500
Sunbeam	6	9
White Horseshoe	373	291
Spring Hill	..	86
Sunbeam Battery	..	2
Transvaal	997	222
Nevoria	302	101
Sundry Claims	1,156	628
Total	31,449	13,297

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

I beg to submit my annual report on the Collie Coalfield for the year 1925.

Five mines are producing coal on the field, viz.:— Proprietary, Co-operative, Westralian, Cardiff, and Premier.

The demand for Collie coal does not seem to expand, with the consequent result that development is not pushed on to any great extent, the winning out places only working two shifts per fortnight more than pit time.

The *Proprietary* Main Dip is still working, and although fully a mile from the surface it is still in good coal.

At the *Co-operative* Colliery they are regrading to go across a fault which cut off their main dip workings.

The *Westralian* have also struck a fault in their main dip which has retarded progress considerably.

The western end of the field seems to be considerably faulted, and the workings steeper than the north-eastern and eastern end of the field.

However, each of these mines have places opened out which could absorb a considerable number of men if the demand was there for the coal.

At *Cardiff* Colliery, which is termed a soft coal mine, only 17 pairs of miners are employed, and these are sufficient to produce all the coal required. The same applies to the Premier Colliery, their trade being 13 per cent. of the railway order.

At fair amount of faulting occurs in the *Premier* Colliery, and operations are at present confined to one district.

Prospecting has been carried out to the right of their main dip, and a drive is being pushed across to connect with the coal on the down side of the fault, which should give them a fair area of workable coal.

Labour conditions on the field have been fairly good. Although a considerable number of disputes have arisen, they have been settled by local arbitration without any stoppages.

The only exception to this is the Premier Colliery, which lost 15½ shifts during the year through stoppages which could have been settled, and were settled when work was resumed.

During November, the engineers, engine-drivers, and firemen stopped work for a week, during which time the mines were kept unwatered by the managers, under managers, and other members of the staff firing at the boilers and attending to the generating plant and other machinery.

The total output of coal for the year was 437,461.20 tons, valued at £363,203, and the number of employees 677. Of this number 523 were employed underground and 154 on the surface.

The output for 1924 was 421,863.86 tons, valued at £363,255, and the total number of employees 673. Of this number 518 were employed underground and 155 on the surface.

The output has increased during the year by 15,597.34 tons, the average output per man employed being 646 tons for the year.

All the coal on the field is machine won, and this easily leads any other coalfield in Australia in this respect.

The conditions under which men work are probably equal to any other part of the world; certainly to any other coalfield in Australia.

The Coal Mines Regulation Act is carried out fairly well by both companies and employees, and I have had no prosecutions for any breach of same during the year.

Although I have to record a considerable number of accidents during the year, I am pleased to say that none have been fatal, and none that have unfitted a man for future work in the mines. The total number of accidents were 217. Of this number 78 were considered serious.

The railway consumption of Collie coal for the year was 266,075 tons as against 254,482 tons in 1924, an increase of 11,593 tons for the year.

Owing to intermittent work and close development there were only three permits granted during the year for Sunday work, as follows:—

Westralian—to relay main haulage road: three roadlayers on September 11th.

Co-operative—repairs to tunnel: four shiftmen on September 18th.

Premier—regrading of winch road: three roadlayers on November 13th.

There were no machinery accidents during the year.

The accompanying tables show outputs and railway consumption for the year.

Amount of Coal produced at each Colliery during Years 1924 *and* 1925.

Colliery.	Output in Tons. 1924.	Output in Tons. 1925.	Employees. 1924.	Employees. 1925.
Proprietary	118,493·97	119,134·00	175	165
Co-operative	112,459·95	120,509·96	178	181
Westralian	97,454·04	100,340·09	158	166
Cardiff	45,936·95	52,394·30	80	83
Premier	47,518·95	45,082·85	83	79
Totals	421,863·86	437,461·20	674	674

Government Railway Order.

Month. 1925.	Large Coal Tons	cwts.	qrs.	Nut Coal. Tons.	cwts.	qrs.	Small Coal. Tons	cwt	qrs.
January	23,207	18	2	209	6	3	17	18	2
February	22,727	16	2	655	13	3	35	15	0
March	23,091	2	3	546	16	1	27	6	0
April	21,506	7	2	687	17	2	24	1	3
May	26,586	6	2	783	18	2	27	4	3
June	19,222	8	1	705	2	0	18	3	3
July	18,449	8	1	808	14	2	17	19	2
August	21,571	8	0	863	7	1	35	14	0
September	18,189	19	3	718	3	3	25	18	1
October	23,187	13	2	814	5	3	17	14	2
November	15,753	8	0	...			8	16	3
December	24,872	4	1	540	9	3	18	10	1
Totals	258,366	1	3	7,433	15	3	275	3	0

Report of Mr. T. Blatchford, Assistant State Mining Engineer.

I beg to submit my annual report for the year ending 31st December, 1925.

With the exception of a short period when instructed by the Under Secretary for Mines to undertake the duties of the State Mining Engineer who was engaged on special work, I occupied the position of Assistant State Mining Engineer.

My duties during the year included several general inspections on reported new developments in gold mining, manganese, etc., and a reported discovery of an oil seepage. A considerable amount of time was spent in the investigation of claims for financial assistance under the terms of the Mining Development Act.

For three weeks I was engaged with Inspector Gourley sampling the heads and residues of the principal treatment plants at Kalgoorlie for Mr. Kingsley Thomas in connection with the Royal Commission on Mining.

Assisted by Mr. Welsh, of the Geological Survey, an exhibition was prepared for the Ugly Men's Association of raw minerals produced in the State, together with their manufactured articles. Of the manufacturers who responded by sending samples of their wares were the Union Plaster Co., Gourley Oil and Colour Company, Calyx Porcelain and Paint Co., Swan White Lead Co., Swan Cement Co., and Wunderlich, Limited. The exhibition caused considerable attention, and illustrated to the public the need for further exploitation of our natural mineral deposits for manufacturing purposes.

On my way back from Mount Vernon I check-sampled the lode at the 300ft. level in the Gwalia Consolidated Mine. The values of my sampling proved to be so close to those issued by the company that there appears to be no doubt that they exist. The future of this mine will depend on whether future development, which is now in active progress, will prove a tonnage sufficient to warrant the installation of a suitable treatment plant, and a cheap means of transport either by rail or motor.

Two new gold discoveries which were inspected are Mount Vernon, otherwise known as Corboy's Find, and Glenelg Hills, 50 miles south of Burracoppin, near the Rabbit-proof Fence.

As will be seen in my report in the appendices, one class of lode at Mount Vernon has every evidence of permanency, and deserves considerable further development. Though there are one or two small quartz veins at Glenelg Hills which carry payable gold values, the prospects of a permanent goldfield in that locality are remote.

At Coppermine Creek, east of the Fitzgerald River, a manganese deposit was inspected and partially sampled. Some of the assays showed a manganese content which would be highly payable provided cheap transport can be made available. Before this can be entertained, further development must be carried out to ensure sufficient tonnage to warrant the necessary capital expenditure.

Two visits were made to the Lake Cave to finalise the drainage system, which has since proved a success, the water falling to about one inch below the pre-flood level. A full report on this scheme appears in annual report for 1924.

A reported new find of a mineral oil seepage at the base of the Porongorup Range was investigated but proved to be a myth, the supposed oil being a vegetable scum. How any sane person could imagine that oil could seep from a massive granite is difficult to surmise, but apparently anything in the form of a scum or film on water is readily seized on by some people as an indication of natural oil seepage, irrespective of any other conditions, which often are so apparent as to render such an idea most ridiculous.

In addition to the reports already referred to, nineteen mines seeking financial assistance were inspected. Reports on these are appended hereto, but for publication they are restricted to the portions which contain information of public interest.

The balance of my time, with the exception of three weeks' vacation, was taken up in office routine.

Report of Mr. R. C. Wilson, Acting Assistant State Mining Engineer.

I beg to submit my annual report for the year ended 21st December, 1925.

My duties consisted for the most part in reporting upon mines and mineral deposits in all parts of the State. I continued to represent the Department on the Board of Control of the Surprise Lead Mine. While not in the field I assisted in the routine work of the office, and in August, when Mr. Montgomery was on leave, I took over his duties as State Mining Engineer.

Brief details of the inspections carried out during the year are as follows:—

In January I visited the Menzies Consolidated Gold Mine at Yunndaga and the Lloyd George Mine at Gibraltar. In each instance I went into the general position and the policy for the future working of the mines, and submitted reports for the information of the Hon. Minister.

In February I spent 13 days examining the North End mines at Kalgoorlie in connection with an application for the erection of a State treatment plant. I came to the same conclusion as Mr. Howe, the Superintendent of State Batteries, that there was no justification for its erection at present. (See my report in Appendix No. 4.)

In March I again visited the Menzies Consolidated Mine, and went carefully into the position with the manager. (See my report in Appendix No. 4.)

I also visited the Sand Queen and Gladsome Mines and reported upon the unwatering problem.

During the same month I visited the Mount Juglah Lease, in the Bulong District, in connection with an application for assistance to erect a plant. I considered the erection of a plant to be premature, but I was prepared to recommend assistance to carry out further development work.

In April I accompanied the Hon. Minister to the Northampton District, and later in the month accompanied the Commissioner, Mr. Kingsley Thomas, and Mr. Howe to the same district. On my return to Perth, I reported upon the district generally. See my report in Appendix No. 4.

In May I spent a good deal of time gathering together all the available information covering the lead and copper mines in the Northampton District for publication in Bulletin form.

In June I again visited Galena. I also visited and reported upon an application for assistance from Hough and Pearsall, at Mount Magnet.

During the same month I visited Poona, accompanied by Dr. Simpson and Inspector Deeble. (See my report in Appendix No. 4.)

In July I visited the Gnow's Nest Gold Mine in the Yalgoo Goldfield, and took the opportunity to visit at the same time the Revival at Melville, and Villier and Alexander's show near Yalgoo. (See my report in Appendix No. 4.)

During the same month the Golden Hope G.M. at Hampton Plains was inspected in connection with an application for assistance, and reported upon.

In August I visited and reported upon an occurrence of beryl at Ferndale. I also visited Greenbushes, and formulated a scheme of development work to test the tin lodes on the Cornwall Lease below water level.

In September I visited the Gnow's Nest G.M. and sampled the reef in the bottom level.

In October I again visited the Northampton District, and in particular looked into the position at The Two Boys Mine at Galena, and the Lady Samson Mine near Northern Gully.

In November I accompanied the Hon. Minister for Mines to Collie and Greenbushes. I also examined and reported upon the occurrence of coal at Nornalup. (See my report in Appendix No. 4.)

In December I again visited Galena and went into the question of a treatment plant with the Leaseholders' and Prospectors' Association. I also visited the Menzies Consolidated G.M. and sampled their concentrate residues.

ACCIDENTS.

The following table gives the number of fatal accidents reported to this office as having occurred on mines, whether to persons employed on the mines or not, for the last five years:—

	1921.	1922.	1923.	1924.	1925.
Total fatal accidents on mines reported	18	10	11	12	13
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	1	1	1	2	1
Fatal accidents to men engaged in mining	17	9	10	10	12
Total men engaged in mining (average)	7,084	6,776	6,497	6,289	6,011
Accident death rate per 1,000 men engaged in mining ...	2·40	1·33	1·54	1·59	2·00
Total fatal accidents on quarries reported	1	1	...	...	...
Total men engaged in quarrying	203	207	326	337	307
Accident death rate per 1,000 men engaged in quarrying ...	4·93	3·75	...	...	...

The mining accidents for the year 1925 are classified in Tables 26, 27, 28 and 29, the previous year's figures being given for comparison, and are forwarded herewith for inclusion in your Annual Report, together with diagram of the fatal accidents year by year, and their causes. (See Report of the Under Secretary for Mines, 1925.)

In Table 26 the accidents are classified according to causes. In 1925 12 were killed and 383 persons were seriously injured, as compared with 10 persons killed and 231 seriously injured during the previous year.

The diagram shows graphically the totals of fatal accidents year by year since 1900. (See Report of the U.S. Mines.)

The death rate per 1,000 persons employed on surface and underground in gold, coal, and other mines is shown in Table 27, the general average rate for 1925 being 2.00, as against 1.59 for 1924. The rates per 1,000 are based upon the figures in Table 21 (Annual Report, Under Secretary for Mines, 1925), which shows a grand total for 1925 of 6,011 men employed at mines above and underground, inclusive of alluvial workers.

Table 28 gives the average number of men employed at quarries, and the death rate per 1,000 persons employed thereon. The total number of men employed during 1925 was 307, as against 337 for 1924, the death rate for 1925 being nil, as against nil for 1924.

Table 29 summarises all the fatal accidents for 1925 above and below ground in gold mines only, with rates per 1,000 men and per 1,000 tons of ore raised, similar figures for 1924 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, 1925), and does not include alluvial workers.

The following table comprises all the fatal and serious accidents reported to this office which occurred during 1925, the accidents being classified according to the gold or mineral field in which they happened, and also as to causes; the totals from each cause for 1924 are shown for comparison:—

—	Explosives.		Falls of Ground.		In Shafts.		Miscellaneous Underground.		Surface.		Machinery.		Total.	
	Fatal.	Serious.	Fatal.	Serious.	Fatal.	Serious.	Fatal.	Serious.	Fatal.	Serious.	Fatal.	Serious.	Fatal.	Serious.
1.—East Coolgardie	...	...	4	4	1	1	2	169	...	58	1	5	8	237
2.—Mt. Margaret ...	...	...	1	1	*1	...	...	22	1	15	...	3	3	41
3.—Murchison ...	...	...	...	5	...	...	...	12	...	4	...	...	...	21
4.—East Murchison	...	...	...	...	1	...	1	...	...	...	...	...	2	...
5.—Coolgardie ...	...	1	...	...	...	...	...	...	...	...	...	2	...	3
6.—Yilgarn ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7.—N. Coolgardie	...	...	...	...	...	...	...	...	...	1	...	...	...	1
8.—N.E. Coolgardie	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9.—Broad Arrow...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10.—Dundas ...	...	...	...	...	...	...	...	1	...	...	...	...	...	1
11.—Pilbara ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12.—Peak Hill ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13.—Yalgoo ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14.—Phillips River	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15.—Collie	...	...	...	11	...	...	...	58	...	9	...	...	...	78
16.—Greenbushes ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17.—Northampton ...	...	...	...	...	...	...	...	...	...	1	...	...	...	1
18.—W. Pilbara ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19.—Swan	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20.—Ashburton ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21.—Roelands ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22.—Kendenup ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23.—State generally	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total for 1925 ...	...	1	5	21	3	1	3	262	1	88	1	10	13	383
Total for 1924 ...	2	3	3	21	2	5	4	147	1	47	...	8	12	231

* Not a "True Mining" Accident.

FATAL ACCIDENTS.

The following are brief particulars of each fatal accident reported to this Department for the year 1925:—

Falls of Ground.

At the Associated Gold Mine, East Coolgardie Goldfield, a man was killed by a heavy fall of ground from back of stope. A creep had occurred a week previously, and the Inspector of Mines agreed that it was safe to bar down, but that no one should go under the shattered ground. While deceased and his mate were barring down, a half-inch air pipe was disclosed lying just under the ground that fell. Deceased went to remove the pipe, and was killed by falling rock. At the Coroner's inquest, the jury returned a verdict of accidental death, with no blame to anyone. (834/25.)

A man was killed at the Great Boulder Proprietary Gold Mine, East Coolgardie Goldfield, by being struck by a small piece of loose rock, weighing about 4lbs., which had been overlooked when testing the ground. This inflicted a large wound on his head, which caused his death five days later. The Coroner's jury gave a verdict of death from injuries accidentally received. (1463/25.)

A fatal accident occurred at the Ivanhoe Gold Mine, East Coolgardie Goldfield. Deceased was engaged shovelling ore into a pass, when a slab of rock came away from the hanging wall and slid down the rill on to him. It appears that this slab of rock must have become fractured, but was held in position by broken ore. The removal of the ore caused the top portion of slab to fall over and roll down the rill. The stope was in good order. An inquest was held and a verdict of accidental death was returned. (1741/25.)

At the Ivanhoe Gold Mine, East Coolgardie Goldfield, three men were working in a stope when a piece of ground suddenly fell from back of stope. One man was killed instantly, but the other two narrowly escaped. They had examined the ground before starting work and considered it quite safe. The Coroner's jury found that deceased came to his death through being crushed by a fall of earth at the 3,000 feet level. (1846/25.)

An unfortunate accident occurred at the Sons of Gwalia mine, Mount Margaret Goldfield. While barring down some loose ground, a man was struck by a piece of rock which came away from the side of the level. Part of one foot was completely severed, but he was recovering when tetanus supervened and he died thirteen days later. At the coroner's inquest the jury brought in a verdict of accidental death. (1604/25.)

In Shafts.

At the Associated Gold Mine, East Coolgardie Goldfield, a man was engaged changing skips and putting cage into shaft. Whilst the cage was being pulled into shaft, one of the hooks fell back and caught the cage on the draw-band. This caused a slight tilt, and he fell from top of cage down the shaft. The coroner's jury returned a verdict of accidental death through injuries received by falling down main shaft, and added a rider that means should be provided on all mines for the platman to step off the top of cage before cage is pulled over the shaft. This has received the attention of the Inspector of Mines. (1397/25.)

A man was fatally injured at the Yellow Aster lease, East Murchison Goldfield, while removing some ladders from a shaft. He was within 15 feet of the brace, and was hooking on the next ladder when the one above, which was the top, gave way, and he fell to the bottom of the shaft, about 50 feet. The rung

had given way and pulled through the hangers which held the ladders up. He succumbed to his injuries the following day. A verdict of accidental death was returned by the coroner's jury. (1618/25.)

Miscellaneous Underground.

A man met his death through falling down a winze at the Great Boulder Proprietary mine, East Coolgardie Goldfield. Several men were coming off shift and had just crossed over the winze. The plat sheet must have become displaced in some way, but it seems almost impossible that it could fall down the winze. At the inquest the jury returned a verdict of accidental death and added a rider that they considered winzes and suchlike places should be better attended in future. A hinged door has been fixed over the winze. (716/25.)

At the Lake View and Star mine, East Coolgardie Goldfield, a man climbed up a ladder to disconnect a hose. After disconnecting, he fell with the hose a distance of about 20 feet on to his head, and fractured his spine. He died five days later. The ladder was safe and sufficiently inclined to permit disconnecting of hose from air pipe with safety. The coroner's jury returned a verdict of death from injuries accidentally received by falling from a ladder, with no blame to anyone. (1847/25.)

At the Havilah gold mine, East Murchison Goldfield, a fatal accident occurred, due to a very unfortunate and unusual delay in the water from an old shaft breaking through to a rise put up to meet the shaft, after a shot had all but demolished the barrier between them. Deceased must have gone back to the rise just as the obstruction gave way. The coroner's jury returned a verdict of death from injuries caused by an influx of water when breaking through from the level into an old shaft, no blame being attributable to anyone. (1839/25.)

Surface (including Machinery).

At the Great Boulder Proprietary mine, a man was cleaning the grizzly when his arm was caught between belt and pulley, and he was probably thrown against concrete pillar supporting the countershaft. At the inquest the jury brought in a verdict of accidental death, and added a rider to the effect that a guard rail should be placed around this spot and other similar belts and pulleys in all mill rooms. This was attended to by the Inspector of Machinery. (1019/25.)

A man was killed at the Sons of Gwalia mine, Mt. Margaret Goldfield, through a piece of piping with which he was working coming into contact with an electric main carrying a pressure of 550 volts. The deceased used an iron rod as a measuring stick instead of the wooden measuring rod which was available. The main lead, though unprotected by insulation, appeared to have been quite safe under ordinary circumstances and in a position where necessity for protection could not be foreseen. The coroner's jury gave a verdict of accidental death, no blame attachable to anyone. (918/25.)

Other Accidents.

The following fatal accident was reported, but not classified as a "true mining accident":—

While engaged in mining a man fell down a public well at Mount Vernon. It is assumed that he went to the well to draw some water, but at the inquest there was no evidence to show how the accident happened. The jury added a rider that they were of opinion the surface of this well was unsafe and required immediate attention. (1882/25.)

Serious Accidents.

All accidents which incapacitate the sufferer from carrying out his usual work in or about a mine for 14 days or more are classified as "serious."

Two hundred and thirty-seven of the 383 accidents during 1925 occurred in the East Coolgardie Goldfield, but only 55 cases 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, smaller dislocations, sprains, wrenches, jars, etc., but of a sufficiently serious nature to cause the injured person to be absent from his work for 14 days or more.

Explosions.

Only one accident was reported under the above classification during 1925. Three shots were charged and only two reports were heard. After waiting an hour and a half, the men returned and were carefully removing the broken rock when an explosion occurred, through which one of the men lost the sight of both eyes.

Falls of Ground.

During 1925, 21 accidents were due to falling ground. In four cases the injuries were sustained while men were engaged in the dangerous but necessary work of pulling down loose ground after firing. In the remaining 17 cases, the injuries were due to ground falling or the men being struck by falling pieces of stone or coal in various parts of the mines.

In Shafts.

Only one accident was classified under the above heading. In this case a man received serious injury through a ladder slipping.

MISCELLANEOUS UNDERGROUND.

Two hundred and sixty-two serious accidents were reported as "miscellaneous underground" during 1925.

In 83 cases the injuries were sustained 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 38 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 20 men received severe cuts and bruises while handling sharp stones; 27 men were injured handling rock drills, coal-cutting machines, and parts of same. Other falls in the workings from stages and ladders, in rills, passes, and so on caused injury to 11 perons, and 16 were hurt by falling tools and pieces of machinery. Flying splinters of stone

and steel were responsible for 14 men being injured, and 17 were hurt while handling timber. The remaining 36 cases were due to various accidental causes, jarring of hands and feet, blows from tools, strains, poisoned cuts, and so on.

SURFACE.
(including machinery.)

Ninety-eight persons were seriously injured while working on the surface; 4 men were burnt in various ways; 20 sustained injuries from falls in the course of their work; 10 were hurt by trucks and skips being jammed or struck by them, or by men sustaining strains while working them. Flying splinters injured two men; falls of timber and pieces of machinery accounted for 19 cases of injury; 10 cases were caused by machinery in motion, four of these being caused by handling belts in motion; three men were injured by being struck by stones; 11 men were hurt by being struck by tools they were using falling or slipping. Other causes of 19 accidents were strains and sprains from heavy weights falling on them, or from their lifting heavy weights, jarred and jammed hands and feet, poisoned cuts, etc.

WINDING MACHINERY ACCIDENTS
(without serious injury to persons).

During the year 1925 there were five accidents reported under the above classification; brief particulars are as follows:—

Overwinding.

An overwind occurred at the Ingliston Consols Extended G.M. through the engine-driver neglecting to reverse the engine, with the result that the rivet was sheared; no damage being done to rope or shaft. (975/25.)

At the same mine another overwind occurred. The engine-driver reversed his lever in error, with the result that the cage in North compartment was overwound. A copper rivet was sheared, but no damage was done to shaft. (1483/25.)

An overwind occurred at the Boulder Perseverance, Limited, due to momentary forgetfulness that level was changed. The North cage was caught in safety thimble, and no damage was done to cage or rope. (1948/25.)

SKIP DERAILMENTS.

One skip derailment occurred at the Sons of Gwalia Mine during the year. The South skip was descending empty when it left the rails, the cause being unknown. (924/25.)

MISCELLANEOUS.

At the Ingliston Consols Extended G.M., while cage was being raised, link on chain gave way, causing cage to become jammed in shaft. (1295/25.)

PROSECUTIONS FOR BREACHES OF THE MINES REGULATION ACTS AND REGULATIONS.

Action was taken against the manager of the Great Boulder Proprietary G.M. for employing seven foreigners, unable to speak the English language readily, contrary to Section 42 of the Mines Regulation Act, 1906. Owing to the men concerned having dispersed out of the town, the action was withdrawn.

EXEMPTIONS FROM SECTION 31, SUBSECTION (4), OF THE MINES REGULATION ACT, 1906."

Eleven exemption permits were issued during the year, five being for mines in the East Coolgardie Goldfield, and six for mines in the North-East Coolgardie Goldfield.

Before these permits were issued the applicants were examined on the particular machinery to which the exemption applied, and satisfied the Inspector of Mines as to their capability of handling it, and that it was not reasonably practicable to insist on employment of a certificated driver.

SUNDAY LABOUR ON MINES.

Five mines were granted permission to work on Sundays, one mine gaining permits on several occasions and another on two occasions. Thirteen permits in all were issued during the year. Two of the permits were required for securing stopes which had been severely damaged by an earth shock, eight for sinking main shaft to avoid loss of time in the subsequent working of the mine, one for relaying main haulage road, one for repairs to tunnel, and one for the regrading of winch road.

AMENDMENTS AND ADDITIONS DURING 1925 TO THE REGULATIONS UNDER "THE MINES REGULATION ACT, 1906," "THE MINES REGULATION AMENDMENT ACT, 1915," "THE COAL MINES REGULATION ACT, 1902, AND 1915," AND "THE MINING DEVELOPMENT ACT, 1902."

"The Mines Regulation Act, 1906."

During 1925 a great deal of time was taken up in preparation of a draft Bill for an amended Mines Regulation Act and Regulations, but owing to pressure of other work, Parliament was not able to complete dealing with it during the year.

Section 63: Cancellation of Clause 4, under Division 2 of Regulation 15, and substitution of salaries of Workmen's Inspectors of Mines. (Gazetted 26th June, 1925.)

Section 63: Amendment of Clause 4, under Division 2 of Regulation 15 (published in *Government Gazette* of 26th June, 1925), salaries of Workmen's Inspectors of Mines. (Gazetted 10th July, 1925.)

Amendment of districts and headquarters of Inspectors of Mines. (Gazetted 28th August, 1925.)

Section 8: Regulation 15, Part 2, Clause 3. Cancellation of *Gazette* notice, 3rd October, 1924, and substitution of boundaries of centres, etc., for Workmen's Inspectors of Mines. (Gazetted 11th December, 1925.)

"The Coal Mines Regulation Act, 1902."

A draft of a Bill for a comprehensive new Coal Mines Regulation Act was also prepared, closely following the Acts now in force in Great Britain, New South Wales, and Queensland, but after discussion with the parties directly interested in the coal mining industry at Collie, this was set aside in favour of a much abbreviated draft Bill, which was submitted to Parliament, and went through its third reading, but was not fully completed in all stages when the session was closed.

Amendment to Regulation 24 under Part 1, Accident Relief Fund, by striking out after the word "secretary," in the first line, the words "who is a subscriber to the fund." (Gazetted, 9th January, 1925.)

"The Mining Development Act, 1902."

Mining Boards: In last year's report record was omitted of the passing, at the end of 1924, of "The Mining Development Act Amendment Act, 1924," to provide for the appointment of Mining Boards. No such boards, however, were actually appointed during 1925.

Extension of operation of Regulations published in *Government Gazette*, 25th August, 1911, relative to subsidies on production of merchantable mica and manufactured mica goods for a further term of 12 months from 1st January, 1925. (Gazetted 13th March, 1925.)

Amendment of Regulations gazetted 22nd January, 1909, relating to ore crushed and tailings purchased at the State batteries. (Gazetted 27th November, 1925.)

Advances on Ores.

The table hereunder shows the minerals on which advances were made to owners of ores suitable for shipment outside the State to enable them to carry on their operations:—

ADVANCES ON ORES.

STATEMENT OF TRANSACTIONS FOR YEAR 1925.

Miscellaneous Minerals.

Mineral.	File No.	Tonnage.	Amount Advanced	Expenses, Shipping, etc.	Balance of proceeds remitted to Owners.	Total Amount realised during year.	Remarks.
			£ s. d.	£ s. d.	£ s. d.	£ s. d.	
Asbestos	856/23	3·15	250 0 0	21 3 5	...	233 14 4	Tonnage and advances shown previously.
Do.	1637/24	2·55	107 0 0	1 8 7	30 11 3	138 19 10	
Do.	111/25	5·6	258 0 0	2 17 10	90 19 4	351 17 2	
Do.	1953/25	2·8	73 0 0	13 9 11	...	...	Proceeds not to hand.
Do.	1968/25	1·387	15 10 0	6 19 1	...	...	do. do.
Do.	1968/25	11·6125	180 5 0	10 5 6	...	...	do. do.
Do.	1968/25	4·5	22 0 0	4 6 9	...	...	do. do.
Do.	1968/25	3·0375	14 15 0	3 0 8	...	...	do. do.
Do.	2009/25	5·5025	27 0 0	...	...	...	do. do.
Do.	2009/25	9·3875	46 0 0	...	...	...	do. do.
Do.	2009/25	3·275	16 8 9	...	...	...	do. do.

It will be seen that advances on asbestos were the principal ones dealt with. During the year Mr. R. G. Prior took a tribute upon Messrs. Barnett Brothers' Asbestos Leases and mill at Lionel, in the Pilbara Goldfield, and to facilitate transport to the railhead at Marble Bar, advances of £5 per ton were made available on delivery there of marketable asbestos to the Warden. The Mines Department then takes charge of the parcels, and sends them by rail and steamer to Fremantle where they are examined and valued, and further advances are made in accordance with the valuation. The mineral is then, if short and of small value, sold to the local cement works in Perth, while the more valuable longer fibre is shipped to England for sale, and sold through the Agent General's office. Any surplus from the sale is then sent to the owners of the ore.

Appendices.

Appendices are attached hereto, giving particulars—

I. Of Mining Development Expenditure during 1925.

II. Sundry Reports by Mr. Blatchford (as listed in Index.)

III. Sundry Reports by Mr. Wilson (as listed in Index.)

IV. Report by State Mining Engineer on the Golden Horseshoe Estates Mine.

I have, etc.,

A. MONTGOMERY,

State Mining Engineer.

APPENDIX No. 1.

SUMMARY OF EXPENDITURE FROM MINES DEVELOPMENT VOTE FROM 1st JANUARY TO 31st DECEMBER, 1925.

Advances in aid of Mining Work and Equipment.

	£	s.	d.
Good Luck G.M., West Pilbara ..	4	16	0
Sawyer, C. E., Menzies	37	10	0
Mooney & Osborn, Marvel Loch	1	1	9
Bastian, Riddle & Bastian, Day Dawn ..	626	19	5
Menzies Consolidated G.M., Ltd., Yunndaga	697	0	4
Cook, Harse & Wakefield, Coolgardie ..	396	17	4
Smith, G. N. B., Westonia	81	14	0
Thompson, J., Marvel Loch	41	5	0
North White Feather G.M., Ltd., Kanowna	792	3	0
Copper Separation, Ltd., Ravensthorpe	1,000	0	0
Lady Shenton G.M., N.L., Menzies ..	501	0	11
Duffy, J. G., Lennonville	40	0	0
Watkins & Stout, Boulder	7	10	0
Lloyd George G.M., Gibraltar	580	3	11
Stahl, F. H., Kalgoorlie	50	0	0
Polson Bros., Parker's Range	40	10	0
Brilliant G.M. Co., N.L., Gnows Nest ..	3,067	15	11
Hunt Bros., Kalgoorlie	645	0	0
Hough & Pearsall, Mt. Magnet	58	7	6
Johnston & Gretchen, Northampton ..	69	6	6
Mararoa G.M. Co., N.L., Reedy's ..	710	2	10
Doherty & Nicholls, Nullagine	70	10	0
Hancock, R. J., Ora Banda	100	0	0
Golding & Gill, Day Dawn	62	0	0
Brown & Erceg, Kalgoorlie	180	0	0
Morris, R., Balgarrie	149	7	4
Stone & Party, Mt. Shenton	181	8	0
Bullfinch Proprietary (1919), Ltd., Comet Vale	7,000	0	0
W.A. Coal Mining & Briquetting & By-Products, Ltd., Collie	100	0	0
Graham & Party, Kalgoorlie	179	18	10
Jewell & Bartholomew, Mt. Magnet ..	164	0	0
Flynn & Flynn, Kalgoorlie	80	0	0
Heydon & Laws, Cue	56	5	0
Purdy & Purdy, Coolgardie	120	0	0
Brown & Watson, Leonora	25	0	0
Baudinette, C. C., Kalgoorlie	100	0	0
Ray & Halls, Kalgoorlie	101	0	0
Prior, R. G., Nullagine	698	7	6
Smitheram & Waller, Bamboo Creek ..	48	2	6
Lillis & Davey, Coolgardie	87	6	4
Dalzell, John, Yilgarn	100	0	0
O'Leary, T., Kalgoorlie	36	0	0
Coombes & Ring, Wiluna	60	0	0
Dwyer, J., Duketon	0	14	6
Menzies Consolidated Gold Mines, Ltd., Yunndaga	1,987	8	0
Murphy & Mooney, Southern Cross ..	57	10	0
De Paoli, G., Southern Cross	89	0	0
Cairns & Heydon, Mt. Magnet	198	16	1
Jenkin & Party, Northern Gully ..	166	2	9
Bordoni, John, Kunanalling	63	14	2
Wearmouth & Paull, Coolgardie ..	51	13	4
Watson & Wellington	25	0	0
Mararoa G. Mines, N.L.	800	0	0
	£22,588	8	9

Boring.

	£	s.	d.
Supervision of Boring at Wiluna—			
Gwalia Consolidated Gold Mines ..	9	5	6
Mararoa Gold Mines	20	6	6
	£29	12	0

Providing Transport and Equipment for Prospectors.

	£	s.	d.
Prospecting	5,164	7	10
State Prospecting Party, No. 5	121	5	10
State Prospecting Party, No. 6	354	10	9
	£5,640	4	5

Water Supplies.

	£	s.	d.
Reduced price of water, Southern Cross Eastwards	£49,134	18	5

	£	s.	d.
Rebates to Prospectors crushing at War Rates	£591	10	7

Subsidies Development Work.

	£	s.	d.
Wright, C. R., Sandstone	12	13	1
Hoffman, E. A., Norseman	5	3	9
Hoffman, E. A., Norseman	10	10	0
	£28	6	10

Subsidies to Batteries crushing for the Public—

	£	s.	d.
Grant, W. R., 102 tons, Westonia ..	15	6	0
Howlett, G. H., 678 tons, Marvel Loch	50	17	0
Patterson, W. A., 110½ tons, Parker's Range	11	1	0
Branson Bros. & Co., 60 tons, Lawlers	7	10	0
Patterson, W. A., 61 tons, Parker's Range	6	2	0
Lang, S. C., 94 tons, Bullfinch ..	11	15	0
O'Brien, Collins & Breen, 409½ tons, Southern Cross	30	14	3
	£133	5	3

Miscellaneous Expenditure—

	£	s.	d.
Preliminary Investigations, Sampling Mines	180	8	9
Maintenance of Securities	60	15	4
Investigations Mineral Industry ..	7	13	7
Recoup to Public Works Department— Half-rent Boring Plant loaned to Freney Oil Co.	215	0	0
Assistance to Prospectors, Supply of Explosives	240	5	6
Subsidy on Ore railed from Yilgarn Goldfields to State Battery, Coolgardie	98	8	0
Rebate to W. J. Davies (Stevens and party), two months' rent on Boiler	18	16	8
Assistance to J. W. Robinson to break Stone at Highland Chief Mine, Warriedar	72	10	0
Free Cartage of Ore from Yalgoo to State Battery, Cue	10	3	11
Subsidy towards Freight on Ore, Coongan to Fremantle	42	11	2
	£946	12	11

Subsidies Carting long distances to Batteries—

Battery.	No. of Parties.	£	s.	d.
Bamboo Creek	1	57	12	0
Boogardie	5	21	9	0
Coolgardie	12	148	16	6
Cue	6	190	4	9
Laverton	5	113	5	0
Leonora	3	33	6	0
Meekatharra	7	93	12	6
Mt. Sir Samuel	4	539	9	6
Ora Banda	7	107	16	6
Peak Hill	4	92	7	3
Sandstone	2	28	5	0
Warriedar	17	758	2	0
Wiluna	10	354	14	9
Yarri	4	53	14	4
Southern Cross	1	18	0	0
		£2,610	15	1

	£	s.	d.
Total (according to Net Treasury figures for the year)	£81,703	14	3

APPENDIX No. 1—*continued.*

Advances refunded—	£	s.	d.
Sawyer, C. E.	58	13	0
Patterson, W. A.	126	10	8
Brown & Owen	10	1	8
Lang & Andrews	33	3	4
Howlett, G. H.	12	4	3
Nevill, A. M.	22	17	4
Lloyd George G.M. Co., N.L.	306	1	6
Pilgrim's Rest G.M. Co.	3	12	6
Sonnenschien, F.	9	18	6
Duggan, Flynn & Worrington	3	3	1
Mopoke Syndicate	9	6	6
Hancock, R. J.	41	10	9
Smith, G. N. B.	24	19	3
Andrews, R. B.	10	4	11
Hunt, H. W.	36	17	6
Great Victoria G.M. Co.	1	15	3
Daisy Queen G.M. Co.	919	15	4
Bastian & party	35	5	2
Golding & Gill	19	7	5
Thorby & Fox	17	18	7
Snell Bros.	9	0	0
Lady Shenton G.M. Syndicate	22	10	0
McNeill, Neil	157	13	0
Mararoa G.M. Co.	340	14	10
Graham & Crain	1	7	3
Brown & Erceg	0	16	6
Stahl, F. H.	7	1	1
Doherty & Nicholls	10	8	7
Johnston & Gretchen	52	13	9
Dwyer Bros.	0	14	6
Scotson & others	0	2	0
Peterzen, C. G.	5	4	6
de Paoli, G.	9	10	0
Brilliant G.M. Co., Ltd.	64	10	6
Carried forward	2,385	13	0

	£	s.	d.
Brought forward	2,385	13	0
Walker, C. H.	0	12	9
Smitheram & Waller	24	8	0
Purdy & Purdy	4	16	10
	£2,415	10	7
Recovered from Sale of Securities—			
Frasers Central G.M.	39	0	0
Nicol, G. M.	30	0	0
Goddard & Dawe	1	10	3
Oversight South G.M.	2	10	0
Big Stone Mine	150	0	0
Chunderloo Mine	15	0	0
Lorna G.M.	4	0	0
Myrtle Central G.M.	30	12	9
Red Guard Mine	5	0	0
Daisy Queen Mine	34	15	8
Central G.M.	10	0	0
	£322	8	8
Miscellaneous Refunds	393	4	11
Prospecting	443	5	4
	£3,574	9	6
The Mining Development Act, 1902—Advances written off to 31st December, 1925—			
Previously reported	34,336	0	1
Year 1925	7,506	9	7
	£41,842	9	8

MINING DEVELOPMENT EXPENDITURE.

Advances Outstanding, 31st December, 1925.

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, 1925.
				Previously to 1925.	During 1925.	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.
Alicia	254F	Mt. Morgans	245 0 0	195 0 0	...	...	195 0 0	4 2 6	54 14 8	249 14 8
Ard Patrick	197	Phillips River	1,331 16 4	1,331 16 4	...	...	1,331 16 4	...	105 11 11	1,437 8 3
Ard Patrick	197	Phillips River	270 0 0	268 8 8	...	...	268 8 8	...	32 4 9	300 13 5
Ajana Lead Mines, Ltd.	153	Northampton	1,500 0 0	1,380 5 10	...	...	1,380 5 10	81 12 0	45 4 7	1,425 10 5
Bulletin	795	Marble Bar	600 0 0	456 1 0	...	26 18 10	429 2 2	50 5 2	96 19 10	526 2 0
Baneygo North	2113T	Laverton	...	200 15 0	...	...	200 15 0	14 5 3	43 17 9	244 12 9
Brittannia	953M	Mt. Magnet	150 0 0	114 12 6	...	43 10 0	71 2 6	...	9 4 6	80 7 0
Bickerton George	378	Phillips River	150 0 0	148 12 6	...	...	148 12 6	...	14 18 2	163 10 8
Black Princess	5166E, 5247E	Kalgoorlie	150 0 0	148 4 8	...	...	148 4 8	...	12 3 4	160 8 0
Bull Oak	1179Y	Bulong	60 0 0	27 2 6	...	...	27 2 6	...	2 1 7	29 4 1
British Flag	5310E, 5316E, 5324E, 5334E, 5354E, 5355E, 5364E, 5365E, 5366E, 5352E	Kalgoorlie	750 0 0	750 0 0	...	...	750 0 0	3 13 1	114 8 5	864 8 5
Bayley's Reward	5127	Coolgardie	100 0 0	99 9 10	...	...	99 9 10	1 18 10	6 8 0	105 17 10
Brilliant G.M. Co., N.L.	880, 897	Yalgoo	2,000 0 0	932 4 1	1,067 15 11	64 10 6	1,935 9 6	61 13 9	65 1 8	2,000 11 2
Brilliant G.M. Co., N.L.	880, 897	Yalgoo	1,000 0 0	...	1,000 0 0	...	1,000 0 0	8 1 9	32 15 4	1,032 15 4
Brilliant G.M. Co., N.L.	880, 897	Yalgoo	1,000 0 0	...	1,000 0 0	...	1,000 0 0	...	20 13 8	1,020 13 8
Baudinette C. C.	P.A. 2040E	Kalgoorlie	100 0 0	...	100 0 0	...	100 0 0	0 3 0	2 16 4	102 16 4
Brown & Erceg	P.A. 1969E	Kalgoorlie	180 0 0	...	180 0 0	0 16 6	179 3 6	2 11 4	5 7 9	184 11 3
Bullfinch Prop. (1919), Ltd.	5217Z, 5476Z	Yunndaga	4,000 0 0	...	4,000 0 0	...	4,000 0 0	46 0 0	126 15 10	4,126 15 10
Bullfinch Prop. (1919), Ltd.	5217Z, 5476Z	Yunndaga	3,000 0 0	...	3,000 0 0	...	3,000 0 0	11 4 4	62 16 9	3,062 16 9
Brown & Watson	P.A. 1137C	Leonora	50 0 0	...	25 0 0	...	25 0 0	...	1 2 5	26 2 5
Bordoni, J.	P.A. 5318	Coolgardie	325 0 0	...	63 14 2	...	63 14 2	...	0 4 0	63 18 2
Champion, South	817N, 1039N	Nannine	400 0 0	400 0 0	...	358 0 0	42 0 0	29 11 8	19 19 8	61 19 8
Clarkson & Son	P.A. 186	Ravensthorpe	150 0 0	119 7 6	...	...	119 7 6	...	16 19 8	136 7 2
Chrysotile, No. 1 and No. 2	274, 275	Pilbarra	250 0 0	250 0 0	...	50 3 4	199 16 8	7 16 5	48 0 6	247 17 2
Coolgardie Redemption	5135	Coolgardie	500 0 0	500 0 0	...	...	500 0 0	...	101 7 7	601 7 7
Coolgardie Redemption	5135, 5136, 5137	Coolgardie	350 0 0	350 0 0	...	...	350 0 0	...	52 0 11	402 0 11
Central	5251E	Kalgoorlie	1,000 0 0	1,000 0 0	...	210 6 2	789 13 10	132 15 9	31 18 2	821 12 0
Christie, J. M.	Dry Dredge Area 1W	Waverley	100 0 0	100 0 0	...	...	100 0 0	0 8 7	19 10 4	119 10 4
Copper Separation, Ltd.	Machy. Lease 11	Phillips Riper	4,000 0 0	4,000 0 0	...	...	4,000 0 0	...	368 15 4	4,368 15 4
Copper Separation, Ltd.	Machy. Lease 11	Phillips River	400 0 0	...	400 0 0	...	400 0 0	...	7 19 7	407 19 7
Copper Separation, Ltd.	Machy. Lease 11	Phillips River	1,000 0 0	...	1,000 0 0	...	1,000 0 0	...	18 3 3	1,018 3 3
Coombes & Ring	P.A. 411J	Wiluna	60 0 0	...	60 0 0	...	60 0 0	...	1 1 7	61 1 7
Dawn of Hope	1504C	Leonora	100 0 0	100 0 0	...	...	100 0 0	0 3 11	...	100 0 0
Dreadnought	4555, 4561, 5190	Coolgardie	750 0 0	296 0 2	396 17 4	...	692 17 6	24 0 5	20 18 8	713 16 2
Digger's Luck	1895W	Cane Grass	175 0 0	174 0 8	...	76 6 8	97 14 0	1 8 10	...	97 14 0
Daisy Queen Gold Mining Co., N.L.	1212, 1221	Lawlers	4,000 0 0	4,000 0 0	...	954 11 0	3,045 9 0	...	245 16 4	3,291 5 4
Duffy, J. G.	P.A. 1018M	Lennonville	100 0 0	49 0 0	40 0 0	...	89 0 0	0 12 2	5 13 9	94 13 9
Dalzell, John	P.A. 1426	Yilgarn	100 0 0	...	100 0 0	...	100 0 0	...	1 5 5	101 5 5
Emily	1510	Cue	400 0 0	372 1 9	...	...	372 1 9	...	44 7 10	416 9 7
Edna May Battler	911, 3170, 3171	Yilgarn	3,000 0 0	2,539 12 9	...	13 6 8	2,526 6 1	86 18 9	310 5 5	2,836 11 6
Eclipse	1047X	Gindalbie	498 19 1	498 19 1	...	267 5 0	231 14 1	62 8 11	...	231 14 1
East Collie Coal Mining Briquetting Co.	294/299, 300/303	Collie	1,000 0 0	790 5 2	...	...	790 5 2	98 15 6	123 16 1	914 1 3
Ellis, J. T.	Reserve 368H	Kalgoorlie	75 0 0	75 0 0	...	6 0 0	69 0 0	...	...	69 0 0
Egan & Sadlier	P.A. 1959E	Kalgoorlie	100 0 0	100 0 0	...	...	100 0 0	...	1 7 5	101 7 5
Firelight & Undaunted	3217, 3222	Yilgarn	464 11 0	390 8 6	1 1 9	0 5 0	391 5 3	3 2 0	64 1 0	455 6 3
Field's Find Extended	902	Yalgoo	361 2 3	361 2 3	...	99 19 0	261 3 3	22 8 3	64 14 4	325 17 7
Flag Leases	136, 137, 138	Phillips River	3,500 0 0	3,080 18 9	...	408 3 9	2,672 15 0	...	177 9 6	2,850 4 6
Flag Tributers (Grant & Edwards)	...	Phillips River	450 0 0	450 0 0	...	0 13 1	449 6 11	15 8 0	38 13 1	488 0 0
Flag Tributers (Grant & Edwards)	...	Phillips River	150 0 0	148 16 10	...	16 12 3	132 4 7	1 2 9	4 7 6	136 12 1
Flynn & Flynn	P.A. 2125E	Kalgoorlie	80 0 0	...	80 0 0	...	80 0 0	0 9 6	1 18 4	81 18 4
Globe	912N	Nannine	500 0 0	444 12 9	...	171 1 6	273 11 3	77 17 10	15 8 1	288 19 4
Gallagher, H. J.	M.L. 145	Northampton	50 0 0	25 0 0	...	...	25 0 0	6 14 6	3 18 4	28 18 4
Gem	184	Phillips River	500 0 0	500 0 0	...	52 9 5	447 10 7	84 14 8	82 4 6	529 15 1
Gem Consolidated	151, 156	Phillips River	1,000 0 0	1,000 0 0	...	...	1,000 0 0	0 18 8	328 7 10	1,328 7 10
Gem Consolidated	151, 156	Phillips River	150 0 0	149 19 1	...	...	149 19 1	...	31 3 6	181 2 7
Golden Lizard	1067R	Edjudina	366 7 4	366 7 4	...	...	366 7 4	45 18 6	35 17 8	402 5 0
Great Southern	2909	Yilgarn	630 0 0	630 0 0	...	...	630 0 0	9 18 5	181 15 10	811 15 10
Great Southern	2909	Yilgarn	500 0 0	500 0 0	...	...	500 0 0	...	58 19 0	558 19 0
Great Southern	2909	Yilgarn	800 0 0	761 3 4	...	...	761 3 4	...	51 11 0	812 14 4
Griffin Syndicate	306/13	Collie	348 0 7	348 0 7	...	...	348 0 7	56 14 2	22 12 5	370 13 0

Griffin Syndicate	306/13	Collie	250 0 0	247 15 0	...	8 0 0	239 15 0	...	15 11 7	255 6 7
Greenhills G.M. Co., N.L.	383F	Linden	350 0 0	286 0 8	...	...	286 0 8	15 3 10	18 1 9	304 2 5
Greenhills G.M. Co., N.L.	383F	Lidnen	225 0 0	171 10 0	...	...	171 10 0	...	4 3 5	175 13 5
Golden Promise	P.A. 2053	Coolgardie	300 0 0	300 0 0	...	...	300 0 0	...	40 4 7	340 4 7
Garden Gully	5147, 5148	Coolgardie	300 0 0	112 10 0	...	...	112 10 0	...	16 12 2	129 2 2
Griffiths Gold Mine	4567	Coolgardie	1,000 0 0	1,000 0 0	...	...	1,000 0 0	10 2 4	153 16 3	1,153 16 3
Golden Hope Gold Mines, N.L.	63, 86	Hampton Plains	2,000 0 0	2,000 0 0	...	...	2,000 0 0	310 11 5	65 10 8	2,065 10 8
Goddard & Dawe	P.A. 1100Z	Menzies	200 0 0	194 8 11	...	1 10 3	192 18 8	...	4 2 6	197 1 2
Golding & Gill	557D	Cue	75 0 0	...	62 0 0	19 7 5	42 12 7	1 6 0	1 15 0	44 7 7
Graham & Crain	5370E	Kalgoorlie	210 0 0	...	179 18 10	1 7 3	178 11 7	2 14 6	5 15 0	184 6 7
Great Empress of Coolgardie	5197	Coolgardie	140 0 0	...	87 6 4	...	87 6 4	...	1 13 0	88 19 4
Havelah	345B	Black Range	600 0 0	355 2 1	...	465 10 10	87 11 3	181 14 2	2 5 5	89 16 8
Havelah	345B	Black Range	500 0 0	496 9 6	...	...	496 9 6	85 6 4	15 12 10	512 2 4
Hawk	725G	Desdemona	120 0 0	116 12 2	...	22 5 11	94 6 3	3 7 10	...	94 6 3
Harbour View Gold Copper Co., Ltd.	M.L. 52 & 94	Kundip	2,886 11 0	2,886 11 0	...	74 16 7	2,811 14 5	8 18 11	620 18 3	3,432 12 8
Hamilton & Congdon	Tributors "Flag" Mine	Ravensthorpe	150 0 0	150 0 0	...	...	150 0 0	...	13 3 8	163 3 8
Hammerston, O. A.	P.A. 184	Ravensthorpe	100 0 0	100 0 0	...	...	100 0 0	...	...	100 0 0
Hobby & Party	...	Youanmi	125 0 0	117 15 10	...	11 0 0	106 15 10	...	...	106 15 10
Humphries & Reid	Dry Dredge Area	Bulong	100 0 0	100 0 0	...	...	100 0 0	4 4 0	9 16 1	109 16 1
Hancock, R. J.	P.A. 1239W	Kalgoorlie	100 0 0	...	100 0 0	41 10 9	58 9 3	0 19 4	2 7 2	60 16 5
Heydon & Laws	2040	Cue	150 0 0	...	56 5 0	...	56 5 0	0 17 2	1 16 10	58 1 10
Hill 60	1215M	Mt. Magnet	660 0 0	...	660 0 0	...	660 0 0	...	...	660 0 0
Ingliston Junction G.M. Co., N.L.	1475N, 1491N	Nannine	200 0 0	98 7 6	...	14 0 0	84 7 6	3 4 10	...	84 7 6
Ives Lake View Reward Junction	4732, 5154	St. Ives	500 0 0	86 10 0	...	51 0 0	35 10 0	4 11 1	1 3 3	36 13 3
Invincible	5358E	Kalgoorlie	75 0 0	25 0 0	50 0 0	7 1 1	67 18 11	1 16 7	2 6 10	70 5 9
Johnston & Stennett	Temp..Reserve 218H	Ravensthorpe	150 0 0	150 0 0	...	0 17 3	149 2 9	17 14 2	4 12 8	153 15 5
Jewell & Bartholomew	P.A. 1024	Mt. Magnet	187 10 0	...	164 0 0	...	164 0 0	...	7 8 5	171 8 5
Kuhlmann & Buckle (Ironclad Tribute)	Res. 196H	Ravensthorpe	300 0 0	263 8 0	...	...	263 8 0	18 8 0	2 17 3	266 5 3
Kuhlmann & Buckle (Ironclad Tribute)	Res. 196H	Ravensthorpe	403 17 3	403 17 3	...	6 1 0	397 16 3	...	...	397 16 3
Kingdom Come	M.L. 112	Northampton	204 14 0	204 14 0	...	110 0 0	94 14 0	5 8 0	15 11 0	110 5 0
Klondyke Boulder	604	Warrawoona	1,000 0 0	999 10 7	...	187 5 6	812 5 1	34 5 4	150 12 7	962 17 8
Kapanga	M.L. 515	Greenbushes	80 0 0	60 0 0	...	25 8 10	34 11 2	4 8 10	1 7 10	35 19 0
Lake View Extended	4536F	Kalgoorlie	1,050 0 0	892 15 5	...	803 0 0	89 15 5	...	54 11 1	144 6 6
Lady Carmen	4556	Coolgardie	500 0 0	500 0 0	...	95 0 0	405 0 0	12 19 1	46 12 2	451 12 2
Lloyd George G.M. Co., N.L.	4580, 4726, 4727	Coolgardie	1,750 0 0	1,750 0 0	...	775 18 9	974 1 3	346 7 10	67 16 7	1,041 17 10
Lloyd George G.M. Co., N.L.	4580, 4726, 4727, 5124, 5156, 5157	Coolgardie	2,000 0 0	1,044 16 0	580 3 11	...	1,624 19 11	8 3 1	94 13 0	1,719 12 11
Lake View Reward	4720, 4721, 4722, W.R. 553, 554	St. Ives	5,657 0 0	5,630 11 5	...	102 14 9	5,527 16 8	152 6 10	545 15 9	6,073 12 5
Lake View Reward	4720, 4721, 4722, W.R. 553, 554, 555	St. Ives	1,000 0 0	1,000 0 0	...	...	1,000 0 0	...	71 15 3	1,071 15 3
Lonsdale & Howard	P.A. 1822E	Kalgoorlie	100 0 0	100 0 0	...	0 19 10	99 0 2	0 9 11	6 3 10	105 4 0
Lake View	5410Z	Comet Vale	100 0 0	100 0 0	...	...	100 0 0	...	17 4 2	117 4 2
Lady Shenton G.M. Synd., Menzies, N.L.	5423Z, 5485Z	Menzies	1,000 0 0	413 18 6	501 0 11	...	914 19 5	8 16 4	31 7 4	946 6 9
Lady Shenton, G.M. Syndicate, Menzies, N.L.	5423Z, 5485Z	Menzies	90 0 0	...	90 0 0	22 10 0	67 10 0	...	...	67 10 0
Lady Samson Lead Mine	M.L. 27 P.P.	Northern Gully	700 0 0	...	166 2 9	...	166 2 9	...	0 13 6	166 16 3
Mindeloo	1518	Mindoolah	300 0 0	198 17 0	...	10 0 0	188 17 0	...	8 1 1	196 18 1
Mt. Rankin Gold Mines, N.L.	3135, 3136	Yilgarn	1,000 0 0	911 19 9	...	115 13 11	796 5 10	...	47 8 4	843 14 2
Mt. Iron	198	Kundip	200 0 0	194 0 0	...	...	194 0 0	...	35 3 7	229 3 7
Melba	1053R	Yerilla	575 0 0	496 18 10	...	90 0 0	406 18 10	...	43 2 9	450 1 7
Mott & Matthews	P.A. 164	Roebourne	750 0 0	483 6 6	...	68 15 11	414 10 7	1 1 10	45 10 7	460 1 2
Mt. Magnet Prospecting Development Syndicate	1190M	Mt. Magnet	250 0 0	122 5 6	...	6 15 6	115 10 0	7 11 0	3 12 9	119 2 9
Mohr, John	P.A. 1522E	Kalgoorlie	150 0 0	143 5 7	...	...	143 5 7	0 7 6	38 2 1	181 7 8
Moyle, W.	P.A. 1842E	Kalgoorlie	75 0 0	75 0 0	...	...	75 0 0	1 6 0	4 10 0	79 10 0
Mararoa G.M. Co., N.L.	1977	Cue	850 0 0	840 4 8	...	371 2 4	469 2 4	173 16 3	23 10 4	492 12 8
Mararoa G.M. Co., N.L.	1977, 1981, 2030, 2033, 2038, 2044/5	Cue	900 0 0	...	900 0 0	...	900 0 0	10 5 9	27 15 4	927 15 4
Mararoa G.M. Co., N.L.	...	Wiluna	1,000 0 0	...	710 2 10	...	710 2 10	20 1 9	23 5 4	733 8 2
Murrin Proprietary G.M. Co., N.L.	372F	Mt. Morgans	550 0 0	550 0 0	...	40 2 0	509 18 0	...	54 8 6	564 6 6
Murrin Proprietary G.M. Co., N.L.	372F	Mt. Morgans	413 3 6	413 3 6	...	85 1 6	328 2 0	...	36 11 6	364 13 6
Mt. Monger Proprietary G.M. Co., N.L.	4770E	Kalgoorlie	300 0 0	196 10 0	...	3 4 8	193 5 4	2 0 9	...	193 5 4
Mt. Zion	1013M, 1183M, 1189M	Mt. Magnet	2,000 0 0	1,959 13 1	...	203 8 0	1,756 5 1	82 2 7	172 5 5	1,928 10 6
Mt. Zion	1013M, 1183M, 1189M	Mt. Magnet	500 0 0	500 0 0	...	...	500 0 0	9 15 9	45 18 8	545 18 8
Menzies Consolidated Gold Mines, Ltd.	4931Z, 4934Z, 4935Z, 4936Z, 5074Z, 5075Z, 5260Z, 5315Z, 5261Z, Garden Area 25Z, 35Z, Tailings Area 55Z	Yunndaga	5,000 0 0	2,660 1 6	697 0 4	...	3,357 1 10	167 0 11	211 5 0	3,568 6 10

Mining Development Expenditure—*Advances Outstanding 31st December, 1925*—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, 1925.
				Previously to 1925.	During 1925.	Repaid, including Sale of Securities, etc.	Balance outstanding.	Paid.	Outstanding.	
			£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Menzies Consolidated Gold Mines, Ltd. ...	4931Z, 5074Z, 4935Z, 4936Z, 5034Z, 5075Z, 5260Z, 5315Z, 5261Z, Garden Area 25Z, 35Z, Tailings Area 55Z	Yunndaga ...	4,000 0 0	...	1 987 8 0	...	1,987 8 0	...	23 7 0	2,010 15 0
Moyagee	1217M	Mt. Magnet ...	365 0 0	...	198 16 1	...	198 16 1	...	1 6 2	200 2 3
Moyagee	1217M	Mt. Magnet ...	365 0 0	...	80 0 0	...	80 0 0	...	1 10 6	81 10 6
Morris, Rupert	P.A. 508	Kalgoorlie ...	150 0 0	...	149 7 4	...	149 7 4	...	6 13 11	156 1 3
Murphy and Mooney	P.A. 1441	Yilgarn	81 5 0	...	57 10 0	...	57 10 0	...	0 6 3	57 16 3
Mopoke Syndicate	P.A. 1182W ...	Broad Arrow ...	200 0 0	194 8 4	...	38 3 1	156 5 3	18 16 4	5 2 5	161 7 8
Mainland Consols	571D	Lake Austin ...	300 0 0	290 9 0	...	0 12 9	289 16 3	19 15 8	9 14 11	299 11 2
McGregor & Grylls	P.A. 1177	Yilgarn	100 0 0	88 2 6	...	...	88 2 6	...	3 0 9	91 3 3
McLelland, Rowe, & Hehir	P.A. 2162	Coolgardie ...	60 0 0	60 0 0	...	...	60 0 0	...	1 5 0	61 5 0
Norseman Prospecting Syndicate	1261	Norseman ...	515 3 8	515 3 8	...	...	415 3 8	6 10 3	146 15 5	561 19 1
North Harbour View	M.L. 370	Phillips River ...	100 0 0	100 0 0	...	...	100 0 0	6 8 1	27 11 4	127 11 4
North End	4732E	Kalgoorlie ...	150 0 0	149 5 0	...	...	149 5 0	...	38 9 2	187 14 2
Norma	1460N	Nannine ...	220 0 0	220 0 0	...	42 8 7	177 11 5	15 7 3	22 4 10	199 16 3
New Victory	5159	St. Ives	300 0 0	150 10 0	...	...	150 10 0	...	6 13 10	157 3 10
New Victory	5159	St. Ives	115 0 0	93 15 5	...	...	93 15 5	...	3 9 9	97 5 2
North White Feather Gold Mines, Ltd. ...	12X, 13X, 1438X, 1443X	Kanowna ...	2,500 0 0	445 2 10	792 3 0	...	1,237 5 10	9 16 4	61 4 6	1,298 10 4
Oates & Party	P.A. 1022Z ...	Menzies	90 0 0	90 0 0	...	4 19 6	85 0 6	...	...	85 0 6
Owen & Brown	M.L. 184	West Pilbarra ...	100 0 0	56 3 0	4 16 0	24 15 3	36 3 9	9 10 5	2 3 5	38 7 2
Orr & Richards	3249	Yilgarn	50 0 0	50 0 0	...	...	50 0 0	...	1 1 4	51 1 4
Oversight, South	1905W	Broad Arrow ...	200 0 0	158 18 1	...	6 8 10	152 9 3	8 0 5	...	152 9 3
O'Leary, T.	... ...	Kalgoorlie ...	50 0 0	...	36 0 0	...	36 0 0	...	0 9 7	36 9 7
Pearl	1095M	Mt. Magnet ...	76 0 0	76 0 0	...	...	76 0 0	...	24 18 2	100 18 2
Pyx	789B	Sandstone ...	600 0 0	571 4 8	...	87 10 7	483 14 1	12 14 5	24 15 0	508 9 1
Pilgrims Rest G.M. Co., Ltd.	165, M.A. 14 ...	West Pilbarra ...	1,500 0 0	503 12 6	...	503 12 6	...	...	102 18 6	102 18 6
Pinder, A.	2102T	Duketon ...	100 0 0	100 0 0	...	2 2 0	97 18 0	...	22 1 8	119 19 8
Peterzen, G. G.	P.A. 1109C ...	Malcolm	20 0 0	20 0 0	...	10 4 6	9 15 6	2 6 1	0 9 1	10 4 7
Pearce, J. A.	P.A. 1315	Yilgarn	60 0 0	60 0 0	...	...	60 0 0	0 13 0	5 17 4	65 17 4
Purdy & Purdy	5208	Coolgardie ...	150 0 0	...	120 0 0	4 16 10	115 3 2	0 17 11	2 13 3	117 16 5
Prior, R. G.	Mineral Claim 1L, 2L, 3L, 4L, 5L	Nullagine ...	200 0 0	...	200 0 0	...	200 0 0	...	2 14 10	202 14 10
Resurrection	3288	Yilgarn	100 0 0	...	89 0 0	9 10 0	79 10 0	...	0 12 9	80 2 9
Ray & Halls	P.A. 1986E ...	Kalgoorlie ...	150 0 0	...	101 0 0	...	101 0 0	...	0 15 9	101 15 9
Rainbow Gold Mining Co., N.L.	5091	Coolgardie ...	230 0 0	182 10 0	...	1 8 4	181 1 8	6 1 7	38 13 0	219 14 8
Rich & Wigglesworth (Sub-Leases) ...	863B, 864B, 942B, 943B	Black Range ...	2,500 0 0	500 0 0	...	...	500 0 0	...	7 6 0	507 6 0
South Cornwall	M.L. 567	Greenbushes ...	1,170 2 0	1,170 2 0	...	141 0 0	1,029 2 0	...	...	1,029 2 0
Stanley	1271X	Kanowna ...	150 0 0	112 0 0	...	...	112 0 0	2 6 0	39 14 8	151 14 8
Scots Greys	2801	Yilgarn	200 0 0	200 0 0	...	...	200 0 0	5 0 0	82 7 3	282 7 3
Scots Greys	2801	Yilgarn	200 0 0	200 0 0	...	...	200 0 0	...	87 7 2	287 7 2
Scots Greys	2801	Yilgarn	120 0 0	101 15 0	...	0 10 0	101 5 0	...	9 5 9	110 10 9
Scots Greys	2801	Yilgarn	50 0 0	...	40 10 0	...	40 10 0	...	1 0 6	41 10 6
Scots Greys	2801	Yilgarn	600 0 0	327 4 1	...	11 9 0	315 15 1	1 5 1	28 5 0	344 0 1
Surprise	M.L. 342	Ravensthorpe ...	100 0 0	100 0 0	...	...	100 0 0	...	0 10 4	100 10 4
Snelgrove & Mendis	P.A. 1880	Widgiemooltha ...	1,285 0 0	1,253 12 7	...	465 0 0	788 12 7	22 0 3	90 17 7	879 10 2
Stevens & Party (Tributors)	... ...	Curran's Find ...	1,047 13 0	1,047 13 0	...	...	1,047 13 0	17 3 10	119 3 9	1,166 16 9
Stevens & Party (Tributers)	... ...	Curran's Find ...	200 0 0	200 0 0	...	49 6 8	150 13 4	26 0 0	...	150 13 4
Stevens & Party (Tributers)	... ...	Curran's Find ...	1,750 0 0	1,123 0 7	626 19 5	90 11 9	1,659 8 3	128 4 0	54 8 4	1,713 16 7
South Fingall	G.M.L. 569D ...	Day Dawn ...	200 0 0	170 11 2	...	...	170 11 2	4 12 3	16 13 5	187 4 7
Sydney Mint	8958	Kunanalling ...	100 0 0	50 0 0	...	1 15 0	48 5 0	0 17 8	7 17 0	56 2 0
Suhard & Simpson	Reward M.L. 220...	West Pilbarra ...	25,000 0 0	20,000 0 0	...	...	20,000 0 0	3,319 9 8	110 8 3	20,110 8 3
Surprise Lead Mine	M.L. 148, 150, 154, 158 and 20 P.P.	Northampton ...	100 0 0	...	48 2 6	24 8 0	23 14 6	...	1 4 0	24 18 6
Smitheram & Waller	850	Bamboo Creek ...	100 0 0	...	70 10 0	10 8 7	60 1 5	2 11 5	2 2 9	62 4 2
Shamrock	219L	Marble Bar ...								

Thomas & McDonald (Tributers)	... ...	Kalgoorlie ...	40 0 0	35 0 0	...	...	35 0 0	...	3 10 9	38 10 9
Thorn, A.	P.A. 1913	Widgiemooltha ...	50 0 0	50 0 0	...	...	50 0 0	1 13 10	1 11 6	51 11 6
Triffitt & Winter	P.A. 1452	Tuckabianna ...	150 0 0	141 0 0	...	...	141 0 0	0 13 11	2 10 0	143 10 0
Triffitt & Winter	P.A. 1452	Tuckabianna ...	75 0 0	75 0 0	...	...	75 0 0	...	...	75 0 0
Thompson, J.	P.A. 1362	Yilgarn	75 0 0	31 10 0	41 5 0	5 0 0	67 15 0	2 5 1	2 0 0	69 15 0
Unexpected	5480Z, 5481Z ...	Mt. Ida	640 0 0	644 15 0	...	15 4 0	629 11 0	121 10 8	36 4 6	665 15 6
V's United G.M. Co., N.L.	271F	Mt. Morgans ...	500 0 0	406 14 1	...	...	406 14 1	1 11 2	25 7 9	432 1 10
V's United G.M. Co., N.L.	271F	Mt. Morgans ...	172 2 0	172 2 0	...	170 0 0	2 2 0	...	9 6 4	11 8 4
Venture	5160	St. Ives	100 0 0	59 4 2	...	...	59 4 2	0 3 1	3 13 10	62 18 0
Victory	P.A. 1382	Marvel Loch ...	26 13 4	...	26 13 4	...	26 13 4	...	...	26 13 4
Williamson & Pender	... ...	Kanowna ...	180 0 0	180 0 0	...	...	180 0 0	7 0 0	12 18 1	192 18 1
Wheal May	Loc. 6	Northampton ...	302 4 6	302 4 6	...	50 0 0	252 4 6	5 15 9	14 9 8	266 14 2
Wilson & Son	P.A. 1103W ...	Broad Arrow ...	26 0 0	26 0 0	...	...	26 0 0	...	0 16 0	26 16 0
Wilga Proprietary Coal Prospecting Co., Ltd.	P.A. 406H	Wilga	1,000 0 0	734 8 4	...	...	734 8 4	...	111 1 9	845 10 1
Wheal Ina	M.L. 23 PP ...	Northampton ...	200 0 0	42 17 0	69 6 6	52 13 9	59 9 9	2 17 0	2 19 6	62 9 3
Warrier	5484Z	Menzies	200 0 0	162 10 0	37 10 0	58 13 0	141 7 0	9 1 7	4 13 2	146 0 2
Wearmouth & Paull'	P.A. 2331	Coolgardie ...	120 0 0	...	51 13 4	...	51 13 4	...	0 1 5	51 14 9
Watson & Wellington	P.A. 1086M ...	Mt. Magnet ...	150 0 0	...	25 0 0	...	25 0 0	...	...	25 0 0
Total	... ...	... ...	...	96,919 7 8	22,372 0 7	8,545 1 0	110,746 7 3	6,574 15 0	7,873 6 0	118,619 13 3
B.—Assistance in Erecting Batteries and Treatment Plants to be used for Crushing for the Public.										
Big Stone	357F, 369F ...	Yundamindera ...	500 0 0	484 2 1	...	1 6 2	482 15 11	37 18 0	60 11 10	543 7 9
Big Stone	357F, 369F ...	Yundamindera ...	1,438 0 0	1,438 0 0	...	568 6 3	869 13 9	...	384 6 3	1,254 0 0
Butcher Bird, No. 1	1933	Yilgarn	1,863 14 2	1,863 14 2	...	17 16 2	1,845 18 0	172 3 10	89 6 5	1,935 4 5
Butcher Bird Tributers (E. A. Cox) ...	... ...	... ...	76 8 4	76 8 4	...	26 4 9	50 3 7	...	...	50 3 7
Butcher Bird Tributers (Jones & Party) ...	... ...	... ...	12 0 3	12 0 3	...	...	12 0 3	...	...	12 0 3
Butcher Bird Tributers (Odgen & James) ...	... ...	... ...	26 4 9	26 4 9	...	...	26 4 9	...	...	26 4 9
Chunderloo	1048N	Nannine	2,032 12 0	1,730 10 2	...	671 4 2	1,059 6 0	...	218 16 2	1,278 2 2
Donovan's Find	768	Yilgarn	1,000 10 0	1,000 10 0	...	306 4 3	694 5 9	612 9 4	17 9 10	711 15 7
Donovan's Find	768	Yilgarn	150 0 0	150 0 0	...	...	150 0 0	55 18 3	4 14 6	154 14 6
Donovan's Find	768	Yilgarn	433 0 0	433 0 0	...	...	433 0 0	111 18 10	13 12 10	446 12 10
Donovan's Find	768	Yilgarn	100 0 0	78 0 9	...	...	78 0 9	17 14 5	2 9 2	80 9 11
Fraser's Central	3228, 3232 ...	Yilgarn	2,971 16 4	2,971 16 4	5 0 0	39 0 0	2,937 16 4	44 12 2	468 16 8	3,406 13 0
Fraser's Central	3228, 3232 ...	Yilgarn	636 17 8	636 17 8	...	...	636 17 8	...	83 6 11	720 4 7
Fraser's Central	3228, 3232 ...	Yilgarn	891 6 0	891 6 0	...	...	891 6 0	...	47 13 7	938 19 7
Fraser's Central	3228, 3232 ...	Yilgarn	650 0 0	650 0 0	...	8 3 10	641 16 2	...	8 16 5	650 12 7
Great Victoria	719, 944/5, 1227 ...	Yilgarn	2,000 0 0	1,643 3 0	...	3 3 0	1,640 0 0	287 3 11	41 6 9	1,681 6 9
Great Southern	2909	Yilgarn	...	3,977 12 7	...	...	3,977 12 7	13 0 0	926 3 6	4,903 16 1
Hodder, E.	M.A. 64Y	Bulong	253 3 2	253 3 2	...	148 13 0	104 10 2	6 8 4	35 11 3	140 1 5
Hunt, H. W.	... ...	Kalgoorlie ...	795 0 0	150 0 0	645 0 0	36 17 6	758 2 6	...	41 14 8	799 17 2
Kirton's South	M.L. 127	Northampton ...	2,050 0 0	2,028 12 9	...	230 12 4	1,798 0 5	537 3 10	146 3 0	1,944 3 5
Kirton's South	M.L. 127	Northampton ...	200 0 0	200 0 0	...	...	200 0 0	15 8 5	14 19 9	214 19 9
Kirton's South	M.L. 127	Northampton ...	500 0 0	500 0 0	...	...	500 0 0	8 14 1	46 16 8	546 16 8
Lalla Rookh	112, 786, T.A. 10...	Marble Bar ...	...	3,176 1 6	...	459 13 11	2,716 7 7	622 10 6	234 3 3	2,950 10 10
Malcolm Prospecting Co.	1175C	Mt. Malcolm ...	1,550 0 0	1,550 0 0	...	15 0 0	1,535 0 0	410 6 10	723 4 9	2,258 4 9
McCahon & Party	... ...	Mt. Ida	400 0 0	400 0 0	...	7 0 0	393 0 0	...	27 14 5	420 14 5
Myrtle Central	3269, 3271 ...	Yilgarn	519 7 4	437 13 4	81 14 0	65 10 0	453 17 4	18 8 3	25 17 10	479 15 2
Neta	1011R	Edjudina ...	200 0 0	200 0 0	...	17 11 7	182 8 5	44 19 2	58 9 8	240 18 1
Nevill A. M.	910	Yalgoo	67 10 0	67 10 0	...	27 16 6	39 13 6	4 8 5	1 14 11	41 8 5
Phoenix	622N	Quinn's	250 0 0	250 0 0	...	39 12 0	210 8 0	17 12 1	17 5 11	227 13 11
Randwick	978C	Mt. Malcolm ...	584 14 0	577 3 5	...	54 4 6	522 18 11	...	45 3 5	568 2 4
Red, White, and Blue	641B	Curran's Find ...	2,676 0 0	2,676 9 0	...	1,216 5 2	1,460 3 10	856 18 10	121 10 1	1,581 13 11
Rocklee	... ...	Yaloginda ...	350 0 0	350 0 0	...	38 0 0	312 0 0	12 2 0	21 14 1	333 14 1
Ravensthorpe Battery Co.	... ...	Ravensthorpe ...	1,300 0 0	1,038 8 2	...	125 0 0	913 8 2	...	326 1 2	1,239 9 4

MINING DEVELOPMENT EXPENDITURE—*Advances Outstanding 31st December, 1925.*—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, 1925.
				Previously to 1925.	During 1925.	Repaid, including Sale of Securities, etc.	Balance outstanding.	Paid.	Outstanding.	
			£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Spring Hill Leases	724, 2633	Parker's Range ...	655 16 5	655 16 5	...	530 17 5	124 19 0	583 18 8	3 4 7	128 3 7
Southern Cross Leases	1067Y, 1076Y ...	Bulong	1,000 0 0	1,000 0 0	...	770 15 3	229 4 9	78 9 6	155 11 10	384 16 7
Triplicate	1914	Tuckabianna ...	730 0 0	608 17 7	...	191 13 10	417 3 9	51 0 8	39 14 7	456 18 4
Totals	... ...	... ...	...	34,183 1 5	731 14 0	5,616 11 7	29,298 3 10	4,621 8 4	4,454 6 8	33,752 10 6
C.—MISCELLANEOUS.										
W.A. Coal Mining, Briquetting and By-Product's Co., Ltd.	... ...	Collie	100 0 0	...	100 0 0	...	100 0 0	...	5 8 7	105 8 7
Duggan, Flynn, & Worrington	P.A. 890B	Youanme ...	150 0 0	150 0 0	...	54 11 4	95 8 8	...	...	95 8 8
Prior, R. G.	... ...	Nullagine ...	498 7 6	...	498 7 6	...	498 7 6	...	15 1 5	513 8 11
Totals	... ...	... ...	...	150 0 0	598 7 6	54 11 4	693 16 2	...	20 10 0	714 6 2
D.—BORING.										
Irwin River	... ...	... ...	...	3,817 5 10	...	...	3,817 5 10	...	...	3,817 5 10
Wilga	... ...	... ...	...	6,037 12 5	...	...	6,037 12 5	...	...	6,037 12 5
Golden Mile Ore Channel Ext., Ltd. ...	... ...	Kalgoorlie ...	...	3,471 11 5	...	...	3,471 11 5	...	...	3,471 11 5
A. H. Williams Boring "Lady of Lake"	... ...	Kalgoorlie ...	...	1,100 0 0	...	...	1,100 0 0	...	...	1,100 0 0
Totals	... ...	... ...	...	14,426 9 8	...	...	14,426 9 8	...	...	14,426 9 8
A.—PIONEER MINING AND PROSPECTING ...	... ...	... ...	...	96,919 7 8	22,372 0 7	8,545 1 0	110,746 7 3	6,574 15 0	7,873 6 0	118,619 13 3
B.—ASSISTANCE ERECTING BATTERIES, ETC.	... ...	... ...	...	34,183 1 5	731 14 0	5,616 11 7	29,298 3 10	4,621 8 4	4,454 6 8	33,752 10 6
C.—MISCELLANEOUS	... ...	... ...	...	150 0 0	598 7 6	54 11 4	693 16 2	...	20 10 0	714 6 2
D.—BORING	... ...	... ...	...	14,426 9 8	...	...	14,426 9 8	...	...	14,426 9 8
TOTALS	... ...	... ...	...	145,678 18 9	23,702 2 1	14,216 3 11	155,164 16 11	11,196 3 4	12,348 2 8	167,512 19 7

APPENDIX No. 2.

Sundry Reports by T. Blatchford, Esq., Assistant State Mining Engineer.

1.—NEW LODE ON "BIG BELL" MINE.

(5th January, 1926.)

In accordance with your oral instructions, I called in on my way down from Wiluna and made a brief inspection of the "new lode" on the Big Bell Mine.

The new lode runs parallel to and on the East side of the "old lode." As far as can be seen at present the gold values occur in a similar country rock, viz., a very much altered acid schist.

The main workings consist of a number of shallow costeens, one shaft 22 feet deep, about 400 feet south of the old main shaft (a crosscut has been driven 36 feet east from the bottom of this shaft), and a continuation of a crosscut 45 feet from the surface at the main shaft.

The costeens in my opinion were too shallow to warrant sampling. Samples were taken from the 36 feet of crosscutting from the prospecting shaft referred to above and yielded an average of two grains of gold per ton. The crosscut at the main shaft would not strike the lode until it had been continued another 14 feet. This work was in progress when I was on the mine but would take some three weeks more before the lode was struck. The values in the preliminary samples I took were so disappointing that I consider we should take no further action until the crosscut at the main shaft is well into the lode, when the whole proposition should be carefully sampled before any advances are made. The Big Bell "old lode" has been a very low grade mine from its inception, and I will be surprised if the "new lode" turns out any better when taken in bulk, though possibly some considerable amounts of ore may be found carrying payable gold contents.

2.—REPORT ON COLE'S FIND AT PINJIN.

(3rd March, 1925.)

In company with Inspector Gourley and Messrs. Dunne and O'Brien I inspected Cole's Find (G.M.L. 901) at Pinjin.

There is little or no evidence of the lode at the surface, which is covered with a mantle of alluvium. As far as could be ascertained from the underground workings it appears that the gold values occur in lenses; certainly the workings from the prospecting shaft point to this being the case.

The official returns show that 1,327 tons have been milled for a fine gold return of 417 ozs., or at the rate of 6.3 dwts. per ton. The State battery figures show the tailings to average about 16s. per ton.

Of the above tonnage some 800 or 900 tons have been taken from the main stope above the 60 feet level connecting the prospecting and main shafts. The balance has, therefore, been probably mined from workings connected to the north-west shaft which were inaccessible. The stope above the 60ft. level lies a little to the west of the drive. Samples were, therefore, taken from the north end of the stope (1-3), and from the prospecting shaft and west crosscut (4-7). The results of these samples are very disappointing and much below the average of the ore treated. The only conclusion to arrive at is that—

(1) the possibly payable ore has been extracted;
(2) the grade of the ore remaining is extremely low;
(3) the gold values extend neither north nor south.

With regard to the water, it is more than likely that by sinking water would be found at a depth of about 120 feet from the surface. This being so, there is little room to prospect for payable oxidised ore below the 75ft. level. Any quantity of ore, if found, would therefore be in the sulphide zone, and probably unsuitable for a Huntington mill.

Summing up the proposition the facts are:—

(1) There is no appreciable amount of ore developed, certainly none immediately available for stoping.
(2) The assay returns are such that there appears little chance of obtaining values by driving either north or south.
(3) The grade of the ore previously crushed is too low to allow of profitable treatment unless large lodes were first found.
(4) Water may or may not be found in sufficient quantities for treatment purposes on the lease by sinking, but there is none at present.

When these facts are duly considered there seems to be only one reasonable course of action to adopt, and that is to advise the applicants to seek some more favourable proposition for their capital and energy, and not spend them on an undertaking presenting so little hope of success. I can neither recommend an advance for machinery or further development.

3.—REPORT ON A SUPPOSED OIL SEEPAGE AT PORONGORUP.

(3rd March, 1925.)

Dr. Simpson's report on a sample from a spot on the Porongorup Range, where an oil seepage was supposed to be, has just come to hand. The sample shows no trace of mineral oil; "there was therefore no indication whatever of a mineral oil in these borings."

No other result could reasonably be expected after inspecting the locality from which the sample was taken, which was on the southern flank of a granite ridge some two hundred feet up the slope.

I am not quite certain as to how the prospector formed the idea there was a likelihood of an oil occurrence, except that he assures me he sent two samples to a chemist in Perth, and in each instance the report gave a trace of mineral oil. Under the circumstances I do not think there is any reason to pursue the subject further.

The Porongorup Range is a rather elevated granite ridge lying south of the Stirling Range, with an approximately east and west strike.

The granite forming the range is mostly of a gneissic character, but at times is very coarsely crystalline, with fine bands running through the main mass. In places felspars are very well developed, and almost totally replace the other rock-forming minerals. Faulting is not uncommon, and where the alleged oil seepage occurred is an instance of a fault in which a watercourse has formed and the rock has decomposed, the fissure becoming filled with soft clayey material.

4.—McCAHON'S GREAT HOPE MINE, MOUNT MONGER.

(10th March, 1925.)

In passing through Mount Monger with Inspector Gourley I inspected McCahon's Great Hope Mine.

Since my previous reports in 1920 considerable development has taken place, but not in any of the costeens or shafts which were sampled at that time.

The present workings are concentrated wholly on the rich shoot which was sampled and reported on in the Mount Monger Proprietary, and which has since dipped into the Great Hope.

In the Mount Monger Proprietary the shoot was only about eight feet deep, but now it has increased to about 30 feet. The width is about the same, 2ft. 6in. to 4ft., though in certain sections it is greater. Most of the gold has been won from an extremely rich vein one or two inches wide, and at times a mere streak, but usually phenomenally rich. At the 235ft. level there are two rich veins. The second has come in after the first turned to the east at the 200ft. crosscut.

At the 300ft. level the drive is following south between the walls. Mr. McCahon considers this a new make of stone, and not the original one he has followed to the 200ft. level. There is insufficient development at present to be certain on this point, though there appears ample justification for his surmise. When pieces of the rich vein are crushed and washed in a dish in-

numerable specks of fine crystalline gold are visible, showing that the gold is of a secondary origin and has been dissolved and re-precipitated. Some of the richer portions are more gold than gangue.

The narrow band in which the gold occurs is confined between the well defined walls of serpentine, which show little, if any, signs of shearing or foliation. Neither is the rock containing the rich veins foliated to any extent, though it is considerably fractured, and has certainly been sheared along the lines of the rich veins.

The rock between the walls all goes to the mill and is quite high grade.

This gold occurrence is quite an exception, and has no known parallel in the State. The "Wentworth Proprietary," in New South Wales, has been quoted in the *Kalgoorlie Miner* as a similar case, but this is not so for the rich veins there were not in serpentine, but at the contact of serpentine and quite a different class of rock, viz., augite andesite, locally known as diorite. In no case was payable gold found, except where the cross veins in the andesite came in contact with the serpentine. The rich gold values in the sulphide zone were almost always associated with mispickel (arsenical pyrites), the gangue being invariably calcite (carbonate of lime).

Though there is a little sulphide in McCahon's mine, the most of the gold is free. I was told there was nickel arsenide in the sulphides, so collected samples and submitted them to Dr. Simpson for examination. The results are as follows:—

Government Chemical Laboratory,
Perth, 1st April, 1925.

Determination of metallic minerals in a sample for Mr. T. Blatchford.

Description.	Result of Assay.
Auriferous Schist from McCahon's Great Hope Gold Mine, Mount Monger	Bronze-coloured mineral—Chalcopyrite. White mineral:—Pyrite.

Remarks: No trace of arsenic was detected in either mineral, whilst the chalcopyrite contained a minute trace only of nickel.

(Sgd.) Edward S. Simpson,
Government Mineralogist and Analyst.

5.—NOTES ON THE ALLUVIAL AT KANOWNA.

(12th March, 1925.)

My own personal experience of the lead from where it was first opened up to a point a little above the junction of Wilson's gully and North leads is that in addition to the gold found in the wash and overlying "pug" beds secondary gold was deposited in the underlying decomposed rocks but only *immediately* below the gutter in which the payable gold was found. A narrow strip of a few feet thickness was mined and profitably treated for quite a distance but always from under the wash. My conception of the north lead is that before it reached the junction of the Wilson gully lead it commenced to fan and spread out as leads almost invariably do when the gradient falls. When this occurs the main gutter is liable to split up and in consequence the grade of gold bearing wash falls and becomes more erratic. In any case it is getting further away from the source of the gold. The boring west of Rollo's shaft showed gold values over a small section, but they are not comparable with those higher up the lead. The same conditions would probably pertain to gold values deposited in decomposed country rock lying under the lead.

6.—BURBANKS OVERSIGHT GOLD MINE.

(15th April, 1925.)

In accordance with your instructions. I have inspected the new workings on the Burbanks Oversight Mine.

The 83ft. crosscut from C. Shaft (main workings) was continued and connected to the engine shaft. The connecting drive is on the reef and extends 50 feet south-west and 75 feet north-east from the crosscut. Mr. Wilson's sample in the engine shaft at a depth of 15 feet gave a result of 7.4 dwts. over 36 inches.

The stone obtained from the drive to a height of 7 to 8 feet from the floor gave a battery return of 46 ozs. 19 dwts. from 37.75 tons, with 4 dwts. 8 grs. in the tailings. The gold was battery, not fine gold, valued at about £3 14s. per oz. This is a very small tonnage from 125 feet of driving.

All the other reliable evidence of the Oversight reef that I can gather is as follows:—

1. Mr. Wilson's report.

New shaft No. 2, bottom over 48 inches, 4.9 dwts.
New shaft No. 2, 110ft. level 60ft. (in a drive 130ft. long) averaging 9.2 dwts. over 28 inches.
No. 1 shaft 65ft. level, winze south end 21 dwts. over 60 inches; North end 17 dwts. over 30 inches.
A shaft 300 feet south of new shaft, quartz vein 12 inches wide, said to be worth 5 dwts. in the bottom.

At the 300ft. level the late manager of the Birthday Gift says the reef was driven on for from 80-100 feet south, and crushings averaged 7 to 8 dwts. over the plates, the width of stone being from 2ft. to 2ft. 6in. wide. This statement was confirmed by one of the tributers who left the mine when it was flooded, but he added that a small crushing of 24 dwts. was also broken. I am prepared to accept their statements as being somewhat near the mark.

The history of the Birthday Gift lode was that it was low grade except where the reef was found in distorted country. When this occurred the stone was usually larger and much richer.

The Oversight reef to date has proved but a small more or less broken line of reef with erratic values. The tonnage, therefore, will be small.

The values at the 300ft. level, as far as ascertainable, are low and apparently patchy.

The country rock is hard.

7.—BOWDEN BROS. & DAVY'S P.A.

(24th April, 1925.)

Whilst at Coolgardie inspecting the Burbanks Oversight, I took a run down to Widgiemooltha and made an inspection of and sampled the workings of Bowden Bros. & Davy's P.A. with Mr. Gourley, Inspector of Mines.

The P.A., which has no number, lies between the old Cardiff Castle and Imperial mines on the Norseman Road about three miles south of Widgiemooltha Siding.

The workings consist of a trench or opencut some 12 feet long, 10 feet deep, and 6 feet wide. There is no defined lode, but a few very fine quartz veins may be seen traversing oxidised strata very similar in appearance to the sediments found in the vicinity of Gibraltar. As a matter of fact there is a strong resemblance between the two. Samples were broken out of both ends of the trench, one from the bottom, and two were taken from the dump of some 10 to 12 tons broken ore. The results are as follows:—

	ozs.	dwts.	grs.
No. 1. Taken from dump	0	3	16
No. 2. Taken from dump	0	2	18
No. 3. West side opencut, North end, over 3ft. 6in.	0	0	17
No. 4. West side opencut, North end, over 2ft. 6in.	0	4	12
No. 5. East side opencut, South end, over 3ft. 6in.	0	4	19
No. 6. West side opencut, South end, over 4ft.	0	7	23
No. 7. Across bottom of opencut, over 6ft.	0	0	14

The average of the dump is, therefore, 3 dwts. 5 grs. per ton, and the face and bottom of the opencut 3 dwts. 17 grs. As the party are breaking ore from the south face, the average assay value will probably be raised.

I have discussed this matter with the Superintendent of State Batteries, and he informs me that if the crushing will give 2 dwts. over the plates the gold will pay railage and crushing charges and cartage at Coolgardie.

8.—GESSNER AND HUFFA'S FIND.

(20th June, 1925.)

On our way to St. Ives, Inspector Gourley and I called in to see what is known as the "New Find" on the Transcontinental Line. The discovery has been made some 15 miles north of the 51-mile post, and therefore lies on a line between Kurnalpi on the north and Randells on the south. The gold had been found in a large quartz outcrop and also in a small ironstone vein 200 yards north-east of the outcrop. Up to the present no work has been done, though many leases have been pegged.

The surrounding country is flat and much covered with surface detritus. The country rock, as far as could be seen, consists of well developed schists, varying in colour from the dark unweathered hornblende variety to thoroughly leached rocks of a pale yellow to almost white. As far as could be seen the strike of the reef is slightly north of east.

Up to the present there is no justification for considering the find an important discovery, though there is no geological reason why payable gold should not eventually be found. Prospecting will not be an easy matter on account of the prevailing heavy overburden. Inspector Gourley intends revisiting the field when further development is effected.

Three samples were broken, two from the outcrop and one from picked pieces of the ironstone leader. The results of these samples are as follows:—

	ozs.	dwts.	grs.	
No. 1. Outcrop	0	1	15	per ton.
No. 2. Outcrop	0	4	23	„
No. 3. Picked sample, iron-stone leader ..	4	1	7	„

The prospectors assured me they had taken samples from the same places and had obtained very promising results. Our samples will be a check on their results.

9.—RED HILL GOLD MINE, G.M.L. 1019X, KANOWNA.

(22nd June, 1925.)

Since my last inspection of G.M.L. 1019X the workings have been extended northward and a new more or less parallel fault has been located. Some very rich gold was won from the stone on the north-western side of the fault. This gold has been exploited from four (1-4) winzes. The western wall south of the winzes contains fragments of greenstone which are undoubtedly portions of the brecciated conglomerate (Bulletin 47) which is the country rock in this locality. It would appear, therefore, that a tongue of this breccia occupies the western portion of the lease 1019X. The question put to me by the manager was "What is the likelihood of the quartz leaders or reefs passing from the porphyry rock through the breccia into the porphyry known to exist further to the west?" There is no doubt that the porphyry is the latest rock on the field, and has intruded the brecciated rock. On cooling more or less horizontal cracks evidently formed and vein filling took place, after which parallel faulting developed in a more or less north-east south-west direction. Records show that the quartz veins contain more gold in proximity to the faults, though there is no evidence of enrichment in the faults themselves.

I scarcely consider it probable that the vein fissures would extend into the brecciated rocks, as that rock would have already cooled off and would therefore not be subjected to the same conditions. Further prospecting, in my opinion, should be carried out in one or other of the following directions:—

1. Follow the veins on the fault lines in a north-east direction.
2. Bore to ascertain whether there are more parallel veins at greater depth.

10.—McLELLAND'S FIND AT MOUNT MONGER.

(23rd June, 1925.)

On our way back from St. Ives we called and saw McLelland's find, six miles south of the Mt. Monger Proprietary. I found the mine much the same as Inspector Gourley has described it.

The lode consists of a series of narrow quartz veins in apparently a shear zone striking approximately east and west, and dipping at a rather low angle to the north.

The quartz veins have been followed down on the underlay shaft to a depth of some 50 feet, and have proved up to date to be erratic both in size and values. In places there is quite an appreciable quantity of sulphides in the stone. A little galena and arsenical pyrites is apparently also present (School of Mines' Report). I noticed quite an appreciable amount of crystalline limestone, possibly dolomite, in the country rock, which is one of the sheared fine-grained greenstones.

11.—VIKING No. 1 MINE, NORSEMAN.

(13th November, 1925.)

The reported total gold production from this mine is 49,953 ozs. from 51,067 tons.

There are two lodes of quartz reefs on the property. The main or Mildura reef has been successfully worked in several mines, *e.g.*, Scotchman Mildura, Hardy Norseman, Sydney Norseman, etc. The Mildura reef lies to the east of the Mararoa line, with which it runs more or less parallel.

A cross reef which intersects the main reef to the north of the main shaft was the main producer in the Viking mine, though considerable gold has been won also from the main reef, both from the main as well as from the old Viking shaft. I do not consider that there is any reasonable doubt of the reef in the old Viking shaft workings being the same as the main reef worked from the main shaft.

The present applicants are asking for assistance to connect the 5th and 6th levels and thus develop the main lode. Their main reason is that they consider the shoots of gold are pitching south, and on this assumption they assume they will strike the shoots which were worked in the old Viking shaft. That the gold values continue to a depth is evidenced by particularly high grade ore in the north end of the 6th level. The values are, however, low in the north faces of the upper levels. Below the 6th level near the north end a considerable amount of underhand trench stoping has been done, but was covered in water 40 feet below the level. I am assured these stopes extend to the 7th level. The contention is that this is the lower end of a shoot which would be intersected by driving No. 5 and possibly No. 4 levels north.

The north workings from the old Viking shaft are inaccessible at present due to flooding. The water supply, I am informed, is not heavy.

Like most other mining ventures, there is not much definite data to base an opinion on; there are a few points, however, worthy of consideration. In the first place numerous rich shoots have been worked on the Mildura line of reef both in the Viking and other mines on the line. The applicants know the district and the mine, and have a good reputation as sound, practical miners.

Their development scheme is to open up an extensive block of ground which may turn out a permanent mine.

The possibilities of success are, in my opinion, far greater than most cases which come before us.

12.—GLENELG HILL GOLD DISCOVERIES.

(23rd December, 1925.)

Between the 28½ and 52 mile posts on the Rabbit proof Fence south of Burracoppin a narrow greenstone belt passes west through the fence and north-east some three miles, when it turns to the south-east. I am informed by the prospectors that this belt can be traced for several miles in this direction, and continues in a broken line still further in towards the Mid Ironcap. The prospectors are working about 2½ miles North-east of the 50 mile post.

Geology.—The greenstones are bounded on both sides by massive granite. They consist of fine and coarse grained varieties of the epidiorite type very similar in appearance to those found in the vicinity of Weston's Reward, near Westonia. In hand specimens they are identical in appearance with the rocks in that locality. Where the mines are the rock is foliated and intruded by numerous pegmatite dykes. Very little work has so far been done on any of the Prospecting Areas now held.

Messrs. Hollow and Heaton have sunk a shaft on the underlay at an angle of 30 degrees to a vertical depth of about 20 feet, following a rather rich leader about 4 inches wide. A second slightly larger vein some 12in. to 15in. in width underlies the richer vein. A little stoping has been done from the bottom of the shaft on the rich vein and about 7 to 8 tons raised. The stone in the north end continues to carry payable gold values, but they have fallen much in the southern end. Some 45 tons of lower grade ore lies at the dump which is estimated to contain 30 dwts. per ton. At a distance of 36 feet south of the underlay shaft another shaft has been sunk to a vertical depth of 40 feet; drives extend from the bottom of the shaft a distance of some 60 feet. The reef, which is 18 inches wide, is said to average 5 dwts. A second underlay lies about 200 feet south 15 degrees east of the vertical shaft. The depth is 38 feet on the underlay; a drive extends 25 feet south-east from the bottom of the shaft. The north face shows 2 feet of stone, the south 18 inches. The dip is 30 degrees east and strike north-west and south-east. The stone is too low in values to cart to a battery, the estimated value being about 20 dwts. A grab sample of this dump returned 11 dwts. 21 grs. per ton. Two samples taken from the 8 tons of picked ore gave results of 6 ozs. 8 dwts. 1 grain, and 8 ozs. 9 dwts. 18 grs. per ton. The prospectors' estimate was 9 or 10 ounces per ton. This is the only high grade stone found on the field.

Whitting's P.A.—This P.A. lies about three-quarters of a mile north-east from Hollow and Heaton's. A shaft has been sunk 30 feet in a very weathered greenstone, with the object of discovering the source of some scattered quartz which was found on the surface and carried fairly high gold prospects.

At the bottom of the shaft a drive has been made 21 feet long in a S. 10° W. N. 10° E. direction.

The workings are abandoned, and the prospectors are endeavouring to locate the origin of other floaters, some little distance away.

McDonald & Davidson (Blarney Stone).—This P.A. is situated about 300 yards east of the main camp. The work on the property consists of an irregular underlay shaft sunk to a depth on the underlay to 85 feet. There is nothing defined, but irregular gold values have been found in a lode formation which may possibly improve on further development. Samples were taken from several sections in the shaft and gave the following results:—

In a short crosscut at the 75ft. level over 4ft. 6in.—1 dwt. 18 grs.

Footwall section opposite crosscut at 75ft. level over 2 feet of lode material—1 oz. 8 dwts. 20 grs.

South face bottom of shaft over 18 inches—4 dwts 19 grs.

Special sample (one piece) taken at Mr. McDonald's request from bottom of shaft—19 dwts. 19 grs.

From above it will be seen that the payable gold values are very erratic, and a sampling across the whole width is unpayable. This is verified by a grab sample of the dump which yielded 4 dwts 19 grs.

With the exception of a limited amount of costeening there has been no other work done on the field, except Smith, who has sunk a shaft 20 feet deep, and a sample across a very indefinite lode formation gave a result of 2 dwts. 18 grains per ton. Several of the prospectors, however, are hopeful of finding payable reefs, for they have found "floaters" which have yielded quite high gold values. At present all that can be written of the field is that there are possibilities of finding payable gold by future prospecting.

Water.—At present water is scarce on the actual field. Good supplies exist at the 38 mile—Glenelg Rocks—and with the exception of water caught in small dams, etc., the prospectors will probably find it necessary to draw from this supply.

Roads.—A new road had been almost completed to Narembeen, a distance of 40 miles. There is also a good track from the field to Burracoppin, and an inferior track to Southern Cross from the 38 mile, *via* Mt. Hampton.

Crushing Facilites.—With regard to the question of crushing facilities, at present there is no need to consider this aspect further until more work is done in development.

13.—MOUNT VERNON OR CORBOY'S FIND.

(31st December, 1925.)

Location.—Mt. Vernon lies about 55 miles south-east of Wiluna and between the old mining centres of New England and the Bronzewing Group.

Geology.—With the exception of a low range of hills passing through Mt. Vernon, the country as a whole is masked with shallow layer of superficial deposit which hides most of the geological features. Insufficient mining work has been done to make an accurate mapping possible, but there is little doubt that the existing leases have been mostly pegged on the contact between the greenstone belt and massive granite. A minor line is pegged to the east of Trig K. 15 in the greenstone. Between the granite and greenstone are narrow bands of either knotted or chloritic schist, the former being the crushed derivative of the granite, the latter the crushed and much altered form of the greenstone. The line of contact passes through Williams P.A. 527 on the north, Waratah G.M.L. 357, and Corboy's Reward G.M.L. 350, and probably about midway between Guazzelli's Find and Trig. K. 15.

Gold-bearing reefs or lodes are found in each of the four classes of rock, but so far have not been exploited below water level. Unfortunately the water level is shallow and in all instances under 40 feet vertical. The surface water in the north end is fresh and potable, but in one instance, Guazzelli's Lease, salt water was struck at a shallow depth below the fresh water zone. In the south end the water appears to be mostly salt, particularly in the vicinity of Pola's Lease.

Lodes so far discovered are usually of the quartz reef type, but in two instances the quartz has been replaced in the same shear zone by distinctly carbonated lodes. I regard this latter class of lode as a distinctly favourable form of gold deposit. There is no doubt that the formation has originated by replacement along the shear zone. Whether the gold values continue to greater depth is, of course, problematical, but there is every reason to presume that the lodes themselves will continue. These lodes consist essentially of carbonates of lime and magnesium. A similar formation has been noted in the Bullfinch Mine, the "Northern Series," from which large tonnages were won to a depth of over 600 feet; as a matter of fact, with the exception of a rich shoot in this mine, this was the high grade portion of the Bullfinch Mine.

I would very much like to see these carbonated lodes developed at Mount Vernon below the water level and along the strike in leases north and south of the Waratah Leases, where they have been already developed to a limited extent above the water level. If their continuation could be proved and also developed to any considerable depth, it would give the field a very different aspect, and no doubt bring about considerable prospecting in the future. As a matter of fact, in my opinion, the field will depend for its prosperity not on the quartz reefs but on the development of the carbonated lodes.

In general, the lodes and reefs developed to date, though on the small side, have been proved to contain fairly high gold contents.

The following is a brief description of the mines examined:—

Waratah G.M.L. 355.—There is one main shaft on this lease which has been sunk to a vertical depth of some 48 feet. The water level is about 40 feet. At this level drives have been extended north 57 feet and south 32 feet on a highly carbonated lode reported to carry payable gold values. The width of the lode in these drives varies from two to three feet. From the surface to a depth of 18 feet the lode is practically all quartz, but below this depth is replaced with lode material consisting essentially of carbonates of lime and magnesium. The walls in the bottom are very greasy and slickensided, necessitating careful timbering of the workings. The country rock is a chlorite schist. As the lode occurs on the line of junction of the granitic series with the greenstones, the granite should not be far from the footwall. The chlorite schist is no doubt an altered form of the greenstone. The formation is very interesting, and there are few lodes of this character in the State, the nearest approach to my knowledge being the "northern series" of the Bullfinch Mine.

There seems a likelihood of the lode continuing for some distance, for a similar one has been opened up in Lease 357, lying immediately to the south and on the same strike. I regard this lode as one of the most promising on the field and should be much surprised if it did not continue to very considerable depths. Some 50 tons of the quartz and 80 tons of the carbonated lode are estimated to be lying at grass ready for the mill.

Below the bottom level the shaft has been sunk some eight feet when work ceased, due to an influx of fresh water, which proved too heavy to cope with, except by installing adequate pumping plant. An attempt was made to bail the water when I was on the mine, with bucket and windlass, but failed. After pulling for two hours at the rate of 420 gallons per hour, the water was drained to the level of the drive. A further period of two hours and the water fell to two feet below the natural water level, and then made as fast as the rate of bailing. The water is nice and fresh and suitable for any mining or domestic purpose.

The following assays were taken by the Inspector of Mines, Mr. Winzar:—

(1) From lode immediately below quartz in shaft, two samples—19 dwts. 17 grains; 3 ozs. 11 dwts. 8 grs.

(2) From dump taken from shaft immediately below water—1 oz. 2 dwts. 9 grs.

G.M.L. 357.—The main workings on this lease are a shaft 40 feet deep and drives from the bottom 8 feet south and 32 feet north and at the 20 feet level 25 feet south and 15 feet north.

The bottom drives are in carbonated lode similar to that in the Waratah. The walls are also chloritic schist and are very greasy and treacherous. Near the shaft the lode is about 3 feet wide in the bottom but will only average some 2 feet in the north drive. I was informed that two samples taken from the bottom of the shaft by the Inspector of Mines yielded assay returns of 3ozs. 4dwts. 22grs. and 6ozs. 2dwts. 20grs. As in the Waratah, the upper level, *i.e.*, from 20 feet to the surface, the lode consists of quartz which gradually dies out and is replaced by the carbonated lode. In the back of the south end of the 20 feet level, the quartz is three feet wide but only three inches in the floor.

At present there are some 100 tons of quartz and 25 tons of carbonated ore at grass, most of which has been taken out of the drives. The dip of the lode is to the north-east at a high angle, the strike being north by west and south by east.

Irwin & Riggall, 367J.—This lease is to the west of the contact and the workings are in granite. A shaft has been sunk in the north-east corner of the lease to a depth of 28 feet. Drives extend eight feet south and 10 feet north from the bottom of this shaft.

The reef at the surface is about 12 inches wide, but at the water level (28 feet) has split into two veins, each about 6in. thick. Some 61 tons of ore taken from this reef yielded 8dwts. over the plates. The value of the tailings is not yet to hand.

A second shaft has been sunk south-east from the first shaft some 60 feet distant, but the quartz leader which was being followed cut out.

P.A. 598 (*Jones*).—A little work is being done on this lease in a narrow band of knotted schist some 50 feet wide lying between the granite and greenstones. The gold occurs for the most part in small quartz leaders.

In a shaft 20 feet deep situated at the northern end of the P.A. a vein 4in. wide has been exposed.

A considerable quantity of quartz has been unearthed in some shallow workings in the south end of the lease but the gold values are said to be very low.

There is no stone for crushing developed on this area.

P.A. 572 (*Power*).—This area is situated at the northern end of the field. A shaft has been sunk 20 feet deep seven chains south of northern boundary and two chains east of western boundary. The shaft is in a fine grained granitic rock, probably a felspar porphyry, what gold there is occurring in small veins in the porphyry.

The greenstone occurs some 30 feet east of the shaft. There is no stone developed on this area.

P.A. 527 (*Williams*).—Some narrow quartz veins have been worked in surface costeens and a shallow shaft, near the centre of the lease. The gold values are very low. The country rock is foliated greenstone with granite to the west at no great distance.

No stone is available for a battery.

East of Williams' area a quartz vein some three feet in width outcrops for a considerable distance in the greenstone, but so far this reef has not been developed.

There are two points in connection with these reefs which call for notice. In the first place the reefs on Corboy's have not been developed to a greater depth than about 10 feet below the surface, and in the case of Pola's the inspector's sampling of the drive at the 40 feet level has not given very satisfactory results. Seven assays from this level only averaged 3 dwts. 18 grains.

CORBOY'S FIND (MT. VERNON).

Conclusions.

My conclusions based on the information gained during the inspection and set out in my report are as follows:—

(1.) The field occurs at the junction of a greenstone belt with massive granite.

(2.) Most of the payable lodes occur in the vicinity of the contact.

(3.) The payable gold-bearing reefs and lodes are found not only in the greenstone and granite, but also in the foliated greenstone and crushed granite margins, between the two main rock massives.

(4.) Water level has an average depth of some 30 feet below the surface. The supply appears fairly good but has not been thoroughly tested. The water is fresh in the northern end but salt in the southern end of the field.

(5.) None of the lodes or reefs have been developed below water level.

(6.) The lodes are typical replacement deposits and therefore likely to continue to a considerable depth. There is insufficient development and insufficient ore exposed to justify at present the erection of a State mill. Until the lodes are tested below water level, to justify the erection of a State mill, it would be necessary to presume that the profit won from the treatment of the surface stone would be returned in the purchase of pumping machinery and further development, otherwise the utility of the mill would be minimised.

(7.) What is necessary at present to test the field and help the prospector is to develop preferably one of the carbonated lodes to below the water level, and ascertain whether the gold values and thickness of the lode are maintained. Incidentally, this would also test the water supply for battery purposes.

(8.) A successful development on these lines would amply justify the erection of a State mill.

14.—IVES REWARD JUNCTION.

(15th March, 1926.)

With the assistance of Inspector Gourley, I have sampled the Ives Reward Junction Mine, and now submit my report together with a sampling plan of the underground workings with list of assays.*

Description of the Mine and Sampling.

The mine is being worked at present from a main shaft of about 100 feet vertical depth. From the 90 feet level drives extend north and south, the former a distance of 100 feet, the latter 40 feet. At the same level a crosscut has been made eastward from the shaft a distance of 17 feet and from the south end of the drive a crosscut of unknown length has been put out to the west in country rock. This crosscut is now more or less filled with mullock.

Commencing at a point 21 feet north of the main shaft the lode has been stoped for a distance of some 50 feet to within 45 feet of the surface. Ore for the mill was coming from this stope only.

Samples 1-15 were taken from the back of the stope at the 45ft. level across widths varying from 11 to 18

*Not printed.

feet. The result of these samples shows an average value of 8dwts. 14grs. per ton. One section of the north end of the stope is encouraging (1oz. 3dwts. 7grs.), but the second section is very poor (1dwt. 15grs.). The ore being broken consists of the soft portion of a quartz haematite series which lies on the foot wall, the hanging wall section being typical hard siliceous rock of a similar type to that so frequently met with in the Yilgarn Goldfield. The total width is not shown underground but the hanging wall section is wider than the east crosscut at the shaft, viz., 17 feet.

The samples (17-23) from this crosscut yielded very low gold contents and this section of the mine, in my opinion, does not warrant further expenditure in development.

The end of the north drive is valueless, and sample 17, which is really taken from the continuation south of the lode proper is very low.

There is only one conclusion to arrive at from the sampling and that is the payable ore is confined to a very limited length, and though the gold values are good in samples 12 and 15, the general average of the existing ore is 8dwt. 14grs.

Short lenses of ore in quartz haematite formations are typical, e.g., Bullfinch and other Yilgarn mines. Furthermore the experience in Yilgarn is that the gold values usually fall rapidly in the sulphide zone. The Bullfinch Mine is not an exception, for the gold in the lower levels came mostly from the doleritic lode in the north end, not from the rich shoot in the quartz haematite series.

The prospects of the mine do not, therefore, look at all promising, and unless a second level is immediately opened up on the known shoot the surface plant will shut down very soon from lack of ore.

15.—IVES REWARD GOLD MINE.

(23rd March, 1926.

I herewith submit may report on the trial crushing of 400 tons from the accessible stopes in the Ives Reward Gold Mine. The primary object of the crushing was to ascertain definitely the true value of the mine, and the possibility of recovering the loan of £7,000, for the returns obtained for some time past were far below the estimated values of the manager.

With the exception of the central portion of the main stope at the 118ft. level and the north section of the north stope at the 200ft. level, the ore was broken as far as possible from all the working faces.

After each firing samples were taken as a check on the values left. These samples were all broken by Inspector Gourley and myself.

Underground Workings.

There are two main levels at depths of 118 and 200 feet vertical from the surface.

118*ft. level.*—This level has been opened up for 150 feet north of the west crosscut and 65 feet south. The lode has been stoped for a distance of 125 feet. As may be seen from the plan, most of the ore had been broken from the centre of the stope which has reached the back of the old stope from the 69ft. level.

The payable gold values in the south end have vanished, though the lode still shows in the face. In the north end the lode was stoped for width of about 30 feet, but values are very low in the north face and continue so in the drive to No. 4 shaft. No values of consequence exist in the crosscuts from the bottom of this shaft.

The only likely payable ore left in the stopes above the 118ft. level lies above the 69ft. level; as this could not be sampled, the values are problematical. The manager informs me that all the ore above the 69 feet went to the State mill and gave a gross return of 17 dwts. per ton. It is therefore probable that a block of ore still remains which would pay to extract which, taken over a width of 9 feet, 40 feet long, and, say, 40 feet high, would yield, say, 1,200 tons worth in the vicinity of 50s. per ton or better.

There is also a reasonable chance of obtaining some payable ore from the lode in the crosscut connecting the 69ft. level to the main shaft; but as this lode has not been developed, there are no ore reserves to rely on.

200*ft. level.*—There are two main stopes in this level. The southern extends south from the south winze to No. 2 pass south. Beyond this to the south end the lode has been exposed and a leading stope taken off, but the values are too low to break the ore for the mill.

In the vicinity of the winze there is a block of ore which would pay to work and would no doubt yield some 1,500 tons' worth, possibly 10 dwts. per ton of extractable value.

The north stope proved very unsatisfactory as regards good values, and the first 40 feet from the south end are too low to be profitably treated. Unfortunately the north end was not accessible, but it is doubtful whether the values would be any better, as they are going further away from the main shoot, which is no doubt near the No. 1 winze south.

A nice-looking ore body is opening up in the north drive, but the values though encouraging at times do not average payable dirt. The following are details of the sampling:—

Sampling.

Owing to the open nature of the stopes sampling was difficult, and in some cases not possible without incurring unwarranted expense. Samples, however, were obtained from all portions of the lode where accessible, and the results are as follows:—

North Drive at 200*ft. Level.*—A well-defined lode was followed north of the north winze. In places this lode was seven feet wide but the gold values were erratic. the average for seven samples being 5 dwts. per ton.

North Stope, 200*ft. Level.*—Only the south end of this stope was available for stoping, the back of the north end being inaccessible. Samples, however, were obtained from the south face across the back for a distance of 30 feet north of the south face and were taken after each firing while the ore was being broken for the crushing. The results were very disappointing, the average of nine samples being but 4 dwts. The south end is particularly low and quite unpayable.

Furthermore, neither foot nor hanging wall sections show any payable values. The manager states that poor horizontal zones sometimes occur which give a series of low results, but usually improve with the next cut. Such may be the case, but the ore for this section cannot be included in any ore reserves.

200*ft. Level, South Stope.*—From No. 2 pass to the end of the south drive the values are unpayable. Five feet south of the pass a good section was sampled over a total width of 15 feet, the average being only 1 dwt. 8 grs. 25ft. south of No. 2 pass the back of the leading stope was 8 grains over 9 feet, and 10 feet further south across the same width 14 dwts. 4 grains, showing that good values are very erratic and infrequent. The south face of the leading stope gave a fair value in the hanging wall section of 10 dwts. and a similar value over the same section in the south face of the south drive (12 dwts.). The width of these two sections is 3 feet. There is just a chance that the values are still in the footwall of the stope, but such has not been proved.

Commencing in the back of the stope north of the winze from the 118ft. level to a point 3 feet north of No. 1 pass, the gold values are fair and average as follows: Hanging wall section for an average width of 3 feet 3 inches, 11 dwts. 10 grains; footwall section, average width 3ft. 3in., 10 dwts. 3 grs. The footwall values over 3 feet continue to a point over No. 2 pass, but the hanging wall section drops to 3 dwts.

118*ft. Level.*—From the north end of the north stope, between Nos. 2 and 3 passes, eight samples were obtained yielding an average value of 6 dwts. over a width of 8 feet.

118*ft. Level, South End.*—The pillar of ore shown in the plan was practically all broken for the crushing. As it is definitely known from previous samplings that the south end of the 118ft. level and the south end of the 69ft. level above are practically valueless, no sampling was done this end. It was not possible without incurring very considerable expense to sample the back of the centre of the stope, which is fully 35 feet above the level of the mullock.

East Lode, 69*ft. Level.*—In a crosscut from the main shaft a lode was cut with an average width of some 4ft. 6in. A cut was taken from each end and the faces and back sampled. The average of the six samples broken is 16 dwts.

No other development has been done on this ore body at the other levels, so it is impossible to state what will happen until it is driven on for a greater length at the 69ft. level and opened up in the level below. As it appears now it looks like a splice off the main lode and

PLAN AND SECTION

—— OF ——

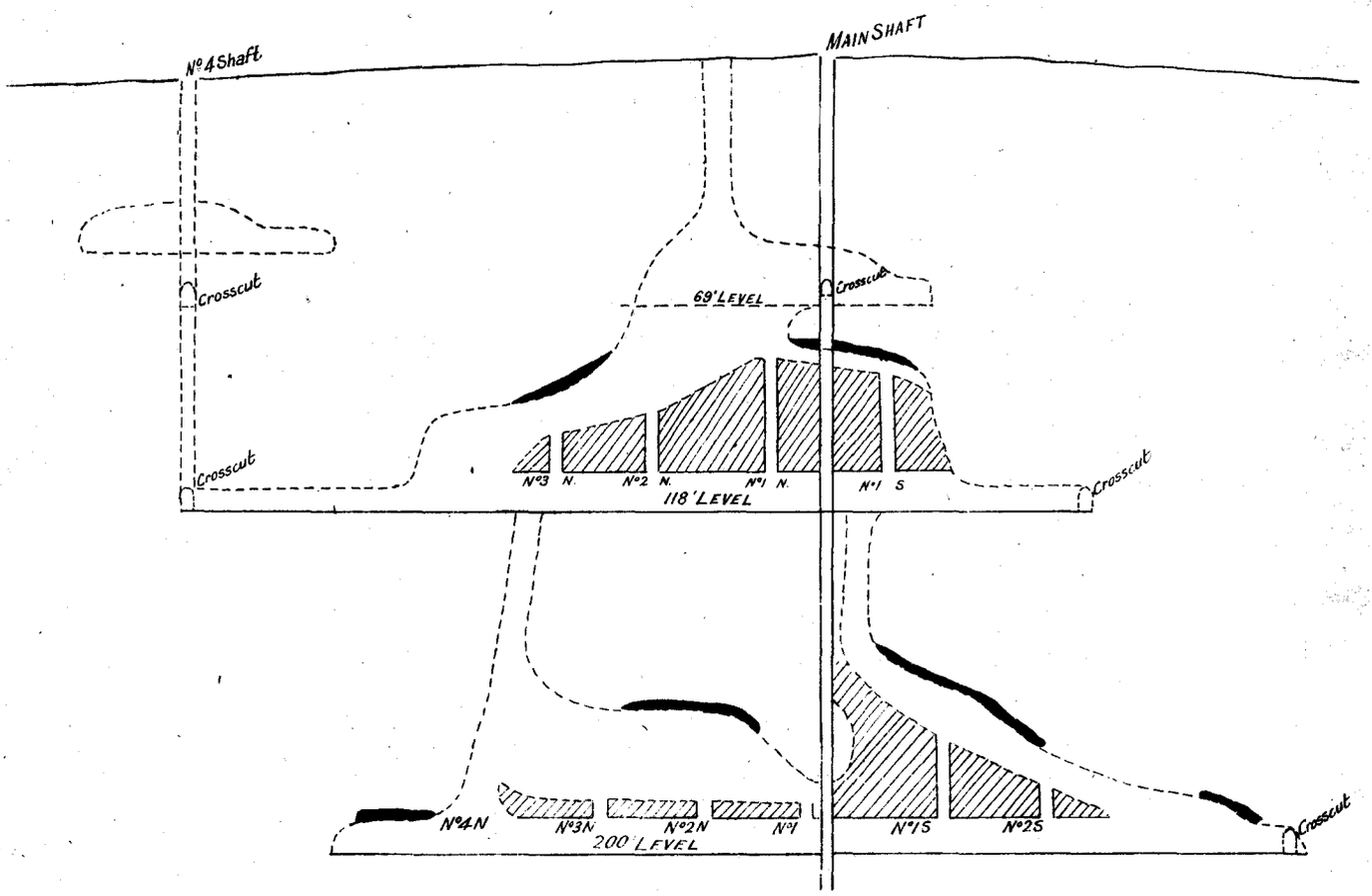
IVES REWARD GOLD MINE

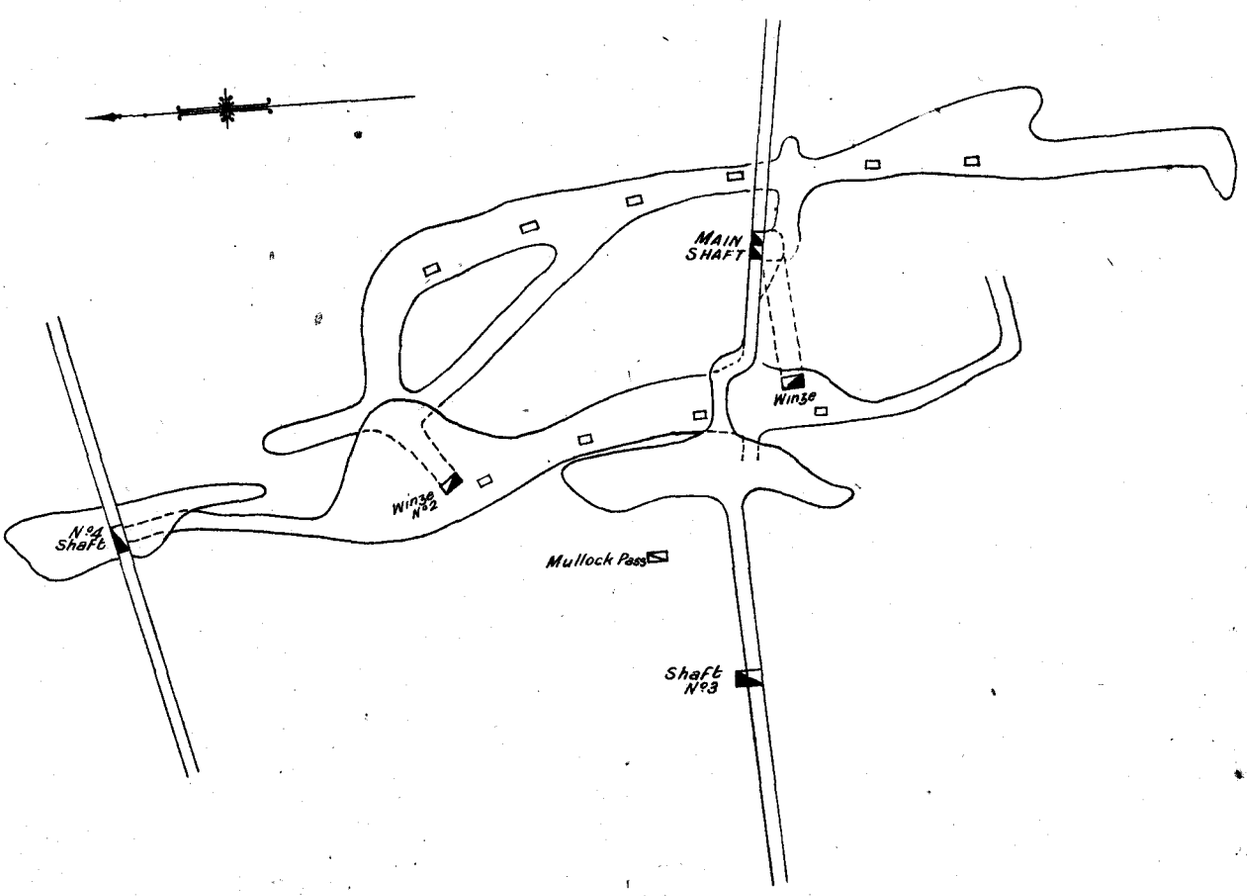
Shewing positions in the stopes, from which the ore was broken for the test crushing.

0 5 10 15 20 40 60 80

Scale of feet

Ore broken for crushing





bears away to the south-east at an angle of about 12 to 15 degrees from the main lode.

It any portion of the mine above the 200ft. level warrants development, it is certainly this ore body.

50ft. Level.—In the early history of the mine, a considerable tonnage of ore was taken from a stope at the 40ft. level from No. 4 shaft. The width of this stope is about 13 feet, and height some 9 feet to 10 feet.

Samples were broken across the north and south faces, but with the exception of the hanging wall section in the north end the values were unpayable, the average being under 4 dwts. The hanging wall section referred to gave a return of 10 dwts. 16 grains over 6 feet. This section should also be driven on.

Concentrates.—Samples were taken of the heap of seconds, about 95 tons, from previous crushings. These were estimated by the manager to contain from 35 to 40 dwts. per ton. The average of the two samples taken by us was 14 dwts. 12 grains, corresponding very closely to the result obtained from the seconds saved from the 300-ton parcel—14 dwts. 17 grains. The 4 tons of first concentrates from the 300-ton parcel averaged 5 ozs. 5 dwts 6 grains, and are therefore worth railing to Kalgoorlie for treatment.

Plant.—The plant may best be considered under two headings: (a) treatment, (b) pumping.

The treatment plant consists of a 10-head stamp mill, amalgamating tables, two grinding pans, and two Wilfley concentrators. The power consists of two 80 h.p. Crossley engines of the hit-and-miss type. Both engines are connected to one main driving shaft which can be broken, so either engine can drive the air compressor or battery. The mill ran very badly during the period of crushing the 300-ton parcel, owing to defects in the equipment. The design of the mill appears to be very open to adverse comment. The mill should feed into the grinding pans first, then over the tables into classifiers, and probably through second grinding pans before reaching the concentrating tables. There is an unnecessary amount of belting to supervise owing to the general outlay of the various members. The elevator to the ore bin is set at too high an angle. The water storage at the battery is too small. The gas pipes from the two producers are not connected, so if one engine only is running and breaks down the second producer must first be fired to start the second engine. This necessitates a delay of some three hours at least. The engines and compressor are old machines and need constant repair, more particularly the two engines.

Pumping Plant.—Until the Lister engine which drives the pump broke down, the engine and pump were a first-class unit, but were asked to do too much, *i.e.*, pump water five miles through a 3in. pipe which was not protected from the rise and fall of temperature. The water too is very dense, containing 25 per cent. of solids.

What is really wanted to obtain efficiency in the pumping scheme is the installation of a supply tank, say, half-way, or at least on the highest ground not more than half-way from the supply, and a second light pump to deliver at the mine, where a second supply tank should be fixed with a capacity of one day's water. One of the constant sources of delay in the running of the mill was the want of sufficient water. The difficulty of breaks in the pipe line might also be overcome by installing expansion joints at regular intervals.

Before any attempt should be made to start up the treatment plant the pumping plant should be altered in some such way as suggested, the grinding pans shifted up to the battery boxes, and the two producer gas pipes connected.

Compared with these, the other deficiencies are of minor consequence, but these three are in my opinion essential.

Unfortunately the ore reserves are so small that the capital expenditure necessary to effect these changes would not be warranted.

Results of the crushing of the 400 tons of ore broken for the trial parcel.—The tonnages are correct, being checked by the exact weighing of the 100 tons sent to the State mill.

The actual gold cleaned up from the 300 tons crushed at the mine mill yielded a return of 85 ounces of a value of £3 14s. 1d. per oz.—£314 17s.; that from the 100 tons crushed at the State mill 26 ounces of a value of £3 16s. 5d. per oz.—£99 9s.

From the above it will be seen that the actual return per ton by amalgamation from the first is 20s. 10d., while that from the State mill was practically 20s. per ton.

To the returns from the 300 tons must be added 4 tons of concentrates worth approximately 5 ozs per ton, say, 6s. 8d. per ton, and the value of the tailings, which are not yet to hand.

It appears at present that the total gold contents of two parcels will be in the vicinity of 8 dwts. The average of our samples works out about 7 dwts. 12 grs., which shows that it is possible to sample and estimate fairly closely.

Summary.

From a mining point of view the position can be easily summed up, and is briefly as follows:—

With the existing plant and development there is not more than some 2,700 tons which would show a profit over mining 15s., milling 10s. 6d., and carting to State mill 4s. 6d.

If capital were found to put the plant and pipe line into a thorough working condition, the payable ore would be considerably increased, for the total cost should not be more than 22s. 6d. per ton. Unless the mine is further developed below the 200ft. level, the capital expenditure on plant would not be in my opinion warranted, as it would probably amount to the following:—

Pumping—

	£
Burying pipe line	150
Installing second pump and two tanks ..	400
Repairs to engines	100
Alteration to plant, new belting, etc. ..	500
	£1,190

In addition, the stope above the 118ft. level would require about £150 worth of sand filling.

There is no doubt that if sufficient water for milling purposes were found on the mine it would alter the position considerably, and with good management the mine might carry on for quite a long time, though it is in a fairly hopeless condition at present.

16.—MANGANESE KNOB, M.L. 321H.

The State Mining Engineer.

In company with Inspector Rockett, I examined the manganese deposit on the above lease at the latter end of the year 1925.

Locality.—Mineral Lease 321H is situated immediately to the West of Copper Mine Creek and adjacent to Mineral Lease 10 at Naendip.

Geology.—As far as could be seen from the much-weathered outcrops, the country rocks consist of similar sediments to those found in the gorge where the Hamersley River breaks through the Eyre Range some three miles North of the coast-line.

The most noticeable varieties are mica schists, shales (carbonaceous), sandstones, and probably very basic tuffs or interbedded basic lavas. The presence of basic members is evidenced by the frequent occurrence of magnesite, which often assumes a pisolitic structure. The prevailing strike is approximately East and West with a very slight dip to the North, corresponding to the series where observed in other localities along the coast.

Manganese.—Manganese ore is found scattered over the surface in several places on the lease. The origin in some cases is not quite clear, but may be described under two main headings:—

(a) Surface deposits. These may be either lateritic in origin or be derived from the wearing down of lode outcrops. I am rather inclined to consider that most of the surface ore is derived from the latter, though the broken pieces may since have been cemented together by solutions containing soluble iron and manganese salts.

(b) Undoubted lodes, the outcrops of which run parallel to the encasing sediments.

Surface Deposits.—Very little information can be obtained with regard to the surface deposits until more prospecting work is done. Five holes have been sunk and samples were taken, the results of which are attached, but this work does not show either the depth or extent of the ore. From what can be seen on the surface, there seems little likelihood, however, of the tonnage of high grade surface ore suitable for shipment being of any very considerable quantity.

Lodes.—Several outcrops of manganese ore occur in the watercourse running through the point marked "D" and passing to the West of point "E."

I have no doubt that these outcrops represent lode formations, though with one or two exceptions they are not traceable for any great distance East or West from the watercourse. Manganese ore, however, can be traced in an almost unbroken line from the point "D" to Copper Mine Creek, and is visible in a section of the Western bank of the creek.

Mica schist seems to be the rock in which the lodes occur, and in several instances there is no doubt that the walls are composed of this rock.

So far as can be judged from the outcrop, the most important group of manganese lodes occurs about 120 yards up the watercourse from the point "D." Here there is a regular series of parallel veins, totalling some 70 feet in width. Unfortunately no costeening or trenching has been done to show the actual widths, the prospectors having the idea at the time that the manganese only occurred as a surface deposit. A sample broken from the outcrops of this series ("F") yielded 46.88 per cent. manganese with fairly low iron and silica contents.

DESCRIPTION OF PROSPECTING WORK AND SAMPLING.

The total amount of development work consists of five shallow holes varying from 4ft. to 7ft. 6in. in depth which have been sunk in the localities where surface manganese ore showed in the greatest quantity.

The position of the holes is shown on the accompanying sketch and are marked "A" to "E."

"A." The hole sunk in this spot is about five to six feet deep. Manganese ore still shows on the North side of the hole and in the bottom, but there is undoubted mica schist on the South side. It is not quite clear whether the manganese scattered around is of a lateritic origin or only the detritus from a lode outcrop. From "A" for about 100 feet South-West a lot of manganese boulders are scattered round, but what the depth of the deposit is cannot be stated at present, though the presence of mica schist would denote it is probably very superficial.

The same conditions pertain around the hole sunk at the point "B." This hole has been sunk to a depth of five feet in fairly solid ore, though 50 per cent. of the sample was discarded as being far too low grade for market purposes.

At the point "C" another hole had been sunk slightly deeper—about seven feet—which looked like better grade ore, only 25 per cent. being discarded from the sample taken. As in the other cases manganese ore was scattered round for a considerable distance on the surface, but has the appearance of being merely superficial.

The hole sunk at the point "D" is three feet deep and is in a watercourse. Mica schist shows on the South wall, and the deposit is without doubt a lode striking more or less East-South-East. This lode can be followed quite a considerable distance towards the South-East, but only by the line of floaters lying on the surface.

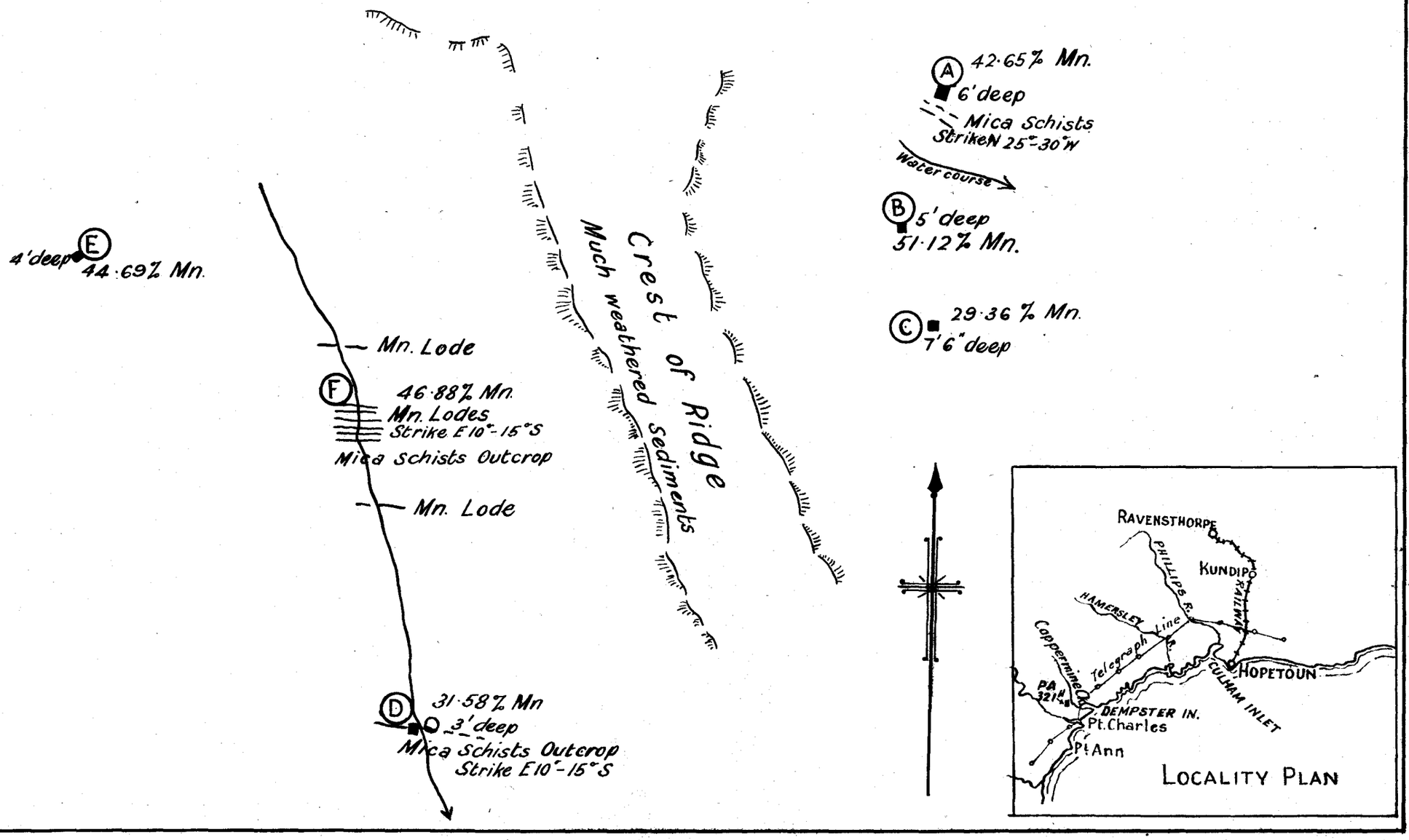
The point "E" lies up and to the West of the watercourse passing through "D." The conditions here are similar to those at "B" and "C," and there is nothing to comment on except that there is a fair amount of manganese ore scattered on the slope of the hill in the vicinity of the hole.

Before discussing the value of the manganese ore at Copper Mine Creek, the market value of manganese ore should be considered.

— ROUGH SKETCH OF WORKINGS ON MANGANESE DEPOSITS —

— NEAR COPPERMINE CREEK —

— Scale :- About 160 ft. to an inch —



In "Marketing of Minerals," by Spurr and Wormser, the following table should form a good guide of American prices, though variations in market price of manganese must be considered from time to time.

Metallic Manganese per cent.	Iron, Maximum per cent.	Silica Maximum per cent.	Phosphorus, Maximum per cent.	Cents per unit per gross ton early 1924.
50 and over	5	12	·15	68
48 to 49-9	5	12	·15	65
46 to 47-99	6	13	·15	60
43 to 45-99	6	14	·15	50
40 to 42-99	5	14	·15	45

The following price list is quoted from the works of the Broken Hill Proprietary, Newcastle, N.S.W., in the year 1921, and is useful only as regards the penalties for excess of silica, iron, and phosphorus, which have probably not varied much. Prices based on ore containing not more than 8 per cent. silica, 10 per cent. phosphorus, and 4 per cent. iron

Ore containing—	£	s.	d.	
40 per cent. and over of Mn.	3	7	0	per ton.
43 " " "	3	15	0	"
45 " " "	4	2	6	"
47 " " "	4	10	0	"
50 " " "	5	0	0	"
53 " " "	5	10	0	"

Above prices are subject to the following deductions:—

For each 1 per cent. silica above 8 per cent., 6d. per ton.

For each 1 per cent. iron above 4 per cent., 3s. 6d. per ton.

For each .01 per cent. phosphorus above 10 per cent., 1s. 7d. per ton.

From the analyses of the samples taken, it is evident that those from the localities "B," "E," and "F" are penalty free and "A" only slightly so. Those from "C" and "D" are too low grade in manganese to be of any commercial value, and the iron contents in particular are very high.

The most pleasing feature is that the sample "F" of the outcrops from the lodes between "D" and "E" is so low in iron and reasonably so in silica, while at the same time the manganese content (46.88 per cent.) is quite good. I consider these lodes warrant testing below the surface.

Shipments.—I was unable to get as far as Doubtful Island Bay, as the roads were not passable for motor traffic and the transport which should have been arranged was not forthcoming. In any case there is ample time to consider that question if necessary; for the present small consignments can be sent off by boat from Point Ann, which is about five miles distant.

T. BLATCHFORD,
Assistant State Mining Engineer.

9th March, 1926.

APPENDIX No. 3.

Sundry Reports by R. C. Wilson, Esq., Assistant State Mining Engineer.

1.—BIG BELL GOLD MINE, NEAR CUE.

(19th January, 1925.)

As instructed, I visited this mine when in the Cue district in November last, accompanied by Mr. J. Chesson, one of the former owners of the mine.

The object of my visit was to ascertain the nature of the "hard floor" upon which the ore was reported to be sitting.

I find that the hard floor consisted of sulphide or semi-sulphide ore, and that there was quite a sharp change from the oxidised ore above.

The sulphide ore consists of a pyritic quartz, muscovite schist, and the oxidised ore of an ironstained quartz muscovite schist. The latter gives out at the south end of the open cut at a depth of about 20 feet, but extends down to a depth of 50 feet on the north side of the shaft.

A face of ore 70 feet north of the main east crosscut, which is 15 feet in height and 56 feet in width, gave an average assay value of 11dwts. 16grs. per ton in value. Time did not permit of the sampling of the sulphide ore underfoot.

Three specimens of this ore were examined microscopically by Dr. C. O. G. Larcombe, and his report upon them is attached. It will be noted that he considers they were most likely originally sediments. The writer did not pay sufficient attention to the geology of the district to form any very definite opinions, but noted that the lode occurred near the junction of the granites and the greenstones, and that it was invaded by a few small pegmatite dykes and showed evidence of having been slightly faulted in places, the impression formed being that the lode represented a somewhat extensive shear zone in the granitic rocks near their junction with the greenstones.

Geological Survey,
Perth, 13th December, 1924.

Petrological report on three samples from the Big Bell Gold Mine.

1. Back of 50-feet level, east crosscut from main shaft:—

A weathered schistose rock stained yellowish-brown by hydrated oxide of iron. The foliation planes are almost flat and coated with scales of muscovite. Cross fractures when examined with a lens present a saccharoidal appearance—due to innumerable quartz grains. The whole rock is slightly ironstained.

Under the microscope, when examined in reflected light, the section is seen to consist of water-clear material, clouded with streaks of yellow ochreous-coloured material. Under crossed nicols the rock is made up of a mosaic of quartz grains averaging about 1/300 of an inch in diameter, and containing many minute dark inclusions. The muscovite rods vary from less than 1/100 to 1/50 of an inch long and 1/1000 of an inch wide. They are remarkably uniform in the arrangement of their axes in a parallel direction. Some of the rods are colourless, but the majority are stained a strong yellowish-brown by iron oxide; they are not pleochroic. The rock is an ironstained quartz-muscovite schist.

2. Floor of 50-feet level, east crosscut from main shaft:—

This is similar to No. 1, though it is denser, harder, and much less weathered. It is a pale-brown saccharoidal siliceous banded schistose rock, with flat planes of schistosity coated with yellowish-brown ironstained scales of muscovite. In places there are small glassy quartz veins parallel to the foliation planes.

Under the microscope this rock is absolutely texturally the same as No. 1, of which it is simply a weathered form. The rock is a slightly ironstained quartz-muscovite schist.

3. From south end of opencut:—

An ash-gray finely banded siliceous schist, with almost flat foliation planes coated with scales of muscovite. One side of the specimen shows much glassy quartz—evidently part of a vein. Several minute quartz veinlets occur parallel to the direction of schistosity. The rock is impregnated with fine-grained iron pyrites. A small ironstained fracture cuts the specimen at right angles to the foliation planes. The muscovite is sufficiently abundant to impart to the rock a distinct pearly-lustred sheen.

Under the microscope it consists of a mosaic of quartz texturally the same as in specimen No. 1, and containing similar minute dark inclusions. The mosaic is traversed by numerous rods of muscovite with a distinct parallel arrangement of their longer axes. The rods are not ironstained, and are somewhat wider than the rods in No. 1 and 2. Grains of iron pyrites are scattered throughout the slide. The rock is a pyritic quartz muscovite schist.

Rocks 1, 2, and 3 are decidedly the same. They are all quartz-muscovite schists. No. 1 is a weathered form of No. 2, and No. 3 is the unweathered representative of No. 2—impregnated with iron pyrites. These rocks were most likely originally sediments.

C. O. G. LARCOMBE,
Acting Petrologist.

2.—NORTH END MINES (Preliminary Report).
(17th March, 1925.)

Acting upon official instructions I began my investigations of the properties at the north end of Kalgoorlie on the 3rd of February last, with a view of ascertaining what quantities of ore might be available for treatment at a Government treatment plant if one were erected.

Beginning at the extreme north end and gradually working south, I made inspections of all the mines operating, completing my work on March 14th, 1925. The whole of this time was not given to these mines, as I left off on occasions to attend to other work, *e.g.*, the Sand Queen, Menzies Consolidated, and Mt. Juglah.

The North End properties visited include the following:—

The Eureka North, P.A. 1997E
Cousin's P.A. 1991E
North Collier P.A. 1959E
Woodhams P.A. 1939E
Hicks G.M.L. 5379E
Devon Consols G.M.L. 5358E
Gamble & Party 1937E
Yorkshire Rose Sth. P.A.1964E
Golden Group P.A. 2024
Creswick
Jennings P.A. 2048E
Mohr's P.A.
Hartigan's G.M.L.
Hoepner's P.A.
J. W. Muir's P.A. 1974E
Hansen Bros. P.A. 2006E
Paymaster G.M.L. 5332E
McManus P.A. 1917E
Howard & Lonsdale's P.A. 1822E
Yorkshire Rose G.M.L. 5376E
North End G.M.L. 4632E
Fair Play 1986E
Hidden Secret
Lynch & Hansen's P.A.
Black & Levy's P.A.
Baudinette's P.A.
Hannan's Reward

Details of my examination of these properties will be given in an appendix to this report.

I found myself in complete agreement with Mr. Howe, Superintendent of State batteries, that the amount of ore likely to be obtained was too small to justify the erection of a State treatment plant. Most of the prospectors at work fully realised this, and quite a number stressed the point that they did not wish to be associated with the agitation in favour of it, as they were well satisfied with the present crushing facilities.

I am enclosing a specimen sheet showing that the Yorkshire Rose was charged 6s. per ton for crushing and that the sands and slime were paid for on the State battery basis.*

For most ore these charges work out approximately the same as the charges in the Boulder mines, and as a matter of fact Hunt has made an offer to me to purchase ore on assay value on the same terms as at present in vogue in the mills at the Golden Mile, if the Hon. Minister for Mines will provide him with a No. 5 ball mill, to be purchased at the end of the year or returned in an equal state of repair if there is insufficient ore to keep it running.

I have prepared a sheet showing the ore at present being carted from the North End mines and treated at the mills at the Golden Mile for the last three months. Hunt's return for the last month is not yet available.

This ore, amounting to 479.0475 tons, might reasonably be expected to be diverted to Hunt's battery, but I personally would not expect to see much additional ore sent, as no producer would care to work on such a small margin of profit as the difference in the cost of carting to Hunt's battery and to the Boulder Block, and any producer with a sufficient supply of low grade ore in sight would no doubt wish to put up his own plant and treat it on the spot.

While on this work I looked into two applications for assistance to erect plants, viz., at Mohr's P.A. and Milne's P.A.

I regret to have to report that in each instance my sampling indicates that the ore they proposed to treat was unpayable.

I have not yet visited some mines which Mr. Hughes wished to show me, but which at present are not being worked.

*Not reproduced.

GREAT BOULDER PERSEVERANCE, LIMITED.

Date.	Lease, Claim, or Area whence derived.	Owner.	Ore treated.	Milled or Smelted. Gold Bullion.	Value of gold in each gross ounce metal produced.	Value per ton of ore treated.
1926.			tons.	ozs.	£ s. d.	£ s. d.
Nov. 12	Paymaster	Wells	55·527	17·574	...	1 5 3
Nov. 22	P.A. 1977	Ward	25·389	13·913	...	2 3 10
Nov. 24	Union Jack	Stearne	41·691	47·840	...	4 11 9
Dec. 15	Lucell 5395	Lynch	62·820	119·640	...	7 12 4
Dec. 23	1912	Stables & Gryljusich ...	3·267	2·615	...	3 4 0
Jan. 16	Union Jack	Stearne	47·773	9·220	...	0 15 5
Jan. 28	P.A. 1893	Lomasney & Rolfe ...	20·284	6·480	...	1 5 6
			256·751	217·282	...	20 18 1

OROYA LINKS, LIMITED.

Nov. ...	North End	Perry	13·508	1·678	...	...
	P.A. 1943	Goodison	11·616	4·746	...	...
	P.A. 1896	Ray	9·906	7·916	...	...
	Yorkshire Rose	T. Clarke	27·490	47·131	...	...
Dec. ...	Do.	do.	14·865	53·514	...	...
	Do.	do.	28·093	10·113	...	...
	P.A. 1990	Oliver	17·641	7·080	...	...
	P.A. 1973	Ward	16·914	9·133	...	...
	G.M.L. 5247	Black	18·320	8·359	...	...
	P.A. 1978	Davey	16·199	4·476	...	...
Jan ...	P.A. 1993	Norton	18·369	4·265	...	...
	P. A. Creswick	Davey	25·584	15·610	...	...
			218·505	174·021	...	...

GOLDEN HORSESHOE CO.

Dec. ...	Surprise	North	*3·7915	255·40	...	...

HANNAN'S REWARD BATTERY (HUNT'S).

Nov. ...	Hannan's Reward ...	Hunt	17	8·70	3 14 10	...
	Mystery	Rolfe	10	8·55	...	...
Dec. ...	Maritana	Hoepner	70	84·85	3 13 5¼	...
	Big Genuine	McLeod	41	35·90	3 15 5	...
	P.A. 1940	Egglestone	Dollied gold	6·10	...	...
	Golden Dream	Woodhams & Williamson	46	15·45	4 0 0	...
Jan. † ...	... ...	... ...	...	...	...	...
			184	159·55	15 3 8¼	...

* Cyanide sands slags. † No return for January received.

SUMMARY.

Name of Mine.	Ore treated.	Gold.
	tons.	ozs.
Great Boulder Perseverance, Ltd.	256·751	217·282
Oroya Links, Ltd.	218·505	174·021
Golden Horseshoe Co.	3·7915	255·40
Grand Total = ...	479·0475	646·703

3.—APPENDIX TO REPORT ON NORTH END MINES.

5th May, 1925.

This P.A., which has recently been taken up by Milne and party, includes the old Great Northern workings. The general trend of the country here is, as usual, north-west and south-east. Most of the gold seems to occur in the more or less parallel cross leaders which cross the country approximately at right angles. The most important of these runs through the main shaft, and has been worked for a short length at the 100ft. and the 150ft. levels in soft country. A few feet of driving only has been done at the 200ft. level, probably because the country has become very hard, and driving consequently expensive.

Milne and his mate are at present sinking a winze on the leader at the 150ft. level.

A little work has also been done on a parallel leader about 20 feet south of the above mentioned, and as Mr. Milne is of opinion that the whole of the material in the mine is auriferous, the ground between these two leaders was sampled to see if it might contain payable values. Assay results were as follows:—

Sample No.	Location.	Value.		
		oz.	dwt.	grs.
W. 2	0ft.— 6ft. South	0	1	10
W. 64	6ft.—12ft.	0	0	10
W. 52	12ft.—16ft.	0	0	21
W. 58	16ft.—18ft.	0	0	5
W. 53	18ft.—20ft.	0	0	21

Sample No. 67, assaying 21 grs. per ton, was taken from a heap of material more or less free from quartz at the 100ft. level; and sample No. 25, assaying 14 grs., was taken from a dump of similar material at the surface. A sample taken in the stope above the 100ft. level assayed 1 dwt. 12 grs. per ton over a width of 24 inches.

These samples would seem to indicate that values are confined to the quartz leaders and that the payable ore has mostly been stoped out.

P.A. 1997E, *the Eureka North.*—Horan and Muir have exposed a big body of lode formation at a depth of 120 feet, which Mr. Muir considered to be too poor for crushing. This opinion was confirmed by my sampling. The first 10 feet of the formation assayed 14 grs. per ton in value, and the next 10 a trace only.

P.A. 1974*E.*—This P.A., which is held by John Wallace Muir, is situated immediately west of Hannan's North. A shaft has been sunk 40 feet, and a crosscut is to be started almost immediately to cut a lode met with in the shaft dipping west. In the shaft the lode is said to be worth 3 to 4 dwts. in value. Some value was also met with in ironstone material in a pot hole 18 feet east of the shaft. No payable ore can be said to be in sight.

P.A. 1991 (*Cousins*).—This P.A. is situated about half a mile east of the Eureka North. Cousins at the time of my visit had no mate. Two shafts are connected by a crosscut at a depth of 100 feet. He is trying to locate the juction of a leader and a lode. His present dump, he informed me, carried a little gold, but probably not more than 2 dwts. per ton. He showed me no ore of a payable nature.

P.A. 2006*E* (*Hansen Bros.*).—This P.A. adjoins the south boundary of P.A. 1991, and is held by Hansen Bros.

These prospectors were sinking a shaft on the top of a hill towards the north end of their holding, and at the time of my visit the shaft was 20 feet deep. At 10 feet a lode about 2 feet wide made its appearance dipping west. I was informed that low values only had been obtained, although good loams had been obtained at the surface.

Near the south boundary of this P.A. is the old Ivy shaft, from which Raven crushed a good deal of ore.

P.A. 1959 (*North Collier*).—The owners of this P.A. are Messrs. Sadlier and Higgins. They had unwatered the mine, and were looking for the continuation of the rich pipe of ore worked above. Hansen's pipe, I was informed, gave out at a depth of 60 feet. Howard found another pipe of ore a few feet north; both pitch south and dip to the west. This party is now winzing down on the track of the shoot in the hope of picking up rich values again. The present face of the mine gave an assay result of 21 grs. per ton only over a width of 24 inches.

These prospectors stated they had no tonnage of low-grade ore, and relied entirely on rich contacts.

G.M.L. 5333*E* (*"Paymaster"*).—This lease adjoins Hartigan's on the south-east side. The principal lode runs practically north and south. At the 80ft. level the main north and south drives have been stripped to an average width of 13 feet for a length of approximately 60 feet, and a little stoping has been carried out above and below the level. The ore won amounted to 393.8 tons, yielding 161.01 ounces of gold over the plates, or an average of 8.2 dwts per ton.

It struck me as being peculiar that stoping operations had been discontinued, so I asked what was the approximate value of back of the stope. As no one could give me any indication I sampled it at intervals of 10 feet, and I regret to say that my sampling indicates it to be quite unpayable. Details of the results obtained are given on the plan attached.*

My samples taken at the 160ft. level were also unpayable, although I was informed by the prospectors that the borings from a north and south bore hole at the present face of the crosscut (which incidentally has more the appearance of a drive) were in about ounce values. Unfortunately these bore holes were not fired, and consequently the reported rich ore has not been exposed.

The prospectors are at present driving north-east on an ironstone leader which they consider to be the continuation of the leader worked by Hartigan in the adjoining lease. Reference to the plan attached* shows that this is rather improbable. It will be noted that Hartigan's leader gave out at a porphyry dyke, and there is no certainty that it exists on the other side of this dyke.

Specimen ore is said to have been obtained in the No. 1 winze about 10 feet above the floor of the 160ft. level.

Proposed Work.—Application has been made for a loan to crosscut east and west at the 80ft. level. On my inspection I found that the west crosscut had already been put out a distance of 85 feet, and that some lode material of little or no value had been met with. The proposed east crosscut (so called) is now in progress. This is the north-east drive on the leader already referred to.

P.A. 5358*E* (*Devon Consols*).—Mr. Stahl was sinking a shaft, and was down 56 feet. At 53 feet he cut formation with a leader. He said he could not show me any low-grade ore that might pay to work.

P.A. 1937*E* (*Gamble and party*).—This P.A. adjoins the southern boundary of the Devon Consols. Gamble is working leaders around the surface. At his request I took two grab samples of a dump of ironstone lode material, said to have been obtained from a lode 20 feet in width. The assay results were as follows: No. 1, 2 dwts 12 grs.; No. 2, 3dwts. 6 grs.

P.A. 1939 (*Woodham and party*).—This P.A. is situated about 30 chains west of the Devon Consols. Woodham is taking out the last of a stope which is 5 feet in width, but he is picking out a small leader. He is producing about 2 tons of ore per week, and considers that the lode material outside of the leader would average under 3 dwts. per ton in value.

G.M.L. 5379*E* (*Thomas Hicks*).—This P.A. is almost alongside the south-west corner of the Devon Consols. Hicks has done a good deal of development work at the 45ft. level, and is at present working on a leader met with in a winze below this level.

An ironstone lode can be traced running right through the lease. Mr. Hicks informed me, however, that payable values are only met with where the lode is intersected by leaders of quartz and ironstone.

P.A. 1917*E* (*McManus and party*).—This P.A. is situated immediately west of Hicks'. McManus and Murray had sunk a shaft to the 40ft. level, and had driven about 15 feet each way on a leader. They estimated they were getting out about 10 tons of ore a month.

P.A. 1822*E* (*Howard and Longsdale*), *now P.A.* 2046E.—This P.A. is situated between the south boundary of Hicks' and the north boundary of the Yorkshire Rose. Howard had sunk a shaft 40 feet on the Yorkshire Rose line of lode and crosscut 48 feet and driven 35 feet. Howard informed me that occasional coarse colours were obtained, but nothing payable.

There is a large dump of ironstone lode of a jaspery nature which Howard informed me came from a lode at the 120ft. level, where there was ore right across the drive a width of 5 feet. He thought this might be the same lode as was worked in Hicks' P.A., and that the ore broken might average 6 dwts.

* Not reproduced.

The North End 4632*E*.—This P.A. is situated about 20 chains east of the Yorkshire Rose, and has been extensively worked down to a depth of 150 feet. At present Mr. Hill is working at a shallow depth, about 20 feet. Three samples were taken to ascertain the value of the lode in this drive, and gave the following results:—

No.	Width.	Value.
	inches.	oz. dwt.grs.
W. 15	54	0 0 14—20ft. south of shaft
W. 33	54	0 0 21—30 „ „
W. 46	54	0 0 17—40 „ „ (face)

With regard to the main workings, Mr. Hill said he did not know where low-grade ore which might pay could be found.

P.A. 1964, *Yorkshire Rose South.*—This P.A. adjoins the south boundary of the Yorkshire Rose, at a depth of 35 feet. Wilson followed a small east and west leader till it junctioned with a north and south leader, and obtained good values at the contact. A rise was put up from this level, and it was then converted into a shaft and sunk to a depth of 60 feet. The values have now given out. I am informed that on this P.A. it is a general rule that the leaders which pitch south carry better values than those which pitch north.

P.A. 2024, *Golden Group.*—On this lease there are three lines of lode running north-west and south-east. The most easterly is a schist lode with only one hole in it; the middle is an ironstone lode formation that has been worked at intervals right through the lease. The main shaft is a three-compartment one, and is 300 feet deep.

The western lode has been worked at the south end. A few specimens are said to have been obtained on this line of lode at the north end, but the lode was not located.

The prospectors were sinking an underlay shaft which was down about 40 feet. This was said to be a fair-grade ore, but my two samples from the bottom assayed a trace only. It is thought that there is a payable block of ore between this shaft and another 200 feet further south, from which two crushings, one 12 dwt. and one 6 dwt. per ton, were obtained from a lode 3 feet in width. No driving has been done as yet, however, to ascertain the value of the lode between these shafts.

1986*E*, *Fair Play.*—On this P.A. a line of lode known as the Fair Play lode has been worked, which is apparently further west than the three lodes seen in the Golden Group. The main shaft is down 197 feet, some three or four hundred feet of driving has been done at the 107ft. level, while at the 197ft. level the north drive has been driven 42 feet and the south drive 30 feet, following a shear plane. The shoot of ore is 70 or 80 feet long. Practically all the ore has been stoped out, but the owner, Mr. E. A. E. Ray, wishes to crosscut into the foot wall at the shaft to try and locate the faulted portion of the lode. This proposed work has, I consider, a reasonable chance of success.

The only work in progress is on another line of lode coming in on the south from the Creswick. Ray has just started to sink here on a rich leader.

The Creswick.—In this lease a quartz reef runs across the P.A. approximately north and south, and dips to the west. This reef and four parallel lodes which run north-west and south-east and intersect it have all been worked.

Davy and Stephens are at present working the second lode from the east, and are driving towards the reef at a depth of about 60 feet. They have about 30 tons of ore at grass.

I was able to inspect the workings at the 100ft. level, where I found extensive driving and crosscutting carried out and all the lodes connected.

I am indebted to Mr. Davy who, I understand, was underground foreman in the company's time, for the following additional information:—

100ft. *Level Workings.*

No. 1 or East Lode was approximately four feet wide and averaged about 10dwts. per ton in value. This north drive has about 100 feet to go to intersect the quartz reef; for the last 30 or 40 feet the lode is 4ft. wide, but too poor to stope; the lode has been stoped for a length of about 50 feet.

No. 2 or Main Lode.—This lode is 52 feet west of the east lode, and has been stoped for a length of 100 feet and a width of 8ft., the average value being about 1oz.

No. 3 Lode is 76 feet west of No. 2 lode, and the material in the crosscut connecting them carries a little gold. This lode has been stoped 80 feet north to the reef and 40ft. south, and averaged about 15dwts. per ton over a width of 9 feet, the widest part being about 30 feet.

Several hundred feet of driving has been done on this lode, and in addition to the main stope two small stopes have been worked further south. The first of these carried low values, perhaps 5dwts. per ton. In the second stope Davy could only find traces of gold.

No. 4 Lode is about 20 feet west of No. 3 and is nearly vertical. It would, therefore, junction with No. 3 level at a depth of perhaps 150 feet. Mr. Davy could not give me particulars of the width and value of this lode.

The main shaft has been sunk to a depth of 400 feet. At 200ft. there is a plat and some crosscutting.

Davy credits Mr. Aiken, manager of the sanitary depot at Brown Hill, with the statement that he saw specimen stones containing tellurides and free gold brought up from the No. 4 level. This statement must of course be taken for what it is worth.

The plant, which had been removed from this mine, consisted of an 18 h.p. motor which pulled the water and ore, and also ran the Huntington mill. The tailings were cyanided, the method being to first cyanide the sand and then add the slimes on top.

Davy said that he would put up a small plant of his own if he could obtain any quantity of ore giving him 3dwts. or over on the plates.

Hidden Secret (*Griffiths & Party*), P.A. 1949E.—Griffiths considers that there is a good block of ore to be taken out near the south boundary of this P.A. The lode has certainly been stoped for a considerable width, and it was clear that a large tonnage of ore would still be available for stoping if the values were payable. Consequently a number of samples were taken resulting as shown in plan attached.*

This sampling indicates that a portion at least of the block on the south side of the shaft will be payable, but that on the north side of the shaft is unpayable. The amount of ore available in the block cannot be estimated as it can only be sampled on one side.

Jenning's P.A. 2048E.—Mr. Mayman is working on the P.A. at the head of an alluvial lead known as Paddy's Gully, situated about 100 yards north-east of his plant. He sunk one shaft in an acid dyke running nearly east and west without meeting any payable values. His mate at the time of my visit had found a small leader in a shaft, and was crosscutting at a depth of perhaps 40 feet to pick it up again.

Lynch and Hansen's P.A. (G.M.L. 5375E).—These prospectors were sinking a winze from the 50ft. level, and had picked up the faulted portion and continued on it to a depth of about 85 feet from the surface. Small crushings may be expected from them.

Hartigan's Surprise North, 5193E.—Hartigan, who has his own treatment plant and consequently would supply no ore to any treatment plant erected at the north end, has worked a fairly persistent quartz and ironstone leader running approximately east and west. At the 120ft. level about 360 feet of driving has been done, while at the 150ft. level about 140ft. of driving has been done. In all 610 tons of ore have been mined for a return of 885.87ozs. of fine gold.

The Corn Cob P.A. 1922E.—Hartigan is also operating the Corn Cob. In this mine a rather short but rich shoot of ore has been worked out down to the 100ft. level. At the time of my visit he was driving north and south at the 200ft. level in hard sulphide ore said to be of fairly good value. The north drive had been driven 30ft. and the south 27ft.

Baudinette's P.A. 2040E.—Baudinette is crosscutting south-west from a prospecting shaft; at 70 feet he met with some ironstone lode material alongside a porphyry

*Not reproduced.

bar. At the time of my visit the crosscut was in 92 feet and still in porphyry. The most encouraging thing about this show is the fact that the small threads of quartz which traverse the porphyry are gold bearing.

Black & Levy's P.A. No. 2008.—Black & Levy are working a small lode at a shallow depth. It has a north-easterly strike, and dips to the north-west. At the 30ft. level a north drive had been driven 90 feet, and a little driving had also been done at the 50ft. level. There were about 10 tons of ore at grass. Only a small tonnage of ore may be expected from here.

P.A. 1522 (*Mohr*).—This P.A. is situated just over the railway line almost due west of Black & Levy's P.A. 2008. The owner, Mr. John Mohr, proposes to obtain supplies of ore from two different sources on the area—

(1) From alluvial workings;
(2) from lode workings.

Both sets of workings were examined and sampled, the results being set out on plans accompanying this report.* The following is a brief description of each:—

Alluvial Workings.—A reasonable amount of ore seems to have been obtained from a highly ferruginous wash which has been worked for a length of roughly 130 feet by a width of 35 feet and a depth of 6 feet.

Eight samples taken of the wash still standing and which Mr. Mohr proposed to crush gave the results indicated in the sketch.* These averaged 14grs. per ton in value.

Lode Workings.—The lode from which Mr. Mohr proposes to obtain his main supplies of ore has been rather well developed to a depth of 150ft., and, as indicated on the longitudinal section attached, a small amount of stoping has been done upon it.

The position and the assay value of the 35 samples taken by Inspector Phoenix and myself are given on the longitudinal section, and it will be noted that they average 1dwt. 5grs. per ton in value. Only two samples gave an assay value of over 3dwts. per ton, one assaying 9dwts. 7grs. and the other 7dwts. 13grs.

It will thus be seen that the ore at present in sight both in the alluvial and the lode workings is quite unpayable, and could not be profitably treated by means of a plant on the spot, as proposed, or at any treatment plant.

4.—MENZIES CONSOLIDATED G.M.

(25th March, 1925.)

As instructed, I visited the Menzies Consolidated Gold Mine on the 5th and 6th instant, and discussed the present position at length with the manager, Mr. Skuthorp, my intention being to see if any means could be devised which would reduce working costs sufficiently to admit of 10dwt. ore being profitably treated.

In view of the fact that the loss made for January was £1,155, and for February £418, the problem was rather a formidable one.

You will note that previous report was of a somewhat optimistic nature, but it was based on the fact that the assay results below No. 19 level gave an average value of nearly 15dwts. per ton, whereas when broken out the ore only averaged about 10dwts. This is partly accounted for by the fact that owing to the rotten nature of the walls a quantity of mullock necessarily gets mixed with the ore. I figured, however, that a better grade could be obtained, and I am still inclined to think that it could if greater care were taken in keeping the ore clean. Until this is demonstrated, however, no better grade than 10dwts. per ton can be assumed.

Reasons for Present High Cost of Working.

Underground:

(a) Breaking Ore.—The bulk of the ore is obtained from below the No. 19 level, and as this is the lowest level connected with the shaft all ore has to be hauled up from the No. 20 and No. 21 levels by means of a skip to a chute at the No. 19 level. From here it has to be trucked about 1,000 feet to the shaft. The ore actually has to be handled as follows:—
  (1) Ore shovelled into chute at No. 21 level.
  (2) Ore trucked and tipped into skip at No. 21 level.
  (3) Ore hoisted to chute at No. 19 level.
  (4) Truck filled from chute and trucked 1,000 feet to shaft.
  (5) Ore hauled to surface bin.
  (6) Truck filled from bin and trucked to plant.

(b) Filling stopes with mullock.—This is expensive because no provision has been made for getting sand filling from the surface, and consequently all mullock has to be obtained by breaking into the walls of the stopes. The previous management used to put in crosscuts into the footwall. The present management are breaking the mullock from alongside the reef on the footwall side.

Machinery and Plant:

(a) Power.—The power costs are unduly high, as will be noted from the following figures taken from the cost sheet for February:—

Tonnage treated—1,244 tons.

——	Development.	Stoping.	Treatment.	Total.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Steam power and hauling ...	71 11 0	251 12 0	284 11 8	607 14 8
Compressing ...	41 15 0	166 18 2	...	208 13 2
Totals ...	113 6 0	418 10 2	284 11 8	816 7 10
Cost per ton treated ...	0 1 10	0 6 9	0 4 7	0 13 2

These high costs are largely due to the scattered nature of the machinery and plant.

Power is supplied as follows:—
  1 set of boilers to run the treatment plant, which is some hundreds of yards away from the main shaft.
  1 set of boilers to run main winding engine.
  1 300 h.p. gas engine to run compressors.

In consequence there are more engine-drivers and firemen employed than should be necessary, and undoubtedly a lot of air is blowing away because the main air pipe down the shaft is worn out. These high power costs have to be charged proportionately to mining and treatment and consequently put up the cost of both.

(b) Treatment Plant.—The treatment plant does not show such bad design as the rest of the plant, but is very old and worn out, and consequently the cost of repairs and renewals is unduly high.

Suitable Plant.—Mr. Skuthorp's idea of the correct plant for this mine is as follows:—

	Approximate H.P.
10-head mill	20
1 tube mill	30
2 amalgamating or grinding pans	20
2 Callow cone classifiers	
1 Dorr thickener	3
2 agitators	6
5 decanting vats	15
5 small centrifugal pumps to agitate them	15
1 return water tank	
1 fresh water tank	
A clarifying system	
1 elevating pump	15
Elevator to raise ore from rock breaker ...	3
Rock-breaker	30
2 concentrating tables	5
	162

This plant should, he considers, be erected near the main shaft. Some of these items would have to be purchased, others could be obtained from the existing

*Not reproduced.

plant. The following is an estimate of the cost of purchase and erection:—

——	Purchase Price.	Cost of Erection.	Total.
	£	£	£
10-head mill (from Menzies Extended)	150	500	650
1 tube mill	600	85	685
2 amalgamating or grinding pans (Kalgoorlie)	60	60	120
2 Callow cones	100	50	150
1 Dorr thickener (using a sand vat)	50	20	70
2 agitators from stock	...	60	60
5 Decanting vats (using sand vats) ...	250	100	350
1 return water tank (30ft. high) ...	...	75	75
Clarifying system (stock)	...	50	50
6 Centrifugal pumps for agitators ...	240	60	300
Elevation of ore (stock)	...	120	120
Rock-breaker (stock)	...	35	35
2 concentrating tables	200	50	250
Ore bin (new, complete)	...	...	400
Alteration of shaft ore bin ...	...	...	150
Shafting and bearings	...	...	560
			4,025

In addition a roaster would have to be purchased and installed or the present one moved. Mr. Skuthorp was not able to indicate at what price a suitable roaster could be purchased and installed, but was inclined to think that the figure would be higher than the limited tonnage of concentrates to be treated justified (i.e., 6,000 tons of accumulated concentrates and 2 tons per day of current concentrates).

Compressed Air.—A smaller compressor would meet requirements. Mr. Skuthorp mentioned a compressor at the Edna May Central of capacity of about 1,000 cubic feet per minute. The cost might be £600, removal and erection £400, total £1,000.

Repairs to Existing Plant.—The 300 h.p. gas engine requires—

	£
2 new liners, cost £200, labour £20 ..	220
Winding engine repairs:	
2 bushes for drums	
2 main bearing brasses	500
8 Corliss valves and seats	
Gear to be erected for lifting half drum (6 or 7 tons)	50
	£770

The following is an estimate of the costs of mining and treatment after the erection of the proposed new plant, based on the present costs:—

Plant—Labour = 30 days plus one holiday.

			£ s. d.	£ s. d.
3 gas engine-drivers... =	93	17/–	79 1 0	
3 gas attendants ... =	93	15/6	72 1 6	
1 wood trimmer ... =	31	14/6	22 9 6	
3 solutionists ... =	93	15/–	69 15 0	
1 amalgamator ... =	31	17/6	27 2 6	
1 carpenter ... ... =	27	18/5	24 17 3	
1 crackerman ... =	31	14/6	22 9 6	
1 fitter ... ... =	27	18/2	24 10 6	
1 sailor ... ... =	27	15/6	20 18 6	
1 surface labourer ... =	27	14/–	18 18 0	
1 blacksmith ... =	27	18/2	24 10 6	
1 blacksmith's striker =	27	14/–	18 18 0	
1 tool sharpener ... =	27	15/6	20 18 6	
Roaster—				
3 roaster hands ... =	93	14/6	67 8 6	
1 conc. labourer ... =	31	14/6	22 9 6	
				536 8 3
Winder—				
3 drivers ... ... =	27	19/–	76 19 0	
1 braceman ... =	27	15/–	20 5 0	
				97 4 0
				633 12 3

Plant, Stores—Daily Cost Monthly.

	£ s. d.	£ s. d.
Firewood, 6 cords 30s.	9 0 0	270 0 0
Water	...	35 0 0
Cyanide, 75 tons at 2s.	7 10 0	225 0 0
Lime, 75 tons at 3d., say ...	0 19 0	26 10 0
Oils—Kerosene	...	31 0 0
Zinc, coke and acid	...	24 0 0
Charcoal	...	8 0 0
Belting	0 10 0	15 0 0
Shoes and dies = 5 shoes ...	...	15 0 0
Pan shoes and dies, 1 set ...	...	35 0 0
Wire ropes at £150 per annum ...	...	12 10 0
Tube mill liners, £200 per set = ...	...	40 0 0
Flints, 150 bags per month ...	...	70 0 0
Incidentals	2 16 10	85 5 0
Packing, insertion, etc.	0 3 0	4 10 0
...		£896 15 0

Underground Labour, 27 days (actual figures).

Tonnage Crushed, 1,250 tons per month—

				£ s. d.	£ s. d.
3 shift bosses ... =	81	21/–		85 1 0	
4 timbermen ... =	108	16/–		86 8 0	
3 winchmen ... =	81	17/6		70 17 6	
1 platman ... =	27	16/6		22 5 6	
17 machine men =	459	15/8		359 11 0	
3 truckers ... =	81	14/–		56 14 0	
14 shovellers ... =	378	14/–		264 12 0	
					945 9 0
Stores:					
1,250 tons—					
Candles and explosives				96 12 0	
Rock drill spares				23 11 0	
Timber				20 0 0	
Steel				7 10 0	
Incidentals				2 14 0	
Tools				13 10 0	
					163 17 0
To increase tonnage to 2,000 tons per month—					
Additional machine men, truckers and shovellers = ...				408 10 2	
Additional stores—Cost of mining 2,000 tons				98 12 2	
					1,616 8 4
Either 1,250 or 2,000 tons—					
Labour on plant					633 12 3
Stores on plant					896 15 0
Salaries					208 0 0
Rents, rates, and taxes					120 0 0
London office					100 0 0
Estimated total monthly expenditure					£3,574 15 7

It will be noted that the cost of mining and treating 2,000 tons works out at £3,574, so that in order to pay working costs the ore treated must have an extractable value of 35s. 9d. per ton.

Conclusion.—The position seems to be somewhat as follows:—

It is no use going on crushing under the present conditions.

A new level might be opened up by the expenditure of £1,000 a month for six months, or £6,000 in all. There might then be 35,000 tons of ore available for stoping. With the further expenditure of about £8,000 a new plant could be erected near the main shaft, and the gas engine and winder repaired.

In order to pay back the £14,000 expended the ore treated would require to show a profit of 8s. per ton. Working expenses are estimated at 35s. 9d., so that it would have to have an extractable value of 44s. 9d. per ton.

The prospects cannot be regarded as being particularly encouraging unless there is a chance of a gold bonus or some other assistance.

The bottom level, however, for a length of 458 feet, assayed 15.7dwts. per ton for a width of 41 inches, so that the mine has a speculative chance. It is a case of either doing further development or closing down.

5.—NORTHAMPTON AND GALENA MINERAL FIELDS.

27th May, 1925.

Acting upon official instructions, I left Perth on 9th April to accompany the Mining Commissioner, Mr. Kingsley Thomas, on his visit to the mines operating in the above fields.

The Commissioner left Galena on the evening of the 11th April, but I stayed on in the district to collect the more detailed information required for this report, making a number of compass surveys to enable me to prepare some of the plans accompanying it.

I left Galena on 17th inst., and made examinations in the Northampton district of the Wheal Ellen, the Narra Tarra, the Baddera, and McGuire's mines.

I was materially assisted in my inspection by Mr. R. A. Anderson, manager of the Surprise mine, who, besides supplying me with a quantity of useful information, put his car at the disposal of myself and Mr. W. G. Sutherland, general manager of the Fremantle Trading Co., who personally showed me over the mines under his control.

The object of this report, primarily, is to indicate to those interested the nature of the present operations, and the opportunities of further profitable investment.

I will also draw attention to the recent new finds, and endeavour to show that this field is a promising one both for prospectors and investors, and that as lead shows every indication of maintaining its present high price of over £30 per ton this is a favourable time to begin more active operations.

I propose, in addition, to revise and bring up to date the report on the Northampton Mineral Field by Mr. A. Montgomery, State Mining Engineer, published in Bulletin form in 1908, which is now out of print, so that it will include such additional information as we have collected since its publication.

As, however, this proposed revision will take some little time in preparation, I am now furnishing this preliminary report, which describes all the present operations, and hope subsequently to embody it in the above-mentioned publication.

Nature of Ore Deposits.

The ore bodies are common throughout an area of 50 miles long and 10 miles wide, over which an archean gneiss is exposed at the surface, extending from the north side of the Murchison River nearly to the Geraldton-Magnet Railway line, and including Galena, Northampton, and Protheroe.

Outside this area the gneiss is covered with Jurassic sediments, and any ore bodies which it may contain are unlikely to be discovered in our time.

The gneiss, which may be looked upon as the country rock of the district, is traversed by a series of roughly parallel basic dykes running north-east and south-west, usually a chain or two in width, and sometimes persisting for several miles in length.

These dykes, which vary in composition from dolerites to gabbros and serpentines, are of more than purely geological interest, inasmuch as the principal ore bodies are found at or near their junction with the gneiss. It is noteworthy also that the lodes are usually associated with pegmatite dykes.

The geological sequence of events which has led to the formation of these lodes seems to be as follows:—

1. The gneiss, the oldest rock of the series, was subjected to strains causing parallel fissuring along north-east and south-west lines. These fissures filled with basic lava and formed basic dykes.

2. After a period of time acid lava in the presence of water vapour forced its way along the line of weakness at the junction of the gneiss and the basic dykes and formed the pegmatite dykes.

3. Mineralising solutions followed along the same line of weakness, deposited their contents, principally lead, copper and zinc, and formed the ore deposits.

I have given this brief description of the geology of the deposits, as I consider the proper understanding of it to be of assistance in the systematic prospecting for other ore deposits. The following rule might serve as a guide to those interested.

General Rule for Prospecting.

A prospector should, in my opinion, follow along one of the many basic dykes, keeping first along its eastern and then its western wall. He should watch for the presence of pieces of felspar or mica strewn about the surface, which indicate the presence of a pegmatite dyke, and pay particular attention to the country in its vicinity. The actual presence of a lode is usually indicated by what the local prospectors know as "trap rock." This consists of weathered "floaters" of lode material usually highly siliceous, sometimes showing carbonates of lead or copper, and when broken sometimes showing sulphides also.

I attach particular importance to the presence of a pegmatite, as I agree with the view expressed by Mr. F. R. Feldtmann, Field Geologist, that the ore bodies of the district and the pegmatites were probably derived from the same magma under lower temperature conditions.*

As I have explained in the context later, the two recent finds of importance, viz., that the The Two Boys and Grant and Shrieve, were found purely accidentally.

The Galena End of the Mineral Field.

The following is a general description of the mines operating at this end of the mineral field:—

Surprise Lead Mine.—This mine is situated just south of the Murchison River. For some years it has been the principal producer of lead concentrates at the northern end of the field, and the township of Galena has sprung up alongside it.

Nature of Ore Body.—The ore body consists of quartz, galena, barytes, and a little iron pyrites, and is comparatively free from blende and copper. The country rock is the usual gneiss of the district, except at the north end of the 110ft. level, where a serpentine has been met with.

In all, six different lodes have been worked above the 110ft. level, but, as will be noted from the plan and cross-section accompanying this report, these lodes show a tendency to join up in all directions. Quite a feature in this mine is the manner in which the lode branches and forms loops of ore, the intervening formation usually carrying a small percentage of lead, which in places has been sufficient to admit of its being profitably mined.

The lodes have been worked for widths of from 3 feet to about 12 feet, and in the opencut where the lodes are close together the whole formation has been worked over a width of 30 to 40 feet.

Grade of Ore.—Since the mine was re-opened with Government assistance in March, 1922, the ore treated was 60,657 tons for a yield of 9,946½ tons of concentrates, or an extracted value of 11.5 per cent. of metallic lead. Prior to this date only the richer ore had been worked, and our records show that 14,249 tons of ore were treated, yielding 5,319 tons of metallic lead, or an extracted value of 37.3 per cent. I am informed that there was a block of ore above the 70ft. level, 80 feet in length, which was worked out for a width of 6 feet, and gave hand-picked ore worth 75 per cent. lead. Unfortunately, no ore of this grade has been found in recent years. The following figures are an indication of the results obtained:—

——	Length of ore Shoot.	Average width.	Average Value Lead.
			%
Main lode at 200ft. level ...	241	10	11·5
West branch lode at 110ft. level	185	10	12·0
Penna's lode at 110ft. level ...	94	4	9·0
East lode at 110ft. level ...	64	5	8·5
Model lode at 110ft. level ...	68	5	12·0
West lode at 110ft. level ...	120	10	11·0

At the 300ft. level the west crosscut passed through 25 feet of lode material containing about 5 to 6 per cent. of lead. This appears to be the main lode. A north drive has been driven 12 feet. Values improved, and for the last 5 feet averaged 10 per cent. over a width of 54 inches. The south drive has been driven 13 feet in lode material of low grade. The extension of these drives is now in progress.

As the ore above the No. 3 level is rapidly being depleted, the No. 3 level is being pushed on as quickly as possible in order to open up fresh supplies of ore. In the meantime an increasing amount of ore is being ob-

*Annual Report of Department of Mines for 1921.

tained from the Three Sisters lead mine, which the Surprise Lead Mining Sydnicate are working on tribute.

The Two Boys.—This mineral lease adjoins the Surprise South on the east side. Lead was not discovered here till a few months ago, when two boys named Jamieson and Porter, being surprised at the weight of a stone they had picked up, broke it, and found galena in the middle. The boys' parents took up the lease, and a shaft was sunk on the lode to a depth of 40 feet in high-grade ore at least 20 per cent. Pb, from which a quantity of pure galena had been picked out ready for bagging.

At the time of my visit a crosscut had been put out from the bottom of this shaft for a distance of 12 feet, also in high-grade ore. Since then I have been informed by Mr. R. A. Anderson, of the Surprise mine, that the crosscut was extended to 21 feet, and the general average would be approximately 16 per cent. The width of the lode may be a little less than this, as the crosscut was not quite at right angles to its strike. This find is, in my opinion, the most promising that has been made in the district for some years, and its development will be watched with interest.

The Three Sisters.—This mine, which was worked in the early days of the field, is situated about 1¼ miles east of north from the Surprise mine, on the other side of the Murchison River, and is the property of the Ajana Lead Mines, Ltd. The ore body is similar in most respects to that of the Surprise mine, except that it is more fragmental in character, suggesting that it was formed under conditions of less intense pressure, consequently it is less completely crushed, and there are more unaltered lumps of country rock through it. On this account it lends itself more readily to sorting, as these lumps can be picked out and discarded by the shovellers.

The lode has the usual north-easterly strike and inclines slightly to the west. A main shaft has been sunk to the 100ft. level, at which depth 224 feet of driving have been carried out.

As already mentioned, the owners of the Surprise lead mine have taken this mine on tribute, and are at present stoping above the 100ft. level. With a little sorting the ore will average 12 per cent. lead contents for a length of 150 feet and a width of at least 12 feet.

This is, I consider, quite a promising property, and it should now be further developed at and below the 100ft. level in order to keep up the supplies of ore, so that a regular output may be maintained.

It seems unlikely that the owners of the Surprise mine will feel inclined to do much in this direction, however, as all the ore required by them for the term of their tribute seems to be in sight, and any ore developed by them would be for the benefit of the Ajana Lead Mines, Ltd. only.

Block 7.—This lead mine is situated four miles south-east of the Surprise mine. It is on freehold land, and is at present owned by Messrs. Thring, Green, and Builder.

The lode, which is alongside the eastern wall of a basic dyke (gabbro), has a strike a little east of north and a dip to the west on a steep angle. On the surface the outcrop can be traced by a line of old workings for a length of 400 feet. At a point roughly 50ft. south of the main shaft the lode appears to branch, forming east and west branch lodes.

The mine has been opened up by means of an underlay shaft to a depth of 122 feet. At the 95ft. level the north drive has been driven 110 feet and the south drive 90 feet. A shoot of rich ore was met with extending from a point 30ft. north of the shaft to a point 70ft. south. Outside of this shoot, which has since been stoped out to the surface, the drives were in milling ore of low grade.

After the best of the ore above the 95ft. level had been taken out shaft sinking was proceeded with, but as the owners were short of funds when it had reached a depth of 122 feet another level was driven at this depth. The south drive has been driven 95 feet. As in the level just above, the first 70 feet was in high grade ore, and the balance low grade ore. No driving north has been carried out at this level. A particularly high grade of galena has been obtained from this mine.

This has not been proved to be a very large mine, but has certainly been a very rich one. As a matter of fact only rich ore can be profitably mined as the treatment consists of simply crushing the ore through a rock breaker and sluicing the product. Rich concentrates have been obtained by this primitive method, but a large percentage of lead is undoubtedly left in the residues.

In addition to the rich ore mined there is no doubt a considerable quantity of lower grade milling ore to be mined, which would pay if better crushing facilities were available.

Spring Vale Lead Mine (Grant & Shrieve's).—This mine is situated about four miles south by west from Block 7 and two miles north-west of the Ajana siding.

It is of more than usual interest as it is one of the recent new finds in the district. The lode is on Shrieve's farming land, and when harrowing his harrow pulled a piece of galena out of the ground. As this was near an old road it was thought that it might have been dropped there and little notice was taken of the occurrence. When Mr. Grant, who was prospecting in the district, heard of this and saw where the galena had been obtained, he decided to give the matter some further investigation. He soon found a good deal more galena in the cement covering the surface, and after doing some costeaning located the lode. It is nearly vertical and runs practically north and south. Two shafts 32ft. apart have been sunk on it, and these have been connected by a drive at a depth of about 35 feet. In both of these shafts the lode was worth about 30 per cent. lead. In the drive the value is estimated at about 15 per cent.

At the time of my visit this drive had been extended 11ft. north of the north shaft, and the face of the drive was in low grade ore. It had also been extended south of the south shaft for 5ft. in ore worth about 14 per cent.

A parcel of 105 tons of ore from development was concentrated by means of a buddle and a sluice, and gave the following result:—

		Lead.	Lead Contents.
		%	tons.
20	tons concentrates	76	15·2
3	„ seconds	40	1·2
50	„ discards pebble size ...	10	5·0
32	„ fine residues	2	·6
105	„ Average Value	21	22·0

A working option has been taken over this property by the Tarcoola Blocks Co., who are now developing it.

Thornton's P.A. 117, *Grand Central.*—This P.A., which is identical with old M.L. 152, adjoins the Three Sisters, M.L. 153, on the north-east side. At the surface three lines of lode have been exposed having a north-easterly strike and a north-westerly dip, but very little work has been done upon them. The present owners are crosscutting at a depth of about 40 feet. The east lode, which was exposed in the first three feet of crosscutting, appeared to be worth about 8 per cent. for a width of 36in. The middle lode was met with at about 20 feet. Stringers of galena were showing over a width of 30 inches. The crosscut was in 41ft., and expected to cut the west lode in the next few feet. When this is done the prospectors will, I understand, drive on one or other of the three lodes.

The Three Sisters North, P.A. 101.—This P.A., which is situated about 20 chains north of the Grand Central, P.A. 117, has recently been taken up by Messrs. Gilbert Lewis and Hoban. A lode, having a strike a little west of north and dipping to the west, has been worked, at intervals, to a shallow depth for a length of 300 feet.

The south shaft was sunk by the present prospectors to a depth of 32 feet, at which depth north and south drives have just been started. In the face of the north drive four feet of milling ore is exposed, six inches of which is rich. I understand that six tons of concentrates were picked out from the ore obtained in sinking this shaft.

At a point 240ft. north of this shaft and 60 feet south of the most northerly shaft another shaft was

sunk to a depth of 38ft., water being met with at 34 feet. At this depth a north drive has been driven 20 feet. A streak of rich ore is showing in the face. It was thought that an old stope from the most northerly shaft would have been met with before this in the south face, of which the present owners were informed there is a galena seam 20 inches in width. These workings seem to be in approximately the same line of lode as was formerly worked by Woodcock about quarter of a mile further north.

Mary Springs M.L. 112.—This old mine is situated about four and a-half miles north by west of the Surprise mine. It was originally worked by the Geraldine Company, who are reported to have obtained a large tonnage of lead from the two parallel lodes, which are shown on the plan* attached as the west lode and the middle lode. Comparatively recently a shaft was sunk 18 feet on a third lode shown as the east lode. In this shaft the lode was two feet in width, and estimated to contain 20 per cent. of lead. The workings are supposed to be nowhere deeper than 75 feet. The mine, which appears to have been one of the important ones in the early days, is, I should say on general appearances, well worth opening up again now that lead is more than twice the price it was when the mine was worked by the old company.

Gallagher's Pyromorphite Lodes.—Gallagher, the owner of Mary Springs mine, has located pyromorphite in two localities in the vicinity of Mary Springs.

At about 700 yards south of this mine he has sunk two pot holes 35 yards apart on a lode consisting of a mixture of anglesite and pyromorphite, which has a strike of N. 35deg. E.

At a quarter of a mile east, or a little south of east of Mary Springs, he has located another outcrop of pyromorphite striking N. 50deg. E., and at the time of my visit had sunk two shallow shafts on it 46 yards apart. The most northerly of these showed an 18in. seam of high grade ore at the surface, which however pinched out at a depth of about 6 feet. It is just possible that this seam has been thrown to the west. Low grade ore only occurred in the other shaft, only a few pieces of copper-stained quartz containing galena and pyromorphite being visible on the dump.

This occurrence of pyromorphite is interesting as it is comparatively rare in the district, and some doubt was expressed locally as to whether such deposits would live down.

Pyromorphite is a combination of lead chloride, 10.3 per cent., and lead phosphate, 89.7 per cent., and is expressed chemically as (Pb. Cl) Pb_4 $(PO4)_3$, and ha probably been formed from galena as an alteration product in the presence of solutions of chlorides and phosphates, in a similar manner to that in which lead carbonate (cerussite), Pb CO_3, is formed from galena PbS, by oxidation in the presence of a carbonate in solution such as calcium bicarbonate. I am, therefore, of opinion that a pyromorphite seam will give place at a comparatively shallow depth to one of galena, in the same manner as a carbonate seam does.

The Southern or Northampton end of the Mineral Field.

At this end of the field the only mines operating are the Wheal Ellen and Narra Tarra, owned by the Fremantle Trading Company. Mr. W. G. Sutherland, the general manager, informed me that he had in view a more vigorous development policy for these mines, and, in addition, that he hoped to do some further development at the Baddera mine, and possibly also at McGuires. As will be noted hereunder, he gave me a quantity of useful information relating to these mines, which I am pleased to be able to place on record for future reference, and he expressed the hope that I would be able in this report to indicate the development work which I could recommend this company to proceed with. The following is a description of the mines in question:—

Baddera Lead Mine.—This mine is situated five miles north of Northampton and a quarter of a mile from Baddera Siding. The holding consists of 70 acres freehold, Victoria Location No. 1472, and, when the mine was in operation, of leaseholds, Baddera South M.L. No. 11, 10 acres, and Baddera West, P.P. No. 11, 48 acres, both now surrendered.

*Not reproduced.

The country rock is the garnet gneiss of the district generally, which in the neighbourhood of the mine is intersected by pegmatite dykes. In this instance no basic dyke appears to be nearer the mine than a quarter of a mile.

I am indebted to Mr. W. G. Sutherland for the following information:—

The Lode:

"The lode runs diagonally through Freehold No. 1472 in a north-east and south-west direction. The main workings are situate near the south-west corner of Freehold No. 1472, where the lode has been worked to a depth of 442 feet from surface over a length of 1,120 feet and a width varying from 4 to 30 feet. The total amount of driving done on all levels is 3,950 feet.

"A branch lode junctioned with the main lode at a distance of 460 feet north from the main crosscut at the 234ft. level and was driven on about 200 feet south-east at that level and about 300 feet south-east at the 341ft. level, and yielded high grade ore. Where the main and branch lodes junctioned ore was stoped over a width of 40 feet.

"At the bottom or 442ft. level the north drive was not driven to the junction with the branch lode.

"Galena values were mostly met with in seams on both hanging and foot-walls, and where the lode was compact and narrow seams of solid galena were stoped over 100 feet in length and three feet in width.

"Values met with in driving the 442ft. level were patchy and erratic, and values below the 341ft. level generally cut out at about 20 feet above the 442ft. level.

"On account of small output then being obtained and the Company being without funds for further development work the mine was closed down in the year 1921, but as the shoots of galena ore pitch northwards the mine is well worth prospecting in that direction, especially with the present price of lead.

"Output.—From the year 1910 to year 1921, when the mine was closed down, the production was as follows:—

Tons Lead Ore Raised.	Lead Contents.	Value.
	tons.	£ s. d.
128,990·84	13,906·7932	329,179 11 0

"*North Baddera.*—The earliest workings on Freehold No. 1472 were near the north-east corner of the property where the lode was worked over 40 years ago to shallow depths over a length of 300 feet.

"The lode is wide at this point, for at the surface there are two parallel lines of workings over 30 feet apart and evidently on the hanging wall and footwall seams of the lode.

"An underlay shaft has been sunk on the hanging wall seam which in the year 1917 was cleaned out and found to be 104 feet deep, with the bottom in ore carrying 4 inch veins of galena.

"A level had been driven north and south at a depth of 84 feet, which was open for a length of 130 feet, the full distance driven could not be ascertained as the timber of the drives had given way. The ore appeared to have been stoped above the drives, but underfoot good ore carrying veins of galena 8 to 10 inches wide was showing, and from which about 50 tons of high grade ore was won by underhand stoping while exploratory work was proceeding.

"At 20ft. south along the 84ft. level the present owners put out a crosscut to cut the footwall seam, and which was driven a total distance of 62 feet. At 37 feet lode formation was met with carrying a little galena, and this continued to 57 feet when 3 feet of good ore was cut, including 6 inches of galena.

"This work was done towards the close of the Company's operations on this property, so it was left until some future time to further develop the ore met with, and the present time is opportune."

General Remarks.

It will be noted from Mr. Sutherland's description that the principal operations were confined practically to that portion of the lode near the south-western end of the freehold, and that little or no exploratory work has been done at the north-east end where the lode was originally worked. Moreover the one piece of development work which was started, and which gave

quite encouraging results, was stopped in 1921 because the general output of the mine had become small and the Company was short of funds.

Exploratory work should certainly be proceeded with at this end of the property, and in view of the fact that good values have been obtained at both ends of the property I do not consider that it has been adequately prospected until something is known of the nature of the lode in between the two lots of workings. As a matter of fact the lode has been unprospected for a length of about 1,700 feet. The testing of this ground by costeaning has been rendered difficult, if not impossible, by its swampy nature. A series of bore holes would probably be as good a method as any to test it.

On the main workings it is to be regretted that the 442ft. level was not continued as far as its junction with branch lode, as it was at this junction that a bulge occurred in the lode in the level above and in the lode being worked for a width of 40 feet.

The possibility of obtaining further ore supplies should this work be carried out, should be borne in mind, but I would recommend that the development of the north-east end of the property be proceeded with in the first place. Besides being quite promising, this work should not be costly.

The Wheal Ellen Lead Mine.—This mine is situated about 1½ miles south-west of the Northampton Railway Station. The holdings consist of Victoria Location No. 1146, 20 acres freehold, M.L. 143, 20 acres, and M.L. 17 P.P., 3 acres.

The geological conditions are the usual ones in the district, the country rock being gneiss, and the lode running north-east and south-west parallel to a basic dyke.

Reference to the plan* attached will show that the normal dip of the lode is to the north-west at an angle of about 60deg. from the horizontal, but that for a length of roughly 300 feet in the vicinity of the main shaft it is practically vertical.

Along the north drive I am given to understand that there was a bulge just where the change took place, but that generally speaking the lode is considerably impoverished where it is vertical. The change from the vertical to the normal dip is so noticeable as to suggest that there is a definite geological reason for it. I do not propose, however, to go into the matter any further in this report.

Mr. W. G. Sutherland has supplied me with the following information concerning the lode, the underground workings, and the output:—

"The Lode and Underground Workings.—The lode runs north-east and south-west through Freehold No. 1146 into M.L. 143, and underlies west into M.L. 17 P.P. at depth.

"The present main shaft is about 600 feet north of an old shaft from which the lode was worked about 40 years ago. Old workings extend for over 400 feet south of the old shaft to 1,500 feet north of the present main shaft, so the known length of the lode is about 2,500 feet.

"From the new main shaft the lode has been driven on for distances of 620 feet north and 530 feet south with levels at depth of 125 feet and 195 feet, and at present the shaft is being sunk to a depth of 300 feet.

"Good values were met with in driving the 125ft. level, but on stoping above the level old workings were met with for a considerable distance.

"At the 195ft. level the lode is much disturbed in the vicinity of the main shaft, and for 100 feet north and 200 feet south, after which the lode becomes more regular.

"Output.—From the year 1918 to date the mine has produced:—

Tons Lead Ore Raised.	Lead Contents.	Value.
22,033·28	tons. 1,818·71	£ 52,456

"When worked about forty years ago the mine produced high grade ore to the value of £70,000, which on present metal prices would be worth over £200,000, and the mine was considered to be the richest in the district."

*Not reproduced.

General Remarks.

It will be noted that since 1918, 22,033 tons of ore were mined for 1,818.71 tons of lead, or a recovery of 8.6 per cent. By far the greater portion of this ore came from the stopes between the 125ft. and the 195ft. level (i.e., a depth of 70 feet). It is probably safe to assume that these stopes produced 15,000 tons of ore averaging 8.6 per cent. of lead in value, so that for an equal amount of driving at a depth of 295 feet (100 feet below the 195ft. level) a tonnage of approximately 21,000 tons of ore would be opened up if the lode maintains its width and grade for a depth of another 100 feet.

In the absence of any winzes below the 195ft. level we have nothing to guide us as to its probable behaviour below this level, but I have Mr. Sutherland's verbal assurance that the lode going underfoot was equal, or better than, the ore already mined. The south drive at the 195ft. level should be extended, and, if necessary, a west crosscut put out to cut the lode worked at this end of the property 40 years ago, which is reported to have been so rich. A quantity of milling ore may reasonably be expected to be obtained at and about these old workings, as in those days it was customary to work only the very high grade ore, which required little or no further dressing, and to leave behind ore of a grade which at the present time can be very profitably mined and treated.

It is to be regretted that this mine has been allowed to get so far behind with its development work. It is equipped with a good treatment plant, capable of treating at least 100 tons of ore a day, and it is always more economical to develop and produce ore simultaneously.

The Narra Tarra Lead Mine.—This mine is situated about 13 miles south-east of Northampton, and about 3½ miles from Nabawa on the Geraldton-Yuna railway. The holdings consist of Victoria Locations No. 830, 200 acres, No. 833, 300 acres, No. 118, 200 acres, No. 19, 200 acres, total freehold 900 acres, and Leasehold M.L. 192, 12 acres.

The country rock is the garnetiferous gneissic granite of the district, in which the lines of foliation coincide with the strike of the lodes, i.e., north-east and south-west. As usual the lodes are associated with pegmatites.

Oxidation has extended downwards to a far greater depth in these lodes than in those at Galena. Lead carbonates are found below the 100ft. level, whereas in the Galena mines galena is usually found almost at the surface.

There are three distinct lines of lode running through the property in a north-east and south-west direction, the main workings being in the west lode. This lode and the east lode on Location 119 dip towards one another, and, according to Talbot, if the present dip is persistent it should unite at about 2,600 feet below the surface. A curious feature about the main lode, which also applies to the east lode to some extent, is that at the south end of the mine the galena gives out quite suddenly, and its place is taken by copper pyrites, the southern portion of the lode having been mined for its copper contents. In the case of the main lode the change from copper to lead is so sharp that I had some little trouble in securing a specimen containing both. In the case of the east lode, however, quite a quantity of the lead ore contains copper also. My specimens seemed to indicate that the copper pyrites had been deposited subsequently to the galena. The feature of the middle lode was the presence of some good specimens of pyromorphite at the north end workings.

The following information concerning these lodes was given me by Mr. W. G. Sutherland:—

"Three distinct lodes traverse the property. The main workings are on the westerly lode. The middle lode has been worked on the north portion and the easterly lode is now being developed.

"In the main workings the lode has been worked over a length of 930 feet to a depth of 550 feet and driven on at all levels a total of 5,500 feet.

"Old workings were started from a shaft sunk on the cap of the lode which was sunk 20 feet on the underlie and then vertical on the footwall side of the lode, and from this shaft levels were driven at depths of 45 feet, 105 feet, and 165 feet. Present owners sunk a new main shaft 142 feet east of old main shaft with

levels at depths 250 feet, 350 feet, 450 feet, and 550 feet. At the 250 ft. level high-grade galena ore (nearly solid galena) was met with for a length of 400 feet and over a width of 3 feet. Good lead ore was also met with at the 350ft. and 450ft. levels, but as values were pitching southwards the 550ft. level had to be driven over 300 feet south before payable ore was met with, and then values were poor and erratic.

"At about 400 feet south at all levels metal values in the ore changed from lead to copper, and this continues in payable values to about 620 feet south of the main shaft, though at this distance the lode continues strongly at all levels between good walls and about 8 feet wide, but copper values are low.

"*Output.*—From year 1914 to 30th April, 1925:—

Tons Lead Ore raised.	Lead Contents.	Value.
	tons.	£ s. d.
113,992·77	12,018·2360	349,490 11 0

Tons Copper Ore raised.	Cu Contents.	Silver Contents.	Value.
	tons.	ozs.	£ s. d.
24,833·11	1,682·328	36,837·5372	116,285 2 3

"*Eastern Lode.*—This lode, which is situated on Victoria Location No. 119 and about 2,000 feet south-east of the main workings, can be traced on the surface for over half a mile. The lode appears to be similar to the main Narra Tarra lode, is within good walls, and contains copper values on the southern portion and lead values on the northern portion. The former portion of the lode was worked for copper ore in the early days of the Colony, and within recent years the lode has been worked by tributers for galena about 300 feet north of the old workings.

"The present owners have sunk a vertical shaft to a depth of 109 feet in country rock on the hanging wall side of the lode near the junction of the lead and copper-bearing portions, and crosscut to the lode at a depth of 102 feet from the surface. The lode was cut at a distance of 45 feet from the shaft, and where intersected by the crosscut was 12 feet wide between good walls, and contained carbonates of lead and copper in seams throughout the lode, and also a little galena.

"The lode has been driven on for distances of 157 feet north and 113 feet south in similar ore. A winze is being sunk below the 102ft. level at 46 feet north of the crosscut, and is down 15 feet in galena ore of good grade. Shafts have been sunk in the lode at 46 feet and 136 feet north and 58 feet south of the main shaft. These shafts were sunk on the footwall of the lode in ore containing carbonates of lead and copper with occasional bunches of galena. Old workings were met with in these shafts at depths of 64 feet, 51 feet, and 63 feet respectively on the hanging wall side of the lode, and apparently only that side of the lode was worked in the early days. The metal values met with so far are mostly lead, and the lode gives promise that with development it will prove to be of equal value as the main Narra Tarra lode."

General Remarks.

Main Lode.—It will be noted that the main lode workings have produced 113,992 tons of lead ore containing 12,018 tons of concentrates valued at £349,490 11s., and in addition, 24,833 tons of copper ore containing 1,682 tons of copper and 36,837 ozs. of silver valued at £116,285 2s. 3d. A glance at the longitudinal section will show, however, that most of the ore above the 550ft. level has been stoped out, leaving very little ore in reserve. Furthermore, the values obtained at the 550ft. level were not sufficiently encouraging in the opinion of the management to warrant the further sinking of the shaft to open up another level. Personally, I would have liked to have seen at least one winze sunk before deciding against further sinking.

It is noticeable that no attempt has been made so far to test the lode north or south of the known shoot of ore. For this purpose at least one of the levels should, in my opinion, be extended north and one south. The 250ft. level was a very rich one, and might be selected as a suitable one to drive north for lead and south for copper. I understand that good indications were obtained in a shallow winze at the south end of this level.

Before deciding upon driving north at the 250ft. level I would pick up the 105ft. level, and see what the face of the drive is like. If encouraging, this drive might be pushed on, as it could probably be done very cheaply. A certain amount of crosscutting also seems advisable, especially at points in the level where a bulge has occurred in the level above or the one below. A good deal of milling ore will probably be obtained near the surface alongside the old workings if, as usual, the richest ore only has been mined.

Middle Lode.—There are two lots of old workings on this lode which are about half a mile apart. On general appearance the lode at the north end where the pyromorphite outcrop occurs appears the more encouraging, and a prospecting shaft to test its value under this outcrop seems justified.

Eastern Lode.—About 1,900 feet to the south-east of the main lode, on Location 119, the eastern lode is now being developed. This was worked in the early days of the field, and was then known as the Narra Tarra copper mine. Like the middle lode, it can be traced for about half a mile, and the workings are also confined to either end of it. In this instance those at the southern end are the principal workings. From shallow workings at the northern end of the lode Shepherd obtained 191.3 tons of ore assaying 55.67 per cent. Pb, which he sold to the Fremantle Smelter, Ltd., about 1906.

At the most southern end the lode was worked for copper in the early days of the Colony, and at about 300 feet north of these workings Lauder and Rowe obtained and sold to the Fremantle Trading Co. 114.88 tons of ore, assaying 61.66 per cent. of lead, in about 1919.

The present main vertical shaft was sunk near the junction of the copper and lead-bearing portion of the lode with the idea of being able to obtain either ore. Some highly stained copper ore has been obtained, but I understand that this on assay gives better lead values than copper. The lode at the 102ft. level is still in the oxidised zone, and is of a very puggy nature closely resembling the main Narra Tarra lode. Values so far have been on the low side, but it is encouraging to note that they show an improvement in the winze at 46 feet north, at a depth of 18 feet below the level. This is a milling ore, and shows small seams of galena and a little copper.

It now seems to me that it would have been better to have sunk the main shaft about 250 feet further north, in the vicinity of the triubters' shaft, and to have proved the ground under their workings. The extension of the present north drive at the 102ft. level may hole into old workings, and in any case will leave practically no backs to be taken out. The management will now have to decide as to whether it will be best to sink the present shaft and put in a long north drive at the 200ft. level, or to sink a new shaft to the 200ft. level near the tributers' workings. The results obtained in the winzes below the 102ft. level will serve to guide them in making their decision.

McGuire's Freehold Location No. 832, 250 *Acres.*

This location is situated 7 miles south of the Northampton townsite, and the railway line from Geraldton passes through it. A smelter was erected here in the early days, and two lines of lode have been worked.

The West Lode.—This is situated in the western side of the railway. Its strike is north 45° east, and it can be traced by a line of shallow workings for a length of about 600 feet. The most northerly shaft is now used as a water shaft, and I am informed by Mr. Sutherland that it is 60 feet deep, that a south drive from the bottom of this shaft has been driven 60 feet, and that in the present face the lode is 9 feet wide, of which 4 or 5 feet is milling ore, and the balance low grade. There were some lumps of good grade ore at the surface.

The other line of lode is on the eastern side of the railway line alongside the old smelter. It can be traced by shallow old workings for about 600 feet: apparently a small tonnage of ore only was obtained from these workings, and judging by the weight of the slag lying about near the smelter, the smelting operations do not appear to have been very successful. I have not had the slag assayed, but its appearance indicates a heavy lead loss.

From the information supplied by Mr. Sutherland, and the nature of the lumps of ore at surface, the further development of the west lode from the windmill shaft seems to be justified, and to be the most promising place to make a start.

Output of District.

The amounts of lead and copper reported to the Mines Department up to 31st December, 1924, are as follows:—

Lead Ore 339,378.48 tons, producing 39,897.04 tons of lead valued at £1,055,958.

Copper Ore 21,433.45 tons, producing 1,682.20 tons of copper valued at £109,525.

These figures do not include the ore won and exported in the early days. Our export figures, which date back to the year 1850, indicate a tonnage from Northampton of 80,456 tons of lead ore valued at £1,415,436 and 30,829 tons of copper ore valued at £268,271.

It will thus be seen that lead and copper to the value of over a million and a half pounds sterling have been won from this district, and it should be borne in mind that most of the mines ceased operations not on account of a falling-off of the lead contents in the ore, but because the market price of lead had become too low to admit of profitable working.

6.—THE "REVIVAL" G.M.L. 953 (MELVILLE).

(17th July, 1925.)

As instructed, I visited this mine on 4th inst., and have to report as follows:—

Ore Body.—The ore body is a quartz reef in greenstone country running north-west and south-east, and is nearly vertical. As is commonly the case in our goldfields, the reef is associated with a porphyry bar with which it is probably genetically related.

As will be noted from the plan* attached, about 200 feet of driving has been done at the 65ft. level, and the main shaft has been sunk to a depth of 110 feet. Three other shafts, Nos. 1, 2, and 3 have been sunk to the 65ft. level, while I understand that the No. 4 shaft, which was sunk on an east and west reef, has been sunk to a shallow depth.

The main reef is at present being worked between the No. 1 and No. 2 shafts, its width here is about 8ft. wide, and I understand that it averages about 15dwts. per ton in value. Most of the ore between No. 2 and 3 shafts appears to have been taken out. The south end of No. 3 shaft, I am informed, will average 15dwts. per ton over a width of 30 inches.

The south drive† from the No. 3 shaft was driven with the idea of driving on the main lode. It will be noticed, however, that the owners have allowed their drive to swing away too much to the east. I pointed this out to them and showed them the direction in which they should have been driving. The north drive from the No. 3 shaft appears to me to have been driven on the east and west reef.

It is not an easy matter to keep the drive on the main reef in the vicinity of this shaft, as two reefs meet here at an acute angle, and the position is complicated by there being a shear, which faults one or both of the reefs.

Nevill has a five-head battery and is rather troubled about the handling problem. He carts the ore up a ramp, dumps it, breaks up the big lumps, and feeds it into the battery. What he really requires now is a battery bin, a rock breaker, and an elevator, also a little extra power.

Unfortunately his gas engine is too small to run both the rock breaker and the battery. I pointed out to him that unless he had a larger engine the best he would be able to do would be to run the cracker until he had filled his bin, and then the battery until he emptied it.

After chatting the matter over he thought it might be better to do a little more development work before going to much expense in altering his plant.

*Not reproduced.

†Although called the "south drive," its bearing is really a little north of east.

7.—MOUNT MAITLAND.

(20th July, 1925.)

When visiting Holden's find in November last, at the request of Mr. Gerrick of Meekatharra, I visited a small show in which he was interested and took a few samples.

Mr. Gerrick gave me to understand that he might be making application for some assistance. As, however, no application seems to have come to hand, I am placing on record the results obtained.

Two prospectors were working on a small quartz leader outcropping along the western slope of Mt. Maitland. The hill itself consists of a hard massive basic rock resembling a dolerite, while the country alongside is much sheared for a width of some hundred feet.

As will be seen from the assay results given hereunder the reef in the north open cut was six inches in width and gave an assay result of 9ozs. 11dwts. 5grs. per ton in value, and the reef in the south open cut, 350 yards south, was 10 inches in width and assayed 9ozs. 6dwts. 20grs. per ton in value. The formation alongside the reef carried low values only.

——	Width.	Value.
North Open-cut—	inches.	ozs. dwt. grs.
Reef on hanging wall	6	9 11 5
Formation on footwall	12	0 1 15
South Open-cut (350 yards south of North Open-cut—		
Reef on hanging wall	10	9 6 20
Formation on footwall	18	0 0 5
Costean (80 yards south of South Open-cut)—		
Formation Eastern Section ...	36	trace
Formation Western Section ...	36	,,

8.—GRAPHITE DEPOSIT AT AJANA.

(20th July, 1925.)

I wish to place on record the following **brief** description of a graphite occurrence in the Ajana district.

Location and General Description.—This deposit is situated five miles north by east from Ajana Siding, just at the boundary between Locations 37 and 38. Two pot holes each about two feet in depth have been sunk in a graphitic gossan. A sample taken of this material was described by the Government Mineralogist and Analyst as a highly ferruginous rock with 11.94 per cent. of fine flake graphite. He reports also that such outcrop material cannot be successfully concentrated, all concentrates being too highly interlaminated with limonite. The deposit it evidently associated with a basic dyke intruding the granite as well as with pegmatite dykes. Two floaters of the basic dyke were determined by Dr. Simpson. One he described as a dolerite dyke rock typical of the Northampton Mining District, and the other on a partly serpentinised peridote, containing much unaltered olivine with serpentine augite magnetite and a little felspar.

Another sample obtained consisted of a coarse grained garnet gneiss with a small percentage of fine flake graphite.

The extent of the graphite deposit could not be estimated, but seemed to be at least 10 and perhaps 20 feet in width.

Provisionally at least I am prepared to regard the graphite as of magmatic origin. In this, and also in another smaller occurrence east of Mary Springs mine, the graphite is associated with an ultrabasic phase of the intruding dyke. A sample taken from the deposit east of Mary Springs consisted of magnesite boulders enclosing occasional small flakes of graphite. Such surface boulders of magnesite are the usual surface indications of the presence of an ultrabasic rock.

9.—GOLDEN HOPE GOLD MINE.

(29th July, 1925.)

As instructed, I visited the Golden Hope G.M. on the 24th inst., and have to report as follows:—

The lode strikes north-west and south-east and dips west at a steep angle, but, as will be noted by reference to the longitudinal section* attached, the pitch of the ore shoot is to the north at an angle of about 30deg.

On account of this northerly pitch payable values were not met with in the north drive at the No. 2 level until 145 feet of driving had been done, and if the pitch remains the same the shoot of ore will begin to pass out of the company's lease at a depth of 240 feet and will have completely passed out at a depth of 340 feet.

The values met with in driving at the No. 2 level are as shown on the sketch* attached and average 11.5dwts. per ton of 2,000lbs. for an average width of 4ft. 11in.

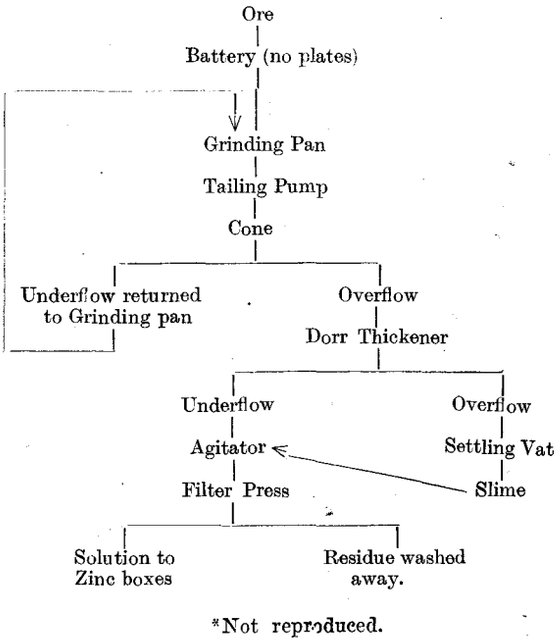
Ore Treated.—I understand that ore treatment started in July, 1923. From that date to the end of June, 13,898 tons (2,240lbs.) of ore were treated yielding bullion to the value of £28,126. The residue, I am informed, assays 3s. to 4s. per ton.

The results obtained in recent months have been as follows:—

April—Tonnage treated 782 tons (2,000lbs.)	
Expenditure on mining	£719
Expenditure on development	22
Expenditure on treatment	652
Total	£1,393
Value of gold won	£1,246
Loss on operations	147
May—Tonnage treated 805 tons (2,000lbs.)	
Expenditure on mining	£691
Expenditure on development	37
Expenditure on treatment	651
Total	£1,379
Value of gold won	£1,262
Loss on operations	117
June—Tonnage treated 830 tons (2,000lbs.)	
Expenditure on mining	£625
Expenditure on development	150
Expenditure on treatment	646
Total	£1,421
Value of gold won	£1,536
Profit on operations	115

Note.—This expenditure does not include insurance, which is paid in Adelaide, or Adelaide office expenses.

The treatment is indicated in the following flow sheet:—



*Not reproduced.

General Remarks.

Apparently the mine under present conditions just barely pays expenses, and furthermore the shoot of pay ore is rapidly passing out af the company's lease into one reserved for themselves by the Hampton G.M. Areas, Ltd. This latter company own the whole of Block 48.

It seems a pity if this mine should be abandoned when the lode going underfoot is worth 11½dwts. per ton and averages 4ft. 11in. in width.

Owing to the pitch of the shoot I could not recommend sinking the shaft another lift. The development work which I would like to see done now would be a winze from the southern end of the shoot at the No. 2 level following the shoot down. The winze should be put down on an even grade bearing in mind the possibility of eventually converting it into portion of an underlay shaft from the surface.

10.—VILLIERS AND ALEXANDER'S P.A.

(1st August, 1925.)

I visited this P.A. on July 4th last and have to report as follows:—

Location and General Description.—Its location, I would say, is about 11 miles south-east of Yalgoo.

A shaft has been sunk 62 feet in soft oxidised schist, probably an altered greenstone. The foliations of the schist run in a north-easterly direction, and near the surface, I gathered from Alexander, the lode seemed to follow them. At the bottom of the shaft, however, he gave me to understand the trend of the values seemed to be at right angles to this direction.

A few samples were taken by myself, giving the following results:—

	Width.	Value.
	inches.	ozs. dwt. grs.
No. 1 Sample across S.W. end of shaft 4ft. from bottom	54	0 0 13
No. 2 Sample across N.W. end of shaft 4ft. from bottom	54	0 2 17
No. 3 Sample across S.E. end of shaft 4ft. from bottom	45	0 13 23
No. 4 Sample across face of cuddy 5ft. S.E. of shaft 10ft. from bottom...	36	trace
No. 5 grab sample of picked ore at grass	...	27 16 0
No. 6 grab sample of seconds ore at grass	...	0 10 12

The picked ore at the surface is undoubtedly rich, some of it showing free gold freely. My sample No. 5 which consisted of a few pieces picked at random gave an assay result of 27ozs. 16dwts. per ton.

Sample No. 6, which was a grab sample of the discarded portion of the shaft material, assayed 10dwts. 12grs. per ton.

The occurrence appears to me to be that of a rich but short shoot or pipe of ore. I recommended the owners to drive from the bottom of the shaft endeavouring to keep on the values. By so doing they will prove the length of the shoot, and if this happens to be short as appearances suggest, driving may result in the location of other shoots.

11.—REPORT ON GREENBUSHES.

(20th August, 1925.)

As instructed, I visited Greenbushes on the 6th instant and went into the proposals of the Greenbushes Road Board with Mr. Lindsay and other members on the ground.

I found they were anxious for some form of assistance to prove the lodes on the Cornwall lease below

water level, and that they had been discussing three proposals among themselves, viz.:—

Proposal 1.—To put in a tunnel from the vicinity of the State mill into the hill to cut across the lodes at a depth of about 100 feet, and to drain them down to this depth.

After going into the matter of levels and distances, the applicants decided this proposal would involve very considerable expense and could not be advocated.

Proposal 2.—To sink a new shaft just on the west side of the Cornwall main lode to a depth of, say, 160 feet and test this lode at a depth of 150 feet, leaving 10 feet of a well hole.

This proposal has a good deal to recommend it, as the Cornwall main lode on general appearances seems to be the principal ore body on the lease, and it could be conveniently worked by a shaft alongside it.

Proposal 3.—To sink the existing main shaft from its present depth of 130ft. (?) to 160ft., and crosscut east and west at a depth of 150ft., leaving a well hole 10ft. deep.

The shaft appears to be in fairly good order, and, as will be noted from the plan attached,* is conveniently placed to work the east lode, and a west crosscut will intercept the southern continuation of the middle lode as well as the Cornwall main lode.

I am inclined to favour this proposal.

The east crosscut to the east lode will be about 50 feet in length and the west crosscut to the main lode about 170 feet.

I could get very little information regarding the cost of shaft sinking or crosscutting, or the amount of water making in the shaft. I gathered that this could not be heavy as a comparatively small pump had previously coped with it.

Under the circumstances no accurate estimate of cost is possible, but judging by the nature of the country rock on the dump, a fairly hard hornblende schist, shaft sinking will not, I should say, cost under £10 per foot. Crosscutting will, of course, be a good deal less, perhaps £3 to £4 per ton, making the estimated cost as follows:—

Shaft sinking 30ft. at £10	£300
Crosscutting, 210ft. at, say, £3 10s. ..	735
	£1,035

There would also be a certain amount of preliminary work cleaning out the shaft, etc., and the purchase and installation of the necessary machinery.

Mr. Lindsay spoke of a gas or oil engine, but as the Inspector of Mines would not permit this shaft to be sunk under a friction hoist, and firewood is plentiful, I am inclined to think that the most suitable plant would consist of a boiler, winch, and steam pump.

Grade of Ore.—Mr. Uphill, who was present, informed me that he worked the east lode 30 years ago, and that down to the 60ft. level it averaged from three to four ounces to the dish (i.e., 21lbs. to 28lbs. per cut yard). From 60 to 80 feet he followed a white streak only. At 80ft. a granity quartz came in carrying tin, which he sunk on for 20ft. Its width was about 8 feet, and the portion taken out by him averaged ½lb. of tin oxide to the dish (i.e., 56lbs. to the cubic yard). He gave me to understand that since then Hunter had crosscut to this lode from the main shaft, and had worked out some of the lode. I was informed by Mr. Gibney that he had spent some money in driving south at the 100ft. level with indifferent results.

The main lode on the Cornwall has been worked for over 500 feet in length, and is said to have averaged at least 3ozs. to the dish (21lbs. per cubic yard) down to a depth of 70 feet.

Tinstone is at present worth about 1s. 6d. per lb., so that ore yielding 3ozs. to the dish is worth 31s. 6d. per cubic yard, or roughly 25s. 8d. per ton.

There might be a small margin of profit on ore of this value if worked on good lines.

I think assistance to carry out either proposal No. 2 or No. 3 can be recommended.

*Not reproduced.

12.—THE BERYL DEPOSITS OF POONA AND FERNDALE.

The State Mining Engineer.

In view of an inquiry through the Agent-General regarding the possibility of securing a beryl property in this State, it was thought advisable that I should examine the accessible deposits and furnish a report.

Accordingly, as an opportunity presented itself, I inspected the deposits at Poona and Ferndale, and beg to report as follows:—

Beryl at Poona.—In company with Dr. Simpson, Government Mineralogist and Analyst, and Mr. Deeble, Inspector of Mines, I arrived at Poona on the evening of the 18th June, and left again on the morning of the 21st. The following is a brief description of the occurrence:—

Geology and Location.—Poona is situated 40 miles N.W. of Cue in a comparatively small greenstone area surrounded by granitic rocks. This area has been described by the late H. P. Woodward in Geological Bulletin No. 57, published in 1914, as follows:—

"In the main belt of the central area of this field the rocks consist of highly altered schist, but owing to their weathered nature it is impossible to determine their true character from surface samples. They are intersected by a perfect network of pegmatite dykes and quartz veins, the latter being in all probability alterations of the former, whilst bosses of porphyritic granite representing magmatic intrusions from which the minor dykes radiate are also exposed in places. The surface of the area occupied by these schists is covered by a thin coating of soil thickly covered by lumps of quartz.

"The schist area is intruded by two main basic dykes which follow the general direction of the belt, the eastern and older of which forms the main central ridge of the area. The rocks comprising it are all more or less schistose, and often micaceous, particularly in the proximity of the porphyritic granite or pegmatite dykes, which latter sometimes intrude them. They are not as a rule intersected by either pegmatite or quartz dykes, but where these are met with in one or two instances they have proved to be either beryl or tin bearing.

"The second or western dyke is of a massive dolerite, schistosity being only developed at the extreme south-eastern end, where it comes in contact with the granite."

A copy of Mr. Woodward's Geological Plan, showing also the Mineral Leases and Prospecting areas

taken up since it was prepared, accompanies this report. Detailed mapping of the pegmatite dykes would be hardly practicable in a plan of this size, and was not attempted.

These pegmatites are the source of both the beryl and tin of the district, and may be regarded as the lodes. They are mostly in the basic schist country, which away from the dykes consists largely of chlorite, but alongside them has been converted into biotite. This biotite schist alongside the pegmatites contains some of the most perfect beryl crystals.

Distribution of Beryl and Tin.—The principal beryl finds have been—

(1) On Mineral Lease 45, situated about 20 chains south of No. 3 bore.

(2) On M.L. 49, situated 100 chains N. 70° E. from M.L. 45, and

(3) On M.L. 73 130 chains N. 115° E. of M.L. 45. The principal tin finds would appear to have been on M.L. 12 and along the gully running through M.L. 19, M.L. 59, and M.L. 52.

As far as I know tin and beryl have not been recorded in the same pegmatite lode, but such an occurrence is quite probable, as beryl is known to occur in the tin lodes at Greenbushes.

Mineral Lease No. 45.—One prospector was camped on this lease, but there was no evidence of recent work. Judging by the size of the dumps a considerable amount of exploratory work has been carried out, at a shallow depth. The shafts, which are now in a state of collapse, have been sunk in beryl bearing biotite schist alongside pegmatite dykes. Although the dumps have been picked over by many visitors a good deal of small beryl is still lying about. A few holes have also been fired in the solid pegmatite, and some beryl was exposed. More tourmaline was found on this lease than elsewhere, but even here it was not at all plentiful.

It was regrettable that the shafts were inaccessible, but nothing that I observed or that I could learn indicated that the beryl occurred in sufficient quantity to admit of its being profitably mined at the present market price of, say, £13 per ton. On this lease and indeed on all the others it would seem that mining operations would have to be carried out for emeralds principally. In the course of such operations a quantity of beryl could no doubt be set aside, and when sold would help to defray mining costs.

Mineral Lease 49.—On this lease also prospecting operations have been carried out at a shallow depth in the biotite schist alongside the pegmatites. In one hole some small but better coloured crystals of beryl were found embedded in the schist.

Mr. Pearl, a jeweller in Perth, informed Dr. Simpson and myself that from amongst the crystals of beryl forwarded to him from this lease he picked out one clear bright green emerald and another even better coloured crystal, which, however, had been broken by the prospectors when breaking up the schist in search of such emeralds. He informed us that he had then mounted and disposed of them in London for £150.

Mineral Lease No. 73.—A fallen-in shaft surrounded by a fairly large dump, perhaps 100 tons or more, is situated in about the position indicated on the geological map. This is shown just inside the boundary of M.L. 73, and just outside the boundary of M.L. 56. The leases have never been surveyed, however, and we could not be quite sure which of these two leases it was really in. The matrix consists as usual of biotite schist, and is much weathered. A large number of small beryl crystals are lying about the surface.

Mineral Lease No. 12.—On this lease there was a shallow shaft in kaolinised pegmatite containing some small but very perfect crystals of tin. There were also several costeans across pegmatites. Very little mining work had been done on the lodes, however. The prospectors seem to have given most attention to the alluvial tin in the creek bed.

This centre was visited and reported upon by Mr. A. Montgomery in 1909, when tin mining was in progress. There were then 12 men at work on the tin field. Mention is made by him of the presence of manganese columbite, wolfram, and scheelite associated with the tin.

COMPOSITION AND ORIGIN.

Emeralds are bright clear emerald green varieties of beryl, the colour being due to the presence of a little chromium, having a chemical composition of $Be_2 Al_2 (SiO_2)_6$, i.e., a silicate of beryllium and aluminium.

The elements in the above mentioned formula were present in the molten magma which formed the pegmatite, and early at the cooling process these combined to form crystals of beryl. It is obvious that these crystallised out before the quartz and felspar from the fact that the beryl is found embedded in these minerals. It is not quite so easy to say by what process the beryl finds its way from the magma into the adjoining schists, but there is no doubt that it was brought up by the magma in molten form. The same is also true with regard to tin which is present in some of the pegmatites.

CONCLUSION.

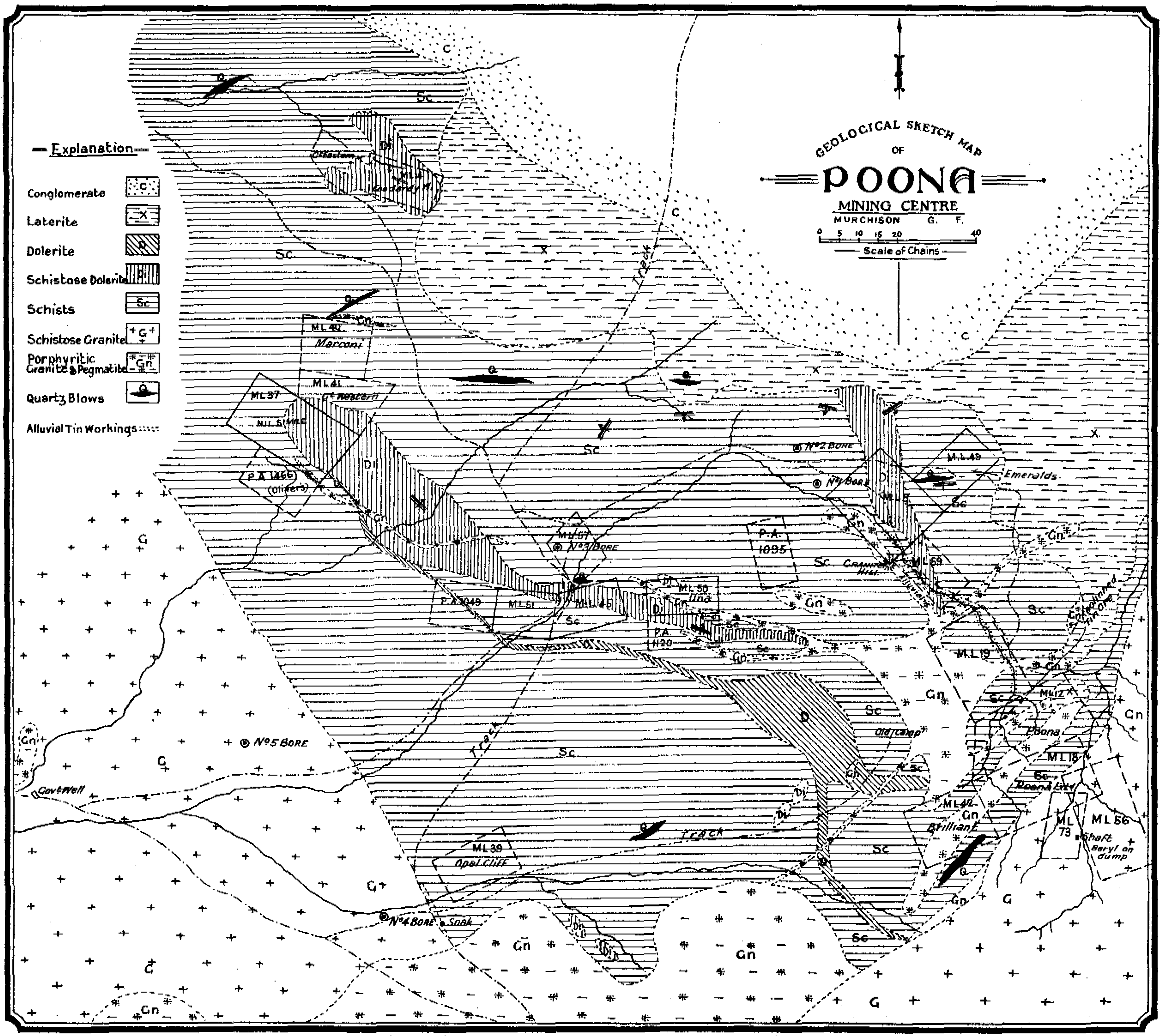
As far as the direct object of my visit was concerned, viz., to ascertain if the beryl could be profitably mined and sent to the market at the present price of about £13 a ton, it was unfortunate that the underground workings could not be inspected. Such evidence, however, as I was able to collect pointed to the fact that the beryl is too scattered through the pegmatites and the schist alongside them to admit of its being profitably mined at this price. At the same time it should be borne in mind that a few valuable emeralds are reported to have been obtained, and as these rank equal to the diamond in value prospecting for gems might be quite worth while, and in the course of this work a quantity of common beryl would no doubt be obtained which would help to defray mining costs.

BERYL AT FERNDALE (NEAR BALINGUP).

Accompanied by the owner, Mr. Grasby, I visited this occurrence on 5th August.

Location.—This beryl deposit is situated on Ferndale Estate, approximately 4 miles south-west of Balingup Railway Station.

Geology and General Description.—The country rock in this vicinity consists of a hornblende schist composed mainly of hornblende and felspar, with minor amounts of ilmenite and apatite. The extent of this country rock is not known, but it appears to be identical with that occurring at Greenbushes seven


GEOLOGICAL SKETCH MAP
OF
POONA
MINING CENTRE
MURCHISON G. F.
0 5 10 15 20 40
Scale of Chains
Explanation
Conglomerate
Laterite
Dolerite
Schistose Dolerite
Schists
Schistose Granite
Porphyritic Granite & Pegmatite
Quartz Blows
Alluvial Tin Workings
ML 40
Marconi
ML 41
Gt Western
ML 37
P.A. 1456
(Olivers)
ML 57
Nº 3 BORE
Nº 2 BORE
Nº 1 BORE
ML 49
Emeralds
P.A. 1095
ML 69
ML 50
Una
P.A. 1049
ML 51
ML 46
P.A. 1120
ML 19
ML 12
Poona
Old Camp
ML 18
Poona Ext
ML 42
Brilliant
ML 73
ML 56
Shaft
Beryl on dump
Nº 5 BORE
Govt Well
ML 39
Opal Cliff
Nº 4 BORE
Soak
Track

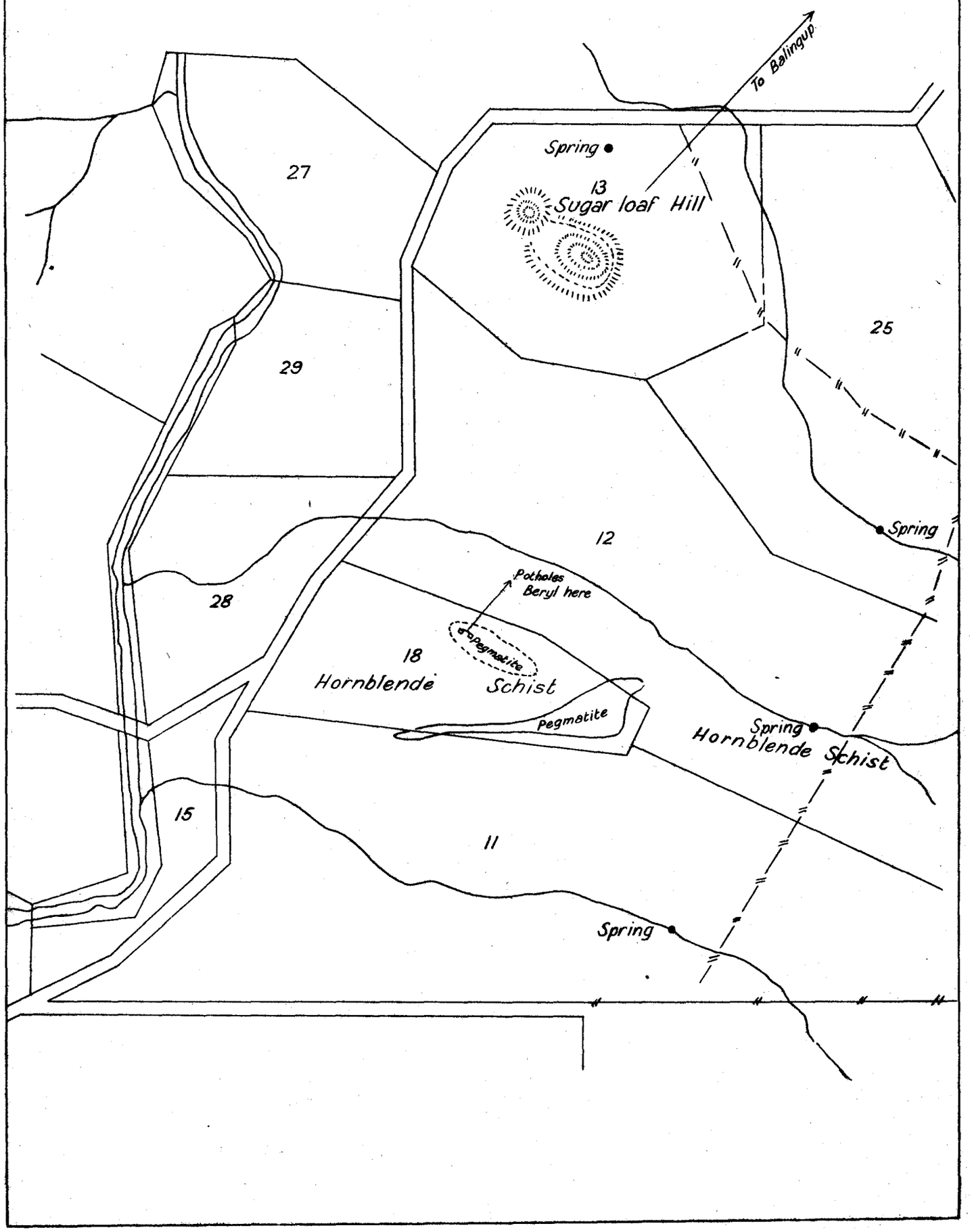
Copy of Plan by H.P. Woodward published in 1914 in Geological Bulletin Nº 57 shewing in addition position of leases taken up subsequently.

— BERYL OCCURRENCE AT FERNDALE —

— NEAR BALINGUP —

Chs. 10 5 0 10 20 Chs.

— Scale —



miles east. This is important from an agricultural view point as this rock on decomposition and disintegration forms a rich chocolate coloured soil.

Intruding this hornblende schist are two large coarsely crystalline pegmatite dykes composed of quartz, muscovite mica and microcline felspar. I saw no mica of commercial size, but the felspar was in places obtainable in large clean white masses several pounds weight in each. A previous sample from this vein submitted to Dr. Simpson contained 12.56 per cent. of potash and 2.86 per cent. of soda with traces only of iron. Dr. Simpson regarded it as an excellent material for pottery purposes.

The most northerly of these pegmatite dykes is several chains in width, has a strike of N. 120° E. and after outcropping for perhaps 10 chains disappears under well grassed soil. At the north-western end of this dyke on the fall of a hill about ½ ton of beryl crystals were obtained from two pot holes, each two or three feet in depth. Some of the best of these were gathered up and sent to the Government Mineralogist and Analyst, who reported as follows:—

"The parcel consists of 8 large specimens of beryl weighing from 1½ to 5¼ lbs. apiece, with an average of 3 lbs. The specimens are not contaminated with more than traces of any other mineral, and would be considered as of the best quality for porcelain makers' use, or for the preparation of beryllium alloys and compounds. A 7 lbs. sample submitted by Mr. A. Oliver in 1923 assayed 13.23 per cent. BeO. The mineral is entirely useless for gem purposes, being irregularly and imperfectly translucent, and of a poor greyish to yellowish tinge."

These two holes represented the whole of the prospecting work done. It would seem that the beryl segregates out in patches which, unfortunately, appear to be very isolated.

Mr. Grasby and I walked over the outcrop without observing any similar rich patches. The southern pegmatite outcrop has an east and west strike, and is more or less bottle-shaped, being comparatively narrow at the west end and widening out going east. It was on this outcrop that Mr. Grasby first discovered a beryl crystal. We could find no indication of any accumulation into a workable patch.

CONCLUSION.

I came to the conclusion that probably isolated rich patches of beryl occur through these deposits, but that these are so far apart that it would be unprofitable to prospect and mine the deposit for its beryl contents alone. If there were a steady demand for felspar for pottery purposes it might perhaps be worked for its felspar contents, beryl being obtained at the same time as a by-product.

RICHARD C. WILSON,
Assistant State Mining Engineer.

15th September, 1925.

13.—COAL AT NORNALUP.

The State Mining Engineer:—

As instructed I visited Nornalup on 21st November, 1925, and have to report as follows:—

Geology.—The formations exposed in the vicinity of Nornalup consist of—

(1) Superficial deposits consisting of sand dunes and alluvial deposits.
(2) Shallow sedimentary deposits, consisting of soft sandstones, showing little or no structure which contain the brown coal.
(3) Crystalline gneiss, which forms the floor upon which the older formations have been laid down.

In addition to the above, coastal sandstones with their customary false bedding are showing at intervals along the coast resting on the crystalline gneiss. I was not able to determine definitely whether these sandstones are younger than the brown coal formation, but at Conspicuous Hill the evidence rather pointed in this direction.

Location and Description of Coal Deposit.—The coal can be seen outcropping along the North-Eastern portion of the Inlet. The top of the coal seam is practically at high water level and its total thickness has not been determined. A prospecting shaft that had been sunk into the coal at the water's edge had, unfortunately, filled up with sand. I was informed by Mr. T. H. Swarbrick, who helped to pay for the sinking of it, that this shaft was sunk 14 feet in solid coal and that no bottom had been reached.

The coal is overlain by a comparatively soft sandstone, which, in turn, is covered with sand. Another shaft was sunk on top of the hill, a hundred yards or so back from the shore, and he informs me that the coal was met with at a depth of about 40 feet, but that water and running sand prevented the prospectors from sinking through it.

The coal on the shore is associated with large quantities of iron pyrites (marcasite). In places so much of this was strewn along the bottom of the water that it was found advisable to avoid scraping the bottom of the boat along the lumps.

In the absence of any boring or other exploratory work, little idea of the extent of the deposit could be formed. It can be traced along the shore in an east and west direction for, perhaps, a mile or more, but no indication is given as to its limits in a northerly and southerly direction.

In a westerly direction the coal formation gives out before the opening into Walpole Inlet is reached, its

place being taken by an outcrop of gneiss, intersecting which a pegmatite dyke was noticed.

In an easterly direction river swamps are met with, but an outcrop of gneiss occurs at Bellinger's house, four miles east, and another outcrop was noticed between it and the coal.

At Conspicuous Hill, which, it will be noted, is a little over six miles east by south of the outcrop, I was informed by Mr. Swarbrick, there was a deposit of similar coal. Unfortunately, at the time visited by me, the site was sanded over and owing to the excessive wetness of the sand, it fell in as fast as we tried to dig a hole. In consequence, a little carbonaceous material only was obtained.

There is an outcrop of garnetiferous gneiss almost alongside this deposit in a south-westerly direction. Conspicuous Cliff, which rises up alongside, consists largely of coastal sandstone. The coal appears to continue under this hill. It may, of course, be cut off by it, however. This information would enable us to say whether the coal is older or younger than the coastal sandstone.

The frequency with which outcrops of gneiss occur on all sides of the coal formations, suggest a shallow sedimentation only. This formation appears to occupy an area of slight depression in the gneiss, possibly irregular in shape, and was formerly a swamp.

Quality of Coal.—An air dried sample of the coal was submitted to the Government Mineralogist and Analyst for analysis, giving the following result:—

Assay Certificate.

Proximate Analysis and Calorific Value of a sample of Brown Coal, from Nornalup, for Mr. R. C. Wilson, Assistant State Mining Engineer:—

No.	Private Mark or description.	Result of Assay.
3136/25	Brown Coal Nornalup.	Proximate Analysis:—
		%
		Moisture ... ... 6·95
		Volatile matter ... 38·64
		Fixed carbon ... 18·50
		Ash ... ... 35·91
		100·00
		Calorific Value, 5,697 B.T.U.
		The volatile matter consists of:—
		%
		Water ... ... 10·88
		Oil ... ... 2·00
		Gas ... ... 25·76
		38·64

Remarks.—The gas yield (approximately 13,000 cub. ft. per ton), is apparently high, but that yielded by such coal is invariably of poor quality, containing a large proportion of carbon monoxide and dioxide.

(Sgd.) EDWARD S. SIMPSON
Government Mineralogist and Analyst

For comparative purposes the following table, taken from "The Mineral Resources of Western Australia," edited by Dr. E. S. Simpson, is instructive:—

ANALYTICAL DATA OF WESTERN AUSTRALIAN COALS.

Locality and Name of Mine.	Thickness of Seam.	Fixed Carbon.	Volatile Hydrocarbons.	Ash.	Moisture.	Sulphur.	Nitrogen.	Calorific Value. B.T.Us. as received.	Calorific Value. Ash and Moisture Free basis.	
COLLIE COAL FIELD.	feet.	%	%	%	%	%	%			
Collie—Co-operative	7	46·11	26·97	7·85	17·50	0·43	1·14	10,017	13,420	These five seams supply coal to the "Trade" and these figures represent the coal as received by the Railway Department at the Collie Depot.
,, Westralian No. 1 ...	10	45·04	27·50	8·30	17·50	0·51	1·15	9,997	13,473	
,, Proprietary	9	42·91	27·30	6·67	21·50	0·42	1·20	9,500	13,224	
,, Premier	5½	33·70	39·30	2·40	23·00	0·60	1·00	9,670	12,962	
,, Cardiff	7	37·63	33·00	4·63	23·00	0·80	0·94	9,157	12,653	
Collie—Westralian No. 2 ...	8	50·52	25·8	4·74	17·50	0·31	1·13	10,776	13,858	Seams opened up at Collie but not supplying coal.
,, Griffin Co.'s Seam ...	8	...	...	3·25	23·0	...	...	9,713	13,190	
WILGA COAL FIELD.										
Wilga—5ft. seam	5	41·57	31·38	8·95	18·10	...	...	8,813	12,081	Recently discovered fields.
,, 6ft. seam	6	35·59	28·61	8·36	27·44	...	...	8,018	12,490	
,, 9ft. seam	9	41·36	31·74	7·49	19·41	...	...	8,813	12,055	
OTHER BLACK COAL FIELDS.										
Irwin River—Tunnel	5	36·83	26·89	13·92	22·36	0·99	...	7,690	12,068	(Average).
,, ,, Bore	12	28·75	26·81	22·63	21·81	...	...	6,154	11,076	
Greenough River	4	34·39	39·18	17·57	8·36	...	...	8,369	11,374	
Fly Brook	5	46·45	37·42	2·82	13·31	...	...	10,167	12,122	
BROWN COALS.										
Donnybrook	5	24·09	29·08	13·36	33·47	...	...	6,423	12,078	(Average of 5 tests).
Deep River	?	11·28	23·89	57·03	7·80	...	...	...	...	
Nornalup	?	16·97	34·55	28·77	19·71	...	...	4,573	8,876	
Pallinup River	?	40·56	42·24	3·30	13·90	...	...	8,910	10,763	
Fitzgerald River	?	26·92	16·70	15·42	40·96	...	...	4,886	11,201	
HYDROUS OIL SHALE.										
Coolgardie	6	9·45	23·62	36·37	30·56	...	...	...	...	

Possible Uses.—It seems unlikely that coal of this quality can be put to any commercial use at present.

It is well worth putting particulars of this deposit on record, however, as one never knows when some use may be found for it.

In January, 1925, for instance, we had an inquiry, regarding inferior coals containing a high proportion of ashes from the Ingersoll Rand Company, advising us that they had received an important order from a French firm who were putting in a plant for producing cement by burning poor coal with a convenient proportion of limestone and other materials.

It was stated that the method had proved so satisfactory in France and some other countries, that they were considering the development of the process in other parts of the world.

Apparently the process consists of making cement clinker directly from the ash of stoney coals fed into cement furnaces in pulverised form, together with the necessary amounts of clay, alumina, etc., to make a proper cement-making mixture.

Other uses to which brown coals of this quality could be put would be for burning on the spot for convertion into electrical power and possibly for the production of briquettes.

Conclusion.

1. The coal occurs at and a little below high water level in Nornalup Inlet.

2. According to the information supplied by Mr. Swarbrick, a shaft, 14 feet deep, had not gone through it, proving it to be of greater thickness than this.

3. It can be traced along the northern shore of the inlet, a distance of a mile or more.

4. The number of outcrops of gneiss in all directions point to the coal formation being a shallow one. Its extent can only be determined by boring.

5. The coal is a brown coal high in ash, having a calorific value of 5,697 B.T.U. Collie coals average about 9,500 B.T.U.

6. It is unlikely to have any immediate commercial value, but could be used for cement making, as a local fuel and possibly for making briquettes.

Dr. Simpson's investigations of this coal as a cement material are appended.

R. C. WILSON,
Assistant State Mining Engineer.

23/2/1926.

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Appendix.

THE INVESTIGATION OF NORNALUP BROWN COAL AS A CEMENT MATERIAL.

Proposals have been made from time to time to utilise brown coals with high ash contents as a source of cement, the combustible matter providing the necessary heat, and the ash acting as a substitute for the whole or greater part of the clay component of the charge. In the following lines the application of these proposals to the Nornalup brown coal is discussed on the basis of the sample of coal collected by Mr. R. C. Wilson recently. It should be borne in mind that this sample laid no claim to be typical of the whole thickness of the seam, and furthermore, was taken at an outcrop where the composition usually varies from that of the main mass under cover.

The coal had the following composition:—

		per cent.
Moisture		6·95
Volatile: Water	10·88	
Oil	2·00	
Gas	25·76	
		38·64
Fixed carbon		18·50
Ash		35·91
		100·00

Including previous analyses of this coal, moisture percentages range from 7.0 to 19.7, and ash percentages from 18.9 to 35.9.

The composition of the ash was—

SiO_2	57·67	K_2O	1·34
Al_2O_3	29·06	TiO_2	2·88
Fe_2O_3	4·85	CO_2	·06
FeO	·29	P_2O_5	·23
MnO	·07	SO_3	1·14
MgO	·51	V_2O_5	·07
CaO	·16	Cr_2O_3	·39
Na_2O	1·24	ZrO_2	traces
			99·96

This ash carries about 14 per cent. of quartz and 62 per cent. of dehydrated kaolin, the balance being mica, iron oxide, etc.

Assuming that a 93 per cent. limestone would be available locally for cement making, calculations were made to determine the ratio of limestone to ash which would give the required cementation index between 1.0 and 1.2, and an acidity ratio* between 2.0 and 3.5. The best mixture was found to be 5 parts of limestone to 1 of ash. Such a mixture would contain—

	per cent.
SiO_2	15·45
TiO_2	·47
Al_2O_3	4·83
Fe_2O_3	·80
CaO †	43·60
CO_2, etc.	34·85
	100·00

This mixture would have a cementation index of 1.14 and an acidity ratio of 2.8, and would therefore be a suitable mixture for the production of Portland cement.

To produce one barrel (375lbs.) of cement would require 475lbs. limestone and 265lbs. Nornalup coal carrying 95lbs. ash. The combustible matter in this mixture would amount to 122½lbs., having a total calorific value of approximately 1.5 million B.T.U.

Using a dry mixture, Eckel considers it takes about 1.75 million B.T.U. to produce a barrel of cement (130lbs. of coal with a B.T.U. of 13,500). For the wet process as adopted at Rivervale, Eckel considers 33 per cent. more thermal units are required, or about 2.3 million B.T.U. Even for the dry mixture there would be a deficiency of thermal units in the Nornalup coal, necessitating the addition of 26lbs. of good Collie coal for each barrel of cement. For the wet process 90lbs. of Collie coal would have to be added per barrel.

These calculations are made on the assumption that local capstone would contain not more than 7 per cent. of silica. If the percentage rose to 10, as it very well might, there would be no probability whatever of being able to make cement with a mixture of Nornalup coal and local capstone. On the other hand, a reliable sampling of the coal seam by boring might show that on the average the seam contains less ash and more combustible matter, which would considerably brighten the prospects.

EDWARD S. SIMPSON,
Government Mineralogist and Analyst.

* *Vide* Eckel, "Cements, Limes and Plasters," p. 299.

† Including equivalent of MgO, etc.

APPENDIX No. 4.

GOLDEN HORSESHOE ESTATES MINE.

The Under Secretary for Mines.

On 15th and 16th instant (December, 1925) I visited the Golden Horseshoe Mine at Boulder to look into the position of affairs there, as a request had been received from the Manager for a further guarantee by the Government of the Company's overdraft at the Bank of New South Wales of £25,000, in addition to that approved last August of a like amount. The Manager and Attorney for the Company, Mr. J. W. Sutherland, explained the position very fully, gave me any plans and tabulated figures, for which I asked, to elucidate it, and showed me the work in progress in the lower levels of the mine, giving all possible information and assistance in arriving at the facts of the position.

The Golden Horseshoe Leases comprise in all 109 acres of ground, but the mine is practically all within Gold Mining Lease 351E, of 24 acres. The longer axis of this lease runs N.N.-Westerly, and immediately adjoining on the East side are the two principal leases of the Great Boulder Proprietary, Ltd. The north boundary of the lease divides it from the principal lease of the Ivanhoe Mine, and the south boundary from the Chaffers Lease. The Ivanhoe lodes run through the Golden Horseshoe ground into that of the Chaffers Mine, and the Great Boulder main lode dips across the eastern boundary at a depth of about 2,500 feet from surface, and is then in the Golden Horseshoe lease at all lower levels. This lode also goes across the south boundary into the Chaffers lease.

The Golden Horseshoe has worked lodes known as Nos. 1, 2, 3 and 4, the last-mentioned being the Great Boulder Proprietary lode, and Nos. 3 and 2, the principal Ivanhoe lodes. The whole system of lodes has a somewhat steep underlay westward, the separate veins keeping nearly parallel to one another as they go downwards, but the Ivanhoe lodes have a more westerly strike than the Great Boulder one and diverge from it going to the north-west, but approach nearer to it going south-easterly. The group of lodes is the very heart of the "Golden Mile."

To the end of 1924 the Golden Horseshoe's share of the production has been 4,668,967 tons of ore, from which has been recovered 2,915,741 ozs. of fine gold.

	£	s.	d.
Working expenses have been ..	6,841,236	7	7
Development	732,960	17	7
Machinery and plant	609,690	15	10
And Dividends	3,652,500	0	0
Total ..	£11,836,388	1	0

The gold raised weighs about 121½ tons.

This is a very wonderful record of gold production from one 24-acre lease. For 27 years, up to the end of 1924, dividends have been declared annually, except on three occasions, 1911, 1912, and 1914, but during 1925, losses have unfortunately taken the place of profits, and a loss of some £30,000 is expected for the year.

The main shaft has been carried down to a depth of 3,404½ feet, the two lowest levels being at 3,380 feet and 3,260 feet. Levels in the deep portion of the mine are 120 feet apart.

The No. 2 shaft, which is 735 feet south-south-easterly from the main shaft, is down to about 20 feet below the 2,500 feet level, but the winding plant is hardly adequate for the work from that depth and is not permitted to haul full loads from below the 2,120 feet level. This shaft is 355 feet from the Chaffers boundary. All the development work below 2,120 feet which is going on is therefore being done from the main shaft, and it will be seen from the figures that the latter shaft has therefore to serve all the lowest part of the mine for over 1,000 feet in depth, below the lowest working level from the No. 2 shaft. It is important to remember this in connection with projects which have been put forward with regard to working the deep ground of the Chaffers lease from the Golden Horseshoe levels. It is also worth noting that very little development has been done on the Nos. 2 and 3 lodes below the 2,120 feet level, and that these are standing almost untouched for some 1,200 feet in depth above the lowest level from the main shaft.

In the Schedule marked "A" herewith,* Mr. Sutherland has supplied a summary of the ore in sight in the mine at 31st December, 1923 and 1924, in the various sections of the four lodes worked. The figures at the end of 1924 are shown in greater detail in blocks of 100 feet in length in the Schedule marked "B,"* tonnage and average value being shown for each block. By inspection of these tables it is possible to see where the ore reserves have been depleted during 1924 and where they have been added to. The grand total of ore in sight at end of 1923 was 506,931 tons, containing 210,634.20 ozs. of fine gold, or an average of 8.31 dwt. per ton, and at end of 1924 both tonnage and value were slightly lower, there being 495,137 tons of ore in sight estimated to contain 200,363.03 oz. of fine gold, or an average of 8.09 dwts. per ton. The tables show very considerable variation in the value of the various blocks of ground which have been taken into the estimate, some being a little below 5 dwts. per ton, while a few others are nearly 20 dwts. per ton value. From their position in relation to each other, it is not good mining to extract only the richest ore, although, of course, a considerable amount of "selective" stoping could be done under pressure of circumstances, and at much increased working cost. A certain amount of this has been done already, as shown by the follow-

* Not printed herewith.

ing extract from the Company's annual report for 1924:—

> "In 1923, owing to abnormal conditions, it was necessary to draw our supplies of ore from the higher grade stopes, averaging 4.39 dwts. per ton above the grade of the reserves. During last year we were able to reduce this difference to 3.03 dwts. per ton. The reduction in the tonnage and value of our reserves is due to the depletion of ore in many of the high grade stopes of our No. 4 lode, and the disappointing nature of some of the development work."

Mr. Sutherland's letter of 5th December, 1925, (page 103 of file 533/18), asking for a further guarantee to the Bank of New South Wales, gives as the reason of the falling off in the gold returns for September, October, and November, that it is "owing to an unusual number of our stopes passing through lower grade sections and not yielding ore of average value, thus considerably affecting the output."

The same letter gives the following particulars of the operations for the first 10 months of 1925 to end of October:—

Tonnage treated, tons of 2,240lbs. ..	86,576
Fine gold obtained, ounces	37,319
(equal to 8.62 dwts. per ton)	
	£
Value of gold	159,301
(equal to 36/9.6 per ton)	
Expenditure	189,444
(equal to 43/9.1 per ton)	
Loss for 10 months	30,143
(equal to 6/11.5 per ton)	

Average number of men employed—452.

Further particulars were given to me by Mr. Sutherland in table herewith marked "C,"* comprising also the month of November:—

Tonnage treated (11 months) (tons) ..	94,364
Fine gold won (ozs.)	40,526
(equal to 8.6 dwts. per ton)	
	£
Value	172,975
(equal to 36/7.8 per ton.)	
Working Expenditure	190,621
(equal to 40/4.8 per ton)	
Development	11,671
equal to 2/5.7 per ton)	
London payments	5,700
(equal to 1/2.5 per ton)	
Grand total expenses	207,992
(equal to 44/1 per ton)	
Loss for 11 months	35,017
(equal to 7/5 per ton)	

It will be seen from the foregoing that during 1925 the returns (36/7.8 per ton) have not been sufficient to meet the bare working expenditure at the mine (40/4.8 per ton) without any provision for development and London expenses, and that the total shortage has been 7/5 per ton. Yet the returns (8.6 dwts. per ton) were above the average grade of the ore-reserves as a whole at the end of 1924 (8.09 dwts. per ton). Clearly the position is most serious, with nothing but continuation of losses in sight unless either (1) better grade of ore can be obtained, or (2) expenses can be materially reduced. It is very unfortunate at the present juncture that the developments on the No. 4 lode below the 3,140 feet level have lately been unfavourable, the lode being found to be greatly broken up by a succession of slides. There is little doubt that this is only a temporary difficulty and that the lode will recover its value when the faulted zone is passed through, but for the time being the ore is much disrupted, and while tonnage is reduced working costs are also increased. This lode gives the best average ore in the property, and has been mostly stoped out above the 3,140 feet level. On the other hand, the prospects on No. 3 lode have lately improved; at the 2,780 feet level the drive north has given assays of 42/6 per ton over 6 feet width for the last 45 feet driven. This is a fine-looking strong lode. At the 2,630 feet level a diamond drill horizontal bore has also got good ore in another part of No. 3 lode, the core showing 27 feet in width of ore, assaying 89/2 per ton. A crosscut has been put in to verify this result, and, when I visited the mine on the 16th inst., this was just reaching the lode, which would be cut through very soon. Another bore at 2,900 feet level, vertically below the first, also cut the lode, but at this point it was only 6 feet wide and assayed 21/3 per ton. The same bore was carried on to cut No. 2 lode, which was 7 feet wide and assayed 21/3 a ton, this point being some 900 feet below the upper workings on this lode. Above the 2,000 feet level this lode (No. 2) has yielded 1,126,000 tons of ore averaging over 34/- per ton. Below the 2,000 feet level little stoping work has yet been done on the Nos. 2 and 3 lodes, operations having been confined to No. 4, and consequently these large and important ore bodies are standing practically unworked in the mine with the shaft 3,404 feet deep alongside them, from which they can be readily developed. It is very rare indeed to have such a position, with lodes of such a fine record of production laid open by a shaft for 1,400 feet below their lowest stoped ground. The values now being obtained below the 2,000 feet level, so far as they have gone, do not show a lower average than in the section from 1,000 feet to 2,000 feet, and it does not seem, therefore, that there has been any material falling off in the average metal contents of the lodes in the lowest parts of the mine yet reached. There is still much development to be done before this conclusion can be accepted as assured, but it can be said that present appearances do not warrant any loss of confidence in the mine maintaining its value down to the deepest levels yet reached. When the numbers 3 and 2 lodes have been fully opened up at the levels already in action on the No. 4 lode, we have every reason to expect that the tonnage in sight will be very large, and that the output can be brought up to over 250,000 tons annually, as in the decade prior to 1916.

There are no good grounds for expecting, however, that the ore raised will exceed the 8 dwts. average at present in sight, and the future of the mine depends on its being possible to obtain a margin of profit on ore not exceeding this grade. At present nearly 11 dwt. returns are required to meet all expenses, and it has only been by calling on the richer ore reserves and crushing ore 3 to 4 dwts. above the average that it was possible to pay dividends in 1923 and 1924. This year the richer ore has not been available and expenses have seriously exceeded returns on a production of 8.6 dwts. per ton. It is clear,

*Not printed herewith.

therefore, that the prospects of the mine being able to be carried on without loss depend mainly upon reduction of the expenses per ton. Improvements in the average value may be hoped for, of course, but there is nothing in the position to justify them being counted upon.

It is a serious problem to ensure that expenses can be so reduced that a profit will be obtainable on the grade of ore in the reserves, but it is to be remembered that there are three unusually large and strong lodes running right through the mine, which are accessible from existing shafts, and each capable of a very large output of ore. With active development for a year at a rate approaching 1,000 feet a month, the ore-reserves would be enormously increased, and it would be possible again to bring the output above 250,000 tons per annum. The figures of tonnage and cost in the Company's last annual report are very informative in this connection, *e.g.*:—

Year.	Tons Crushed.	Working Expenses (Excluding development). Total.	Per ton.
		£ s. d.	£ s. d.
1912	280,868	311,187 6 8	1 2 1·908
1913	280,512	319,670 2 10	1 2 9·503
1914	284,496	308,001 8 1	1 1 7·830
	845,876	938,858 17 7	...
Average per annum ...	281,959	312,952 19 2	1 2 2·382
1622	110,220	231,811 17 3	2 2 0·761
1623	90,126	194,231 9 5	2 3 1·226
1624	110,760	205,261 13 5	1 17 0·772
	311,106	631,305 0 1	...
Average per annum ...	103,702	210,435 0 0	2 0 7·018

It will be seen that the average working cost per ton in 1912-1914 was 22/2.4, with treatment of an average of 281,959 tons per annum, but ten years later, when the average tonnage had fallen to 103,702 tons, the working cost had risen to 40/- per ton. The cost of wages and supplies has risen greatly in the 10 years, but not enough of itself to increase the earlier cost by 18/4.6 per ton, or 82.8 per cent. Quite half the rise is probably due to the decrease in the tonnage treated, and would be recovered if the quantity mined and milled were to come back to its old figure. A reduction of 9/- per ton on the figures in table "C"* would convert the total loss of 7/5 a ton into a small profit, without counting any difference which would be made by the increased tonnage to the figures for "development" and "London Office expenses." These also would be reduced more or less. These figures are submitted to exemplify the difference made by increasing the tonnage rather than for any positive value they may have as practically attainable results.

The ore-reserves now in sight would be used up in about two years if crushing were resumed on a scale of 250,000 tons per annum, and it is therefore obvious that very vigorous development is required to put them well ahead of the mill. This will involve sinking the No. 2 shaft another 900 feet to make it the same depth as the main shaft, and providing it with a large new winding equipment, but by crosscutting from the levels on No. 4 lode to the position of No. 2 shaft it would be quite practicable to sink it from several levels simultaneously, and so complete the sinking rapidly. It may be suggested that it might be worth while to make out careful estimates of the cost of constructing and equipping this shaft as a two-stage one, as is now becoming customary in many deep mines, with electric winders in the second stage, from, say, 2,120 feet, the depth to which the present winder is permitted to work, to, say, 4,520 feet eventually. I understand, however, from Mr. Sutherland that he would prefer to put on a new winder capable of going to 4,000 feet in one lift like that at the main shaft. It will require careful and complete estimating of costs of equipment and subsequent working before it can be seen which is best, not forgetting that increased costs of labour for engine-drivers and platmen in the two-stage system will be more or less compensated for by much less first cost, and interest on the difference in the first cost of the lighter plant used for it. The engines and ropes for hoisting 4,000 feet in one lift are necessarily very heavy, and the hoisting speed to raise a given load must be double that used when two engines raise the load simultaneously, each lifting half the distance.

In the mill plant, I understand from Mr. Sutherland, that he desires to erect one unit of a flotation plant in order to try this method out on this particular ore on a full working scale, in the hope (which the preliminary experimental work already done elsewhere on the field abundantly justifies) that this method will prove to be a very great improvement on present practice and will lead to great simplification of the mill treatment and reduction of the quantity of machinery and buildings required, with consequent considerable reduction in milling costs. One very important advantage of the method is that it permits of all crushing being done wet, with great benefit from absence of dry and harmful dust.

The present position of the mine is hopeless unless there is a great alteration in the policy followed by the Company in recent years. As things are, ore of 11 dwts. per ton is required to meet expenses, and the average of the ore reserves is only 8 dwts., so that expenses must be reduced if working is to be continued. The best and most practical way of lowering the expenses is to raise and treat a greatly larger amount of ore, and this involves very active development work, which, in turn, requires serious expenditure from capital. My examination of the position has not been sufficiently detailed to estimate closely what developments are most necessary or what they will cost, but it will be something of the order of £5,000 a month for all the coming year, and probably around £2,000 per month for the next year. In 1912-1914 (inclusive), when the mine had its maximum output, the development costs averaged £42,784 13s. 10d. per annum, or 3/0.4 per ton of ore crushed, and for the next two years, at least, to get and maintain thereafter, an output of, say, 250,000 tons per annum, it would seem that development to the extent of 4/9 to 3/3 per ton is necessary. Since 1918 the Company has been economising on development, the average spent on it during 1919-1923 (inclusive) being £4,198 per annum. In 1924 a better showing was made, £13,947 19s. 7d. being spent in development and for 11 months of 1925 the sum has been £11,671, or at the rate of £12,732 for the year. During the same years 1919-1924 (inclusive) £240,000 were paid in dividends. Since 1914 the Company has paid £517,500 in dividends, and it would seem that the policy has been to pay dividends at all costs without regard to the welfare of "the goose that laid the golden eggs."

* Not printed herewith.

To remedy past errors in this respect it is necessary to rush new development, and for this a very considerable sum of money is required. Taking into account the existing liability at the end of 1925 of about £25,000, and a requirement for 1926 of, say, £60,000 for development, it would seem to be advisable that the Company should raise at least £100,000 to put the mine into a good position to continue to make profits, and probably it would be wiser not to provide less than £150,000 of new capital, in order to allow for improvements in the mill also.

It seems to me that the mine thoroughly warrants this provision, and that it has a long life before it if supported now through the difficulties into which it has been allowed to drift.

Table "D"* herewith, supplied by Mr. Sutherland, gives the principal items of revenue and expenditure for the year 1925 up to the end of November, with an estimate of the position at 31st December, 1925. It will be seen that the gold won showed credits over expenses in January, April, July, and August, and debits in February, March, May, and June, but that at the end of August there was still, on the whole, a small credit balance of £96. In September it was necessary to remit £1,000 to London, mostly for purchase of necessary stores, and to pay taxation amounting to £2,070, and the month finished with a debit balance of £2,219. In October and November the gold returns were much poorer than they had been previously, October finishing with a debit of £11,949, which November increased to £19,148. The expenses included £5,500 remitted to London which, I am informed, is nearly all for the purchase of necessary stores. These will be on hand for the work of the earlier months of next year, and are therefore equivalent to cash in hand. On Sheet "D"* herewith there is a table showing stores purchased and paid for through the London office for 1925, the total amounting to £9,983. The total remitted to London for all purposes is shown on the same sheet to have been £11,150.

In June last, Mr. Sutherland applied to the Government for assistance under the Industries Assistance Act by way of a guarantee to the Bank of New South Wales of an overdraft of £25,000 on account of expenses to be incurred from the date of the document. This was approved by Cabinet on August 23, 1925, and the guarantee document was executed on 22nd September, 1925. Sums of £10,500 and £6,000 were transferred from the Guarantee Account to Bullion Account in October and November, and the estimate on sheet "D"* for December shows that the whole overdraft practically will have been used by the end of December, leaving the mine with no funds to meet the expenses of January, prior to receipt of the month's bullion return. There is therefore very urgent and immediate necessity to make provision for a further outlay of, say, £10,000 for wages alone for January, payable before gold returns are available. Mr. Sutherland does not see where this amount can be secured, and consequently does not see his way to restarting the mine after the Christmas holidays until money has been arranged for. If this mine has to stop, about 455 men will be out of employment, which will probably mean loss of their living to some 2,000 persons altogether. This is a most serious position, and one to be averted if it be at all possible. It is also right upon us, and requiring most urgently that if any palliative measures be possible they must be taken at once. The Company has asked that the guarantee be raised from the £25,000, already granted, to £50,000, giving as security a mortgage and bill of sale over the whole mining property. It is very hard to guess what this would realise if the security had to be sold. The plant alone stands in the mine books as having cost £572,317 7s. 5d., all of which has been written off by annual allowances for depreciation. The value on which it is insured is £128,000, which does not appear to me to be at all excessive as a valuation as a going concern. What it would bring at a sale for removal is quite another matter and very problematical, and would depend very greatly on whether it was sold as a whole at once or piecemeal, probably over some years as occasion may serve. It seems to me very doubtful if £50,000, or even £25,000, can be regarded as safely secured by any reasonably expectable sale value of the plant.

So with the mine development also: The books show £702,672 5s. 10d. expended to end of 1924, and this has been all written off in the balance sheets. Most of it has served its purpose in production of the 4,668,967 tons already treated, but there are also 495,137 tons of ore reserves still to be raised as a result of it, and the existing development has also gone a very long way towards making accessible a very large amount of as yet only partially developed ore. This development is a very large asset to the Company if it continues operations, or to any other owner who might buy the property if it went into liquidation. But it is worth nothing unless to an owner prepared to work the mine and with adequate funds to do so.

The adequacy or otherwise of the security is therefore seen to depend very largely on the arrangements to be made for continuance of mining operations, and unless it can be seen that these would be sufficiently provided for, it would be out of the question for the Government to advance further moneys. If doing so would only prolong the life of the mine for a few months and then have a recurrence of the existing position, it would be far better to face the loss of the mine at once, with all its disastrous consequences. Doubtless a number of parties of tributers could be found to carry on a certain amount of selective mining of the richer portions, as in the case of the Great Boulder Perseverance, but this sort of work would probably result before long in the mine becoming a mere wreck, impossible to be re-opened.

If the mine should go into liquidation it would probably be purchased by one or other of the owners who hold the adjoining leases, with a view to working it with their present mines, and from the point of view of the Government and the public of the district, it does not really matter what company or owner works the mine, so long as it is adequately worked at profitable returns.

From this point of view the possibility of the Company going into liquidation can be looked upon with considerable equanimity by the public, who will feel assured that it is far too good to be left unworked. But liquidation operations often take a long time to complete, and in the meantime there would be much hardship to the men who have lost their employment

*Not printed herewith.

and also to the whole community, as the latter must suffer appreciably from the cessation of operations of such an important producer of gold. It is therefore manifest that every possible effort should be made to prevent closing down of the mine.

It is difficult to believe that the shareholders of the Golden Horseshoe Estates Company fully appreciate the position or recognise the very high value which their property still has on its merits. It is very far from worked out or proved impossible to work at a profit, and if they understood the position I cannot but think that they would readily subscribe the money necessary to put the mine again on a paying basis. To encourage them and give them necessary time to arrange for more money, either by debentures issued or by reconstruction, it seems to me that it would be good policy for the State Government to take some further risk than the £25,000 already advanced (in effect) to the mine, and make an offer to the Company that, provided the Company will undertake within six months to reconstruct or issue debentures or preference shares sufficient to provide further working capital of £150,000, under penalty of foreclosure of the mortgage on the property in the event of failure, it will guarantee further advances on overdraft at a rate not to exceed £10,000 for the month of January, 1926, and thereafter not more than £3,000 a month until the total guarantee shall have reached the sum of £50,000, to be repaid as a first charge from the further capital subscribed. The continuance of the guarantee from month to month to depend upon the Minister being satisfied with and approving of the work carried out in the mine in each month and proposed to be carried out in the succeeding month. This would give the mine a good chance to carry on without loss for time enough to bring about the arrangements for fresh capital. Should the Company not accept this offer there seems nothing better to be done than refuse further help and hope that liquidation would bring the mine into the hands of a more enterprising lot of shareholders.

A. MONTGOMERY,
State Mining Engineer.

22nd December, 1925.

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

The Under Secretary for Mines, Perth, W.A.

Office of the State Mining Engineer,
Mines Department, Perth,
14th April, 1926.

Sir,

We have the honour to submit for the information of the Hon. the Minister for Mines the Annual Report of the Board of Examiners for the year 1925.

Board Meetings.

Two Board meetings were held during the year, the first on the 21st April, and the second on the 28th October, 1925, all members of the Board being present at each meeting.

Examination for First and Second Class Certificates of Competency.

April.—An examination for First and Second Class Certificates of Competency was advertised to take place in April, but no applications to sit for certificates were received.

October.—In response to the advertised examination to be held on the 7th, 8th, and 9th October, 1925, four candidates sat for examination for Second Class Certificates of Competency, copy of examination papers herewith. Two condidates were successful, and Second Class Certificates of Competency were issued to Messrs. Jarman and Watkins. Two candidates failed to obtain the requisite number of marks for a pass.

Mr. McVee, Inspector of Mines, Collie, supervised the examination, both written and oral, and the examinees' papers were dealt with by the full Board.

We have the honour, etc.

A. MONTGOMERY,
State Mining Engineer, Chairman.
A. GIBB MAITLAND,
Government Geologist, Member.
JAS. McVEE,
Inspector of Mines, Member.

V. RUSSELL,
Acting Secretary.

THE COAL MINES REGULATION ACT, 1902.

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

Subject: VENTILATION AND DANGEROUS GASES.

Wednesday, 7th October, 1925, 10 *a.m. to* 11.30 *a.m.*

Possible Marks.	
50	1. What are the chief points to be considered in establishing and maintaining substantial and reliable ventilation in coal mines.
50	2. In a mine employing 576 men, and 22 horses to haul the coal— (a) What quantity of air must be entering the mine to comply with the Coal Mines Act? (b) How many splits will be required?
50	3. Name and describe the noxious gases common to coal mines. What are their dangers to life and their injurious effects on man? Give also their symbols, specific gravities, and properties. Where are they found? How are they produced? Give their effects on combustion.
50	4. In a return airway the quantity passing is 135,000 cubic feet per minute. This air contains 3.7 per cent. of CH_4. How many cubic feet of gas are given off in the mine; and supposing the quantity of air to be decreased to 100,000 cubic feet per minute, what would then be the percentage of gas in the air?
50	5. What are the duties of a shotfirer before and after firing a shot in a safety-lamp mine where firedamp is occasionally found?
50	6. Show how best to ventilate the workings in the accompanying plan with due regard to haulage, etc.
300	

THE COAL MINES REGULATION ACT, 1902.

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

Subject: MINING OF COAL.

Wednesday, 7th October, 1925, 11.30 *a.m. to* 1 *p.m.*

Possible Marks.	
50	1. What are the dangers to be guarded against in removing pillars, and how should a mine be laid out to minimise these dangers?
50	2. What precautions would you adopt to reduce to a minimum the production and distribution of coal dust?
50	3. A place is approaching old workings containing water; how would you work it, having due regard to safety? Describe some method whereby you could control a flow of water through a borehole.
50	4. State briefly how you would deal with an underground fire. Assume the outbreak has occurred in a mine with which you are well acquainted.
50	5. How would you work a 9ft. seam of coal with 3ft. of bad roof above it, over which there is a good sandstone roof, so as to afford the miners the greatest amount of safety?
50	6. Write a report on a colliery at which you have been employed, dealing with— (a) Thickness and nature of the seams and their depths. (b) Method of working. (c) System of haulages. (d) Pumping. (e) Lighting.
300	

THE COAL MINES REGULATION ACT, 1902.

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

Subject: ARITHMETIC.

Wednesday, 7th October, 1925, 2 *p.m. to* 3 *p.m.*

Possible Marks.	
16	1. Work out the quantity of coal contained in 40 acres of a seam of the following section:— Coal .. .. 2ft. 3in. Band .. .. 0ft. 11in. Coal .. .. 2ft. 9in. The specific gravity of the coal is 1.28. If 7 per cent. is allowed for waste, what is the quantity available for use?
17	2. A bailing bucket capable of carrying 2 tons of water and making 45 trips per hour is operating on water in a 17ft. diameter shaft. Assuming no ingoing feeder, how many feet will the water level be lowered in 8 hours? Allow for a leakage of 2½ per cent. in the bucket.
16	3. A seam 210 feet below the surface is to be opened out for working. This may be done either by sinking two shafts, each costing £20 per foot; by driving two tunnels on a grade of 1 in 7, each costing £10 per yard; or by sinking one shaft and driving one tunnel. Which is the cheaper method?
17	4. The rope of an endless rope haulage travels at a rate of 2 miles per hour. Skips carrying 22 cwt. are clipped on in pairs; at what distance apart must they be spaced to deliver 800 tons in 7 hours' hauling?
17	5. A bed of coal measuring 4 feet thick is passed through in a borehole, but the strata are dipping at the rate of 1 in 3. What is the actual thickness of the seam?
17	6. Add together seven-twelfths of 1 cwt., two-thirds of 1 qr. and four-fifths of 1 lb., and express the result as the decimal of one ton.
100	

THE COAL MINES REGULATION ACT, 1902.

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

Subject: ROADWAYS.

Wednesday, 7th October, 1925, 3 *p.m. to* 4 *p.m.*

Possible Marks.	
50	1. What instruction should be given to men in charge of timbering along the main haulage road?
50	2. Describe various systems of underground haulages, and state under what conditions each system is suitable.
50	3. Make practical remarks on the question of using main return airways as travelling roads. What would be the advantages of having all the men and horses travel out by way of the main return airways?
50	4. A special drive is started, and it is required to be kept straight and at an even grade of 3 inches per yard; how would you carry out this work if it was placed in your charge?
50	5. Describe with sketches how you would replace broken timber in a road which is heavily weighted?
50	6. It is proposed to make an overcast over a main haulage road. How would you do this work so as not to impede traffic? mine working one shift; roof of overcast 6 feet above the timber.
300	

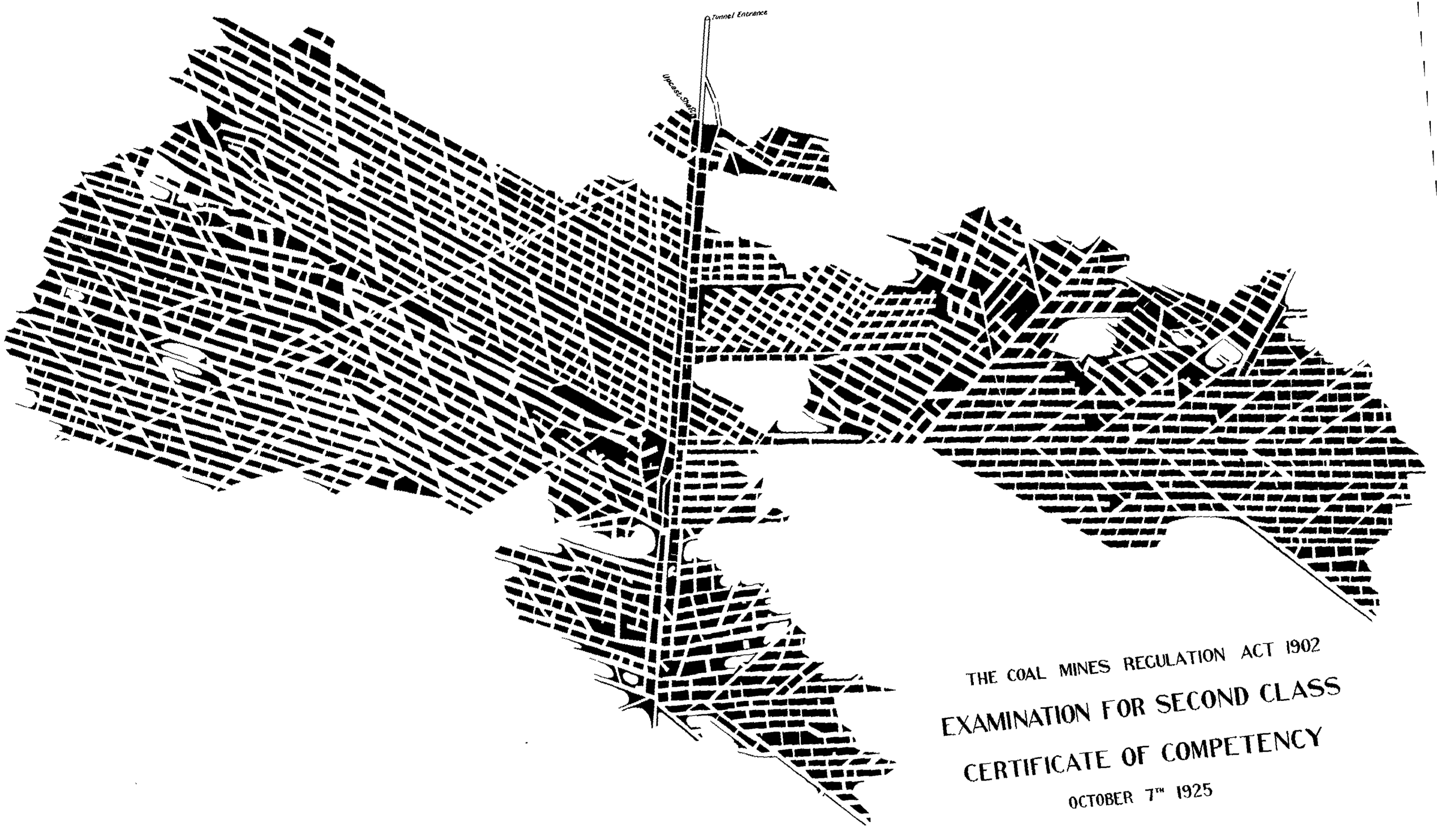
THE COAL MINES REGULATION ACT, 1902.

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

Subject: THE COAL MINES REGULATION ACT, 1902.

Wednesday, 7th October, 1925, 4 *p.m. to* 5 *p.m.*

Possible Marks.	
16	1. State in substance what the Coal Mines Regulation Act requires in regard to the use of explosives in the coal mines of this State.
16	2. What does the Act require in regard to— (a) Firing of shots on a dry and dusty haulage road? (b) Firing of shots in a dry and dusty working place?
17	3. What does the Act require as to ventilation— (a) by fire, (b) by machinery?
17	4. What is adequate ventilation as described in the Coal Mines Regulation Act?
17	5. What does the Act require to be done where a mine is abandoned or the working thereof discontinued?
17	6. What are the provisions of the Act in regard to single shafts, tunnels, or outlets?
100	



THE COAL MINES REGULATION ACT 1902

EXAMINATION FOR SECOND CLASS CERTIFICATE OF COMPETENCY

OCTOBER 7TH 1925

DIVISION III.

Report of the Superintendent of State Batteries.

Department of Mines,
State Batteries Branch,
Perth, 8th May, 1926.

The Under Secretary for Mines.

Sir,

I have the honour to submit my report on State Battery operations for the year 1925. This is the twenty-eighth Annual Report.

MILLING.

Six 10-stamp and twelve 5-stamp batteries were in operation during the year, and five batteries (45 stamps) were leased.

Tonnage.—Four hundred and sixteen parcels of ore were crushed, representing 18,093¼ tons. The largest tonnage was crushed at Wiluna, 2,281 tons, then followed Cue with 2,180 tons, Coolgardie 1,937¾ tons, Warriedar 1,492¼ tons, Meekatharra 1,442 tons, Ora Banda 1,287 tons, and Boogardie 1,090¼ tons. The other batteries crushed less than 1,000 tons each.

During 1924 there were 439 parcels of ore crushed, aggregating 18,063 tons; hence the tonnage during 1925 showed a very slight increase.

Amalgamation.—17,413¼ tons of ore were treated in the first instance by amalgamation, and 19,045ozs. of bullion, estimated to contain 16,143.6ozs. of fine gold, were recovered. The gross contents of the tailing were 5,272.65ozs., and the value of the ore was 104s. 6d. per ton. The recovery by amalgamation was 75.38 per cent., compared with 75.29 per cent. in 1924, when the gross value of the ore was 100s. 8½d. per ton.

Charges.—There were no alterations in crushing charges during the year. Rebates granted for low grade ores were paid on 3,728¼ tons milled and amounted to £499 5s. 6d. During 1924 an amount of £536 7s. 7d. was paid on 3,932¾ tons of low grade ore.

Revenue.—The revenue collected amounted to £9,695 1s. 6d., and as usual included small amounts for the sale of water and sundry items. The revenue per ton crushed was 10s. 8.59d., compared with 10s. 9.52d. during 1924, a decrease of 0.93 pence per ton.

Expenditure.—The cost of operating and maintaining the batteries was £20,463 0s. 10d., equal to 22s. 7.41d. per ton, an increase of 1s. 7.22d. per ton on the cost for 1924. The cost of maintenance is increasing year by year as the batteries get older, some of them now having been over 25 years in commission.

The loss on milling operations was £10,767 19s. 4d., compared with a loss of £9,230 19s. in 1924, and £11,044 9s. 4d. in 1923.

TIN ORE TREATMENT.

During some months of the year an officer was sent to Greenbushes at the request of the local prospectors, in order that the treatment plant should be available for the public. Although the market price of tin was satisfactory, only 268 tons of ore were offered for treatment, and the operations showed a loss of £118 4s. 10d., and unfortunately the plant has been again closed down.

TAILING TREATMENT.

At 13 plants 14,289½ tons of tailing were treated with highly satisfactory results. We get an extraordinary mixture of ores, and some of them are by no means easily treated on account of mineral contents. Managers are to be commended for the high extractions record.

The head value of the tailing was 7.415dwts. per ton and the residue value 1.483dwts. per ton. The assay extraction was 80 per cent. and the actual recovery 80.7 per cent. The gold call was £22,290 and the actual recovery was £22,450, a surplus of £160.

Details of the tonnage treated, values and recovery are recorded in the statement following.

Revenue.—The gross revenue amounted to £11,557 18s. 10d., or 16s. 2.11d. per ton treated. An amount of £1,500 received on account of the Gold Producers' Association is included.

Expenditure.—The gross expenditure, including repairs to plants, realisation of bullion, etc., amounted to £8,256 8s. 1d., equal to 11s. 6.67d. per ton, compared with 10s. 8.68d. per ton during 1924, when the greater tonnage of 19,767½ tons were treated.

The profit for the year was £3,301 10s. 9d., compared with a loss of £68 13s. 1d. last year.

TAILING TREATMENT AND EXTRACTION.

For Year ended 31st December, 1925.

Battery.	Tons Treated.	Head Value.	Contents.	Tail Value.	Contents.	Percentage Extraction.	Shortage.	Surplus.
		dwts.	dwts.	dwts.	dwts.	%	£	£
Bamboo Creek*	960	10·530	10,109	1·935	1,858	81·6	...	84
Boogardie	1,482	8·231	12,332	1·703	2,525	79·5	...	73
Coolgardie	1,666	6·039	10,062	1·000	1,666	83·4	28	...
Cue	1,215	4·263	5,180	1·053	1,280	75·0	...	...
Linden	1,233	8·420	10,381	2·000	2,466	76·2	...	66
Norseman	2,257·5	9·694	21,595	2·218	4,942	77·1	...	...
Ora Banda	2,010	6·567	13,201	1·010	2,032	84·6	...	112
Payne's Find	520	2·230	1,160	·940	489	57·8	...	6
Peak Hill	821	7·107	5,835	1·052	864	85·1	37	...
Sandstone	480	7·083	3,400	1·135	545	83·9	24	...
Warriedar	931	5·400	5,032	1·093	1,018	79·7	64	...
Wiluna	350	11·246	3,936	1·700	595	84·8	...	...
Youanmi...	258	10·573	2,728	2·775	716	73·7	27	...
	14,153·5	*7·415	104,951	1·483	20,996	80·0	180	341

Comparative Synopsis :—

	1925.	1924.
Tons treated	14,153·5	19,767·5
Head Value	7·415 dwts.	5·403 dwts.
Tail Value	1·483 dwts.	1·008 dwts.
Value of Gold Call	£22,290	£22,841
Theoretic Extraction	80%	81·3%
Actual Extraction	80·7%	80·6%

* In addition to 14,153½ tons of mixed tailing, 136 tons of extremely refractory material were treated at Coolgardie, but the extraction was unsatisfactory.

TAILING PURCHASE.

9,583¼ tons of tailing were purchased for £8,776 5s. 10d. net to prospectors. During 1924 the purchase of tailing amounted to £9,180 15s. 2d. for 10,038¾ tons.

REPAIRS AND RENEWALS.

The cost of maintenance was £3,763 5s. 7d., a decrease of £564 13s. 3d. compared with the cost during 1924. Batteries cost £178 more for maintenance this year, but the tailing plants cost £743 less for the reason that the vats and tanks in all except two instances have been reinforced with wire netting and cement and sand. At the present time the vats at the two plants referred to are being reinforced.

At a number of old batteries the mud logs, sills, mortar blocks, and other timbers either below or at the ground level are showing more or less serious signs of rot. Two such plants are now being overhauled, and it is certain that foundation timbers at other batteries will have to be renewed or replaced with concrete in the near future.

TOTAL OPERATIONS.

In all operations 32,650¾ tons were treated at a cost of £28,887 11s. 3d., or 17s. 8.3d. per ton.

The revenue was £21,302 17s. 10d., or 13s. 0.5d. per ton.

The loss on the year's operation was £7,584 13s. 5d., compared with a loss of £10,345 9s. 3d. during 1924.

Comparative Synopsis of Results at State Batteries for 12 months ended 31st December, 1924 and 1925.

	1925.			1924.		
	Tonnage.	Expenditure.	Revenue.	Tonnage.	Expenditure.	Revenue.
		s. d.	s. d.		s. d.	s. d.
Milling	18,093¼	22 7·41	10 8·59	18,063	21 0·19	10 9·52
Tailing Treatment	14,289½	11 6·67	16 2·11	19,767½	10 8·68	10 7·87
Slime Treatment	...	...	...	4,615	12 4·10	8 7·69
Tin Treatment	268	12 6·55	3 8·66	392¼	13 4·89	3 7·70

Receipts and Expenditure.

	Tonnage.	Expenditure.	Revenue.	Profit.	Loss.
		£ s. d.	£ s. d.	£ s. d.	£ s. d.
Milling	18,093¼	20,463 0 10	9,695 1 6	...	10,767 19 4
Tailing Treatment	14,289½	8,256 8 1	11,557 18 10	3,301 10 9	...
Tin Treatment	268	168 2 4	49 17 6	...	118 4 10
	32,650¾	28,887 11 3	21,302 17 10	3,301 10 9	10,886 4 2
				Less Profit ..	3,301 10 9
				Net Loss ...	£7,584 13 5

OUTPUT SINCE INCEPTION.

Tons of Gold ore milled—1,419,875.

Production—	
By Amalgamation	£4,841,128
By Sand Treatment	741,654
By Slime Treatment	265,266
By Residue Treatment	9,353
	£5,857,401

Tons of Tin ore treated—80,728.

Production—	
By Black Tin	93,436
Total Value of Production	£5,950,835

STAFF.

A general transfer of managers was completed early in the year. Mr. G. N. B. Smith was appointed to fill the place vacated by Mr. T. W. Lees. Living conditions and procuring the necessary labour for our operations are becoming more difficult each year at State Batteries. During four months that I was engaged with the Royal Commission on the Mining Industry, the duties of my office were efficiently performed by Mr. D. F. Browne, Inspector of State Batteries. Members of the staff at Head Office and on the Goldfields gave loyal and efficient service.

The cost of administration was the lowest on record.

GENERAL REMARKS.

The tonnage milled showed a small increase of 60 tons, compared with 1924 figures, but decreases of 5,478 tons in tailing treatment and 4,615 tons in slime treatment were chiefly responsible for a decrease of 10,187 tons handled in all departments. 32,650¾ tons were treated during the year, and indications at the centres in which plants are operated suggest that the tonnage for the ensuing year will be somewhat similar.

When supplies of lode material to our plant at Wiluna ceased, it became necessary to close the grinding and slime treatment sections and convert the plant into an ordinary 10-stamp mill equipped with a leaching plant for the treatment of tailing at a cost of £1,635. When the work was completed and all available ore treated the manager was withdrawn. This plant in future will be added to one of our circuits.

Final and small rounds of crushing were treated at Laverton and Leonora at the close of the year, and the plants have been closed. The small tonnages from those centres will in future be railed to Coolgardie for treatment. The accumulated tailing at Laverton has been treated and a clean-up of the battery site effected, and a similar procedure will be carried out at Leonora at the first opportunity. It is a matter for regret that centres, once so prosperous, have to be abandoned by this branch of the Mines Department, on account of lack of ore supplies.

For the first time since 1904 there was no slime treatment. Wiluna was the last centre at which this operation was carried out. All slime is now mixed with sand and the whole of the tailing accumulations are leached and the operations are designated tailing treatment.

During the year subsidies for the cartage of ore to State Batteries for distances over five miles and not more than thirty miles, but not exceeding one shilling per ton per mile were paid to prospectors. 5,229 tons of ore qualified for subsidies, which aggregate £3,177 14s. 1d., paid from the Mines Development Vote.

Our three Ford cars have done a great deal of running, often with heavy loads, and have been the means of enabling our programme of work to be carried out expeditiously and cheaply, insofar as transport of staff is concerned. Five managers now have private cars, which are also used for departmental purposes, and for which services allowances are paid.

It would be difficult and expensive to operate our circuits, in circumstances now obtaining, without motor transport. Ford cars doing heavy work have a limited life of efficiency, and next year we should sell one or two that are becoming costly to keep in good running order. It will be advisable to replace them with new Fords, or preferably, in my opinion, with cars of a heavier and more durable type.

Attached are Schedules showing details of operations for the year, and information relative to operations and production since the year 1899.

I have, etc.,

A. M. HOWE.
Superintendent of State Batteries.

Schedule 1.

Return showing the number of tons crushed, gold yield, average per ton in shillings, and total value for year ended 31st December, 1925.

Battery.	Tons Crushed.	Gold Yield, Bullion.	Average per ton in shillings.	Total Value.
		ozs.		£
Bamboo Creek ...	631·5	1,238·25	141·18	4,457·70
Boogardie	1,090·25	2,129·86	140·64	7,667·49
Coolgardie	1,937·75	2,203·87	81·88	7,933·93
Cue	2,180·0	1,241·20	40·98	4,468·32
Laverton	210·5	546·05	186·76	1,965·78
Leonora	218·0	225·65	74·54	812·34
Marble Bar	508·0	720·35	102·08	2,593·26
Meekatharra	1,442·0	2,455·80	122·62	8,840·88
Norseman	645·25	1,467·85	163·78	5,284·26
Ora Banda	1,287·0	1,075·40	60·16	3,871·43
Payne's Find ...	478·5	686·20	103·24	2,470·32
Peak Hill	969·0	947·12	70·00	3,391·63
Sandstone	775·5	1,218·90	113·16	4,388·04
St. Ives	883·5	545·60	44·46	1,964·16
Warriedar	1,502·25	610·15	29·24	2,196·54
Wiluna	1,611·0	1,307·50	58·42	4,707·00
Yarri	172·25	177·40	74·14	638·64
Youanme	881·0	247·85	20·26	892·26
	17,423·25	19,045·00	78·68	68,543·98
Wiluna Lode ...	670·0	255·68	27·46	920·44
	18,093·25	19,300·68	76·78	69,464·42
TIN PLANTS.		Yield Tons.		
Greenbushes	268·0	1·91	...	...

Schedule 2.

Return showing the number of tons crushed, gold yield, average per ton, and value since inception to 31st December, 1925.

Battery.	Tons Crushed.	Gold Yield.	Average per ton.	Value.
		ozs.	ozs.	£
Bamboo Creek ...	11,736·50	20,510·21	1·74	73,836·76
Boogardie	70,911·65	49,253·91	·69	178,708·25
Coolgardie	122,504·75	82,299·94	·67	296,333·42
Cue	16,294·75	18,491·95	1·13	66,571·01
Darlot	33,210·00	37,637·74	1·13	138,928·25
Laverton	19,336·75	21,578·63	1·11	78,854·79
Leonora	56,753·45	62,817·90	1·10	229,618·76
Linden	19,783·00	22,531·70	1·14	81,114·21
Marble Bar	12,715·75	16,084·45	1·26	57,904·17
Meekatharra	82,461·50	97,843·66	1·19	354,916·56
Mt. Egerton	7,893·25	4,084·86	·52	13,972·32
Mt. Ida	43,259·15	54,648·86	1·26	200,038·07
Mt. Keith	9,787·00	8,618·75	·88	31,027·50
Mt. Sir Samuel ...	9,681·25	7,505·97	·77	27,021·41
Mulline	77,008·45	98,573·64	1·28	354,035·25
Niagara	64,866·00	57,770·81	·89	210,163·11
Norseman	67,034·45	76,182·81	1·13	277,440·58
Ora Banda	23,350·50	13,000·27	·55	46,800·91
Payne's Find ...	28,231·25	35,102·06	1·24	126,367·41
Peak Hill	25,109·80	24,801·99	·98	90,440·40
Sandstone	75,437·90	77,542·17	1·03	279,347·14
Siberia...	16,024·00	16,625·59	1·03	59,777·45
20-Mile Sandy ...	12,184·15	19,055·77	1·56	68,930·34
St. Ives	7,081·00	5,107·34	·72	18,386·42
Tuckanarra	15,476·85	21,276·06	1·38	78,217·53
Warriedar	9,145·50	5,135·35	·56	18,487·26
Wiluna	59,850·00	33,353·24	·56	120,216·84
Yarri	48,907·50	32,749·43	·67	117,897·77
Youanme	32,538·50	10,863·24	·33	39,107·65
Batteries closed ...	259,629·34	270,313·31	1·04	981,998·47
	1,338,500·94	1,301,621·96	·97	4,717,397·34
Wiluna Lode ...	81,671·75	34,540·18	·42	124,667·40
	1,420,172·69	1,336,162·14	·94	4,842,064·74

Tin Plants.

	Tons.	Tons Black Tin.
Greenbushes	1,451·25	8·242
Plants Closed	79,276·75	969·276
	80,728·00	977·518

Milling.

	Tons.	ozs.
Up to 1901 (3 yrs)	68,791 ...	75,553
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 ...	53,888
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 ...	33,523
1919	40,291 ...	27,027
1920	46,494 ...	28,450
1921	34,761 ...	24,035
1922	35,722 ...	32,736
1923	29,715 ...	21,876
1924	18,063 ...	18,515
1925	18,093 ...	19,300

Sand Treatment.

	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
1910	43,915
1911	27,444
1912	18,599
1913	18,300
1914	6,219

Tailing Treatment.

	Tons.
1913	13,078
1914	32,723
1915	31,887
1916	34,725
1917	24,890
1918	24,364
1919	15,764
1920	15,437
1921	19,763
1922	24,234
1923	14,307
1924	19,767
1925	14,289

Slime Treatment.

	Tons.
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
1919	12,780
1920	11,525
1921	7,370
1922	7,492
1923	8,848
1924	4,615

Schedule 3.

Tailing Treatment for 1925.

Battery.	Tons.	Yield.	Value.
		Fine ozs.	£
Bamboo Creek	960	432·61	1,837·33
Boogardie	1,482	507·80	2,156·66
Coolgardie	1,802	410·98	1,745·50
Cue	1,215	195·43	830·00
Linden	1,233	435·20	1,848·26
Norseman	2,227·5	743·38	3,180·86
Ora Banda	2,010	754·26	2,438·91
Payne's Find	520	21·49	91·29
Peak Hill	821	248·18	1,053·80
Sandstone	480	141·19	599·70
Warriedar	931	185·32	787·09
Wiluna	350	375·16	1,593·32
Yarri	...	21·76	92·42
Youanme	258	94·16	399·95
	14,289·5	4,386·92	18,655·09
		SLIMES.	
Wiluna	...	3·46	14·70

Schedule 4.

Sand and Tailing Treatment since inception to 31st December, 1925.

Battery.	Tons.	Yield.	Value.
		Fine ozs.	£
Bamboo Creek	10,038	3,760·59	15,985·90
Boogardie	54,624	14,574·50	61,318·65
Burtville	16,788·75	5,464·13	22,793·76
Coolgardie	73,946	11,438·84	48,425·56
Cue	13,290	2,727·76	11,572·09
Laverton	17,516	3,079·91	12,886·98
Leonora	40,908·5	9,951·39	41,499·54
Linden	18,150	6,054·21	25,731·89
Meekatharra	55,095	11,049·31	46,759·61
Mt. Keith	7,053	816·70	3,468·72
Mt. Sir Samuel	5,988	1,367·56	5,809·39
Mulline	44,794·5	12,261·27	49,863·24
Mulwarrie	23,809·25	4,675·53	19,220·11
Niagara	44,828	6,839·37	28,471·79
Norseman	50,668·5	11,905·11	49,858·61
Ora Banda	11,454	2,592·98	11,014·56
Payne's Find	19,091	2,059·31	8,834·27
Peak Hill	1,623	411·97	1,749·45
Quinn's	7,486	686·56	2,916·43
Sandy Creek	11,496·25	3,512·53	14,639·07
Sandstone	49,948	14,659·87	61,986·05
St. Ives	2,310	450·08	1,911·38
Siberia...	5,550	1,201·56	5,105·20
Warriedar	7,047	3,576·94	15,191·13
Wiluna	18,202	8,305·95	35,184·19
Yarri	47,555	4,790·81	20,086·57
Youanme	13,378	3,662·59	15,554·29
Batteries Closed	134,971·5	25,074·55	103,894·38
	807,609·25	176,951·88	741,732·81

Residue Treatment from inception to 31st December, 1925.

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

Slimes Treatment from inception to 31st December, 1925.

Battery.	Tons.	Yield.	Value.
		Fine ozs.	£
Mulwarrie	4,733·5	751·79	3,194·22
Wiluna	96,784·0	37,665·46	159,961·27
Slimes Plants Closed ...	111,196·25	25,088·87	102,110·62
	212,713·75	63,506·12	265,266·11

Tin Residue Treatment from inception to 31st December, 1925.

	Tons.
Greenbushes B.E.	315
Greenbushes, Salt Water Gully	1,444
	1,759

Schedule 5.

Return showing Number of Parcels treated and Tons crushed at State Batteries for Year 1925.

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. dwts. grs.	ozs. dwts. grs.	ozs. dwts. grs.	ozs. dwts. grs.	dwts. grs.	£ s. d.
8	Bamboo Creek	631·5	1,238 5 0	1,049 12 5	281 3 19	1,330 16 0	42 3	8 19 0
32	Boogardie	1,090·25	2,129·17 0	1,805 7 16	508 18 11	2,314 6 3	42 10	9 0 3
70	Coolgardie	1,987·75	2,203 17 12	1,868 2 14	520 16 15	2,388 19 5	24 15	5 4 8
51	Cue	2,180·0	1,241 4 0	1,052 2 6	335 9 15	1,387 11 21	12 17	2 14 0
12	Laverton	210·5	546 1 0	462 17 5	87 1 21	549 19 2	52 4	11 1 9
12	Leonora	218·0	225 13 0	191 5 10	67 10 9	258 15 19	23 17	5 0 9
9	Marble Bar	508·0	720 7 0	610 12 4	89 13 0	700 5 4	27 13	5 17 1
42	Meekatharra	1,442·0	2,455 16 0	2,081 13 10	636 15 20	2,718 9 6	37 16	8 0 1
22	Norseman	645·25	1,467 17 0	1,244 4 14	313 9 17	1,557 14 7	48 6	10 5 1
24	Ora Banda	1,287·0	1,075 8 7	911 11 14	339 7 15	1,250 19 5	19 10	4 2 6
9	Payne's Find	478·5	686 4 0	581 13 5	44 13 2	626 6 7	26 4	5 11 3
13	Peak Hill	969·0	947 2 12	802 16 15	289 6 19	1,092 3 10	22 13	4 15 10
22	Sandstone	775·5	1,218 18 0	1,033 4 4	283 6 17	1,316 10 21	33 22	7 4 2
7	St. Ives	883·5	545 12 0	462 9 15	127 7 0	589 16 15	13 8	2 16 8
33	Warriedar	1,492·25	610 3 0	517 3 19	223 7 9	740 11 4	9 22	2 2 2
29	Wiluna	1,611·0	1,307 10 0	1,108 6 5	863 13 8	1,971 19 13	24 11	5 4 0
5	Yarri	172·25	177 8 0	150 7 10	27 15 19	178 3 5	20 16	4 7 10
8	Youanme	881·0	247 17 0	210 1 19	232 16 1	442 17 20	10 1	2 2 8
408		17,413·25	19,045 0 7	16,143 11 22	5,272 13 1	21,416 4 23	24 14	5 4 6
8	Wiluna Lode	670	No amal	gamation.	319 11 20	319 11 20	9 13	2 0 7
416		18,083·25						
	Plus tons not cleaned up, 31–12–25	10						
		18,093·25						

Schedule 6.

Expenditure from Consolidated Revenue Vote and Loan Expenditure Fund on Erection of State Batteries, for Year ended December 31st, 1925, and Totals since inception.

Battery.	From Revenue.	From Loan.	Total.
	£ s. d.	£ s. d.	£ s. d.
Reconstruction State Batteries, Wiluna	...	1,635 4 5	1,635 4 5
Erection of State Batteries—			
Expenditure to 31st December, 1907	91,981 1 8	...	...
Loan Expenditure to 31st December, 1924	...	309,605 4 0	401,586 5 8
	£91,981 1 8	311,240 8 5	403,221 10 1

Schedule 7.

Direct Purchase of Tailing for year 1925.

Battery.	Tons.	Amount.
		£ s. d.
Bamboo Creek	504·75	626 9 6
Boogardie	864·25	921 18 10
Coolgardie	1,021·5	779 14 7
Cue	733	366 17 11
Laverton	...	2 11 4
Leonora	195	152 7 6
Linden	...	9 12 1
Meekatharra	671·75	773 15 0
Norseman	489	717 15 4
Ora Banda	779·75	521 18 11
Payne's Find	74·75	9 6 10
Peak Hill	713·5	733 8 11
Sandstone	339·5	288 17 9
St. Ives	438	172 6 4
Warriedar	459·25	236 7 6
Wiluna	1,627·	2,073 0 5
Yarri	39	5 17 8
Youanme	633·25	383 19 5
	9,583·25	8,776 5 10

Schedule 7a.

Return showing Tailing payable and unpayable and Gross Contents for year 1925.

Battery.	Tailing payable.		Tailing unpayable.		Totals.	
	Tons.	Gross Contents.	Tons.	Gross Contents.	Tons.	Gross Contents.
		ozs. dwts. grs.		ozs. dwts. grs.		ozs. dwts. grs.
Bamboo Creek	504·75	281 3 19	...	...	504·75	281 3 19
Boogardie	871·5	500 16 10	55·25	8 2 1	926·75	508 18 11
Coolgardie	1,109·75	456 18 16	531·75	63 17 23	1,641·5	520 16 15
Cue	803·75	247 1 16	1,031·5	88 7 23	1,835·25	335 9 15
Laverton	166·75	85 10 9	12	1 11 12	178·75	87 1 21
Leonora	148·5	65 12 2	20·5	1 18 7	169	67 10 9
Marble Bar	405	89 13 0	...	...	405	89 13 0
Meekatharra	836·25	584 6 0	388·75	52 9 20	1,225	636 15 20
Norseman	478·75	303 3 7	72·25	10 6 10	551	313 9 17
Ora Banda	878	318 16 3	194·75	20 11 12	1,072·75	339 7 15
Payne's Find	40	7 13 8	366·75	36 19 18	406·75	44 13 2
Peak Hill	572·25	275 19 6	244	13 7 13	816·25	289 6 19
Sandstone	596·5	276 19 2	63·75	6 7 15	660·25	283 6 17
St. Ives	198·5	52 17 19	551·5	74 9 5	750	127 7 0
Warriedar	424·25	153 18 9	321	69 9 0	745·25	223 7 9
Wiluna	1,249·75	847 18 7	119·25	15 15 1	1,369	863 13 8
Yarri	103·5	24 1 2	42·75	3 14 17	146·25	27 15 19
Youanme	633·25	222 12 23	111·75	10 3 2	745	232 16 1
	10,021	4,795 1 14	4,127·5	477 11 11	14,148·5	5,272 13 1
Wiluna Lode	670	319 11 20	...	...	670	319 11 20
	10,691	5,114 13 10	4,127·5	477 11 11	14,818·5	5,592 4 21

Schedule 8.

Statement of Receipts and Expenditure for Year ended 31st December, 1925.

MILLING AND TIN TREATMENT.

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.	£ 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	631·5	134 2 10	355 15 3	246 14 7	736 12 8	23 3·84	230 10 7	101 17 4	1,069 0 7	33 10·27	379 14 0	12 0·28	...	689 6 7
Boogardie	1,090·25	89 15 3	310 5 5	237 7 0	637 7 8	11 8·30	86 19 10	125 13 0	850 0 6	15 7·10	467 0 4	8 6·79	...	383 0 2
Coolgardie	1,937·75	501 5 2	598 13 0	518 5 3	1,618 3 5	16 8·41	799 3 9	329 15 4	2,747 2 6	28 4·24	1,052 14 1	10 10·36	...	1,694 8 5
Cue	2,180·0	290 12 10	533 3 11	582 18 0	1,406 14 9	12 10·87	106 0 3	340 18 10	1,853 13 10	17 0·07	980 14 11	8 11·97	...	872 18 11
Laverton	210·5	25 15 10	167 11 1	83 4 9	276 11 8	26 3·33	8 15 8	30 15 9	316 3 1	30 0·45	119 4 9	11 3·93	...	196 18 4
Leonora	218·0	33 12 10	127 15 3	92 1 3	253 9 4	23 3·04	9 0 0	35 4 6	297 13 10	27 3·72	123 14 0	1 4·17	...	173 19 10
Linden	...	12 0 0	8 10 9	22 6 6	42 17 3	...	0 5 6	27 12 1	70 14 10	...	9 8 11	...	...	61 5 11
Marble Bar	508·0	196 19 7	269 7 4	274 11 10	740 18 9	29 2·04	268 6 3	67 19 4	1,077 4 4	42 4·92	362 5 5	14 3·14	...	714 18 11
Meekatharra...	1,442·0	253 8 9	463 5 5	416 10 9	1,133 4 11	15 8·59	248 11 8	239 14 4	1,621 10 11	22 5·88	649 11 3	9 0·11	...	971 19 8
Mt. Ida	...	260 13 3	...	28 16 9	289 10 0	...	...	1 2 6	290 12 6	...	...	...	...	290 12 6
Mt. Keith	...	...	...	...	...	...	...	...	...	...	2 0 0	...	2 0 0	...
Mt. Sir Samuel	...	...	...	1 3 2	1 3 2	...	...	...	1 3 2	...	33 13 10	...	32 10 8	...
Mulline	...	50 9 3	4 6 8	168 17 11	223 13 10	...	...	9 10 11	233 4 9	...	1 0 0	...	...	232 4 9
Niagara	...	...	...	3 3 8	3 3 8	...	...	...	3 3 8	...	32 19 10	...	29 16 2	...
Norseman	645·25	264 12 2	317 5 1	266 12 8	848 9 11	26 3·57	273 13 6	179 1 2	1,301 4 7	40 3·98	478 0 4	14 9·79	...	823 4 3
Ora Banda	1,287·0	156 19 9	503 17 10	376 1 10	1,036 19 5	16 1·36	117 10 2	166 9 7	1,320 19 2	20 6·33	1,056 12 7	16 5·04	...	264 6 7
Payne's Find	478·5	42 0 0	153 11 3	168 15 9	364 7 0	15 2·73	19 18 0	53 4 5	437 9 5	18 3·40	252 14 3	10 6·74	...	184 15 2
Peak Hill	969·0	77 7 6	261 8 2	209 4 6	548 0 2	11 3·72	116 1 0	117 14 3	781 15 5	16 1·60	355 17 2	7 4·12	...	425 18 3
Sandstone	775·5	273 11 7	235 7 10	309 16 3	818 15 8	21 1·39	480 8 7	121 1 11	1,420 6 2	36 7·53	418 9 3	10 9·50	...	1,001 16 11
Sandy Creek	...	...	69 14 2	...	69 14 2	...	...	...	69 14 2	...	...	...	...	69 14 2
St. Ives	883·5	112 2 8	389 12 6	270 14 1	772 9 3	17 5·83	114 6 3	120 6 9	1,007 2 3	22 9·45	460 3 9	10 4·99	...	546 18 6
Siberia	...	...	...	7 2 5	7 2 5	...	4 0 0	...	11 2 5	...	13 0 0	...	1 17 7	...
Tuckanarra	...	...	...	...	...	...	...	...	...	...	17 6 6	...	17 6 6	...
Warriedar	1,502·25	110 8 1	433 3 0	345 17 5	889 8 6	11 10·09	92 4 2	262 4 6	1,243 17 2	16 6·72	755 10 0	10 0·69	...	488 7 2
Wiluna	1,611·0	173 0 0	311 16 3	164 0 0	648 16 3	8 0·88	95 16 8	213 0 0	957 12 11	11 10·65	1,074 2 11	13 4·00	116 10 0	...
Yarri	172·25	37 0 1	137 5 7	105 15 2	280 0 10	32 6·19	30 15 4	25 9 3	336 5 5	39 0·52	98 15 5	11 5·61	...	237 10 0
Youanme	881·0	68 8 0	283 5 1	226 8 2	578 1 3	13 1·46	60 12 0	103 12 7	742 5 10	16 10·20	299 8 0	6 9·55	...	442 17 10
	17,423·25	3,164 5 5	5,935 0 10	5,126 9 8	14,225 15 11	16 3·93	3,162 19 2	2,672 8 4	20,061 3 5	23 0·33	9,494 1 6	10 10·77	200 0 11	10,767 2 10
Wiluna Lode	670·0	72 6 8	130 0 0	69 9 10	271 16 6	8 1·34	40 0 0	90 0 11	401 17 5	11 11·95	201 0 0	6 0·00	...	200 17 5
	18,093·25	3,236 12 1	6,065 0 10	5,195 19 6	14,497 12 5	16 0·28	3,202 19 2	2,762 9 3	20,463 0 10	22 7·41	9,695 1 6	10 8·59	200 0 11	10,968 0 3
Greenbushes	268·0	109 15 8	22 8 3	24 19 5	157 3 4	11 8·73	...	10 19 0	168 2 4	12 6·55	49 17 6	3 8·66	...	118 4 10
	18,361·25	3,346 7 9	6,087 9 1	5,220 18 11	14,654 15 9	15 11·54	3,202 19 2	2,773 8 3	20,631 3 2	22 5·66	9,744 19 0	10 7·36	200 0 11	11,086 5 1

Schedule 9.

Statement of Receipts and Expenditure for Year ended 31st December, 1925.

TAILING TREATMENT.

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 ...	960	118 3 5	279 12 6	32 18 2	172 9 0	603 3 1	12 6·78	29 15 7	160 5 9	793 4 5	16 6·30	964 12 8	20 1·15	171 8 3	...
Boogardie	1,482	87 9 0	263 12 7	39 9 3	178 10 1	569 0 11	7 8·13	32 0 3	147 9 11	748 11 1	10 1·22	1,044 1 0	14 1·05	295 9 11	...
Coolgardie	1,802	48 4 5	346 5 2	13 9 0	150 5 11	558 4 6	6 2·35	146 14 10	122 8 11	827 8 3	9 2·18	1,021 5 5	11 4·00	193 17 2	...
Cue	1,215	53 12 11	210 19 8	2 15 9	99 19 2	367 7 6	6 0·57	28 16 9	61 7 5	457 11 8	7 6·38	566 14 4	9 3·93	109 2 8	...
Linden	1,233	171 4 8	235 9 7	34 3 0	217 13 6	658 10 9	10 8·18	141 13 0	211 6 2	1,011 9 11	16 4·87	990 11 1	16 0·79	...	20 18 10
Meekatharra... ...	...	5 12 1	14 18 0	18 16 9	12 2 1	51 8 11	...	21 1 2	1 9 6	73 19 7	...	10 3 9	...	...	63 15 10
Mulline	...	...	...	...	...	...	...	...	1 15 10	1 15 10	...	23 16 6	...	22 0 8	...
Norseman	2,227·5	159 4 8	535 14 8	59 7 10	231 16 3	986 3 5	8 10·24	78 17 3	358 6 1	1,423 6 9	12 9·36	1,235 19 4	11 1·15	...	187 7 5
Ora Banda	2,010	69 10 6	297 0 4	32 3 10	216 11 4	615 6 0	6 1·46	23 1 6	129 2 2	767 9 8	7 7·63	1,295 5 9	12 10·65	527 16 1	...
Payne's Find ...	520	20 18 3	69 6 0	11 8 0	33 11 5	135 3 8	5 2·39	...	89 15 4	224 19 0	8 7·82	106 1 10	4 0·96	...	118 17 2
Peak Hill	821	94 3 11	183 11 3	5 12 4	71 3 4	354 10 10	8 7·63	9 16 6	147 17 2	512 4 6	12 5·73	499 4 11	12 1·94	...	12 19 7
Sandstone	480	50 9 0	77 0 3	8 5 10	59 18 9	195 13 10	8 1·84	35 2 6	51 0 11	281 17 3	11 8·92	366 0 6	15 3·00	84 3 3	...
St. Ives	...	...	...	...	...	...	...	...	1 16 7	1 16 7	...	21 13 3	...	19 16 8	...
Warriedar	931	58 15 6	163 13 8	22 6 5	169 13 11	414 9 6	8 10·84	142 18 0	129 12 5	686 19 11	14 9·09	504 7 8	10 10·03	...	182 12 3
Wiluna	350	18 3 2	117 0 0	36 9 11	41 16 8	213 9 9	12 2·37	17 8 10	55 8 0	286 6 7	16 4·33	1,401 16 3	80 1·24	1,115 9 8	...
Yarri	...	...	...	...	...	...	...	...	0 18 8	0 18 8	...	Dr. 111 11 5	...	...	112 10 1
Youanme	258	15 14 0	31 5 6	15 13 1	38 6 9	100 19 4	7 9·91	35 0 3	20 8 10	156 8 5	12 1·51	154 8 0	11 11·61	...	2 0 5
Niagara	...	...	...	...	...	...	...	...	...	...	...	Dr. 36 12 0	...	...	36 12 0
Transferred from Revenue Suspense Account	...	...	...	...	...	...	...	...	...	...	...	1,500 0 0	...	1,500 0 0	...
	14,289·5	971 5 6	2,825 9 2	332 19 2	1,693 18 2	5,823 12 0	8 1·81	742 6 5	1,690 9 8	8,256 8 1	11 6·67	11,557 18 10	16 2·11	4,039 4 4	737 13 7

Schedule 10.

Balance Sheet—December 31st, 1925.

	£	s.	d.	£	s.	d.		£	s.	d.	£	s.	d.
To Capital Expenditure—							By Batteries, Tailing and						
From General Loan Fund	311,240	8	5				Slime Plants	403,221	10	1			
From Consolid'td Revenue	91,981	1	8				„ Less Depreciation ...	340,802	12	11			
				403,221	10	1					62,418	17	2
To Treasury				159,826	0	9	By Stores				12,238	18	5
„ Interest and Sinking Fund ...				365,398	12	6	„ Sundry Debtors				7,624	16	7
„ Sundry Creditors				1,980	9	8	„ Profit and Loss Account ...				848,144	0	10
				£930,426	13	0					£930,426	13	0

Profit and Loss Account.

	£	s.	d.		£	s.	d.
To Expenditure	1,443,208	2	6	By Revenue	1,301,265	7	1
				„ Loss on Working carried down ...	141,942	15	5
To Loss on Working brought down ...	141,942	15	5		1,443,208	2	6
„ Interest at 3½ per cent. and Sinking Fund at 1¼ per cent. on Capital Expenditure	365,398	12	6				
„ Depreciation	340,802	12	11				
	£848,144	0	10	By Gross Loss	£848,144	0	10

Schedule 11.

Working Profit and Loss Account for Year ending December 31st, 1925.

	£	s.	d.		£	s.	d.
To Working Expenditure—				By Revenue—			
Batteries and Tin Plants	20,631	3	2	Batteries and Tin Plants	9,744	19	0
Tailing and Slimes Plants	8,256	8	1	Tailing and Slimes Plants	11,557	18	10
				„ Loss on Year's Operations	7,584	13	5
	£28,887	11	3		£28,887	11	3

Schedule 12.

State Battery Statistics from Inception to 31st December, 1925.

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	5,415
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	5,982
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
1919 ...	40,290¾	12 4·1	8 2·0	8,426	15,764	9 2·4	9 3·8	91	12,780	9 1·1	7 4·6	1,089	1,204	10 0·9	3 11·2	369	9,925
1920 ...	46,494¼	12 6.4	7 11·5	8,954	15,437	9 0·4	13 4·1	3,325	11,525	9 11·2	8 8·4	713	737	8 11·2	9 3·3	†12	6,363
1921 ...	34,761	17 3·8	9 0·7	14,361	19,763	10 0·8	17 10·0	7,677	7,370	10 11·6	8 5·7	918	54	82 0·5	8 0·4	200	7,802
1922 ...	35,722	16 11·8	9 2·3	13,862	24,234	9 11·7	15 8·9	6,988	7,492	11 10·5	8 5·8	1,271	...	...	...	55	8,200
1923 ...	29,714	17 0·4	9 6·8	11,044	14,307	11 5·5	14 2·1	1,943	8,848	11 1·3	8 11·7	945	...	...	...	26	10,072
1924 ...	18,063	21 0·1	10 9·5	9,231	19,767	10 8·6	10 7·8	§69	4,615	12 4·1	8 7·6	854	392	13 4·8	3 7·7	192	10,346
1925 ...	18,361¼	22 7·4	10 8·5	10,768	14,289	11 6·6	16 2·1	3,301	...	...	...	...	268	12 6·5	3 8·6	118	7,585

* Tailing Treatment commenced 1913. † Profit. ‡ Details of Ore dressing and Residue Treatment not shown, but financial result included in the figure of this column. § Loss.

DIVISION IV.

ANNUAL PROGRESS REPORT

OF THE

GEOLOGICAL SURVEY

FOR THE

YEAR 1925.

With Six Plates and One Figure.

TABLE OF CONTENTS.

FIGURE.

LIST OF PLATES.

ANNUAL PROGRESS REPORT OF THE GEOLOGICAL SURVEY FOR THE YEAR 1925.

The range of activities of the Geological Survey during the year ending the 31st December, 1925, has been similar to that of recent years.

Having regard to the somewhat limited personnel, most of whom were occupied in work at head-quarters, engaged in the preparation of reports, etc., very little field work became possible.

As has been the case in the past, a good deal of time has been taken up in answering inquiries for information relating to the geology and mineral resources of Western Australia, some of which has been imparted verbally to those making application in person, and some given in the form of correspondence and published reports and maps.

In addition to the normal work of the Survey a number of advisory reports have been made on matters arising out of the Mining, Mining Development, and Land Acts, the latter relating to the alienation of mineral-bearing lands.

Administrative, routine, and other important office duties left practically no time for active work in the field.

A good deal of my own time was taken up with the editorial and other duties connected with the publication of bulletins, comprising 448 pages of typescript, together with 42 figures and 31 maps. Geological reports lose a very large part of their value if not scientifically indexed, a work which naturally takes time.

The only field work it was possible for me to undertake during the year was a very brief visit, in company with the Government Mineralogist and Analyst, to Lake Brown, about 20 miles north of Burracoppin, in connection with an inquiry under the Mining Act relating to the occurrence of a deposit of alunite at Campion. A note relating to the occurrence of alunite in the bed of a salt lake or clay pan has already been given by Dr. Simpson.*

An article was prepared during the year on the Phosphate and Pyrites Deposits of Western Australia for presentation to and publication by the International Geological Congress, held in Spain during the month of May, 1926, in the volume relating to the world's resources in Phosphates and Pyrites.

THE STAFF.

The staff in 1888, the first year of its active existence, consisted solely of the Government Geologist, Mr. H. P. Woodward, whilst at the end of 1925, besides the Government Geologist, it numbered two field geologists, together with an acting petrologist and his assistant, in addition to one clerk and a messenger. There has been no change in the personnel of the staff during the year under review.

FIELD WORK.

The attached table shows the distribution of the field work during the year, together with the names of the officers so engaged and the districts in which they were employed:—

Table showing the distribution of Field Work during the year 1925.

Goldfield or Land Division.	F. R. Feldtmann.		A. G. D. Esson.	
	No. of days in the field.	Percentage of working days.	No. of days in the field.	Percentage of working days.
South-West Division	26	7·1	...	...
East Coolgardie Goldfield	50	13·7	...	...
Total ...	**76**	**20·8**	...	...

F. R. Feldtmann, Field Geologist.

The early portion of the year 1925 was largely taken up by Mr. Feldtmann with the examination of certain gypsum deposits and the preparation of reports and maps in connection therewith. The period between 22nd January and 6th February was spent in field work on the Gypsum Deposits of the Baandee neighbourhood; that between the 16th and 20th February on the Woolundra Deposits; and that between the 2nd and 6th March on the Gypsum Deposits in the vicinity of Cunderdin. Field work at Kalgoorlie occupied Mr. Feldtmann's time from the 2nd of November to the 22nd December. In all, 76 days were spent by this officer in the field during the year, particulars of which are set out in the table above.

A. G. D. Esson, Field Geologist.

No time was devoted by Mr. Esson to work in the field, the whole of his time having been occupied in work at head-quarters in connection with the preparation of reports, maps, etc., of the previous year.

PRINCIPAL RESULTS OF THE YEAR'S FIELD OPERATIONS.

1.—SOME GYPSUM DEPOSITS OF THE AVON DISTRICT, SOUTH-WEST DIVISION.

(F. R. Feldtmann.)

GENERAL STATEMENT.

A number of gypsum deposits were examined during the year, in connection with applications for mineral claims. These included deposits at Baandee, North Baandee, Woolundra, and Cunderdin. Deposits

* Sedimentary alunite at Campion, E. S. Simpson, Appendix II., Annual Report of the Chemical Branch, Mines Department, for the year 1925, p. 18. Perth: By Authority, 1926.

at Dukin,* on Lake Cowcowing, and at Hines Hill† were examined in previous years. All these localities are situated in the Avon District.

Most of the deposits examined, including those at North Baandee, Baandee, Hines Hill, and Woolundra occur along a very long and important lake system—mentioned on page 20 of the Annual Report for 1925—which includes Lakes Seabrook and Deborah, in the Yilgarn Goldfield and Lake Brown, west of No. 1 Rabbit-proof Fence. The Dukin deposit, as well as one at Koorda, is, as stated, on Lake Cowcowing, and that at Cunderdin is on a small isolated clay pan, a short distance south of a well-defined salt river, which runs west and joins Mortlock River.

West of Lake Brown the previously-mentioned lake system runs in a general southwesterly direction towards Burran Rock townsite, about eight miles NNE. of North Baandee. South of Burran Rock it is joined by another lake system, which comes in from the North. The combined system then runs in a general southsoutheasterly direction towards the Eastern Goldfields Railway. About two miles N. of the railway the system splits, the main branch running southwest to Baandee, the other to Hines Hill. South of the railway, the main branch runs approximately westsouthwest to south of Woolundra, thence turning westnorthwest for a short distance. Thence it runs in a general southwesterly direction—passing to the north of Mount Stirling—towards Avon River, which it joins about 10 miles E. of Mount Kokeby Siding, on the Great Southern Railway.

In the areas examined, the system consists for the most part of a great number of salt lakes or clay pans of greatly varying size and usually of eliptical shape, separated by low-lying areas of soil and, in places, sand dunes; narrow river-like channels connecting the clay pans in places; and samphire swamps.

Only a relatively small proportion of the clay pans contain gypsum in sufficient quantities to be workable. Still, fewer contain workable deposits of salt.

The gypsum deposits may be classified according to:—

1. Their mode of occurrence relative to the lakes or clay pans on which they occur, namely; whether (a) occupying small areas on a large lake, or (b) occupying the greater portion of a small clay pan. The deposits at Dukin are typical of the first group, most of the other deposits falling into the second group. Those at Baandee, however, are intermediate between the two.

2. The type of deposit, namely; whether (c) deposited from solution and situated on the lake bed, or (d) wind-blown and forming a dune on or close to the edge of the lake or clay pan. The second type is secondary, relative to the first type. In places both types occur on the one lake. The Woolundra (in part) and Cunderdin deposits are typical of (c). Fairly large typical dunes of seed gypsum occur at North Baandee and Hines Hill. At Dukin the dunes fringing the lake are mainly composed of the earthy form "kopai."

3. The form of the gypsum, namely, whether (e) deposited as a layer of uncompacted seed gypsum; (f) as a more or less compacted aggregate of coarser crystals; or (g) of large crystals of the arrowhead type or large masses formed of two or more imperfect crystals of that type occurring in a band of puggy clay. Most of the deposits fall into group (e). The Cunderdin deposit and part of a deposit on one of the Woolundra lakes belong to group (f). Group (g) is represented by a deposit at Dukin, about 24 chains W.N.W. of the southwest corner of Lot 125.‡ A fourth type, consisting of seed gypsum compacted to form a cellular rock, may also be mentioned. A deposit of this kind occurs at North Baandee.

The deposits on the larger lakes appear to be mainly confined to small bays on the southeastern sides of the lakes, and on the smaller lakes or clay pans a greater accumulation of gypsum on the southeastern portions is noticeable in many cases. Moreover, the gypsum and kopai dunes appear to be confined mainly, if not wholly, to the southeastern sides of the lakes. This accumulation of gypsum on the southeastern sides of the lakes is obviously due to the action of northwesterly winds in the dry season.

GYPSUM DEPOSITS ON AND NEAR MINERAL CLAIM 30H, NORTH BAANDEE.

GEOGRAPHY.

Location.—Baandee Siding§ is situated on the Eastern Goldfields Railway, approximately 149 miles E. of Perth. North Baandee townsite is situated, as the crow flies, approximately 15 miles W. of N. of Baandee Siding.

Mineral Claim 30H is siuated near the middle of the northern portion of Loc. 22818 and 3¾ miles ENE. of North Baandee townsite. It is approximately 17½ miles, by road, north of Baandee siding, and about 14 miles, as the crow flies, south of Kwelkan townsite on the Dowerin-Merredin Railway. A track to Locs. 12190 and 12169,‖ south of and adjoining Loc. 22818, and thence to Loc. 22818, leaves the main Baandee-North Baandee road north of Loc. 12186, 3 miles SE. of North Baandee townsite.

Topography and vegetation.—Between Baandee and North Baandee, north of the York road, the country is undulating, the lake system being, except immediately north of the York road, from 2 to 6 miles east of the main road. The country consists of soil flats or valleys separated by low ridges on some of which granite outcrops, others being covered by sand. The track from the main road to Loc. 22818 is mainly over a high sand-plain. The drainage is in an easterly or southeasterly direction towards the lake system.

The vegetation is varied, but near Baandee much of the country has been cleared. Salmon and other gums occur on the better flats and valleys, but on some of the poorer soil on the slopes of the ridges white gums are prevalent. Small patches of cypress pine occur in a few places. The vegetation on the sand-plain on the track to Loc. 22818 is largely mallee with patches of ti-tree and spearwood, but a narrow salmon gum flat occurs on the southern portion of Loc. 22818. Dense ti-tree fringes the western side of the lake on the northern boundary of Loc. 22818. On the gypsum dune on M.C. 30H are occasional salmon gums, cypress pine, sheoak, and quandong.

GEOLOGY.

The country rock of the district is granite, but outcrops are comparatively few. At Bocanning Soak, 2¾ miles N. of Baandee Siding and a few chains north of York Road, is a low bare ridge, trending

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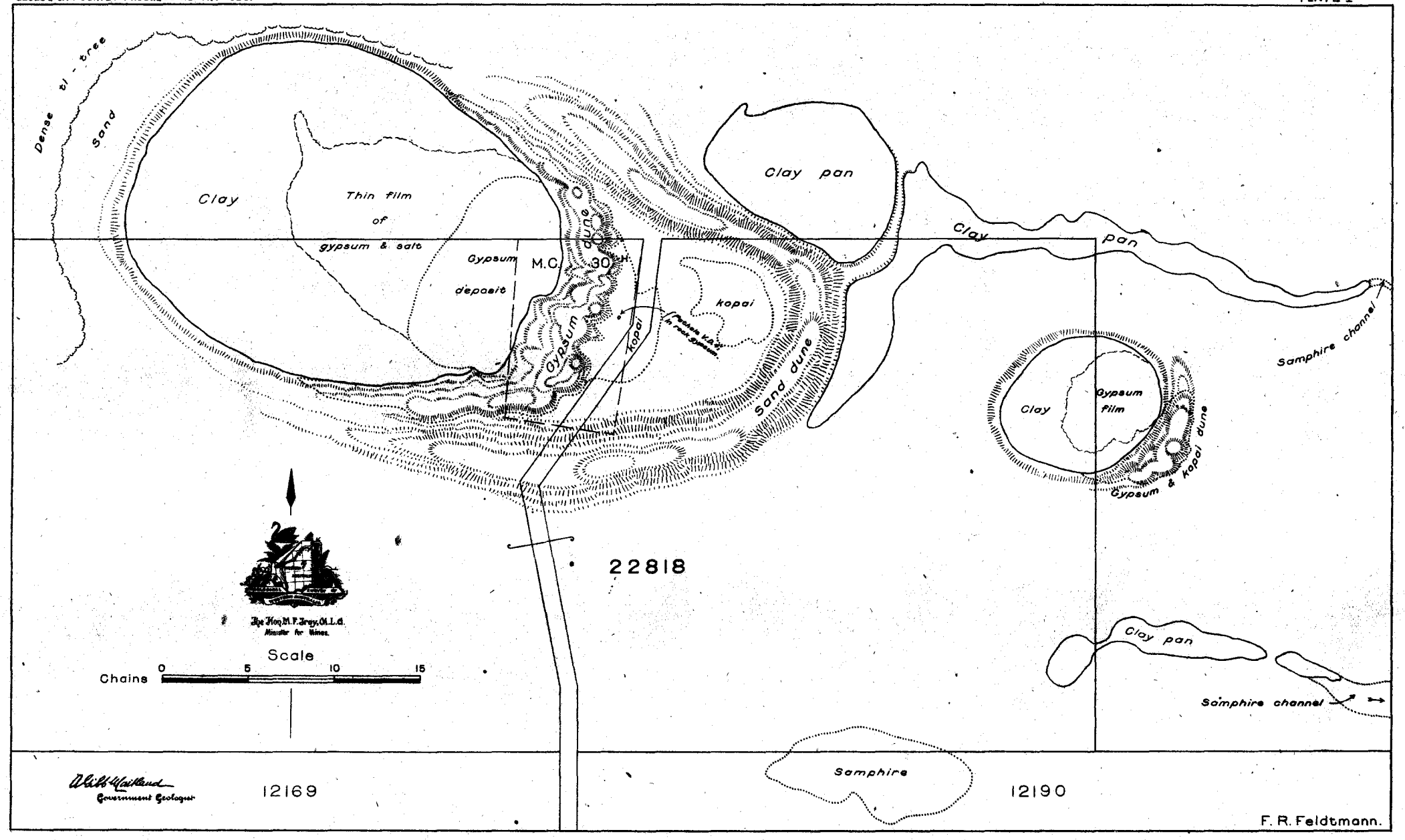
* Feldtmann, F. R., The gypsum deposits at Dukin, Avon District, South-West Division: W.A. Geol. Survey Ann. Rept., 1924, pp. 9–10, 1925. † Feldtmann, F. R., The gypsum deposits on Mineral Claims 27H and 28H, Hines Hill, Avon District, South-West Division: W.A. Geol. Survey Ann. Report. 1923, pp. 20–21, 1924. ‡ *op. cit*, p. 10. § *Vide* Lands and Surveys Department Lithograph 25/80. ‖ *Vide* Lands and Surveys Department Lithograph 34/80.

GEOLOGICAL SURVEY PROGRESS REPORT 1925.

MAP OF THE GYPSUM DEPOSITS, NORTH BAANDEE, SOUTH—WEST DIVISION.

PLATE I



Fred. Wm. Simpson, Government Printer, Perth.

about northeast, composed of fairly coarse-grained biotite granite, more or less sheeted. A fairly well defined zone of sheeting from 100 to 120 feet wide, striking about N.28°E. and practically vertical, is noticeable immediately east of the highest point at the southwest end of the ridge. A few outcrops of granite were noted near the North Baandee road, one being a partly bare ridge about halfway between Baandee and North Bandee and a short distance south of Medway Tank. Other small outcrops occur on Loc. 12186, south of the track to Loc. 22818. Granite also outcrops on the northern portion of Loc. 12190, southeast of Loc. 22818, where it forms a low breakaway on the southwest edge of a small lake.

The Gypsum Deposits.

As may be seen on the accompanying map, a number of small lakes or clay pans occur along the northern and eastern boundaries of Loc. 22818, including three on the northern boundary and two on the eastern. These, particularly the northern three, were probably originally joined to form one lake, but have been gradually separated by the formation, through wind action, of dunes of sand or sand and clay. In the case of the three northern lakes this is strongly suggested by their shape and relative position. The eastern portion of the easternmost clay pan is of river-like form and the line of the channel east of the clay pan is continued by a samphire swamp. The western end of the clay pan bends south along the edge of a large sand dune, 25 or more feet in height. This clay pan is separated from the second clay pan, which lies to the northwest, by a low bank of sand from about 30 to 80 feet in width. The sand dune, which is acutely crescent-shaped with the concave side facing west, forms the southwestern edge of the second clay pan and separates the two clay pans from a small depression on the concave side of the dune. A crescent-shaped dune of gypsum separates the third and most westerly and largest clay pan. This clay pan, the southeastern end of which is partly covered by the northwest portion of M.C. 30H, forms an ellipse with the major axis striking in an east-southeasterly direction. The axes measure approximately 1,600 feet and 1,260 feet.

Of the two clay pans on the eastern boundary of the location, the more northerly is elliptical in shape with axes about 620 feet and 520 feet in length, the major axis striking ENE. The other clay pan is of the narrow river or creek-like type.

Two of the lakes are gypsum-bearing, namely: the main western lake on the northern boundary of the location, and the more northerly clay pan on the eastern boundary. The small depression between the sand and gypsum dunes east of the main lake may be regarded as an easterly extension of that lake after the sand dune had started to separate it from the two more easterly lakes.

On and east of the main lake, the gypsum occurs in four ways:—

(a) As a deposit of seed gypsum covering the extreme southeast portion of the lake bed;

(b) as the crescent-shaped dune, previously mentioned, of seed gypsum fringing the southeastern edge of the lake;

(c) as two small deposits of the earthy form, kopai, on the depression separating the gypsum and sand dunes; and

(d) as a deposit of rock gypsum underlying the more westerly of the kopai deposits.

(a.) The deposit on the lake bed ranged, where tested, from a film to 19 inches in thickness, averaging 3 or 4 inches. Most of the gypsum is moderately clean, but where the deposit is thick the upper portion is cleaner than the lower. The thickest portion was on the extreme eastern edge of the lake, where cut by the northern boundary of Loc. 22818. Here the deposit was composed of an upper layer of 6 inches of fairly clean gypsum followed by 13 inches of gypsum of a dirty grey colour due to the presence of a small proportion of clay. The whole was underlain by puggy grey clay. A sparse growth of samphire marked this portion of the lake, the rest being practically bare of vegetation. West of the gypsum deposit and occupying the centre of the lake was a small area marked by a very thin film of salt and gypsum, covering the clay of the lake bed. On those parts of the lake north, west, and south of this area, a trace of salt was visible on the surface of the clay.

(b.) The dune fringing the southeastern portion of the lake has a total length of about 2,300 feet with a maximum width of about 300 feet, and rises to a maximum height of about 18 feet above the floor of the lake. It is composed, so far as examined, of comparatively clean seed gypsum—the top four inches being practically pure—but owing to the growth of cypress pines, sheoaks, and smaller bushes, contains numerous rootlets, which, however, might be separated by a suitable washing plant. A trace of sand was visible in a few places on the surface of the dune, and a small amount appeared to be present in the dune itself, but probably not in sufficient quantity to materially affect the treatment of the gypsum.

Mineral Claim 30H covers the southeastern and better portion of the dune.

A sample (Lab. No. 598/25) of typical gypsum from this dune was reported on by the Government Mineralogist and Analyst as follows:—

Rather coarse crystals of gypsum, slightly tinted:

	per cent.
Insoluble in acid	4·28
Acid soluble lime, CaO	0·94
Equal to calcite, $CaCO_3$ ...	1·68
Water soluble lime, CaO	30·36
Equal to gypsum, $CaSO_4 \cdot 2H_2O$	93·21
Salt, NaCl	traces.

Yields a good white plaster, slow setting (25 minutes) and with strong body. It is inferior to Lab. No. 597/25 (from the northern lake at Baandee) but of good commercial grade.

(c) The more westerly of the two small areas of kopai adjoins the eastern side of the gypsum dune, south of the north boundary of Loc. 22818. It has a length of about 550 feet and averages for the most part about 200 feet in width. The kopai, where tested, ranged from a film to about 14 inches in thickness. The eastern portion appeared to be mainly underlain by seed gypsum, part of the western portion by the rock gypsum.

The other kopai area occupies the eastern portion of the depression and adjoins the middle portion of the concave side of the sand dune. It has a length of about 440 feet and a maximum width of about 300 feet. It was tested in one place, near the northern end, where it consisted of about 18 inches of cream-coloured kopai, underlain by seed gypsum of a dirty buff colour.

(d) The deposit of rock gypsum was exposed in a small pothole 300 feet south of the north boundary of Loc. 22818, and between the eastern side of the gypsum dune and a surveyed road which runs through the location, being about 60 feet west of the western peg marking an angle of the road. The pothole exposed about four inches of kopai underlain by rock gypsum. The pothole was deepened by me to a total depth of four feet without reaching the bottom of the deposit. The deposit is composed of small gypsum crystals cemented together to form a somewhat porous but tough rock of biscuit colour. The extent of the deposit was not determined. It appeared to be fairly clean and pure, but owing to its toughness might be difficult to work.

The deposits on and east of the small elliptical clay pan on the eastern boundary of the location are not of any great size. They consist of a film of gypsum, too thin to be workable, on the eastern portion of the clay pan, and a small dune on the southeastern edge. The dune has a length of about 500 feet, and a maximum width of about 170 feet. It is composed in part of kopai, in part of dirty brown seed gypsum. The dune rises to a height of some 10 or 12 feet above the lake-bed, but probably only the top half, or less, consists of gypsum, the remainder consisting mainly of sand.

An examination of the lake country southeast of the area examined would doubtless reveal other workable deposits of gypsum. I was shown some moderately clean gypsum which was stated to have been obtained from a lake some miles southeast of those described. The deposit was said to be of some extent.

THE BAANDEE GYPSUM DEPOSITS.

Geography.

Location.—As stated in the preceding report, Baandee Siding is situated on the Eastern Goldfields Railway, 149 miles E. of Perth. Mineral Claim 31H, in connection with the application for which this area was examined, is situated 2¾ miles (3¼ miles by road) S.W. of the siding.

Topography.—The country in the immediate vicinity of Baandee, and for a considerable distance south, is much flatter than that north of York Road, which lies about 2½ miles north of the siding, and the only areas rising above the general level of the country are low ridges or banks of sand or soil. The siding and townsite lie within the lake area, what appears to be the main channel passing close to, and northwest of, the townsite. Here the lake system is more river-like in form and its general trend is southwesterly. About a quarter of a mile south of the railway, at a point 1½ miles west of the siding, the lake channel opens out to form a large elliptical clay pan or lake about 1¼ miles long by nearly a mile wide, the major axis lying north and south. This clay pan is enclosed on the north and west by low banks of soil or sand, and on the east and south by much higher and steeper banks of brownish-grey clay, sandy in places. At the extreme southern end a low narrow bank of sand separates the clay pan from a short winding river-like channel which runs into a second and larger lake. This second lake forms an ellipse, imperfect on the northwest side, the longer axis of which trends southwest. The lake measures approximately 2 miles in length by nearly a mile in width. Mineral Claim 31H is situated on the northeastern portion of this lake, the southeast corner being 27 chains northwest of the southwest corner of Loc. 10717.*

A second claim, 36H, was pegged to the south of M.C. 31H. An area on the eastern side of the northern lake and immediately west of Loc. 10716 was pegged by Joseph Saunders.

The Gypsum Deposits.

The northern lake.—The gypsum deposits on this lake appear, from the brief inspection made, to be confined to a narrow strip along the foot of the bank on the eastern edge, west of Loc. 10716. The gypsum, which is of the seed type, is largely obscured by a covering of sand or clay of varying thickness, but the line of the deposit may be traced by a series of small exposures, mostly only a few inches in extent, along a general line situated from 10 to 40 feet east of the lake edge and between it and the high bank. Owing to the covering, the width of the deposit was not determined. It was traced for a length of more than 2,000 feet.

The deposit had been tested in two trial holes, one situated about 700 feet north of the southwest corner of Loc. 10716, the other about 800 feet south of the northwest corner. A trench had also been dug between the two potholes and about 1,200 feet south of the north-west corner of Loc. 10716.

The material exposed in the northernmost pothole was as follows:—

0 to 7	inches	.. gypsum streaked with clay.
7 to 15	„	.. cleaner gypsum.
15 to 19	„	.. clayey gypsum.
19 to 25	„	.. gypsum with streaks of clay.
25 to —	„	.. clay.

In the trench, at the western end, a layer of gypsum about an inch thick was exposed from a depth of 15 inches; at the eastern end, gypsum was exposed from a depth of 5 to 17 inches. The gypsum layer was overlain by clay with a little gypsum.

In the southern pothole the material exposed was:—

0 to 13 inches—gypsum streaked with thin layers of clay.

13 to 18 inches—fairly clean gypsum.

This was underlain by clay containing a little gypsum. The material contained a few rootlets to a depth of about 13 inches.

A sample (Lab. No. 597/25) of typical gypsum from this area was analysed by the Government Mineralogist and Analyst with the following results:—

Rather fine prismatic crystals of gypsum (seed gypsum), very white and clean looking:

	per cent.
Insoluble in acid	2·94
Acid soluble lime, CaO	0·40
Equal to Calcite, $CaCO_3$	·71
Water soluble lime, CaO	31·46
Equal to Gypsum, $CaSO_4 \cdot 2H_2O$ ...	96·59
Salt, NaCl	traces

Yields a rather slow setting (20 minutes) plaster, pure white in colour and of strong body. This is an excellent sample of gypsum for plaster making or other purposes.

The southern lake.—Unlike the northern lake, the surface of which is practically even, the southern lake consists of a series of comparatively small clay

* *Vide* Lands and Surveys Department Lithograph 25/80.

pans separated by slightly higher areas mostly covered by a sparse growth of samphire. A samphire swamp averaging about 750 feet in width fringes the southeastern edge of the lake, the southeastern portion of which consists largely of a channel-like clay pan.

On this lake the gypsum occurs:—

(a) As a long narrow dune fringing the southeastern side of the main clay pan and separating it from the samphire swamp;

(b) as low narrow banks on the surface of the northeastern portion of the lake;

(c) as a deposit on the bed of the clay pans; and

(d) in places as a deposit on the higher areas covered by samphire.

(a) The gypsum dune is of great length as compared with its width and height. It rises to a maximum height of about 6 feet but for a considerable part of its length it is little more than a low bank, and is very narrow at its northeastern end. It was traced for a distance of about 1½ miles. It passes close to the southeast peg of Loc. 9155 on the southern portion of the lake. At this point the dune is only a low bank but has a width of nearly 50 feet. The gypsum is very fine in grain and fairly clean except for numerous rootlets due to the presence of a fairly thick growth of ti-tree.

(b) The largest of the low gypsum banks runs diagonally through M.C. 31H. It starts about 180 feet north of the northwest corner of the claim (as pegged) and runs in a southeasterly direction to a point about 500 feet NW. of the southeast corner. Thence it runs south, gradually turning southsouthwest. It was examined for a length of about 2,500 feet, but extends for some distance farther south. The width ranges from about 35 feet to 110 feet, averaging about 70 feet.

Several long trenches had been cut on this bank, including one, about 300 feet in length, along the top of the bank near the middle of M.C. 31H and one, across the bank, from 135 feet to 235 feet west of the southeast corner of the claim. From this last trench two others ran at right angles. In this trench seed gypsum was exposed to a depth of 16 inches. The gypsum was underlain by puggy grey clay.

At a point on the middle of the bank about 480 feet SW. of the southeast corner of the claim the deposit consisted of about 14 inches of fairly clean gypsum underlain by 3 inches of thin layers of gypsum and what appeared to be salt, followed by fine, puggy red clay.

A sparse growth of samphire covered the gypsum bank.

A typical sample (Lab. No. 596/25) from the main trench west of the southeast corner was reported on by the Government Mineralogist and Analyst as follows:—

The sample consisted of rather coarse crystals of gypsum (seed gypsum), slightly tinted.

	per cent.
Insoluble in acid	0·31
Acid soluble lime, CaO	0·06
Equal to Calcite, $CaCO_3$ ...	0·11
Water soluble lime, CaO	32·42
Equal to Gypsum, $CaSO_4 \cdot 2H_2O$	99·53
Salt, NaCl	traces

Yields a slow setting plaster (25 minutes), white in colour but containing a number of minute black specks due to the presence of organic matter. This gypsum, however, could be used for plaster making.

Washing in a suitable plant would probably remove much of the organic matter which probably consists of samphire rootlets.

Another smaller bank runs southsouthwest from the edge of the lake at a point about 880 feet NNE. of the southeast corner of the claim, and extends to about 160 feet NE. of that corner. The bank also extends north for a short distance along the edge of the lake from the point where it joins the edge. This bank has a total length of about 900 feet, and averages about 30 feet in width, the southern portion being the narrower.

A pothole about 100 feet south of where the bank joins the lake edge showed about nine inches of gypsum, of which the upper portion was moderately clean, overlain by 2 inches of clay and underlain by 2 inches of clay with thin seams of gypsum, followed by reddish clay. Near the southern end of the bank, the deposit consists, at the top of the bank, of 18 inches of dirty gypsum.

(c) Two clay pans near M.C. 31H were treated for gypsum. One runs south from the river-like channel connecting the two large lakes, and lies immediately west of the smaller gypsum bank, ending about 170 feet N. of the southeast corner of the claim. No gypsum was found on the eastern portion of the clay pan near the northern end of the gypsum bank, the lake bed here consisting of a thin layer of black mud underlain by red clay, but near the northeast peg of the claim the bed of the clay pan consisted of 1½ inches of clay overlying a layer, from 2 to 3 inches thick, of gypsum underlain by clay.

West of the larger gypsum bank is a larger clay pan, which was tested at a point about 30 feet W. of the bank, and about 350 feet S. of the south boundary of the claim. Here the lake bed consisted of about a quarter of an inch of cinnamon-brown clay followed by an inch of blackish-grey clay, below which was a band 4 inches thick, composed of alternate layers of fine gypsum and salt (?) underlain by reddish clay.

(d) As stated, a large part of the lake consists of irregular areas covered by a sparse growth of samphire and slightly higher than the clay pans. The southeast corner of the claim is situated on one of these areas. Here the lake bed consisted of an inch of black mud underlain by 9 inches of clean seed gypsum, about the size of rice grains, followed by bluish-grey clay.

Another samphire covered area separates the northern portion of the main gypsum bank from the more easterly clay pan, and occupies the northeastern half of M.C. 31H. This area was tested at three points. About 100 feet W. of the northeast corner of the claim, the lake bed consisted of 2 inches of grey clay followed by 9 inches of fairly clean gypsum overlying grey clay. About the middle of that portion within the claim, the samphire area consisted of half an inch of black mud underlain by gypsum to a depth of several inches—the thickness not being determined. Immediately east of the northwest corner of the claim the bed consisted of a film of grey clay followed by 11 inches of fairly clean gypsum.

The deposits forming the low banks and the long dune should pay to work, unless the latter is found to contain sand in any quantity. No sand, however, was observed, but the vegetation on the dune might interfere to some extent with the working of this deposit. Possibly, portions of the samphire-covered areas

might be worked, but the samphire would interfere to some extent with the removal of the overlaying clay, and where this consisted of black mud the gypsum might be found to contain organic matter. Such deposits as were found on the clay pans appeared to be unworkable.

The layer of black mud mentioned as covering the gypsum in places on the clay pans and samphire area is of interest. The layer is usually from half to three-quarters of an inch thick, and was nowhere observed to exceed an inch. When *in situ* it is jet black in colour and has a somewhat sulphurous odour, but on exposure it gradually loses moisture and becomes grey in colour.

A sample (Lab. No. 595/25) that had been kept for a few weeks and was of a grey colour when analysed, gave the following results:—

A fine-grained mixture of gypsum, salt, sand, clay, and finely-divided organic matter.

	per cent.
Gypsum, $CaSO_4 \cdot 2H_2O$	44·55
Magnesium suphlate, $MgSO_4 \cdot 7H_2O$ ...	1·70
Magnesium chloride, $MgCl_2 \cdot 6H_2O$ ...	5·59
Sodium chloride, NaCl	12·40
Free sulphur, S	·22
Carbon, C. 4·15, equal to humus ...	7·14
Insoluble in water	25·13
Moisture	3·87
	100·60

Salt.

Salt has been obtained from a small clay pan south of the railway and about half a mile west of Baandee siding. According to information supplied by Mr. Joseph Saunders, who worked the deposit, a total of 166 tons of crude salt with a gross value (including railway freights) of approximately £370 was forwarded to Messrs. Cumming, Smith, & Co., at West Guildford, during 1919 and 1920.

THE WOOLUNDRA GYPSUM DEPOSITS.

Geography.

Location.—Woolundra Siding* is situated on the Eastern Goldfields Railway 137¾ miles E. of Perth. Mineral Claim 32H, in connection with which the area was examined, is 1¾ miles S. of the siding, in the northern portion of Loc. 17183, the northeast peg of the claim being 320 feet SW. of the northeast corner of the location.

Topography.—Viewed broadly, the country round Woolundra is undulating, the area northeast of the siding, namely that north of the railway between Woolundra and Doodlakine, being more markedly so than that to the south. Between Baandee and Woolundra the main lake system occupies a broad valley with, east of Woolundra siding, a fairly steep northern escarpment. Southwest of Woolundra the valley appears to be less defined. South of the valley the country rises again, but the rise is less marked.

Though occupying a fairly well defined valley, the lake system near Woolundra is irregular and ill-defined and consists of a number of small, more or less isolated, clay pans, it being difficult to determine the main drainage channel. From Woolundra the system appears to run approximately westnorthwest to a point about three quarters of a mile south of the 135 mile peg on the Eastern Goldfields Railway. Thence it turns in a southerly direction.

Geology.

The country rock of the district is granite, of fairly coarse grain where examined. Outcrops are not uncommon in places on the higher ground. A fairly prominent feature about a mile east of the siding is Badgetopping Rock, a small bare granite knoll on Lot 50 and at the top of the slope north of the lake valley. The nearest outcrop to the lake area seen was near the southwest corner of Lot 48 and about half a mile from the nearest lakes.

The soil resulting from the degradation of the granite appears to vary considerably, ranging from a good chocolate-coloured or dark-red loam to a gray sandy loam. In places on the lower ground, the soil occupying the areas between the lakes contains a large proportion of kopai, the earthy form of gypsum.

The Gypsum Deposits.

Four of the lakes near Woolundra contain, or contained, gypsum deposits of fair size. These lakes are:—a small more or less elliptical lake on the northern portion of Loc. 9136; a comparatively narrow lake, elongated in a north and south direction and west of the first lake, on the common boundary of Locs. 7554, 7659, 9136, and 12933—both these lakes are to the north of M.C. 32H; a somewhat larger lake, more or less elliptical in shape, but elongated at its south west end, on the northern portion of Loc. 17183 and covered by M.C. 32H; and a small elliptical lake, southeast of the last, on the boundary between Locs. 8723 and 10198. I was informed by the Ajax Plaster Company's representative at Woolundra that he had examined the lake country for a considerable distance south and west of the above-mentioned lakes, but had seen no other lakes containing gypsum deposits of any size.

The first two lakes contained deposits of seed gypsum, mainly on the eastern portions of the lakes. Both lakes are flanked, in places, by high banks on the eastern side. These banks consist mainly of fine clay and sand with some kopai, and contain, in places, layers of gypsum. An attempt was made to work a fairly thick layer on the eastern side of the more westerly lake, but the deposit was found to contain too much sand to be workable. Both these lakes are now practically worked out.

The lake on the boundary between Locs. 8723 and 10198 was being worked at the time of my visit. It is about 1,400 feet long by 1,100 feet wide. It contains a fair-sized deposit of gypsum on the bed of the lake, mainly on the southern portion. Although a fair proportion of seed gypsum is present, the gypsum of this lake is, as a whole, somewhat coarser than usual, and a band of particularly coarse gypsum, striking about northeast, was noticeable immediately north of the boundary between the two locations. This band extends to a depth of more than three feet in places and consists of a compacted mass of interlocking crystals of various sizes, many being more than an inch in length. The crystals are very imperfect.

The lake on Loc. 17183 covered by M.C. 32H, is somewhat larger than the other three. It occupies most of that portion of Loc. 17183 between Locs. 9136 and 10307. In shape the lake approaches the enclosed elliptical type, the major axis of the ellipse striking between northeast and northnortheast. The ellipse would, if perfect, measure about 3,000 feet by 2,100 feet. It is, however, broken by a reentrant angle on the southern side, and the southwest end is

* *Vide* Lands and Surveys Department Lithograph 25/80.

elongated in a southerly direction, the lake bearing in outline a resemblance to a bearded aboriginal head, facing west. The elongation at the southwest end forms a narrow channel, which runs toward the northeastern edge of another lake, occupying the eastern portion of Loc. 18208, a low narrow bank separating the two lakes. The lake covered by M.C. 32H is mostly surrounded by low banks, somewhat broken on the western side. The concentration—due to wind action—of the gypsum in the southeastern portion of the lake, observed in the examination of other deposits and noticeable to some extent on the two northern lakes, is not marked on this lake, where the gypsum occurs as a fairly even layer on the middle and greater portion of the lake, the deposit being almost entirely surrounded by a deeper channel in which there is little or no gypsum, but in which salt, which crystallises out at a higher degree of concentration, is deposited. A comparatively thin and narrow layer of wind-blown gypsum, probably containing too much sand to be workable, occurs on the eastern and southern edges of the lake, and the bank, near the southeastern corner contains a fair amount of kopai in places.

The main gypsum deposits occupies an area of 57 acres. It consists for the most part of somewhat dirty gypsum of fine grain, mixed with a proportion of clay. The grain is fairly even and fine throughout, but, as a rule, the lower portion is slightly coarser than the upper. The gypsum is underlain by a puggy dark-grey clay, but in places a layer, about two inches thick, of dark clay containing numerous small fibrous rootlets of samphire separates the gypsum from the main body of the clay. In places a second layer of very impure gypsum, at a depth of about 16 inches from the surface, was noticed.

The main deposit ranges from 1½ to 10 inches in thickness, but is mostly from four to six inches. Twenty trial holes put down in various parts of the deposit gave a mean of 5.17 inches. This gives a total of 1,072,954 cubic feet and, after allowing a deduction of 30 per cent. for air spaces and impurities, a total of 47,900 tons for the deposit. A small portion at the bottom of the deposit is, however, usually left, and I was informed by the Ajax Plaster Company's representative that it was found that the gypsum from those lakes which they had worked out, after carting and washing, averaged out at one ton per cubic yard of the deposit (83lbs. to the cubic foot). On this average, the net product of the deposit, taking the above area and average depth, would be 34,575 tons. As stated, the gypsum contains a considerable proportion of clay and, in places, samphire rootlets, but should be easily cleaned at the very efficient washing plant erected by the Ajax Plaster Company, close to the eastern edge of the lake on Loc. 9136.

The absence of well-defined gypsum dunes in this area may be accounted for by the fact that, the country southeast of the gypsum lakes being open, the wind-blown gypsum is not concentrated in a restricted area to form dunes, but is spread over a relatively wide area.

THE GYPSUM DEPOSIT ON MINERAL CLAIM 33H, NEAR CUNDERDIN.

Geography.

Location.—Cunderdin townsite* is situated on the Eastern Goldfields Railway, 104 miles E. of Perth. Mineral Claim 33H is situated immediately north of the railway line, on Loc. 13052†, 4½ miles E. of the townsite and 1½ miles E. of No. 2 Rabbit-proof Fence. The datum peg of the claim is 5½ chains NW. of the southeast corner of Location 13052.

Topography.—The country for some distance north of the railway line is almost flat. The main drainage channel is in the form of a fairly well defined salt river, or comparatively narrow salt lake channel. East of Loc. 20630, which adjoins Loc. 13052 on the north, this channel comes from a northeasterly direction, but about 11 miles NE. of Loc. 20630 the trend is from the northwest. No evidence is, however, available to show with what lake system this channel is connected. In and west of Loc. 20630 the channel runs almost due west and eventually joins the east branch of Mortlock River about three miles NE. of Meckering.

South of the railway line the country is more undulating, and about 1¼ miles SW. of Cunderdin rises abruptly to form Cunderdin Hill, a prominent landmark, which, however, is more marked from the south than from the townsite.

Geology.

The main rock of the district is, without doubt, granite, but except at and near Cunderdin Hill, and along a low ridge running east from the hill, outcrops are infrequent, the rocks being almost entirely obscured by soil.

The hill itself is composed of granite, in part coarse-grained with felspars up to about 1½ inches in length, in part fine-grained with coarse pegmatitic veins. The coarse-grained facies appears to predominate. Owing to the steep slope, the hill is partly bare, particularly near the base on the northern and western sides. The strike of the hill is nearly northeast. The granite forming the hill is traversed by a remarkably parallel series of very fine-grained epidiorite dykes striking approximately northeast. Owing to their superior resistance to weathering, the dykes stand out slightly above the enclosing granite and form in places a series of terraces. The dykes range from a mere thread to about 12 feet in width, most being, roughly, between 3 and 6 feet in width. They appear to be nearly vertical. In some of the dykes are numerous fragments of granite that have been caught up during their intrusion. These fragments range from a fraction of an inch to more than 6 inches in length. Some of the dykes appear to be paler in colour, possibly due to their having assimilated portions of the granite.

The Gypsum Deposits.

Mineral Claim 33H is situated on a small isolated lake of the enclosed elliptical type. The lake forms a nearly perfect ellipse with the major axis striking approximately northnortheast. The axes measure about 1,030 feet by 800 feet. The gypsum deposit occupies the middle portion of the lake and covers an area, according to my survey, of exactly 7 acres. Its boundary is nearly parallel to that of the lake but is slightly straighter on the western side. The boundary of the deposit is somewhat ragged, particularly on the eastern side. The deposit is surrounded by a deeper channel, wider on the western than on the eastern side. There is a trace of gypsum in this channel, but salt predominates, particularly in the southwest portion.

* *Vide* Lands and Surveys Department Lithograph 26/80. † *Vide* Lands and Surveys Department Lithograph 26c/40, 1917 edition.

The gypsum deposit consists of slightly raised small rounded areas a few feet in diameter, surrounded by narrow depressions. Fairly coarse gypsum outcrops on the raised areas, but in the depressions the gypsum at the surface is of fine grain. A few small deeper depressions, which appear to consist of clay without gypsum, occur near the edge of the deposit, particularly at the northern end. These, however, are not of any extent.

The raised portions of the deposit have been better tested than the lower. About a dozen trial holes have been dug, including a cut several feet in length near the southeastern edge, but of these probably 10 are in the raised areas, where the gypsum ranges from about 7 to 18 inches in thickness, averaging, in the trial holes, 11.6 inches. The gypsum of the raised areas is all of comparatively coarse grain, but the lower half of the deposit is usually considerably coarser than the upper portion and consists of a compacted aggregate of interlocking crystals. The maximum length of the crystals, which are very imperfect, is about 2½ inches, and a large proportion are more than an inch in length.

In the lower areas the upper portion of the deposit consists of a layer of fine-grained gypsum crystals, of a pale reddish or yellowish colour owing to impurities, underlain by a layer of coarse gypsum similar to that of the raised areas. In the only hole in the lower areas examined, the upper layer of fine-grained gypsum was 4 inches in thickness and was underlain by 5 inches of coarse gypsum. The whole deposit is, as usual, underlain by puggy grey clay. A small proportion of red clay occupies the interstices between the crystals of the coarse-grained portion of the deposit.

Samphire rootlets do not appear to be so common as in many other gypsum deposits, but a little dead samphire, in addition to a few larger bushes, was noticed, particularly on the northern portion of the deposit.

As stated, the average depth of the gypsum of the raised areas is about 11.6 inches, that of the lower areas being probably about 9 inches. The raised portions appear to occupy the larger area, and, allowing for the few small clay areas near the edge of the deposit, the average depth of the deposit for the area of 7 acres is probably about 10.66 inches. This gives a total of 270,769 cubic feet and, at a rate—after allowing for air spaces and impurities—of 100 lbs. to the cubic foot, a total of 12,088 tons of gypsum for the deposit. Owing to the irregular surface of the bottom of the deposit and the fact that the crystals are so closely interlocked, it is difficult to estimate what proportion of the gypsum would have to be left.

The unusually coarse grain of the deposit is a disadvantage, necessitating a greater amount of crushing and probably the alteration of a plant designed to handle seed gypsum of normal size.

The Government Mineralogist and Analyst's report on a typical sample of the coarser gypsum is as follows:—

Lab. No. 599/25.

A compact mass of large ironstained gypsum crystals:

	per cent.	per cent.
Insoluble in acid		1·74
Acid soluble lime, CaO ...	1·10	
Equal to Calcite, $CaCO_3$		1·96
Water soluble lime, CaO ...	31·00	
Equal to Gypsum, $CaSO_4 \cdot 2H_2O$ ...		95·18
Salt, NaCl		traces

This sample was discoloured with ferruginous clay giving a pink-coloured powder on fine grinding. It yields a slow setting (35 minutes) plaster of good body but too cream-coloured to be of any commercial value except as a land dressing, for which purpose there is at present almost no demand. Washing the crystals with water would, however, probably remove a large proportion of the iron and improve the colour of the plaster.

2.—PROGRESS REPORT ON THE KALGOORLIE SURVEY.

(F. R. Feldtmann.)

Location of area examined.—During the year the mapping of the Kalgoorlie auriferous area on a scale of 100 feet to an inch was continued, the area in which operations were carried on being that covered by Sheet 22 of the 2-chain series of maps. This sheet covers an area south of Sheet 20 and east of Sheet 21 published with Geological Survey Bulletin 69. Among the old leases covered wholly or in part by this sheet are the Golden Point G.M.L 1028E, Kalgoorlie G.M.L 1026E, Golden Chain G.M.L. 1027E, Oratava G.M.L. 1029E, Brown Hill Consols North G.M.L. 860E, Brown Hill Consols G.M.L. 552E, and the Iron Hill G.M.L. 1007E. Among the more recent leases are the Marne G.M.L. 4630E, Lucelle G.M.L. 5375E, and G.M.L. 5247E, but much of the southern portion of the area has been held as machinery or tailings leases.

Topography.—The southern portion of the flat which lies to the south of Williamstown occupies the north-west corner of the sheet. East of the flat is a low saddle, on the northern boundary of the sheet, on which the Lucelle lease is situated. This saddle runs southsoutheast from Mount Ferrum and links it with the Brown Hill Consols hill. A small creek runs southwest from the saddle and crosses the west boundary of the sheet about 400 feet south of the old Golden Point No. 4 Shaft. This creek drains a fairly extensive area.

The most prominent feature covered by the sheet is the Brown Hill Consols hill or ridge, which occupies a large part of the middle and southern portions of the sheet and was covered by parts of the Brown Hill Consols mine and the Iron Hill, Golden Chain, and Oratava leases. This ridge, which has a southwesterly trend, rises to a height of about 55 feet above the Leucelle saddle and about 80 feet above the point where the creek crosses the Brown Hill Railway.

Geology.—A short distance south of Mount Ferrum the eastern portion of the great Younger Greenstone dyke form a comparatively short, broad tongue, the exact dimensions of which are difficult to determine. The western boundary of this tongue runs northwest into Williamstown, but exactly how far cannot at present be determined. Boring in this locality will, however, throw some light on this point. West of the tongue the eastern boundary of the dyke runs slightly east of south, gradually bending till nearly due south. It appears to cut the northwest boundary of the Marne G.M.L. 4630E about 200 feet NE. of the west corner. It continues south through former G.M.L. 4259E and, so far as can be determined, crosses the Brown Hill Railway a short distance northwest of the south corner of G.M.L. 4259E, close to where the previously mentioned creek crosses the railway. The eastern boundary of the dyke is thus for the most part situated close to the western boundary of Sheet 22, the area covered by the sheet being almost wholly in the Older Greenstones.

A noticeable feature in this area is that whereas the Older Greenstones have been intensely sheared and have been completely chloritised and carbonated, being mainly represented by chlorite-carbonate schists, the Younger Greenstones are massive and have undergone practically no vein alteration and are represented by quartz dolerite epidiorite. The shearing of the older rocks is particularly noticeable near the junction. Both rocks are almost entirely obscured by superficial deposits—by soil to a depth of fully 5 feet, in places, on the flat, and by a deposit of dense laterite on the Brown Hill Consols ridge. Completely oxidised rock outcrops in places on the northwest side of the ridge, but on the south-east side the rock is largely obscured and that portion of the ridge southwest of the Brown Hill Railway is now covered by tailings.

A long albite porphyrite dyke runs diagonally southeast across the sheet. It is most noticeable in the southeast portion of the Marne G.M.L. 4630E, where it is from about 20 feet to 100 feet south-west of the northeast boundary. The northwestern end of the dyke is obscured by the soil of the flat, and in general the dyke can only be traced by close examination. The southeastern portion is obscured by detrital material on the north-west slope of the Brown Hill Consols ridge. This dyke is practically on the line, extended southeast, of the large Williamstown dyke. It was partly indicated by a small "felsite" dyke on Mr. Campbell's map, but was omitted from Mr. Gibson's map. Fragments of albite porphyrite, apparently from another dyke west of the first, are noticeable on the dumps of three shafts on the northwest slope of the ridge, close to the southeast boundary of G.M.L. 4630E, but the exact position of this dyke cannot be determined without an examination of these shafts, which are at present inaccessible. Fragments resembling weathered albite porphyrite were also observed on the dumps of shallow shafts close to the junction of the Older and Younger Greenstones. The material was, however, too weathered for determination and may be only decomposed and bleached quartz dolerite epidiorite.

Lodes and quartz veins.—Four lodes are shown on the southern portion of Sheet 20 of Plate XIII., Bulletin 69. The westernmost is the southerly continuation of a long line of shearing, striking nearly north and south and with unusually shallow dip, which from the Bulong Road to south of Mount Ferrum is situated along or close to the junction of the Older and Younger Greenstones. The exact position of the southern extension of this line, which south of Mount Ferrum is entirely in the Older fine-grained greenstones, is uncertain, and the line could not be definitely traced in the area covered by Sheet 22, but probably runs close to the south corner of former G.M.L. 4550E.

Two lodes, east of the above, were worked by Sassella Bros. in the former Williamstown G.M.L. 4499E, and have been recently worked by Hansen and Lynch in the Leucelle G.M.L. 5375E, which covers the northern portion of G.M.L. 4499E. These lodes appear to be very nearly on the southerly continuation of the Hidden Secret lodes, but are in the fine-grained greenstone, whereas the Hidden Secret lodes are in dolerite greenstone or its bleached equivalent. Good patches have been obtained from these lodes, but most of the ore obtained by Sassella Bros. was of low grade. What appear to be the southerly extensions of the lodes were observed a few feet southeast of the southeastern boundary of the Leucelle and from about 110 to 120 feet and 150 to 190 feet, respectively, east of an old shaft with a high dump, from which some prospecting is said to have been done by one of the Sassellas. The occurrences noted at these points were two parallel zones of intense shearing, which, apparently, had not been tested. The more westerly lode or shear zone is about 8 feet wide at this point, the other about 30 feet. They strike towards the lodes worked by Sassella Bros. Southeast of the points mentioned these shear zones are obscured by the detritus from the Brown Hill Consols ridge, but should pass close to the tunnel on the northeast end of the ridge.

The fourth line shown on Sheet 20 is that of the Mt. Ferrum Consols West lode. It appears to be converging, going south, towards Sassella Bros.' lodes, but could not be definitely traced south of Sheet 20. A quartz reef observed in a pothole about 130 feet southeast of the more easterly of the two shear zones previously mentioned is, however, approximately on the strike of this lode.

The old Brown Hill Consols lode is situated in the northeast corner of Sheet 22 about 500 feet ENE. of the mouth of the previously mentioned tunnel. A fair amount of work, including open-cutting, has been done on this lode, which is about 3 feet wide. It does not, however, appear to have been followed over any great length and most of the ground to the south is now obscured by tailings.

Two lodes have recently been worked by Black and Levy on the northern slope of the Brown Hill Consols ridge and near the northwest boundary of G.M.L. 5247E. The more easterly cuts the northwest boundary of that lease about 240 feet from the west corner, and has been worked from an underlay shaft at this point. This lode is situated about 200 feet southwest of the southeasterly extension of the line of the Lucelle West lode. The lode strikes about 10° or 12° west of north and dips west at about 70°. It has been driven on north for about 90 feet at a depth of 29 feet, but only one small shoot of payable ore, between about 40 feet and 55 feet north of the shaft, was found.

The second lode has been worked from a shaft about 265 feet south of the shaft on the first lode and about 200 feet southeast of the west corner of G.M.L. 5247E. The shaft, which has a depth of 63 feet, cuts the lode about 5 feet from the surface. The lode has been driven on for about 40 feet north and 60 feet south of the shaft at the 63ft. level. A small shoot of fair ore was cut by the shaft between the 39ft. and 63ft. levels but did not extend for more than a few feet north and south of the shaft, the remaining portions of the drives being in very low-grade lode matter. A fair amount of cross-cutting has been done east of the shaft at the 63ft. level, what is probably the southerly continuation of the first lode being cut about 50 feet east of the shaft. The lode, however, only contained a trace of gold at this point.

As stated in the description of the geology of this area, the fine-grained greenstones are much sheared near their junction with the quartz dolerite epidiorites. On account of the general intensity of the

shearing it is difficult to trace any particular lode or shear zone for any great length. One line, striking slightly east of south, follows the junction between the two rocks for some distance. It has been worked from several shallow shafts in the northern portion of former G.M.L. 4259E, but evidently was not payable. Most of the lodes or shear zones, however, strike about southsoutheast, diverging from the junction at an acute angle. One, on which a little work has been done from two shallow shafts, follows the southwest boundary of the Marne G.M.L. 4630E very closely. Another lode, southwest of the last, has been worked in the southern portion of G.M.L. 4259E from two shafts, one on each side of the creek. North of these shafts the lode passes about 60 feet east of the old Golden Point No. 4 shaft, put down by the Hannan's Proprietary Company. A little stoping has been done on this lode from the shaft south of the creek.

No lodes appear to have been found in the quartz dolerite epidiorite west of the junction, and from the absence of vein alteration and the massive character of the rock it is unlikely that payable lodes occur therein. Small cross veins of quartz, however, occur, and some of those have been worked at the surface. Most of these veins are too small and the enclosing rock too hard to pay to work.

Prospecting on the flat occupying the northwest portion of Sheet 22 and parts of the adjoining sheets has been much hindered by the covering of superficial deposits, and the only portion of the flat where systematic prospecting has been done is at the southern end, where four shafts were put down in the early days of the field by the Hannans Proprietary Company. About 950 feet of cross-cutting from these shafts, which are now inaccessible, and short drives were put in, in places, but the results were evidently not encouraging. Nevertheless, as the gold content of the lodes in the fine-grained greenstones is very erratic, it is possible that short shoots of payable ore occur in the lodes cut by these crosscuts. As only the two more westerly shafts are connected, and the easternmost of the four shafts is only about 800 feet east of the junction of the two rocks, a considerable width of possibly auriferous country remains untested.

3.—WORK DONE DURING 1925 IN THE VICINITY OF THE PAYMASTER AND MYSTERY LODES AND DYKES AT THE NORTH END, KALGOORLIE.

(F. R. Feldtmann.)

Introduction.

While continuing the survey of Kalgoorlie during 1925, a brief examination was made of some of the work done on the northern portion of the field subsequently to my examination of that area in 1924, in particular of that from the Paymaster main workings, with a view to obtaining further data relating to the Paymaster and Mystery lines of lode and the Paymaster albite porphyrite dyke. A good deal of work was done during the year by the Paymaster Syndicate, including most of that recommended during the previous examination. Some crosscutting near the northern end of the Paymaster dyke has also been carried out by Bandinette and party, as well as a crosscut to, and a little driving on, what appears to be the Mystery line of lode, north of the Belgravia hill and east of the Broad Arrow Road.

THE PAYMASTER GOLD MINE.

(Plate II.).

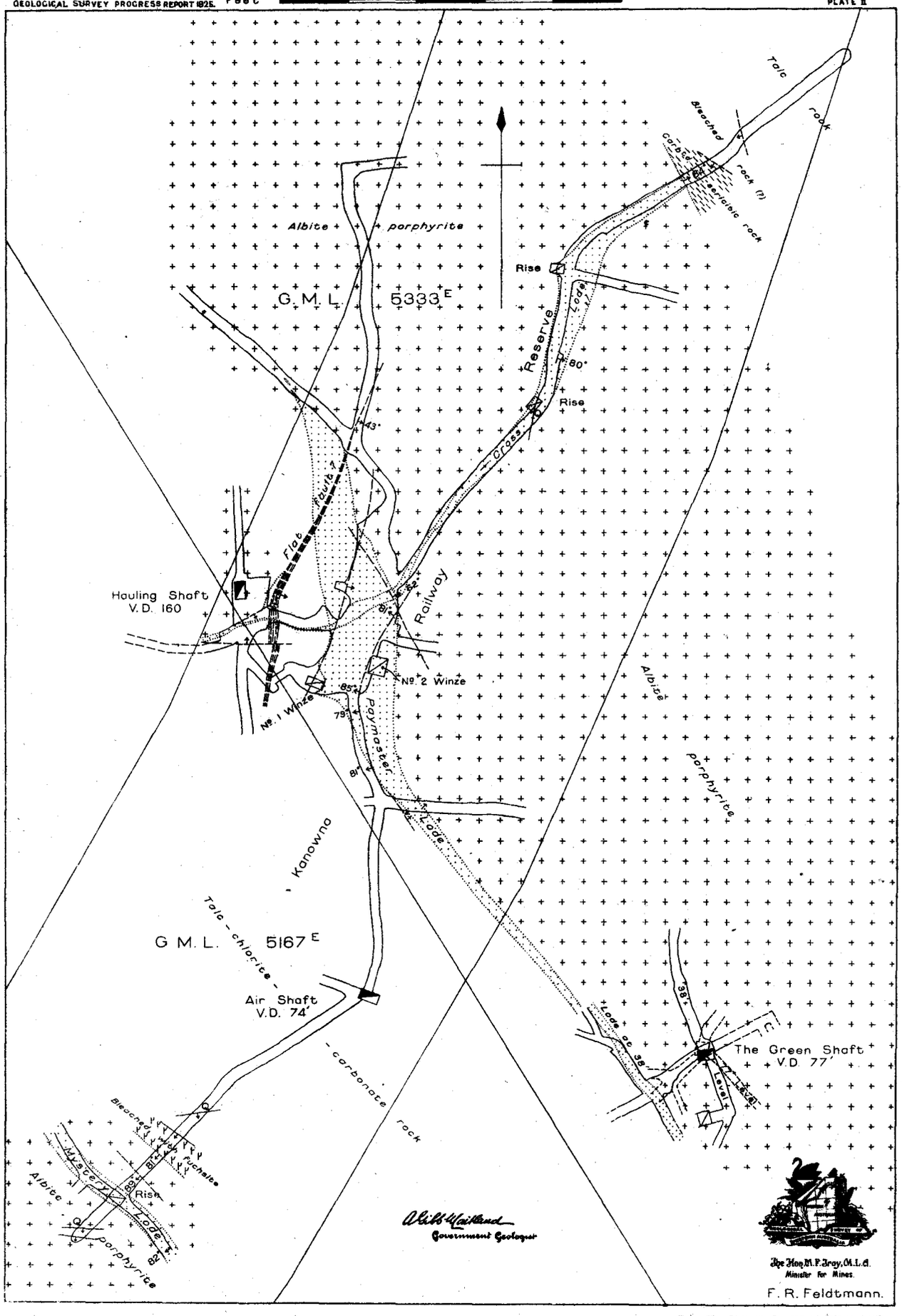
In the description of this mine given in the Anuual Report of the Survey for 1924, mention was made (p. 13) of what appeared to be the easterly continuation of the Surprise North Cross lode in the east crosscut from the plat of the haulage shaft at the 80 feet level. This lode has since been driven on northeast from the east side of the stope, on the main ore body at the 80 feet level, the drive extending for a distance of about 210 feet from the stope. On meeting the western edge of the Paymaster albite porphyrite dyke, immediately west of the stope, the lode, which in the Surprise North workings strikes slightly south of east, changes its course and strikes about N. 40°E to a point about 70 feet NE. of the stope. From this point it strikes about N. 12° E. for about 38 feet, thence bending to strike about N. 50° E. for a further 40 feet, at which point it hits the eastern wall of the Paymaster dyke, against which it appears to end. The remaining portion of the drive is in decomposed talc-chlorite-carbonate rock, somewhat sheared and sericitised for about 10 feet from the junction. For the greater portion of the drive the lode is not very well defined. It appears to range from a foot to about 10 feet in width, probably averaging nearly four feet. The lode was stated to carry gold, but not in sufficient quantity to warrant further work. The lode is nearly vertical in places, but for the most part dips southeast at about 80°. The apparent cutting off of the lode by the east wall of the porphyrite dyke is probably due to faulting along the margin of the dyke.

From a point in the south drive, off the main east crosscut, about 56 feet north of the air shaft, a crosscut was put in east for 42 feet. This crosscut cuts the Paymaster main lode from about six to 12 feet east of the drive. The lode, however, was not payable in this crosscut, which east of the lode is in kaolinised albite porphyrite.

Acting on a suggestion given orally to members of the syndicate, a crosscut was driven southwest from the air shaft to cut the Mystery-Lone Hand line of lode on the eastern margin of the main (Mystery) albite porphyrite dyke. The lode was cut at 91 feet from the air shaft and was driven on, northwest for 26 feet, and southeast for 23 feet. The lode is about five feet wide at the crosscut, but the walls are not well defined and the enclosing rock is intensely sheared to about 10 feet southwest of the drive. In these workings the lode is wholly in the albite porphyrite, but the exact position of the eastern margin of the dyke is, owing to the alteration and bleaching of the talc rock in its vicinity, very difficult to determine, particularly as the rocks are completely weathered. It appears to lie between seven and 23 feet northeast of the lode, most probably at 15 feet, with a band of fuchsite-carbonate rock between it and the talc rock. As the lode carried sufficient gold to encourage further work, though not to be payable, an irregular rise was put in above the crosscut to a total height of about 30 feet above the level and a few feet of driving was done northwest

PLAN OF THE 80 FEET LEVEL, PAYMASTER G. M.
KALGOORLIE, EAST COOLGARDIE G. F.

GEOLOGICAL SURVEY PROGRESS REPORT 1925. Feet 0 20 40 60 80 100 PLATE II



Alfred Gaitskell
Government Geologist

The Hon. M. F. Troy, M.L.C.
Minister for Mines.

F. R. Feldtmann.

FRED. WM. SIMPSON, Government Printer, Perth.

from the rise in places. No payable shoot being found, however, the work was abandoned. The average gold content of the lode was, I was informed, about 4dwts. The lode is highly schistose in these workings, consisting of highly sheared kaolinised sericitic albite porphyrite, with some ferruginous matter in places. A few quartz veins striking east, and dipping south at a steep angle, occur, but do not appear to carry gold.

The lode cut in the main workings of the Paymaster Mine have now been tested pretty thoroughly. The only patch of payable ore found was at the junction of the main lode with the cross lode and the only hope of obtaining another shoot appears to be in the discovery of a junction of the main lode with another cross lode.

Workings at the Northern End of the Paymaster Dyke.

Prior to my previous examination of this area, an old shaft, 300 feet north of the west corner of the Paymaster G.M.L. 5333E, had been deepened by Bandinette and party to a vertical depth of 58 feet and a crosscut driven southwest for 77 feet.* This crosscut cut the eastern edge of the Paymaster albite porphyrite dyke at 68 feet from the shaft. It was stated in the previous report that the dyke, going north, should pass between two old shafts, both in the talc rock, east of the Broad Arrow Road.

During 1925, another shaft was sunk to a depth, I was informed, of 54 feet by Bandinette and party 190 feet WNW. of that previously deepened by them, and crosscuts were driven west for 50 feet and east for 42 feet, the west crosscut being mainly on a cross quartz vein. This shaft was inaccessible at the time of my visit, but I was informed that the eastern edge of the porphyrite dyke was cut in the west crosscut about 15 feet from the shaft, and the crosscut continued in albite porphyrite without reaching the western edge of the dyke. The more southerly of the two old shafts mentioned is about 80 feet SW. of Bandinette's shaft, and this shaft is in the talc rock, but a trace of albite porphyrite was found on the dump, indicating that the dyke was cut in the workings. A pot hole, about half-way on the line, between this shaft and Bandinette's shaft, is in the albite porphyrite, the western edge of which must lie between the pothole and the old shaft. The dyke is much narrower here than in the Paymaster main workings and probably does not extend much farther north. Apparently no payable ore body along the western edge of the dyke was cut in the workings from the old shaft.

Another shaft, some distance southwest of those mentioned, had been sunk by Bandinette to a depth of about 50 feet on the northern slope of the Belgravia hill and a short distance northeast of the Broad Arrow Road. A crosscut driven west from this shaft cut what appeared to be the Mystery line of lode from 10 to 13 feet west of the shaft. The lode is ill-defined and the shearing much less marked than in the Surprise North and Paymaster Proprietary leases and quartz veins are absent, and the general appearance of the lode at this point is not encouraging. A small patch of payable ore was, I was informed, cut in the crosscut, but only extended for about 5 feet north and a similar distance south of the crosscut. It would be advisable to extend the crosscut a short distance farther west, to determine whether the main lode has been cut.

4.—ALUNITE AT THE NORTH END, KALGOORLIE.

(F. R. Feldtmann.)

During the year the opportunity was taken of examining the workings from Clay's Shaft, situated in former G.M.L. 584 (213E), one of the more northeasterly of the old Mt. Charlotte leases.† This shaft, which is 210 feet west of the Kanowna Road and opposite the former Red White and Blue haulage shaft on that road, was inaccessible for many years, but ladders were recently put in by Howard and party. The shaft has a vertical depth of 104 feet and a crosscut extends west for about 470 feet at the 50 feet level. The shaft was sunk on a narrow jasper which is practically vertical and is, so far as could be determined, entirely in albite porphyrite—the southerly extension of the big Mystery dyke. Owing to the extreme degree of weathering, it was impossible to determine the rocks in the west crosscut with any certainty, but a short crosscut east of the shaft shows the rock east of the jasper to be decomposed albite porphyrite, which appears to extend for a few feet west of the jasper. East of this the rock is probably decomposed quartz dolerite greenstone, but extending east for some distance from a point about 20 feet west of the shaft is completely kaolinised rock with irregular veins and lenses of iron ore, which may be sheared and decomposed albite porphyrite. In the west crosscut, between the shaft and a point about 20 feet west are a number of veins of alunite, mostly a few feet apart and striking northwest and dipping southwest at a comparatively shallow angle. From about 9½ to 11½ feet west of the shaft, on the south side of the crosscut, is a shear zone, dipping at a steep angle, in which are a few thin veinlets of alunite. A few alunite veins also occur west of the band of kaolinised rock, and a few were likewise observed in the east crosscut. The veins are lenticular in habit, with lenses of alunite up to about a foot in length and about 2 inches in maximum width.

The occurrence is of interest as alunite has not previously been recorded from Kalgoorlie. The corresponding sodium compound natroalunite has, however, been noted at two localities in Kalgoorlie,‡ namely, on the Maritana lease on Mt. Gledden, and on a dump between T.L. 15 and T.L. 19, Lake View Townsite. The first occurrence was a narrow vein, about half an inch wide, in a shallow shaft in quartz dolerite greenstone, about half-way up the northeast slope of Mt. Gledden and 210 feet north of the cairn.

The alunite veins in the workings from Clay's Shaft do not appear to be sufficiently large or close together to be payable. There is no evidence as to the length of ground over which they occur. The following is the Government Mineralogist and Analyst's report on a typical sample from the west crosscut from Clay's Shaft.

L. 3319. This is alunite carrying K_2O, 7·24 per cent.; Na_2O, 2·50 per cent.; soda soluble SO_3, 37·48 per cent. By calculation this indicates 95.78 per cent. of clean alunite. Under the microscope the mineral is seen to be crystallised in minute pseudo-cubes, which appear to be the common form.

* W.A. Geol. Survey Ann. Rept., 1924, p. 12, 1925. † W.A. Geol. Survey Bull. 69, Plate XIII., Sheet 13, 1917.
‡ W.A. Geol. Survey Ann. Rept., 1917, p. 17, 1918.

5.—PEAT IN WESTERN AUSTRALIA WITH PARTICULAR REFERENCE TO ITS GEOLOGICAL OCCURRENCE IN THE BAYSWATER DISTRICT, METROPOLITAN AREA, SOUTH-WEST DIVISION.

[ALEXANDER G. D. ESSON, M.A. (Aberd.), Field Geologist.]

CONTENTS.

I.—INTRODUCTION.

The wealth of a country is to be largely interpreted in terms of its mineral resources and of their potential value in regard to application and utilisation in various industries. It is only of comparatively recent years that some nations throughout the world have been "stock-taking" in this way and have had peat under consideration from this point of view. Up to the present practically nothing has been done in Western Australia to investigate the scientific and economic aspects of peat, although deposits have been known to occur throughout the coastal area in the swamps from Geraldton to Israelite Bay. There is an undoubted economic value and importance for peat if sufficiently extensive deposits can be found.

Official literature issued by this department contains very few references to peat occurrences, and a brief summary of such information as is available is given below. In Bulletin 4, A. Gibb Maitland, Government Geologist, refers to the wind-blown origin of sand covering the coastal plains and makes brief mention of peat swamps. In Bulletin 6, E. S. Simpson notes the occurrence of peat in most of the swamps along the coast from Geraldton to Albany. In Bulletin 44, E. C. Saint-Smith briefly describes coastal limestones and wind-blown sand dunes in the vicinity of Bunbury, as well as some swamps associated with these.

In the past it has been customary to regard peat swamps as inferior land on account of the immediate difficulty of drainage, but when public opinion has been properly broadened and educated, people will realise that these peat swamps are commercially of high value and economically of great importance. Their close proximity to markets makes their utilisation assured so long as the drainage problem can be mastered.

In the vicinity of Perth there are a number of swamps and swamp-lakes, of which some are undoubtedly peat-forming. Many of these have been used in the past for intensive market gardening by Chinese and of more recent years white people have been putting them to the same use. In most cases, however, rough and ready methods of utilisation are the rule. Hence scientific experimental work in this regard is urged wherever it is found practicable and the advice of an agricultural chemist will be found of value. In these enlightened days of scientific farming and manufacture, it ought not to be necessary to stress the close co-operation needed between the scientific aspect and practical aspect of peat utilisation. In this report an attempt will be made to demonstrate what may be done with our local peat deposits in addition to ordinary market-gardening utilisation.

In originating an investigation into the peat deposits of the State, the preliminary work has been centred in Bayswater on account of the easy accessibility of that place and of its proximity to Perth. There are other known deposits close to Perth, *e.g.*, Monger's Lake, the drained Herdsman's Lake, and various other lakes and swamps in the Wanneroo district, and doubtless the consideration and examination of these will come later. Hence this report must be regarded merely as an introduction to the wider consideration of what may prove to be a valuable addition to the known mineral resources of the State of Western Australia. Much more work would be necessary to deal with the matter from a broad State point of view and it is hoped that this preliminary investigation may prove of sufficient value and interest to lead to that in the future.

A certain amount of official field work and unofficial spare-time work has been done by the writer, and a map showing the results of these field investigations accompanies this report. In addition a geological section will be found along with this report. This section has been compiled by the writer partly from the result of field work and partly from the available reports upon artesian bores throughout the metropolitan area. Although a complete examination of these bore cores has not as yet been made, the writer has endeavoured to correlate beds of various kinds and to show their probable stratigraphical relationship and position along the line of section. The examination of bore core reports and the projection of strata has entailed much investigation and work, and it is hoped that the section will be of some value in the consideration and elucidation of the general geology of the metropolitan area and of the Western Australian coastal area.

II.—Geology.

1. *Geology.*—The area examined, comprised, roughly, within the limits of the Bayswater Roads Board district, forms portion of that extensive coastal strip of Western Australia lying between the Indian Ocean and the Darling Range. Before going into the detailed geology of Bayswater, it will be necessary to briefly recapitulate the generally accepted ideas held regarding the broad geology of this western coastal area.

The greater portion of Western Australia can be considered to be an extensive plateau of gently grading level now approximating to about 1,400 feet in height above sea-level in the interior. In the main this plateau consists of pre-Cambrian rocks. There are extensive portions of the plateau consisting of rocks of a later age, but the foundations of the plateau may be considered to be Pre-Cambrian in age. Certain stratigraphical strains and movements developed a line of weakness which became ultimately a line of fault where now the Darling Ranges occur. Hence the so-called Darling Ranges can be considered to be merely the escarpment of this fault towards the sea. Jutson * has pointed out that this scarp is due to fairly recent faulting along an old line of fault running roughly parallel to the present coast line and extending further north and south than the present Darling Ranges scarp line. Other fault lines have been observed, but, as these do not come within the scope of this report, it is not considered necessary to discuss them.

Hence a coastal strip of the great plateau slipped down along the Darling fault escarpment to below sea-level and became submerged by the sea. Examination of cores from various artesian bores throughout the Metropolitan Area would show that there must have been considerable vertical movement. The deepest of these bores have not penetrated to the older underlying crystalline rocks, and hence it is impossible to state the exact amount of movement. Upon this submerged shelf various sediments were deposited. The exact relationships of the sediments encountered in artesian bores have, as yet, not been fully determined and will not be until very careful investigation has been undertaken by petrologist, palæontologist, and chemist.

There is little doubt that a number of the sedimentary beds are lenticular in form, an occurrence that would militate against correlation of them at separate points throughout the Metropolitan Area. The writer has attempted to make a general correlation of similar beds in the section accompanying this report. Reference to this section shows that the uppermost beds are more or less unconsolidated sand dunes which are consolidated near the coast and popularly but erroneously known as coastal limestone. These are recent beds and are now named the "Coastal Calcareous Sandstone Series." From information given by old settlers, it would appear that these sand dunes—particularly in the vicinity of Bayswater—were covered by a heavy growth of timber, which would tend to arrest movement. Within the last thirty years this timber has been cut out and there would seem to be distinct evidence of a resultant movement of the dunes. These dunes are in themselves wind-blown deposits and there is a tendency for them to move in some direction governed by prevailing winds. In France and Ireland it has been found necessary to arrest this movement by planting trees such as *Pinus silvestris*. The Public Works Department issued a series of contour maps of the Metropolitan Area in 1897 and a later series in 1920. Discrepancies between the two series might be explained by this tendency of sand dunes to migrate when the restraint of tree growth is removed.

By action of rain, etc., these wind-blown deposits become consolidated. If there is an excess of limey matter in the sand, consolidation will produce a sandy limestone which will gradually grade into limey sandstone. On the other hand the cementing matter may be limonite, hydrated oxide of iron, and in this case the resultant product will be a ferruginous sandstone known locally as "coffee rock."

In connection with the aeolian nature of "coastal limestone" it is to be noted that Simpson and Jutson† have proved it to be of this nature at Albany. They find it to be composed mainly of foraminiferae and fragmentary calcareous algæ which have been blown into their present position by prevailing winds. This seems to be explanatory of the "coastal limestones" of the Metropolitan Coastal Area, and doubtless the division between resultant sandy limestone and calcareous sandstone is by no means exact. One will be found to grade into the other according as calcareous matter occurs in greater or less content in the sand. Hence there is no very marked division between the two except as regards comparative chemical composition.

The calcareous coastal sandstone series have a thickness varying up to 140 feet, but in general to about 100 feet.

Partly overlain by the Coastal Sandstone Series are the Guildford clays. These are lenticular and would represent Swan River beds denoting four ages of the Swan River. The lowermost of the three beds has been marked "dark clays and boulders" and it would represent the earliest deposit of the river on underlying sandstones. Above this bed are "clays and silts" deposited as estuarine deposits while the river was still quick-flowing. The topmost bed is marked "clay" and represents a flood plain of the river. This flood plain is now being cut into and eroded by the river in its present form.

Beneath the Guildford Clay beds are sandstones which are comparable to those of the present day forming the Coastal Calcareous Sandstone Series. These sandstones may represent wind-blown dunes upon underlying beds and gradually grading into the Coastal Calcareous Sandstone Series.

Underlying the sandstones are marls and gritty sands containing much glauconitic matter. Whether these are extensions of the Gingin glauconitic deposits is not at all clear, as no direct evidences of the overlying Gingin chalk are to be found in bores in the Metropolitan Area. It is possible, however, that the Gingin chalk may be represented by the marls associated with glauconite in the Metropolitan Area. In both cases dark shales are found underlying the glauconitic beds and sandstones overlying (c.f. Section, Fig. 69, p. 43, "Summary of Geology of Western Australia," by A. Gibb Maitland, G.S. Memoir No. 1, Chap. 1, 1919).

The shales underlying the glauconitic beds are marked "sandy carbonaceous shales and mudstones" which may represent estuarine or shallow-sea conditions. It is possible that these are underlain—in part at least—by fossiliferous limestones with a general tilt westwards. These are followed by further carbonaceous shales interbedded with somewhat calcareous sandstones, all having a general dip westwards.

It would be foolish to dogmatise upon the relative age of these beds until further examination of them

* J. T. Jutson, Bull. 61, G.S., W.A., "An Outline of the Physiographical Geology of Western Australia." † "Notes on Geology and Physiography of Albany," by J. T. Jutson and E. S. Simpson, B.E., B.Sc., F.C.S., Journ. Roy. Soc., W. Australia, Vol. II., 1915–16.

has been undertaken, but it is hoped that the basis of differentiation of beds adopted by the writer may be of some value when final determinations are made. There seems reason for believing that rocks of Cretaceous age are represented in the series of beds and the Government Geologist reports † that Mesozoic rocks, consisting chiefly of shales, sandstones and limestones, are found in the Coastal Area overlying the older crystalline and Palæozoic rocks and underlying Tertiaries. He reports also that in artesian bores in the Agricultural Show Ground, Hospital for Insane (Claremont), and in Rottnest Island, Cretaceous rocks were observed. Assuming this to be determined, then a basis for interpretation of strata underlying and overlying the Cretaceous can be got.

There is little doubt of the age of the uppermost sand dune or Coastal Calcareous Sandstone Series, and we can confidently place this as Recent. The Guildford clays can be regarded as Post Tertiary, but it is not clear whether the underlying sandstones are of greater age than Post-Tertiary. If they are assumed to be an early sand dune formation upon which, by subsidence, the Guildford clays were deposited, then it is not unreasonable to give their age as Tertiary or Post Tertiary. The next beds, marked "Greensands, Marls and Gritty Sands," might correspond to the Cretaceous beds referred to above.

That there have been uplifts and general alterations in level is evidenced by wave-cut platforms observed by the writer on Rottnest Island at at least three different heights above sea-level; by estuarine oyster beds found as far up the Swan River as Perth; and by raised beaches found at various points throughout the Metropolitan Area.

With this brief mention of the geological features of the coastal strip in the vicinity of Perth, Guildford and Fremantle, the writer will pass on to the description of the more detailed geology of Bayswater district.

2.—*Detailed Geology of Bayswater.*

Examination of the map and section accompanying this report will show that almost the total area is covered with aeolian or wind-blown deposits of characteristic sand dune formation. These sand dunes have the usual ridge and valley form and gradually decrease in height as they spread towards the River Swan until the Guildford clays appear on the surface. These dunes attain in places a height of 155 feet above sea level and their total thickness vertically would appear to be about 100 feet on an average at some distance from the river and about 140 feet in the higher points.

They are unconsolidated at the surface and they contain successive thin layers or lenses of "coffee rock" at varying depths. "Coffee rock" is a brown iron-stained sandstone formed from the sand of the sand dunes by percolating waters. It may be due in part to a form of silicic laterisation, in part to the cementing action of calcareous layers or of calcareous solutions and most probably to the action of organic matter in solution in leaching iron materials from overlying or adjacent layers of sand. Specimens of coffee rock obtained by the writer appeared to consist of dune sand cemented by hydrated oxide of iron (limonite). This coffee rock when not open to and affected by the atmosphere is very hard, but occasionally a somewhat incoherent sandstone is found. It is possible and indeed probable that these lenses or layers of coffee rock form impermeable or slowly permeable barriers which restrict normal drainage, hold up water and form springs.

The Guildford Clay deposits, which appear at the surface near the River Swan at a lower level than the sand dunes, have been discussed under the general geology above, but it is to be noted that the uppermost clay deposit would appear to be the latest deposit of the Swan River before it assumed its present attenuated form. This river, which Jutson has described as being "precociously mature" is now eroding the flood plain deposited by itself in its late youth. The maturity of the Swan is well evidenced by its meanderings and many twistings back upon itself.

These river clays, or "Guildford Clay" deposits are lenticular and would appear to die out on either side of the Swan River. On the edges they would seem to be overlapped by sand dunes or the Coastal Calcareous Sandstone Series. That this should be so is quite understandable when one considers the aeolian nature of sand dunes and their tendency to "creep." Upon the surface the clays are found to vary considerably and to grade from heavy black, red or white clays to sandy clay or sandy gravel—all of them evidently of fluviatile deposition. In some places abandoned clay pits are found. Some of these are of fair size and apparently a quite considerable manufacture of bricks was at one time undertaken.

The natural drainage would appear to be towards the Swan River and the section shows a gradual decrease in level in that direction. Most drainage channels seem at one time to have been connected up with a main drainage channel emptying into a swamp lying between King William Street and Slade Street south of the Guildford Road. Along these drainage channels there are now a series of lakes and swamps which are caused by the formation of barriers across the channels at convenient points. These barriers may have their origin in a number of ways.

(1) They may be "coffee rock" deposits.
(2) They may be caused by "creep" or driftage of dune sand.
(3) They may be caused partly by (1) and (2) in conjunction, and carbonaceous matter may choke up channels so as to produce restricted drainage. This would seem to be the most likely cause of the lakes and swamps.

With restricted drainage, carbonaceous matter and black, heavy muds will be deposited in the beds of lakes and thus there is a commencement to the formation of peat. Where water is able to stand for some time, or, at the best, to percolate away very slowly, there plant life will flourish. This plant life is of a particular kind and includes ti-trees, paperbark trees, bull-rushes, sedges, ferns, bracken, reeds, grasses, occasional mosses and aquatic plants similar to cress, etc. With plenty of water these will have strong growth and every year the resultant dead growth will accumulate in the water, thus causing further checking of drainage and incidentally aiding in the formation of swamp and its resultant peat.

At a number of places throughout the Bayswater area swamps were observed and in most of them peat was obtained. The depth or thickness of peat varied and would appear to be dependent upon the extent of restriction in drainage. Peat swamps were found to be confined to no particular height above sea

† "The Artesian Water Resources of Western Australia," by A. Gibb Maitland, Mining Handbook, Geol. Survey, Mem II., Chap. ii., Sec. 24, 1919.

GEOLOGICAL SKETCH MAP
OF
BAYSWATER
METROPOLITAN AREA

—By—

A.G.D.Esson, M.A.

Field Geologist

0 10 20 30 40 50

Scale of Chains

— LEGEND —

Clay

Dune Sand

Sandy Swamp
black & peaty sand

Peat

Geological boundaries

Contours
(Supplied by P.W.D.)
All heights in feet above low water of Fremantle

Bayswater Road Board
District boundaries

Sandy Swamps often under water to 2 feet

Peaty marsh

Mainly black sand

Chinese Gardens

Black peaty soil (very sandy) under cultivation

Black peaty sand

Windblown sand

Chinese Gardens
Peaty sand soil

Swamp

Sand

Windblown sand

Peaty sand

Sandy flat

Hayne Peaty tidal Lake

Partly cultivated

Cummings Lake

Mostly peaty swamp

Sandy Swamp under cultivation

Peaty sand

Patches of sandy swamp

Cultivated sandy peat

Reservation Recreation Ground

Coffee rock outcrops

Sandy flat occasionally under water

Sandy clay

Clay pan

Red clay

Large Swamp under water

Sandy Clay

Peaty Swamp

Black sand

Peaty sand

Peaty swamp

Bayswater Reserve

Bayswater Pumping Station

Bayswater Road Board Depot

Bayswater Road Board Office

Public Hall

Public School

Presbyterian Church

Methodist Church

Roman Catholic Church

Railway Station

Tramway Terminus

Tramway

Railway

Main Roads

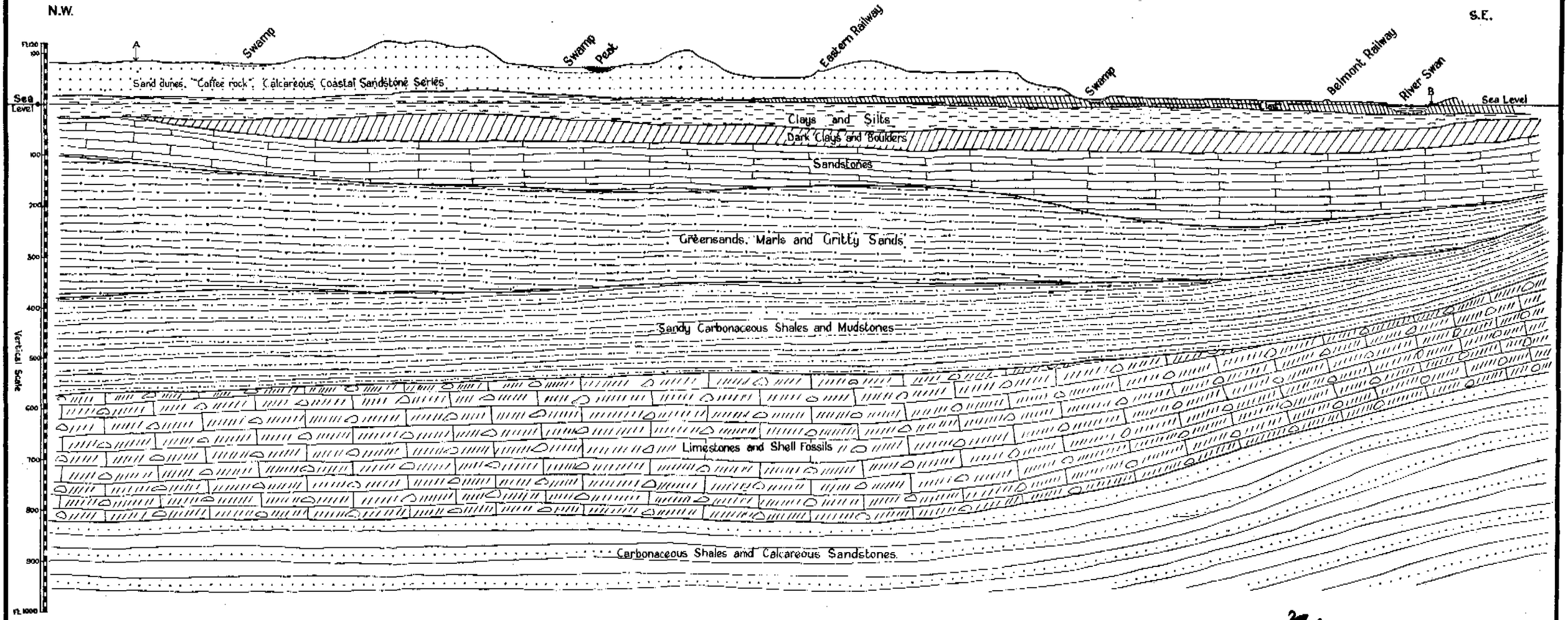
Streets

Creeks

Swan River

Government Geologist

FRED. WM. SIMPSON, Government Printer, Perth.



BAYSWATER METROPOLITAN AREA

Section AB along Drake and Slade Streets from Rudlock Road to South Bank of River Swan

by

A.G.D. Ession M.A. Field Geologist.

This section shows the probable stratigraphical formation and is based partly upon field work and partly upon information gained from various artesian bores throughout the Metropolitan Area.

Chains 10 0 10 20 30 40 50 60 Chains

Horizontal Scale

The Hon. M.F. Troy, M.L.A. Minister for Mines.

Government Geologist

1926. Wm. Simpson, Government Printer, Perth.

level, the height varying from 20 feet to 80 feet or more. The dominant factors in the formation of peat would seem to be a steady supply of water and improper or restricted drainage.

The age of peat deposits in the Bayswater area cannot be greater than that of the dune sands upon which it occurs. If we assume that the dune sands are recent, then approximately the same age must be given to the peat. Hence the peat is a present day occurrence, originating soon after the formation of the dunes. It must be noted, however, that peat deposits may be of varying ages—a fact that is proved by its occurrence throughout the world. Peats have been formed in all ages and indeed the present day formation of peat is merely a modern picture of the first stages in the formation of many coalfields in the past. Earlier peat deposits may now be found in a modified form such as lignite, coal, etc.

Le Conte considers that many European peat bogs are the product of a growth of not more than 1,800 years as they were forests in the time of the Romans. In Britain this is evidenced by the finding of Roman coins, Roman weapons, cut stumps of trees, etc., at the bottom of peat deposits.

III.—Detailed General Discussion on Peat.

1.—*What is Peat?*

Essentially Peat is carbonaceous matter arising from the partial decomposition of organic remains, *i.e.*, of plants and animals and chiefly of the former. Dana defined peat as half decomposed vegetable matter, accumulating in wet or swampy places over the interior of a continent or about its estuaries.

A more detailed definition of peat is that *it is an accumulation of organic matter whose accumulation is dependent upon the fact that the matter collects below water level at a greater rate than the rate of decomposition in such a way that excess is preserved by means of peaty acids which are caused in the first instance by partial decomposition.*

In temperate climates peat has been found to consist largely of spongy mosses (Sphagnum Moss), which are very absorbent of water, with lesser amounts of the remains of sedges, grasses, heather, reeds, pond weeds, ferns, bracken, trees. Animals are occasionally found embedded in these deposits, usually in a fair state of preservation owing to the antiseptic action of the peaty acids. Subsidiary amounts of various minute infusoriae as well as of fresh water sponge spicules are also found in these temperate climate deposits.

Osbon* draws attention to the confusion resulting from inaccurate use of the names "peat" and "muck." He gives a definition of each substance and it may be worth while to note these definitions, as there is little doubt he has drawn attention to rather an important point. Briefly peat is partly carbonised organic residuum, and it contains much of the carbon of the original vegetable matter. Vegetal structure is easily seen under the microscope and in general peat is acidic. Inorganic matter is in a much less proportion than organic (down to 4 per cent. inorganic in purer peats). Muck on the other hand is uncarbonised organic soil containing a large proportion of inorganic material. Muck may grade into peat, but relative uses and values are not the same.

The relative purity of various peats is dependent largely upon ash content, *i.e.*, of contained inorganic material. This may vary, the purer peats in anhydrous form containing about 4 per cent. of ash. This percentage is dependent upon various factors, the chief being the rate of deposition of the peat. If peat is formed slowly there will be a gradual increase in ash content, as with slow deposition there must be a corresponding large amount of decomposition of organic matter and hence unaltered inorganic matter must increase. Dana gives a number of analyses of peats, but it is regretted that he gives no corresponding ash content. According to him ultimate analyses of presumably air-dried peat give 50.86 to 59.71 per cent. of carbon, 5.27 to 6.52 per cent. of hydrogen, 31.51 to 42.57 per cent. of oxygen, and .77 to 2.59 per cent. nitrogen. In Irish peats it has been found that air-dried peat (containing about 25 per cent. of water) has a calorific value of about 7125 B. Th. U. per lb. (net calorific value = 6845 B. Th. U.). Hence Professor Purcell estimates that one ton of coal (calorific value of about 14,000 B. Th. U. per pound) has the same calorific value as two tons of Irish peat. This point is interesting, and has an important bearing upon the economic use of peat.

There is a high percentage of water in peat, a percentage varying from 88 in well-drained peat bogs to 95 in badly drained bogs. The aim generally, is to produce, by air drying, peat of about 25 per cent. water content. This aspect, also, has an important bearing upon the economics of peat as it means a big wastage of energy in preliminary handling.

The Government Analyst examined a sample from the Hill Street or Number One Swamp in Bayswater. This, after air-drying, gave 23.43 per cent. moisture, 43.66 per cent. volatile matter, 26.51 per cent. fixed carbon, and 6.40 per cent. ash. This compares favourably in some ways with some of the peats of temperate climates, but a full discussion regarding this will be found in its proper place below. It is sufficient meantime to note that so far as our investigations have gone in Western Australian peats, they seem to be formed from the remains of paper bark and ti-trees, reeds, bull-rushes, ferns, bracken, grasses, sedges and various aquatic plants, with mosses in a very minor degree.

2.—*How is peat formed?*

In the present day formation of peat there is found an analogy to the older formation of coals, for, after all, coal is simply consolidated peat and, although the species forming coal is in large measure different from those forming peat, the mode of accumulation would seem to be the same in each. It would appear, however, that coals have the additional changes brought about by changes of temperature and pressure. These additional changes are consolidation and lessened moisture content as well as some changes in physical properties. It has been proved that certain later lignites, found in old estuaries, are in reality the product of hardened peats. The process of peat formation seems to have been one that would early arise with the growth of plant life, etc., and there seems to be no reason why it should not continue so long as life upon this earth is dependent upon carbon, oxygen and hydrogen for continuance.

It has already been pointed out that peat is due to the accumulation of organic remains below water level at a greater rate than that of decomposition. This brings us to the consideration of two questions:

* Min. Res. U.S., 1918, Pt. II., Non-metals, United States Geol. Survey, 1921.

"What causes decomposition?" and "What arrests decomposition?"

An important condition upon which the formation of peat depends would seem to be that an excess of moisture is always present, *i.e.*, that withered and excess plant growth should fall into and be covered by water. Normally, withered growth, open to the atmosphere, is attacked by fungi and bacteria and rapidly decomposes. These micro-organisms transform plant cellulose (a compound of carbon, hydrogen and oxygen) into Carbon Dioxide (CO_2) and water (H_2O). Under water, however, the oxygen supply is much lessened and hence the action of the micro-organisms is restricted. For that reason decay is slow, much of the fixed carbon is retained as such, methane as well as carbon dioxide is formed, and peat collects. During this change, certain peaty acids would seem to be evolved and these, having an antiseptic value, help, in turn, to preserve the deposited and depositing peat. A number of writers have remarked upon the effect of these acids in preserving the bodies of men and other animals that have become engulfed in the peaty matter of bogs and swamps. The famous example is that of the woman found in 1747 in an English peat bog and, despite the fact that the body must have been a considerable number of years entombed, skin, nails and hair were found to be in almost perfect preservation. Trunks of trees have been found preserved in the same way. There is no reason why such relics of life should not be found in deep bogs in Western Australia. That deep bogs have existed in Western Australia is evidenced by the fact that a thickness of about 45 feet of peaty matter was met in bores in the Albany district. It is to be noted also in this connection that carbonaceous shales of some considerable thickness are found in artesian bores in the metropolitan area.

In the writer's opinion, certain writers have been inclined to lay too much stress upon the effect of cold as a condition of growth of peat. It is not the most important condition and it may be considered to be merely an accessory condition. The most important condition of growth of peat would seem to be that of excessive moisture and that, in turn, requires the ultimate condition of inefficient drainage so that the water may not lose its average content of peaty acids. If cold were the most important condition, then we should not expect to find peats forming in Western Australia to-day.

We have already enumerated the plants forming peat in Western Australia and briefly we can summarise the method of growth of peat in Bayswater in so far as we can do so from personal observations there. In all sand dune country we would expect the surface configuration to be similar, *i.e.*, high hills of sand with intervening steep valleys, both dependent upon the direction of prevailing winds. Springs will arise near the base of these dunes, and valleys will carry off excess water. With the formation of "coffee rock" or driftage sand barriers and with choking by carbonaceous matter, etc., dams are created. These dams will interfere with normal drainage. Water will therefore be held up in depressions and plant life will flourish. The remains and waste of this plant life will accumulate in the water as peat so long as conditions of drainage remain the same.

3. *How can peat be utilised?*

For long, peat bogs and swamps were regarded as so much waste land, but with advanced knowledge and careful experimental work, they have come to occupy a more elevated position in popular estimation. The great problem and the main difficulty has been that of drainage. Without efficient drainage they will never be properly utilised.

In Great Britain numerous peat bogs (or "peat mosses," as they are often popularly named), are found throughout Scotland, England and Ireland, and it is estimated that in the United Kingdom of Great Britain and Ireland there is a total area of 14,000 square miles of peat bog. Other countries have correspondingly big areas of peat deposits and their respective Governments have, for economic reasons, been forced to investigate the practical utility of these areas and of their contained peats. Much remains yet to be done, but a considerable advance in our knowledge of peat and of its applications has been made. We shall briefly deal with these below:

(a.) *Agricultural Uses.*

To the ordinary man the first practical application of peat is its use in agriculture. There are a number of ways in which peat can be utilised in agriculture and we shall correlate these under three main headings.

(i.) *Cultivation of peat areas.* Actual peat areas may be cultivated, and if proper methods are taken, the resultant soil and crops well repay the necessary expense and labour. In the past, peat bogs and swamp land have been regarded as being of less value than properly drained soil and there is little doubt that this is justified. Drainage is a problem of paramount importance and wherever it is found impossible to institute efficient drainage, there is little use in attempting to bring peat swamps under proper cultivation. The drainage question is largely an engineering question dependent upon the contour of the surrounding country. Certain areas may be found to present a problem involving too great expense to be worked with economic results.

First of all the actual peat bog must be trenched and thin (2 inch) pipe drains placed in it as a series of roughly parallel drains leading into main drains carrying the water to a lower level. These leader drains should not have their pipes cemented, as it is necessary that the pipes should be able to gather up excess water from the immediately adjacent ground. The next process needing to be done is that of deep ploughing and breaking up accompanied by lime dressing. This will keep the soil loose and the lime will neutralise the acidity of the peat, enabling humic decomposition to ensue. First croppings and, indeed, periodic croppings should consist of peas, beans and such leguminous plants as are known to be able to store up nitrogen in soluble form. For preference the roots and stems of these legumes should be turned into the ground to form a valuable available storage of nitrogen for plant life.

Manures are not necessary for some years after preparation in the manner described above, and the aim should always be to keep the soil as loose as possible, properly drained and non-acidic (*i.e.*, neutral).

In Western Australia, owing to the difficulties experienced in tilling peaty soils, it has been customary to leave their cultivation to the ubiquitous Chinaman who has utilised them in places for intensive cultivation in the form of market gardens. When properly treated, peat and peaty soils can be transformed into the most fertile of all soils. It is obvious that, where peat is of sufficient purity and extent to be economically used for other purposes, it would be foolish to use it merely

for cultivation. On the other hand, peats containing much inorganic matter (*i.e.*, having a high ash content) or "muck," which has already been defined, would be highly suitable for ordinary intensive cultivation. In this connection it might be noted that Professor Purcell,* A.M.I.C.E., reports H.R.H. The Prince of Wales has reclaimed 300 acres of peaty moorland with success and that he intends to reclaim a further 1,100 acres in Dartmoor which has a rainfall of over 80 inches per annum. In the same way thousands of acres of the swampy "fens" of Lincolnshire and Cambridgeshire have been reclaimed to produce excellent potato soil. In Western Australia some of the peaty swamps grow excellent truck crops. In various countries throughout the world it has been found possible to raise on reclaimed peaty soils wheat and other grains such as oats and corn, and truck crops such as pumpkin, marrow, potato, lettuce, turnip, carrot, celery, cabbage, kale, etc. In addition the growing of leguminous plants is advisable for enrichment of the soil with soluble free nitrogen although, in general, varying percentages of soluble nitrogen may be found in most peats.

It is not necessary to enlarge further upon the economic value of peat land from the point of view of cultivation for agricultural purposes, especially as the average cultivator in dealing with the coastal dune sand finds in practice that it is "hungry" and certainly of far less ultimate value than any peaty soil.

Peat, being generally black, is heat absorbent. Other advantages are its affinity for moisture and its humus content.

Before being cultivated, peats should be examined by an agricultural chemist so as to decide what chemical fertilisers, if any, are necessary for their proper utilisation. Some may need potash and some nitrates, and some may be in no immediate need of either. Generally in all, acidity must be counteracted by treatment with lime, slaked or unslaked. Unslaked lime seems to have a more immediate effect upon the peaty matter and, in addition to neutralising the acid content, it aids in loosening the soil and in killing grubs. Unburned lime may remain inactive for some time after application. It may be further noted that the addition of lime serves to break up potash containing minerals and helps to set free nitrogen.

The author tested in his own garden, Bayswater, peat from the Hill Street swamp. The garden, which was situate upon a sandy ridge at a height of 90 feet above sea-level, consisted solely of wind-blown sand. The steep contouring of the ridge assured a quick drainage of surface waters and rendered the garden very dry in all weathers. To one bed peat was added after the latter had been well broken up. No lime was used and the ground was found to remain sour for some considerable time during the rainy season. Growth was slow and only average results were obtained. The bed was shaded and, later on, shade-loving plants such as pansies and violas did fairly well upon it. On the other hand a bed, prepared in the same way but with the addition of lime, showed quickly a marked difference in growth of plants. Liming resulted in a big improvement in growth. Again, a bed dug up, unlimed, and without peat, was prepared with the addition of superphosphate and bone dust and it was found that growth, although quick, was not lasting, and in addition was somewhat scraggy and poor when compared with that of the limed peat bed.

(ii.) *Peat as a fertiliser.* In America peat is being largely used as a direct fertiliser or as an ingredient of commercial nitrogenous fertilisers. To be utilised as fertiliser, the peat must be black, loose, friable peat and the deposit must have been cultivated, drained, and ploughed for some years before use. After being thoroughly powdered, it can be added as an ingredient of commercial fertilisers. When required as a direct fertiliser, the peat must first be composted with manure or else inoculated with nitrifying organisms.

As a source of plant food, peat is found to hold an important position, and Osbon† has pointed out that the average nitrogen content is about 2 per cent., although some grades may contain a somewhat higher percentage. This nitrogen may be extracted as ammonium sulphate by treatment, but it is not necessary that it should be extracted. From the nature of peat it will be easily seen that bacterial action will help to release soluble nitrogen gradually.

Osbon points out further that a new process of the commercial application of bacteriology to soil fertilisation consisted in cultivating the peat deposit for several seasons and in excavating, air-drying and neutralising it (or rendering it slightly alkaline). It is then used as a carrier and energiser of several varieties of legume and of other bacteria. This theoretical process is capable of being carried into practice by ploughing up and cultivating a thoroughly drained peat swamp as indicated, and by lime-dressing to neutralise acidity or to render the peat slightly alkaline. The practical process is completed by growing and turning in leguminous plants such as peas and beans.

As a means of adding "body" and giving humus to sandy soil, the experiments of the writer prove peat to be unequalled.

(iii.) *Stock food, etc.*—In some parts of the world peat is utilised as stock food, but it does not seem likely that this aspect of peat utilisation is of immediate application in Western Australia. Such peat is, in the main, formed from sphagnum moss, and few, if any, of the peats observed here seem to be derived from such mosses. In some cases purer peats, after reduction by closed distillation to charcoal, have been used as correctives in stock food in much the same way as pure charcoal is used as a medicinal corrective in human digestion.

(b.) *Fuel Uses.*

(i.) *Hand Cut.*—Of the known uses of peat throughout the world, this use is perhaps the oldest and commonest. People would early find that, in lighting a fire on top of a dry peat bog, they were tempting Providence in the same way as if they were to light a fire on top of a big heap of dry wood shavings. Peat bogs, when dry, have been known to burn for many months on end, and considerable damage has been done, with, at the same time, a big depth of peat destroyed. Wilful burning of peat swamps and peat bogs is reprehensible and deserves drastic measures. It is understood by the writer that the Hill Street (Bayswater) peat swamp has been set on fire on more than one occasion. Once it burned for some months until the winter rains came, and in consequence several feet (depth) of peat were destroyed. Obviously this is wilful waste and wanton destruction due to ignorance of the nature of peat. Careless burning of peaty swamps, when clearing, will result in lessened available peat or humus and in lessened purity of the peat.

The writer has travelled for many miles through the outlying country districts of Scotland where peat was the main fuel, and in some cases the only fuel. There is litttle doubt that if deposits can be obtained sufficiently large areally, then these will form potential sources of fuel. In Scotland it has been customary to prepare peat for fuel in the same manner for centuries, but in Canada, United States, and in

* "The Peat Resources of Ireland" Fuel Research Board, Special Report, No. 2. † *Loc. cit.*

various countries where coal is scarce and expensive, additional methods of preparation have been devised. With slight variations of method, peat in Scotland, England, and Ireland is hand-cut. With a specially made peat-cutting spade the peat is cut into rectangular blocks. In Scotland these blocks were generally about 12 inches by 6 inches by 4 inches thick, and in Ireland 10 inches by 10 inches by 3 inches thick. These blocks or "peats" as they are sometimes called, may, when first cut, consist of 80 per cent. to 90 per cent. of water, and hence they have to be air-dried down to a moisture content of about 25 per cent. To do this the peats are up-ended and built in stacks or rested upon poles so that prevailing winds may play their part in drying. The drying ground utilised is generally the drained upper surface of the cleared peat swamp, which must be properly cleared and grubbed before peat cutting. Air-dried peat will obviously be much lighter than wet, newly cut peat.

(ii.) *Machine handling.*—Hand cutting of peat is laborious and necessitates much handling, but it is quite suited for areas of less than 100 acres of good peat. For use on larger areas, special peat cutting and drying machines with caterpillar driving devices have been invented, and it seems likely that these will soon near a state of perfection that will enable costs to be minimised considerably.

In Holland and in other places on the Continent new peat is well macerated and pulped by machinery upon the peat bog and the resultant liquid is pumped and flooded on to drying fields where it is cut into blocks. In Germany wet peat is macerated and pressed in briquettes. Of late some nations have been using powered dry peat as an important constituent of briquettes, and there is little doubt that there are great possibilities in this direction. The main difficulty connected therewith meantime seems to be that of finding a convenient and cheap binding for the briquettes, but doubtless that difficulty will soon be overcome.

As a source of fuel and electric power peat has long been established, but, where coal is convenient and cheap, obviously peat will not find a place except for use in the immediate vicinity. It is reported that the Russian power station at Bogerodsk is now the largest station of its kind in the world completely run on peat which, by the way, is machine prepared. Much has been said in Ireland regarding the utilisation of the large Irish peat reserves for power purposes, but certain eminent authorities do not seem to be agreed that this proposition is meantime economically sound.

Reference has been made to reports of a deposit in Albany 50 feet thick, and if this is sufficiently pure and extensive, evidently there should be a source of cheap fuel for use in that district. A number of large lakes in the vicinity of Perth seem to have beds composed of fairly pure peat, but in some cases the peaty matter contains much infusorial matter derived from small diatoms. For that reason peats should be examined by experts before being exploited for any particular purpose. Diatomaceous peat may, after preparation, be suitable for use as an abrasive of the same nature as tripoli.

(c.) *Other Uses of Peat.*

During the Great War sphagnum mosses, which are the main constituents of peats of temperate climates, were utilised as absorbent pads in surgical operations. By distillation of purer peats, coke and charcoal can be produced as well as certain valuable by-products in small quantity, viz.: oils, spirit, alcohol, ammonia, ammonium sulphate, acetic acid, waxes, phenol, etc. The charcoal produced, being very pure, is highly suited for smelting purposes.

Peat that has been dried and powdered is a non-conductor of heat, and hence it is suitable for packing fruits and vegetables as well as for interstitial packing of walls of ice-chests and ice chambers. If suitable packing material can be obtained from local peats, obviously there is here an efficient substitute for imported cork in packing grapes and other fruits.

In addition, pulverised peats, when of sufficiently long fibre, have been found to be suitable for pulping into cardboard, cloth, paper, rugs, etc., usually with the addition of various substances such as wool. Evidently sedgy peats would be highly suited for such purposes, and a number of these peats are known to occur in Western Australia.

Germany has been long famed for "mud baths" prescribed for rheumatic troubles. These mud baths utilise well-macerated and powdered fine-grained peats. The writer is not qualified to discuss the medicinal or curative properties of peat, and doubtless a medical practitioner is better able to state its value in this direction.

IV. Details of Particular Peat Deposits in Bayswater District.

The writer examined a number of deposits of peat throughout Bayswater district and in most cases it was found that, although peat of excellent quality could in many cases be obtained, the areal extent was not sufficiently great to justify their utilisation for fuel purposes but that in the main they could be used as areas of intensive cultivation or sources of fertiliser and humus for local purposes.

(1.) *Swamp at intersection of Hill Street and King William Street.*—Old residents have informed the writer that about 30 years ago this swamp was completely surrounded by high timber which clothed the slopes of the surrounding sand dunes. Nowadays very few trees are seen, and in consequence the sand would seem to be moving forward over the peaty flat. The value of Bayswater as a residential district would have been much enhanced if the cutting of timber on sand dunes had been restricted or prevented. This swamp was formerly known as Number One Swamp, and nowadays it has a total area of about 3 acres. Samples of the peat were taken and found to be quite suitable for fuel although unsuitable for distillation. Part of the swamp is cultivated and appears to produce excellent truck crops.

The extent of peat in area is small, but its depth in some parts of the swamp would appear to be in excess of 15 feet. With proper drainage and treatment there is no doubt that there is here an area highly suited for intense cultivation and possibly suited also as a source of humus for building up "hungry" soils. Specimen 1/4003A (G.A. 1435/25), collected from the surface of the swamp, was examined by the Government Mineralogist and Analyst, and the following proximate analysis is the result of that examination:—

Proximate Analysis of Air-dried Sample.

Moisture	23.43 per cent.
Volatile matter	43.66 per cent.
Fixed carbon	26.51 per cent.
Ash	6.40 per cent.
	100.00 per cent.

Colour of ash is white with red specks

Nitrogen (N) .. .. 0.95 per cent.

Remarks.—This is a peat of average value for fuel purposes. It is low in nitrogen however, and is not, therefore, suited for distillation; peats for this purpose contain from 2 per cent. to 3 per cent. nitrogen.

It will be noted that the ash content is comparatively low, and if the extent of similar material were greater there would be little doubt of the suitability of utilising this deposit for fuel purposes. Even with the low percentage of nitrogen, the writer feels sure that the deposit is suited as a small reserve for humus purposes and as an area of intense cultivation.

The material obtained in this swamp may be taken as an example of a peat of medium quality, and will serve to refute any insinuation that we have no real peat in Western Australia. When examined under the microscope by the writer it was found to consist of blackish-brown carbonaceous matter derived evidently from plant growth—a deduction made from observation of stringy, fibrous structure in places. In addition spicules of fresh water sponges could be seen, and no diatoms were present.

In this case the peat is formed from such plant growth as bracken, bull-rushes, grasses and various aquatic plants. The swamp is fed by small springs which run from the bottom of surrounding sand ridges, and a creek drains the middle of the valley. Evidently this swamp formed portion of a longer creek running about southeast between sandhills towards the River Swan. Wells on the sand ridges in the immediate vicinity, without exception, proved to go down through somewhat incoherent sandstone or sand with occasional hard layers of "coffee rock" at varying depths. This lends support to the theory of formation of these swamps given by the writer under sections iii. and ii. In most cases the usual spear-head pump is found to be quite sufficient for use in windmill and hand pump wells in the Bayswater district. The height of the swamp would be about 40 feet above sea level.

(2.) *Swamp at intersection of Guildford Road and King William Street.*—This swamp is somewhat irregular in shape, and has an area of about seven acres. The height above sea level is about 20 feet, and there would seem to be here a continuation of the drainage channel referred to under 1. The swamp is now fed by springs arising near the base of the sandridges, and excess water is carried off by drains constructed by the Bayswater Roads Board.

Practically all this swamp has been under cultivation as market gardens and private householder's blocks. Much of it consists simply of windblown sand with an admixture of carbonaceous matter. In places peat to a depth of one foot is found, but in that case the peat is sandy and, on the whole, the area would seem to be suited for intense cultivation only. Close to Slade Street and about six chains from the Guildford Road higher banks of peaty matter are found upon the side of the sandhills rising at that point. This peaty matter is formed from ferns and bracken, and is of no great extent.

Taken as a whole the swamp has the appearance of an old flood plain of the creek which must have meandered along the present site of King William Street in days gone by. The artificial drainage ditch appears to be placed so as to avail itself of the contours of this old creek formation, and ultimately leads into a deep swamp nearer the Swan River and further along King William Street. This lower swamp was absolutely impassable on account of the depth of water, but it would appear to be upon a lower portion of the old clay flood plain of the Swan. Vegetation flourishes in it, and it is likely that peat is here in process of formation. In drier portions near the river bank peaty matter was observed.

(3.) *Swan Lake or "Duck Lake," lying across Garratt Road between the intersections with Murray Street and the railway line.*—Swan Lake, occasionally known as Duck Lake, has an elevation of between 55 feet and 60 feet above sea level. By means of drains it has been partially rid of its stagnant water. The drains are not, however, of sufficient depth to secure proper drainage, as there is a strong inflow of water from springs at the bottom of sand ridges on the north and northwest side of the lake. Upon digging at some points on the north side, the ridges were seen to be incoherent, and indeed in places to be composed of quicksands. Peat has been deposited on the central portion of the lake, and about 25 acres of peat of varying quality occupies that position.

That portion lying on the southwest side of Garratt Road is almost completely utilised for market gardens by Chinese. The peat occurring here has been much cultivated, and is now admixed with sand to some extent. It appears to have a depth of at least 4 feet, and tails off gradually towards the edges of the lake. Excellent results are being obtained in these areas of intensive cultivation, although in the opinion of the writer drainage could be more efficiently done. The Chinese are now adding sand to the peat so as to loosen the soil, but it is not known if they are adding or have added lime to counteract acidity and to keep the soil loose.

The portion northeast of Garratt Road has been partly utilised as householders' building blocks and part, which has not been under cultivation, is enclosed within the Bayswater Roads Board Recreation Ground. Householders have evidently been obtaining good results, and strawberries, tomatoes, beans, peas, cabbages, fruits, flowers, etc., grow excellently and produce fine crops. Here again it is not known if lime has been utilised to sweeten the soil, and it is suspected that far better results would be obtained if this were done.

On the Recreation Ground the Roads Board have had the task of reclaiming the swamp and relevelling equally so as to obtain a grassy park suitable for sports such as football and cricket. A certain amount of shallow ploughing and later harrowing was done, and a drain placed below the surface. The peat apparently was not limed, and it seems likely that drainage will remain a serious problem during winter months. On the surface, sand from adjoining ridges has been spread to a depth of about one foot, and upon this grass has been planted. It still remains to be seen if this experiment will be successful, and the writer would anticipate a greater measure of success if the peat had been properly limed to enable decomposition of the peaty matter to proceed apace, and if small feeder drains had been placed below the surface so as to lead into the main drains.

Upon the Recreation Ground the peat is of a dark-brown colour when wet, and of a greyish-black when dry. It seems to contain a large amount of fine carbonaceous matter, and it has been derived from the usual swamp material, viz., reeds, rushes, fern, bracken, decayed paper-bark, etc. The depth of peat appears to vary, and in some places would seem to be not less than five feet, although at the edges it thins out to quite a superficial covering.

(4.) *Coode Street Lake near Patterson Street.*—This is a fairly extensive lake-swamp that seems to

have occupied about 76 acres. It has been drained by large open drains, which appear to fulfil their function fairly well. It is formed by two large portions joined by a narrow neck crossing Coode Street and the longer axis runs about east and west.

The western portion consists in the main of black peaty sand, in which carbonaceous matter has been incorporated with siliceous matter from the surrounding dunes, and patches of heavier peat are to be found also. This portion of the lake was under water to the depth of five feet in places at one time, but drainage ditches have reduced water-level considerably, and now only a few deeper portions hold water for any length of time. The western portion is partly under cultivation as market gardens worked by Chinese and as small dairy farms owned by white settlers. In each case good results seem to be obtained and good crops of cabbages, potatoes, maize, etc., were to be seen at the time of visit.

The eastern portion of the lake lying between Coode Street and Drake Street is largely occupied by Chinese market gardens, and consists of much black carbonaceous sand with a central patch of grayish peat. The black sand would approximate to the American definition of "muck." The peat, on the other hand, seems to be a real peat which, when wet, is dark brown in colour, and when dry a light grey. There is a marked difference in weight when wet and dry, and it burns readily. It is very productive when cultivated, and in the Chinese gardens truck crops thrive well wherever the soil is the result of careful cultivation.

Further east beyond Drake Street extends the extreme eastern portion of the lake terminating in small adjoining lagoons. Messrs. Brookes and Pennell's market garden is situate partly upon the extension of the grey peat deposit, and occupies an area of about five acres. The deposit is irregular, and the depth of peat varies from over four feet in places to nothing on the edges. Apparently no lime has been used in the treatment of this peat, but superphosphate and bonedust have been added in places. Efficient drainage enables the garden to produce pumpkins, beans, celery, cabbage, lettuce, etc., with much success. During the very hot summer months watering by sprinklers is resorted to.

North of this garden there is a small tail of the lake, and in this was found the nearest approach to British peat that has as yet been observed in Western Australia by the writer. This deposit was very small in extent, but seems to be derived largely from a species of moss comparable to the sphagnum mosses of temperate climates. It was much admixed with sand, and appeared to have a depth of a few feet. It was uncultivated.

What would appear to be an extreme eastern extension of the main lake body filled a small depression and formed a small swamp, now under cultivation. In this case the surface material consisted mainly of an impure peaty "muck," the impurities being mainly sand derived from the surrounding ridges. Various flowers (including roses), truck crops, strawberries, etc., were cultivated on it with success.

Although the writer is not of the opinion that the Coode Street Lake has been cultivated in the best way possible, still he has little doubt that it may be cited as a typical example, showing what can be done with similar areas where the surface soil consists largely of impure peaty matter.

A glance at the map would show that contouring would prove the area to be composed of a number of depressions, but there is little doubt that these at one time would form part of a main swampy lake body surrounded by high sand dunes, which have a height up to 160 feet above sea level. The whole area varies in height from about 70 feet to 75 feet above sea level, but peat would appear to occur mainly at the lower elevation of 70 feet. Comparison with height above sea level of other deposits proves the contention that throughout Bayswater district peat does not occur at any fixed level, and that it occurs in the deeper portions of depressions between sand dunes. The writer would estimate that about 10 acres of grey peat occur at the 70 feet level in this lake.

5. *Catherine Street—Coode Street Swamp.*

This swamp occurs on the northwest extension of Coode Street, at its intersection with Catherine Street, and it occupies an area of about 45 acres. In the main, it lies in a depression with a height of about 80 feet above sea level. It has been customary for water to rise to a fair height in this swamp during rainy seasons, but there is no great deposition of peat. In places black peaty matter with much sand occurs and it would probably be better identified as "muck." The bulk of the swamp is black sand, consisting of siliceous particles from the surrounding sand dunes and fine black carbonaceous matter.

There are swampy areas further northwest, along Coode Street, where water rises to two or three feet above the surface level, but in none of those that were examined could peat be found. Nevertheless, it is reported that good crops have been grown there in black sands—wheat to a height of 4½ feet and maize to a height of 8 or 10 feet.

Throughout these areas the so-called "coffee rock" is found in thin lenses at varying depths below the surface—in some cases within a foot of the surface. These lenses would appear to be responsible for the flooding.

6. *Killarney Lake and Swamp.*

This swamp lies between Main Road, Beechboro Road, Langley Road and Drynan Street. Close to Beechboro road, the southeast end of the swamp forms what is known locally as Killarney Lake. The total area of this swamp would be about seven acres of which five acres are excellent peat and the remainder a black sandy loam. The average level of the deposit approximates to 70 feet above sea level.

At the time of examination Killarney Lake was more or less dry except in the centre proper, and it was possible to get samples of peat from the bed of the lake. These consisted in the main of carbonaceous matter derived from the partial disintegration of sedges, reeds and bulrushes. From the shape of the depression, the writer would estimate the peat to have a depth of at least 10 feet in its deeper portions, athough only practical examination by digging could prove this. Careful drainage of this lake should yield a good though small deposit of peat of good quality and highly suited for such agricultural puposes as fertiliser. Taking the method of calculation, given by Osbon, there should be between 1,000 and 1,600 tons of average quality air-dried peat in the body of the lake.

Part of the northeast portion of the swamp is separated from Killarney Lake by a slight elevation. This part has been reclaimed and is included in Shackleton's garden. A considerable amount of work

is being done on this block, but the holder seems to be handicapped by want of efficient drainage, as water rises above the surface during the winter months. The peat here is a very heavy, black, combustible peat of high value in intensive cultivation. The introduction of proper pipe leader drains leading into an efficient main exit drain would enhance the value of this portion of the swamp and would be an immense improvement for intense cultivation. In addition, liming with quicklime should be done, as the deposit in its present condition is undoubtedly sour and acidic, and as liming will help to keep the soil loose. Some attempt has been made to conserve soluble nitrogen by growing peas and by digging the shaws and roots into the soil. This should be continued.

The peat itself increases from a film at the edge to more than five feet in the centre of the marsh. This was proved by digging. Although the block has been only a few years under treatment and cultivation, Mr. Shackleton, in spite of inefficient drainage, has had excellent results with rhubarb, peas, beans, lettuce, strawberries, roses, etc., and citrus trees (off the flooded portions.)

The original swamp intervening between Shackleton's and Killarney Lake portions contains excellent peat derived from reeds, bulrushes, sedges, ti-trees, paper bark trees, etc. The whole swamp lies in a depression, receiving water from springs arising at the base of surrounding sand ridges.

7. *King Street-Beechboro Road Swamp.*

In this locality are a number of swamps in which peaty sand occurs. On the southwest side of King Street is a large swamp which has long been successfully cultivated as market gardens by Chinese. The central portion of this swamp consists of about 5 acres of brown peat. Drains carry off excess water towards the Swan River and seem to follow an old drainage basin which doubtless was choked up at various points, thus enabling peat to be deposited.

Following this drainage channel southwards we come to a small swamp with about 4 acres of peat on the north side of the main Eastern Railway line and close to the intersection with the Belmont Branch line. Here the peat is a black compact material containing much woody substance derived from roots. The usual swamp flora contributes to the formation of this peat, viz.: paper-bark trees, ti-trees, reeds, bulrushes, ferns, bracken, grasses and various minor aquatic plants. The depth of peat would appear to be at least 3 feet, and is probably greater in places. The deposit seems to contain less sand than is usual in Bayswater peaty matter, and evidently this formation is due to arrested drainage. Drainage creeks following the surface contours lead on to the deep swamp on King William Street near the river and south of the Guildford Road. At a point close to the intersection of Slade Street and Guildford Road there is a small deposit of peaty material.

On the southwest side of Clune Street there is a sandy swamp of fair size now under cultivation as a dairy farm. It is composed mainly of black carbonaceous sand, and a drainage channel leads on to the main drainage channel discussed above.

On the north side of King Street there is a small patch of sandy swamp consisting of black peaty sand. In the northeastern end of this swamp, on the north of Collier Road, water is held up and the peaty matter increases in content. This swamp is under cultivation and has been utilised for growing such crops as maize.

8. *Hoyne Lake.*

This is a placid sheet of water on the north side of Collier Road near to and west of Grey Street. At time of examination there was about 11 acres of clear, pellucid water, which has a depth towards the middle of the lake of up to about 10 feet. The bottom is peaty and there is a narrow margin of peaty swamp surrounding the lake and showing up in marked contrast to the white sands of the surrounding sand dunes. The lake is fed by springs upon its north side.

9. *Cumming's Lake.*

This is an extensive swampy lake lying near to Hoyne Lake and on the east side of Grey Street. There is a large deposit of peat forming the bed of the lake which is drained in places for use as Chinese gardens. The flora forming the peat consists mainly of tall bulrushes and reeds which cover most of the lake. The lake lies outside the Bayswater Road Board District proper, but as it partly lies within the map its boundaries have been roughly indicated on the map.

From a cursory examination of this deposit, the writer is of the opinion that there may be found here a peat suitable for use in fertiliser. The drainage problem will, however, require some consideration.

10. *Essex Street-Lawrence Street Flat.*

Southwest of Lawrence Street near its intersection with Essex Street there is an extensive flat which apparently is the bed of an old lake. It consists of much peaty sand or "muck" with occasional patches of more peaty material. Evidently this formed an extension of the Coode Street-Patterson Street Lake discussed under 4. This area should not require much drainage, and its "muck" and peat deposits ought to be found suitable for market gardening or other form of intense cultivation.

In the description of these deposits selected *supra*, it is recognised that there may be more deposits throughout the Bayswater district. Some of these are indicated on the map. It is hoped, however, that, to save reiteration of general qualities, enough has been said to give a general idea of the properties and possibilities of peat deposits throughout the Coastal Plain of Western Australia.

V. General Conclusions and Future Possibilities.

The subject of peat, both generally from the scientific point of view and particularly in regard to Bayswater, has been discussed at length in this report, and a few words in conclusion are still necessary.

In all the areas examined it was found that, although good peat was undoubtedly present, no single area could be used as a machine-fuel proposition. The areas are in general somewhat too small and scattered to be considered as business propositions. Nevertheless in one or two cases sufficient peat is present to be used as a local source of fuel to be cut by hand and used locally or also as a local source of fertiliser or fertiliser constituent. In addition, with proper drainage, all can be used for the intensive cultivation of truck crops, maize, oats, wheat, roses and other flowers, strawberries, and citrus trees. Of recent years in California it has come to be recognised that peat soil is highly suited for citrus cultivation, but it is obvious that great care has to be taken to see that roots do not go down into a *sour* peat deposit. Some of the purer peats may, after treatment, be used for packing as described in III. 3 c.

Undoubtedly these peat deposits constitute a potential source of wealth, and with proper treatment and cultivation their value will soon be recognised. The promiscuous burning off of peat swamps cannot be too much deprecated, and it is hoped that measures will be taken to stop this wasteful practice, which is a danger to the community at large. The writer will be well pleased if this report helps to bring about the utilisation of more extensive peat deposits throughout the State.

PETROLOGICAL WORK.

(C. O. G. LARCOMBE, D.Sc.)

Much time was devoted during the year to a special detailed investigation into the petrology of Wiluna, which involved a close investigation of 2,166 feet of core from the Nos. 1, 2, and 3 new bores put down by the Wiluna Development Syndicate.

The object of the petrological investigation was to work out the underlying principles controlling the geology of the area, and as a result a box containing 20 polished cores has been prepared. These cores will serve as an "index" or "key" to future economic petrological work on rocks from Wiluna. In addition, mineralogical and physical conditions were taken into consideration—especially evidence of dynamic effects— and consequently much light has been thrown on the rock formations, as well as on the nature, origin, occurrence, and economic aspects of the ore bodies on Leases 6J and 7J, held by the Wiluna Development Syndicate.

At the end of July, Perth was visited and an examination was made of the core from the Nos. 1, 2, and 3 bores in the Supreme Court buildings. Material was selected for later petrological investigation. Details of the report made to the Government are attached herewith.

In addition to the numerous duties in the form of discussions with the Government Geologist, field, and other departmental officers, as well as interviews with the public and the supply of information, the result of petrographic investigation, the following may be regarded as a summary of the more important work carried out during the year:—

1. A petrographical investigation into the cores from Nos. 1, 2, and 3 New Bores put down on Leases 6J, 7J, 271J, and 280J by the Wiluna Development Syndicate, Wiluna, East Murchison Goldfield.

2. Petrological report on rocks from the No. 19 level in the Menzies Consolidated Gold Mine, Menzies.

3. Petrological examination of two bores put down at Wiluna by the Mararoa Gold Mining Company.

4. Petrology: Leonard Range, Eastern Division.

5. Boring for Oil, Boddington, South-West Division.

6. Determinations and reports for other departments, as well as for the general public:—

(a) Graphite from Wagin.

(b) Granite from quarry at Parkerville.

(c) Unakite from Gilgarna rock, 20 miles north-east of Kurnalpi, for the Government Mineralogist; and

(d) Leucophyllite schist from Peedamulla Station, for Mr. Blatchford.

I. A PETROLOGICAL INVESTIGATION INTO THE CORES FROM NOS. 1, 2, AND 3 NEW BORES PUT DOWN ON LEASES 6J, 7J, 271J, AND 280J BY THE WILUNA DEVELOPMENT SYNDICATE, WILUNA, EAST MURCHISON G.F.

TABLE OF CONTENTS.

1. INTRODUCTION.

I first inspected the No. 2 New Bore on 31st July, 1924, in the presence of the State Mining Engineer, Mr. John McDermott and others. I visited Perth on 17th August, 1925, and inspected 2,166 feet of core taken from these three bores, and selected 197 pieces of rock from various depths, viz.: No. 1 Bore, 85 samples; No. 2 Bore, 75 samples; and No. 3 Bore, 37 samples. Fifty-three microscopic sections were examined in connection with this report.

Three bores were put down in a westerly direction as follows:—

No. 1 New Bore: Depth 1,002 feet; inclination from horizontal, 50 degrees; direction of bore, N. 75° W.

No. 2 New Bore. Depth, 544 feet; inclination from horizontal, 50 degrees; direction of bore, N. 75° W.

No. 3 New Bore: Depth 620 feet; inclination from horizontal, 50 degrees; direction of bore, N. 77° W.

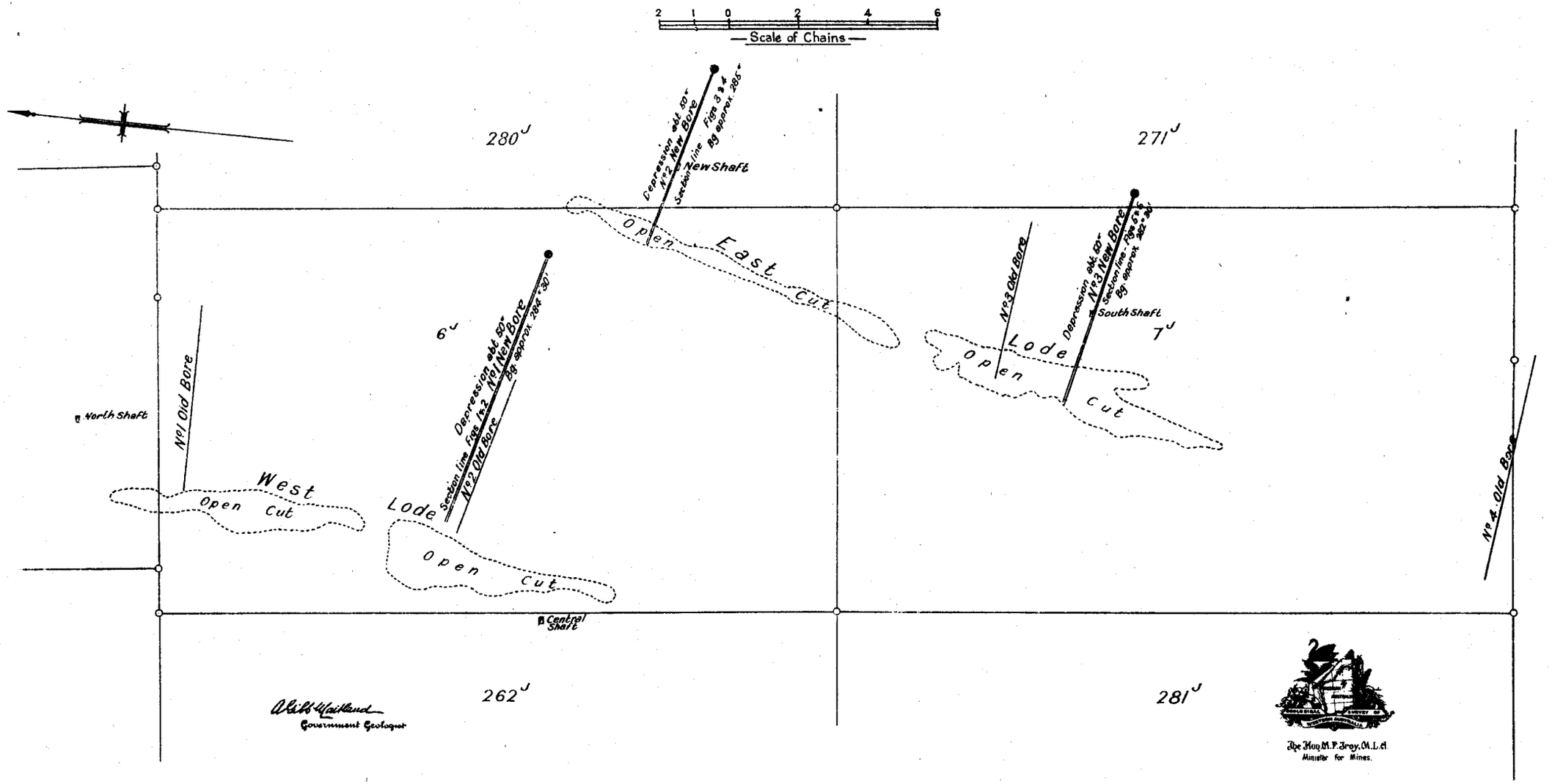
A plan, Plate V., is submitted, showing the position of these three bores as well as the open cuts. Plate II. contains sections through No. 1 Bore on a scale of 200 feet to one inch, and Nos. 2 and 3 bores on a scale of 100 feet to one inch, together with enlarged sections on a scale of 20 feet to one inch, showing the distribution of values where the bore passed through the lodes.

2. GEOLOGY.

The State geological map indicates that Wiluna is situated in a extensive area of greenstone, surrounded on all sides by granite. This belt of greenstone country is 50 miles wide towards its northern end, where Wiluna is located, and five miles wide towards its southern end.

The examination of core from these three new bores has revealed the fact that the four chief rock formations at Wiluna belong to the same family—even

PLAN OF LEASES SHEWING POSITIONS OF Nos 1 2 & 3 NEW BORES AS SET DOWN BY THE COMPANY WILUNA DEVELOPMENT SYNDICATE WILUNA, EAST MURCHISON G.F.



Alfred Maitland
Government Geologist

The Hon. M. F. Troy, M.L.C.
Minister for Mines.

FRED. WM. SIMPSON, Government Printer, Perth.

though they are not lithologically the same in every way—as the rocks on the Kalgoorlie goldfield.

The chief rock formations are:—

A. Quartz dolerite greenstone.
B. Fine-grained greenstone ("calc schist.")
C. Felsite (keratophyre?).
D. Porphyrite.

Petrographical investigations indicate that these four rocks at Wiuna have, on account of their inherent physical, structural, chemical, and mineralogical properties, a similar influence on the distribution of the gold, the lines of weakness which control the occurrence, and the ultimate economic aspect of the ore deposits, as the analogous rocks of Kalgoorlie on the ore deposits of the Golden Mile, *e.g.*, the quartz dolerite greenstone makes good ore; so does the calc schist along its line of contact with the quartz dolerite greenstone. But more information is yet required to be certain about the behaviour at depth of the lodes in the "calc schist" away from the contact zone, such as in the No. 1 deep bore, beneath the western lode. The ore in the felsite (keratophyre ?) has not yet proved to be satisfactory, while the porphyrite does not carry payable values. However, experience has shown that in those places in Western Australia where earth forces have been sufficiently powerful to form a well-defined shear channel, and the auriferous solutions have been present in sufficient quantities, and under suitable conditions, ore deposits will form.

A. *Quartz dolerite greenstone.*

This is a compact, dense, pale green to dark green rock, presenting a somewhat mottled appearance. It is characterised by (a) abundant glassy pseudophenocrysts of quartz, (b) patches of dirty gray dull leucoxene—well seen on wetted surfaces, and (c) small patches of dark green, almost black, chorite.

Under the microscope the mineral constituents are: Quartz, plagioclase felspar, carbonates, chlorite, leucoxene, sericite, a little apatite, and occasional grains of iron pyrites. The quartz, which contains dust-like inclusions and exhibits shadowy extinction in places, is much in evidence. It is cracked and in part replaced by carbonates. The plagioclase is greatly altered. All the original ilmenite has practically been converted into whitish leucoxene. The rest of the rock has been broken down into an indefinite mixture of carbonates and chlorite with a little sericite. In places the quartz dolerite greenstone is bleached—a common feature in Western Australian greenstones. The bleached form is much paler, almost whitish-gray in colour. The leaching is due to increased carbonation, sericitisation, and sometimes the introduction of pyrites. Micropegmatitic patches are common. The quartz dolerite greenstone is continuous in the No. 2 Bore from the surface to 471 feet, at which point it is replaced by calc schist. In the No. 3 Bore it continues from the surface to 356 feet and contains the main lode formation. It is not present in the No. 1 Bore, which is evidently too far to the west.

B. *Fine-grained greenstone ("calc schist.")**

This rock is best seen in the core from the No. 1 Bore, which is almost entirely within it. It is also present from 471 to 544 feet in the No. 2 Bore and from 386 to 620 feet in the No. 3 Bore.

The fine-grained greenstone is not constant in physical appearance, but for the most part it is a dense, compact, felsitic looking rock of an ash-gray to greenish-gray and slaty colour. In some places it is dark green—the greenstone type. This rock possesses three distinctive features, viz.: (a) minute acicular cracks, (b) a "feathery" texture, and (c) in places a spotted appearance, due to the dissemination of black patches of chlorite. Under the microscope the rock is for the most part a dense mass of carbonates and chlorite. The curious colourless lines and "feathery" textures are in many places a feature of the rock. The patches of green chlorite are quite distinctive. Veins of carbonate—with a little chlorite—frequently traverse the rock.

C. *Felsite (keratophyre?).*

This rock was met with in the No. 3 Bore, between 358 and 386 feet. It was not seen in either the No. 2 Bore or the No. 1 Bore. It evidently forms an old dyke, about 18 feet wide. It was certainly in existence before the ore bodies were formed.

In hand specimens it might easily be mistaken for the calc schist. It is a compact, dense, pale brown to pale gray or ash coloured felsitic rock, with a somewhat resinous-looking lustre. Specimens from 372 feet show small glistening laths of felspar. The rock is pyritic throughout, traversed by small veinlets of carbonates, and contains small values.

Under the microscope the freshest specimens are made up of a plexus of small plagioclase laths lying in all directions. These laths are separated by indefinite carbonated material. The rock has suffered dynamic action, and small sheared lines are filled with colourless sericite. The felspars are carbonated, kaolinised, and sericitised.

D. *Porphyrite.*

This rock was met with in the No. 1 Bore between 971 and 1,002 feet. In hand specimens it is a dense, soft, greenish-gray rock with distinct rectilinear white phenocrysts.

Under the microscope it consists of decomposed, rectilinear plagioclase phenocrysts set in a base of felspar microlites and chlorite. So far as assayed it does not carry any gold.

3. Description of No. 1 New Bore.

General Remarks.—This bore reached a total depth of 1,002 feet along the incline, or a vertical depth† of 767 feet.

Detailed microscopic investigation shows the rocks met within this bore, and the depth drilled, to be as follows:—

Depth drilled (in feet).	Nature of Rock.
0—185	Rotten decomposed greenstone.
185	Bottom of zone of oxidation (weathering).
185—970	Fine-grained greenstone "calc schist" in various stages of alteration.
970—1,002	Porphyrite.

* The term "calc schist" is used in the same sense as Dr. Maclaren used it at Kalgoorlie. † Assuming that there was no deflection.

Distribution of Values.—The cross section, Fig. 2, Plate II., shows the distribution of the values indicated in the following table:—

Depth in Bore (in feet).	Inclined distance (in feet).	Horizontal distance (in feet).	Value, per ton. Government: 2,240lbs. Mine: 2,000lbs.
801—804 (801′ 5″—804′ 6″	3	2	Govt.: 801′ 5″ to 804′ 6″, 16/8 to £2 17s. 2d. Mine average: 801′ to 804′ 38/–.
804—810 (804′ 6″—810′)	6	3·8	L. 2 dwt.
810—814	4	2·6	Govt.: 34/11 to 50/3. Mine average: 40/–.
814—818	4	2·6	L. 1 dwt.
818—846	28	18·0	Traces.
846—852	6	3·8	L. 4 dwt.
852 882	30	19·3	Traces.
882—898	16	10·3	L. 4 dwt.
898—902	4	2·6	Govt.: 32/–. Mine: 29/9.
Total ...	101	65·0	

The rock was first assayed from a depth of 540 feet. No values of any account were encountered till 801 feet 5 inches.

It will be seen from the above table that the area over which gold has been distributed extends from 801 feet 5 inches to 902 feet, a distance of 100 feet 7 inches along the direction of inclination of bore, or a horizontal width of 65 feet. But throughout this horizontal width of 65 feet there is only 7.2 feet of ore, split up into widths of 2 feet, 2.6 feet, and 2.6 feet respectively, none of which will average more than 40s. per ton.

Rock formations.—Practically the whole of No. 1 New Bore was in fine-grained greenstone ("calc schist"), with the exception of 32 feet of porphyrite between 970 and 1,002 feet. The bore ended in porphyrite.

Sheared lines.—At 796 feet there is evidence of fracturing and shearing. Between 801 and 814 feet the rock is distinctly silicified and fractured. A powerful schisted line was noted at 808 feet, and at 810 feet there is a strong chloritic sheared line.

4. Description of No. 2 Bore.

General Remarks.—This bore reached a total depth of 544 feet along the incline, or a vertical depth of 410 feet, *i.e.* assuming an inclination of 47 degrees to 300 feet and 51½ degrees from 300 to 544 feet.

The rocks met with in this bore, and the depths drilled, are as follows:—

Depth drilled (in feet).	Nature of the rock.
0—383	Rotten pinkish to whitish decomposed mottled quartz dolerite greenstone.
383	Bottom of zone of oxidation (weathering).
383—471	Quartz dolerite greenstone with lode material as shown in Figs. 3 and 4, Plate VI.
471—544	"Calc schist" with lode material as shown in Figs. 3 and 4, Plate VI.

Distribution of Values.

The cross section, Fig. 4, Plate VI., shows the distribution of values indicated in the following table:—

Depth in Bore (in feet).	Inclined distance (in feet).	Horizontal distance (in feet).	Value, per ton. Government: 2,240lbs. Mine: 2,000lbs.
400—402 (402′ 2″—402′ 2″)	2	1·3	Govt.: £8 14s 0d. Mine: £8 19s. 3d.
402—406	4	2·6	Traces.
406—408 (406′ 2″—408′ 2″)	2	1·3	Govt.: £87 12s. 4d. Mine: £89 11s. 0d.
408—434	26	16·7	L. 1 dwt.
434—446	12	7·7	Govt.: 13/7 to 38/9. Mine average: 23/10.
446—454	8	5·0	L. 1 dwt.
454—472	18	11·6	Govt.: 3/– to 16/8. Mine average: 454′ to 468 16/–. About 4 dwt.
472—478	6	3·8	Govt.: 25/– to 75/3. Mine average: 46/–.
478—500	22	14·0	Traces.
500—522	22	14·0	Govt.: Traces to 48/4. Mine average: 17/10.
Total ...	122	78·0	

The assays were first commenced on rock taken from a depth of 392 feet 2 inches in the bore. No values were then encountered till a depth of 400 feet 2 inches. From this point, as shown in the above table and in the cross section, Fig. 4, Plate VI., values occurred intermittently to a depth of 522 feet, below which to the end of the bore at 544 feet nothing more than traces were recorded.

The values in the bore ranged from traces to £87 12s. 4d. per ton. The crosscut put out from the main shaft at a vertical depth of 290 feet passed through (according to the Company) 42 feet of lodestuff of an average value of 39s. 6d. per ton.

The distribution of gold-bearing rock extends over an inclined distance of 122 feet or a horizontal distance of 78 feet. Over this distance of 122 feet assays indicate that 60 feet of rock contained less than 1 dwt. per ton, and 18 feet less than 5 dwts. per ton. The lodestuff indicated in the bore as occurring between 500 and 522 feet does not appear to have been cut in the crosscut.

Figures 3 and 4 of Plate VI. show that the auriferous solutions were extensive enough to make lodestuff in both the quartz dolerite greenstone and the calc schist. The lodestuff in the calc schist, along its immediate line of contact with the quartz dolerite greenstone, makes just as rich ore as the best average in the quartz dolerite greenstone. But away from the quartz dolerite greenstone, *e.g.*, between 500 and 522 feet, the ore is set down as averaging 17s. 10d. per ton.

The high values appear to be confined to very limited zones, controlled by small shear planes and sheeted lines, where there has been a concentration of the gold. In the matter of bulking the ore a great deal will depend on the number and distribution of these lines of enrichment, because the calc schist and quartz dolerite greenstone are so dense that replacement takes place with some difficulty away from the lines of sheeting and shattering, and it is not easy to bring about a sufficient coalescence of ore particles to make large payable ore bodies.

DIAGRAMMATIC REPRESENTATION OF COUNTRY ROCK, AURIFEROUS ZONES & LODESTUFF

(as determined by petrological investigation)

PASSED THROUGH IN THE Nos 1.2&3 NEW BORES PUT DOWN BY THE WILUNA DEVELOPMENT SYNDICATE ON G.M.L.6,7,271,280 AT WILUNA, W.A.

Quartz dolerite greenstone — Fine grained greenstone (Calc schist) — Keratophyre (felsite) dyke — Surface soil — Lodestuff (in Quartz dolerite greenstone) — Lodestuff (in Fine grained greenstone) — Low grade (L 4 dwt.) material

Note: Values are expressed in dwts. per ton & in shillings per ton of ore as determined by the Mine authorities & by the Government.

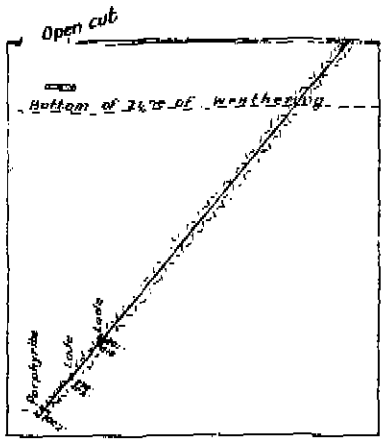


Figure 1
Geological Section through No1 New Bore

Scale 0 50 100 Feet

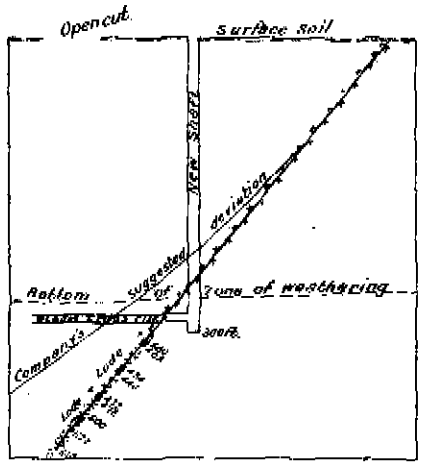


Figure 3
Geological Section through No2 New Bore

Scale 0 50 100 Feet

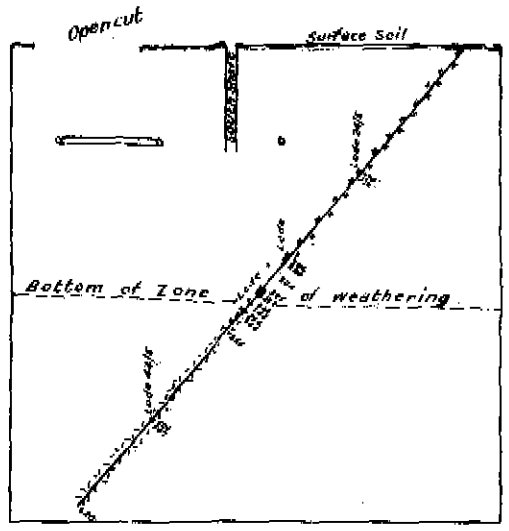


Figure 5
Geological Section through No3 New Bore.

Scale 0 50 100 Feet

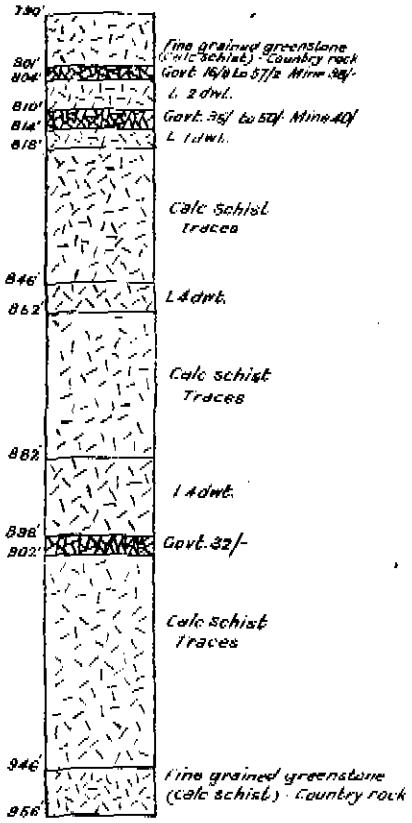


Figure 2.
Enlarged diagrammatic section of core between depths of 790 feet and 966 feet showing distribution of values in No1 New Bore

Scales
Vertical 0 10 20 Feet
Horizontal 0 ½ 1 Inch

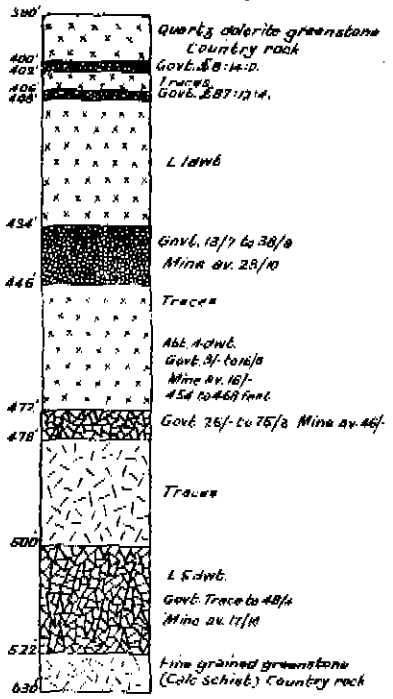


Figure 4
Enlarged diagrammatic section of core between depths of 390 feet and 530 feet showing distribution of values in No2 New Bore

Scales
Vertical 0 10 20 Feet
Horizontal 0 ½ 1 Inch

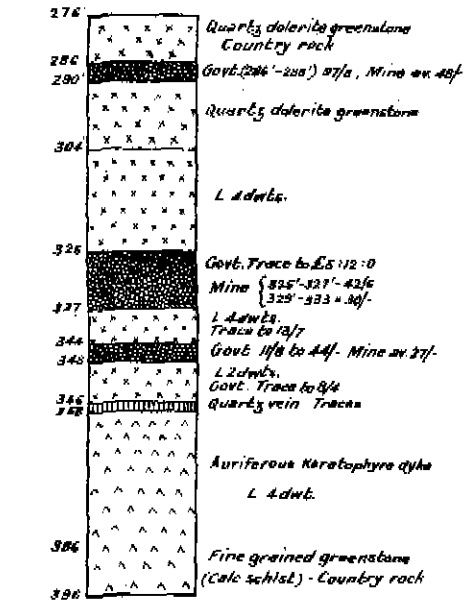


Figure 6
Enlarged diagrammatic section of core between depths of 276 feet and 396 feet showing distribution of values in No3 New Bore

Scales
Vertical 0 10 20 Feet
Horizontal 0 ½ 1 Inch

A.G.R. Hallimond
Government Geologist

The Hon. M.F. Troy, M.L.A. Minister for Mines

FRED. WM. SIMPSON, Government Printer, Perth.

Rock formations.—Only two rocks were met with in this bore, viz., quartz dolerite greenstone and fine-grained greenstone ("calc schist"). The quartz dolerite greenstone is normally dark green in colour and very compact, though in places it has been much bleached. The fine-grained greenstone is mostly of the calc-schist type, a dense, grayish bleached form with numerous minute fractures and "feathery" textures. In places it is decidedly greenish with black patches of chlorite.

5. Description of No. 3 New Bore.

General Remarks.—This bore reached a total depth of 620 feet along the incline, or a vertical depth of 475 feet. The rocks met with in the bore, and the depths drilled, are as follows:—

Depth drilled (in feet).	Nature of the rock.
0—340	Brownish-red decomposed greenstone, somewhat hardened and greenish in places, with values from 170 to 172 feet and from 286 to 340 feet.
340	Bottom of zone of oxidation (weathering).
340—356	Quartz dolerite greenstone, with values.
356—358	White quartz vein.
358—386	Intrusive dyke of dense pale brownish pyritic felsite (keratophyre), with values.
386—620	Fine-grained greenstone ("calc schist"), showing between 500 and 502 feet ore worth 44/5 per ton.

The geological section, Fig. 5, Plate VI., shows the above distribution of rock formations.

Distribution of values.—The cross section, Fig. 6, Plate VI., shows the distribution of values indicated in the following table:—

Depth in Bore (in feet).	Inclined distance (in feet).	Horizontal distance (in feet).	Value, per ton. Government: 2,240lbs. Mine: 2,000lbs.
170—172	2	1·3	Govt.: 24/5. Mines: 25/6.
286—290	4	2·6	Govt.: 286′ to 288′, £4 17s. 3d. Mines average: 286′ to 290′, 48/–.
290—304	14	9·0	Rock: traces.
304—325	21	13·5	L. 4dwt. Govt.: Nil to 18/11. Mine: Traces to 17/–.
325—337	12	7·7	Govt.: Traces to £5 11s. 11d. Mine: Traces to £5 12s. 2d. Mine average: 325′—327′, 42/6. 329′—333′, 30/–. 334′ 10″—336′ 10″, £5 12s. 2d.
337—344	7	5·0	L. 4dwt. Govt.: 6d. to 13/7. Mine: Traces to 14/5.
344—348	4	2·6	Govt.: 11/8 to 44/5. Mine: 12/9 to 41/7. Mine average: 27/–.
348—356	8	5·0	L. 2dwt. Govt.: Traces to 8/4. Mine: Traces to 7/8.
356—358	2	1·3	Quartz vein: trace.
358—386	28	18·0	L. 4dwt. Govt.: 11d. to 17/–. Mine: Traces to 18/8.
Total, 286—386	100	64·7	
500—502	2	1·3	Govt.: 44/5. Mine: 42/6.

The assaying was first commenced on rock from a depth of 131 feet. Nothing but traces (with one assay of 8s. 8d. per ton between 163 feet 1 inch and 164 feet) was obtained till a depth of 170 feet was reached. From 170 to 172 feet the ore assayed 44s. 5d. per ton. From 172 to 286 feet nothing more than traces were obtained.

Values, as indicated in the above table and diagrammatically represented in Fig. 6 of Plate VI., were obtained between 286 feet and 386 feet. The highest assay was £5 11s. 11d. per ton between 334 feet 10 inches and 336 feet 10 inches. From 386 feet to 620 feet, the end of the bore, no assays worth mentioning were recorded, with the exception of an assay of 44s. 5d. per ton between 500 feet and 502 feet.

Between 286 and 340 feet the lodestuff was all in decomposed rotten rock from the zone of oxidation.

At 356 feet a 2 feet wide quartz vein was cut.

From 358 feet to 386 feet the rock in the bore consisted of a dense brown pyritic felsite—evidently a keratophyre dyke of intrusive origin. This dyke is auriferous throughout, but it nowhere carried values greater than 17s. per ton.

Rock formations.—Three rocks were met with in this bore, viz,: quartz dolerite greenstone, felsite (keratophyre?), and a fine-grained greenstone ("calc schist"). The bulk of the quartz dolerite greenstone is highly decomposed; it carries the lode between 286 and 356 feet. A little dark green fresh quartz dolerite greenstone was noted between 340 and 356 feet. The felsite (keratophyre?) is a dense brown fine-grained rock. It is evidently a dyke rock—pre-gold in origin, and therefore older in age than the lode formations. Throughout its 27 feet in the bore it is pyritic, more or less fractured with veinlets of quartz, and contains an average of less than 4 dwts. of gold to the ton. The fine-grained greenstone changes somewhat in physical appearance. For the most part it is the usual dark gray "calc schist" type, with minute fractures and curious feathery textures. In some places it is strongly bleached and somewhat pyritic; in other places it is a typical soft chloritic greenstone.

6. The Ore Deposits.

A. *Classification and mode of occurrence.*

All the ore bodies on Leases 6J and 7J may be regarded as lode formations, *i.e.* more or less vertical zones of rock that gradually merge into the surrounding rock, which is of similar origin but distinct from it in carrying metallic ores disseminated through it in payable quantites.

As a result of the circulation of siliceous, carbonated, sulphide-bearing solutions, auriferous deposits have formed in the rocks; but these deposits seldom have any definite horizontal boundaries, except those determined by a decrease in the assay value of the rock.

The eastern lode, on which the new shaft has been put down to 300 feet, has formed along a contact zone of shattering and sheeting between quartz dolerite greenstone and calc schist. In the No. 3 New Bore the western wall of this lode is occupied by a pyritic felsite dyke 18 feet wide.

The western lode is entirely in calc schist. So far as can be determined by the No. 1 Bore, this lode, between 801 and 902 feet, has been split up into two channels: an easterly one 8½ feet wide, and 54 feet to the west, a westerly lode 2.6 feet wide. This western lode has been formed by the replacement of calc schist along sheared and somewhat shattered lines.

The lode formations occur in three rock formations, viz.: (a) quartz dolerite greenstone, (b) calc shist, a d (c) felsite (keratophyre?).

(a) *Lodes in quartz dolerite greenstone.*—The typical lodestuff in quartz dolerite greenstone may be seen in the No. 2 Bore between 434 and 446 feet. The very high values, viz., £8 14s. per ton between 400 feet 2 inches and 402 feet 2 inches, and £87 12s. 4d. per ton between 406 feet 2 inches and 408 feet 2 inches, came from the lode stuff in quartz dolerite greenstone.

In hand specimens the ore in quartz dolerite greenstone has the appearance of pale grey pyritic (iron and arsenical) lodestuff. It gives no clue as to its origin. The iron pyrites is irregularly distributed in small grains—in part crystallised. The mispickel is also in shapeless grains, but it is frequently in small needle-like crystals. In places the sulphides are more or less aggregated into patches.

Under the microscope the lodestuff is seen to contain the following minerals: Quartz, felspar (plagioclase), carbonates of lime and magnesia, sericite, leucoxene, a little chlorite, occasional rods of apatite, iron pyrites, and mispickel. The iron pyrites is in very small grains; the mispickel is also granular, but it often occurs in needle-like forms. Both sulphide and sulph-arsenide show a strong tendency to replace the white leucoxene—important evidence of metasomatism. There is a tendency for these two minerals to arrange themselves along minute shears and cracks; in fact, wherever there is a line of weakness the sulphides segregate. Carbonates of lime and magnesia are abundant; they occur in shapeless patches and grains all through the rock—thus indicating that carbonation was an important process. Much of the original quartz has been broken up into "archipelagoes." There is not excessive secondary silicification, but secondarily introduced mosaics of quartz were observed in patches in the vicinity of shear tracks or lines of weakness. Relict micropegmatitic textures were noted. Some slides showed a good deal of sericite. Chlorite is quite subordinate. The aforegoing facts afford positive proof of the metasomatic origin of the ore.

(b) *Lodes in calc schist.*—The typical lodestuff in calc shist may be seen in the ore from 473 feet in the No. 2 New Bore and in ore from 811 and 899 feet respectively in the No. 1 New Bore.

In the eastern lode, along the contact zone, the calc schist lodestuff has been, in places, intensely silicified. In hand specimens it is a dense gray flinty rock with small patches of carbonates and glassy quartz, and contains pyritic carbonate veinlets. The whole rock is impregnated with fine-grained pyrites.

Under the microscope it consists of an exceedingly dense microcrystalline aggregate of carbonates and quartz, impregnated with fine-grained pyrites, collected in places into patches. Veinlets of pure carbonates are common.

This intensely silicified flinty form is not the common type of ore. The typical ore is usually a dense, felsitic, pale olive green rock, somewhat silicified, traversed mainly by carbonate and some quartz veinlets, and impregnated with fine-grained pyrites and some mispickel. The ore in places is riddled with carbonate veinlets. Minute cracks and a curious feathery texture are typical features.

On the western lode in the bore at 811 feet the rock is dense, siliceous and flinty, with patches of pale olive-green calc schist impregnated with fine-grained pyrites. At 899 feet the rock is more chloritic. Along the western lode at these depths the ore is so shattered and cut up by carbonate veinlets as to form a pyritic calc schist breccia. The residual patches of calc schist are very heavily impregnated and replaced by iron pyrites.

(c) *Lodes in felsite (keratophyre).*—This ore is not easily identified, and may be taken for lodestuff in the calc schist. For the most part it is a pale brownish to pale gray felsitic rock with a somewhat resinous lustre. At 380 feet in the No. 3 Bore minute glistening plagioclase phenocrysts may be seen. The rock is pyritic throughout.

Under the microscope it is a more or less turbid mass made up of somewhat kaolinised, carbonated and sericitised plagioclase surrounded by carbonated material. Quartz is quite subordinate. Carbonate and some quartz veinlets are not uncommon. The pyrites is apparently for the most part of secondary origin, introduced contemporaneously with the gold-bearing solutions.

B. *Chemical and mineralogical constitution of ore in the East Lode.*—The lodestuff in the quartz dolerite greenstone is made up of the following minerals: Quartz, felspar (plagioclase),carbonates (calcite and dolomite), sericite (secondary mica), leucoxene, some chlorite, a little apatite, iron pyrites, mispickel, and very rarely free gold.

The following table has been prepared from interesting analyses of Dr. E. S. Simpson, Government Mineralogist and Analyst, coupled with petrological examination:—

Depth in bore (in feet).	Gold contents (per ton).	Percentage of iron pyrites	Percentage of mispickel.
Lodestuff in quartz dolerite greenstone—			
400′ 2″—402′ 2″	40dwt. 23gr.	3·89	2·06
406′ 2″—410′ 2″	206dwt. 20gr.	1·46	·89
434′—440′	5dwt. 8gr.	2·77	1·22
442′—446′	6dwt. 12gr.	4·82	3·50
Average ...	...	3·23	1·92
Lodestuff in calc schist—			
472′—478′	9dwt. 21gr.	3·09	2·47
500′—508′	3dwt. 5gr.	2·88	·93
512′—522′	4dwt. 21gr.	4·13	2·56
Average ...	...	3·37	1·98

These tables reveal the interesting fact that the percentages of iron pyrites and of mispickel are about the same in both quartz dolerite greenstone and calc schist.

Dr. Simpson submitted the following analysis—evidently of lodestuff in the calc schist—of ore taken from the No. 2 Bore between 472 and 478 feet.

SiO_2	...	...	49·92
Al_2O_3	...	...	4·98
Fe_2O_3	...	...	3·26
FeO	...	...	7·04
MnO	...	...	·23
MgO	...	...	7·90
CaO	...	...	6·50
Na_2O	...	...	1·66
K_2O	...	...	·50
H_2O-	...	...	·28
H_2O+	...	...	2·25
TiO_2	...	...	·48
CO_2	...	...	9·46
P_2O_5	...	...	·08
Fe	...	...	2·32
Cu.	...	...	traces
Sb	...	...	*Nil*
As	...	...	1·14
S	...	...	2·14
			100·14

Gold, 9 dwt. 21gr. per ton.
Mispickel (FeSAs), 2·48.
Iron pyrites (FeS_2), 3·09

There is considerable resemblance between the above analysis and the analysis of ore from the Oroya shoot at Kalgoorlie. The magnesia is certainly higher, and potash considerably lower—owing to the much smaller amount of secondary sericite in the Wiluna ore—than the Kalgoorlie calc schist ore. The absence of antimony is satisfactory.

C. *Origin of the Lodestuff*:

The ore, both in the quartz dolerite greenstone and in the calc schist, has been formed by a process of metasomatic replacement, *i.e.*, a gradual molecular substitution of one complex substance (calc schist) or heterogenous aggregate of minerals (quartz dolerite greenstone) for another, viz., ore.

The auriferous sulphide-bearing solutions penetrated these rocks along a contact zone of shattering. Every line of weakness—such as pores, joints, cracks, small shear and other tracks, and lines of sheeting—were taken to advantage of as a starting point of attack for the processes of replacement (metasomatism), and the subsequent growth of lodestuff, by the coalescence of particles of ore as they formed.

The greater the coalescence, the greater the integral mass, and consequently the size of the ore body. In auriferous zones of this nature, many factors might interfere with the growth of the ore. The process of replacement might be arrested at any stage, either through lack of further supply of solutions or through the final neutralisation of all the chemically active agents present in the circulating waters. But structural features were probably the determining factors in controlling the amount of ore formed, rather than lack of auriferous solutions.

The mode of origin just described accounts well for the observed facts regarding the distribution of values and their rapid variation from point to point. Nevertheless, this mode of origin has much to do with controlling the tonnage of payable ore available. Consequently, too much attention cannot be paid to the structural features in the ore channel, particularly in so far as they affect the distribution of values, for information of this kind will facilitate bulking of the ore and treatment of the lowest grade that will show a profit, so as to enable advantage to be taken of the enormous tonnages available in these auriferous zones.

D. *General Remarks and comparison with gold deposits at Kalgoorlie*: In so far as mode of origin by processes of metasomatic replacement is concerned, there is very little difference between the ore at Wiluna and the ore from the large mines at Kalgoorlie.

The ultimate chemical composition after replacement, as shown by the analysis quoted, is very similar to the lodestuff in the calc schist at Kalgoorlie. The Kalgoorlie ore has no arsenic, and the Wiluna ore has no tellurium. The tables showing values and percentages of sulphides in the lodestuff indicate that the ore in the calc schist, along its line of contact with the quartz dolerite greenstone, is just as rich as the ore in the quartz dolerite greenstone. It remains to be seen how the lodes in the calc schist (*e.g.*, the western lode) behave in depth away from the line of contact.

The chief rocks replaced at Wiluna were quartz dolerite greenstone and calc schist. Both these rocks belong to the same family as those at Kalgoorlie, but the quartz dolerite greenstone is not quite the same.

It cannot so far be said that the wonderful vein systems, sheeting, shearing, and in places schisting, that are features at Kalgoorlie, are present at Wiluna.

7. Summary of Petrographical Investigations:

The detailed petrographical, mineralogical and physical investigations have thrown much light on the rock formations and the nature, origin, occurrence, and economic aspect of the ore bodies on Leases 6J and 7J, held by the Wiluna Development Syndicate. A general summary of these investigations may be set down as follows:—

1. Petrographical investigations into the origin of the ore, coupled with a study of the distribution of the gold, indicate that the inherent nature of the rock, and its physical and mineralogical contents, determined its ability to bring about such metasomatic replacement and segregation as caused the formation of areas, patches, lenses, or zones of ore.

2. The growth of the ore was further controlled by (a) the main line of contact and weakness between the quartz dolerite, greenstone and the calc schist; (b) the position of the main shear track or tracks; and (c) the distribution of lines of sheeting, and the extent of fracturing and shattering.

3. An examination of Figs. 2, 4, and 6 of Plate VI. will show that the factors mentioned in (1) and (2) determined the distribution of payable values. These figures indicate clearly (a) the rapid change in values from point to point, (b) the dependence of enrichment on small shear lines, fractures and other physical features, and (c) the great width of the auriferous zones, throughout which values are quite erratically distributed.

4. The ore formed by processes of metasomatism under great difficulties, viz., mainly by the spread of siliceous replacement, carbonation, and pyritification, through the medium of very minute pores, fractures, sheeted lines, joints, and small shear tracks.

5. In consequence of its peculiar mode of origin, and the absence of more open spaces of discission or control lines, the payable ore was of necessity very erratically distributed in lenses, zones, streaks, and patches, the extent of which cannot yet be determined.

6. There is evidence of strong shear lines at considerable depth. Strong shear lines and distinct indications of shattering were noticed in the middle of dense calc schist in the core from the No. 1 Bore at

depths of 808 and 810 feet along the incline (about 620 feet vertical depth). This is a hopeful sign, more particularly as the line of weakness along the junction of the quartz dolerite greenstone and calc schists should be prone to shearing and shattering at great depths.

7. Petrographical study, coupled with an examination of the distribution of values, indicates an important feature in the ore occurrence at Wiluna, viz., the great width of the auriferous zone over which gold has been distributed.

The auriferous zone in the eastern lode at a vertical depth of 290 feet is 78 feet wide, as indicated by the No. 2 New Bore. On account of the inclination of the bore (51½ degrees depression) the thickness of rock passed through was 122 feet, but about half of it (60 feet) is split up into four zones of 4, 26, 8, and 22 feet respectively, each of which assayed less than 1 dwt. of gold per ton, as shown in Fig 4, Plate VI. Eight hundred and forty-five (845) feet south, as indicated in No. 3 Bore, the maximum horizontal width at the same vertical depth (290 feet), inclusive of 18 feet of the felsite dyke, is 65 feet. The thickness of rock passed through along the inclination (50 degrees) of the bore was 100 feet, but here again 80 feet out of the 100 is split up into six zones of 14, 27, 7, 8, 2, and 28 feet respectively, each of which assayed less than 4 dwts. per ton. It will thus be seen that the values over the greater width of these auriferous zones are low (less than 4 dwt.) rather than high.

8. Petrographical investigation of No. 1 New Bore gives somewhat vague information about the western lode. It is difficult to say, until a survey has been made, where this bore is at an inclined depth of 1,002 feet (vertical 767) and whether it has passed completely through the western lode, though the presence of porphyrite at the bottom suggests that it has. This bore appears to have been commenced too far to the eastward. Microscopic examination proved the No. 1 New Bore to be entirely in calc schist, with the exception of 32 feet of porphyrite at the bottom. Only three lodes, 3, 4, and 4 feet wide respectively, were met with at inclined depths of 801, 810 and 898 feet. As shown in Fig. 2, Plate VI., not one of these three lodes averaged more than 40s. per ton.

9. The microscope revealed the presence of a large dyke (18 feet wide) of felsite on the western side of the eastern lode at 280 feet in vertical depth, as shown in Fig. 5, Plate VI. This dyke was not met with in the other two bores, and its strike and disposition are therefore indefinite. The felsite is older than the lodes, and, though impregnated with iron pyrites, its physical features make it doubtful whether it will pay to mine it as ore.

8. Conclusions and Recommendations.

The general result of the examination indicates that the ore bodies on Leases 6J and 7J are large low-grade deposits, with no specific signs of secondary enrichment such as prevailed at Kalgoorlie. The wonderful series of vein systems, sheeting, shearing, and in places schisting, that form a feature of the Kalgoorlie goldfield are absent at Wiluna.

Figures 1 to 6 on Plate VI. show clearly the remarkable and rapid change in values from point to point, and the intermixing of wide patches of rock assaying only traces, with ore worth about 40 shillings per ton.

The mode of origin of the ore, and the absence of prominent spaces of discission, make it appear as if it will be an uphill fight all the time to bulk the ore to an average payable value and to make profitable use of the large tonnages available in these wide auriferous zones.

Notwithstanding the numerous low-grade zones, totalling 60 feet, assaying less than 1 dwt. per ton, out of 122 feet of rock passed through in the No. 2 New Bore, and 80 feet assaying less than 4 dwt. per ton out of 100 feet of rock passed through in the No. 3 Bore, the Company sank the new shaft 290 feet and put out a cross-cut which passed through ore that they estimate to be worth 39s. 6d. per ton over a width of 42 feet.

For this reason alone it is essential, and of the greatest importance, that the 290ft. level should be opened up in a southerly direction in order to gain more definite information regarding what width of rock can safely be bulked and a profit made from the 850 feet of rock between the new shaft and the south shaft. The extension of the lode could also be tested in a northerly direction. In this way valuable information would be gained as to the nature of the lenses and the possible position and number of sheeted or sheared tracks that caused in places the increased values. A certain amount of winzing would also be helpful.

The information so far gained about the western lode is not encouraging. Only three small lodes, each less than three feet wide, and not one of them averaging more than 40s. per ton, were met with between 800 and 902 feet. Two of these three lodes are separated by 54 feet of unpayable rock.

It may be the fault of the No. 1 Bore; if not, then the indications are that there has been a considerable splitting up of the western lode inside a vertical depth of less than 700 feet.

Much information would be gained by (a) sinking the central shaft another 100 feet to 300 feet and testing the west lode; (b) cross-cutting westward from the 200ft. level in the new shaft; or (c) cross-cutting about half-way across to the west lode from the 290ft. level of the new shaft and test by means of depressed bores the value and nature of both the east and the west lodes between 600 and 700 feet in vertical depth.

The felsite dyke cannot be regarded as payable ore. More information is required about the strike, disposition, and extent of this dyke and the possibility of it containing payable values.

There is no doubt as to the deep-seated origin and primary nature of the ore; there are also indications that the shear or fault lines will probably live below 1,000 feet. But the mode of formation of the ore, and the absence of well-defined spaces of dicission or schisting, such as are found in some ore channels, make it necessary that a lot more information must be gained by further development before it can be said that these ore bodies will make a big mine that will yield large tonnages—not less than 20,000 tons a month—of payable ore.

Through the courtesy of Mr. Vail I visited Wiluna during the year by motor car. Advantage was taken of the opportunity to make notes of the country passed through, and in this way I was able to prepare a rough geological reconnaissance of the area. As a result of these observations, a diagrammatic sketch section was drawn of the country between Menzies and Wiluna. The main geological and physical features, calling places, and time of travel are represented.

It is interesting to note that out of the 190 miles of country passed through between Leonora and Wiluna, there would be, roughly speaking, about 150 miles of greenstone as against 40 miles of granite.

As this sketch section may be of interest to travellers and others interested in the country between Leonora and Wiluna, it is submitted herewith.

II. Petrological Report on Rocks from the No. 19 Level in the Menzies Consolidated Gold Mine, Menzies Goldfield.

A suite of rocks collected from the No. 19 level in this mine proved to be of more than ordinary interest. Generally speaking, the rocks presented the appearance of greenstone schists that had been intruded by acidic granitic material which wedged itself along and between the foliation planes of the schists. The acid intrusive proved on microscopic examination not to be granite, for there was a total absence of the holocrystallinity typical of that rock. The intrusive rock is a grade of alaskite ranging from quartz porphyry through felspar porphyry to typical quartz veinlets. The rock looks so much like granite that the term "granite" will be used in macroscopic descriptions.

The "Granite."

Specimen A. 1/3880, S. 4589, is typical of the white "granite." It shows much glassy quartz, incipient schistosity, and contains an undoubted ferromagnesian constituent.

Under the microscope, in plain light, it is seen to be made up of clouded and water-clear areas, throughout which prisms and fragments of dark bluish-green hornblende and minute scales and fragments of brown biotite are distributed.

The constituents have separated out into more or less parallel bands of different degrees of crystallinity. The clear areas are made up of bands and lenses of coarse quartz mosaic. The clouded areas form a very fine-grained microcrystalline aggregate of quartz with some felspar, in which large clouded phenocrysts of orthoclase are set. The groundmass seems to have flowed round the phenocrysts, which present a type of "augen" structure. Lumps and fragments of hornblende have been broken from the greenstone schist and enclosed in the acid magma. Rods and scales of biotite appear to form accessory constituents.

The rock is a sheared, slightly biotitic orthoclase porphyry (alaskite), the schistosity being in part due to "flowing" and in part due to dynamic effects. Specimen C, 1/3882, S. 4591, is another phase of the alaskite porphyry. In hand specimens it has the appearance of a pure white siliceous "granite."

Under the microscope it is strongly porphyritic. It contains two kinds of phenocrysts—(1) felspar, and (2) quartz. The felspar is orthoclase, and it occurs as large irregular-shaped clouded (kaolinised and party carbonated) phenocrysts. The quartz separated out as occasional single homogeneous individuals, but in nearly all places it formed mosaic aggregates that may be rounded, lens-shaped, lenticular, or even in bands. The quartz is, nevertheless, for the most part phenocrystal in habit.

The texture is at once curious, but it seems to be a feasible possibility in the crystallisation and consolidation of these thin residues of alaskitic magma. The groundmass is a very fine-grained cryptocrystalline quartz-felspar mosaic, which may in places become quite coarse in grain. Minute strips of brown biotite are common, and the axes of this mineral are arranged in parallel direction. A little chlorite and occasional patches of calcite may be seen. The rock is a somewhat sheared *biotitic quartz orchoclase porphyry* of alaskitic origin.

The greenstone schist.

Specimen D, 1/883, S. 4592, is typical. It is a beautiful hornblende schist with biotite-quartz mosaics squeezed along the foliation planes. The development of biotite is considerable. The rock is a hornblende-biotite schist.

Specimen B, 1/3881, S. 4590, is from a part of the hornblende schist traversed by thin siliceous streaks no wider than one-fifth of an inch, evidently of granitic origin, and thus pointing to the extreme tenuity of the invading solutions.

Under the microscope it is a beautiful hornblende schist, with coarse and fine-grained mosaics of quartz and of groundmass material from the acid intrusive—squeezed along and between the foliation planes.

The bands of hornblende alternate with (a) bands of coarse quartz mosaic of igneous origin, (b) bands of fine mosaic made up of a cryptocrystalline aggregate of quartz with some felspar, remnants of shapeless orthoclase phenocrysts, and (c) bands of coarse quartz-calcite mosaics.

Specimen F, 1/3885, S. 4594, is a piece of greenstone schist about an inch from a thin wedge of intrusive "granite."

Under the microscope the rock is a typical hornblende schist. The spaces between the hornblende plates—the axes of which are arranged in parallel direction—present the appearance of "gutters" of water-clear material that may be resolved into a fine-grained mosaic consisting of quartz with little rods and wisps of biotite. The mosaic is evidently a product of the residual alaskitic or acid porphyry solution.

In places the schist presents the appearance of having been saturated with the siliceous solutions forced into it from the acid intrusive.

The Contact Rock.

Specimen E, 1/3884, S. 4593, was taken from the junction of the "granite" with the hornblende schist for one-fifth of an inch on each side of the line of contact.

Under the microscope the acid intrusive at its contact with the hornblende schist is powerfully porphyritic. Large rounded and irregular-shaped phenocrysts of quartz (and a few of orthoclase) are set in a very fine-grained mosaic or cryptocrystalline aggregate of quartz and felspar. The rock is a quartz felspar porphyry of alaskitic origin.

The acid magma evidently forced its way along the foliation planes in the hornblende schist, and portions of the hornblende became detached and settled in the siliceous solution that constituted the magma. The edge of the magma was very siliceous, because lenses of a coarse quartz mosaic may be seen immediately inside the first layer of hornblende in the schist. Fine mosaics (evidently from the groundmass of the acid eruptive) with distinct lumps of phenocrysts of felspar and patches of calcite are common

between the foliation planes and along the planes of schistosity.

General Remarks.

The occurrence of these acid alaskitic intrusions into hornblende schist at the No. 19 level in the Menzies Consolidated Mine, is of considerable interest. The microscopic examination enables one to gain an insight into (1) the textural changes, (2) the mineralogical changes, (3) the changes in viscosity of the magma, and (4) finally the metamorphic effects along the contact zones, where the magma intruded itself.

The textural changes range from powerfully porphyritic patches to felsitic zones and fine and coarse mosaics of quartz; the mineralogical changes range from quartz porphyry and orthoclase porphyry to quartz veins; and studies in viscosity indicate extreme tenuousness for the solutions along the immediate contacts.

The hornblende schists were intruded by a highly siliceous alaskitic magma. From this magma crystallised a porphyritic rock with a base ranging from a fine-grained quartz-felspar mosaic to a mixture of quartz-felspar and quartz mosaic exhibiting a tendency to "flow." The consolidation of the felspar in general preceded that of the quartz. It is probable that crystallisation took place under great pressure and subsequent to injection. This crystallisation, however, was slow, so that the residual quartz was, before its final consolidation, in part drawn off and injected into the schists, and so could play the role of an independent intrusion, so proving a process of magmatic differentiation by partial crystallisation. That the lenses are the fillings of cavities which were present in the schists, does not seem likely. The parallelism of the schistosity with the curving walls of the lenses shows that the intrusion filled spaces which it itself created.

The form of the quartz and alaskitic lenses is compatible with the normal one for attenuated, aqueous, but still viscous, granitic material injected into the schists. The alaskitic fluid must have been much the same as that of the quartz, being less fluid than that which has formed the true granite which must exist somewhere in the area. The rock probably crystallised at a relatively lower temperature, when compared with that of less siliceous igneous rocks, and remained mobile below the fusing point of most of the granitic constituents, on account of the intermixture of water, which was one of the most abundand and efficient factors in the process of crystallisation. More knowledge is required about the quantity of water a magma can contain.

The microscopic evidence favours slow and interrupted crystallisation, because two distinct periods or generations of crystals are frequently represented, though there was only one generation in that portion of the magma that possessed sufficient mobility to be injected into the schist. It would appear as if the quartz is younger than the felspar. The quartz was segregated into chains, lenticles, and the patches of perfectly allotriomorphic grains that constitute the mosaics. In those places where physical conditions permitted of more free growth, the grain-size of the quartz increased. The interstices and spaces between the foliation planes of schist were filled with the residual fluid under great pressure. The available evidence indicates further that as crystallisation progressed the residue left became finer in grain and more aqueous. A convenient expression would be "magmatic quartz" for the silica that was forced through, permeated and saturated the hornblende schist along its contact with the alaskitic magma.

Alaskite is a general term, without regard to texture, applied to siliceous end products consisting essentially of quartz and alkali felspar from granitic magmas. Holmes, in his "Nomenclature of Petrology," refers to alaskite as "A leucocratic granite, containing quartz and alkali-felspars, with only traces of other minerals."

The rock from the Menzies Consolidated Gold Mine quite agrees with Holmes' description in that it consists of quartz and alkali felspars with traces of biotite. However, the alaskites so far examined by me from Western Australia, viz., those at Balgarrie (G.S. W.A. 113/22) and at Menzies, exhibited a powerful porhpyritic tendency, and in this respect resemble the dyke rocks from Forth Mile Creek, Alaska, which have been described by J. E. Spurr (A.I.M.E., 1913, p. 273) as follows: "One remarkable phase (of alaskite, C.O.G.L.) studied is a porphyritic dike rock, whose groundmass consists entirely of quartz in small interlocking grains, giving, both in hand specimen and under the microscope, the appearance of quartzite. Yet this rock contains scattered, but regularly distributed, porphyritic crystals of felspar. It is thus not only related by the closest ties to similar slightly less siliceous alaskites of the same district, but it is only removed by its scattered porphyhritic crystals from being a true quartz vein." In the specimens from the Menzies Consolidated Gold Mine the quartz porphyry, felspar porphyry, cryptocrystalline aggregates of quartz and felspar, and pure quartz veins may all be seen within the space of four square inches.

Figure 1 is a photograph of the hornblende schist with intrusive alaskite.

III. Petrological Examination of Two Bores put down at Wiluna by the Mararoa Gold Mining Company.

During the year a detailed examination was made of material received from two bores—No. 1 and No. 2—put down by the Mararoa Gold Mining Company.

No. 1 Bore.

This bore was put down to a depth of 500 feet. The angle of depression was 40 degrees. The amount of core obtained from every hundred feet of boring was as follows:—

Depth of Bore.	Core obtained.
feet.	ft. in.
0—100	19 10
100—200	33 0
200—300	56 6
301—400	82 11
400—500	83 0
	275 3

A general and careful petrographic examination of the core shows that with slight textural variations and changes in degree of chemical and mineralogical alteration—especially in the vicinity of the lode—the rock throughout the whole 500 feet is the same, viz., a dense fine-grained amphibolite.

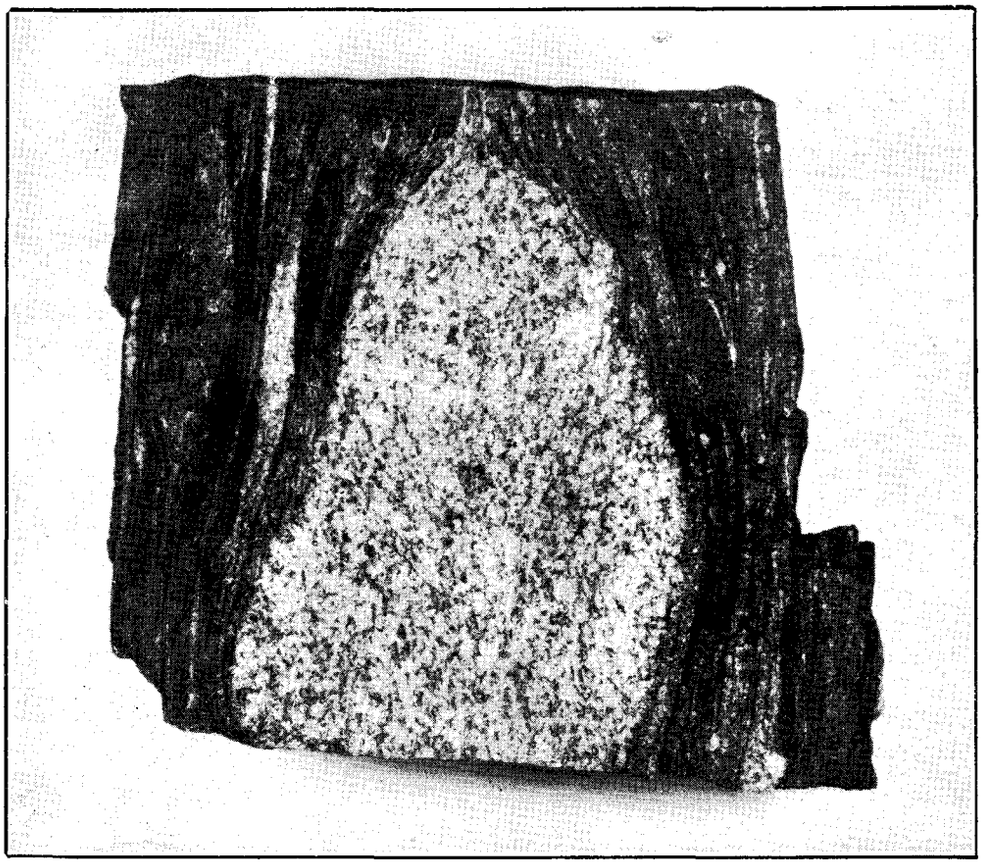


Figure I.

Alaskite intruding hornblende schists.
(Menzies Consolidated Gold Mine, Menzies Goldfield.)

From Surface to 150 *feet.*

The zone of oxidation ends about 253 feet 6 inches, which shows that the agencies of weathering have long been at work in this region. In the zone of oxidation the rock consisted of ironstained weathered greenstone with very ferruginous patches. Down to 150 feet the rock did not show sufficient shearing or evidence of silicification to warrant assays being made. A little quartz was noted between the depths of 26 feet to 31 feet.

From 150 *feet to* 253 *feet* 6 *inches.*

From 150 feet to 253 feet 6 inches, the bottom of the zone of weathering, the rock was a little harder, but still consisted of weathered fine-grained greenstone, dirty pale-greenish in colour, and traversed by numerous cracks, many of which were filled with little seams of ironstone, and, in places, quartz.

In view of (1) the glassy quartz veins, (2) the evidence of shearing, (3) the fracturing, and (4) other evidences of dynamic pressure between 150 feet and 253 feet 6 inches, five samples were selected and assays made of core from the following depths: 182ft. 4 in. to 187ft.; 195 ft. to 195ft. 8in.; 202ft. 9in. to 205ft. 6in.; 220ft. 4in. to 222ft. 8in.; and 231ft. 5in. to 234ft. 8in. The highest assay was 5 grains of gold per ton.

From 253 *feet* 6 *inches to* 395 *feet.*

The rock between these depths consisted of dense fine-grained greenstone, in some places brecciated or crushed, in others slightly sheared. Quartz and calcite veinlets and a little gypsum were noted. At 391 feet the rock was slightly pyritic and carbonated. In consequence of the facts several assays were made of core from the following depths: 298ft. 6in. to 299ft. 6in.; 344ft. 6in. to 345ft. 6in.; and 391ft. to 392ft. The results were unfortunately negative, nothing higher than traces of gold being recorded.

From 395 *feet to* 430 *feet.*

Between these depths the country rock is still the same, viz., dense fine-grained greenstone. But at about 396 feet the rock becomes highly altered and more or less sheared. At 400 feet the rock is slightly pyritic with quartz veinlets parallel to the planes of schistosity. From 400 feet 11 inches to 401 feet 11 inches the rock is heavily impregnated with very fine-grained pyrites. Between 401 feet 11 inches and 404 feet 6 inches the rock becomes more siliceous and schistose, with fine-grained pyrites along the foliation planes. Between 404 feet 6 inches and 407 feet 9 inches the core consisted of heavily impregnated dark pyritic siliceous ore. The rock contained no values between 411 feet and 423 feet. From 423 feet to 430 feet the core consisted of pyritic mottled greenstone with patches of siliceous pyritic lodestuff.

In view of the foregoing evidences of lodestuff nine assays were made of core taken between depths of 398 feet 5 inches and 413 feet. The highest assay was 11 dwt. 20 grains of gold per ton from rock between 404 feet and 406 feet 2½ inches. Between depths of 423 feet and 430 feet four assays were made: the highest return for gold was 3 dwts. 4 grains per ton.

From 430 *feet to* 450 *feet.*

Between these depths the rock consisted mostly of dense fine-grained greenstone. Between 439 feet and 441 feet there was some poor lodestuff consisting of dense pale greenstone, somewhat pyritic and siliceous with glassy quartz and calcite veins. Two assays were made. The highest gold return was 3 dwt. 16 grs. per ton. Each assay showed 8 grains of silver per ton.

From 450 *feet to* 500 *feet.*

From 450 feet to the bottom of the bore (500 feet) the rock consisted of the usual dense grayish fine-grained amphibolite, in part bleached and for the most part slightly pyritic with occasional quartz and calcite veins. There was not sufficient shearing, silicification, or mineralisation between 450 feet and 500 feet to warrant assays being made. The rock from 500 feet was a calc schisty gray greenstone showing no mineralisation or shearing whatever.

Conclusions.

The petrological investigations indicate that the rock through which the No. 1 Bore passed was one homogeneous mass, changed only by various degrees of alteration (carbonation, etc.) and in places disturbed by earth forces that were sufficiently powerful to produce a certain amount of shearing as a result of the elongation of the rock particles in one definite direction.

The lode formation evidently started at a depth of 398 feet, and continued to 411 feet—a total distance of 13 feet. From 411 feet to 423 feet the mineralisation was not sufficient to class the rock as ore. Values came in again at 423 feet and continued to 428 feet 4 inches, making a total width of 5 feet 4 inches of very poor lodestuff. Two feet of poor ore was noted at 439 feet.

The assay results and petrographic investigation indicate that the bore passed through about 13 feet of low-grade lodestuff between 398 feet and 411 feet; 5 feet 4 inches of still lower grade ore between 423 feet and 428 feet 4 inches. The two feet of lodestuff at 439 feet is negligible.

The lodestuff was evidently formed by metasomatic or replacement processes that proceeded from poorly defined sheared lines. By this means sulphides were introduced into the fine-grained greenstones.

It is unfortunate that where the bore penetrated this lode there was not greater shearing and concentration of gold contents. The shear lines at this point were evidently not powerful enough, and the gold contents not sufficient, to enable the whole of the massive rock between 398 feet and 428 feet 4 inches to be replaced to a sufficient extent to bring the grade up to a value that would admit of profitable extraction by bulking the ore.

No. 2 *Bore.*

This bore was put down to an angle of 60 degrees to a depth of 350 feet 6 inches. Detailed petrographic investigations indicated that the country rock passed through in this bore was the same as that met with in the No. 1 Bore, viz., fine-grained amphibolite (1/3819), with similar textural, chemical, and physical alterations.

The depth of the zone of oxidation was about 250 feet. Some siliceous ironstone with glassy quartz was met with in the first three feet of core, but the assay gave negative results.

General Remarks.

Judging from the amount of core obtained in boring, attention is called to the great necessity for carefully examining the oxidised ground. From 34 feet to 52 feet 6 inches there was no core, and this distance is quite enough to contain a large lode. Again between 250 feet and 253 feet only five inches of

core were obtained. At 250 feet there is a silicified zone that might have been auriferous; but five inches of core does not leave much to work on.

The rock from the No. 2 Bore, taken as a whole, did not exhibit much evidence of lodestuff or shearing. At various depths between 228 feet and 287 feet 9 inches it was thought that there might have been some values, but the assays were disappointing.

IV. Petrology: Leonard Range, Eastern Division.

The late Mr. F. Hann, during his explorations in the vicinty of the South Australian border in 1902-03, collected some interesting rocks. These have been examined with a view to correlating them with rocks from auriferous areas in Western Australia. They consist of acid porphyries, greenstones, and epidote-quartz rock. The following is a brief description of the specimens submitted:—

Ophitic quartz dolerite (*now quartz dolerite greenstone*). (5115.)

A dark green, medium-grained (doleritic) rock, apparently consisting of felspar and a ferromagnesian constituent.

Under the microscope the rock is seen to contain the following minerals:—augite, felspar, epidote, uralite, chlorite, quartz, ilmenite, leucoxene, and a little apatite. Some of the augite is quite fresh, and cores of it are surrounded by epidote, uralite, and chlorite. The pyroxene has been converted into pseudomorphs of fibrous uralite and chlorite. The felspars seem to have changed into an indefinite mixture of albite, saussurite, and epidote. Ophitic texture is strongly in evidence. Most of the ilmenite has been leucoxenised. A little clear quartz was noted.

This rock was originally made up of augite, plagioclase, quartz, and ilmenite. By processes of pressure and other metamorphism, such as one usually meets with in epidiorites on the goldfields, the plagioclase has been completely albitised, epidotised, partly saussuritised, and partly sericitised; while the augite was converted for the most part into aggregates of chlorite and feathery uralite in about equal proportions.

Epidote-quartz rock (5116).

A dense, more or less pistachio-coloured rock with an uneven fracture. Only two constituents—epidote and quartz—are visible macroscopically.

Under the microscope the rock is seen to be a mass of shapeless quartz and irregular-shaped plates of epidote associated with some water-clear material. Small rods of apatite were noted.

This rock has probably been regenerated from an epidiorite by contact metamorphism, or in any event a type of metamorphism accompanied by siliceous solutions.

Acid felsitic orthoclase porphyry (5118).

A siliceous, dark, felsitic (almost flinty-looking) and somewhat banded or streaky rock. The "streakiness" or "pseudo-flow" structure is due to the alternation of imperfect dark, almost black bands and flesh-coloured bands. Hand specimens show distinct evidence of small rectangular cleavable phenocrysts of felspar with all the appearance of orthoclase.

Under the microscope the rock is seen to consist of microcrystalline to cryptocrystalline aggregates of quartz and felspar. The banding is due to an alternation of fine and mediumly coarse-grained mosaics of quartz. Felspar may be seen distinctly in the coarser grained mosaics, which are in places (a) arranged in parallel lines as a result of dynamic stress, (b) aggregated in patches suggestive of crushed phenocrysts, and (c) gradually merging into the finer microcrystalline groundmass.

The rock is an acid eruptive in which the psuedo-flow structure or streakiness was caused by dynamic stress during the process of consolidation. It bears a strong resemblance to some of the acid porphyries of the Warburton Range, described by Mr. Farquharson on pages 124-125 of Bulletin 75.

Comparison of specimens from Leonard Range with rocks described in Bulletin 75, *G.S.W.A.*:

It would appear as if these three rocks (5115, 5116 and 5118), bear a strong resemblance to certain rocks described by Messrs. Talbot, Clarke, and Farquharson in Bulletin 75, "A Geological Reconnaissance in the Country between Laverton and the South Australian Border (near Latitude 26 degrees)."

The Acid Porphyhies: Mr. Farquharson, when describing (page 124) the acid porphyries between the Warburton and Barrow Ranges, strongly emphasised "their extremely fine-grained felsitic and flinty nature." He also referred to the black and pinkish tints, as well as to pinkish orthoclase phenocrysts.

There are many points of analogy between specimen 5118 and the acid porphyries described by Mr. Farquharson, *e.g.*—

1. Their extremely fine grained and flinty nature.
2. Their blackish and pinkish tints.
3. The presence of pinkish orthoclase phenocrysts.
4. The microcrystalline nature of the base, and
5. The streakiness or pseudo-flow structure.

The Greenstone: Messrs. Talbot and Clarke, when describing the country between Laverton and the South Australian border, divided the greenstones into four belts. Nos. 5115 and 5116 appear to belong to the greenstones of the third belt, which extends from Elder Creek to the south end of Barrow Range. No. 5115 may be classed with the greenstones—medium to fine-grained fibrous epidiorites and amphibolites that have been derived from dolerites and gabbros—extending eastward from the Warburton Range, described by Mr. Farquharson on page 131, No. 1/1044, a greenstone near the intrusion, has been described as "a rather fine-grained zoisitised and chloritised dolerite." In the neighbourhood of Muller Hill, there is a highly epidotic rock—1/1046.

Correlation with rocks from the auriferous areas of Western Australia: The opinion has been formed that all these rocks (5115, 5116 and 5118), could come from goldfields areas in Western Australia. The ophitic chloritised epidiorite (5115) is quite analogous to the greenstones of the goldfields, and epidotic products such as 5116 could occur.

Acid eruptives are not uncommon on the goldfields, but I am not acquainted with banded and streaky felsitic orthoclase porphyries like 5118, though Mr. Farquharson says that the acid porphyry facies may be represented at Niagara and in the Kookynie district.

There is no geological reason why auriferous deposits may not be found in such rocks as 5115, because its microscopic features indicate that along suitable lines, and in the presence of auriferous solutions, this rock would be amendable to replacement.

The contact areas between Elder Creek and Mount Squires, though not of great areal extent, may yet prove to be auriferous.

V. Boring for Oil, Boddington, South-West Division.

In March a series of samples was submitted from a bore put down in search of oil at Boddington, in the South-West Division. The following is a description of the samples received:—

Depth in Bore.	Nature of material.
feet.	
2—18	Ironstained rotten granite.
18—24	Small lumps of a glassy, ice-like quartz.
24—69	Kaolinised clayey material with quartz grains. Evidently rotten granite.
69—88	Broken up quartz and felspar—evidently from granite.
89—100	A very acid type of granite.
Bottom (Mar. 16)	Solid and slightly kaolinised granite.

The whole of the material from this bore is represented by phases of granite, an acid igneous crystalline rock, that could not possibly hold oil. On March 23 the Government Geologist wrote to say the bore was down 154 feet and still in solid granite. It is really unfortunate that money should be wasted in boring for oil in this type of country, when there are sedimentary areas in which boring may be justified.

VI. Determinations and Reports for other Departments, as well as for the General Public.

The following are synoptical notes of some of the more important investigations:

(a) *Graphite from Wagin*: A sample was received from Wagin. It consisted of a holocrystalline admixture of glassy quartz, dark green plates of hornblende, and flakes of black lustrous graphite. The graphite is of commercial type, and should be amenable to concentration. If this material occurs in any quantity, it should be further examined, with a view to determining (a) the percentage of graphite present, (b) the percentage possible by concentration, and (c) the commercial value of the stone.

(b) *Granite from a Quarry at Parkerville.*—This sample was obtained from Messrs. Wilson, Gray, & Coy.'s quarry. It is understood that this granite after being dressed and polished for ornamental work, developed a dirty gray-white film on the surface, which rendered it quite useless for monumental work. The sample was submitted with a view to determining whether its microstructure or mineral composition might throw any light on the matter.

The rock is a normal biotite granite. The minerals observed were: Quartz, orthoclase, microcline, plagioclase, biotite, kaolin, sericite, and epidote.

Features in this rock that may be detrimental to its use for ornamental work are as follow.—

1. The rock contains a large proportion of dark brown biotite. Microscopic investigation indicates that this mineral formed prior to the felspar, in which it is included as small scaly plates that might fall out or be pulled out in polishing. The larger part of the biotite is very ragged around its edges. Processes of weathering may take some of the iron oxide into solution and in this way produce a stain.

2. Although the rock looks fresh, much of the felspar has been considerably altered. The microcline seems to resist the weathering, and it is practically unchanged. In the orthoclase there is considerable sericitisation and some kaolinsation; but the plagioclase (and in part the orthoclase), which makes up a large part of the rock, has suffered considerable epidotisation, the epidote taking the form of almost colourless and exceedingly small grains. It is conceivable that this microscopic epidotisation may, in the surface zones, and under the action of meteoric waters, give rise to solutions that could produce staining.

3. The rock has apparently been taken from near the surface, and with increase in depth it is not unreasonable to suggest that the defects referred to may be remedied—unless, of course, the biotite is the absolute or main cause of the trouble.

(c) *Unakite from Gilgarna Rock, 20 miles north-east of Kurnalpi.*

A special examination of a curious rock (1/3829) from the abovenamed locality was made for Dr. E. S. Simpson, Government Mineralogist and Analyst. The following is an account of the more important features.

Macroscopic features: In hand specimens this rock has the appearance of a coarsely crystalline granite. It is made up of large plates of pink cleavable orthoclase, which forms by far the largest part of the rock. The glassy quartz is quite subordinate. Small grains of a dark green ferromagnesian-looking mineral are scattered throughout the rock at irregular intervals, and there are occasional black cleavable flakes of biotite.

Microscopic features: Under the microscope the rock is typically holocrystalline and granitic in texture. The minerals observed were: quartz, orthoclase, microcline, epidote, biotite, sphene, calcite, and kaolinite.

Quartz shows no special features, beyond inclusions of epidote, calcite, and sphene. It is typically allotriomorphic, and, when compared with the orthoclase, is quite subordinate.

Orthoclase forms by far the largest proportion of the rock. It occurs in large plates, practically kaolinised, and in places showing carlsbad twinning with irregular composition planes. All the felspar showed a lower refractive index than quartz or balsam. A good deal of the orthoclase showed a curious submicroscopic twinning, which may be due to soda in the orthoclase. On the other hand, if the analysis does not show an appreciable quantity of soda, the submicroscopic twinning may be the result of pressure in the orthoclase.

There is evidence of strong pressure in the rock in the form of mosaic patches in and along the composition planes of the felspar. It is a known fact that microcline is mostly found in older eruptive rocks that have been subjected to pressure, and that normal orthoclase may assume the microstructure of microcline when it has experienced strong pressure. Microcline is present, but it is quite subordinate to the orthoclase.

Epidote: A curious feature in this rock is that the ferromagnesian constituent is mainly represented by epidote of a pale green colour. It is not augite because all the extinctions measured were straight and parallel to a rather well-marked cleavage, traces of the (001) cleavage showing along plates evidently parallel to the general direction of elongation (100) of the crystals. The absence of pleochroism negatives hornblende.

Biotite showing strong pleochroic colours is intimately associated with the epidote.

Calcite occurs in irregular patches, as well as in small grains replacing the orthoclase.

Kaolinisation is evident in the somewhat turbid cloudiness in parts of the felspar.

A possible order of separation of the minerals may have been: sphene, calcite, spidote, biotite, orthoclase, microcline, and quartz.

Sphene of a dark brown colour is present in granular pieces, as well as in perfect wedge-shaped crystals.

Nomenclature: This rock is a variety of alkalic granite. A granitic rock low in quartz, with considerable pink felspar and epidote, has been termed "unakite." (T. L. Watson: Am. Journ. Science, XXII., 1906, p. 248.)

This rock is of interest in that, according to the aforegoing description, it is a typical unakite.

(d) *Leucophyllite schist from Peedamulla Station, North-West Division.*

This rock was submitted by Mr. Blatchford. It is a white, finely-foliated and somewhat contorted schist. The lustre is rather dull when examined across the foliation planes, which are distinctly wrinkled and pearly lustred as a result of the development of scaly sericite.

In section the rock is seen to consist of a mass of microscopic scales of sericite less than 1/1000th of an inch in width, and all with their axes arranged in a parallel direction. The scales of sericite touch one another. Under the microscope distinct waves and folds may be seen in the schist.

A chemical examination for potash and soda by the Government Mineralogist and Analyst resulted as follows:—

Potash (K_2O)	3.66 per cent.
Soda (Na_2O)	0.42 per cent.

Judging from the small percentage of potash, it is reasonable to infer that the mineral is leucophyllite. The rock is an incipiently contorted leucophyllite schist, similar to some schists from Ofenbach, Austria.

GEOLOGICAL SURVEY MUSEUM AND COLLECTIONS.

Little or no progress has been made in connection with the re-arrangement, etc., of the Geological Survey Collections, of which they stand in need. The accessions to the Survey Collection during the year 1925 amounted to 221, thus bringing the total number registered up to 17,947. The number of micro-sections cut and registered was 74, thus making a total of 4,597 slides in the possession of the Geological Survey.

The following is a list of the minerals presented to the Departmental Collection:—

Reg. No.	Description.	Locality.	Donor.
1/3775	Pyrite Pebble	Nullagine, Pilbara Goldfield, North-West Division	F. S. Cooke.
1/3875	Tin Ore ...	Brickwooda, Tinga Tinfield, New South Wales	P. C. Larsen
1/3887	Fossil ...	21 miles east of Albany, Warriup Road, South-West Division	C. J. LeMesurier
1/3894	Meteorite	Murchison Downs Station, Kyarra District, Murchison Goldfields	— Richardson
1/3897	Stibnite ...	20-Mile Battery, Nullagine, North-West Division	L. Ives
1/3915	Sulphate of Ammonia	Flinders Range, near Woolltana Station, South Australia	— Montague
1/3916	Fossil ...	P.A. 154H, Esperance District, Eucla Division	C. Hancock

The Geological Survey collection of photographs comprises 2,138 negatives, accumulated by the officers of the Department in the ordinary course of their official duties during the last 30 years. The photographs cover a wide range of subjects and are representative of the various portions of the State in which departmental activities have extended. The complete set of photographic prints is contained in 44 special albums and placed in the Survey library. These photographs are of no inconsiderable scientific and historical value, which increases as years go by.

LIBRARY.

The Library of the Survey was enriched during 1925 by 745 publications from cognate institutions throughout the world, including all the newly created Geological Surveys, and in addition 47 volumes were added by purchase.

The distribution of the official publications issued by the Geological Survey during 1925 amounted to well over 1,000. These were transmitted to the addresses on the regular exchange list and to others in response to requests for specially named reports, bulletins, or maps.

A. Gibb Maitland

Government Geologist.

Geological Survey Office,
Perth, 8th June, 1926.

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DIVISION V.

SCHOOL OF MINES OF WESTERN AUSTRALIA.

The Under Secretary for Mines, Mines Department, Perth.

School of Mines,
Kalgoorlie, 26th January, 1926.

I beg to forward, for the information of the Hon. the Minister, my report for the year 1925.

Due to the continued unsettled condition of mining and the difficulty experienced by students in securing suitable employment, the number of individual students in attendance at classes was a little smaller than during the corresponding terms in 1924. There were 167 students on the roll at the beginning and 110 at the end of the year.

Mr. G. M. Lumb, who commenced duty early in December, 1924, as Clerk in Charge of the office work, has proved an efficient and painstaking officer. During his absence on long service leave for a little over four months from the beginning of July, Mr. C. E. Stahl carried on the office work in a satisfactory manner.

During the first half of 1925, Mr. C. Kingsley Thomas, the Royal Commissioner appointed to inquire into the mining industry, made several visits to the school. He was keenly interested in the flotation tests which were carried out to demonstrate the possibility of treating local ores by the flotation process and, after discussing with the staff various matters dealing with ore treatment, he called upon Messrs. Moore and Winter to give evidence before the Commission. He also discussed with Mr. McDougall matters dealing with power plants, and with Dr. Larcombe questions relating to the geology of the district. In his report he expressed his appreciation of the good work that was being done at the school.

The work of the school progressed satisfactorily along the lines of previous years. The students and the members of the staff worked conscientiously, and the examination results were satisfactory.

There was a decided improvement in the mathematics classwork. It is anticipated that, in 1926, several students will ask for instruction in a grade of mathematics which will enable them to prepare for University Examinations. This will accentuate the difficulty which is now experienced of making adequate provision in the time table for classwork in this important subject.

The Gas Engine Class, which commenced with a larger enrolment than usual, showed a falling away in the second and third terms, but accomplished a large amount of useful work. The Drawing and Engineering Classes, which were well and regularly attended, maintained their usual high standard. The models secured during the past few years proved extremely helpful for demonstration purposes, but additional equipment, such as a testing machine, would add greatly to the usefulness of the Engineering Department of the School.

In June, Mr. C. E. Roberts, who during the past two years had rendered good service as Instructor in Fitting and Turning, resigned, as he was leaving the State. He was succeeded by Mr. C. G. Slee. Classwork proceeded without interruption and, notwithstanding the adverse conditions due to lack of equipment in the workshops, students made good progress.

The course in ore dressing was remodelled to bring it into line with present day practice, and small classes were conducted in both first and second year mining and surveying. Good enrolments were secured in Preparatory Physics and Drawing. The increased facilities for laboratory instruction were greatly appreciated. During the year, the Lecturer in Physics and his assistant took a party of 30 students on a visit of inspection to the Commonwealth Health Laboratory, and, through the courtesy of Dr. Nelson and the Radiographer, Mr. Leacock, had the benefit of a full demonstration of the X-Ray Plant. At the end of the second term the Lecturer and a number of his students visited the Sons of Gwalia, where they were afforded the opportunity of making a thorough inspection of the electrical equipment of the mine.

There was increased activity in the Geology Department, the scope of the classes being extended to include classwork leading up to leaving certificate and first year University examinations. In the course of several excursions, which were made to Ora Banda, Siberia, Waverley and round about the Kalgoorlie area, students received a good practical training in field geology.

At the beginning of the year Mr. A. S. Winter, formerly Assistant in Chemistry, was appointed Research Metallurgist, to devote his whole time to the experimental plant, Miss E. Weidner was selected as Cadet and Mr. B. H. Moore was appointed to exercise control over the conduct of the investigations. Mr. F. F. Allsop, B.Sc., who took up the vacant position of Assistant in Chemistry, performed his duties in a satisfactory manner and rendered valuable service in connection with the experimental work conducted by Mr. Winter.

The Research Metallurgist was kept busy throughout the year with investigations for the Mines Department and for various mining companies. Excellent extractions were obtained by flotation of several small parcels of local ores, and a method was worked out of greatly reducing the time of operation of the actual flotation. In general, the results of the tests were satisfactory, and point to the possibility that flotation may prove a suitable method of treatment

of ores from various parts of the goldfields. The following investigations were completed during 1925:—

Mt. Zion, Boogardie.
Surprise Lead Mine, Northampton (residues.)
South Kalgurli Consolidated.
Associated Gold Mine.
Oroya Links (Croesus Proprietary.)
Menzies Consolidated (old concentrates.)
Logan's Find.
Ives Reward (residues.)
Lake View and Star.
Wiluna.
Blue Spec Mine, Nullagine (antimony ore.)

About the middle of the year, the Copper Separation Company was granted the loan of the services of Mr. B. H. Moore to assist them to overcome difficulties experienced in their treatment plant. During his four months at Kundip, Mr. Moore was able to indicate improved methods of treatment and to show that a satisfactory recovery of copper could be made from low grade oxidised ores and copper-bearing residues. In addition to rendering assistance to the Company he had opportunities of gaining experience in practical problems of metallurgy, which will enhance his value as a lecturer at the School of Mines. During Mr. Moore's absence his classwork was carried on by Messrs. Butement, Winter and Allsop.

In September the Resident Manager of the Oroya Links, Ltd., wrote offering to run his pilot plant under the direction of an officer of the School of Mines, in order that it might be ascertained whether the satisfactory results which had been obtained in the School laboratory could be reproduced on a large scale in the Company's plant. After the battery had been cleaned up and various adjustments made, Mr. A. S. Winter commenced work at the pilot plant on October 5th. The tests were conducted with the Company's own appliances and crude oils. Although the results during the early part of the run were not altogether up to expectation, satisfactory results were obtained over a period of several weeks prior to November 27th, when the flotation tests were discontinued. It was shown that the value of the residues could be kept down below 1 dwt., and that flotation could be made to produce a high grade concentrate, which could be roasted and cyanided without difficulty. The trial run at the pilot plant involved a very large amount of assay work at the School.

In August Dr. Larcombe visited Wiluna and made a geological survey of the Wiluna Mine at a time when the option holders were cross-cutting the lode at the 300ft. level. Tests made in the School of Mines experimental plant on a parcel of ore forwarded by the manager of the mine to ascertain whether the values could be recovered by flotation, indicated that the gold could be readily collected into a high grade concentrate, which could be easily roasted and cyanided. The results obtained may have an important bearing on the method of treatment to be adopted at Wiluna.

The experimental work conducted by members of the staff of the school has aroused the interest of outside companies, and shows the necessity for systematic investigation of ore treatment problems, first in the laboratory and afterwards in the mine plants, to determine whether successful experimental methods will prove satisfactory on a large scale in actual practice.

The recognition of the School of Mines as an affiliated institution of the University of Western Australia has been renewed for a further period up to the end of December, 1930, and the University has notified the School that courses in Chemistry I. and Geology, Mineralogy and Petrology will be recognised during the coming year as qualifying towards graduation. Associates of the School who wish to enter upon the Engineering Course at the University can obtain a reduction of the period of attendance at University classes. At the end of the year examinations in degree subjects for University undergraduates at Kalgoorlie were held at the School of Mines and were supervised by Messrs. E. H. Illidge, B.Sc., and Mr. F. F. Allsop, B.Sc., both graduates of the University of Western Australia.

The visit of the Hon. the Minister for Mines to the School on the occasion of the annual dinner of the Students' Association was greatly appreciated. There was a record attendance of students and mine managers and several interesting speeches were made during the course of a most successful evening.

During the year the students formed a School of Mines Mining, Metallurgical, and Engineering Society, the aim of which is to promote interest amongst students, ex-students and others connected with mining, metallurgy and engineering. It is proposed to do this by arranging excursions to industrial plants and by holding meetings for the presentation and discussion of papers prepared by the members. The preliminary meetings in 1925 were well attended.

By furnishing reports as to assay values, and by indicating means of utilising and disposing of base metal ores, every effort has been made to give prospectors information likely to be of assistance to them. During 1925, 297 free assays and mineral determinations were made for prospectors of material from Crown lands not held under lease for mining purposes, as follows:—

Assays for gold and silver ..	236
Other metals	7
Determinations of rocks, minerals, etc.	54
Total	297

The statistics dealing with the enrolment of students and the examination results are forwarded herewith.

F. B. ALLEN,
Director, School of Mines.

SCHOOL OF MINES OF WESTERN AUSTRALIA.

EXAMINERS.

The following Examiners conducted the Examinations in November, 1925:—

Subject.	Examiners.
Preparatory Mathematics ...	F. B. Allen, M.A., B.Sc.; R. Davis, B.Sc., and E. Illidge, B.Sc.
Preparatory Chemistry	F. F. Allsop, B.Sc.
Preparatory Physics and Electricity	C. Cecil.
Preparatory Geology	C. O. G. Larcombe, D.Sc., F.S.T.C., F.G.S.
Preparatory Mechanical Drawing	C. Cecil.
Mathematics I.	E. H. Illidge, B.Sc., and R. Davis, B.Sc.
Mechanics—Theoretical	R. Davis, B.Sc., and E. H. Illidge, B.Sc.
Physics I.	R. Davis, B.Sc., and D. McDougall, A.I.E.E.
Chemistry I.	F. F. Allsop, B.Sc., and R. R. Baxter, B.Sc.
Engineering Chemistry I. and II.	L. W. Phillips, M.Sc., and B. H. Moore, B.E., F.S.A.S.M.
Assaying I.	B. H. Moore, B.E., F.S.A.S.M., and G. S. Compton, B.Sc.
Assaying II.	
Metallurgy I. and II. ...	
Petrology	
Mineralogy	C. O. G. Larcombe, D.Sc., F.S.T.C., F.S.G., and G.S. Compton, B.Sc.
Geology	
Mining Geology	C. O. G. Larcombe, D.Sc., F.S.T.C., F.G.S.
Practical Mathematics	E. H. Illidge, B.Sc.
Mechanical Drawing I. and II....	J. H. Tate.
Applied Mechanics ...	B. H. Moore, B.E., F.S.A.S.M., and J. H. Tate.
Building Construction ...	
Mechanical Engineering I. and II.	J. H. Tate and T. Butement, A.O.U.S.M.
Machine Design	
Surveying I. and II. ...	T. Butement, A.O.U.S.M.
Mining I. and II.... ...	
Electrical Engineering I. and II.	D. McDougall, A.I.E.E.
Fitting and Turning I. and II. ...	C. D. Slee.
Engine Driving I. and II. ...	C. C. Meredyth.
Gas Engine	A. R. E. Bosustow.
Indicator	

JUNIOR SCHOLARSHIP.

Subject.	Examiners.
Physical Geography	C. O. G. Larcombe, D.Sc., F.S.T.C., F.G.S.
Mathematics	F. B. Allen, M.A., B.Sc.
English	

ATTENDANCES, 1925.

Subjects.	Effective Enrolment.		
	1st Term.	2nd Term.	3rd Term.
Elementary Mathematics	29	19	15
Preparatory Mathematics	27	30	26
,, Mechanical Drawing ...	50	34	29
,, Physics	32	26	23
,, Chemistry	28	22	17
,, Geology	19	15	13
Mathematics—First Course	29	25	23
Practical Mathematics	6	5	3
Theoretical Mechanics	5	5	4
Physics—First Course	18	13	13
Chemistry—First Course	15	12	12
University Chemistry—First Course ...	2	2	2
Engineering Chemistry—First Course ...	1	...	...
Assaying—First Course	4	4	4
Assaying—Second Course	1	1	1
Metallurgy—First Course	4	4	4
Geology	2	2	2
Mineralogy	4	4	3
Petrology	2	1	1
Mining and Economic Geology	2	1	1
University—(Geology, Petrology, Mineralogy)	1	1	1
Leaving Standard—(Geology, Mineralogy)	1	1	1
Mining—First Course	1	1	1
Mining—Second Course—(Mine Sampling)	1	1	1
,, ,, (Ore Dressing)	5	5	4
,, ,, (Mine Accounts)	1	1	1
,, ,, (Mine Administration) ...	...	...	...
Surveying—First Course	2	2	2
,, Second Course	2	2	2
Mechanical Drawing—First Course ...	11	7	7
,, ,, Second Course ...	10	9	9
Building Construction	2	2	2
Machine Design	2	2	2
Mechanical Engineering—First Course ...	7	5	5
,, ,, Second Course	9	7	7
Electrical Engineering—First Course ...	3	3	3
,, ,, Second Course	7	3	3
Fitting and Turning—First Course ...	23	16	13
,, ,, Second Course ...	9	8	7
Gas Engine and Indicator	32	23	17
Applied Mechanics	10	8	8
Total Enrolments	419	331	291
Individual Students ...	169	128	110

	1924.			1925.		
	1st Term.	2nd Term.	3rd. Term.	1st Term.	2nd Term.	3rd Term.
Total Enrolments ...	379	344	292	419	331	291
Individual Students	174	133	117	169	128	110

EXAMINATION RESULTS.

The following table shows the passes obtained by students of the Western Australian School of Mines, Kalgoorlie, at the Annual Examinations held in November, 1925, including the Supplementary Examinations held in February, 1925:—

Subject.	Class of Pass.		
	Credit.	Pass.	Totals.
Elementary Mathematics	5	6	11
Preparatory Mathematics	1	12	13
,, Mathematics (Arithmetic) ...	...	7	7
,, Mathematics (Algebra) ...	...	2	2
,, Mathematics (Geometry) ...	1	2	3
,, Chemistry	4	7	11
,, Physics	10	9	19
,, Drawing	13	11	24
,, Geology	3	2	5
Mathematics, First Course	...	5	5
,, First Course (Algebra) ...	...	4	4
,, First Course (Trigonometry)	...	6	6
,, First Course (Geometry) ...	...	4	4
Theoretical Mechanics	...	2	2
Physics	...	7	7
Chemistry, First Course	1	3	4
Assaying, First Course	1	2	3
Metallurgy, First Course	...	1	1
Mining Geology (Surveyor's Course) ...	...	1	1
Mining and Economic Geology	...	1	1
Mining, First Course	...	2	2
,, Second Course (Ore Dressing) ...	...	2	2
,, ,, (Mine Accounts)	...	1	1
,, ,, (Mine Administration) ...	...	1	1
Surveying, First Course	...	3	3
,, Second Conrse	1	1	2
Mechanical Drawing, First Course ...	2	5	7
,, ,, Second Course ...	2	7	9
Applied Mechanics	4	1	5
Mechanical Engineering, First Course ...	1	4	5
Mechanical Engineering, First Course (Gas Engine)	4	8	12
Mechanical Engineering, First Course (Indicator)	4	6	10
Building Construction	1	1	2
Electrical Engineering, First Course ...	2	1	3
,, ,, Second Course ...	...	4	4
Fitting and Turning, First Course ...	1	11	12
,, ,, Second Course ...	3	4	7
Mechanical Engineering, Second Course ...	4	3	7
Machine Design	...	2	2
Practical Mathematics	1	...	1
Totals	69	160	229

ASSAYER'S CERTIFICATES.

The following have gained certificates:—

Adams, H.	P.T.S.	March, 1904.
Adams, P.	P.T.S.	February, 1905.
Beech, S. J.	K.S.M.	November, 1906.
Brown, T.	P.T.S.	November, 1906.
Brooking, J	P.T.S.	November, 1906.
Hutchinson, D. M.	K.S.M.	November, 1906.
Banks, R.	K.S.M.	November, 1908.
Gabel, J.	K.S.M.	November, 1908.
Pike, R. W.	P.T.S.	November, 1908.
Woolf, M.	K.S.M.	November, 1908.
Baxter, R. R.	P.T.S.	November, 1909.
Bradley, W. S.	K.S.M.	November, 1909.
Burrows, M. F.	P.T.S.	November, 1909.
Compton, G. S.	P.T.S.	November, 1909.
Cook, H. J.	P.T.S.	November, 1909.
Klem, L. G.	P.T.S.	November, 1909.
Fraser, W.	K.S.M.	November, 1910.
Rowledge, H. P.	P.T.S.	November, 1910.
Benjamin, L. R.	P.T.S.	November, 1911.
Jackson, L. T. C.	P.T.S.	November, 1911.
Leevers, J. C.	K.S.M.	November, 1911.
Lapsley, R. G.	P.T.S.	November, 1912.
Kurth, E. E.	K.S.M.	November, 1913.
Grace, J. N. A.	P.T.S.	November, 1916.
Noall, J. C.	K.S.M.	November, 1917.
Cecil, Clyde	K.S.M.	November, 1918.
Terrell, J. H.	K.S.M.	November, 1918.
Nairn, T. W.	K.S.M.	November, 1918.
Roberts, T. J.	K.S.M.	November, 1919.
Chapman, F. E.	P.T.S.	November, 1920.
Lethlean, H. V.	K.S.M.	November, 1921.
Carrigg, C. G.	K.S.M.	November, 1922.
Greer, J. H.	K.S.M.	November, 1922.
Mundle, E. B.	K.S.M.	November, 1922.
Esdaile, A. N.	K.S.M.	November, 1923.
Paterson, A. V.	K.S.M.	November, 1923.

INDUSTRIAL CHEMIST'S CERTIFICATES.

The following have gained certificates:—

Cecil, C.	K.S.M.	November, 1921.
Chapman, F.	P.T.S.	November, 1922.
Carrigg, C. G.	K.S.M.	November, 1922.
Esdaile, A. N.	K.S.M.	November, 1922.
Paterson, A. V.	K.S.M.	November, 1924.

MINE SURVEYOR'S CERTIFICATES.

The following have gained certificates:—

Peat, J.	K.S.M.	November, 1909.
Adams, H.	K.S.M.	November, 1910.
Banks, R.	K.S.M.	November, 1911.
Gabel, J.	K.S.M.	November, 1911.
Pike, R. W.	K.S.M.	November, 1912.
Godden, F. R. W.	K.S.M.	November, 1915.
Mundle, E. B.	K.S.M.	November, 1915.
Leevers, J. C.	K.S.M.	November, 1916.
Crutchett, I. A.	K.S.M.	November, 1920.
Powell, T.	K.S.M.	November, 1921.
Agnew, R. J.	K.S.M.	November, 1922.
Crutchett, E. G.	K.S.M.	November, 1922.
Davies, I.	K.S.M.	November, 1922.
Eddy, J. T.	K.S.M.	November, 1922.
Rosenberg, J. M.	K.S.M.	November, 1923.
Gibbons, L. P. J.	K.S.M.	November, 1924.
Terrell, J. H.	K.S.M.	November, 1924.

DRAUGHTSMEN'S CERTIFICATES.

The following have gained certificates:—

Galt, W.	K.S.M.	November, 1915.
Butement, J. C.	K.S.M.	November, 1915.
Edmondson, F. C.	K.S.M.	November, 1915.
Lang, J. H.	K.S.M.	November, 1915.
Davies, W.	K.S.M.	November, 1917.
Weselman, C.	K.S.M.	November, 1917.
Thompson, E. P.	K.S.M.	November, 1920.
Gill, L. J.	K.S.M.	November, 1921.
Macbeth, R. A.	K.S.M.	November, 1921.
Rosenberg, J. M.	K.S.M.	November, 1921.
Spalding, J.	K.S.M.	November, 1922.
Taylor, H.	K.S.M.	November, 1922.

ELECTRICIAN'S CERTIFICATES.

The following have gained certificates:—

Galt, W.	K.S.M.	November, 1915.
Butement, J. C.	K.S.M.	November, 1915.
Edmondson, F. C.	K.S.M.	November, 1915.
Lang, J. H.	K.S.M.	November, 1915.
Davies, W.	K.S.M.	November, 1917.
Weselman, C.	K.S.M.	November, 1917.
Thompson, E. P.	K.S.M.	November, 1920.
Gill, L. J.	K.S.M.	November, 1921.
Macbeth, R. A.	K.S.M.	November, 1921.
Rosenberg, J. M.	K.S.M.	November, 1921.
Spalding, J.	K.S.M.	November, 1923.
Taylor, Harry	K.S.M.	November, 1923.
Meredyth, C. C.	K.S.M.	November, 1925.

GEOLOGIST'S CERTIFICATES.

Gabel, J.	K.S.M.	November, 1911.
Leevers, J. C.	K.S.M.	November, 1916.
Mundle, E. B.	K.S.M.	November, 1920
Agnew, R. J.	K.S.M.	November, 1923.

DIPLOMAS.

The following students have gained Diplomas:—

Beech, S. J. (K.S.M.), Diploma in Metallurgy, November, 1906.
Adams, P. (P. and K.), Diploma in Metallurgy, November, 1907.
Adams, H. (P. and K.), Diploma in Metallurgy, November, 1908.
Banks, R. (C. and K.), Diploma in Metallurgy, November, 1910.
Burrows, M. F. (P. and K)., Diploma in Metallurgy, November, 1910.
Compton, G. S. (P.T.S.), Diploma in Metallurgy, November, 1910.
Cook, H. J. (P.T.S.), Diploma in Metallurgy, November, 1910.
Gabel, J. (K.S.M.), Diploma in Metallurgy, November, 1910.
Gabel, J. (K.S.M.), Diploma in Mining, November, 1911.
Pike, R. W. (P. and K.), Diploma in Metallurgy, November, 1911.
Galt, W. (K.S.M.), Diploma in Mechanical and Electrical Engineering, November, 1915.
Butement, J. C. (K.S.M.), Diploma in Mechanical and Electrical Engineering, November, 1915.
Edmondson, F. C. (K.S.M.), Diploma in Mechanical and Electrical Engineering, November, 1915.
Lang, J. H. (K.S.M.), Diploma in Mechanical and Electrical Engineering, November, 1915.
Grace, J. N. A. (P.T.S.), Diploma in Metallurgy, November, 1915.
Bradley, W. S. (K.S.M.), Diploma in Metallurgy, November, 1915.

DIPLOMAS—*continued.*

Kurth, E. E. (K.S.M.), Diploma in Metallurgy, November, 1916.
Getty, A. (K.S.M.), Diploma in Metallurgy, November, 1916.
Le Mesurier, C. R. (K.S.M.), Diploma in Metallurgy, November, 1916.
Leevers, J. C. (K.S.M.), Diploma in Mining, November, 1916.
Davies, Watcyn (K.S.M.) Diploma in Mechanical and Electrical Engineering, November, 1917.
Weselman, Carl (K.S.M.), Diploma in Mechanical and Electrical Engineering, November, 1917.
Nairn, T. W. (K.S.M.), Diploma in Metallurgy, November, 1919.
Mundle, E. B. (K.S.M.), Diploma in Mining, November, 1920.
Thompson, E. P. (K.S.M.), Diploma in Mechanical and Electrical Engineering, November, 1920.
Gill, L. J. (K.S.M.), Diploma in Mechanical and Electrical Engineering, November, 1921.
Macbeth, R. A. (K.S.M.), Diploma in Mechanical and Electrical Engineering, November, 1921.
Rosenberg, J. M. (K.S.M.), Diploma in Mechanical and Electrical Engineering, November, 1921.
Rowledge, H. P. (P. and K.), Diploma in Metallurgy, November, 1922.
Taylor, Harry, (K.S.M.), Diploma in Mechanical and Electrical Engineering, November, 1923.
Spalding, J. (K.S.M.), Diploma in Mechanical and Electrical Engineering, November, 1924.
Sinclair, R. J. (K.S.M.), Diploma in Mechanical and Electrical Engineering, November, 1925.

ENGINE-DRIVERS' CERTIFICATES.

The following students of the School of Mines have passed the examinations held by the Chief Inspector of Machinery during 1925 for various Engine-drivers' Certificates:—

Name.	Class.
Willmott, E.	Winding Engine Competency.
Yews, D. C.	First Class Competency.
Scott, T. C.	First Class Competency.
Lloyd, R. F.	First Class Competency.
Beames, H. M.	First Class Competency.
Maguire, D. E.	Loco. (only) Competency.
Rasmussen, L. P.	Internal Combustion Competency.
Johns, E. N.	Boiler Attendants.
Craib, W.	Boiler Attendants.

SCHOLARSHIP EXAMINATIONS, 1925.

Junior Scholarship.

Candidate.	District.
Smith, Ivan	Boulder.
O'Hanlon, C.	Boulder.
Graham, R.	Kalgoorlie.
Allanson, R.	Kalgoorlie.
Browne, G.	Kalgoorlie.

Scholarship not awarded.

Entrance Scholarship.

Candidate.	District.
Warman, C. H.	Kalgoorlie.
Bell, W. R.	Kalgoorlie.
Crocos, A. J.	Kalgoorlie.
Lehman, K.	Trafalgar.

Warman gains the Entrance Scholarship.

Senior Scholarship.

Candidate.	District.
Nevile, R. L.	Kalgoorlie.

Chamber of Mines Scholarship in Metallurgy.

Candidate.	District.
Weatherall, M. V.	Kalgoorlie.

M. V. Weatherall has been recommended for this Scholarship.

The Critchley Parker Prize.

The following students have been recommended for the prizes offered by Critchley Parker, Esq., Melbourne:—

A. J. Laver—The Industrial Australian and Mining Standard.
Manners, G. S.—Mining Standard Publication.

Mechanics' Institute (Kalgoorlie) Free Membership Prizes.

The following have been recommended:—

Bell, W. R.; Crocos, A. J.; Golding, H. D.; Manners, G. S.; McConnell, T. R.; Turner, L. A.; Vincent, J.; Warman, C. H.

APPENDIX No. 1.

Laboratory Flotation of Kalgoorlie Ores.

Since the inception (11th June, 1923) of the investigation into the possibility of applying the flotation process to the treatment of the sulphotelluride ores of Kalgoorlie, nearly three hundred laboratory flotation tests have been carried out on these ores, while further tests have also been carried out on sulphide ores from mines outside the district. Up till the present time the Kalgoorlie ores treated have been supplied by the following mines:—South Kalgurli, Lake View and Star, Ivanhoe, Boulder Perseverance, Associated. Oroya Links, and Great Boulder Pty. This leaves the ore from only one of the large producing mines, the Golden Horseshoe, to be tested. Hence, any conclusions drawn from this experimental work have been arrived at as a result of a comprehensive investigation during which it was found that the same general principles were capable of successful application to all the ores tested. The conditions necessary for successful flotation, which were determined from the results of the experimental investigation of Kalgoorlie ores were also found to apply, with but slight modification, in the case of ores from Wiluna and Celebration.

SALT WATER.

At the commencement of this investigation—on South Kalgurli ore—it was found that a serious drawback to the flotation of the pyrite was the presence in this ore of considerable quantities of colloidal matter which not only tends to float but also tends to prevent complete flotation of the pyrite. It therefore became necessary to devise some means of preventing this action of the colloidal matter. After considerable experimenting it was found that common salt was a suitable flocculator of the colloidal matter and as a result of the use of salt water no difficulty is experienced in securing complete flotation of the pyrite with consequent production of a low grade residue and a high grade clean pyritic concentrate. Similar experiments showed that mine water from different mines at Kalgoorlie and also from Wiluna which contained common salt in solution, gave equally satisfactory results. This leads to the conclusion that any mine water containing salt can be used for flotation, and, in fact, its use is a decided advantage so far as the actual flotation is concerned. An additional advantage of the use of salt water is that both concentrates and residues settle rapidly. When, however, salt water is used for flotation, it is necessary, in order to obviate loss of gold by volatilisation during roasting, that the concentrates should be washed with fresh water to remove all salt. As the concentrates settle rapidly and the wash water can be used in the flotation circuit, the expense entailed in the washing operation is very slight. Apropos of the improved results obtained by the use of salt or mine water in the flotation of auriferous pyrite, it may be pointed out that at Broken Hill in the flotation of lead and zinc sulphides, mill practice has shown that the use of salt water is advantageous.

OILS.

In all recent experimental work the oils used have been crude eucalyptus, crude coal tar, and kerosene. Because of the difficulty of emulsifying coal tar when added separately to the pulp, this reagent has been mixed with the eucalyptus which is used not only for the purpose of dissolving the tar but also on account of its value as a flotation oil. This mixture consists of one part of eucalyptus to six parts of coal tar, by weight. Kerosene is added separately in small quantities. The total quantity of oils used varies from 1½ to 2 pounds per ton of ore, and the cost of oils is approximately 5d. per ton of ore.

The only reagent, other than salt and the oils, used for flotation has been potassium xanthate which may, with advantage, be used on some ores. This is used as a pulp conditioning agent and as its cost is about 1s. per pound, and when used, it is used in very small quantity its cost per ton of ore treated is approximately one penny.

LABORATORY PRACTICE COMPARED WITH MILL PRACTICE.

All flotation authorities are agreed that laboratory flotation results can at least be duplicated and usually improved upon in mill practice. In all mills where flotation is practised laboratory investigations are carried on continuously and mill practice is based on the results of the laboratory experiments. The present high standard of flotation practice is due to the enormous amount of investigation work carried out in the laboratory.

In the laboratory investigation the principal object has been to produce a low grade residue. The whole of the froth has been collected in the form of a concentrate, including the latter portion of the froth corresponding in mill practice to the froth produced in the last cells of the series, which is returned as a middling for re-treatment. Hence, the concentrates obtained in mill practice should be a lower percentage of the ore and of higher grade than that obtained in the laboratory in batch tests.

For those ores which contain coarse free gold, which is not capable of complete flotation on account of the particles of gold being flattened out during the crushing and grinding operations, amalgamation of the mill pulp must be practised either before or after flotation. Tests have been carried out by both methods on ores of this nature with highly satisfactory results.

AVERAGE RESULTS—

South Kalgurli Ore—	Assay value, 13·22 dwt. Au per ton.
Number of tests	19
Concentrate, assay value ...	81·76 dwt. per ton.
Concentrate, percentage weight	14·1
Residue, assay value	0·74 dwt. per ton.
Recovery, per cent.	94·4

Associated Ore— Assay value, 11·2 dwt. Au per ton.

Number of tests	13
Concentrates, assay value ...	75·15 dwt. per ton.
Concentrate, percentage weight	15·9
Residue, assay value	0·92 dwt. per ton.
Recovery, per cent.	91·8

Oroya Links Ore— Assay value, 7·39 dwt. Au per ton.

Number of tests	15
Concentrate, assay value ...	49·84 dwt. per ton.
Concentrate, percentage weight	13·5
Residue, assay value	0·515 dwt. per ton.
Recovery, per cent.	93·0

Lake View and Star Ore— Assay value, 5·49 dwt. Au per ton.

Number of tests	10
Concentrate, assay value ...	32·6 dwt. per ton.
Concentrate, percentage weight	14·2
Residue, assay value	0·38 dwt. per ton.
Recovery, per cent.	93·08

Ivanhoe Ore— Assay value, 10·0 dwt. Au per ton.

Number of tests	23
Concentrate, assay value ...	77·87 dwt. per ton.
Concentrate, percentage weight	12·8
Residue, assay value	0·79 dwt. per ton.
Recovery, per cent.	92·1

Boulder Perseverance Ore— Assay value, 16·6 dwt. Au per ton.

Number of tests	6
Concentrate, assay value ...	101·8 dwt. per ton.
Concentrate, percentage weight	12·5
Residue, assay value	0·76 dwt. per ton.
Recovery, per cent.	95·4

Great Boulder Pty. Ore— Assay value, 15·2 dwt. Au per ton.

(a) Amalgamation before flotation:

Number of tests	3
Concentrate, assay value ...	57·3 dwt. per ton.
Concentrate, percentage weight	12·9
Residue, assay value ...	0·8 dwt. per ton.
Recovery, per cent. ...	94·7

(*b*) Amalgamation after flotation:

Number of tests	3
Concentrate, assay value ...	112·0 dwt. per ton.
Concentrate, percentage weight	12·6
Residue, assay value ...	0·68 dwt. per ton.
Recovery, per cent. ...	95·5

ROASTING AND CYANIDATION OF CONCENTRATE.

Samples for this purpose have been prepared by mixing the flotation concentrates from individual laboratory tests. Roasting of these composite samples has then been carefully carried out in a muffle furnace, keeping the temperature low during the initial stages, *i.e.*, during the oxidation of the first half of the sulphur of the pyrite. When this oxidation is complete, the temperature may be much increased without any risk of sintering, and the product of roasting is porous and much more voluminous than the raw concentrate. As already stated in the report on operations in the Oroya Links Pilot Plant, the roasting of flotation concentrate offers no difficulties, but in order to avoid sintering of the material, the temperature must be kept low until the first half of the sulphur is oxidised, when the temperature may be raised without harmful result.

The average results of laboratory cyanide tests on this roasted concentrate are shown below:—

Number of cyanide tests ...	10
Roasted concentrate, assay value	81·8 dwt. per ton.
Cyanide residue, assay value ...	2·66 dwt. per ton.
Recovery, per cent.	96·8

These preliminary tests indicate that no difficulty should be experienced in roasting and cyaniding the flotation concentrate, and there is no reason why the value of the residues from the cyanidation of the roasted concentrate should not be reduced below 2 dwt. per ton.

Assuming that the flotation concentrate constitutes 12·5 per cent. of the ore and that the assay values of the flotation residues and cyanide residues are 0·7 and 2·66 dwt. per ton, respectively, then the assay value of the total residues is 0·945 dwt. per ton.

CONCLUSIONS.

As a result of the experimental work the following conclusions have been arrived at:—

1. As the whole of the fine grinding of the ore for flotation must be carried out wet, no necessity exists for supplying the ore dry to the mill, and therefore no restriction need be placed on the use of water underground for drilling and dust prevention. Consequently, more hygienic conditions will prevail underground and in the mill when flotation is practised than under the present system of dry crushing and all-roasting of the ore. This fact alone should tend to improve mining conditions and reduce mining costs.

2. It is advantageous to use mine saltwater for flotation purposes.

3. A concentrate can be produced averaging 12·5 per cent. of the ore, or less, and an even better result should be expected in regular mill practice.

4. The production of a 12·5 per cent. concentrate means that the cost of the subsequent treatment of this product becomes reduced to one-eighth when it is made a charge on the treatment of the original ore. Hence, the lower the percentage of concentrate consistent with a high recovery, the less becomes the cost of its treatment as a charge against the original ore.

5. When flotation is carried out in salt water, not only is the percentage weight of concentrate lower and its grade higher than when fresh water is used, but the concentrate and residues both settle readily and rapidly so that the salt water is readily returned to circuit by decantation and the cost of dewatering of concentrates and residues is reduced to a minimum.

6. Sweet roasting of the concentrate, which is essential for cyanidation treatment is easier of accomplishment than is the roasting of the small percentage of pyrite when the whole of the ore is roasted, because in the latter case the fine particles of gangue tend to coat the particles of pyrite and prevent them from being exposed to the oxidising action of the air in the roasting furnace.
7. Roasting of flotation concentrate is a cheap process because the high percentage of sulphur in the concentrate acts as a fuel and minimises the amount of extraneous fuel required for heating purposes.
8. The roasted concentrate can be readily cyanided and a high percentage recovery of the gold obtained.
9. The oils and reagents used in flotation are inexpensive, and, being used in small quantity, the total cost of these materials per ton of ore treated is small.
10. The total cost of treatment, including cost of flotation and royalty should not exceed ten shillings per ton of ore treated.

The following extract from the report appearing in the "Engineering and Mining Journal Press" of New York, of 27th March, 1926, of a discussion on flotation by members of the American Institute of Mining and Metallurgical Engineers is of interest as showing the importance of flotation in modern ore treatment:—

> "Flotation has revolutionised and is revolutionising methods of ore treatment both in the mill and smelter. Perhaps it is the most important single process in the economical recovery of metals; but the method of 'trial and error' remains as the only reliable way to determine just how to use it."

A. S. WINTER,
Research Metallurgist.

B. H. MOORE,
Lecturer in Metallurgy.

School of Mines, Kalgoorlie,
12th May, 1926.

APPENDIX No. 2.

Report on the Investigation carried out in the Pilot Plant of Oroya Links, Limited, on Crœsus Proprietary Gold-Bearing Ore.

INTRODUCTORY.

Since June, 1923, a considerable amount of experimental work in connection with the flotation of Western Australian gold ores, particularly with reference to the ores of the Kalgoorlie belt, has been carried out in the Metallurgical Laboratory of the School of Mines. As a result of this work, methods of flotation of the Kalgoorlie ores were devised, by means of which it was found possible to obtain consistent results, with the production of low grade residues. Evidence on this experimental investigation was given by us before the Royal Commission on Mining in May, 1925.

From about the middle of 1924, the Oroya Links, Limited, had been trying out flotation in its Pilot Plant and had obtained encouraging results. On September 1st, 1925, on the completion of an experimental run extending over about ten months, the Resident Manager of the Company offered to hand over the Pilot Plant temporarily to the School of Mines, and to supply all necessary power and labour to enable tests to be made under the direction of the School Research Metallurgist. The Hon. Minister for Mines gave his approval and Mr. Winter conducted a series of experiments at the Oroya Links Pilot Plant, extending over a period of eight weeks from October 5th to November 27th.

The work was undertaken to try out the School method of flotation, and had two main objects :—

1. To duplicate the results obtained by the Company, and
2. To endeavour to duplicate on a large scale in the Pilot Plant the results obtained on a small scale in the Metallurgical Laboratory at the School of Mines.

As far as possible the investigation has been carried out on similar lines to those adopted in the laboratory experiments, but, except for the use of salt water instead of fresh, and the use of kerosene, none of these points has been exactly duplicated, for some of the reagents required were not available in the necessary quantity, nor were some procurable in Australia. In the laboratory experiments the use of potassium xanthate was found to yield lower grade residues than without its use, and concentrates averaging 13·5 per cent. of the ore, while without its use the concentrates constituted approximately 25 per cent. of the ore. In addition, the use of pyridine was discontinued after a short period on account of the difficulty, stated by the Management to exist, of procuring the necessary supplies for large scale operation. For these reasons it was not possible to parallel exactly, so far as reagents were concerned, the method adopted in the laboratory.

In the laboratory experiments, oiling was performed in a thick pulp during the grinding operation in the pebble mill, a method which proved to be very efficient. In the plant, however, until the erection of a drag classifier to thicken the tube mill feed, which had previously been too thin to permit of efficient oiling, there appeared to be no point in the circuit where the oil could be effectively introduced. Until the introduction of the drag classifier into the circuit it was found that under the circumstances, the best method of oiling consisted in adding the oils to the agitator supplying the feed to the flotation machine, although it was necessary at the same time to add further oil to the machine. The efficiency of this method of oiling was somewhat increased by increasing the speed of agitation. On the introduction of the drag classifier, the oils were added to the thickened tube mill feed, with marked improvement in efficiency.

ORE.

During the whole of the run the ore treated was from the Croesus Proprietary lease, which was transported, as supplies were required, from the mine to the plant in drays. This intermittent supply of ore for treatment resulted in very great variations, from day to day, in the grade of the ore treated, the maximum and minimum values of the battery feed being 11·2 dwt. and 4·3 dwt. per ton, respectively. These values do not, however, represent the grade of ore supplied to the flotation machine, for during the crushing and grinding and subsequent operations prior to flotation, considerable sorting out, not only of pyrite but also of free gold took place, notably in the battery pulp collecting box and in the tube mill and agitator. On the completion of the eight weeks' run, an accumulation of gold was found in the battery pulp collecting box and in the washings from the tube mill. The presence of free gold in these washings indicated that considerable concentration had taken place in the tube mill, with consequent lowering of the grade of ore supplied to the cone classifier. Further alteration in the grade took place in the cone classifier, and, apparently, further concentration and settlement of rich material had taken place in the agitator until the speed of agitation had, of necessity, to be increased. That this concentration of values in the agitator had taken place was clearly shown by the sudden and marked increase, immediately subsequent to the alteration in the speed of agitation, in the grade of the float feed from October 27th until this accumulation had been removed.

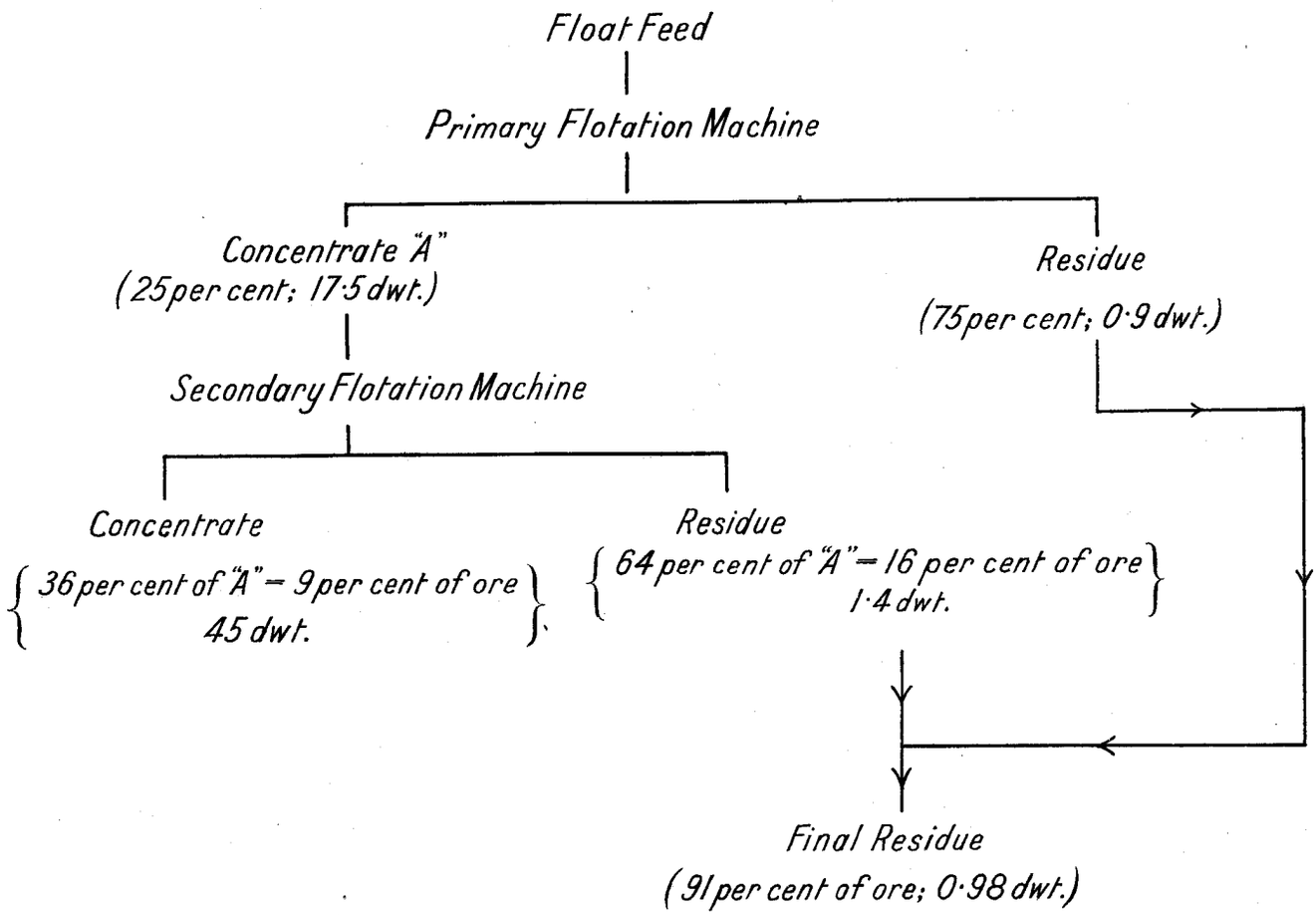
In addition, a further decrease in grade of the feed to the flotation machine was brought about by the return directly to the agitator of the low grade flotation concentrates produced in the last four cells of the machine.

For all these reasons, the grade of the battery feed was no criterion of the value of the ore actually subrected to flotation, *i.e.*, the float feed.

PREPARATION OF ORE FOR FLOTATION.

The ore was coarsely crushed in a Blake type breaker from which it was elevated to the stamp battery bin. From the bin it was delivered by means of an automatic feeder to the mortar boxes of a ten-head battery crushing through coarse screens, the product containing forty per cent. of minus 150 mesh product. From the battery discharge the pulp was delivered through a launder to the sump of a sand pump which elevated it to the cone classifier. Until the introduction of the drag classifier, the

— FLOW SHEET —



CONCENTRATE _____ 9 per cent of ore; 45 dwts Au. per ton.

RESIDUE _____ 91 per cent of ore; 0·98 dwts Au. per ton.

underflow from the cone classifier passed by gravity to the tube mill for fine grinding in a very dilute pulp. The tube mill product junctioned with the battery product and passed to the cone classifier, making a closed circuit. After the introduction of the drag classifier, *i.e.*, during the last three weeks of the run, three distinct modifications of the flow sheet were made, *viz.* :—

1. The product from the ten-head of stamps went to the cone classifier, and the drag classifier was used to thicken the underflow from the cone, so as to supply a thick feed to the tube mill, while the slime overflow passed to the launder carrying the tube mill product.
2. The product from five head of stamps followed the same routine as in No. 1, while that from the second five-head passed directly to the drag classifier.
3. The product from the ten-head of stamps passed directly to the drag classifier, while the cone classifier was used to classify only the tube mill product.

In all these variations of method, the overflow from the cone classifier passed to a mechanical thickener, the overflow from which, clear water, was returned to circuit, while the underflow, thickened slime, after being diluted to the required density with a portion of the overflow, passed by means of a launder to an eight foot agitator, the function of which was to keep the machine supplied with a pulp of uniform density. Into this agitator was returned by means of a bucket elevator, the flotation concentrate from the last four cells of the machine.

FLOTATION.

Type of Machine.

The machine installed is an eight compartment, six-inch stirrer, modified Minerals Separation unit of the sub-aeration type, whose capacity on Eclipse ore is estimated by Minerals Separation to be 14cwt. per hour. The speed of the stirrer spindles is 1,200 R.P.M., and the power required to drive the flotation machine is stated to be 10 H.P. The machine consists of eight rectangular compartments without spitzkasten, the necessary quiet flotation area being obtained by placing a grid above the impeller, so that the agitation box also acts as a collector of the froth which is discharged from overflow lips on each side of the box. The pulp passes directly from one compartment to the next, through an opening in the partition wall, while the residues from the end of the machine are discharged partly by overflow and partly from the bottom of a box attached to the last compartment. The necessary fittings are provided for admitting to each compartment under the impeller the air necessary for flotation, either in the form of compressed air or by the suction produced by the rotation of the impellers.

It is advisable to draw attention to the fact that operations in a continuous flotation machine are not exactly similar to those in a charge machine, for in the former the pulp passes continuously through the machine, while in the latter the pulp can be retained in the machine until the whole of the pyrite has been floated. In the continuous machine the extent to which flotation of pyrite takes place depends to some extent on the rate at which the pulp passes through the machine. Hence, increased rate of flow and consequent increased tonnage capacity will be accompanied by the production of higher grade residues because of the shorter time during which the material is subjected to flotation.

The rate of flotation is largely regulated by the air admitted, slow flotation and usually high grade concentrate being obtained when air is admitted by suction, while the rate of flotation and consequent grade of the products can be closely controlled by careful regulation of the introduction of compressed air.

Experience has shown that the grade of concentrate and of residues is controlled to a large extent by the rate of flotation. While it is possible to float the greater portion of the pyrite, the grade of concentrate will be dependent on the amount of gangue material mechanically included with the float, and this in turn will depend on the amount of compressed air introduced into the machine.

Use of Salt Water.

Early experimental work on the flotation of Kalgoorlie ores showed that, when using fresh water, it was impossible to obtain a concentrate free from colloidal slime. It was found that common salt (sodium chloride) by its flocculating action prevented the flotation of the colloids and enabled a clean concentrate to be produced. Although during the latter part of the run on Croesus Proprietary ore the concentrate produced was not clean, this was not due to flotation of colloidal slime, but to the presence of gangue mechanically carried over by the rapid flotation. A clean concentrate could be obtained at any time by reducing the compressed air supply, showing the flocculating action of the salt. The salt water used during the run was that pumped from the Company's Oroya North block, which contained a high percentage of sodium chloride and other salts.

Oils and Reagents.

The following oils and reagents and mixtures thereof have been used during the course of the trial :—Kerosene, eucalyptus oil, pyridine, coal tar, potassium xanthate, sodium sulphide, ferrous sulphate, sodium hydroxide, and sodium silicate.

In consequence of the success attending the use of kerosene in the laboratory experiments, this oil has been used throughout the whole of the run. Kerosene has been found to assist flotation by acting as an oiler, by quickening flotation, and by bringing the froth more readily under control.

Pyridine, in conjunction with other oils, was at first used, but its use was discontinued owing to the small stock on hand and the apparent difficulty of obtaining supplies sufficient for large scale work. The pyridine used in the plant was a crude variety of much lower degree of purity than that used in the laboratory experiments.

Mixtures of eucalyptus oil and coal tar of different concentrations were used throughout, and it was found that the best results were obtained by dissolving the tar in the eucalyptus oil in the proportion of six to one by weight. This mixture was added separately from the kerosene.

A small quantity of potassium xanthate had been procured for experimental purposes from America by the School of Mines, but the supply was not sufficient to permit of its continuous use. This reagent was used in small quantity for two days.

Sodium sulphide was used in conjunction with sodium hydroxide, the latter to produce an alkaline pulp, for the purpose of determining whether the extraction could be improved by making use of its sulphidising action on partially oxidised pyrite or on pyrite filmed with oxide. In the case of this ore, very little, if any, benefit was derived from the use of these reagents.

Ferrous sulphate was used in conjunction with sodium sulphide in an alkaline pulp for the purpose of precipitating on the surface of pyrite particles a film of ferrous sulphide, and so of making the mineral more amenable to flotation. Results were inconclusive and its use was discontinued after a short time.

Sodium silicate was used with sodium sulphide to determine whether a cleaner concentrate could be produced by making use of the wetting action of this salt on the gangue particles, and so rendering them less liable to flotation. No particular benefit was derived from its use, although its use would probably be beneficial in the re-cleaning of primary concentrates.

Methods of Oiling.

It is generally recognised that oiling is most effective when carried out in a thick pulp during the grinding operation, so that the fresh surfaces of the minerals are immediately susceptible to the oiling action. This has been found to be the case in the laboratory, but in the pilot plant, until the drag classifier was installed to provide a thick feed for the tube mill, oiling in the mill was found to be unsatisfactory owing to the thinness of the pulp. Up till this time various methods of oiling were tried. Oil was introduced into the battery product, the tube mill feed, the agitator pulp, and into various compartments of the flotation machine. Of these, oiling in the agitator and at various points in the flotation machine was the only method that gave at all satisfactory results, which were somewhat improved after increasing the speed of the agitator arms. After the drag classifier was put into operation the major part of the oiling was performed in the tube mill in a thick pulp, the kerosene and a small amount of eucalyptus-tar mixture being added in the agitator.

FLOTATION FEED.

Density.

Pulps of varying densities were tried, but it was found that a density of approximately 1·22 to 1·24, equivalent to 28 to 30 per cent. of solids, gave the best operating conditions consistent with high tonnage capacity and ready control of the froth. This density was not always under exact control because of the difficulty of maintaining a regular flow of thickened slime from the thickener, which produced a slime so thick that a regular and uniform outflow was difficult to maintain. To produce a pulp of the required consistency for flotation, the thickened slime had to be diluted with overflow water from the thickener. Consequently, sudden and unavoidable changes in the rate of outflow of thickened slime resulted in sudden variations in the density of the pulp. For this reason the density continually varied, and great difficulty was experienced in maintaining a constant density pulp. This difficulty was accentuated by the necessity, previously mentioned, of using the agitator, prior to the erection of the drag classifier, as an oiling machine rather than simply as an agitator and supply tank for the flotation machine.

Fineness of Grinding.

The only material of any value in furnishing information as to the fineness of the feed to the flotation machine was the thickened pulp issuing from the thickener. A sample of this product gave the following results:—

Wet grading—3·5 per cent. of plus 150 mesh (I.M.M.).
Dry grading—5·5 per cent. of plus 150 mesh (I.M.M.).

Return Concentrate.

The general practice was to return to the agitator supplying the feed to the flotation machine, the concentrates produced in the last four compartments. An average determination of the amount of concentrate so returned for re-treatment was estimated to be 3cwt. dry weight per hour. This concentrate, being of low grade, must be returned for further treatment.

CONCENTRATE.

It has been conclusively shown that it is possible, under proper operating conditions, to produce in one operation a high grade clean concentrate from a flotation feed of moderate grade, but that the residues are of somewhat higher grade than when producing a lower grade concentrate under the same working conditions, *e.g.*:—

October 27, 1925.—Concentrate, dwt. per ton		72·8
	Residue, dwt. per ton...	1·3
October 28, 1925.—Concentrate, dwt. per ton		180·0
	Residue, dwt. per ton ...	1·6
October 10, 1925.—Concentrate, dwt. per ton		130·0
	Residue, dwt. per ton ...	1·6

(These assay values were supplied by Oroya Links, Ltd.)

In other words, doubling the grade of the concentrate increased the grade of the residue by 23 per cent.

It has also been shown during the last three weeks' run that it is possible to produce consistently a flotation residue of lower grade than 1dwt. per ton, but that the necessary alteration in working conditions also results in the production of a much lower grade concentrate, which, in ordinary practice, would be subjected to a second re-cleaning flotation to produce a high grade concentrate, the residues from which would either be discarded or returned to the head of the primary unit.

As an example of the result possible of attainment by retreatment of the comparatively low grade concentrate produced simultaneously with low grade residues, the following flow sheet is based on the retreatment in the laboratory of a sample of plant concentrate taken on November 27th.

Therefore it becomes a question of economics as to which method of operation is the more profitable. The following is a comparison:—

High Grade Concentrate produced in One Operation, October 26–31:

Concentrate, percentage weight of ore ...		12
Residues, percentage weight of ore ...		88
Cost per ton of Ore:	s.	d.
Crushing and grinding	3	0
Primary flotation	2	0
Washing, drying, roasting and cyanidation at 15s. per ton of concentrate ...	1	10
Disposal of residues	0	4
Royalty	1	0
Total	8	2
Value of residues, 1·26 dwt. per ton ...	5	0
Total cost plus loss in residues ...	13	2

Low Grade Concentrate, Nov. 9-27—Cleaned by Second Flotation in School of Mines Metallurgical Laboratory:

Concentrate, percentage weight of ore	...	27·5
Residues, percentage weight of ore	...	72·5
Cost per ton of Ore:		s. d.
Crushing and grinding	...	3 0
Primary flotation	...	2 0
Secondary flotation at 2s. per ton of concentrate feed	...	0 7
Washing, drying, roasting and cyanidation at 15s. per ton of concentrate (10 per cent. of ore feed)	...	1 6
Disposal of residues	...	0 4
Royalty	...	1 0
Total	...	8 5
Value of residues—72·5 tons at 0·83dwt. plus 17·5 tons at 1·4dwt. = 90 tons at 0·94dwt.	...	3 9
Total cost plus loss in residues	...	12 2

Residue value of 1·26 dwt. per ton is the average value of the residues for the week, October 26th to 31st; residue value of 0·83 dwt. per ton is the average value of the residues for the last three weeks' run.

Hence there is shown a saving in cost per ton of ore treated of one shilling in favour of the production of a low grade concentrate and re-treatment of same.

Collection and Dewatering of Concentrate.

The flotation concentrate from the machine was delivered by gravity to the sump of a plunger pump, from which it was transferred to shallow ponds for collecting, dewatering and drying. Three ponds were in use, each collecting a week's output of concentrate, so that, while one was being used for collection, the contents of the other two were drying, and therefore, each week's output was enabled to be dried naturally for two weeks. The return water from these ponds was sent back into the treatment circuit. The concentrates settled rapidly, mainly on account of the use of salt water for treatment purposes. Common practice is to dewater flotation concentrates either in Dorr or cone classifiers, and then to spread the concentrate out on drying floors. Filter presses of various types are also used for dewatering. The former method is in vogue at Broken Hill and has the advantage of requiring very little plant.

The use of salt water for treatment necessitates washing the concentrates with fresh water to remove the salt, because, during the subsequent roasting operation, considerable volatilisation of gold would take place unless the salt were removed. For this reason, a filter press of the washing type would probably be the most suitable for carrying out the dewatering operation.

Weighing and Sampling of Concentrate.

After a week's output of concentrate had been removed from the dam, it was stacked until opportunity arose for transporting it to the mill. On arrival at the mill, the concentrate was weighed in the dray on a weighbridge and then dumped into a bin from which the assay sample was taken, sometimes after the lapse of several days. During the interval between weighing and sampling, considerable loss of moisture must inevitably have taken place and therefore the deduction from the weight of the concentrate made on the basis of the moisture content determined on the assay sample was less than the actual deduction that should have been made. Hence, when this procedure is adopted, the recorded weight of concentrate, calculated from the wet weight, is greater than the actual, and therefore the recorded percentage of concentrate is greater than the actual.

Roasting and Cyanidation of Concentrates.

Although there seems to have been a conflict of opinion about the roasting of flotation concentrate, we have expressed the view, based not only on theoretical considerations, but also on the results of laboratory experiments on the roasting of flotation concentrate, that the roasting of this material under properly controlled conditions should offer no difficulty. This view, we understand, has been upheld by the results of the roasting of a parcel of 48 tons of flotation concentrate from the Pilot Plant by the Company, when it was not only found that roasting was a simple operation but that the roasted product readily yielded its gold content to treatment by cyanidation.

ASSAYS.

The value of the results of an investigation of this kind depends on the accuracy of the results of assays of the various materials. At first some difficulty was experienced in securing agreement between the assays conducted by the various interested parties, but later on this difficulty was surmounted, and towards the end of the run a fairly close agreement was reached in the results of the assays made on the essential parts of the operations.

Three different methods of assay of the flotation residues were used by the Oroya Links, Ltd., the Lake View and Star Ltd., and the School of Mines, as follows:—

OROYA LINKS, LTD.:

Residue	2 A.T.
Soda	2 A.T.
Litharge	7·5 A.T.
Borax	Cover

Fuse in new H crucible with enough reducing agent to reduce a lead button of not less than 35 gram.

LAKE VIEW AND STAR, LTD.:

Residue	2 A.T.
With measured quantity of bulk flux containing Soda	45 gram.
Litharge	36 gram.
Borax	19 gram.
Flour (added)	1·5 gram.
Silver sufficient for parting	
1 iron rod	

Flux and ore mixed in G crucible. Borax cover about 15 gram. Time of fusion about 40 min. in wood-fired furnace. Lead button 25–30 gram. Cupellation in wood-fired furnace in L muffle, mabor cupels. Parting acid HNO_3 (S.G. 1·42), 1 part; H_2O, 2 parts. Duplicate assays and resultant gold prills weighed separately and then together.

SCHOOL OF MINES:

Residue	2 A.T.
Soda	50 gram.
Litharge	45 gram.
Borax	30 gram.
Argol	4 gram.

Duplicate assays in new H crucibles. Lead button 35–40 gram. Cupellation in mabor cupels with silver sufficient for parting. Parting acid HNO_3 (S.G. 1·42), 1 part; H_2O, 2 parts.

COMPARISON OF ASSAY METHODS.

In order to compare the results of assays by the three methods, twelve assays by each method were made by the School of Mines on a large sample of flotation residues, and the following average results were obtained:—

Oroya Links Method	...	0·509 dwt. per ton	(2,240lbs.)
Lake View and Star Method		0·537 „	„ „
School of Mines Method	...	0·524 „	„ „

RESULTS IN THE PILOT PLANT.

The work in the Pilot Plant can be conveniently divided into two periods during which the main object sought was the production of a low grade residue. In addition, during the first period of five weeks an endeavour was made to produce a high grade concentrate constituting a reasonably small and economical percentage of the ore, while during the latter period the grade and percentage of concentrate produced were considered as of secondary importance and all efforts were concentrated on the production of a lower grade residue than had been found to be possible concurrently with the production of a high grade concentrate.

The accompanying summary of the results obtained during these two periods shows that success was attained and that the objects aimed at were achieved in each case.

During the first period of five weeks there was produced a concentrate of fifty per cent. higher grade than that produced during the second period of three weeks, although the grade of the residues in the former case was practically fifty per cent. higher than that in the latter case. At the same time it was found possible by suitable regulation of the mechanical conditions of flotation to produce a clean pyritic concentrate of grade as high as 180 dwt. per ton from a flotation feed of 13·2 dwt. per ton, giving a ratio of concentration of 13·6 to 1, a result obtained on 28th October.

During the second period of three weeks when the grade and percentage of concentrate were made subservient to the production of low grade residues, the average assay of the latter for the whole three weeks' run was 0·83 dwt. per ton, and during the whole period the assay value of the daily residues was always less than 1 dwt. per ton.

As pointed out previously, the production of a low grade concentrate together with a low grade residue is to be preferred to the production of a high grade concentrate with correspondingly high grade residues, If the total cost of treatment includes the value of the residues, it is more economical to produce by a primary flotation a low grade concentrate and a correspondingly low grade residue, followed by a secondary flotation of the primary concentrate for the production of a high grade concentrate and a residue to be either discarded or returned to the primary unit, rather than to endeavour to produce a high grade concentrate in one operation, since the latter method also involves the production of a residue of so much higher grade that the additional loss in value more than counterbalances the extra cost of the re-cleaning operation.

STATEMENT OF RESULTS IN THE PILOT PLANT.

The work in the Pilot Plant was divided into two periods of five weeks and three weeks, respectively.

Five weeks' campaign, Oct. 5th to Nov. 7th:

Tonnage treated	... ...	151	
Float feed, assay value	...	7·43dwt.	per ton
Concentrate, assay value	...	33·66 „	„
Concentrate, percentage weight		17·8	
Residue, assay value	... ...	1·39 „	„

Three weeks' campaign, Nov. 9th to 27th:

Tonnage treated	... ...	99	
Float feed, assay value	...	5·27dwt.	per ton.
Concentrate, assay value	...	22·24 „	„
Concentrate, percentage weight		27·5	
Residue, assay value	... ...	0·83 „	„

AIR SUPPLY FOR SUB-AERATION.

The Minerals Separation machine does not require high pressure air, but requires a considerable volume of air at low pressure. Consequently, on account of the high cost of compressing air, a blower should be used which would supply a large volume of air at low pressure and at a much lower cost.

FLOTATION MACHINES.

While this investigation has been carried out in a Minerals Separation machine, it does not necessarily follow that this is the most suitable type of machine for the large scale flotation of these ores.

A horizontal type of flotation machine, the Seale Shellshear, has been tried and is now in use for large scale treatment on some of the Broken Hill mines, where, we understand, it is giving excellent results. Two particular advantages of this machine are its low power consumption, 25 H.P., and its high capacity, 30 tons per hour, on Broken Hill ores.

Conclusion.

Before summarising the information gained as a result of this investigation it is necessary to draw attention to the fact that as it was necessary to modify laboratory methods to suit plant practice before definite operating conditions could be laid down, it was not to be expected that we should be able to reach finality in eight weeks.

An investigation into the application of a process such as the flotation of pyritic gold ores should be systematically carried out over a considerable period, so that all possible conditions and methods of application may be given a fair trial for the purpose of determining the best conditions, both metallurgically and economically. It is a common occurrence in other parts of the world for companies proposing to instal new processes to erect a pilot plant and to investigate that process over a period, not only of months, but in same cases, of two years and more. For example, the New State Gold Areas in Africa investigated the application of the Crowe precipitation process in a pilot plant for eighteen months before deciding to instal the process in their mill.

Hence this investigation, in view of the encouraging results obtained by us, should be continued systematically and scientifically until it has been proved conclusively whether the process can be economically applied to the pyritic gold ores of this State. The satisfactory results we obtained indicate

that the process can be economically applied to the treatment of these ores, but at the same time the investigation requires to be continued for the purpose of determining conditions which will enable still better results to be obtained on a large scale.

We consider that the following conclusions have been reached as a result of this investigation :—

1. Low grade residues and consequent high percentage recovery can be obtained by flotation.
2. High or low grade concentrates can be produced at will in one operation by simple alteration of conditions of flotation.
3. When a high grade concentrate is produced in one operation the grade of the residues is also increased.
4. When a low grade concentrate is produced the grade of the residue is also low, and it is advisable to subject such a concentrate to a secondary cleaning operation to produce a high grade concentrate and so reduce the cost of the subsequent roasting and cyanidation.
5. The use of salt water prevents the flotation of colloidal slime with the pyrite.
6. The pyritic flotation concentrates produced when salt water is used settle rapidly and are easy to dewater.
7. Oiling is most efficient if carried out in a thick pulp during the fine grinding operation in the tube mill.
8. The density of the flotation feed requires careful control.
9. Fresh water may be used instead of salt water, but in that case colloidal slime will float in considerable quantity with the pyrite, yielding a low grade concentrate of large bulk for subsequent treatment.
10. A clean concentrate can be produced by the use of salt water but not when fresh is used.
11. Flotation treatment of these ores is a commercial proposition which is capable of producing lower grade residues than can be obtained by existing methods.
12. The total cost of treatment with the introduction of flotation must of necessity be considerably lower than the cost of treatment by present methods, because the roasting and cyaniding operations are carried out on only a fraction of the ore, the major portion of the ore having been discarded in the form of residues immediately after flotation.

A. S. WINTER,
Research Metallurgist.

B. H. MOORE,
Lecturer in Metallurgy.

School of Mines, Kalgoorlie.

DIVISION VI.

OPERATIONS UNDER "THE INSPECTION OF MACHINERY ACT, 1921."

Annual Report of the Chief Inspector of Machinery and Chairman of the Board of Examiners for Engine-Drivers for the Year ending 31st December, 1925, with Statistics.

Office of the Chief Inspector of Machinery,
Central Government Buildings,
St. George's Terrace,
G.P.O. Box F. 358,
Perth, 9th February, 1926.

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, 1921," in the districts proclaimed thereunder, together with statistical tables, for the year ending 31st December, 1925.

The report is divided 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 useful boilers on the register at the end of the year was 3,261 as against 3,199 at the end of 1924, showing an increase of 62 boilers. There were 78 new registrations during the year, including air receivers and steam-jacketed vessels; two boilers which had been permanently condemned were reconstructed and reinstated as boilers, and three were transferred from other Departments. As against this there were 12 permanently condemned, and nine were transferred beyond the jurisdiction of the Act.

Of the 78 new registrations 31 were imported from the United Kingdom, 9 from America, 4 from the Eastern States, and 11 (mostly air receivers), whose origin could not be traced. Twenty-three were made in this State, including one Loco. portable, one Loco. stationary, two locomotives, nine air receivers, eight steam-jacketed vessels, and two vulcanisers.

Operations in the various Districts.

The following return shows the operations in the various proclaimed districts in connection with boilers as compared with 1924:—

Return showing operations in the Proclaimed Districts (Boilers only) during the year ended 31st December, 1925.

	Totals.	
	1925.	1924.
Total number of boilers registered and capable of being used as steam generators	3,261	3,199
New registrations during the year	78	103
Boilers re-instated	2	2
Inspections for year—		
Thorough	1,600	1,598
Working	150	164
Boilers condemned during year—		
Temporarily	92	96
Permanently	12	25
Boilers transferred beyond the jurisdiction of this Act	9	16
Number of notices issued for repairs during the year	388	462
Number of certificates issued (including those issued under Section 30) during the year	1,589	1,606
	£ s. d.	£ s. d.
Total amount of fees for 1925 ...	3,020 15 6	...
Total amount of fees for 1924 ...	...	3,023 8 3
Total number of Inspectors ...	8	8

The revenue from boilers shows a decrease of £2 12s. 9d. as compared with revenue from this source for 1924.

The number of thorough and working inspections was 1,600 and 150 respectively, making a total of 1,750, showing an increase of two thorough inspections, and a decrease of 14 working inspections.

In the South-Western district 1,399 inspections were made, or nearly 80 per cent. of the total number made in all districts. The inspections made in this district show an increase of 37 as against 1924.

In the Kalgoorlie group 281 inspections were made, being 16 per cent. of the total inspections. The inspections in this district showed a decrease of 26.

In the North Coolgardie and Mount Margaret districts 29 inspections were made, or 1.65 per cent. of the total number. The inspections show a decrease of 24 as against 1924.

In the East Murchison and Murchison and Yalgoo districts 39 inspections were made, or 2.23 per cent. of the total number, and the inspections showed a decrease of one.

Two inspections were made in the Carnarvon district.

The following table shows the number of boilers temporarily or permanently condemned, as a percentage of inspections made each year, since the inception of the Act controlling boilers:—

Number of Temporarily 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
1919	3·14	3·547
1920	3·28	2·171
1921	4·33	1·358
1922	5·22	·940
1923	3·76	1·213
1924	5·44	1·418
1925	5·25	·685

It will be seen from the above table that the number of boilers temporarily condemned for repair during the year has again been large.

The repairs in many cases were extensive, and a large number of boilermakers was kept busy throughout the year.

In connection with repair work, I wish to again impress upon owners the necessity of having all such work done by skilled workmen, and of seeing that the material used is new and of good quality.

The number of boilers permanently condemned as being no longer safe to be used as steam generators was unusually small, but as there are now many boilers in the State well over 30 years old, it is certain that the number of boilers which will be permanently condemned will be a rapidly increasing one in the next few years.

DIVISION II.

Explosions and Interesting Defects.

Up to the last year we have been singularly free from anything in the nature of an explosion. No boiler has actually burst, and no life has been lost from this cause. During the year, however, there were two rather serious accidents, either of which might easily have resulted in an explosion and loss of life.

The first of these occurred at a refrigerating works during night shift. The engine-driver heard a hissing noise, and on going into boiler-room he found the fire-door blown open, and flames and steam issuing. He closed the damper and retired to the engine-room. When the boiler was cooled down it was found that five of the lower tubes had drawn completely out of front headers, and several others had partially drawn.

The whole of the evidence went to show that at the time of the accident the water must have been exceedingly low, in fact the boiler must have been nearly empty, as comparatively very little steam escaped. Had the boiler been filled to its ordinary working level, as soon as the first tube drew out there would have been a great rush of water heated to about 350 deg. F., and this would have immediately flashed into steam of sufficient volume to fill both the boiler-room and the engine-room. As the driver was actually able to *enter* the boiler-room, and close the damper, it is clear that no such rush of water could have taken place. The damage was confined to the drawn tubes and two seams in the drum which were sprung and leaking.

The accident was due to neglect in attending to the feed water, and the engine-driver was dealt with by the Board of Examiners.

Fortunately no one was injured and the damage, though extensive, was easily repaired by replacing and expanding the tubes, and caulking up a few seams.

The second accident referred to consisted of a rather serious collapse of the crown of the firebox of a locomotive type of boiler, used as a stationary log hauler. The boiler was made by an English firm of repute in 1912. The firebox was of Belpaire type, and the crown consequently had a very large area of flat surface. This was stayed to the shell in the usual way common to this class of firebox. The stay bolts were steel and 7/8in. diameter, swelled at the screwed ends to 1⅛in. Many of these stays became severely corroded for about 1in. in length, close to their entrance into the copper crownplate. The upper part of the stays was the original size, and there was no corrosion of any importance elsewhere in the boiler. There was no reason to suspect such severe corrosion at the parts affected, and unfortunately the position of the sight holes was such that, though the upper parts of the stays, which were unaffected, could easily be seen, the corroded parts could not.

A large number of the stays broke where weakened by corrosion, and as a consequence the crown plate was bulged down for a considerable distance. Fortunately there was no rending of the plates, and no personal injury was involved.

It is obvious that at some stage of the boiler's existence water had been used which caused severe electrolytic action to take place at the base of the broken stays.

The bulged plate was skilfully forced up, restored to shape, and new stays were fitted.

The following accidents also occurred during the year, and are all instructive:—

One end of an expansion bend on a steam pipe line in the Eastern Goldfields pulled out of its cast iron flange. The only damage done was the escape of all the steam and stoppage of the plant. The boiler supplied a winding engine with steam. This engine was fitted with gravity brakes, *held off* by steam. When the steam failed the brakes were automatically applied, and no damage to cage or shaft occurred. The accident is a good argument in favour of this class of brake.

One of the header caps of a water tube boiler blew off. Beyond blowing open the casing doors and stopping the boiler, no damage was done. The boiler was at once isolated by the leading fireman, and work carried on as usual.

In my 1924 report I referred to the common practice of overstressing the bolts securing these caps by using improperly long spanners. Only the spanner supplied for the purpose should be used. In the case above referred to, the pressed clamp securing the header cap was found badly fractured, and the bolt drawn nearly through it.

Early in the year a rather peculiar accident occurred in connection with a Lowcock's "Economiser" at one of the Kalgoorlie mines.

The economiser had been shut down on a Saturday for a minor repair, the dampers at each end being left closed till about 10 a.m. on the following Monday when they were opened up, and the economiser put into commission again. Nothing happened till about 26 hours afterwards. The boiler dampers were closed from about midnight on Monday to 8 a.m. on Tuesday and fires were banked. At about 2.30 on Tuesday a violent explosion occurred. Much of the brickwork round the economiser was shattered, and one nest of twelve sections of tubes was lifted bodily, and many of the tubes and headers were broken.

The remainder of the apparatus was sufficiently disturbed to break all the connections between the nests of sections.

A very careful investigation was made into the cause of the explosion. It was abundantly clear that it was *not* an explosion of the heated water or steam *in* the economiser tubes, and equally clear that it was a gas explosion.

The conclusion arrived at was that a pocket of rich gas had lodged in the soot chamber, through which there was no direct draught. This gas probably collected on Monday night while fires were damped, and strangely enough remained quiescent most of Tuesday. Possibly air leaks through cracks in brickwork diluted it until it became an explosive mixture, and then an extra long flame or a few sparks reached the chamber and caused the explosion of the gas.

The occurrence points to the advisability of providing some means (*e.g.*, a blower) for the supply of a good current of air through the soot chamber when fires have been damped, and before opening the boiler damper.

Much of the brickwork was thrown 20 to 30 feet away, but fortunately no one was hurt, nor was any damage done to the boilers.

A serious explosion occurred in connection with a refrigerating plant at a butcher's shop in Coolgardie. The vessel which exploded was *not under the jurisdiction of this Department,* but the occurrence can be profitably alluded to as there is a lesson to be learned from it.

The vessel which exploded was a brine tank about seven feet long by 15½ inches in diameter. It had been out of use for a considerable time. It contained brine at a very low temperature, when in use, so that if the refrigerator were stopped it would keep the chamber cool for a considerable time. It was filled through a 1¼in. hole fitted with a screwed plug, and was thus *hermetically sealed.* Under ordinary circumstances this would be quite safe. But unfortunately a fire occurred in the building, the vessel became overheated and burst with disastrous results.

Portion of the vessel was propelled across the street through a crowd of spectators, and finally landed 150 yards from where it started. The results were terrible. A married couple each lost a leg, and a young man had both legs taken off. All three died within 24 hours, and a fourth person was so injured that he was receiving hospital treatment for nine months.

The object lesson, of course, is that all such vessels should have a vent, either an open pipe, or a good safety valve. If they are not so fitted, in case of a fire an explosion is almost inevitable.

Towards the close of the year another locomotive boiler was found to have developed a bad fracture along the longitudinal seam at side of firebox casing. The inspector suspected the seam, and had some rivets taken out. The fracture was then obvious. As this particular type of defect has occurred in several locomotives, I have dealt with the matter more fully under the heading "General."

In November a peculiar accident occurred to a single cylindered engine mounted on a portable boiler—Britannia type. The strap securing the small end of the connecting rod broke, allowing the piston to strike the back cover of the cylinder. This cover was undamaged, but the six ⅝in. studs securing it were broken. The cover struck the Salter's spring balance safety valve and unshipped the lever. The valve was blown off its seat and all steam escaped. The fire was immediately drawn, and beyond the broken strap and studs, no damage was done.

DIVISION III.

Inspection of Machinery.

The following return shows a classification of the power-driven machinery in the proclaimed districts.

The total number of groups now registered is 6,104, which shows an increase of 541 for the year.

Electrically-driven groups now number 3,726, showing an increase of 475 during the year. Steam-driven groups remain stationary. Suction gas-driven groups have decreased by three. Ordinary town gas groups have decreased by three. Hydraulic groups remain as in 1924, and compressed air groups have increased by two. Oil engine groups have increased by 70.

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, 1925.

Classification.	Totals.	
	1925.	1924.
No. of groups driven by—		
Steam Engines	1,106	1,106
Oil Engines	995	925
Ordinary Gas Engines ...	8	11
Suction Gas Engines	221	224
Compressed Air Engines ...	38	36
Electric Motors	3,726	3,251
Hydraulic Pressure	10	10
	6,104	5,563

The following table shows the number and description of all lifts in this State:—

Passenger Lifts—	
Electrically driven	87
Goods Lifts—	
Electrically driven	85
Hydraulically driven	9
Belt driven	10
Hoists	88
	279

Six new passenger lifts and 20 hoists were erected during the year.

Four of the older goods lifts were scrapped, so that although there were 26 new lifts and hoists erected during the year, the actual increase is only 22.

The number of notices ordering protection, etc., for various classes of machinery was 325, which is somewhat smaller than the previous year.

As a majority of such notices are issued in connection with new machinery, and as there were 541 new groups added during the year, the fact of only 325 notices having been issued is proof that persons acquiring machinery are becoming educated in the matter of safe-guarding their plants.

As a matter of fact owners generally are showing commendable zeal in trying to make everything as safe as possible. In spite of this, and constant inspection, the personal element creeps in, men take risks, and the unforeseen happens as witness the still somewhat large number of accidents.

I am pleased to say the new regulations as regards lifts are working well, and the lifts in this State compare very favourably with the rest of the world in the matter of safety. When it is remembered that the number of persons carried in these lifts is exceedingly large, one accident during the year (and that a minor one, due to absolute carelessness and disobedience) is an excellent result.

Return showing Operations in the Proclaimed Districts (Machinery only) during the year ended 31st December, 1925.

	Totals.	
	1925.	1924.
Total registrations of useful machinery	6,104	5,563
Total inspections made ...	4,863	4,169
Certificates bearing fees ...	4,394	3,718
Certificates (steam) without fees	469	451
Extension certificates granted under Section 42 of Act	...	8
Notices issued "Machinery dangerous"	325	350
	£ s. d.	£ s. d.
Total amount fees of for 1925 ...	2,284 14 9	...
Total amount fees of for 1924 ...	...	1,972 10 0
Number of Inspectors ...	8	8

The total number of registrations shows an increase of 541, mostly electrically-driven groups, or 193 more than the increase in 1924.

In the South-Western district there was an increase of 622 in the number of useful groups registered.

In the other districts the number of registrations has decreased by 81.

In all districts the number of inspections made was 4,863, as against 4,169 in 1924. This shows an increase of 694.

Interesting Accidents to Machinery.

Early in the year (February) the clutch disc of one of the drums of a winding-engine on the Kalgoorlie Goldfields fractured. The engine is a first-motion engine, having cylinders 13in. diameter and stroke 42in. The accident occurred during baling operations. The broken disc was a steel casting, and the accident apparently occurred through there being a large blow hole in the boss, and the metal generally about the key-way being spongy.

The disc was replaced by a cast-iron one of somewhat heavier section wherever possible.

Early in October this new cast-iron disc fractured. The crack apparently started from the same place as the first one, viz., the key-way. It was replaced by another one still slightly heavier. The latter disc lasted one week, and fractured in the same place. Another new one (the fourth in the year) was fitted on 29th October, and this also broke in the key-way the first time it was used.

Since then the engine has been working on one drum, awaiting a new steel clutch from the makers.

It is curious that in each of the four accidents the engine was being used for baling, and it appears probable that the sudden accession of load as the tank left the water might have been a contributing cause, especially if the engine-drivers inadvertently lowered the tank a little further than was necessary. If it were immersed deeper than necessary, the speed of the engine would be greater when tank was leaving water than if only just sufficiently immersed, and the jerk on leaving would consequently be greater.

In April a rather curious accident occurred to an air compressor. The compressor is a two stage one, having steam cylinders 27¾in. and 50in. diameter, and air cylinders 28¼in. and 46¼in. diameter.

After running over three hours (which fact practically eliminates water in the cylinder being the cause of the accident) the engine pulled up sharply. The high-pressure cylinder piston rod was found slightly bent, and on opening up the cylinder the lower part of the piston was found to be broken into many pieces. Some of these dropped into the exhaust ports (corliss valve gear) and caused the valve spindles to be badly twisted. Beyond this and light scoring of the cylinder, there was no further damage. Had the valves been the old fashioned slide valve type, probably the cylinder end would have been knocked off and other serious damage done.

In March a "runabout" electric crane used on the Fremantle wharf capsized and fell into the harbour. The crane was being used to pick up heavy wooden fenders which had been in use for a mail boat. The driver after picking up two of these wanted to deposit them further up the wharf. A truck had been left on the other set of rails, and there was not room for the projecting "cab" of the crane to pass it. So, with the load on, the driver slewed the crane without elevating the jib, with a view of getting the cab on the water side. When the jib was at right angles to the wharf the whole crane capsized. The driver got out through the window as it struck the water and swam ashore uninjured. Probably few men have had such a narrow escape.

The crane in question is not supposed to be worked unless properly blocked up, and the Department's certificate clearly states this. Not only was it worked without blocks, but it was slewed to the worst possible position. The whole accident was due to the driver underestimating the load and working the crane in an unauthorised way. His certificate was suspended for six months. Having a good record up to the time of the accident, on the expiration of the six months he was reinstated, and I do not think he is likely to ever again take the same risk.

DIVISION IV.

Prosecutions under the Act.

During the year there were two prosecutions, both for not registering machinery and working it without the prescribed certificate. In one case the defendant was fined £5 and 5s. costs, and in the other £3 and 5s. costs, or 48 hours' imprisonment.

DIVISION V.

Accidents to persons caused by Machinery.

During the year accidents to 42 persons were reported, including three which ended fatally. This shows an increase of four as compared with 1924. There has been an increase of four in the number of accidents in the Goldfields districts, and those in the South-Western district remain the same as in the year 1924.

The following table shows the number of accidents and the percentage of these, based on the total number recorded for the year, caused by various kinds of machinery mentioned:—

Number of Accidents.	Class of Machinery.	Percentage of total Accidents.
5 (1)	Circular Saws	14·28
1	Band Saws	2·38
(1)	Log Traveller and Twin Saws	2·38
3	Buzzers	7·15
1	Shaper (Woodworking) ...	2·38
2	Printing Machine	4·76
1	Stapling Machinery	2·38
1	Goods Lift	2·38
4	Belting	9·55
2	Conveyor Belt	4·76
2	Flywheels	4·76
2	Shafting	4·76
1	Quartz Battery	2·38
2	Steam Engine	4·76
1	Gas Producer	2·38
2	Guillotine Cutter	4·76
1	Tin Press	2·38
1	Cardboard Box Machinery ...	2·38
1	Hair Devil	2·38
1	Teasing Machine	2·38
1	Sausage Machine	2·38
1	Mincer	2·38
1	Churn	2·38
2	Steam Calendar	4·76
(1)	Grain Conveyor	2·38
39 (3)	—Total 42.	

Note.—Accidents marked (1) were fatal.

Wood-working machinery again occupies the unenviable position of heading the list. Saws, buzzers, and shapers accounting for 12 out of the total of 42 accidents (two of which were fatal) or nearly 29 per cent. of the total number.

The next largest number of accidents was caused by "belting." The rest of the accidents call for no remark as far as their number is concerned. Two of the saw accidents were fatal. In the first case the deceased apparently tried to take a short cut between the end of a log approaching a pair of twin saws, slipped and fell on the large saw. His right leg was almost severed, and the left one badly cut. The unfortunate man died before he reached the hospital. Just before the occurrence the log was seen to be only about 12 inches from the saws. It is clear the man took a terrible risk. This is the first recorded accident with twin saws. They are clearly so dangerous that hitherto they have been treated with respect. It is not possible to erect any kind of efficient guard.

In the second case a benchman was cutting a small piece of timber to use as a scraper. By some means it fell across the back of the saw, was thrown over by the saw, penetrated his chest and killed him.

The remaining 10 accidents due to woodworking machinery resulted in severe cuts and loss of fingers. The third fatal accident was caused by a gantry grain conveyor at Fremantle. The machine was stopped and deceased was standing on the conveyor near the end tumbler, with his legs between the slats fixing the shute to deliver grain into a boat. By a most unfortunate misunderstanding the conveyor was started, and the deceased was drawn in between the auxiliary roller and the tumbler. He was severely crushed and died in hospital after an operation for abdominal injuries.

If due care had been exercised this accident could not have happened. There seems to have been a want of co-ordination between the hands employed in getting the machine ready for work, those responsible for giving the order to start it, and the person operating the motor.

In the early part of the year an explosion of gases occurred in a suction gas-engine down draught producer in a flour mill. The accident occurred early on a Monday morning, after the producer had been stopped for the week end. There was some difficulty in getting a start, and after blowing for some time the gas was found to be of bad quality. It was then decided to "burn up" again, but the valve outlet pipe to atmosphere was accidentally left open. Evidently air found its way through this pipe to the generator, owing to the up draft in generator while "burning up," and an explosive mixture was formed. All four doors of the generator were open while burning up, and when the explosion occurred a quantity of incandescent fuel was blown through one of the doors on to the face and chest of the driver, who was somewhat badly burned.

The accident points to the importance of correctly manipulating the various cocks and valves in connection with gas generators. Had the explosion been a little more violent, and there does not appear to be any reason why it should not have been, the result might have been disastrous.

Two fatal accidents occurred during the year from electric shock, and though these are not accidents caused by machinery they are instructive.

The first of the accidents occurred at a timber mill in the South-West district. The engineer and a fitter were on the roof of the mill fixing up electric light wires. The engineer heard a shout, and looking round saw that the fitter had evidently slipped on the roof, and had made contact with two of the main wires. The engineer, at grave personal risk, very pluckily pulled him away from the wires, and attempted artificial respiration. This was unsuccessful as the unfortunate man probably received over 500 volts alternating current, and death was instantaneous.

The second accident occurred at a mine in the Mt. Margaret district. A fitter was doing some pipe work near the electrician's workshop. He was instructed to use a measuring stick to ascertain the lengths required, but apparently used a length of 1in. piping instead. This came into contact with a live wire overhead carrying 550 volts. When the pipe made contact with the wire its bottom end was resting on a casting, and deceased got only part of the current. Unfortunately in trying to disconnect the pipe from the wire the pipe got knocked off the casting, and then he got the whole 550 volts and death was practically instantaneous.

These two accidents point to the necessity of using the greatest care when dealing with "live" wires. No one should be employed to work on such wires who is not fully cognisant of the danger. Rubber gloves should always be used, and wherever possible operators should be insulated from earth by a dry board, rubber or other non-conducting material.

DIVISION VI.

Engine-drivers Examinations and kindred Matters.

During the year four examiations were held in Perth, two in Kalgoorlie, one in Leonora, and one in Bunbury. Examinations were advertised to be held at Southern Cross, Mt. Magnet, Geraldton, and Albany, but fell through owing to the necessary number of candidates not being forthcoming.

The following table shows the certificates granted and their classification:—

Return showing total number of Engine-drivers and Boiler Attendants' Certificates (all classes) granted in 1925 as compared with 1924.

Class of Certificate.	No. Granted.	
	1925.	1924.
Winding Competency (including certificates issued under Regulation 40 and Section 60 of the Act) ...	4	2
First Class Competency (including certificates issued under Regluations 40 and 45 and Sections 60 and 63 of the Act)	9	8
Second Class Competency (including certificates issued under Regulations 40 and Sections 60 of the Act)	15	11
Third Class Competency (including certificates issued under Regulation 45 and Section 63 of the Act) ...	37	25
Locomotive Competency	18	4
Traction Competency	9	10
Internal Combustion Competency ...	11	10
Crane and Hoist Competency ...	14	8
Boiler Attendant's Competency ...	48	46
Interim	2	5
Copies	10	11
Transfers	12	22
Totals	189	164

In all during the year there were 240 applications received, and of these 189 were granted certificates, showing an increase of 45 applications and 25 certificates granted.

The revenue from application fees and fees for granting certificates was £262 1s., which shows an increase of £66 13s. as against 1924.

Inquiries, Prosecutions, etc., during the year ending 31st December, 1925.

Four overwinds occurred on mining winding-engines during the year. No damage ensued beyond the shearing of safety hook rivets.

The accidents were inquired into, and as all of them occurred while bailing or hauling material, and as the engine-drivers involved had good records, the Board took no action beyond recording the accidents.

Two cases of negligence which are alluded to in this report were dealt with by the Board of Examiners during the year, one certificated engine-driver was fined £2 2s., and his certificate suspended for six months, while the other was fined £10, and his certificate was also suspended for one year.

No engine-driver was prosecuted for breach of Act or Regulations during the year.

DIVISION VII.

General.

The year under review has passed without any incident calling for special comment.

There has been a still further falling-off in the number of boilers in use, particularly on the Goldfields, and a slight decrease in revenue from this

source. This loss has, however, been more than compensated for by the very satisfactory increase in the number of machinery registrations. The number of applications for engine-drivers' certificates also shows a good increase as against those of 1924. In the aggregate the revenue shows an increase of over £304, which is a very satisfactory result.

The work in the South-Western district has of late years been rapidly increasing, and, chiefly with a view of easing the pressure in this district it was decided at the end of 1924 to work part of East Murchison and Murchison and Yalgoo districts from Kalgoorlie. (These districts had previously been worked from Head Office.) This change was made at the beginning of 1925, and is working satisfactorily.

Carnarvon was visited during the year, but from a revenue point of view the visit was unsatisfactory. This visit materially increased the distance travelled during the year, and so brought up the average miles per inspection.

Owing to the large area over which our inspection work is spread, the average miles per inspection is necessarily great. For many years past efforts have been made to reduce this average, and by constant watchfulness in arranging inspections much has been done in this direction. The average for 1925, in spite of the Carnarvon visit, was only 6.42 per inspection. There was a slight increase in the total miles travelled, and an increase of 690 in the number of inspections made. The reduction of the average is therefore very satisfactory.

Although there has been a considerable falling-off in inspections made on the Goldfields, the distance to be travelled has not consequently been decreased, and if there be a still further reduction in the number of plants in use in the outback districts, the average miles per inspection will, of course, tend to increase.

The total number of registrations at the end of the year, boilers and machinery, excluding boilers permanently condemned and dispersed groups of machinery, was 9,365.

The work, by dint of careful arrangement, has been performed by the staff, which has been in existence for the last six years, viz., eight inspectors, and this number cannot be reduced if efficiency is to be maintained.

The demand for copies of the 1921 Act and Regulations has been large, and towards the middle of the year it was found necessary to order a further supply. The opportunity was taken to revise the Regulations relating to Lifts, Hoists, and Cranes. None of the alterations was vital; some "definitions" were added, and a few regulations were slightly altered for the sake of clarity.

The Act and Regulations, as now printed, are quite up to date.

In my Annual Reports for 1921 and 1923, I referred to the somewhat mysterious fracturing at the longitudinal seams of plates forming the firebox casing of certain locomotives. When writing the latter report, I had come to the conclusion that the faults were due to bad design rather than faulty material or bad workmanship. Longitudinal seams in the position in which these occurred are certainly objectionable, and are liable to peculiar stresses. It is, of course, far preferable to have the "wrapper plate" in one plate, and so avoid the longitudinal seams.

Mr. C. E. Stromeyer, Chief Engineer of the Manchester Steam Users' Association, which was founded by Sir William Fairbairn in 1854, read my report, and finding the matter interesting, wrote asking for details, and a sample of the fractured plates for investigation. These were sent him, but unfortunately the plate sample miscarried. Another sample was forwarded, and early in the past year I received his reply.

Mr. Stromeyer, who has been connected with the above association for many years, and has well-equipped laboratories and testing apparatus installed, has probably conducted more investigations in connection with the materials used in the construction of steam boilers than most other engineers. He has evidently gone to considerable trouble (at no cost to this Department) with the sample of plate sent him, and I very greatly appreciate his opinion, and his kindly interest.

His chemical analysis shows that—

> "The phosphorus is decidedly high and the nitrogen is about one-half what is customary in open hearth acid steel. I presume therefore that the steel has been made in an open hearth acid furnace and that, accidentally, some impure scrap with much phosporus had got into the bath. The standard mechanical tests would not reveal the resulting brittleness, unless bend samples with sheared edges were also taken, but that test is a very unsatisfactory one, much depending on the sharpness of the shears, and little importance is attached to it." . . . "The fact that in two samples the phosphorus differs by 25 per cent. of the mean, suggests that it is unevenly distributed, and may in some parts be very much higher than ascertained by us."

It is obvious from the above extract that in Mr. Stromeyer's opinion the cause of failure in the boiler from which sample piece of plate was sent to him was *brittleness* caused by excess of phosphorus, and his remarks point to the necessity (which is now becoming generally recognised) of a system of careful and constant analysis being carried out in connection with the manufacture of steel plates used for boiler purposes.

At the end of 1925 yet another boiler was discovered having similar fractures at the seams in question. The defect was discovered by timely inspection. It was quite invisible, and was only determined by the removal of several rivets and the use of a magnifying glass.

The recurrence of this particular defect in several boilers by different makers leads me to adhere to my original opinion, viz., that the defects were due to the particular *construction* rather than to bad material.

It is unlikely that in *all* these cases the plates used suffered from excess of phosphorus, though in the case examined by Mr. Stromeyer this factor no doubt greatly increased the tendency to fracture. It is, however, certain that all of the boilers which failed as described, were of the same objectionable construction, and that fractures appeared only at the longitudinal seams in side of firebox casing. I have, therefore, issued instructions to inspectors to take such steps as will insure the crown and sides of firebox

casings of all new locomotives coming under the jurisdiction of this Department, being in one plate, thus avoiding the objectionable seams.

Inspectors have also been instructed to be particularly watchful in the case of any existing fireboxes of this type. In this connection I wish to reiterate a remark made in my Annual Report for 1921, viz., that the possibility of the existence of such very serious and obscure defects is the strongest possible argument in favour of expert and systematic inspection. A serious explosion, in each of the cases referred to, was almost a certainty if the fractures had not been discovered when they were.

Developments, etc.

In the East Coolgardie district important additions have been made to the Chaffers Plant of the Lake View and Star, Limited, consisting of roasters, ball mills, a tube mill, agitators, classifiers, etc. This plant is now in full swing, and is dealing with a much larger tonnage. This will, no doubt, reduce costs and tend to better conditions generally.

The erection of an electrically-driven air compressor has been completed at above company's Lake View main shaft, and is running well.

At the South Kalgoorlie mine the electrically-driven air compressor, referred to in last year's report, has been completed and is giving every satisfaction. The old steam mill engine has been discarded, and the plant has been regrouped into small units driven by electric motors. This plant has also been augmented by the erection of a tube mill and Edwards duplex roaster.

It is interesting to note that the Kalgoorlie Foundry has recently started manufacturing ball mills, tube mills, and the gearing for roasters. The firm has also installed an electric welding plant, and a skilled operator is kept busy on repairs to such things as ball mill mantles and rock-breaker spindles which previously had to be scrapped. This is an important item to the mining industry, as for a comparatively small sum expenditure of a very large amount for *new* machinery is obviated.

The tendency referred to last year, viz., that of breaking up large steam plants into smaller electrically-driven groups still continues, and in order to cope with increased demands for electric power, the Kalgoorlie Electric Power and Light Company are installing two Babcock and Wilcox boilers, and probably an additional turbo-generator similar to the one erected last year.

In the Mount Margaret district the Sons of Gwalia Gold Mine have installed two new 500 h.p. suction gas-engines. They are the four-cylinder horizontal type. The cylinders are 20in. diameter and the engines are designed to run at a normal speed of 200 revolutions per minute. One of these is coupled direct to a vertical two-stage air compressor, and the other to a three-phase generator rated at 344 K.V.A. at 550 volts. The new unit replaces a Crossley gas engine.

At Wiluna, although there are as yet no important mechanical developments, there appears to be every prospect of greatly increased activity during the coming year.

In the South-Western district the timber industry is flourishing. Several small mills are being erected in remote localities, the introduction of motor transport making it possible to work them at a profit.

The large new mill at Nannup, referred to in my last report, is partially at work, but is not yet completed.

"Log-haulers" are evidently proving satisfactory, as their number is being increased. Four new ones of a powerful type have been installed during the year.

Caterpillar tractors for log-hauling are apparently not proving so successful as they were first thought to be.

Coal-mining is still active; five mines are working in spite of a still further falling-off in the bunkering trade. There has been no remarkable increase or change in the plants at the collieries. Some of the boilers have about reached their useful limit, and will shortly have to be renewed.

The proposed scheme for erecting a large electric power plant at Collie should give this industry a boost, and when it eventuates should be the means of relieving many of the older plants in the district and incidentally of starting many secondary industries.

Tin-mining appears to be moribund, and much of the plant formerly used for this purpose has been removed and put to other uses.

Most of the tree-pulling plants on the group settlements, which were so busy in 1924, are now practically idle. It is hoped this is only temporary, and that before long these plants will be again providing employment for many persons. Tractors for agricultural purposes continue to increase.

In my last year's report I referred to the large number of aged boilers in the State. Owners possessing such boilers should look ahead, and make timely arrangements for replacing them by new ones. There is too great a tendency to look on a boiler as a permanent fixture. From the day a boiler starts work deterioration commences, even though there may be nothing to indicate this deterioration. Boilers are often complicated structures, liable to peculiar and obscure stresses, and it does not do to conclude that just because they look all right, that they really are so.

Work done for other Departments.

About the usual amount of work has been carried out on behalf of other Departments during the year, chiefly inspecting and valuing plants connected with subsidised industries.

Inspectorial Staff.

The staff remains the same in number and personnel as in 1924, and although work has increased it has been kept up to date cheerfully, and has been performed efficiently.

Clerical Staff.

This remains as in 1924, and the work has been satisfactorily performed.

Revenue.

The total revenue from all sources during the year was £5,750 2s. 3d., made up as follows:—

	£	s.	d.
Fees for boiler inspections	3,020	15	6
Fees for machinery inspections	2,284	14	9
Engine-drivers' fees	262	1	0
Incidentals (being fees for special inspections, expenses, etc.)	182	11	0
	£5,750	2	3

The revenue for the year shows an increase of £304 14s. 10d. against that of the year 1924, made up as follows:—

——	Increase.	Decrease.
	£ s. d.	£ s. d.
Boiler Fees	...	2 12 9
Machinery Fees	312 4 9	...
Engine-drivers' Fees	66 13 0	...
Incidentals	...	71 10 2
	378 17 9	£74 2 11
	74 2 11	
Total Increase ...	£304 14 10	

The following is an analysis of the increases and decreases in fees for boilers and machinery in the various districts, and also shows the increase due to engine-drivers' fees:—

——	Increase.	Decrease.
	£ s. d.	£ s. d.
South-West Group	388 6 0	...
Kalgoorlie Group	...	93 0 2
North Coolgardie and Mt. Margaret	...	43 1 0
East Murchison and Yalgoo ...	...	18 10 6
Carnarvon	4 7 6	...
Engine-drivers' Fees	66 13 0	...
	459 6 6	£154 11 8
	154 11 8	
Total Increase ...	£304 14 10	

The loss of revenue to the Department incurred by not charging fees for boilers and machinery belonging to the Government non-trading concerns was £74 1s. 6d., and the expenses connected with such inspections amounted to £25 19s. 11d.

During the year the amount written off as bad debts was £7, being only about ·12 per cent. of the total revenue.

Mileage.

The total distance travelled by inspectors during the year was 42,461 miles, of which 14,522 were by rail, 27,933 by road, and six by water. The distance travelled shows an increase of 809 miles as against 1924, with an increase of 690 in the number of inspections made. The increase in mileage is accounted for by the Carnarvon trip, the 804 miles travelled in connection with this trip almost balancing the increase. The average miles travelled per inspection was 6.42, showing a decrease of .61 miles per inspection as against 1924.

I am pleased to report that the average number of miles travelled per inspection is still on the down grade, in spite of an increase of 690 in the number of inspections.

Conclusion.

In conclusion, I wish to tender my sincere thanks for the assistance rendered by officers attached to the Crown Law, Police, and Postal Departments in various districts in connection with the administration of the Act.

My staff have carried 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 CHEMICAL BRANCH, MINES DEPARTMENT, FOR THE YEAR, 1925.

Government Chemical Laboratory,
Wellington Street,
Perth, 28th January, 1926.

The Under Secretary for Mines, Perth.

I have the honour to submit for the information of the Hon. the Minister my report on the work of this Branch during the year 1925.

Staff.—Mr. A. J. Hoare, A.A.C.I., was appointed from the 1st January to succeed Mr. Palmer as Supervising Chemist for Agriculture, Water Supply and Sewerage. After consequent promotions Mr. E. C. Orton, B.Sc., A.A.C.I., was appointed to complete the staff, which now comprises three supervising chemists, three senior chemists, and nine junior chemists. There was much ill-health amongst officers during the year, for which I blame the fact that the laboratory has been completely cut off from the free play of air by recent building operations, added to which there has been an exceptional number of toxicological samples dealt with, many of them of a highly obnoxious nature. The work in the Mineral Section continues to be heavier than in either of the other two sections, and in order to cope with it temporary transfers have to be made from time to time from one of the other sections.

Foods and Drugs.—Two meetings of the Food Standards Advisory Committee were held during the year and attended by myself. Various aspects of the Food and Drug Regulations were discussed at these meetings, particularly the results obtained by analysis of various materials submitted to the Government Laboratory by Health Inspectors. The analyses are referred to in detail by Mr. Stacy on a subsequent page. It is well here to draw attention to the large proportion of samples which fail to comply with the provisions of the Regulations in regard either to composition or labelling. The beverages sold under the name of "tonic wines" were a subject of review during the year, and proved for the most part to be of inferior quality, devoid of any tonic quality other than that contained in the original wine, though the price of the latter has been doubled or trebled, because of the supposed addition of substances of medicinal value. In England recently there was a successful prosecution of a vendor of a "tonic wine" which was proved to be ordinary wine with not more than a few drops per bottle of extract of beef or malt. Similar material is at present on the market in Western Australia. Mr. Stacy's table on page 6 shows that of 14 samples analysed only two complied with the labelling regulations (of great importance in this case), and only four with the regulations relating to composition.

Toxicological Cases.—An abnormal number of these were dealt with, some presenting unusual features. One case of severe poisoning was traced to a pharmacist having dispensed tartaric acid in both packets of a seidlitz powder. The toxicity of this acid is not widely known. In this case the ingestion of 11 grams of the acid in one dose gave rise to severe but fortunately not fatal effects.

Malt Liquor.—A number of local and imported Eastern States and English ales and stouts were examined for their alcoholic strength and preservatives. The Australian ales were of closely uniform strength, averaging 4.02 per cent. by weight of alcohol (8.76 per cent. proof spirit). The stouts ranged from 4.57 per cent. to 6.08 per cent. alcohol (9.95 to 13.23 per cent. proof spirit). Salicylic acid was present as a preservative in the majority of the ales, in seven cases beyond the limit of 3 grains per gallon allowed under the Health Act. A further analysis in the case of one of the imported ales disclosing a similar large excess, a successful prosecution resulted.

Mineral Oil.—The active search for this, except in the Kimberley region, has now been practically abandoned. Samples of swamp soils, chalybeate seepages, and other supposedly petroliferous material continue, however, to be submitted from time to time. From most of the swamp soils which are heavily charged with humus, diatom remains, etc., traces of undecayed vegetable waxes and resins are extractable by suitable solvents. None of the samples submitted showed any trace of an undoubted mineral oil or petroleum residue, such as ozocerite or asphaltum.

Owing to persistent reports of the presence of mineral oil in the Porongorup Range near Albany, the locality was visited by Mr. Blatchford, Assistant State Mining Engineer, and myself in January. We found the supposed oil seepage to be in a soakage of peaty water emerging from a small fault at an elevation of about 1,000 feet in a narrow range composed wholly of granite gneiss. Needless to say no trace of petroleum could be detected in the samples collected.

Mineral Investigations in the Field.—In January an inspection was made of the bauxite deposits at Wooroloo and Sawyers' Valley with a view to increasing our knowledge of these possible sources of aluminium.

In June I spent eight days with Mr. R. C. Wilson, Assistant State Mining Engineer, in the Murchison District, the most important work undertaken being

an examination of the beryl deposits at Poona. Some notes on this will be found in Appendix I. on page 17.

In August I accompanied the Government Geologist to investigate a most unusual type of alunite deposit at Campion, in the Avon District. A description of this will be found in Appendix II. on page 18.

New Mineral Occurrences.—In addition to those noted in subsequent pages by Mr. Bowley, the following are worthy of record:—

Rutile, Coodardy.—Whilst in the Murchison Division with Mr. Wilson a visit was paid to the open cut of the deserted Big Bell G.M. at Coodardy. The rock exposed is a mica schist traversed by innumerable minute quartz veins and a few small pegmatite veins. Associated with the latter I found a black mineral, usually well crystallised, which proved to be rutile, carrying about 97 per cent. of titanic oxide. Masses ranging from 1 ounce to 1 pound in weight were collected. The amount seen was not sufficient to provide a commercial supply, but as the masses were unusually large and clean, further search in the neighbourhood might reveal a deposit of economic importance.

Lithiophilite, Wodgina.—This very rare phosphate of manganese and lithium formed the main part of a large detrital block discovered recently in the Wodgina district (North-West Division). At the centre the unweathered mineral was light greenish yellow in colour and slightly translucent, but the surface of the boulder was heavily coated with black and brown manganese and iron oxides. The pure lithiophilite was found to contain 7.81 per cent. of lithia, of which it would prove a valuable source if discoverable in sufficient quantities.

Apatite, Wodgina.—In proximity to the lithiophilite, apatite (fluophosphate of calcium) has been found in large crystalline masses up to several pounds in weight.

Fertilisers.—An unusually large number of fertilisers have been examined, mainly to check their compliance with the provisions of the Fertiliser and Feeding Stuffs Act. Almost without exception they were found to be of excellent quality. It is pleasing to note that whilst of 36 samples of the more expensive organic nitrogenous fertilisers 8 were slightly below the guaranteed percentage of nitrogen, the average assay of the 36 was 5.03 per cent. nitrogen as against a guaranteed average value of 4.13 per cent. The deficiencies in the 8 samples referred to ranged from 0.06 to 0.20 per cent. nitrogen, all within the limit allowed under Section 11 of the Act.

The value as a fertiliser of the drift algæ in the river does not seem to be widely known. A sample of dry weed mixed with sand, collected at the water's edge in Crawley Bay, contained:—

Moisture	.. .. ..	4.48 per cent.
Nitrogen	.. .. ..	1.48 „
Lime	.. ..	7.65 „
Potash	.. ..	1.65 „
Phosphoric oxide	.. ..	.41 „
Ash	.. ..	60.87 „

This is of slightly better quality than average farmyard manure, and might be used in the same way.

A sample was examined of a new proprietary fertiliser of French origin named "Sulfurophosphate," which was advertised to give "a quicker germination" than superphosphate, and to yield "more vigorous crops than any other phosphatic fertiliser of similar grade." Further it was stated "sulphurophosphate while being insoluble, immediately becomes soluble by reason of the sulphurous gases given off in contact with the soil . . . and the plants get the full advantage of the phosphoric content." An analysis made of this material showed:—

Moisture	.. .. ..	0.80 per cent.
Free sulphur	.. .. ..	2.00 „
Phosphoric oxide	.. ..	17.99 „
Tricalcium phosphate	..	39.29 „
Calcium carbonate	.. ..	49.35 „

A test of the grain size showed 73.75 per cent. passing a 100-mesh sieve.

None of the phosphoric acid was water soluble or citrate soluble in the original sample, nor after keeping it mixed with moist sand for first a week, and then a fortnight. It is evident that the oxidation of the whole of the sulphur would not suffice to attack more than a small fraction of the calcium carbonate, leaving the phosphorus-bearing material (ground rock phosphate) absolutely unaffected.

Salt in Rain.—In pursuance of the investigation into the source and distribution of salt in our arable lands, an examination for salt of the rain collected at certain meteorological stations is being made in association with other official laboratories throughout the Commonwealth. Seventy samples were tested for chlorine during the year from Perth, Esperance, Wiluna, Mundiwindi, and Condon. The greatest amount of salt observed was at Perth on the 9th of July, when it rose to the very unusual figure of 0.0164 grammes per 100 cc. The lowest records are at Perth in June, and Mundiwindi in May, both being 0.00033 grammes per 100 cc.

Pyrite in Swamp Soils.—From time to time swamp soils are submitted, because it is found impossible to grow vegetables, etc., in them although at first sight they appear to be good peaty soils eminently suited for this purpose. In almost every case the inhibiting factor is found to be free sulphuric acid and iron sulphates. Such swamps in their natural condition carry concretions and scattered grains of marcasite or pyrite (both consisting of iron sulphide) below the permanent water level. When by drainage this level is lowered, air gains access to the sulphides and oxidises them to sulphuric acid and ferrous sulphate which later still further oxidises to ferric sulphate. All three of these compounds are very toxic to plants. The first instance of this was noted in the swamps a few miles west of Albany, where serious trouble from this cause arose after lowering the water level by drainage. Later it was observed at Monger's Lake and Smith's Lake on the north side of Perth, and this year at Clontarf, south of Perth. An extract of one sample of the Clontarf soil indicated no less than

6 per cent. of free sulphuric acid with about an equal amount of ferrous and ferric sulphates. The only remedies for such a condition are (1) free drainage without further lowering of the water level, and (2) heavy dressings with ground limestone, marl, or lime sands.

Metropolitan Water Supply.—At the end of the year water for this supply was being drawn from no less than twenty-one sources, including hill streams, shallow wells, shallow artesian bores, and deep artesian bores. This extraordinary multiplicity of supplies has given rise to serious problems in regard to the bacteriological and chemical purity of the mixed waters supplied to the public. To deal with these problems it was arranged in September that an advisory committee should be constituted, consisting of the Acting Engineer for Metropolitan Water Supply (Mr. J. Parr, B.Sc., M.I.C.E.), the Medical Officer of Health (Dr. J. Dale, M.D., Ch.B., B.Sc., M.R.C.S., L.R.C.P.), and the Government Analyst (Dr. E. S. Simpson, D.Sc., B.E., F.C.S., A.A.C.I.). This Committee has met at regular intervals, and although it has no statutory authority nor any funds at its disposal, has in the short period of its existence been able to do some useful work in the direction of safe-guarding the quality of the water supply of the metropolitan area.

Two unusual growths in supply pipes were submitted to the laboratory for examination. In one case a factory supply pipe of galvanised iron was found to be completely choked by a deposit of which about 75 per cent. consisted of hydrous silicate of zinc, the balance being iron hydroxide with a little magnesia and organic matter. It would appear as it the zinc of the galvanised iron had been attacked by the alkaline city water, whose average PH is 8.3. In the second case small and large fresh water sponges (*Ephydatia sp.*) were found growing on the inside of a main.

Scientific Research.—The visit to Perth of Sir Frank Heath, secretary of the British Department of Scientific and Industrial Research, was greatly appreciated by local scientists. Opportunities occurred for meeting him in company with other members of the National Research Council, and for showing him the Government Laboratory and discussing local research questions with him. He expressed great interest in the researches made in the past into the poison plants of the State, the ceramic resources and rare metal ores, but regretted that routine work was at present fully occupying the time of the whole of the staff to the exclusion of research. His official report to the Commonwealth Government on scientific research in Australia is awaited with eagerness.

EDWARD S. SIMPSON, D.Sc., B.E., A.A.C.I.
Government Mineralogist and Analyst.

SECTION I.—TOXICOLOGY, FOODS, AND DRUGS.

(C. E. STACY.)

During the past year samples have been received from the following sources:—

State Hotels	6
Health Department	136
Explosives Branch	34
State Saw Mills	101
Police—Criminal Investigation Branch...	69
„ Inspection of Liquors Branch ...	49
Mines Department	15
Agricultural Department	37
Tender Board	18
Department of Works and Labour ...	6
Department of the North-West ...	2
Forestry Department	1
Chemical Laboratory	14
Public Pay...	55
Public Free	33
Total	576

Samples were classified as follows:—

Foods and Drugs	103
Toxicological	77
Powellising	98
Hydrometers	8
Oils	57
Petroleum—Tests for	23
Mine air	6
Explosives	33
Waters	16
Sheep Dip	4
Rabbit Poisons	3
Spirits	25
Chinese liquor	11
Beers and Stout	32
Medicated wines	18
Non-excisable fermented drinks ...	13
Resins (?)	2
Salts	2
Pseudo-bitumen	4
Insecticides	4
Soaps	11
Ambergris (?)	4
Miscellaneous	22
Total	576

The number of samples examined is approximately the same as the previous year. At the risk of appearing importunate I must reiterate my regret, expressed for some years, that the services of this section of the Chemical Branch are not utilised to their full extent.

I think no one will deny that a pure food and drug supply is essential to the well-being of any community. The old crude methods of food sophistication, such as mixing sugar with sand, have disappeared, and now scientific methods of adulteration are applied which demand great skill on the part of the food and drugs analyst to detect. Where the article itself escapes direct adulteration clever manipulation of the label often deceives the public into believing that the article supplied is of first rate quality or disguises the presence of, say, preservatives, by printing which is smaller than that prescribed by the regulations and by reason of, I was going to say "careless" but perhaps "careful" is the better word, careful printing the words indicating the presence of the preserving substance have the appearance, in many cases, of a frill round the label rather than the warning of what may be considered a noxious substance.

The number of food samples examined during the past year was 103 as against 173 for the previous year, and apparently the staff of food and drugs inspectors is as small and overworked as in previous years. May I be permitted to make yet another plea for a more improved inspection of the articles which we have to eat and drink and of the medicines and drugs which are used to restore us in case of sickness.

Hereunder is a table of the number and kind of food and drug samples submitted and their quality as judged by the Food and Drug Regulations:—

Reg. No.	Material.	No. of Samples.	No. complying with labelling Regulations.	No. complying with Regs. *re* composition.
28	Milk	41	41	39
28	Milk, condensed ...	2	...	2
18	Baking powders ...	2	2	2
19	Custard powders ...	2	1	...
45	Cakes and Pastry ...	2	2	2
37	Mustard	2	2	2
39	Vinegars	3	2	2
37	Pepper	1	1	1
36	Cocoa	2	1	...
20	Infants' foods ...	3	...	3
15	Cereal foods ...	1	1	1
23	Fish	2	2	1
46	Ice cream	1	1	1
49	Essences	1	1	...
60	Non-excisable fermented drinks ...	13	9	6
63, 66, 67	Medicated wines ...	14	2	4
79	Soaps	11	4	9
69	Ales and Stout ...	4	4	3

Milk.—Two only of the samples were below the standard. Many of the samples were not taken for prosecution purposes but for information required by the Royal Commission on Milk Supply lately sitting here. As stated in previous reports, the milk supply is under supervision by the Local-Government Analyst (Mr. Geary), whose report will furnish a better idea of its quality than one from this section, members of whom are almost solely arbitrators in case of legal disputes as to the quality of the sample in question.

Condensed Milk.—Only two samples were submitted, neither of which complied with the labelling provisions. This also applies to the three samples of infants' foods supplied.

Non-excisable Fermented Drinks.—Thirteen samples were supplied, four of which failed to comply with the labelling provisions, and seven with the required composition.

Soaps.—Eleven samples submitted, seven of which failed to comply with the labelling provisions, and two with those regarding composition.

Medicated and Tonic Wines.—As will be seen by the above table the number of samples of any article only reached double figures in four cases—one of these medicated or tonic wines. Fourteen of these were submitted and only two complied with the labelling regulations, and only four with the regulations regarding composition. Apparently the manufacturer buys a port wine of average quality and adds a drop or two of malt extract, meat extract, or perhaps a minute quantity of quinine or other drug; he then by means of silver or gold paper decorations and an attractive label makes the liquor out to be a panacea for all the ills that flesh is heir to, raises the price to two or three hundred per cent. of its intrinsic value, and makes a very good thing out of it with very little benefit to the purchaser. But perhaps the worst aspect of this article is the ease with which alcohol can be consumed by all and sundry in the guise of medicine.

The regulations governing medicated and tonic wines are rather obscure. A medicated wine must contain a drug in such a proportion that at least a minimum pharmacopœal dose is contained in one ounce, whilst a tonic wine must contain some tonic substance not in *"excess of the quantity permitted under the Act."* The italics are mine, for this sentence seems meaningless as beef extract, for instance, is a tonic substance but is not regulated in quantity by any Act. Thus a quinine wine, if labelled medicated wine, must contain at least 20 grains of quinine per pint, but if labelled quinine tonic wine may have as little as 5 grains per pint and not more than 20 grains per pint. It may, however, be labelled tonic wine and comply with the regulation governing such substance at the same time being in conflict wth the regulation governing medicated wines.

Anomalies frequently crop up in the regulations, and it is a matter of extreme difficulty to avoid such during their framing. Thus boric acid is allowed in cream but not in ice cream, and since the latter must contain not less than 29 per cent. of the former, a permitted substance in one food becomes an adulteration in another derived one.

Uniformity of standards throughout the States of the Commonwealth is an object greatly to be desired, and two conferences of public analysts have been held, the first in 1911 and the second in 1923, in order to attain this object. Differences in local and climatic conditions, however, make it very difficult of achievement, and different administrations have varying ideas as to the importance of different articles of food.

I would like once more to suggest the value which might arise from a butter survey throughout the Commonwealth with a view to providing a legal Reichert-Meissl standard for Australian butter to guard against the sophistication of butter by foreign fats, the above test being of great value in detecting the same by revealing the low volatile fatty acid content of such adulterated articles.

Drugs.—No drugs of any kind were submitted by the Health Inspectors during the year for analysis. This either implies a wonderful confidence in our wholesale and retail chemists or else a regrettable lack of supervision upon one of the most important influences on the health of the community.

Spirits.—Twenty-five samples were examined for false trade description, or for being sold under the strength permitted by the Licensing Act. This number also includes two standard samples. Five out of seven samples for false trade description were not genuine, and eleven were below the required spirit strength.

The usual batch of standard samples came in too late to be analysed during the year and were transferred to the 1926 register, which makes the number of spirits analysed less than usual.

Beers and Stout.—Thirty-two samples were submitted, seven of which had salicylic acid in excess of that permitted. No other preservatives or foreign substances were discovered in the samples.

Chinese Liquors.—Eleven samples of Chinese liquor were submitted by the Police Department, by whom a charge of unlawfully selling liquor without a license was laid and sustained. Four of these were wines, and seven spirits. In some cases, whole lizards and other reptiles, together with herbs, were contained in the spirit to be consumed, testifying to the curious character of the Celestials' taste.

Oils.—Fifty-seven samples of oil were examined, the majority being for the Tender Board, for examination as to their suitability for general departmental use as lubricants.

Toxicological.—Seventy-seven samples were examined, a large increase on the previous year's samples, the majority of which were exhibits in connection with suicides.

During the first three months of the year this work was carried out by Mr. F. J. Malloch, Assistant Toxicologist, during my absence on long service leave.

In one case, a sample of vomit from a man who suspected his wife of slowly poisoning him, was forwarded in a tin. Tin was found in the exhibit. It should haraly be necessary to warn the persons responsible for forwarding such exhibits how necessary it is for the utmost care to be taken in regard to clean and incorrodable containers for all exhibits of such a nature.

An unusual poison detected during the year was sodium nitro-prusside.

A celebrated case during the year was that of a Chinese female found in the river, whose death was testified by the doctors who performed the autopsy as not being due to drowning. The stomach and contents were submitted for analysis, and as no clue was available a complete analysis was made during which all of the exhibit was used. Eventually a small quantity of an alkaloid, one-eighth of one grain, was isolated, which gave unmistakable reactions for strychnine. During the trial of one arrested for causing the woman's death, strong comment was made by the defending counsel that a portion of the viscera submitted had not been reserved for check analysis by an independent toxicologist. Such a question has never before been raised in this State, and it appears only right that if any such action is desirable in a similar case, the exhibits removed from the body should be divided and sealed by the medical officer or officers conducting the autopsy, and the second portions of the exhibit placed in some frozen chamber under the control of the Police.

While writing of the reports of autopsies it must be stated that the details supplied by medical officers are in many cases extremely meagre, although elaborate and carefully prepared advice letters are supplied to all centres for the use of medical officers. These forms contain the following queries:—

1. Signs and symptoms observed.
2. Food, drink, and medicine taken previous to development of symptoms.
3. Interval between food and (a) appearance of symptoms, (b) death.
4. If same food, etc., had been partaken of by any other persons, were any injurious results observed?
5. What drugs, if any, were administered by medical attendant, or others ?
6. Nature of poison suspected.
7. Post-mortem appearances.
8. Any further observations or information which may assist the analyst.

Of course in many cases the information cannot be supplied by the doctor directly, but inquiries can be made and the answers supplied more or less completely, thereby saving much time and useless work, to say nothing of the saving of the material supplied. In many cases a quick and direct search may be made for poisons thus indicated which otherwise might become decomposed and lost in a long and tedious general examination. Another procedure which should be avoided, but which occasionally occurs, is the dumping of a number of viscera into one receptacle and forwarding it "en bloc" to the toxicologist. On one occasion I had to take such an exhibit to a government medical officer to have them separated, labelled, and placed in different receptacles.

A remarkable feature in connection with a strychnine case was the extraordinary abnormality of some physiological effects of strychnine on frogs. One small frog received 1/588th of one grain of strychnine hydrochloride and showed no tetanic convulsions, whilst a large one received 1/35th of one grain and, although exhibiting marked characteristic convulsions, completely recovered. The poison was administered hypodermically into the abdominal tissue. Authorities declare than 1/5000th of a grain and less will give the usual physiological reactions with frogs.

C. E. STACY, A.A.C.I.,
Assistant Government Analyst and Toxicologist.

SECTION II.—MINERALOGY, MINERAL TECHNOLOGY, AND GEOCHEMISTRY.

(H. Bowley.)

During the year 1,550 samples were entered for examination by the mineral section, and the number of estimations made during the year totalled 3,665. The services of Mr. H. E. Hill, of the Food and Drug Section, were made available to this section for six months, but owing to the fact that I was absent for sixteen weeks on leave, and that a considerable amount of time was lost by other members of the staff of this section owing to sickness, it was only by a special effort and close application that the more urgent work was dealt with. It was found practically impossible to devote attention to anything but purely routine work, a fact to be very much regretted as it is highly desirable and advisable that a certain amount of research work into the chemical and physical properties of Western Australian minerals, about which much remains to be learnt, should be performed each year.

The arrears of work at the end of the year amounted to 149 samples, brought about mainly by the large number of examinations carried out for the State Mining Engineer's Branch under the Mines Development Act, in addition to which there were 524 samples of bore cores from Wiluna for gold assay, which were sampled and entered in our register the previous year. If the demand for work from this source is still to continue at the present rate (94 samples having been received during the first week of this year, 1926) extra assistance will have to be provided in order to cope with it, and so avoid any unnecessary delay in issuing the results, which in most cases are urgently required.

In addition to the above a considerable amount of my time has been devoted to attending to and advising prospectors in regard to mineral samples, also acting as deputy to the Government Mineralogist and Analyst during Mr. Stacey's absence early in the year. I was enabled at this time to make satisfactory arrangements with a local firm for the supply of pure chemicals for analytical work.

During the year I was appointed honorary secretary to the Commission des Produits Ceramiques under the International Union of Applied Chemistry, Australian National Committee, with Dr. E. S. Simpson as chairman; no doubt this section, and incidentally the State, must benefit considerably by this arrangement in regard to our knowledge of ceramic research.

Another important activity assumed by myself is that of joint honorary secretary to Section B (Chemistry) of the Australasian Association for the Advancement of Science for its meeting to be held in Perth in August next. This meeting of Australian scientists will be of great advantage in giving opportunities for an interchange of scientific thought and ideas, and at the same time interesting others in our local problems.

I have also been appointed as the representative of the Australian Chemical Institute on the State Advisory Committee on Paints, Paint Oils, Varnishes, and Enamels of the Australian Commonwealth Engineering Standards Association.

I devoted several days of my leave to examining the Alunite Deposit at Campion and assisting the finder in taking representative samples of the deposit for analysis by this Branch.

The following list shows the sources of the samples dealth with:—

Mines Department—	
Minister for Mines	7
State Mining Engineer	466
School of Mines	31
State Batteries	398
Geological Survey...	40
Royal Commission	12
Explosives	1
Mineral Laboratory	66
State Implement Works	2
Department of Works and Labour ...	6
W.A. Museum	3
Prospectors	419
Public Pay	99
	1,550

Classified as:—

Aluminium ore	15
Alunite	27
Antimony ore	3
Arsenic ore	2
Asbestos	2
Beryl	2
Building Material	6
Coal	8
Clay	22
Corundum	8
Copper ore	8
Felspar	9
Garnet	5
Gemstones	5
Glauconite	4
Gold ores	1,059
Graphite	8
Gypsum	8
Iron ore	38
Lead ore...	68
Limestone	14
Manganese ore	36
Meteorite	2
Metallurgical Product	11
Mica	11
Microphoto	23
Miscellaneous Minerals	42
Petroleum	2
Pigment	3
Platinum	2
Rock	33
Spinel	5
Silica, etc.	9
Sulphur ore	9
Tantalum ore	8
Titanium ore	13
Tin ore	2
Unclassified	19
	1,550

It will be noted that only eight gypsums and two mineral oils are shown in the above list, the decrease in numbers from previous years being due to the fact that the examination of the former has been transferred to the Agricultural Section, whilst the latter are now being handled by the Food and Drug Section.

Routine Work.—The majority of gold ores consisted of check samples for both the State Mining Engineer's and State Batteries Branches, whilst examination of a number of ores were made to determine the best method of treatment for the recovery of the valuable metals. This section was also called upon to check the value of the residues from the leading Kalgoorlie mines for the Royal Commission on Mining, also to check the residues from the pilot metallurgical plant at Kalgoorlie for the Director of the School of Mines. A number of rocks were submitted, during the previous year, by the Government Geologist for complete analysis, but owing to the rush of work these analyses could not be made until the present year; some of the results were published in the Geological Section of the Mines Report for 1924 just issued, and the remainder are shown hereunder.

A complete analysis of a representative sample of the ore met with in No. 2 Bore on the Gwalia Consolidated Group of Gold Mines, at Wiluna, made during the year, is also included in this report. A large number of minerals were examined during the year, and a description of the most interesting ones will be found hereunder.

ANALYSES OF THREE ROCKS FROM THE SOUTH-WEST DIVISION.

Lab. No.	1060/24.	1062/24.	1064/24.
Mark	1/3665.	1/3667.	1/3664.
Rock	Gneissic quartz epidiorite.	Lamprophyre.	Spicular Sandstone.
Analysis:	%	%	%
SiO_2	50·02	53·61	74·36*
Al_2O_3	12·98	13·56	11·33
Fe_2O_3	2·75	·69	2·29
FeO	12·16	4·84	Undetermined †
MnO	·29	·19	Trace
MgO	6·16	6·28	·95
CaO	10·13	7·49	·10
BaO	...	·27	...
Na_2O	2·04	2·18	·26
K_2O	·44	6·22	1·04
Li_2O	...	...	...
H_2O-	·03	·03	3·63
H_2O+	1·72	·65	5·84‡
TiO_2	1·42	1·20	·62
CO_2	·06	·43	·05
P_2O_5	·26	1·24	·06
FeS_2	·06	·98	·23
Cr_2O_3	...	·02	...
V_2O_3	...	·03	...
F	...	·37	...
ZrO_2	Present	Trace	Trace
B_2O_3	Present	*Nil*	*Nil*
	100·46	100·28	100·76
		O = F ·16	
		100·12	
Sp. Gr.	3·11	2·89	
Analyst	D. G. Murray.	D. G. Murray.	D. G. Murray.
Minerals noted:	Hornblende Andesine Quartz Sphene Zoisite Zircon Apatite Rutile Tourmaline	Biotite Augite Orthoclase Plagioclase Hornblende Quartz Apatite Sphene Calcite Rutile Zircon Ilmenite	Sponge spicules (Opal) Quartz Muscovite Kaolin Limonite Glauconite Biotite Chlorite Ilmenite Zircon

* Silica soluble in 5% NaOH solution, 41·77%, being opal silica of siliceous sponge spicules.

† Organic matter prevented the determination of this constituent.

‡ Includes a little organic matter.

1060/24—Gneissic quartz epidiorite. Loc. 426, Lower Palinup River.

1062/24—Lamprophyre. Reserve 10187, No. 2 Rabbit Proof Fence, Dilling, Avon District.

1064/24—Spicular Sandstone. Plantagenet Beds, Lower Palinup River.

GOLD ORE, WILUNA.

Analysis of typical Sulphide Ore (Metasomatic Dolerite Gwalia Consolidated Group of Gold Mines, Wiluna.

Lab. No. 1006.

No. 2 Bore. Depth 472′ — 478′

	%		
SiO_2	49·92	H_2O+	2·25
Al_2O_3	4·98	TiO_2	·48
Fe_2O_3	3·26	CO_2	9·46
FeO	7·04	P_2O_5	·08
MnO	·23	Fe	2·32
MgO	7·90	Cu	Trace
CaO	6·50	Sb	*Nil*
Na_2O	1·66	As	1·14
K_2O	·50	S	2·14
H_2O —	·28		
			100·14

Gold, 9 dwts. 21 grains per ton.

FeAsS, 2·48 per cent.; FeS_2, 3·09 per cent.

Analyst—D. G. Murray.

A series of samples from the three bores put down on the Gwalia Consolidated Group of Gold Mines was assayed for antimony, arsenic, and sulphur with the following results:—

No. 1 Bore:

Depth.	801′ 5″–814′	818′–852′	896′–904′	912′–940′
	%	%	%	%
Antimony	*Nil*	*Nil*	*Nil*	*Nil*
Arsenic	0·94	0·33	0·82	0·28
Sulphur	2·69	1·33	2·07	2·33
Pyrite	4·28	2·23	3·22	4·14
Arsenopyrite	2·04	0·72	1·77	0·60
Gold per ton	6 dwts. 3 grs.	7 grs.	5 dwts. 0 grs.	2 grs.

No. 2 Bore:

Depth.	400′ 2″–402′ 2″	406′ 2″–410′ 2″	434′–440′	442′–446′
	%	%	%	%
Antimony	*Nil*	*Nil*	*Nil*	*Nil*
Arsenic	0·95	0·41	0·56	1·62
Sulphur	2·49	0·96	1·72	3·28
Pyrite	3·89	1·46	2·77	4·82
Arsenopyrite	2·06	0·89	1·22	3·50
Gold per ton	2 ozs. 0 dwts. 23 grs.	10 ozs. 6 dwts. 19 grs.	5 dwts. 8 grs.	6 dwts. 12 grs.

No. 2 Bore:

Depth.	472′—478′	500′—508′	512′—522′
	%	%	%
Antimony	*Nil*	*Nil*	*Nil*
Arsenic	1·14	0·43	1·18
Sulphur	2·14	1·72	2·72
Pyrite	3·09	2·88	4·13
Arsenopyrite	2·47	0·93	2·56
Gold per ton	9dwts. 21grs.	3dwts 5grs.	4dwts 21grs.

No. 3 Bore:

Depth.	286′–288′	320′ 10″–326′ 10″	334′ 10″–350′
	%	%	%
Antimony	*Nil*	*Nil*	*Nil*
Arsenic	*Nil*	*Nil*	*Nil*
Sulphur	0·18	0·41	0·06
Pyrite	0·34	0·77	0·12
Arsenopyrite	*Nil*	*Nil*	*Nil*
Gold per ton	1oz. 2 dwts. 21 grs.	4dwts. 19grs.	6dwts. 14grs.

Depth.	358′–386′	498′–506′
	%	%
Antimony	*Nil*	*Nil*
Arsenic	0·03	0·39
Sulphur	1·13	1·28
Pyrite	2·10	2·09
Arsenopyrite	0·07	0·85
Gold per ton	1 dwt. 15 grs.	3 dwts. 21 grs.

QUARRY DUST.

A sample of fine dust from the Public Works Department's quarry and crushing plant at Boya, in the Darling Range, taken from that which had settled on a beam of timber, was examined in connection with the question of silicosis and miner's

phthisis. The stone crushed is a mixture of Darling Range granite and epidiorite of similar composition to the analyses quoted below:—

	Granite Mahogany Creek. %	Epidiorite Smith's Mill. %
SiO_2	73·36	50·96
Al_2O_3	13·88	11·89
Fe_2O_3	·84	2·54
FeO	·93	13·64
MnO	·15	·34
MgO	·51	6·26
CaO	1·69	9·94
Na_2O	3·22	2·68
K_2O	5·07	·29
H_2O —	·11	·16
H_2O + ...	·18	·05
TiO_2	·04	1·84
ZrO_2	Trace	...
CO_2	*Nil*	*Nil*
P_2O_5	·07	...
FeS_2	·05	...
BaO	·09	...
Total ...	100·19	100·59
Sp. Gr. ...	2·66	3·08
Analyst ...	A. J. Robertson.	E. S. Simpson.

Examination of Dust—Grading Tests.—The dust was first graded by sieving, yielding:—

	per cent.
Refuse 90 mesh	1·0
„ 200 mesh pass 90 mesh ...	9·2
pass 200 mesh ...	89·8
	100·0

The material passing 200 mesh was then graded by careful washing, yielding the following grades:—

	per cent.
Between 100 and 30 microns diameter— ...	57·47
„ 30 and 20 „ „ ...	13·11
„ 20 and 10 „ „ ...	5·39
Under 10	13·83
	89·80

That under 10 microns consisted mainly of particles under five microns diameter.

The dust consists of a mixture of fragments of granite and epidiorite, containing the following minerals:—quartz, felspar, hornblende, ilmenite, and traces of others.

An estimation of the insoluble alkalis present in the powder passing a 200 mesh screen gave:—

	per cent.
Soda, Na_2O	2·92
Potash, K_2O	3·30

This is equivalent to 44 per cent. of alkali felspars.

Chemical examination of particles less than 10 microns in diameter.—No accurate method appears to be available for the determination of free quartz in such a mineral complex.

A partial analysis of the separated particles under 10 microns in diameter gave the following figures:—

	per cent.
Silica, SiO_2	68·87
Alumina, Al_2O_3	16·73
Ferric oxide, Fe_2O_3	1·97
Ferrous oxide, FeO	1·17
Magnesia, MgO	·51
Lime, CaO	2·06
Soda, Na_2O	3·83
Potash, K_2O	3·67
	98·81

The minerals present being quartz, oligoclase, labradorite, microcline, hornblende, and ilmenite.

This material was then treated with fuming sulphuric acid to remove the soluble constituents and the separated silica from the attacked silicates in the residue was dissolved in soda solution, leaving 79.3 per cent. of unattacked minerals, which should include the whole of the free quartz as well as most of the felspars, etc.

A partial analysis of the residue gave the following figures after calculation to 100 per cent. of the material under 10 microns in diameter:—

	per cent.
Alumina Al_2O_3	10·36
Soda, Na_2O	3·27
Potash K_2O	2·62
Lime, CaO	·73
Ferrous oxide, FeO ...	·30
Magnesia, MgO	·12

The approximate mineral composition calculated from the above figure is:—

	per cent.
Quartz	31·0
Albite	27·6
Microcline	15·5
Anorthite	3·6
Hornblende	1·6
	79·3
Acid and soda soluble minerals	20·7
	100·0

The approximate proportion of free quartz in the dust of 10 microns diameter and under is therefore 31 per cent.

SAND LIME BUILDING BLOCKS.

Building blocks are being manufactured by calcining a local calcareous dune sand and mixing it with raw sand and water and moulding under pressure; some of these were submitted for chemical and physical examination.

Two types were examined, one being grey in colour and the other cream coloured.

Chemical Composition.—The raw calcareous sand, which is the chief raw material, had the following composition:—

Silica.	Alumina.	Iron oxide.	Lime.	Magnesia.
36·22	1·97	0·39	30·17	2·21

The total insoluble, which included the silica, was 39.21 per cent. The lime was equal to calcium carbonate 53.84 per cent. The magnesia was equal to magnesium carbonate 4.62 per cent.

This was an unusually fine-grained sand with grains of the following sizes:—

Over mm.	Over mm.	Over mm.	Over mm.	Over mm.	Under mm.
1	0·75	0·5	0·25	0·1	0·1
%	%	%	%	%	%
0·1	0·7	0·1	70·4	28·2	0·5

On burning, most of the calcium carbonate is converted into quick lime, and most of the silica remains unchanged, but a small proportion of both combine to form silicate of lime. The extent to which this desirable combination takes place is indicated by the figure for "combined silica" in the analyses of the two blocks.

Analyses of Blocks.

	Grey. %	Cream. %
Silica, free	33·84	51·66
Silica, combined ...	3·21	3·06
Iron oxide	·78	1·12
Alumina	1·05	3·17
Lime	33·97	22·97
Magnesia...	1·78	1·14
Carbonic acid and water	25·37	16·87
	100·00	100·00

The setting of such a block would be due to the hydration of the silicate of lime, a rapid process, and to the slow combination of the free lime and magnesia with the carbonic acid of the air. This process is not yet complete in either block, so that they may be expected to strengthen appreciably with time.

Absorption of Water.—The rapidity and extent to which building blocks of any description will absorb water is an important factor in determining their suitability for outside work. Other things being equal a block with the slowest and lowest total absorption will be the best. It is to be remembered that the rapidity of absorption depends not only upon the total pore space but still more upon the shape and size of the pores.

Comparisons under identical conditions were made between these blocks and pressed bricks from the State Brickworks and from a private kiln (Armadale). For determining rapidity of absorption a glass cylinder was luted to the face of the block with clay, and in each case 100 cc. of water (about 3½ ozs.) was poured on so as to give a maximum head of one inch over a circular area 2¼ inches in diameter. The length of time taken to absorb this water was as follows:—

SPEED OF ABSORPTION.

Block.	Face.	Time taken to absorb 100cc. water.
Sand lime, grey ...	Smooth face ...	Not complete after 30 hours.
Do.	Smooth cross fracture	One-third left after 24 hours.
Sand lime, cream ...	Smooth face ...	26 hours.
Do.	Smooth cross fracture	One quarter left after 24 hours.
Armadale pressed brick A	9 x 4 bed ...	30 minutes.
	9 x 3 face ...	40 minutes.
Armadale pressed brick B	do.	30 minutes.
State Brick Works pressed brick A	do.	2¼ minutes.
State Brick Works pressed brick B	do.	2½ minutes

The Sand Lime bricks therefore show great resistance to the penetration of water compared with local pressed bricks.

Total Porosity.

Block.	lbs. water absorbed per 100lb. brick.
Sand Lime Grey ...	12·5
Sand Lime Cream ...	13·5
S.B.W. Brick A ...	11
S.B.W., Brick B ...	13
Armadale Brick A ...	12
Armadale Brick B ...	12

N.B.—A standard London brick has a porosity not exceeding 9.

FULLER'S EARTH.

An examination of a white clay from two miles South of Bardoc indicated its suitability for use as a fuller's earth. The results of the investigation are as follows:—

General Description.—A pure white, hard compact clay, possessing a greasy feel and of a brittle nature, probably a kaolinised greenstone. It contains 1.37 per cent. of common salt which, when present in quantities exceeding one-third of one per cent., generally has a deleterious effect on clays when burnt at high temperatures.

Mechanical Analysis.—Washing tests showed the presence of the following constituents:—

	per cent.
Clay substance	73·08
Grit under 90 mesh	24·60
,, ,, 60 ,, ...	1·85
,, ,, 30 ,, ...	·47
,, over 30 ,, ...	*Nil*
	100·00

The grit consists mainly of sericite mica, iron hydrates and quartz.

Working Qualities.—The clay is easily ground and disintegrates readily in water; it is very smooth and sets to a firm strong body on air drying after moulding, but shows a strong tendency to crack and warp on air drying. It is highly plastic, the figure for plasticity obtained by Ashley's method is 318, which is that for fuller's earths.

Preliminary Burning Tests.—Briquettes were made of the clay after washing out the salt, and burnt at 1,050 degrees, 1,150 degrees, 1,250 degrees, and 1,350 degrees Centigrade in an assay muffle furnace, the duration of heat being about seven hours each.

Temperature.	Linear Shrinkage from air dry.	Porosity (Water absorbed).	Body, Colour, etc.
1050 ...	% 4·37	% 14·18	Good white, over steel hard, tough, fine smooth surface warped and cracked badly. Incipient vitrification
1150 ...	12·00	2·98	Cream, over steel hard, tough fine surface, warped and cracked badly. Advanced vitrification.
1250 ...	13·34	·09	Light grey, over steel hard, fine surface, warped and cracked badly. Complete vitrification.
1350 ...	13·17	·03	Light grey, over steel hard, fine surface, warped and cracked badly. Complete vitrification.

The shrinkage from wet plastic to air dry states observed in these tests was 18.1 per cent. Owing to the extreme cracking of the briquettes it was difficult to obtain exact figures for shrinkage and porosity.

This is a fuller's earth of a pure white colour, of excellent quality, and of a very fine grain containing 1.37 per cent. of common salt. Before it could be used for pottery purposes it would be necessary to remove the salt by washing, when owing to its high shrinkage and tendency to crack its uses in the pottery trade are limited; its main value would be as an addition in small quantities to a non-plastic clay to improve the strength and working qualities of the mixture.

A test of its capacity for decolorising and clarifying oils was found to be highly satisfactory; it may also be used to absorb grease in wool scouring.

Miscellaneous Mineral Notes.

Glauconite.—Four samples of glauconitic material were received from Quindalup, and are described hereunder:—

No. 556.—Sedimentary rock composed of siderite and glauconite.

No. 557.—Sediment composed of glauconite and kaolin with quartz and traces of felspar, garnet, ilmenite, and siderite.

No. 558.—"Greensand," a sediment composed of quartz and glauconite, with a little kaolin, and traces of felspar, garnet, zircon, pyrite, amphibole, epidote, kyanite, hypersthene, siderite, and rutile.

No. 2489.—Sediment composed of glauconite, kaolin, quartz, and limonite with a little felspar and ilmenite.

	556	557	558	2489
Acid soluble—	%	%	%	%
Phosphoric oxide, P_2O_5 ...	0·26	...	...	...
Potash, K_2O	1·86	4·20	2·22	2·12
Soda, Na_2O	·46	·22	·24	·14

Agate.—Specimens of agate from 30 miles East of Ilgarere consisted of two varieties, viz., carnelian-onyx and carnelian. The onyx is quite suitable for the cutting of cameos, the banding being regular and of parallel growth. The carnelian is associated with a core of quartz and goethite.

Fluorite.—Further samples of fluorite (fluorspar) have been received during the year, one from 80 miles south of Wyndham consisting of calcite, fluorite, galena, and quartz, with a limonite coating containing:—

Lead ...	...7·99 per cent.
Gold ...	... *Nil*
Silver ...	... 5 dwts. 2 grains per ton.

Peat.—A sample of peat from Maylands of an average value for fuel purposes, but low in nitrogen, gave the following figures on the air dried sample:—

	per cent.
Moisture	23·43
Volatile matter	43·66
Fixed carbon	26·51
Ash	6·40
	100·00
Nitrogen	0·95

Cacoxenite.—A sample of cacoxenite (hydrous phosphate of iron) in ironstone, which had been mistaken by the finder for gold, was received from seven miles north-east of Bowgada. The rock contained 0.39 per cent. of phosphorus pentoxide.

Spinel.—Further samples of spinel (variety ceylonite, magnesium iron spinel) associated with a little biotite mica, olivine, hypersthene, chlorite, talc, apatite, magnetite, and ilmenite from West Pilbara were examined during the year. An analysis of this mineral is published in the annual report for 1923.

Bauxite.—Two samples of bauxite (aluminium ore) from Boddington gave 35.36 per cent. and 35.72 per cent. of alumina soluble in 5 per cent. caustic soda solution.

Tantalite.—Interest has been revived in the tantalum ores of the Pilbara district; analyses of six samples gave the following figures:—

	1482.	1986.	1987.	1988.	1989.	1990.
	%	%	%	%	%	%
Tantalic oxide ...	25·98	36·6	15·12	23·38	50·9	49·0
Niobic oxide ...	57·14	28·6			27·5	25·9
Tin	...	12·93	53·89	51·63	3·14	4·79

1,482 was from Mt. Francisco, the others from Tabba Tabba.

Cobattiferous Bornite (Sulphide of copper and iron with cobalt), Surprise Lead Mine, Galena. This specimen consisted of an unusual type of bornite containing cobalt, associated with some chalcocite (copper sulphide), smithsonite (zinc carbonate), and cerussite (lead carbonate).

Phosphor-Bronze for Meter Parts.—At the request of the Manager of the State Implement Works a series of bronzes used for water meters were examined, and a specification for phosphor-bronze for that purpose was laid down.

H. BOWLEY, A.A.C.I.,
Senior Mineralogist and Chemist.

15th January, 1926.

SECTION III.—AGRICULTURE, WATER AND SEWERAGE.

(A. J. HOARE.)

The staff of the Agricultural section was short-handed until Mr. E. C. Orton, B.Sc., joined in August.

The samples received for analyses during the year totalled 586, and were received from the following sources:—

Agricultural Department...	192
Metropolitan Water Supply and Sewerage	63
Department of Works and Labour ...	41
Lands Department	2
Health Department	5
Department of the North-West	9
Mines Department	3
State Saw Mills Department	2
State Hotels	2
Geological Survey...	1
Premier's Department	1
Royal Agricultural Society	17
Perth Public Hospital	3
W.A. Museum	1
Commonwealth Meteorological Bureau...	70
Chemical Laboratory	9
Public Pay...	142
Public Free	23
Total	586

Samples were classified under the following heads:—

Soils	48
Fertilizers	104
Wheats	28
Flours	34
Waters	265
Limes and Limestones	4
Sewage	38
Fungicides	15
Fodders	17
Salt	3
Gypsum	16
Felspar	3
Bauxites	2
Miscellaneous	9
Total	586

Soils.—At the request of this Department, the officers in the fruit, wheat, and potato sections of the Agricultural Department collected samples of typical soils from different parts of the State proved to be fertile in regard to the particular crop grown. This, it is hoped, is the beginning of a more complete soil survey of Western Australia. Twelve samples have been received up to date, and their analyses are given below:—

Lab. Nos.	214 Surface.	215 Subsoil.	216 Surface.	217 Subsoil.
Roots	Trace	Trace	*Nil*	*Nil*
Stones	*Nil*	*Nil*	*Nil*	*Nil*
Fine soil	100%	100%	100%	100%
pH of 10% suspension	6·2	6·4	6·0	6·0
Reaction	Faintly acid	Faintly acid.	Faintly acid	Faintly acid
On steam-dried sample—				
	%	%	%	%
Loss on ignition	37·44	31·86	64·11	75·85
Residue after ignition	62·56	68·14	35·89	24·15
Organic Carbon	16·35	13·84	24·41	23·45
Nitrogen	·854	·770	1·580	1·500
Lime as carbonate	·550	·421	·233	·127
Lime as sulphate, etc.	·490	·154	1·490	1·247
Hydrochloric acid soluble potash	·075	·056	·246	·129
Hydrochloric acid sol. phosphoric oxide	1·077	·990	·163	·125
Available * potash	·041	·018	·128	·050
Available phos. oxide	·023	·006	·029	·062
Total, water sol. salts (after gentle ignition)	·180	·136	·614	·524
Sodium chloride calculated from chlorine	·086	·089	·165	·148
Mechanical analysis of residue after ignition—				
Sand grade	17·9	21·7	28·5	27·5
Silt grade	59·6	63·4	34·0	35·1
Clay grade	22·5	14·9	37·5	37·4
Soil apparent Sp. gr.	·97	·98	·73	·62
Colour (wet)	Black	Black	Black	Black
Description	fine sandy peat	fine sandy peat	fine sandy peat	fine sandy peat
	Analyst: B. L. Southern.		Analyst: R. G. Lapsley.	

* Soluble in 1 per cent. citric acid.

Nos. 214, 215, 216 and 217.—Four market garden soils from Osborne Park, typical swamp soils, the first two being potato soils, and the other tomato and celery soils.

Lab. Nos.	1633 Surface.	1634 Subsoil.	326 Surface.	327 Subsoil.
Roots	*Nil*	*Nil*	*Nil*	*Nil*
Stones	*Nil*	4	51·	67·
Fine soil	100	96	49·	33·
(pH of 10% suspension)	7·9	7·8	6·6	6·6
Reaction	Faintly alkaline	Faintly alkaline	Neutral	Neutral
On steam-dried sample—				
	%	%	%	%
Loss on ignition	7·27	7·29	13·63	11·07
Residue after ignition	92·73	92·71	86·37	88·93
Organic Carbon	·775	·559	3·24	2·39
Nitrogen	·045	·073	·207	·095
Lime as carbonate	·153	·879	·204	·106
Lime as sulphate, etc.	·055	·649	·066	·061
Hydrochloric acid soluble potash	·392	·470	·095	·074
Hydrochloric acid sol. phos. oxide	·024	·021	·086	·045
Available* potash	·017	·014	·023	·023
Available phos. oxide	Trace	Trace	·017	·009
Total, water sol. salts (after gentle ignition)	·296	·470	·120	·130
Sodium chloride calculated from chlorine	·148	·221	·025	·043
Mechanical analysis on steam-dried sample—				
	%	%	%	%
Sand grade	24·8	21·0	43·9	34·2
Silt grade	32·9	33·9	47·6	51·0
Clay grade	42·3	45·1	8·5	14·8
Soil apparent Sp. gr.	1·26	1·28	1·31	1·27
Colour (wet)	brown	light brown	chocolate	light brown
Description	clay loam	clay loam	very sandy loam	sandy loam
	Analyst: B. L. Southern.		Analyst: A. J. Hoare.	

* Soluble in 1 per cent. citric acid.

Nos. 1633 and 1634.—Soils from Merredin experimental farm, typical salmon gum and gimlet country in the virgin state, known to be good wheat growing soil.—Nos. 326 and 327.—Very gravelly soils from a stone fruit orchard near Armadale.

Lab. No.	2147 Surface.	2148 Subsoil.	2554 Surface.	2555 Subsoil.
Roots	Trace	Trace	*Nil*	*Nil*
Stones	7·7	4·0	3·8	4·8
Fine soil	92·3	96·0	96·2	95·2
(pH of 10 % suspension)	6·1	6·1	6·5	6·4
Reaction	Faintly acid	Faintly acid	Faintly acid	Faintly acid
On steam-dried sample—				
	%	%	%	%
Loss in ignition	14·34	9·90	6·29	6·10
Residue after ignition	85·66	90·10	93·71	93·90
Organic carbon	3·30	1·43	1·688	·859
Nitrogen	·134	·073	·074	·050
Lime as carbonate	·136	·083	·104	·041
Lime as sulphate	*Nil*	*Nil*	·112	·101
Excess CO_2	·103	·065	...	...
Hydrochloric acid sol. potash	·055	·044	·157	·137
Hydrochloric acid sol. phos. oxide	·089	·066	·070	·064
Available* potash	·024	·015	·011	·007
Available phos. oxide	·046	·023	·002	·003
Total, water sol. salts (after gentle ignition)	·105	·078	·089	·081
Sodium chloride calc. from chlorine	·043	·036	·020	·046
Mechanical analysis on steam-dried sample—				
	%	%	%	%
Sand grade	36·30	31·60	28·1	27·6
Silt grade	44·40	36·60	42·5	34·5
Clay grade	19·30	31·80	29·4	37·9
Soil apparent Sp. gr.	1·26	1·05	1·38	1·39
Color (wet)	chocolate	red brown	chocolate	brown
Description	sandy loam	sandy loam	clay loam	clay loam
	Analyst: J. Pericles.		Analyst: E. C. Orton.	

* Soluble in 1 per cent. citric acid solution.

Nos. 2147 and 2148.—Typical citrus soils from Carmel, the premier orange growing centre. Nos. 2554 and 2555.—Typical citrus soils from Lower Chittering.

Denmark.—Two soil samples received from the Dairy Expert. Although this land looks rich, the crops have been a failure for the past two years. The acidity and salinity of these soils would probably explain the lack of fertility.

Analyses on steam-dried sample—	1485 Surface.	1486 Subsoil.
	%	%
Loss on ignition	18·83	12·96
Residue after ignition	81·17	87·04
Organic carbon	10·52	7·57
Nitrogen	·370	·235
Lime as carbonate	·022	·015
Lime as sulphate, etc.	·264	·134
Hydrochloric acid sol. potash ...	·120	·092
Hydrochloric acid sol. phos. oxide	·045	·044
Total water soluble salts (ignited dull red) ...	·130	·092
Sodium chloride calculated from chlorine	·080	·060
pH on 10 per cent. suspension...	4·6	4·6
Reaction	weakly acid	weakly acid
Description	black sand	black sand

Analyst: J. Pericles.

Fertilisers.—There has been an increase in the number of fertilisers received this year over last year. Of the total number received about 80 are from the Agricultural Department, the majority of which are of local manufacture. The general physical condition was good and in most cases the analysis was above the guarantee.

Fungicides.—The following table gives the analyses of some of the basic copper carbonates on the local market used in dry pickling of wheat to control smut:—

Lab. Nos.	Chemical examination.		Physical examination.	
	Copper Cu.	Equivalent to basic copper carbonate. $CuCO_3$. $Cu(OH)_2$.	Portion retained by 200 mesh sieve after flocculation with water.	Density expressed in lbs. per cubic foot.
	%	%	%	%
549	46·48	80·85	43·6	63·2
550	50·04	87·04	·6	58·5
551	51·08	88·85	17·5	61·0
552	49·88	86·75	5·15	76·9
553	49·76	86·55	7·2	68·1
554	53·48	93·02	8·3	72·2

Sulphates were the principal impurities.

Analyst:—B. L. Southern.

Waters.—The samples of water received this year show an increase of 74 over last year, a fair proportion of the samples being for stock and irrigation purposes. In some cases these were too saline and unfit for stock or irrigation, the extreme limit for cyclic salts being taken in the Department at 450 grains per gallon for horses, 700 grains per gallon for cattle, and 900 grains per gallon for sheep. For irrigation 150 grains per gallon of dissolved salts has usually been looked upon as the extreme limit, except in a climate where the rainfall is very high and the ground exceptionally well drained.

Quarterly hygienic analyses of the waters supplied for metropolitan use are now made, and a complete chemical analysis every month of one of the supplies in rotation. Samples of rain water to be tested for salinity have been received during the year; these are in connection with a Commonwealth rain survey; the samples tested in this laboratory were received from Condon, Mundiwindi, Wiluna, Esperance, and Perth, the highest figure for chlorine so far coming from Perth—99.7 parts per million.

A water sent in from a deep bore at the Old Men's Home, Claremont, is reputed to have a beneficial effect on persons suffering from rheumatism. The subjoined table gives the chemical and spectroscopic analysis.

Lab. No. 1515/25.

	Parts per cent.	Grains per gal.
Silica, SiO_2	*Nil*	...
Iron and aluminium oxides, Al_2O_3 Fe_2O_3	0·0001	0·07
Calcium carbonate, $CaCO_3$ ...	·0080	5·60
Magnesium carbonate, $MgCO_3$ ...	·0035	2·45
Sodium carbonate, Na_2CO_3 ...	·0044	3·08
Potassium sulphate, K_2SO_4 ...	·0029	2·03
Sodium sulphate, Na_2SO_4 ...	·0009	·63
Sodium nitrate, $NaNO_3$	·0004	·28
Sodium chloride, NaCl	·0829	58·03
	0·1031	72·17

Reaction, pH 7·8—faintly alkaline.
Analyst:—B. L. Southern.

A spectroscopic examination showed the presence of traces of lithium with small traces of strontium and barium.

An interesting mine water was received from the St. Ives Victory gold mine, which on pumping yields water at the rate of 150,000 gallons per day.

Lab. No. 2932/25.

	Grms. per 100 ccs.	Grns. per gallon
Calcium carbonate	0·012	8·4
Calcium sulphate	·397	277·9
Magnesium sulphate	2·145	1501·5
Sodium nitrite	Trace	Trace
Sodium nitrate	·002	1·4
Magnesium chloride	3·299	2309·3
Potassium chloride	·141	98·7
Sodium chloride	17·026	11918·2
Silica	·001	·7
Iron and aluminium oxides ...	·001	·7
Total	23·024	16116·8

Analyst:—J. Pericles.

Sewage.—The number of samples received from the Perth treatment works and from Fremantle shows a large decrease when compared with last year, a difference of over 300 samples. A sewage treatment works should be under chemical control, and it would appear advisable that samples should be taken at regular and frequent intervals, and not every three or four months as at present.

Fodders.—Two samples of subterranean clover were received, one from a manured plot and the other from an unmanured plot. The following table shows the marked superiority in nutritional value of the clover from the manured plot:—

	Air-dry samples, handpicked	
Lab. Nos.	2987 No. 1 Unmanured	2988 No. 2 Manured
	%	%
Moisture	8·49	9·16
Ether extract (sulphuric ether)	1·94	4·20
Carbohydrates (non-nitrogenous extract)	29·37	42·95
Protein (N x 6·25)	15·40	19·08
Crude fibre	31·57	14·12
Ash	13·23	10·49
Total	100·00	100·00

Analysis of Ash—

	In ash.	Original sample.	In ash.	Original sample.
	%	%	%	%
Potash, K_2O	2·40	0·32	3·62	0·38
Phosphoric acid, P_2O_5 ...	1·94	·26	4·62	·48
Lime, CaO	11·56	1·53	16·60	1·74
Unit Values—(Guthrie's basis)	49·13		71·48	

Analyst: R. G. Lapsley.

Included in the fodder totals are 6 brans and 6 pollards received from the Agricultural Department and taken from well-known mills in the State. These were taken with the idea of trying to fix a standard for mill offal.

Wheat and Flour investigation.—The wheat milling and flour investigations were carried out by Mr. R. G. Lapsley, B.Sc., Agr., A.A.C.I., who has supplied the following notes:—

The wheat samples submitted for the milling test totalled 22, of which 17 were from the Royal Agricultural Society in connection with their annual wheat competition. Five others were milled and reported on for the Agricultural Department. Six varieties of wheat, including the year's F.A.Q., were submitted by the Agricultural Department for chemical analyses.

The flour samples totalled 34, of which the Agricultural Department submitted 20, the balance being from private sources.

The Royal Agricultural Society's Wheat Exhibits.—The total number of entries received this year was 17. The judging was carried out as in previous years, the bushel weight being first taken, and after careful inspection of the exhibits in order to select the best, four were rejected. The remainder were milled in the experimental mill, and prizes were finally awarded according to points assigned for the milling characteristics. The champion prize was awarded to exhibit No. 1, a magnificent sample of Florence from Kellerberrin, which was nearly equalled by exhibit No. 2, a fine sample of Comeback also from Kellerberrin. The Comeback variety in this competition was outclassed on account of its failure to produce as large a percentage of flour as usual.

The judges appointed for the competition this year were:—

Mr. G. L. Sutton, Director of Agriculture.

Mr. E. W. Wilson, miller to the Peerless Roller Flour Milling Co.

Mr. R. G. Lapsley, B.Sc.Agr., Senior Chemist and Miller, Agricultural Section.

The list of prize winners and tabulated results are given on page 176.

Wheat and Flour investigations for the Agricultural Department.—Five samples of wheat were submitted from the Chapman State farm in connection with comparative stud variety trials. These were milled and examined for their comparative milling qualities. Five samples of our local wheat varieties and one of the year's F.A.Q. wheat were submitted during the year for information regarding their comparative nutritional qualities.

Twenty samples of flour were received, 10 of which were for comparative strength tests of Commonwealth flours. The tests were carried out in five States and the results tabulated. Owing to the different methods and manipulation used in each State, the figures were found difficult to compare. Further research in this direction is plainly necessary. The testing in this State was carried out by Messrs. Lapsley and Southern of this section.

A. J. HOARE, A.A.C.I.

WHEATS FOR MILLING FOR THE ROYAL AGRICULTURAL SOCIETY'S SHOW, 1925.

Lab. No.	Zone.	Class.	Variety.	Sample. No.	Rain-fall.	Percentage of Products.				Percentage of Gluten.			Flour strength—Qts. of water per 200lbs.		Colour Marks.	Total Marks.	Bushel Wgt.	Pounds weight of bread per ton of wheat.	Prizes.	Exibitor.
						Flour.	Bran.	Pol-lard.	Marks.	Moist.	Dry.	Marks.	Strength.	Marks.						
					inches.															
1968	1	Soft 1	Florence ...	1	7·45	73·2	18·5	8·3	36·0	48·07	16·34	4·75	50·0	37·50	4	82·25	65½	2369	1st prize and Champion	J. Deane Hammond.
1980	...	...	Nabawa ...	13	...	72·4	18·2	9·4	34·0	40·15	14·40	4·25	46·8	33·50	4	75·75	64	2285	2nd prize ...	J. Lethlean.
1983	...	...	Nabawa ...	16	...	70·1	20·8	9·1	27·25	36·68	12·62	3·75	45·0	31·25	5	67·25	65	2181	3rd prize ...	S. A. Brown.
1970	2	Soft	Nabawa ...	3	11·60	70·7	20·5	8·8	28·75	36·93	12·38	3·75	46·0	32·50	5	70·00	62½	2217	3rd prize ...	R. R. B. Achland.
1972	...	2	Florence ...	5	9·00	70·3	20·9	8·8	27·75	33·21	11·05	3·50	50·4	38·00	4·5	73·75	64½	2282	1st prize ...	J. M. Carroll.
2145	...	...	Minister ...	17	8·00	70·1	21·1	8·8	27·25	24·07	8·25	2·75	50·0	37·50	4·5	72·00	64½	2268	2nd prize ...	R. F. Baxter & Sons.
1976	3	Soft	Bald Early ...	9	12·00	67·6	22·8	9·6	21·00	24·89	8·84	2·75	44·8	31·00	5	59·75	63	2099	3rd prize ...	W. Ford.
1977	...	3	Dollar ...	10	14·00	67·6	22·9	9·5	21·00	14·98	5·28	2·00	48·0	35·00	4	62·00	62	2153	2nd prize ...	do.
1978	...	...	Niloc ...	11	15·00	69·3	21·8	8·9	25·25	25·14	8·71	2·75	50·0	37·50	4·5	70·00	63¼	2242	1st prize ...	do.
1969	1	Strong	Comeback ...	2	7·45	70·9	20·7	8·4	29·25	46·98	17·46	5·0	53·2	41·50	4·5	80·25	66½	2350	1st prize ...	J. Deane Hammond.
1975	...	4	Comeback ...	8	...	68·4	23·0	8·6	23·00	38·04	14·22	4·25	52·6	40·75	5	73·00	65½	2257	2nd prize ...	Hughes Bros.
1973	2	Strong	Carrabin ...	6	12·00	68·7	21·3	10·0	23·75	40·67	14·57	4·25	52·4	40·50	4·5	73·00	65	2264	2nd prize ...	J. K. Hebiton.
1974	...	5	Comeback ...	7	12·00	71·2	20·5	8·3	30·00	39·41	14·51	4·25	51·6	39·50	5	78·75	66	2332	1st prize ...	do.
...	3	6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	No exhibitor.

Appendix I.

THE OCCURRENCE OF COMMON AND PRECIOUS BERYL AT POONA.

By E. S. SIMPSON, Government Mineralogist.

In June of this year I was able to spend three days at Poona in company with Mr. R. C. Wilson and Mines Inspector Deeble, and during that time to visit most of the mine workings on the field. The only person working on the field during our visit was Mr. A. Oliver, and the only mineral holding still remaining unforfeited was his P.A. 1486.

The field was geologically mapped by H. P. Woodward in 1912, about the time that beryl was first discovered. His map has been published in Geological Survey Bulletin 57, and is an invaluable aid to any inspection of the field after one has plotted upon it the later mineral leases and prospecting areas. In this Bulletin also are some mineral notes by the present writer.

The mineral-bearing area is about four miles long in a northwesterly direction by two miles wide, and comprises deposits of both tin and beryl, the first mining operations being confined to the former. It is an area of Archæan greenstones surrounded by granite, and invaded by tongues of the same rock and of its characteristic effusive pegmatites. The greenstone for the most part is a more or less foliated fine-grained amphibolite, which often forms extremely rough outcrops resembling a series of parallel saw blades with the teeth uppermost. Alongside many of the pegmatites it is highly metamorphosed, having absorbed potash, water and fluorine from the magmatic waters travelling along the pegmatite fissures. The result is a biotite schist, which is of economic importance, and will be referred to later.

The main mass of the granite and the larger tongues of it on the eastern end of the field are of rather fine grain with porphyritic crystals of microcline somewhat frequent. These tongues reach up to 10 chains or more in width.

Probably genetically associated with this granite are a large number of major pegmatite veins from one foot to 20 feet in width. These veins are composed largely of quartz, albite*(?), and microcline in coarse individuals. The centres of them, where wide, are often occupied by large lenses of pure quartz, which, owing to their superior resistance to weathering, have most conspicuous outcrops, and by their disintegration cover the slopes of the hills over many acres with large angular white quartz boulders Micas are not prominent constituents of the veins, but muscovite was noticed in several places in scales up to about one inch in diameter, usually on the outer margins of the veins. On Oliver's P.A. 1486 lepidolite is rather common in small pink scales on the margin of one of the veins, and Montgomery noted it in other veins. On M.L. 45 (Mt. Ryan Reward), a peculiar spheroidal mica was observed in one part of a pegmatite vein.

These major pegmatites sometimes carry cassiterite, but are usually devoid of beryl. In M.L. 45, however, cloudy green beryl is very plentiful, usually intergrown with a coarsey lamellar white felspar of unusual composition corresponding to a potassic oligoclase (K_2O, 3.30 per cent; Na_2O, 5.08 per cent.; CaO. 6.55 per cent.). The beryl is also found embedded in a central lens of pure quartz. The individual fragments of beryl seen ranged from about one quarter of an inch in length and diameter up to 10 times that size. The largest beryl crystal recorded from Poona was a little over three inches long and nearly two inches in diameter. Most of the individual crystals are much smaller than this, though they are found sometimes in aggregates somewhat larger. In the pure quartz the crystals are more perfectly developed, prisms often reaching several inches in length but always remaining slender.

Branching from these major pegmatites are much smaller ones seldom more than six inches wide and of no great length, passing in places into discontinuous strings of small lenses of white felspar, quartz, or beryl. Such veins are often composed wholly of felspar or of a mixture of felspar and beryl, the latter seldom more than one inch in length. They are important carriers of beryl at all four localities on the field where this mineral is prominent, viz.: (1) the vicinity of M.L. 37, Nil simile; (2) the area covered by M.Ls. 45 and 51; (3) the vicinity of M.L. 49, Goondawa; and (4) on M.L. 73, Tina, which is amongst the eastern breakaways. Further, they are accompanied by nests and isolated crystals of beryl in the biotite schists which flank them, and such beryl, whilst at times almost milk white, ranges through all degrees of translucency and all tints of paler greens up to strong greens approximating Ridgway's emerald green (35) and vivid green (37). Beryl of such colours when transparent and almost or quite free from cracks and other flaws constitutes the very valuable gem known as emerald. The biotite schists therefore in the four localities above mentioned have been opened up by numerous costeens and shafts to a depth of nearly 100 feet in search of emeralds, a search which has been rewarded by quite a number of small gems of varying tints and by a few of high value, notably one sold in London for £120 which was found in biotite schist on M.L. 49. The total value of gems hitherto found on the Poona field, however, would not exceed £500.

The field is now practically abandoned. Green beryl not of gem quality but suitable for potters and alloy makers could be obtained in some hundredweights from the larger and smaller pegmatite veins, but not probably in larger quantities, owing to the small size of the individual crystals (almost always much less than one ounce in weight), and the inapplicability of gravity concentration to their recovery, beryl having a density very close to that of quartz and felspar. Some semi-precious bright green beryl has been analysed with the following results:—

SiO_2	BeO	MnO	MgO	CaO	Li_2O	Na_2O	K_2O	H_2O +	Al_2O_3	Fe_2O_3	Cr_2O_3
64·40	14·28	·19	·52	·16	tr.	·48	·14	1·60	18·03	·50	·23

Total 100·53—D.2·69.

If a further search for precious emerald is to be made prospecting should be confined to the bands of biotite schist on either side of the pegmatite veins, as it is only in these that transparent rich green beryl has been found in the past. The vicinity of M.L. 49 (Goondawa) and of M.L. 73 (Tina) are the most favourable spots known at present. There are many other places, however, where bands of biotite schist are associated with pegmatites, and these should therefore be worth a preliminary examination to determine whether or not they contain beryl of any kind. If they do, further prospecting on them is justified.

Perth, 1st December, 1925.

*A white plagioclase with polysynthetic twinning which has not yet been analysed. It may be albite or potassic oligoclase, *vide supra*.

Appendix II.

SEDIMENTARY ALUNITE AT CAMPION.

By E. S. SIMPSON, Government Mineralogist.

In April, 1925, Mr. J. Chandler, of Campion (an agricultural district on the north side of Lake Brown, 20 miles north of Burracoppin), submitted samples of fine mud from the bed of a small salt lake for mineral examination. This and subsequent samples were found to consist of a mixture of 50 per cent. or more of alunite, wtih quartz, kaolin, mica, felspar, salt, gypsum, and organic matter.

A letter received early in August from Mr. Chandler stated that the material occurred in large quantities at the surface, and as a reward claim has been applied for, I accompanied the Government Geologist to the locality to inspect the deposit. Hitherto alunite has only been found in solid veins or concretionary masses where large bodies of sulphides were in process of decomposition, or in rocks exposed to the sulphurous exhalations of active or recently extinct volcanoes. The present deposit is of an entirely novel character, the alunite being in the form of a very fine powder intermixed with kaolin and fine sand forming the bed of two salt clay pans (salinas) identical in outward appearance with thousands of others occurring through the interior of the State. There are no rock outcrops in the immediate vicinity, the surrounding country consisting of undulating brown clay, heavily timbered and partly cleared for wheat growing. Between the two clay pans and to the northward are ridges of loose seed and powdery gypsum. The pans form part of the long string of similar pans or "lakes" known as Lake Brown. About 1½ miles west, on the opposite side of the lake country, are some low outcrops of granite gneiss and other foliated rocks, in which Mr. H. Bowley has observed a quartz reef studded with cubical cavities representing weathered pyrite crystals. So far this is the only known source from which the sulphuric acid could have come which is required for the formation of alunite.

The eastern and smaller lake appears to be the richer of the two. Its position is shown on Lands Plan 35/80 immediately west of Block 15985. It covers an area of about 30 acres.

The deposit has been tested to a maximum depth of four feet, of which only the top 9 to 15 inches is likely to be of any economic value. The richer surface material, like a fine grey mud in appearance, passes rapidly downwards into a more sandy mixture much lower in alunite. This was well shown by a trial hole in the middle of the lake which yielded the following material:—

Position.	Surface to 14″	14″ to 26″.	26″ to 42″.	Below 42″.
	%	%	%	%
Insoluble SO_3 ...	28·70	11·04	11·15	10·88
Alunite	73·90	28·38	28·64	28·03
Potash in alunite ...	7·60	2·92	2·95	2·88

A series of samples of the fine top layer taken over the surface of the small lake gave the following results:—

No.	Position.	Thickness, inches	Insol. SO_3	Alunite.	Potash.
			%	%	%
1	N.E. corner ...	8	27·82	69·0	7·15
2	N. side, towards W.	8	25·43	63·0	6·78
3	Middle of E. side ...	6	20·95	53·9	5·55
4	20 yds. W. of 3 ...	8	27·42	70·6	7·26
5	20 yds. W. of 4 ...	10	27·47	70·7	7·27
6	20 yds. W. of 5 ...	10	26·20	67·4	6·94
7	Centre	14	28·70	73·9	7·60
8	10 yds. from S. end	4	14·09	36·3	3·73
9	20 yds. N. of 8 ...	7	26·50	68·3	7·02
10	20 yds. N. of 9 ...	11	25·93	66·8	6·87
11	10 yds. E. of middle of W. side ...	7	27·17	69·9	7·19
12	20 yds. E. of 11 ...	8	27·77	71·4	7·35
13	20 yds. E. of 12 ...	15	28·16	72·5	7·46

In all these samples the chief impurity was fine-grained quartz.

It is estimated that the lake to an average depth of 9 inches contains 45,000 tons of alunite averaging 7 per cent. of potash. The ore is fine grained and quite incoherent when wet, but dries to a hard mud.

A complete analysis was made of sample No. 2, from the north end of the lake, after thorough washing with distilled water until all traces of salt, gypsum, and other soluble salts had been removed. The results obtained were:—

Washed Alunite Campion.

H_2O+	K_2O	Na_2O	Al_2O_3	SO_3	Fe_2O_3	CaO
(9·63)	7·68	·46	26·29	26·87	1·99	·13

MgO	SiO_2	TiO_2	Organic	H_2O-	Total.
·35	22·48	·19	3·01	·92	100·00

About 20 of the 22 parts per cent. of SiO_2 are present as quartz, the balance as muscovite and kaolin.

The only sample collected from the larger lake, on its east side, was found to carry:—

K_2O	Na_2O	SO_3	Cl	CaO	MgO
5·47	2·31	14·58	1·32	·18	·16

These figures include both soluble and insoluble constituents.

The gypsum occurring in large quantities as ridges to the north of the small lake was found to have the following composition:—

Variety.	"Kopi."	"Seed."
	%	%
Insoluble in acid	8·58	2·42
Water soluble, CaO	28·06	28·36
Equal to gypsum, $CaSO_4$, $2H_2O$	86·14	87·07
Acid soluble CaO	1·58	3·52
Equal to calcite, $CaCO_3$ ...	2·82	6·28
Salt, NaCl	·08	·02

The "kopi" yielded a plaster which was dirty grey in colour and refused to set hard. The "seed" gypsum yielded a pinkish plaster which set hard in two hours.

Perth, 14th December, 1925.

DIVISION VIII.

REPORT OF THE CHIEF INSPECTOR OF EXPLOSIVES FOR THE YEAR, 1925.

The Under Secretary for Mines.

I have the honour to submit for the information of the Hon. the Minister for Mines, in compliance with Section 45 of "The Explosives Act, 1895," a report on the work of the Department during the year 1925.

The following table shows the quantity of explosives imported into the State during the year:—

TABLE I.

Importation of Explosives into Western Australia during 1925.

	Quantity lbs.
Gelignite	893,650
Gelatine Dynamite	234,500
Blasting Gelatine	84,350
Permitted Explosives	7,500
Blasting Powder	130,000
Pellet Powder	100,000
Fuse (Coils)	335,880
Detonators (number)	2,756,000

Table No. II. gives particulars with regard to quantities of the different classes of explosives imported into the State during the past five years:—

TABLE II

Comparison of Explosives imported into Western Australia during the past five years.

	1921.	1922.	1923.	1924.	1925.
	lbs.	lbs.	lbs.	lbs.	lbs.
Gelignite	375,325	520,000	997,000	1,439,000	893,650
Gelatine Dynamite	75,000	110,200	165,000	282,000	234,500
Blasting Gelatine	25,100	60,850	30,000	91,250	84,350
Permitted Explosives	...	65,000	2,500	50,000	7,500
Powder, Blasting	25,000	95,000	180,000	148,750	730,000
Powder, Sporting	...	700	...	...	...
Fuse (Coils)	4,500	213,600	368,640	365,400	335,880
Detonators (No.)	...	...	1,150,000	3,000,000	2,756,000

From this table it will be seen that there has been a fairly marked falling off in the imports of high explosives and an increase in the quantity of blasting powder imported during the year, when compared with the year 1924.

The reduced imports of explosives of the nitro compound class may be accounted for by the fact that a large shipment of this class of explosives arrived late in 1924, and the stocks therefore in the magazines were heavy at the beginning of the year.

SHIPMENTS OF EXPLOSIVES.

There arrived at Fremantle, during the year under review, five ships having on board consignments of explosives for this State, and two ships with consignments for the Eastern States. The explosives in transit on boats having general cargo for Fremantle are transferred into lighters in Gage Roads, and there stored during the time the boat is in the harbour, and again placed on board after the ship clears the inner harbour.

All these shipments arrived in good condition, and the samples taken passed the official tests prescribed under the provisions of the Act, but it was discovered, on transferring the consignments from lighters at the Woodman's Point Jetty, that a number of cases from two shipments which arrived at Fremantle during the early part of the year had been ullaged; one consignment contained six cases which had been broken open and no less than seventy pounds of explosives removed.

It is very difficult, of course, to say where this pilfering took place, but measures have been taken with the object of detecting and preventing a recurrence, as it will be readily realised there is a very real danger involved in the opening of cases of explosives illegally in a magazine containing up to 5,000 cases of high explosives.

The following licenses have been issued during the year for the storage and sale of explosives:—

TABLE III.

Licenses issued during 1925.

For Magazines on Government Reserves	45
For Magazines used by Government Departments	13
For Magazines erected on private property ..	52
Store Licenses for the sale of Explosives—	
Mode A	81
Mode B	4
For sale of Fireworks only	244
Licenses for the preparation and use of Explosives of Class IV. Chlorate Mixtures	2
Licenses for the importation of explosives into the State of Western Australia	3

A table has again been prepared showing the distribution and the relative percentage of explosives of the nitro compound class in the several industries where explosives are used.

TABLE IV.

Distribution and Consumption of Explosives during 1925.

——	lbs.	Percentage of Total.
Gold Mining	804,900	54·3
Agricultural and Land Clearing...	529,650	35·7
Government Departments, including Railways, Public Works, and Water Supplies	44,000	2·9
Quarrying	52,100	3·5
Lead Mining	24,400	1·6
Copper Mining	700	·05
Coal Mining	24,200	1·6
Tin Mining	1,300	·9

For the purpose of comparison the figures are given for the years 1924 and 1925 in Table No. V.

TABLE V.

Distribution and Consumption of Explosives.

——	1924.		1925.	
	lbs.	Percentage of Total.	lbs.	Percentage of Total.
Gold Mining	830,000	48·9	804,900	54·3
Agricultural and Land Clearing	695,300	40·9	529,650	35·7
Government Departments, including Railways, Public Works, and Water Supplies	49,100	2·9	44,000	2·9
Quarrying	62,300	3·6	52,100	3·5
Lead Mining	29,250	1·7	24,400	1·6
Copper Mining	10,000	·6	700	·05
Coal Mining	19,700	1·2	24,200	1·6
Tin Mining	1,650	·1	1,300	·9

This table shows that there has been a slight falling off in the quantity of explosives supplied to the different classes of industry, with the exception of coal mining, when compared with the year 1924.

Inspections have been made of all licensed premises at the following centres throughout the State:—Perth and Fremantle (including all the Metropolitan Area), Northam, Westonia, Merredin, Southern Cross, Coolgardie, Norseman, Kalgoorlie, Menzies, Kookynie, Laverton, Leonora, Meekatharra, Nannine, Cue, Day Dawn, Magnet, Sandstone, Youanmi, Yalgoo, Geraldton, Mullewa, Northampton, Moora, Albany, Beverley, York, Narrogin, Pingelly, Wagin, Ravensthorpe, Lake Grace, Corrigin, Bunbury, Busselton, Bridgetown, Capel, Donnybrook, and Greenbushes. The number of inspections made was 267, as a result of which it was found necessary to confiscate and destroy the following explosives owing to non-compliance with the requirements of the Explosives Act:—

TABLE VI.

Destruction of Explosives during 1925.

Date, 1925.	Place.	Kind and Quantity.	Remarks.
Feb. 3rd	Busselton	3 lbs. Gelignite	Chemical Deterioration.
Do.	do.	30 lbs. Gelignite	Absorption of Moisture.
Feb. 5th	do.	100 Detonators	do. do.
Feb. 10th ...	Manjimup	100 Detonators	do. do.
Do.	do.	100 Detonators	do. do.
Feb. 11th ...	do.	100 Detonators	do. do.
Do. ...	do.	7 lbs. Gelignite	Chemical Deterioration.
Feb. 15th ...	Busselton	80 lbs. Gelignite	do. do.
March 9th ...	Fremantle	30 lbs. Viking Powder	Absorption of Moisture
Do. ...	do.	2 lbs. Gelignite	Exudation of Nitro-glycerine
July 6th	Perth	90 Detonators	Confiscated
Oct. 9th	do.	50 lbs. Gunpowder	Absorption of Moisture
Oct. 16th ...	do.	100 Detonators	Confiscated
Nov. 17th ...	Yalgoo	5 lbs. Gelignite	Chemical Deterioration
Dec. 2nd	Geraldton	20 lbs. Viking Powder	Absorption of Moisture
Dec 4th	Moora	5 lbs. Gelignite	Chemical Deterioration
Dec. 10th ...	Fremantle	15 lbs. Gelignite	do. do.

It was only deemed necessary to take proceedings against one person for a breach of the Act, particulars of which are as follows:—

TABLE VII.

Date.	Place.	Offence.	Fine.
30-9-25	Perth ...	Storing in excess of quantity allowed by License	£3 fine, £1 4s. costs.

There were also served on a number of persons notices directing their attention to minor breaches of the Act, and requesting them to take immediate action to remedy the irregularities complained of.

On two occasions during the year detonators were found exposed for sale in shop windows in the city. This being a breach of the Act, of which the proprietors of the stores pleaded ignorance, no proceedings were taken against them, but the detonators were confiscated and destroyed.

The following tests and analyses were made for the purpose of ascertaining whether the explosives imported into this State comply with the requirements of the Act:—

TABLE VIII.

Heat tests	499
Complete analyses	33
Fuse tests	180
Velocity of detonation	37
A.D.C. tests	10
Miscellaneous tests	63
Total	922

There were no applications received during the year to have placed on the authorised list of explosives any new explosives for importation into, or manufacture within, the State.

The number of Government reserves for explosives remains the same as last year, there having been no new reserves declared during the year.

The number of reserves vested in the Hon. the Minister for Mines for the purpose of erecting magazines for the storage of explosives is 51, with a total area of 3,056 acres.

The main reserve at Woodman's Point is in a satisfactory condition, and has been well maintained during the year.

It is with regret I have to record the fact that a number of magazines situated on Government reserves and private property have been broken into and quantities of explosives stolen during the year under review. This is a very serious state of affairs, but owing to the necessary isolation of magazines for the storage of large quantities, it is difficult to detect or prevent unauthorised persons trespassing on the areas set aside for the storage of explosives.

STORAGE AND CONTROL OF INFLAMMABLE LIQUIDS.

Observations made during the year with regard to the careless and thoughtless manner in which petroleum is carried and stored in thickly populated centres convince me that legislation to control this trade is very desirable and necessary for the protection of life and property.

On two occasions during the year motor trucks, while conveying large quantities of inflammable oils from the city to the country centres caught fire, fortunately clear of any habitation, and it was noticed that the leaves of tall trees 70 yards away from where the motor burnt were badly scorched.

The secretary of one of the Road Boards in the Metropolitan Area brought under my notice the fact that several thousand cases of petroleum were being stored in a motor garage, which is surrounded by business premises and residences, without any effort on the part of the proprietors of the garage to protect it against fire, and desired to know if there were any regulations in force to control the storage of petroleum. This is a serious menace to property and life, as is also the very common practice of allowing motor trucks fully loaded with petroleum to stand for hours unguarded in the streets of the city.

I find that dealers in inflammable liquids always appreciate advice given to them in regard to the safest methods for storing and handling inflammable oils, and venture the opinion that legislative control and proper inspection would be welcomed by most dealers in this commodity, but in order to cause the least inconvenience and expense to traders who may be erecting special stores for the keeping of petroleum, in accordance with what they think is a safe practice, but in fact may not comply with the conditions specified by regulations to be made under future legislation, early consideration of this question is desirable.

The revenue derived from licenses, etc., during the year amounted to £2,046.

I have to again acknowledge the courtesy of the Commissioner of Police and his officers for the great assistance rendered during the past year.

T. N. KIRTON,
Chief Inspector of Explosives.

8th May, 1926.

WESTERN AUSTRALIA.

DEPARTMENT OF MINES.

MINING STATISTICS,

1925.

T. 5.

MINING STATISTICS TO 31st DECEMBER, 1925.

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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.C. Mineral 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.
N.E.I. Not elsewhere included.

SUMMARY OF MINERAL PRODUCTION.

GOLD AND OTHER MINERALS PRODUCED DURING 1925, AND THE ESTIMATED VALUE THEREOF, TOGETHER WITH A COMPARISON FOR PREVIOUS YEARS, AND THE TOTAL PRODUCTION TO DATE.

	Description of Mineral.	1925.		1924.		1923.		1922.		Previously to 1922.		Total to date.	
		Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
			£		£		£		£		£		£
1.	Antimony ... ... (Exported) statute tons	...	...	...	...	...	...	...	...	88½	1,743	89	1,743
2.	Arsenical Ore ... ... (Exported) do.	*	1,045	*	777	*	686	1,075	1,784	2,519	7,566	...	11,858
3.	Asbestos ... ... (Reported) do.	51	1,641	74	2,206	115	4,032	181	7,600	488	24,064	909	39,543
4.	Bismuth ... ... (Exported) do.	...	...	...	...	...	...	...	...	11	844	11	844
5.	Coal ... ... (Reported) do.	437,461	363,203	421,864	363,255	420,714	368,949	438,443	381,555	5,540,497	3,081,374	7,258,979	4,558,336
6.	Copper { Ore ... ... (Exported) do.	1,201	18,200	2,795	40,676	3,394	48,907	352	5,519	72,382	873,717	80,124	987,019
	{ Ingot and Matte (Exported) do.	...	...	...	...	1,057	16,193	660	14,860	11,697	786,926	13,414	817,979
7.	Gadolinite ... ... (Reported) do.	...	...	...	...	...	...	...	...	1	112	1	112
8.	Gold ... (Exported and Minted) fine ounces	441,252	1,874,320	485,035	2,060,298	504,512	2,143,028	538,246	2,286,325	34,302,122	145,706,152	36,271,167	154,070,123
9.	Graphite ... ... (Exported) statute tons	...	...	...	...	...	...	*	3	65	693	65	696
10.	Gypsum ... ... (Reported) do.	3,060	4,118	4,237	5,278	...	...	63	16	665	622	8,024	10,034
11.	Ironstone ... ... (Reported) do.	...	...	...	...	...	...	...	...	57,830	36,695	57,830	36,695
12.	Lead (Ore and Concentrates) (Exported) do.	...	...	...	...	...	...	...	...	44,032	508,748	44,032	508,748
13.	Lead and Silver Lead (Ore and Concentrates) (Exported) do.	4,664	103,300	4,854	83,095	3,172	43,416	...	...	8,230	151,221	20,920	381,032
14.	Lead (Pig) ... ... (Exported) do.	...	...	...	...	20	609	2,796	69,528	20,236	558,819	23,052	628,956
15.	Limestone ... ... (Reported) do.	...	...	...	...	...	...	...	...	93,706	18,290	93,706	18,290
16.	Magnesite ... ... (Exported) do.	...	...	...	...	2	8	...	...	804	1,518	806	1,526
17.	Manganese ... ... (Exported) do.	...	...	20	160	22	200	...	...	18	152	60	512
18.	Mica ... ... (Exported) do.	...	...	...	...	...	...	2	60	*	1,297	...	1,357
19.	Molybdenite ... ... (Exported) do.	...	...	...	...	...	...	51	505	26½	360	78	865
20.	Pyritic Ore ... ... (Reported) do.	...	...	...	...	...	...	3,441	4,203	70,607	41,293	74,048	45,496
21.	Silver ... ... (Exported) fine ounces	81,226	11,661	89,146	13,409	109,005	16,036	118,696	18,164	4,005,547	552,075	4,403,620	611,345
22.	Tantalite ... ... (Exported) statute tons	5	1,010	...	...	5	688	...	...	*	18,092	...	19,790
23.	Tin Ore ... ... (Exported) do.	108	15,392	87	12,008	131	15,095	110	10,930	15,324	1,484,041	15,760	1,537,466
24.	Tungsten Ore { Scheelite ... (Exported) do.	...	...	...	...	...	...	...	...	21	2,507	21	2,507
	{ Wolfram ... (Exported) do.	...	...	...	...	...	...	...	...	15	1,441	15	1,441
25.	Zinc ... ... (Exported) do	...	...	...	...	...	...	...	...	184	5,437	184	5,437
	Unenumerated ... ... (Exported)	...	...	...	...	...	103	...	574	...	6,414	...	7,091
	Total Values	...	2,393,890	...	2,581,162	...	2,657,950	...	2,801,626	...	153,872,213	...	164,306,841

* Weight not stated.

The value of gold is calculated at the fixed price of £4·24773 per fine oz. Sales of gold by the Gold Producers' Association averaged £4·693 for the year 1922, £4·4244 for the year 1923, and £4·65107 for the year 1924. The amounts of £239,487, £89,158, and £195,629 should, therefore, be added to those years respectively, to make up the actual value of such gold.

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 1925.

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
		£		£		£		£		£		£		£
Alunite ... ... Statute tons	...	...	531	2,124	...	...	...	...	...	...	...	...	...	...
Antimony (Metal and Ore) do.	...	...	29	395	...	...	120	5,380	...	...	...	...	...	...
Arsenical Ore ... do.	*	1,045	3,346	8,333	1,115	11,150	...	...	...	...	100	600	...	...
Asbestos ... ... do.	51	1,641	...	...	...	...	...	...	...	...	...	...	...	...
Bismuth (Metal and Ore) do.	...	...	11	2,950	½	79	...	...	...	...	...	...	...	...
Coal ... ... do.	437,461	363,203	11,396,199	9,302,515	1,179,661	1,042,816	1,410,714	762,521	81,698	70,424	...	...	2,114,995	2,114,995
Copper (Ingot and Matte) do.	...	...	478	30,215	3,909	254,074	...	...	6,539	436,661	570	35,878	...	...
Copper Ore ... ... do.	1,201	18,200	...	...	...	...	...	...	...	...	...	...	...	...
Gold ... ... Fine ounces	441,252	1,874,320	19,422	82,498	46,406	197,118	47,296	200,958	3,524	15,041	832	3,535	111,061	471,759
Gypsum ... ... Statute tons	3,060	4,118	...	...	...	...	14,518	11,291	...	...	72,276	63,242	...	...
Iron ... ... do.	...	...	95,530	525,415	...	...	...	...	...	...	...	...	1,289	8,701
Iron Oxide ... ... do.	...	...	4,376	2,436	...	...	...	...	...	...	...	...	...	...
Ironstone ... ... do.	...	...	...	...	345	345	...	...	...	...	586,652	674,649	...	...
Lead and Silver Lead do.	4,664	103,300	277,566	5,314,977	5,235	187,681	...	...	526	197,452	37	1,455	...	...
Limestone ... ... do.	...	...	135,115	33,779	82,571	38,091	...	...	124,670	124,670	114,870	43,076	...	...
Magnesite ... ... do.	...	...	14,012	12,832	267	267	91	273	...	...	351	878	...	...
Manganese Ore ... do.	...	...	1,164	3,635	...	...	...	...	...	...	...	...	...	...
Molybdenite ... ... do.	...	...	6	1,648	3	271	34	5,545	...	...	...	...	...	...
Osmiridium ... ... Ounces	...	...	...	...	...	...	...	...	3,366	103,570	...	...	...	...
Phosphate Rock ... Statute tons	...	...	...	...	...	...	...	...	...	...	742	1,142	...	...
Platinum ... ... Fine ounces	...	...	573	11,061	...	...	...	...	...	...	...	...	...	...
Precious Stones	...	...	...	10,270	...	35,573	...	...	...	...	...	9,070	...	...
Tungsten Ores { Scheelite Statute tons	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Tungsten Ores { Wolfram do.	...	...	7	311	5	184	...	...	174	14,658	...	...	2	64
Shale (Oil) ... ... do.	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Silver ... ... Fine ounces	81,226	11,661	46,544	5,999	385,489	53,003	2,082	291	730,194	105,509	1,458	200	514,565	74,267
Tin (Ore and Ingot) ... Statute tons	108	15,392	957	250,944	1,012	161,500	69	11,592	1,130	297,515	...	...	...	...
Zinc (Spelter and Conc.) do.	...	...	226,525	1,022,016	171	2,350	...	...	3,113	110,691	...	...	...	...
Other	...	1,010	...	2,484,638	...	33,035	...	2,912	...	224,670	...	194,746	...	472,493
Total Value ...	...	2,393,890	...	19,108,991	...	2,017,537	...	1,000,763	...	1,700,861	...	1,028,471	...	3,142,279

* Weight not stated.

PART I.—GOLD.

TABLE I.

MONTHLY PRODUCTION OF GOLD, IN FINE OUNCES, SHOWING THE QUANTITY REPORTED TO THE MINES DEPARTMENT DURING 1925.

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 ...	... ...	...	...	...	...	...	6·35	...	2·47	...	·61	...	...	...	...
Pilbara	Marble Bar ...	...	...	...	8·42	33·52	49·83	319·60	319·60	593·34	593·34	56·25	56·25	326·46	326·46
Do.	Nullagine ...	...		8·42		16·31		...		...		...		...	
West Pilbara ...	... ...	...	2·13	...	4·29	...	2·65	...	2·82	...	6·84	...	...	...	5·38
Ashburton ...	... ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Gascoyne ...	... ...	...	3·37	...	...	...	...	...	...	...	...	...	...	...	...
Peak Hill ...	... ...	...	...	...	59·49	...	82·72	...	73·52	...	67·46	...	65·03	...	330·32
East Murchison...	Lawlers ...	179·22	455·12	42·51	114·24	106·58	549·66	100·81	174·02	116·32	161·18	50·01	492·71	99·73	917·26
Do.	Wiluna ...	275·90		...		...		...		...		377·93		677·06	
Do.	Black Range ...	...		71·73		443·08		73·21		44·86		64·77		140·47	
Murchison ...	Cue	44·47	1,632·21	132·79	1,597·31	47·71	2,685·23	267·31	2,003·17	152·52	2,735·47	62·57	1,872·72	14·73	2,056·59
Do.	Meekatharra...	1,587·74		1,388·08		2,558·93		1,554·30		1,818·43		1,666·78		1,638·38	
Do.	Day Dawn ...	...		...		34·34		4·33		24·73		99·29		76·61	
Do.	Mt. Magnet ...	...		76·44		44·25		177·23		739·79		44·08		326·87	
Yalgoo	... ...	...	22·53	...	246·55	...	214·53	...	20·79	...	...	...	197·32	...	187·56
Mt. Margaret ...	Mt. Morgans...	101·70	2,866·59	277·10	3,234·30	284·60	3,579·68	247·00	3,149·72	441·30	3,359·63	514·07	3,552·48	508·07	3,758·66
Do.	Mt. Malcolm...	2,594·42		2,846·27		3,143·56		2,818·22		2,819·55		2,954·68		3,166·08	
Do.	Mt. Margaret	170·47		110·93		151·52		84·50		98·78		83·73		84·51	
North Coolgardie	Menzies ...	446·04	453·38	602·65	608·01	343·85	343·85	351·18	361·78	394·53	394·53	358·61	358·61	274·18	325·55
Do.	Ularring ...	...		...		...		...		...		...		...	
Do.	Niagara ...	7·34		5·36		...		10·60		...		...		51·37	
Do.	Yerilla ...	...		...		...		...		...		...		...	
Broad Arrow ...	... ...	...	...	...	...	...	...	...	1,243·48	...	1,424·13	...	1,689·27	...	1,427·01
N.E. Coolgardie...	Kanowna ...	278·77	308·21	66·29	66·29	612·52	638·09	523·41	535·70	746·99	776·88	90·71	90·71	1,207·09	1,217·38
Do.	Kurnalpi ...	29·44		...		25·57		12·29		29·89		...		10·29	
East Coolgardie ...	E. Coolgardie	23,956·94	23,956·94	24,364·63	24,364·63	26,128·58	26,138·30	25,097·86	25,274·50	23,843·08	23,843·08	25,152·66	25,563·94	29,080·88	29,165·97
Do.	Bulong ...	...		...		9·72		176·64		...		411·28		85·09	
Coolgardie ...	Coolgardie ...	152·29	758·55	239·87	278·04	294·01	571·06	895·05	1,356·00	212·84	312·88	408·08	577·89	2,411·45	2,427·34
Do.	Kunanalling	606·26		38·17		277·05		460·95		100·04		169·81		15·89	
Yilgarn ...	... ...	...	948·80	...	1,045·24	...	1,102·25	...	1,230·03	...	906·59	...	1,302·48	...	1,350·32
Dundas	... ...	...	179·78	...	701·75	...	110·95	...	263·96	...	455·62	...	300·37	...	...
Phillips River ...	... ...	...	1·44	...	...	...	6·67	...	...	...	...	...	7·15	...	4·41
State Generally ...		...	...	...	...	...	...	...	...	...	3·61	...	...	...	...
TOTAL	Fine Ounces ...	...	31,589·05	...	32,328·56	...	36,081·82	...	36,031·56	...	35,041·85	...	36,126·93	...	43,500·21
	Sterling Value	£134,182		£137,323		£153,266		£153,052		£148,848		£153,457		£184,777	

TABLE I.—*Monthly Production of Gold in Fine Ounces*—continued.

GOLDFIELD.	DISTRICT.	AUGUST.		SEPTEMBER.		OCTOBER.		NOVEMBER.		DECEMBER.		Total for 1925.	
		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 ...	... ...	...	...	...	...	...	...	...	...	...	...	...	29·43
Pilbara ...	Marble Bar ...	17·90	67·75	28·50	28·50	296·52	296·52	456·38	478·92	276·51	276·51	2,404·98	2,502·10
Do. ...	Nullagine ...	49·85		...		...		22·54		...		97·12	
West Pilbara ...	... ...	...	1·34	...	4·63	...	...	...	2·87	...	2·00	...	34·95
Ashburton ...	... ...	...	5·38	...	5·25	...	...	...	...	...	...	...	10·63
Gascoyne	... ...	...	...	...	...	...	...	...	...	...	...	...	3·37
Peak Hill ...	... ...	...	517·75	...	266·94	...	56·03	...	60·27	...	56·12	...	1,635·65
East Murchison ...	Lawlers	139·24	453·54	112·11	266·04	93·92	228·33	47·58	970·79	166·48	615·61	1,254·51	5,398·50
Do. ...	Wiluna	273·09		2·00		16·55		92·00		423·13		2,137·66	
Do. ...	Black Range ...	41·21		151·93		117·86		831·21		26·00		2,006·33	
Murchison ...	Cue	71·09	1,971·36	239·04	2,474·93	464·93	2,462·45	266·17	4,789·73	575·38	3,158·05	2,338·71	29,439·22
Do. ...	Meekatharra ...	1,722·09		1,879·35		1,837·98		2,305·72		2,411·59		22,369·37	
Do. ...	Day Dawn ...	103·61		15·64		154·46		71·06		54·61		638·68	
Do. ...	Mt. Magnet ...	74·57		340·90		5·08		2,146·78		116·47		4,092·46	
Yalgoo	... ...	...	294·09	...	287·67	...	574·69	...	367·53	...	415·10	...	2,828·36
Mt. Margaret ...	Mt. Morgans ...	792·70	4,184·92	514·87	3,457·97	392·08	3,625·04	400·40	3,912·92	330·80	3,167·97	4,804·69	41,849·88
Do. ...	Mt. Malcolm ...	3,319·77		2,867·20		3,161 ·79		3,431·40		2,322·45		35,445·39	
Do. ...	Mt. Margaret ...	72·45		75·90		71·17		81·12		514·72		1,599·80	
North Coolgardie...	Menzies	481·53	481·53	98·77	102·64	272·38	507·66	179·19	179·19	408·99	432·93	4,211·90	4,549·66
Do. ...	Ularring	...		...		...		...		...		...	
Do. ...	Niagara	...		3·27		86·95		...		23·94		188·83	
Do. ...	Yerilla	...		·60		148·33		...		...		148·93	
Broad Arrow ...	... ...	...	1,146·33	...	229·73	...	525·45	...	393·29	...	163·69	...	8,242·38
N.E. Coolgardie ...	Kanowna ...	129·95	143·71	119·21	124·91	876·49	882·94	193·76	196·92	902·12	916·01	5,747·31	5,897·75
Do. ...	Kurnalpi ...	13·76		5·70		6·45		3·16		13·89		150·44	
East Coolgardie ...	East Coolgardie...	25,796·32	25,796·32	26,346·07	26,371·19	27,915·34	27,956·79	26,527·10	26,555·94	20,682·39	20,781·51	304,891·85	305,769·11
Do. ...	Bulong	...		25·12		41·45		28·84		99·12		877·26	
Coolgardie ...	Coolgardie ...	563·01	793·19	456·09	988·44	556·19	649·61	281·38	377·83	989·49	1,217·61	7,459·75	10,308·44
Do. ...	Kunanalling ...	230·18		532·35		93·42		96·45		228·12		2,848·69	
Yilgarn	... ...	...	763·41	...	1,200·01	...	1,077·05	...	1,273·04	...	1,097·75	...	13,296·97
Dundas	... ...	...	...	...	15·81	...	...	...	369·98	...	203·08	...	2,601·30
Phillips River ...	... ...	...	...	...	...	...	...	...	...	...	7·53	...	27·20
State generally ...	...	...	...	...	...	...	...	...	...	...	104·72	...	108·33
TOTAL Fine Ounces ...		...	36,620·62	...	35,824·66	...	38,842·56	...	39,929·22	...	32,616·19	...	434,533·23
TOTAL Sterling Value		£155,555		£152,173		£164,993		£169,609		£138,545		£1,845,780	

The total gold yield 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, 1925.

GOLDFIELD.	DISTRICT.	1925.		1924.		1923.		1922.		1921.		1920.	
		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	... ...	...	29·43	...	12·77	...	30·55	...	5·01	...	49·35	...	...
Pilbara	Marble Bar ...	2,404·98	2,502·10	1,858·12	2,134·38	2,388·05	2,543·62	2,779·45	3,100·16	2,556·95	2,626·57	3,164·15	4,052·49
Do.	Nullagine ...	97·12		276·26		155·57		320·71		69·62		888·34	
West Pilbara ...	... ...	...	34·95	...	76·45	...	64·22	...	94·33	...	67·10	...	133·91
Ashburton	... ...	...	10·63	...	3·18	...	9·24	...	13·57	...	22·31	...	...
Gascoyne	... ...	...	3·37	...	2·46	...	...	...	1·52	...	7·46	...	...
Peak Hill	... ...	...	1,635·65	...	2,113·13	...	1,699·82	...	2,159·89	...	1,078·53	...	1,655·71
East Murchison ...	Lawlers	1,254·51		2,453·98		4,302·94		4,650·83		3,008·81		2,693·15	
Do.	Wiluna	2,137·66	5,398·50	1,083·97	4,896·94	3,697·11	11,016·41	5,385·30	13,050·62	4,092·30	18,762·26	5,478·99	19,600·25
Do.	Black Range ...	2,006·33		1,358·99		3,016·36		3,014·49		11,661·15		11,428·11	
Murchison	Cue	2,338·71		1,912·68		4,155·09		4,840·68		7,186·83		9,642·63	
Do.	Meekatharra ...	22,369·37	29,439·22	19,225·14	24,425·20	20,355·91	27,037·53	26,953·23	36,304·33	30,046·77	41,256·53	28,163·45	46,604·07
Do.	Day Dawn ...	638·68		775·94		850·79		1,114·58		726·80		4,671·54	
Do.	Mt. Magnet ...	4,092·46		2,511·44		1,675·74		3,395·84		3,296·13		4,126·45	
Yalgoo	... ...	...	2,828·36	...	5,611·23	...	7,713·45	...	18,132·49	...	3,579·20	...	2,965·43
Mt. Margaret ...	Mt. Morgans ...	4,804·69		5,552·43		5,556·38		7,768·38		7,612·89		5,560·87	
Do.	Mt. Malcolm ...	35,445·39	41,849·88	35,839·35	43,704·83	20,301·14	26,876·42	16,811·82	27,649·19	8,364·49	20,803·51	42,800·83	77,335·84
Do.	Mt. Margaret ...	1,599·80		2,313·05		1,018·90		3,068·99		4,826·13		28,974·14	
North Coolgardie ...	Menzies	4,211·90		8,252·74		11,278·60		11,650·21		8,034·25		11,468·50	
Do.	Ularring ...	...	4,549·66	210·98	9,509·19	219·18	12,212·93	1,401·44	13,624·14	1,605·06	10,640·08	57·53	12,024·18
Do.	Niagara	188·83		197·30		269·14		197·17		345·17		223·26	
Do.	Yerilla	148·93		848·17		446·01		375·32		655·60		274·89	
Broad Arrow ...	... ...	...	8,242·38	...	2,660·61	...	2,740·98	...	3,628·56	...	8,875·01	...	7,445·23
N.E. Coolgardie ...	Kanowna ...	5,747·31	5,897·75	4,525·97	4,690·51	4,592·90	4,714·51	3,882·13	4,545·10	3,378·29	4,147·98	1,248·14	1,738·80
Do.	Kurnalpi ...	150·44		164·54		121·61		662·97		769·69		490·66	
East Coolgardie ...	East Coolgardie...	304,891·85	305,769·11	335,480·59	336,098·63	369,859·84	370,669·86	375,757·25	376,388·69	378,344·62	378,429·92	401,417·01	401,495·91
Do.	Bulong	877·26		618·04		810·02		631·44		85·30		78·90	
Coolgardie	Coolgardie ...	7,459·75	10,308·44	7,100·35	10,242·79	9,929·81	13,076·81	9,662·68	16,170·54	4,629·54	9,547·74	3,482·79	5,986·43
Do.	Kunanalling ...	2,848·69		3,142·44		3,147·00		6,507·86		4,918·20		2,503·64	
Yilgarn	... ...	...	13,296·97	...	8,451·00	...	8,375·97	...	12,793·95	...	19,241·50	...	37,636·51
Dundas	... ...	...	2,601·30	...	3,429·14	...	6,357·85	...	8,043·99	...	5,455·77	...	6,541·18
Phillips River ...	... ...	...	27·20	...	145·44	...	374·58	...	688·75	...	865·75	...	1,422·76
*Donnybrook ...	... ...	...	...	...	...	...	...	...	...	...	...	...	...
State generally		...	108·33	...	...	...	157·74	...	144·45	...	99·85	...	20·67
TOTAL	Fine Ounces ...	...	434,533·23	...	458,207·88	...	495,672·49	...	536,539·28	...	525,556·42	...	626,659·87
	Sterling Value	£1,845,780		£1,946,343		£2,105,483		£2,279,074		£2,232,422		£2,661,880	

* Abolished 4th March, 1908.

TABLE II.—*Total Yearly Production of Gold, in Fine Ounces, etc.*—continued.

GOLDFIELD.	DISTRICT.	1919.		1918.		1917.		1916.		Previous to 1916.		Total to December 31st, 1925.	
		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	... ...	...	150·73	...	15·08	...	82·25	...	161·91	...	17,610·38	...	**18,147·46**
Pilbara	Marble Bar ...	2,960·51	3,421·39	2,991·73	3,748·40	2,463·66	5,406·75	3,515·58	5,881·60	113,796·62	186,231·85	**140,879·80**	**221,649·31**
Do.	Nullagine ...	460·88		756·67		2,943·09		2,366·02		72,435·23		**80,769·51**	
West Pilbara ...	... ...	...	95·26	...	120·37	...	304·77	...	608·84	...	26,552·85	...	**28,153·05**
Ashburton	... ...	...	...	...	...	...	6·50	...	...	...	8,876·74	...	**8,942·17**
Gascoyne	... ...	...	...	...	...	...	...	...	14·48	...	662·06	...	**691·35**
Peak Hill	... ...	...	2,255·38	...	1,089·31	...	1,743·72	...	2,389·29	...	246,504·88	...	**264,325·31**
East Murchison ...	Lawlers	4,951·82		4,115·55		4,784·50		6,579·41		886,944·20		**925,739·70**	
Do.	Wiluna	7,035·72	27,413·39	7,909·60	29,210·72	9,523·65	32,856·56	14,472·13	46,811·44	51,000·56	1,614,160·68	**111,816·99**	**1,823,178·27**
Do.	Black Range ...	15,426·35		17,185·57		18,548·41		25,759·90		676,215·92		**785,621·58**	
Murchison	Cue	9,020·49		10,183·75		9,689·81		6,011·29		331,935·39		**396,917·35**	
Do.	Meekatharra ...	35,436·80	50,569·85	44,119·86	63,285·43	44,269·00	82,305·83	51,322·56	84,422·89	712,787·31	2,676,254·08	**1,035,049·40**	**3,161,904·96**
Do.	Day Dawn ...	2,383·58		4,176·83		23,746·93		18,134·71		1,256,080·81		**1,313,301·19**	
Do.	Mt. Magnet ...	3,728·98		4,804·99		4,600·09		8,954·33		375,450·57		**416,637·02**	
Yalgoo	... ...	...	4,788·38	...	4,397·89	...	5,812·74	...	8,194·69	...	98,381·78	...	**162,405·64**
Mt. Margaret ...	Mt. Morgans ...	5,302·34		5,294·03		6,314·21		8,439·99		483,922·58		**546,128·79**	
Do.	Mt. Malcolm ...	49,506·74	88,151·93	46,368·64	85,346·97	59,488·04	101,874·54	57,541·13	100,612·34	1,390,283·05	2,532,808·45	**1,762,750·62**	**3,147,013·90**
Do.	Mt. Margaret ...	33,342·85		33,684·30		36,072·29		34,631·22		658,602·82		**838,134·49**	
North Coolgardie ...	Menzies	20,859·22		30,345·06		30,725·13		36,756·35		858,655·19		**1,032,237·15**	
Do.	Ularring	931·66	23,019·41	4,791·82	36,829·91	1,090·35	34,795·55	2,989·66	45,146·57	278,150·96	1,825,858·93	**291,448·64**	**2,028,210·55**
Do.	Niagara	746·51		1,203·81		1,185·17		1,790·01		496,744·04		**503,090·41**	
Do.	Yerilla	482·02		489·22		1,794·90		3,610·55		192,308·74		**201,434·35**	
Broad Arrow ...	... ...	...	11,728·57	...	4,125·88	...	16,518·64	...	22,215·92	...	424,994·53	...	**513,176·31**
N.E. Coolgardie ...	Kanowna ...	5,250·96	5,472·08	3,439·60	3,700·25	5,912·39	5,933·17	6,392·00	6,678·02	669,013·04	697,456·35	**713,382·73**	**744,974·52**
Do.	Kurnalpi ...	221·12		260·65		20·78		286·02		28,443·31		**31,591·79**	
East Coolgardie ...	East Coolgardie	396,995·28	397,054·89	524,729·46	524,823·36	557,874·83	557,983·37	578,183·41	579,344·34	15,278,214·19	15,437,997·32	**19,501,748·33**	**19,666,055·40**
Do.	Bulong	59·61		93·90		108·54		1,160·93		159,783·13		**164,307·07**	
Coolgardie	Coolgardie ...	4,222·21	5,814·30	5,334·36	7,962·75	6,980·68	10,285·68	8,768·13	13,618·32	946,948·75	1,144,092·84	**1,014,519·05**	**1,247,106·64**
Do.	Kunanalling ...	1,592·09		2,628·39		3,305·00		4,850·19		197,144·09		**232,587·59**	
Yilgarn	... ...	...	54,002·74	...	70,765·88	...	78,244·77	...	87,993·68	...	669,972·74	...	**1,060,775·71**
Dundas	... ...	...	12,529·61	...	15,949·44	...	18,419·01	...	21,594·78	...	538,859·87	...	**639,781·94**
Phillips River ...	... ...	...	1,700·12	...	4,478·49	...	4,734·52	...	5,418·97	...	69,309·89	...	**89,166·47**
*Donnybrook ...	... ...	...	...	...	...	...	...	...	...	...	841·76	...	**841·76**
State generally ...	... ...	...	46·41	...	195·43	...	111·41	...	618·78	...	6,735·08	...	**8,238·15**
TOTAL	**Fine Ounces ...**	...	**688,214·94**	...	**856,045·56**	...	**957,419·78**	...	**1,031,726·86**	...	28,224,163·06	...	**34,834,738·87**
	Sterling Value ...	**£2,923,351**		**£3,636,250**		**£4,066,861**		**£4,382,497**		**£119,888,624**		**£147,968,565**	

* 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 1925.

Goldfield.	District.	Date of Proclamation of Goldfield.				Area in Square Miles.		Leases in force, 31-12-1925.		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	...	...	...	...	...	...	...	...	...	...	5
West Kimberley	...	19-3-20	1-3-20	...	...	98,600	...	...	...	...	...	...	...	...	...	...	...
Pilbara	Marble Bar	1-10-88	1-10-88	1-3-07	1-3-07	32,696	25,809	10	85	50	4	10	...	...	10	30	14
	Nullagine						6,887	3	30	28	1	13	...	...	11	4	17
West Pilbara	...	20-9-95	1-11-95	1-3-07	1-3-07	10,843	...	1	6	10	1	...	...	...	1	1	2
Ashburton	...	11-12-90	11-12-90	18-10-01	14-10-01	14,230	...	...	...	...	...	...	...	...	...	...	2
Gascoyne	...	25-6-97	15-4-97	...	...	5,313	...	2	12	...	...	...	...	...	...	...	2
Peak Hill	...	19-3-97	1-4-97	13-11-14	1-12-14	23,650	...	8	42	10	...	9	...	...	19	8	6
East Murchison	Lawlers	28-6-95	28-6-95	2-2-20	2-2-20	26,058	6,691	12	178	30	4	18	...	...	20	10	2
	Wiluna						10,496	5	86	18	...	6	...	...	49	37	...
	Black Range						8,871	51	1,067	45	4	8	...	...	30	33	2
Murchison	Cue	24-9-91	24-9-91	28-11-13	1-1-14	25,474	8,593	14	198	50	2	25	2	...	35	21	1
	Meekatharra						12,250	22	356	70	9	11	...	...	89	138	18
	Day Dawn						896	7	73	13	1	25	...	...	16	16	...
	Mt. Magnet						3,735	10	91	25	2	14	...	3	40	38	4
Yalgoo	...	8-2-95	23-1-95	30-7-15	9-8-15	23,230	...	16	239	40	5	20	...	...	54	55	2
Mt. Margaret	Mt. Morgans	12-3-97	1-4-97	2-2-20	2-2-20	59,918	14,007	6	102	30	3	13	5	1	44	27	...
	Mt. Malcolm						6,018	25	547	75	4	7	4	1	167	199	...
	Mt. Margaret						39,893	9	182	30	5	16	1	...	34	7	...
North Coolgardie	Menzies	28-6-95	28-6-95	7-9-17	17-9-17	13,746	6,805	19	295	55	12	18	4	1	47	23	...
	Ularring						3,093	...	...	20	1	...	...	...	3	1	...
	Niagara						688	2	17	15	4	...	...	...	8	4	...
	Yerilla						3,160	3	51	20	1	5	...	...	11	7	...
Broad Arrow	...	17-11-96	20-11-96	8-6-06	1-7-06	1,038	...	16	274	35	16	9	7	2	75	64	6
North-East Coolgardie	Kanowna	20-3-96	15-4-96	27-3-08	1-4-08	20,604	1,094	13	165	50	1	2	...	...	32	36	2
	Kurnalpi						19,510	1	24	5	1	2	...	...	16	6	2
East Coolgardie	East Coolgardie	21-9-94	1-10-94	27-3-08	1-4-08	1,800	810	112	1,673	305	198	81	132	57	1,186	1,466	27
	Bulong						990	3	69	...	...	...	...	...	30	10	4
Coolgardie	Coolgardie	6-4-94	6-4-94	1-3-07	1-3-07	11,702	9,384	30	474	58	6	40	4	...	126	147	20
	Kunanalling						2,318	10	133	25	4	9	...	...	32	36	...
Yilgarn	...	1-10-88	1-10-88	28-1-16	1-2-16	17,700	...	34	544	120	13	33	10	4	91	72	...
Dundas	...	31-8-93	31-8-93	1-3-07	1-3-07	11,430	...	8	108	15	...	10	...	...	43	42	...
Phillips River	...	21-9-00	14-9-00	28-1-16	1-2-16	5,078	...	7	94	35	...	1	...	...	8	3	1
State generally	...	...	...	...	...	...	...	9	156	...	2	...	...	...	2	...	...
	Total	...	...	...	...	436,943	...	469	7,395	1,282	304	405	169	69	2,329	2,541	139

TABLE III.—*Return showing for the respective Goldfields and Districts, etc.*—continued.

Goldfield.	District.	1925 GOLD AND SILVER YIELD—DISTRICTS.						1925 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 ...	...	...	...	...	...	...	...	29·43	...	...	...	29·43	...
Pilbara ...	Marble Bar ...	69·33	17·65	1,294·50	2,318·00	2,404·98	...	89·83	21·88	1,360·50	2,390·39	2,502·10	...
Do. ...	Nullagine ...	20·50	4·23	66·00	72·39	97·12	...						
West Pilbara ...	...	...	...	...	...	...	...	34·95	...	...	...	34·95	...
Ashburton ...	...	...	...	...	...	...	...	10·63	...	...	...	10·63	...
Gascoyne ...	...	...	...	...	...	...	...	...	3·37	...	...	3·37	...
Peak Hill ...	...	...	...	...	...	...	...	...	...	822·75	1,635·65	1,635·65	...
East Murchison ...	Lawlers ...	...	5·96	566·00	1,248·55	1,254·51	...	...	136·43	5,141·55	5,262·07	5,398·50	...
Do. ...	Wiluna ...	...	3·60	2,742·00	2,134·06	2,137·66	...						
Do. ...	Black Range ...	...	126·87	1,833·55	1,879·46	2,006·33	...						
Murchison ...	Cue	48·06	...	4,356·74	2,290·65	2,338·71	4·00	329·82	883·07	51,803·11	28,226·33	29,439·22	4·00
Do. ...	Meekatharra ...	193·18	87·16	44,784·00	22,089·03	22,369·37	...						
Do. ...	Day Dawn ...	12·10	75·54	1,042·16	551·04	638·68	...						
Do. ...	Mt. Magnet ...	76·48	720·37	1,620·21	3,295·61	4,092·46	...						
Yalgoo ...	...	...	...	...	...	...	...	·93	...	5,018·50	2,827·43	2,828·36	...
Mt. Margaret ...	Mt. Morgans ...	...	...	13,234·66	4,804·69	4,804·69	...	14·24	62·03	102,307·77	41,773·61	41,849·88	3,339·63
Do. ...	Mt. Malcolm ...	4·07	...	88,540·00	35,441·32	35,445·39	3,271·63						
Do. ...	Mt. Margaret...	10·17	62·03	533·11	1,527·60	1,599·80	68·00						
North Coolgardie...	Menzies ...	20·99	108·32	3,406·45	4,082·59	4,211·90	...	31·59	118·93	3,630·19	4,399·14	4,549·66	...
Do. ...	Ularring ...	...	...	...	...	...	...						
Do. ...	Niagara ...	10·60	10·61	51·49	167·62	188·83	...						
Do. ...	Yerilla ...	...	...	172·25	148·93	148·93	...						
Broad Arrow ...	...	...	...	...	...	...	...	4·68	173·69	9,793·69	8,064·01	8,242·38	...
N.E. Coolgardie ...	Kanowna ...	3·36	47·83	6,574·44	5,696·12	5,747·31	...	45·49	57·54	6,692·44	5,794·72	5,897·75	...
Do. ...	Kurnalpi ...	42·13	9·71	118·00	98·60	150·44	...						
East Coolgardie ...	East Coolgardie	55·25	354·22	562,912·87	304,482·38	304,891·85	57,125·11	55·25	403·58	563,311·33	305,310·28	305,769·11	57,125·11
Do. ...	Bulong ...	...	49·36	398·46	827·90	877·26	...						
Coolgardie ...	Coolgardie ...	3·51	42·96	14,406·54	7,413·28	7,459·75	...	21·75	69·32	17,728·59	10,217·37	10,308·44	...
Do. ...	Kunanalling ...	18·24	26·36	3,322·05	2,804·09	2,848·69	...						
Yilgarn ...	...	...	...	...	...	...	...	1·15	14·01	31,448·99	13,281·81	13,296·97	...
Dundas ...	...	...	...	...	...	...	...	...	42·44	1,176·22	2,558·86	2,601·30	...
Phillips River ...	...	...	...	...	...	...	...	...	...	62·00	27·20	27·20	...
State generally ...	...	...	...	...	...	...	...	3·61	...	...	104·72	108·33	60·02
Total for 1925 ...		...	...	...	...	...	...	673·35	1,986·29	800,297·63	431,873·59	434,533·23	60,528·76

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	...	...	...	...	...	...	...	4,020·21	...	17,597·50	14,127·25	18,147·46	...
Pilbara	Marble Bar ...	12,427·34	3,713·87	83,153·03	124,738·59	140,879·80	613·91	19,212·10	4,197·93	124,112·27	198,239·28	221,649·31	642·58
Do.	Nullagine ...	6,784·76	484·06	40,959·24	73,500·69	80,769·51	28·67						
West Pilbara ...	...	...	...	...	...	...	...	5,769·17	275·00	19,302·71	22,108·88	28,153·05	1,331·07
Ashburton	...	...	...	...	...	...	...	8,626·53	315·64	...	...	8,942·17	7,787·69
Gascoyne	...	...	...	...	...	...	...	331·64	21·88	356·70	337·83	691·35	...
Peak Hill	...	...	...	...	...	...	...	2,289·75	4,186·06	523,012·51	257,849·50	264,325·31	2,287·63
East Murchison ...	Lawlers ...	5,614·49	7,247·81	2,039,143·36	912,877·40	925,739·70	25,997·48						
Do.	Wiluna ...	97·37	200·87	216,390·50	111,518·75	111,816·99	232·00	7,220·95	23,457·49	3,450,239·25	1,792,499·83	1,823,178·27	42,730·05
Do.	Black Range ...	1,509·09	16,008·81	1,194,705·39	768,103·68	785,621·58	16,500·57						
Murchison	Cue	1,268·65	5,764·12	480,572·12	389,884·58	396,917·35	512·68						
Do.	Meekatharra ...	11,498·97	13,441·38	1,515,609·24	1,010,109·05	1,035,049·40	5,028·90						
Do.	Day Dawn ...	2,439·15	9,349·02	1,972,276·83	1,301,513·02	1,313,301·19	169,210·44	17,087·57	44,242·84	4,519,758·65	3,100,574·55	3,161,904·96	175,926·20
Do.	Mt. Magnet ...	1,880·80	15,688·32	551,300·46	399,067·90	416,637·02	1,174·18						
Yalgoo	...	...	...	...	...	...	...	1,578·54	1,863·06	223,328·30	158,964·04	162,405·64	689·43
Mt. Margaret ...	Mt. Morgans ...	1,765·98	3,796·75	1,005,271·70	540,566·06	546,128·79	5,775·05						
Do.	Mt. Malcolm ...	2,696·41	7,565·05	3,429,788·11	1,752,489·16	1,762,750·62	87,761·14	7,908·73	19,376·94	6,064,198·74	3,119,728·23	3,147,013·90	150,384·06
Do.	Mt. Margaret...	3,446·34	8,015·14	1,629,138·93	826,673·01	838,134·49	56,847·87						
North Coolgardie ...	Menzies ...	1,141·87	3,873·59	1,237,675·58	1,027,221·69	1,032,237·15	19,224·48						
Do.	Ularring ...	22·17	1,152·06	298,568·88	290,274·41	291,448·64	5,973·05						
Do.	Niagara ...	1,514·64	1,618·39	899,318·01	499,957·38	503,090·41	5,603·42	3,925·89	14,216·41	2,654,345·01	2,010,068·25	2,028,210·55	30,863·99
Do.	Yerilla ...	1,247·21	7,572·37	218,782·54	192,614·77	201,434·35	63·04						
Broad Arrow ...	...	...	...	...	...	...	...	19,457·37	15,529·01	864,346·94	478,189·93	513,176·31	2,184·96
N.E. Coolgardie ...	Kanowna ...	104,492·49	11,316·42	960,387·80	597,573·82	713,382·73	2,522·12						
Do.	Kurnalpi ...	12,059·59	6,121·23	5,844·41	13,410·97	31,591·79	11·22	116,552·08	17,437·65	966,232·21	610,984·79	744,974·52	2,533·34
East Coolgardie ...	East Coolgardie	27,664·47	34,346·44	30,925,345·45	19,439,737·42	19,501,748·33	2,075,180·59						
Do.	Bulong ...	26,725·61	15,158·71	155,654·43	122,422·75	164,307·07	12·92	54,390·08	49,505·15	31,080,999·88	19,562,160·17	19,666,055·40	2,075,193·51
Coolgardie	Coolgardie ...	9,248·76	11,273·83	1,580,986·90	993,996·46	1,014,519·05	891·44						
Do.	Kunanalling ...	910·20	6,481·20	285,603·54	225,196·19	232,587·59	48·67	10,158·96	17,755·03	1,866,590·44	1,219,192·65	1,247,106·64	940·11
Yilgarn	...	...	...	...	...	...	...	92·80	1,497·00	2,302,225·51	1,059,185·91	1,060,775·71	32,288·71
Dundas	...	...	...	...	...	...	...	2,032·03	14,029·29	909,930·56	623,720·62	639,781·94	36,392·90
Phillips River ...	...	...	...	...	...	...	...	472·63	781·93	92,439·20	87,911·91	89,166·47	15,688·17
Donnybrook † ...	...	...	...	...	...	...	...	23·24	...	1,653·30	818·52	841·76	...
State generally		...	...	...	...	...	...	146·02	294·09	27·00	7,798·04	8,238·15	30,875·96
Total to 31st December, 1925 ...		...	...	...	...	...	...	**281,296·29**	**228,982·40**	**55,680,696·68**	**34,324,460·18**	**34,834,738·87**	**2,608,740·36**

* 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 1925, AND THE TOTAL PRODUCTION TO DATE.

Kimberley Goldfield.

MINING CENTRE.	NUMBER OF LEASE.	REGISTERED NAME OF COMPANY OR LEASE.	TOTAL FOR 1925.					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. Dockerell	...	Voided leases	...	...	...	...	...	...	...	44·00	435·93	...
Ruby Well ...	...	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	29·43	...	...	...	...	4,020·21	...	...	...	...
		Total	**29·43**	...	...	...	...	**4,020·21**	...	**17,597·50**	**14,127·25**	...

Pilbara Goldfield.

MARBLE BAR DISTRICT.

Bamboo Creek	(795)	Bulletin	...	...	...	...	...	...	...	114·10	230·43	...
Do. ...	(843)	Cave	...	...	...	...	...	...	...	11·50	27·37	...
Do. ...	850	Federation	...	...	12·00	66·10	...	...	...	12·00	66·10	...
Do. ...	819	Forrest Abbey	...	...	96·00	61·50	...	...	...	131·50	139·14	...
Do. ...	707	Kitchener	...	...	235·00	398·30	...	...	...	3,767·00	7,805·27	...
Do. ...	740	(Mount Prophecy)	...	...	...	...	...	...	1·11	1,040·50	1,898·07	...
Do. ...	740, 794 ...	(Mt. Prophecy leases) ...	...	...	156·50	200·80	...	...	...	1,620·00	2,473·78	...
Do. ...	794	(Perseverance)	...	...	...	...	...	...	...	290·50	584·21	...
Do. ...	817	Prince Charlie	...	...	117·00	408·30	...	...	...	233·25	807·16	...
Do. ...	...	Voided leases	...	...	...	...	...	...	508·66	15,203·00	23,257·69	...
Do. ...	...	Sundry claims	...	...	15·00	14·30	...	...	307·83	1,195·35	1,504·29	...

Boodalyerrie ...	...	Voided leases	...	...	...	...	...	...	292·07	120·25	587·86	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	7·16	...	...	...
Breen's Find...	...	Voided leases	...	...	...	...	...	...	...	14·00	66·82	...
Elsie ...	...	Voided leases	...	...	...	...	...	...	...	178·00	352·06	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	...	10·25	58·01	...
Lalla Rookh	(786), R.C. 112	Haig	...	...	...	...	...	...	4·78	3,059·00	1,984·16	...
Do. ...	...	Voided leases	...	...	...	...	...	...	...	224·50	2,186·65	574·01
Do. ...	...	Sundry claims	...	...	...	...	...	...	...	6,992·00	6,881·04	...
Marble Bar ...	844	Anglo-French	...	...	66·00	88·31	...	...	...	166·50	167·81	...
Do. ...	841	Franklin	...	...	25·00	21·87	...	...	...	92·50	84·19	...
Do. ...	805	Homeward Bound East ...	...	...	84·00	110·35	...	...	...	708·50	862·79	...
Do. ...	(694)	Jo Jo	...	...	88·00	61·39	...	...	33·97	2,664·00	2,944·49	...
Do. ...	845	Outward Bound	...	...	281·00	341·74	...	...	...	389·00	442·34	...
Do. ...	...	Voided leases	...	...	...	...	...	...	147·90	18,845·45	24,371·70	...
Do. ...	...	Sundry claims	...	...	119·00	129·28	...	38·68	149·23	5,190·14	5,777·06	...
North Pole ...	...	Voided leases	...	...	...	...	...	...	...	474·00	340·75	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	...	50·50	69·56	...
North Shaw...	(820)	McLeod's Reward	...	...	...	...	...	...	...	403·00	178·24	...
Do. ...	...	Voided leases	...	...	...	...	...	7·53	...	359·45	683·04	...
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	...	...	...	...	...	...	73·90	1,438·50	1,739·44	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	171·69	639·25	797·44	...
Warrawoona...	...	Voided leases	...	...	...	...	...	...	16·99	10,072·80	18,136·84	...
Do. ...	...	Sundry claims	...	...	...	...	...	44·30	403·70	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[illegible]	...	...	...	...	...	...	9·31	642·75	619·35	...
Do. ...	...	Voided leases	...	...	...	...	...	...	33·55	115·04	493·98	...
Do. ...	...	Sundry claims	...	...	...	...	...	·93	39·41	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		...	...	...	...	...	...	...	...	3,123·38	39·90
	State Battery, Marble Bar		...	...	...	415·76	...	...	...	...	493·88	...
	Various Works		...	...	...	...	...	...	...	237·95	1,204·91	...
	Reported by Banks and Gold Dealers		69·33	17·65	...	...	...	12,128·04	326·78	...	...	...
	Total		**69·33**	**17·65**	**1,294·50**	**2,318·00**	...	**12,427·34**	**3,713·87**	**83,153·03**	**124,738·59**	**618·91**

TABLE IV.—*Production of Gold and Silver from all sources, etc.*—continued.

PILBARA GOLDFIELD—continued.

NULLAGINE DISTRICT.

Mining Centre.	Number of Lease.	Registered Name of Company or Lease	Total for 1925.					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	219L	Shamrock	...	...	...	...	...	...	...	89·00	109·15	11·77
Do. ...	...	Voided leases	...	...	...	...	...	...	8·19	4,482·00	8,854·88	...
Do. ...	...	Sundry claims	...	...	66·00	72·39	...	...	3·77	449·50	716·04	16·90
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	...	Voided leases	...	...	...	...	...	...	...	6,211·90	8,433·68	...
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	...	4·23	...	...	...	156·85	210·96	3,984·75	9,336·03	...
20-Mile Sandy	...	Voided leases	...	...	...	...	...	...	3·20	5,093·70	7,786·99	...
Do. ...	...	Sundry claims	...	...	...	...	...	33·10	20·55	2,802·65	3,855·08	...
	From District Generally :—											
	Sundry Parcels Treated at :											
	Doherty's Works		...	...	...	...	...	...	...	...	1,177·32	...
	Fremantle Trading Co. Ltd., Works		...	...	...	...	...	...	...	...	8·29	...
	State Battery, 20-Mile Sandy		...	...	...	...	...	...	...	62·00	1,767·60	...
	Various Works		...	...	...	...	...	...	...	50·50	2,641·67	...
	Reported by Banks and Gold Dealers		20·50	...	...	...	...	6,593·74	35·54	...	...	...
		Total	**20·50**	4·23	**66·00**	**72·39**	...	**6,604·76**	**484·06**	**40,959·24**	**73,500·69**	**28·67**

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 ...	...	Voided leases	...	...	...	...	...	...	48·12	267·00	413·59	...
Do. ...	...	Sundry claims	...	...	...	...	...	1·11	86·24	163·00	249·86	...
Roebourne ...	(M.L. 174) ...	Good Fortune	...	...	...	...	...	...	...	...	3·96	112·83
Do. ...	M.L. 183, M.L. 167	Carlow Castle :—Roebourne Copper Mines, Ltd.	...	...	...	...	...	...	...	...	21·12	...
Do. ...	...	Voided leases	...	...	...	...	...	...	...	113·36	573·91	237·91
Do. ...	...	Sundry claims	...	...	...	...	...	...	...	108·60	93·85	96·53
Station Peak...	165	(Belladonna)	...	...	...	...	...	...	17·93	943·00	262·93	...
Do. ...	...	Voided leases	...	...	...	...	...	177·74	23·44	9,993·00	11,084·49	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	...	37·50	48·19	...
Towranna ...	...	Voided leases	...	...	...	...	...	...	2·62	3,965·80	5,187·51	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	...	22·00	12·35	...
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	...	Voided leases	...	...	...	...	...	...	...	...	...	883·80
	From Goldfield Generally :— Reported by Banks and Gold Dealers		34·95	...	...	...	...	5,558·48	92·82	...	7·16	...
	Total		**34·95**	...	...	...	...	**5,769·17**	**275·00**	**19,302·71**	**22,108·88**	**1,331·07**

Ashburton Goldfield.

Mt. Mortimer	...	Sundry claims	...	...	...	...	...	354·37	315·64	...	...	74·47
Uaroo ...	...	Voided leases	...	...	...	...	...	...	...	...	...	7,713·22
	From Goldfield Generally :— Reported by Banks and Gold Dealers		10·63	...	...	...	...	8,272·16	...	...	...	...
	Total		**10·63**	...	...	...	...	**8,626·53**	**315·64**	...	...	**7,787·69**

Gascoyne Goldfield.

Bangemall ...	...	Voided leases	...	...	...	...	...	...	6·22	350·70	313·82	...
Do. ...	...	Sundry claims	...	3·37	...	...	...	...	15·66	6·00	24·01	...
	From Goldfield Generally :— Reported by Banks and Gold Dealers		...	...	...	...	...	331·64	...	...	...	...
	Total		...	**3·37**	...	...	...	331·64	21·88	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 1925.					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 ...	...	Voided leases	...	...	...	...	...	60·86	30·91	4,725·25	2,019·78	...
Do, ...	...	Sundry claims	...	...	...	...	...	235·35	23·51	1,093·75	506·79	...
Horseshoe ...	...	Voided leases	...	...	...	...	...	...	1,962·66	728·38	1,973·46	2·00
Do. ...	...	Sundry claims	...	...	...	...	...	15·70	648·12	16·05	45·14	...
Mt. Fraser ...	...	Voided leases	...	...	...	...	...	...	...	389·50	320·96	...
Do. ...	...	Sundry claims	...	...	8·75	10·65	...	...	...	145·25	120·91	...
Peak Hill ...	459P	Atlantic	...	...	...	...	...	...	...	463·50	669·90	...
Do. ...	448P	Evening Star	...	...	153·00	179·43	...	...	...	1,938·25	3,612·97	...
Do. ...	491P	Independent	...	...	64·25	146·06	...	...	...	126·25	230·58	...
Do. ...	5P, 306P ...	No. 1 North Leases	...	...	202·75	204·61	...	...	61·10	4,299·75	3,383·34	·04
Do. ...	492P	North Star	...	...	111·00	22·07	...	...	...	222·00	57·96	...
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. ...	...	Voided leases	...	...	...	...	...	...	543·06	21,712·62	7,385·66	...
Do. ...	...	Sundry claims	...	...	283·00	147·46	...	30·07	251·84	20,101·00	5,669·05	...
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 Gold elds Generally,										
		Sundry Parcels treated at :—										
		Purcell's Works	...	...	...	676·75	...	...	...	...	2,192·20	...
		State Battery—Egerton	...	...	...	...	...	...	...	...	294·87	...
		State Battery, Peak Hill	...	...	...	248·62	...	...	3·05	15·00	2,203·80	...
		Various Works	...	...	...	...	...	...	...	30·00	319·97	...
		Reported by Banks and Gold Dealers	...	...	...	...	...	1,947·77	345·17	...	...	...
		Total	...	...	**822·75**	**1,635·65**	...	**2,289·75**	**4,186·06**	**523,012·51**	**257,849·50**	**2,287·63**

East Murchison Goldfield.

LAWLERS DISTRICT.

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	1231	Roderick Dhu	...	...	59·00	26·78	...	...	...	59·00	26·78	...
Do. ...	382	(Yellow Aster)	...	...	...	...	...	...	...	37,605·00	27,051·42	...
Do. ...	382	(Yellow Aster)	...	...	...	...	...	...	...	1,714·00	949·04	...
Do. ...	382, 1197 ...	Yellow Aster Leases	...	...	...	244·60	...	...	...	3,555·00	2,815·14	...
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	1,505·75	879·66	...
Lake Darlot...	...	Voided leases	...	...	...	...	...	...	4,448·42	65,385·30	48,740·44	...
Do. ...	...	Sundry claims	...	...	...	...	...	1·16	474·45	3,972·64	3,387·61	2·60
Lawlers ...	(22), (37), 58, 62, (70), (155), (156), (157), (158), (376), (377), (381), (385), (390), (426), (427), (459) (474) (500) (508) (509) (510) (511) (512) (552) (562), (563), (573), (811), (840)	(East Murchsion United, Ltd.) ...	...	...	...	...	...	...	...	291,797·00	155,594·26	900·48
Do. ...	(1171)	(Great Eastern)	...	...	...	...	...	...	...	927·00	337·72	...
Do. ...	(1171)	Great Eastern	...	...	...	...	...	...	...	217·00	168·80	...
Do. ...	(1171), (1186) ...	(Great Eastern Leases) ...	...	...	...	...	...	...	...	1,601·74	1,352·43	...
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)	(London and Western Australian Exploration Coy., Ltd.)	...	...	...	...	...	...	...	179,563·00	40,438·14	2,560·31
Do. ...	(1233)	Mayree	...	...	79·00	36·83	...	...	...	79·00	36·83	...

TABLE IV.—*Production of Gold and Silver 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 1925.					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 ...	(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. ...	(1212)	(Queen)	...	...	...	...	...	...	...	168·00	124·30	...
Do. ...	(1212)	Queen: Daisy Queen G.M. Co., N.L.	...	...	90·00	19·90	...	...	...	4,248·00	2,373·10	...
Do. ...	58, 62, 918, 1178	Waroonga G.M. Co., Ltd.	...	...	...	...	...	...	...	55,269·00	13,443·49	...
Do. ...	62, (562), (563)	Waroonga South Leases ...	...	...	...	...	...	...	...	42,150·00	14,329·48	...
Do. ...	58	(Waroonga: London and Western Australian Exploration Co., Ltd.)	...	...	...	...	...	...	...	2,438·50	2,755·45	...
Do. ...	...	Voided leases	...	...	...	...	...	...	687·39	304,608·48	157,459·70	2,533·25
Do. ...	...	Sundry claims	...	5·96	94·00	105·98	...	14·81	261·04	11,539·48	7,111·96	268·34
New England ...	...	Voided leases	...	...	...	...	...	...	57·54	899·00	720·25	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	4·32	554·50	465·23	...
Sir Samuel ...	1230	Canberra	...	...	8·00	2·36	...	...	...	19·00	14·80	...
Do. ...	1225	Combine	...	...	...	...	...	...	...	13·00	7·74	...
Do. ...	1228	Vanguard	...	...	...	...	...	...	...	163·00	67·40	...
Do. ...	1232	Westralia	...	...	222·00	120·53	...	...	...	222·00	120·53	...
Do. ...	...	Voided leases	...	...	...	...	...	...	13·49	266,065·50	138,811·99	10,225·58
Do. ...	...	Sundry claims	...	...	14·00	7·58	...	...	21·37	4,330·00	2,976·19	...
Wiluna ...	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. ...	870, [10J] ...	(Moonlight)	...	...	...	...	...	...	...	1,856·00	787·66	...
Do. ...	917, [12J] ...	(Squib)	...	...	...	...	...	...	...	276·50	67·00	...
Do. ...	...	Voided leases	...	...	...	...	...	...	537·27	104,086·75	62,811·02	124·00
Do. ..	...	Sundry claims	...	...	...	...	...	5·30	...	2,841·15	1,516·76	...

From District Generally :—												
Sundry Parcels treated at :												
Great Eastern Battery	...	...	...	569·36	...	...	...	...	6,006·94	151·37
Lawlers Public Battery (Retreatment Works) ...	...	...	...	...	...	...	...	...	1,439·37	...
Queen Works	...	...	...	...	...	...	...	...	1,275·11	39·36
State Battery, Lake Darlot	...	...	...	...	...	...	...	315·00	1,097·09	...
State Battery, Sir Samuel	...	...	...	114·63	...	...	...	23·50	1,725·77	...
State Battery, Wiluna	...	...	...	...	...	...	...	390·00	2,047·17	20·00
Western Machinery Co., Ltd.	...	...	...	...	...	...	...	80·00	37·25	...
Various Works	...	...	...	...	...	...	...	1,619·50	14,563·26	744·33
Reported by Banks and Gold Dealers	...	...	...	...	...	5,593·22	67·15	...	5·74	...
Total	...	**5·96**	**566·00**	**1,248·55**	...	**5,614·49**	**7,247·81**	**2,039,143·36**	**912,877·40**	**25,997·48**

WILUNA DISTRICT.

Collavilla ...	...	Voided leases	...	...	...	...	...	...	...	1,518·00	496·28	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	...	30·00	21·47	...
Corboy's Find	350J	Corboy's Reward	...	...	108·00	76·80	...	...	...	108·00	76·80	...
Do. ...	359J	Corboy's Reward, North ...	...	...	100·00	82·66	...	...	...	100·00	82·66	...
Do. ...	367J	Laughing Jack	...	...	61·00	15·65	...	...	...	61·00	15·65	...
Do. ...	340J	Wandilla	...	...	25·00	22·11	...	...	...	25·00	22·11	...
Gum Creek ...	...	Voided leases	...	...	...	...	...	...	...	1,334·50	579·16	...
Mt. Keith ...	...	Voided leases	...	...	...	...	...	...	8·29	8,279·50	6,882·05	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	78·26	1,595·25	976·93	...
New England	353J	Toscana	...	...	109·00	424·03	...	...	...	109·00	424·03	...
Do. ...	...	Voided leases	...	...	...	...	...	...	...	952·00	309·11	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	...	115·00	100·62	...
Wiluna ...	91J, [940] ...	(Adelaide)	...	...	...	...	...	...	...	401·00	33·29	...
Do. ...	352J	Black Adder	...	...	242·25	364·90	...	...	...	331·00	467·90	...
Do. ...	231J	Brilliant	...	...	279·75	75·60	...	...	...	778·25	299·31	...
Do. ...	373J	Brilliant, North	...	...	57·75	160·60	...	...	...	57·75	160·60	...
Do. ...	(294J)	Bulletin Consols	...	...	...	...	...	...	...	35·25	28·20	...
Do. ...	370J	Bulletin, North	...	...	50·25	15·09	...	...	...	50·25	15·09	...
Do. ...	369J	Cromarty Hope	...	...	185·00	96·90	...	...	...	185·00	96·90	...
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. ...	372J	Hawk's Nest	...	...	36·75	25·70	...	...	...	36·75	25·70	...
Do. ...	10J, [870] ...	(Moonlight)	...	...	...	...	...	...	...	5,181·00	1,078·40	...
Do. ...	10J, [870 E.M.], 37J, 91J, 109J, (123J)	Moonlight leases	...	...	...	...	...	...	...	28,741·25	11,966·35	...
Do. ...	333J	Neb	...	...	754·75	257·16	...	...	...	754·75	257·16	...
Do. ...	288J	Ullina	...	...	...	...	...	...	...	117·50	66·68	...
Do. ...	275J	W.A.	...	...	85·25	82·30	...	...	...	152·75	127·10	...

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 1925.					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 ...	6J, [542], 7J, [548], (8J), (550), (11J), (13J), (14J), (15J), (17J), (21J), (161J), (163J), (193J), (194J), (256J), (257J)	Western Machinery Co., Ltd. ...	...	...	...	...	...	...	...	69,555·00	33,178·75	...
Do. ...	12J, [917], (23J), ([946]), (28J), ([954]), (30J), ([959]), (33J), ([967]), (36J), ([975]), (43J), ([1018]), (76J), ([1090]), (113J), 119J, (124J), (137J), 266J	Wiluna Gold Mines, Ltd. (In liq.) ...	...	...	...	...	...	...	...	31,069·75	14,653·06	...
Do. ...	...	Voided leases	...	...	...	...	...	...	27·92	23,700·25	10,839·24	...
Do. ...	...	Sundry claims	...	3·60	647·25	400·96	...	87·59	83·48	10,295·75	4,923·10	·33
	From District Generally:—											
	Sundry Parcels treated at:											
	State Battery, Mt. Keith		...	...	...	...	...	...	...	...	781·64	12·68
	State Battery, Wiluna		...	...	...	33·60	...	...	...	202·00	11,516·58	198·70
	Reported by Banks and Gold Dealers		...	...	...	...	...	9·78	2·92	...	...	...
	Total		...	**3·60**	**2,742·00**	**2,134·06**	...	**97·37**	**200·87**	**216,390·50**	**111,518·75**	**232·00**
		BLACK RANGE DISTRICT.										
Barrambie ...	...	Voided leases	...	...	...	...	...	...	...	455·50	1,862·24	...
Do. ...	...	Sundry claims	...	...	23·00	305·57	...	...	77·14	150·05	446·07	...
Bellchambers	...	Sundry claims	...	...	10·00	3·00	...	...	...	55·00	39·62	...
Birrigrin ...	...	Voided leases	...	...	...	...	...	...	820·68	12,018·16	15,040·45	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	34·52	744·50	678·89	...

Curran's Find	...	Voided leases	...	...	...	...	...	18·24	222·89	7,038·50	3,001·02	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	29·38	1,188·50	430·37	...
Erroll's ...	...	Voided leases	...	...	...	...	...	14·17	132·04	72·00	426·68	...
Do. ...	...	Sundry claims	...	...	...	...	...	6·53	399·11	228·00	327·90	...
Hancock's ...	...	Voided leases	...	...	...	...	...	...	6,523·59	31,359·75	32,496·84	55·72
Do. ...	...	Sundry claims	...	...	159·00	89·69	...	4·21	119·02	2,808·50	1,430·65	...
Maninga Marley	203B	(Havilah)	...	...	...	...	...	...	...	1,507·50	2,315·74	...
Do. ...	203B	(Havilah)	...	...	...	...	...	...	...	638·00	716·05	...
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, 345B ...	Havilah leases	...	...	171·00	177·38	...	...	...	332·00	409·70	...
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	952·34	9,000·75	4,813·99	...
Do. ...	...	Sundry claims	...	...	...	...	...	46·67	1,455·98	3,601·90	2,212·33	...
Sandstone ...	944B	Black Range	...	...	101·00	98·59	...	...	...	101·00	98·59	...
Do. ...	(893B)	(Nous Verrons)	...	...	98·00	98·82	...	...	...	447·00	368·44	...
Do. ...	946B	Nous Verrons	...	...	112·50	105·22	...	...	...	112·50	105·22	...
Do. ...	885B	(Oroya East)	...	...	...	...	...	...	17·77	508·15	860·92	...
Do. ...	885B	Oroya East: Black Range G.M. Co., N.L.	...	46·41	67·50	130·67	...	...	46·41	179·50	215·76	...
Do. ...	947B	Waratah	...	...	26·55	44·14	...	...	...	26·55	44·14	...
Do. ...	...	Voided leases	...	...	...	...	...	4·75	3,185·47	687,305·77	440,915·62	11,754·22
Do. ...	...	Sundry claims	...	80·46	184·00	203·47	...	33·72	1,358·39	5,354·65	3,230·51	...
Youanmi ...	(863B), (864B), (865B), (866B)	Yuanmi Gold Mines, Ltd.	...	...	807·50	182·20	...	...	...	56,933·25	38,856·25	1,658·83
Do. ...	...	Voided leases	...	...	...	...	...	·36	126·92	302,045·53	138,026·29	2,949·72
Do. ...	...	Sundry claims	...	...	73·50	43·50	...	1·07	2·31	2,350·25	646·60	...
	From District Generally:—											
	Sundry Parcels treated at:											
	State Battery, Black Range		...	...	...	71·29	...	...	...	202·00	16,104·34	59·53
	State Battery, Youanmi		...	...	...	325·92	...	...	...	...	3,908·96	...
	Various Works		...	...	...	...	...	...	...	37·00	5,644·78	...
	Reported by Banks and Gold Dealers		...	...	...	...	...	1,353·43	11·43	...	...	...
		Total	...	**126·87**	**1,833·55**	**1,879·46**	...	**1,509·09**	**16,008·81**	**1,194,705·39**	**768,103·68**	**16,500·57**

TABLE IV.—*Production of Gold and Silver from all sources, etc.*—continued.

Murchison Goldfield.

CUE DISTRICT.

Mining Centre.	Number of Lease.	Registered Name of Company or Lease.	Total for 1925.					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.
Barrambie ...	...	Voided leases	...	...	...	...	...	...	22·49	16,903·92	14,338·52	125·60
Do. ...	...	Sundry claims	...	...	...	...	...	...	...	70·50	35·81	...
Cuddingwarra	1860	Big Bell	...	...	...	...	...	...	...	64,448·36	10,965·90	85·29
Do. ...	...	Voided leases	...	...	...	...	...	10·59	124·53	35,855·75	43,796·59	15·42
Do. ...	...	Sundry claims	...	...	276·89	103·24	...	...	82·10	870·43	1,229·44	...
Cue	203, 1148 ...	(Cue Consolidated G.M., Ltd.) ...	...	...	...	...	...	...	...	23,427·50	18,382·10	...
Do. ...	203	Cue No. 1	...	...	...	...	...	...	...	7,781·75	12,961·68	20·40
Do. ...	(2032)	(Monte Carlo Bank)	...	...	...	...	...	...	...	257·00	1,095·88	...
Do. ...	2039	Monte Carlo Bank	...	...	379·50	70·33	...	...	...	379·50	70·33	...
Do. ...	2043	Primrose	...	...	210·75	208·88	...	...	...	210·75	208·88	...
Do. ...	...	Voided leases	...	...	...	...	...	34·72	535·34	248,777·17	182,873·27	46·23
Do. ...	...	Sundry claims	12·09	...	163·60	116·33	...	50·54	604·80	18,182·89	11,039·61	...
Eelya ...	...	Voided leases	...	...	...	...	...	...	8·78	971·00	1,778·94	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	101·86	595·15	630·47	...
Erroll's ...	...	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	1,017·00	1,130·39	...
Reedy's Find	1977	Emu	...	...	...	...	...	...	...	555·50	280·88	...
Do. ...	1981	Emu North	...	...	2,902·00	1,056·16	4·00	...	...	3,431·00	1,338·62	4·00
Do. ...	(2018)	Turn of the Tide	...	...	...	...	...	...	...	31·25	341·61	...
Do. ...	...	Voided leases	...	...	...	...	...	...	214·65	1,315·50	5,765·74	...
Do. ...	...	Sundry claims	...	...	...	...	...	169·59	87·00	451·30	395·09	...
Tuckabianna	...	Voided leases	...	...	...	...	...	...	162·70	3,020·00	4,302·51	...
Do. ...	...	Sundry claims	...	...	80·50	43·80	...	23·44	102·14	498·75	300·40	...
Tuckanarra ...	2042	Lady Lucy	...	...	8·00	2·02	...	...	...	8·00	2·02	...
Do. ...	...	Voided leases	...	...	...	...	...	14·65	3,061·77	17,992·40	20,706·27	172·77
Do. ...	...	Sundry claims	3·54		335·50	566·61	...	97·15	618·36	3,814·73	7,572·98	...

From District Generally :—												
Sundry Parcels treated at :												
Cue No. 1 Works	...	...	...	...	...	...	...	...	1,870·50	6,684·54	...
State Battery, Cue	...	...	...	...	...	...	...	...	...	1,846·96	...
State Battery, Tuckanarra	...	...	...	123·28	...	...	...	...	518·50	3,925·50	...
Triplicate Works	...	...	...	...	...	...	...	...	...	3,546·56	...
Various Works	...	...	...	...	...	...	...	...	5,055·02	18.568·66	...
Reported by Banks and Gold Dealers	32·43	...	...	...	...	864·90	7·54	...	...	...
Total	**48·06**	**...**	**4,356·74**	**2,290·65**	**4·00**	**1,268·65**	**5,764·12**	**480,572·12**	**389,884·58**	**512·68**

MEEKATHARRA DISTRICT.

Abbott's ...	...	Voided leases	...	...	...	...	...	...	26·45	35,210·60	37,124·40	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	·49	68·60	99·08	...
Burnakura ...	...	Voided leases	...	...	...	...	...	...	3,239·43	38,480·95	30,579·03	26·90
Do. ...	...	Sundry claims	...	...	...	...	...	12·51	81·11	144·50	118·98	...
Chesterfield ...	...	Voided leases	...	...	...	...	...	29·02	409·15	6,756·26	7,445·01	·80
Do. ...	...	Sundry claims	...	...	...	...	...	...	41·63	435·60	487·80	...
Gabanintha ...	...	Voided leases	...	...	...	...	...	...	16·93	21,918·00	13,447·58	815·57
Do. ...	...	Sundry claims	...	...	...	...	...	13·05	74·38	1,063·50	724·83	...
Garden Gully	...	Voided leases	...	...	...	...	...	26·36	74·91	29,854·06	21,435·37	1,102·59
Do. ...	...	Sundry claims	...	...	46·00	53·27	...	...	5·38	394·10	450·65	...
Gum Creek ...	...	Voided leases	...	...	...	...	...	25·27	88·12	3,63 ·08	3,359·56	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	...	338·00	278·36	...
Holden's Find	(1460N)	Norma	...	...	...	...	...	...	...	213·75	167·26	...
Do. ...	1291N	Waterloo	...	...	...	...	...	...	...	14,256·00	4,949·09	...
Do. ...	...	Voided leases	...	...	...	...	...	...	18·00	1,273·25	987·62	...
Do. ...	...	Sundry claims	...	...	...	...	...	164·95	44·63	206·00	173·56	...
Jillawarra ...	...	Voided leases	...	...	...	...	...	...	1,134·68	1,499·55	2,801·53	...
Do. ...	...	Sundry claims	...	...	...	...	...	169·94	142·95	23·50	53·81	...
Meeka Pool ...	...	Voided leases	...	...	...	...	...	...	...	111·58	82·27	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	2·84	211·72	184·83	...
Meekatharra...	597N	Commodore	...	...	...	...	...	...	...	165·50	120·86	...
Do. ...	597N	(Commodore)	...	...	...	...	...	...	...	498·00	1,268·71	...
Do. ...	597N, (915N), (1041N), (1365N)	(Commodore G.M. Co., N.L.) ...	...	...	...	...	...	....	...	40,527·00	16,121·38	3·32
Do. ...	1501N	Empire	...	25·80	138·50	467·77	...	...	39·89	342·75	807·02	...
Do. ...	477N	(Fenian)	...	...	...	...	...	...	...	8,831·75	18,289·22	...
Do. ...	477N, 814N ...	Fenian leases	...	...	21·00	313·66	...	...	...	313,485·94	254,921·73	...
Do. ...	1331N	Gwalia	...	...	33·50	44·53	...	...	132·98	4,327·25	9,660·97	...
Do. ...	1326N	Gwalia Extended	...	...	86·00	250·23	...	...	...	125·00	340·75	...
Do. ...	1466N	Haveluck	...	...	81·75	180·21	...	...	...	570·25	941·75	...
Do. ...	1528N	Haveluck North	...	...	25·00	47·29	...	...	...	25·00	47·29	...
Do. ...	(555N)	Ingliston	...	...	91·25	86·04	...	...	...	548·50	691·53	...
Do. ...	(555N)	(Ingliston)	...	...	...	...	...	...	...	1,202·49	2,332·27	...

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 1925.					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.
Meekatharra...	475N	(Ingliston Consols Extended) ...	...	...	...	...	...	...	...	1,536·25	4,248·25	·30
Do. ...	475N, 515N, 729N, 822N	Ingliston Consols Extended leases	...	...	43,317·00	19,606·58	...	...	...	404,545·22	213,867·70	...
Do. ...	(555N), (1239N)...	(Ingliston leases)	...	...	...	...	...	...	...	21,324·85	19,947·12	...
Do. ...	1531N	Ingliston G.M. Co., N.L.	...	...	133·25	208·61	...	...	...	133·25	208·61	...
Do. ...	(1489N)	(Ingliston G.M. Co., N.L.)	...	...	...	...	...	...	...	65·00	179·89	...
Do. ...	533N	Marmont	...	...	117·75	194·40	...	...	...	55,115·35	39,815·31	...
Do. ...	580N	(Marmont Extended)	...	...	...	...	...	...	...	43·00	38·03	...
Do. ...	580N, (888N) ...	(Marmont Extended leases) ...	...	...	...	...	...	...	...	152·00	129·61	...
Do. ...	597N, (915N), (1041N), (1365N)	(New Commodore G.M. Co., N.L.) ...	...	...	...	...	...	...	...	127·10	76·78	...
Do. ...	1530N	United	...	...	74·00	150·08	...	...	...	74·00	150·08	...
Do. ...	...	Voided leases	...	...	...	...	...	3·88	465·44	284,476·20	142,381·91	2,451·42
Do. ...	...	Sundry claims	...	8·70	441·75	282·92	...	187·56	193·04	7,972·95	4,021·01	...
Mistletoe ...	1502N	Munarra	...	49·53	41·00	50·45	...	...	993·40	74·75	175·49	...
Do. ...	...	Voided leases	...	...	...	...	...	4·15	...	...	...	...
Do. ...	...	Sundry claims	10·68	...	...	...	...	113·64	63·65	...	...	...
Mt. Maitland	...	Sundry claims	...	...	24·75	43·05	...	...	...	41·25	96·25	...
Munara Gully	...	Voided leases	...	...	...	...	...	...	...	13,167·75	6,489·65	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	11·62	90·50	66·31	...
Nannine ...	166N	Nannine	...	...	5·00	10·46	...	...	218·15	267·00	772·96	...
Do. ...	(16N), (25N), 166N	(Nannine leases)	...	...	...	...	...	...	8·71	23,649·60	24,385·66	127·60
Do. ...	...	Voided leases	...	...	...	...	...	34·02	372·54	68,097·02	43,048·73	39·85
Do. ...	...	Sundry claims	28·41	3·13	...	...	...	74·53	418·05	2,482·45	1,991·28	...
Quinn's ...	...	Voided leases	...	...	...	...	...	7·30	1,186·50	18,931·16	8,886·79	90·70
Do. ...	...	Sundry claims	2·86	...	...	...	...	13·64	1,172·91	1,671·50	1,458·18	...
Ruby Well ...	...	Voided leases	...	...	...	...	...	...	...	7,443·00	3,988·36	...
Do. ...	...	Sundry claims	125·97	...	...	...	...	700·76	389·32	261·00	341·66	...
Stake Well ...	...	Voided leases	...	...	...	...	...	...	200·12	21,362·00	9,566·18	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	31·79	286·50	301·26	...
Star of the East	...	Voided leases	...	...	...	...	...	...	...	27,244·00	20,305·40	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	...	127·62	94·97	...

Yaloginda ...	...	Voided leases	...	...	...	...	...	...	1,591·82	25,776·02	13,256·35	8·68
Do. ...	...	Sundry claims	...	...	106·50	68·43	...	13·82	536·58	2,136·17	1,779·69	...
	From District Generally :—											
	Sundry Parcels treated at :											
		Ruby Well Battery	...	...	...	...	...	...	...	...	699·32	...
		State Battery, Meekatharra	...	...	...	...	...	...	...	14·00	11,546·00	19·00
		State Battery, Quinn's	...	...	...	...	...	...	...	...	618·79	...
		Tumbulgum Sand Syndicate Works	...	...	...	31·05	...	...	...	...	205·95	...
		Various Works	...	...	...	...	...	...	...	172·75	4,475·42	342·17
	Reported by Banks and Gold Dealers		25·26	...	...	...	...	9,904·57	13·79	...	...	...
	Total		**193·18**	**87·16**	**44,784·00**	**22,089·03**	...	**11,498·97**	**13,441·38**	**1,515,609·24**	**1,010,109·05**	**5,028·90**

DAY DAWN DISTRICT.

Day Dawn ...	557D	Great Fingall No. 2	...	...	86·25	46·76	...	...	...	468·75	345·03	...
Do. ...	1D	Great Fingall No. 1	...	...	...	5·93	...	...	...	...	5·93	...
Do. ...	1D, (2D), (86D), (87D), (99D), (119D), (129D), (158D), (159D), 170D, (185D), (191D), (209), 210D, (211D), (212D), (213D), (224D), (225D), (249D), (424D), (453D), (455D), (467D)	(Great Fingall Consolidated, Ltd.) ...	...	...	...	...	...	...	18·19	1,865,708·45	1,185,412·46	169,210·20
Do. ...	1D	(London, Australian and General Exploration Co., Ltd.)	...	...	...	...	...	...	...	32·00	10·24	...
Do. ...	569D	South Fingall	...	...	502·25	197·58	...	...	...	776·95	402·96	...
Do. ...	(570D)	Star	...	34·34	...	...	...	34·34	34·34	...	...	...
Do. ...	...	Voided leases	...	...	...	...	...	126·30	511·03	45,558·63	30,974·34	·24
Do. ...	...	Sundry claims	...	1·01	420·66	106·25	...	24·74	300·33	4,068·16	2,615·74	...
Jasper Hill ...	...	Voided leases	...	...		...	...	4·90	1,210·23	16,080·75	9,369·47	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	401·27	358·50	468·44	...
Lake Austin (Island)	536D	Eureka	...	...	...	...	...	...	1,271·01	57·25	892·61	...
Do. ...	...	Voided leases	...	...	...	...	...	601·92	1,591·39	29,954·12	45,477·99	...
Do. ...	...	Sundry claims	12·10	...	33·00	33·95	...	36·49	567·57	896·64	544·80	...
Mainland ...	571D	Mainland Consols	...	40·19	...	...	...	...	40·19	...	...	...
Do. ...	...	Voided leases	...	...	...	...	...	·41	2,706·26	7,272·13	23,129·51	...
Do. ...	...	Sundry claims	...	...	...	...	...	3·24	677·12	103·95	164·86	...
	From District Generally :—											
	Sundry Parcels treated at :											
		Neptune Works	...	...	...	160·57	...	...	...	...	160·57	...
		Various Works	...	...	...	...	...	...	16·61	940·75	1,537·30	...
	Reported by Banks and Gold Dealers		...	...	...	...	...	1,606·81	3·48	...	·77	...
	Total		**12·10**	**75·54**	**1,042·16**	**551·04**	...	**2,439·15**	**9,349·02**	**1,972,276·83**	**1,301,513·02**	**169,210·44**

TABLE IV.—*Production of Gold and Silver from all sources, etc.*—continued.

MURCHISON GOLDFIELD—*continued.*

MOUNT MAGNET DISTRICT.

Mining Centre.	Number of Lease.	Registered Name of Company or Lease.	Total for 1925.					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.
Lennonville ...	964M	(Empress)	...	...	...	...	...	...	...	1,649·00	7,361·81	...
Do. ...	964M	Empress	...	...	...	28·18	...	...	...	75·00	403·65	...
Do. ...	964M, (1078M), (1079M), (1115M), (1116M), (1117M)	(Empress leases)	...	...	...	...	...	...	...	4,813·00	3,171·33	...
Do. ...	...	Voided leases	...	...	...	...	...	...	3,196·79	134,931·23	113,240·12	458·82
Do. ...	...	Sundry claims	...	...	488·25	138·42	...	13·51	98·01	2,849·92	2,402·62	...
Mt. Magnet ...	1215M	Hill 60	...	...	275·00	72·92	...	...	...	275·00	72·92	...
Do. ...	1156M	Leap Year	...	...	88·00	87·00	...	...	...	1,511·75	1,199·25	...
Do. ...	(1200M)	Morning Star	...	...	10·50	5·23	...	...	...	211·25	132·62	...
Do. ...	1020M	Neptune	...	...	57·00	48·05	...	...	...	272·75	391·61	...
Do. ...	1075M	New Havelock	...	...	8·00	71·55	...	...	15·77	2,105·00	987·18	...
Do. ...	1216M	Revenue	...	...	33·75	591·14	...	...	...	33·75	591·14	...
Do. ...	1209M	Royal Consols	...	...	137·50	32·80	...	...	...	204·00	48·04	...
Do. ...	...	Voided leases	...	...	...	...	...	27·83	8,409·19	368,076·86	208,793·50	714·36
Do. ...	...	Sundry claims	...	22·78	464·01	1,573·73	...	1·82	1,237·42	23,000·48	15,092·07	...
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 ...	(1213M)	(Evelyn)	...	...	·70	6·10	...	...	...	20·70	26·27	...
Do. ...	...	Voided leases	...	...	...	...	...	...	5·08	4,550·75	6,670·21	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	111·10	658·23	735·45	...
Paynesville ...	1196M	Elsie	...	552·30	...	...	...	...	1,200·84	·25	101·95	...
Do. ...	...	Voided leases	...	...	...	...	...	...	178·89	39·02	69·52	...
Do. ...	...	Sundry claims	...	145·29	57·50	96·41	...	...	433·13	117·17	824·03	...
Youanmi ...	...	Sundry claims	...	...	...	...	...	...	...	33·00	44·58	...

From District generally :—												
Sundry Parcels treated at :												
Fremantle Trading Co., Ltd., Works	...	...	...	...	...	...	...	...	...	143·80	...
Long Reef Cyanide Works	...	...	...	37·48	...	...	...	...	...	203·78	...
Morning Star Battery	...	...	...	...	...	...	...	...	...	874·80	...
State Battery, Boogardie	...	...	...	506·60	...	...	...	92·51	16,701·08	...
Various Works	...	...	...	...	...	...	...	43·06	15,828·72	1·00
Reported by Banks and Gold Dealers	76·48	...	...	...	...	1,774·35	·35	...	...	...
Total	**76·48**	**720·37**	**1,620·21**	**3,295·61**	...	**1,880·80**	**15,688·32**	**551,300·46**	**399,067·90**	**1,174·18**

Yalgoo Goldfield.

Adavale ...	...	Sundry claims	...	...	...	...	...	...	...	10·00	12·56	...
Bilberatha ...	...	Voided leases	...	...	...	...	...	...	...	554·00	200·07	...
Do. ...	...	Sundry claims	...	...	17·00	85·90	...	...	2·90	17·00	85·90	...
Carlaminda ...	...	Voided leases	...	...	...	...	...	...	...	947·32	524·72	3·30
Do. ...	...	Sundry claims	...	...	...	...	...	...	...	114·00	71·96	...
Field's Find...	907	Brown's Reward	...	...	1,584·00	600·19	...	...	...	2,657·25	1,901·61	...
Do. ...	902	Field's Find Extended	...	...	23·50	7·61	...	...	10·38	·31·50	31·35	...
Do. ...	968	Hayes Gold Mine	...	...	...	...	...	...	5·08	38·00	30·85	...
Do. ...	...	Voided leases	...	...	...	...	...	...	204·26	36,169·05	26,802·83	...
Do. ...	...	Sundry claims	...	...	153·25	88·96	...	5·77	163·59	699·00	608·11	...
Goodingnow...	878	Carnation	...	...	37·00	15·50	...	...	...	2,941·50	4,715·05	...
Do. ...	606	(Lake View)	...	...	...	...	...	...	...	163·00	185·46	...
Do. ...	606	Lake View: Payne's Find Development Co., N.L.	...	...	293·50	377·54	...	...	15·58	10,203·50	10,374·44	...
Do. ...	974	Princess Mary	...	...	...	...	...	...	...	38·00	36·01	...
Do. ...	973	Sweet William	...	...	87·00	210·43	...	...	...	312·00	701·99	...
Do. ...	...	Voided leases	...	...	...	...	...	146·70	257·15	14,942·06	17,968·59	...
Do. ...	...	Sundry claims	...	...	61·00	29·92	...	148·00	80·76	3,309·00	1,845·53	...
Gullewa ...	...	Voided leases	...	...	...	...	...	...	·78	23,074·50	15,137·98	...
Do. ...	...	Sundry claims	...	...	5·25	7·90	...	...	14·76	695·25	573·44	...
Kurkalucka ...	...	Sundry claims	...	...	...	...	...	...	...	8·80	4·01	...
Messenger's Patch	880, 897... ...	Brilliant G.M. Co., N.L.	...	...	879·00	546·78	...	...	...	879·00	546·78	...
Do. ...	952	Golden Monarch	...	...	...	...	...	...	·44	4·50	·81	...
Do. ...	880	(Gnow's Nest)	...	...	...	...	...	...	...	10,938·00	9,827·20	158·06
Do. ...	880, 897... ...	(Gnow's Nest G.Ms., Ltd.)	...	...	...	...	...	...	...	6,175·00	6,709·40	363·97
Do. ...	...	Voided leases	...	...	...	...	...	...	321·36	587·26	382·29	...
Do. ...	...	Sundry claims	...	...	...	...	...	463·12	315·11	438·55	280·85	...

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 1925.					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. Farmer ...	...	Voided leases	...	...	...	...	...	...	...	64·00	40·19	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	...	5·00	6·22	...
Mt. Gibson ...	...	Voided leases	...	...	...	...	...	...	6·44	434·50	803·57	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	...	76·00	40·84	...
Ninghan ...	...	Voided leases	...	...	...	...	...	...	...	10·00	1·41	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	...	5·00	17·89	...
Noongal ...	953	Revival	...	...	405·00	202·05	...	...	...	1,052·00	585·61	...
Do. ...	...	Voided leases	...	...	...	...	...	...	15·86	3,086·95	1,847·66	...
Do. ...	...	Sundry claims	...	...	63·00	12·60	...	11·55	64·97	480·75	278·87	...
Nyounda ...	...	Voided leases	...	...	...	...	...	...	217·63	416·00	183·91	...
Do. ...	...	Sundry claims	...	...	26·00	11·57	...	...	4·28	44·00	33·24	...
Pinyalling ...	...	Voided leases	...	...	...	...	...	...	1·36	2,281·60	902·03	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	2·59	160·50	132·57	...
Rothesay ...	(975)	Rothsay South	...	...	129·75	42·94	...	...	...	129·75	42·94	...
Do. ...	...	Voided leases	...	...	...	...	...	...	...	9,230·50	3,517·44	...
Do. ...	...	Sundry claims	...	...	914·50	372·28	...	...	...	1,184·00	538·43	...
Wadgingarra...	...	Voided leases	...	...	...	...	...	...	...	541·61	600·91	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	...	71·50	38·21	...
Warda Warra	...	Voided leases	...	...	...	...	...	...	...	15·50	14·88	...
Do. ...	...	Sundry claims	...	...	56·00	27·86	...	...	...	66·00	53·40	...
Warriedar ...	(961)	Highland Chief	...	...	44·50	13·53	...	...	...	222·25	94·01	...
Do. ...	...	Voided leases	...	...	...	...	...	...	...	11,899·75	4,219·12	7·30
Do. ...	...	Sundry claims	...	...	239·25	31·86	...	...	2·84	1,702·60	638·99	...
Yalgoo ...	...	Voided leases	...	...	...	...	...	...	3·23	6,314·50	9,965·18	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	19·89	856·50	518·75	...
Yuin ...	...	Voided leases	...	...	...	...	...	...	127·12	66,048·50	27,188·08	130·13
Do. ...	...	Sundry claims	...	...	...	...	...	...	4·70	279·50	59·20	...

From Goldfield generally :—												
Sundry Parcels treated at :												
Field's Find Extended Treatment Works ...		...	...	...	...	...	...	...	...	152·40	...	
Goodingnow (Payne's Find) State Battery ...		...	...	...	18·29	...	...	...	38·50	1,934·01	...	
State Battery, Warriedar		...	...	...	123·72	...	...	...	...	3,310·91	...	
Yuanmi Gold Mines, Ltd., Works (Warriedar Options)		...	...	...	...	...	...	...	...	310·93	26·67	
Various Works		...	...	...	...	...	9·42	...	664·00	1,332·45	...	
Reported by Banks and Gold Dealers		·93	...	...	...	...	793·98	...	...	...	...	
Total		**·93**	**...**	**5,018·50**	**2,827·43**	**...**	**1,578·54**	**1,863·06**	**223,328·30**	**158,964·04**	**689·43**	

Mount Margaret Goldfield.

MOUNT MORGANS DISTRICT.

Australia United	...	Voided leases	...	...	...	...	...	...	1,911·63	15,913·69	23,305·76	1·76
Do. ...	...	Sundry claims	...	...	...	...	...	...	580·98	799·25	2,072·62	...
Eucalyptus ...	...	Sundry claims	...	...	...	...	...	...	...	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 ...	346F [1024R] ...	Great Carbine	...	...	...	...	...	...	...	136·50	41·07	...
Do. ...	(388F)	New Bindah	...	...	...	...	...	...	...	...	219·40	...
Do. ...	341F, [903R], 343F, [985R]	Torquay leases	...	...	514·66	516·07	...	...	...	5,623·53	3,592·62	·68
Do. ...	...	Voided leases	...	...	...	...	...	...	...	26,124·75	12,719·85	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	...	1,056·75	728·35	...
Mt. Margaret	...	Voided leases	...	...	...	...	...	·37	...	6,412·89	4,290·53	12·55
Do. ...	...	Sundry claims	...	...	...	...	...	16·61	62·05	366·10	289·21	...
Mt. Morgans	(6F)	(Lily of the Valley South : Westralia Mt. Morgans G.M's., 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. ...	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. ...	...	...	12,720·00	3,791·40	...	...	...	173,503·82	47,032·54	...
Do. ...	...	Voided leases	...	...	...	...	...	...	76·56	34,334·25	20,938·55	77·86
Do. ...	...	Sundry claims	...	...	...	...	...	6·61	22·66	1,392·29	1,704·22	...
Murrin Murrin	...	Voided leases	...	...	...	...	...	10·43	222·93	128,706·22	101,163·09	29·60
Do. ...	...	Sundry claims	...	...	...	...	...	...	237·80	1,492·55	1,618·35	...

TABLE IV.—*Production of Gold and Silver from all sources, etc.*—continued.

MT. MARGARET GOLDFIELD—*continued.*

MT. MORGANS DISTRICT—continued.

Mining Centre.	Number of Lease.	Registered Name of Company or Lease.	Total for 1925.					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.
Redcastle ...	...	Voided leases	...	...	...	...	...	4·49	436·54	2,509·95	2,169·63	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	103·58	139·00	163·01	...
Yundamindera	...	Voided leases	...	...	...	...	...	...	...	2,553·50	2,093·61	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	2·35	787·60	491·70	...
	From District generally :—											
	Sundry Parcels treated at :											
	Battlesville Battery		...	...	...	...	...	...	...	126·00	370·00	15·94
	Hainault Sulphide Plant, Kalgoorlie		...	...	...	...	...	...	...	127·21	83·91	...
	Mt. Morvern Cyanide Works		...	...	...	...	...	...	...	...	129·48	...
	State Battery, Linden		...	...	...	497·22	...	...	...	10·00	1,909·21	...
	Westralia Mt. Morgans Works		...	...	...	...	...	...	...	...	153·10	...
	Various Works		...	...	...	...	...	...	...	788·50	3,010·07	84·03
	Reported by Banks and Gold Dealers		...	...	...	...	...	1,709·52	32·47	...	...	...
	Total		...	...	**13,234·66**	**4,804·69**	...	**1,765·98**	**3,796·75**	**1,005,271·70**	**540,566·06**	**5,775·05**

MOUNT MALCOLM DISTRICT.

Cardinia ...	(1532c)	Contact	1·88	...	1·00	12·54	...	13·87	23·37	3·50	62·91	...
Do. ...	...	Voided leases	...	...	...	...	...	...	...	1,568·29	1,628·24	3,550·42
Do. ...	...	Sundry claims	2·19	...	37·00	30·48	...	2·19	22·37	60·00	89·52	...
Diorite King	...	Voided leases	...	...	...	...	...	...	845·23	34,659·03	31,744·34	24·05
Do. ...	...	Sundry claims	...	...	...	...	...	9·06	148·62	2,664·80	3,189·00	...
Dodger's Well	...	Voided leases	...	...	...	...	...	...	57·90	1,299·30	1,927·94	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	3·37	798·75	665·13	...
Lake Darlot	...	Voided leases	...	...	...	...	...	...	...	1,048·11	450·52	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	5·52	579·20	144·01	...
Leonora ...	198c	(Eastern)	...	...	...	...	...	...	...	302·00	321·72	...
Do. ...	(1548c)	Ping Pong	...	...	...	...	...	...	...	92·75	47·80	...

Do. ...	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), 1341, 1342, (1343c), (1344c), (1345c), (1346c), (1347c)	Sons of Gwalia Ltd	...	...	88 235·00	35 057·19	3,271·63	...	..	2,864,729·67	1 356,024·55	86,037·1 5
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.	...	...	...	...	...	...	...	1,541·00	3 220·24	...
Do. ...	263c, (774c), (793c)	(Trump leases)	...	...	...	...	...	...	...	21,794·45	16,002·07	...
Do. ...	...	Voided leases	...	...	...	...	...	...	1,852·57	138,744·25	66,203·89	10·71
Do. ...	...	Sundry claims	...	...	180·00	148·94	...	23·76	319·42	10,687·05	9,387·86	...
Mt. Malcolm	...	Voided leases	...	...	...	...	...	...	47·07	62,301·78	47,425·54	...
Do. ...	...	Sundry claims	...	...	...	...	...	5·75	26·50	3,060·90	2,116·50	...
Mertondale ...	...	Voided leases	...	...	...	...	...	...	...	88,663·00	60,840·00	1,497·58
Do. ...	...	Sundry claims	...	...	...	...	...	1·45	63·04	1,092·46	1,538·97	...
Mt. Clifford	(1544c)	Bannockburn	...	...	...	...	...	...	...	107·50	278·66	...
Do. ...	1329c	Victory No. 1	...	...	85·00	190·52	...	...	249·29	2,424·46	7,826·03	...
Do. ...	...	Voided leases	...	...	...	...	...	...	1,364·45	3,274·00	7,060·57	...
Do. ...	...	Sundry claims	...	...	...	...	...	19·27	271·55	1,037·50	1,625·25	...
Pig Well ...	1547c	Starlight	...	...	2·00	1·65	...	...	...	12·00	3·45	...
Do. ...	...	Voided leases	...	...	...	...	...	...	...	13,575·32	14,673·13	63·68
Do. ...	...	Sundry claims	...	...	...	...	...	...	34·61	2,738·40	1,160·33	...
Randwick ...	...	Voided leases	...	...	...	...	...	...	239·49	8,065·15	8,671·57	...
Do. ...	...	Sundry claims	...	...	...	...	...	66·57	159·37	1,282·14	944·20	...
Webster's Find	...	Voided leases	...	...	...	...	...	30·30	...	21,760·00	13,970·17	...
Do. ...	...	Sundry claims	...	...	...	...	...	36·37	15·73	1,397·80	939·58	...

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 1925.					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.
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	27,395·10	12,638·18	1·05
Do. ...	...	Sundry claims	...	...	...	...	...	4·68	12·67	814·00	1,086·36	...
	From District generally :—											
	Sundry Parcels treated at :											
		Fremantle Trading Co., Ltd., Works	...	...	...	...	...	...	...	...	1·42	...
		State Battery, Leonora	...	...	...	...	...	...	...	103·00	11,259·41	98·14
		Various Works	...	...	...	...	...	...	...	371·50	7,149·72	20·12
		Reported by Banks and Gold Dealers	...	...	...	...	...	2,483·14	131·00	...	...	...
		Total	**4·07**	**...**	**88,540·00**	**35,441·32**	**3,271·63**	**2,696·41**	**7,565·05**	**3,429,788·11**	**1,752,489·16**	**87,761·14**

MOUNT MARGARET DISTRICT.

Burtville ...	2138T	Nil Desperandum	...	...	287·25	232·13	...	...	...	549·87	1,509·24	...
Do. ...	...	Voided leases	...	...	...	...	...	2·29	413·80	66,801·18	103,935·19	275·27
Do. ...	...	Sundry claims	...	...	...	...	...	...	122·10	3,261·90	2,942·79	...
Duketon ...	...	Voided leases	...	...	...	...	...	3·54	3,213·21	31,485·42	22,318·21	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	65·43	238·50	370·38	...
Eagle's Nest	...	Voided leases	...	...	...	...	...	...	145·34	331·00	1,215·78	...
Do. ...	...	Sundry claims	6·86	59·46	...	...	...	10·86	394·54	147·50	133·96	...
Erlistoun ...	2113T	Baneygo North	...	...	...	...	...	...	...	587·00	182·55	...
Do. ...	...	Voided leases	...	...	...	...	...	...	11·66	27,012·07	18,461·35	...
Do. ...	...	Sundry claims	...	...	...	...	...	1,179·43	116·81	2,189·24	1,964·86	...
Euro ...	...	Voided leases	...	...	...	...	...	...	65·14	91,556·25	37,582·89	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	46·52	259·50	370·57	...
Laverton ...	2083T	Beria Main Reef...	...	...	46·00	21·17	...	...	...	1,205·50	192·85	...
Do. ...	715, 806T,(1206T), (1207T), (1483T), (1523T), (1524T), (1525T), (1542T), (1544T), (1548T)	(Kalgoorlie and Boulder Firewood Co., Ltd.)	...	...	...	...	...	...	...	71,802·00	25,003·11	3,364·01

Do. ...	715, 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.	...	...	...	999·30	68·00	...	...	...	352,729·78	130,131·66	21,081·58
Do. ...	2200T	Pinnacles	...	...	18·00	5·93	...	...	...	...	18·00	5·93	...
Do. ...	...	Voided leases	...	...	...	...	...	17·66	2,024·11	...	456,060·24	260,674·99	4,674·69
Do. ...	...	Sundry claims	1·54	2·57	166·86	242·42	...	206·12	1,396·48	...	51,844·70	4,965·81	...
Mt. Barnicoat	...	Voided leases	...	...	...	...	...	...	...	...	652·00	359·12	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	...	...	23·00	23·37	...
Mt. Shenton...	(2150T)	Chapman's Reward	...	...	15·00	26·65	...	...	...	...	15·00	26·65	...
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		...	...	...	...	...	...	...	...	6·00	181·20	...
	State Battery, Laverton		...	...	...	...	...	...	...	...	77·50	2,704·97	15·64
	Various Works		...	...	...	...	...	...	...	...	151·00	9,603·44	...
	Reported by Banks and Gold Dealers		1·77	...	...	...	...	2,026·44	...	...	...	...	...
	Total		**10·17**	**62·03**	**533·11**	**1,527·60**	**68·00**	**3,446·34**	**8,015·14**	**1,629,138·93**	**826,673·01**	**56,847·87**

North Coolgardie Goldfield.

MENZIES DISTRICT.

Comet Vale ...	5217z	(Gladsome)	...	...	...	...	...	...	...	...	10,897·50	8,678·16	95·29
Do. ...	5217z, (5333z), (5380z), 5476z	Gladsome leases	...	...	...	...	...	...	...	...	64,875·00	50,329·09	1,410·36
Do ...	5410z	Lake View	...	...	138·40	34·39	...	...	10·04	1,048·40	287·76	...	
Do. ...	...	Voided leases	...	...	...	...	...	...	409·70	147,111·07	119,022·33	3,839·28	
Do. ...	...	Sundry claims	...	...	10·00	15·20	...	...	34·99	906·94	630·44	...	
Goongarrie ...	...	Voided leases	...	...	...	...	...	·94	1,027·51	27,198·29	17,428·84	...	
Do. ...	...	Sundry claims	4·05	91·81	43·50	87·50	...	37·77	681·38	1,321·27	1,507·62	...	

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 1925.					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 ...	5489z	Crusoe	...	16·51	166·05	569·20	...	...	16·51	200·05	621·90	...
Do. ...	5423z	Lady Shenton	...	...	...	...	...	...	...	5,289·58	4,207·03	...
Do. ...	4931z, 4934z, 4935z, 4936z, 5074z, 5075z, 5260z, 5261z, 5315z	Menzies Consolidated G.M s., Ltd. ...	...	...	2,379·00	2,638·17	...	...	...	515,822·46	271,619·74	78·67
Do. ...	5484z	Warrior	...	...	220·00	78·17	...	...	...	856·00	406·52	...
Do. ...	...	Voided leases	...	...	...	...	...	45·42	1,049·04	373,305·96	423,936·52	11,263·06
Do. ...	...	Sundry claims	15·76	...	294·50	242·16	...	44·12	362·30	20,209·64	14,616·28	776·49
Mt. Ida ...	5480z, 5481z ...	Unexpected leases	...	...	155·00	82·56	...	...	...	705·00	331·49	...
Do. ...	5481z	(Unexpected South)	...	...	...	...	...	...	...	36·00	29·45	...
Do. ...	...	Voided leases	...	...	...	...	...	...	77·07	57,882·37	68,229·23	106·63
Do. ...	...	Sundry claims	...	...	...	...	...	43·79	9·57	5,394·00	3,088·35	...
	From District generally :—											
	Sundry Parcels treated at:											
	Balkis Battery		...	...	...	...	...	...	...	65·75	4,648·28	...
	Boddington Cyanide Works		...	...	...	...	...	...	...	...	1,069·35	...
	Crusoe Wedderburn Cyanide Works		...	...	...	...	...	...	...	...	1,497·89	...
	Fremantle Trading Co., Ltd., Works		...	...	...	...	...	...	...	...	212·98	...
	Gidney's Cyanide Works		...	...	...	...	...	...	...	...	906·97	585·27
	Lady Harriet Battery		...	...	...	335·24	...	...	...	279·50	4,512·99	30·00
	Menzies Mining & Exploration Corp., Ltd., Works		...	...	...	...	...	...	...	639·50	732·04	...
	Mt. Ida State Battery		...	...	...	...	...	...	...	1,842·25	5,028·57	...
	Various Works		...	...	...	...	...	...	...	1,807·05	23,641·87	1,039·43
	Reported by Banks and Gold Dealers		1·18	...	...	...	...	969·83	195·48	...	...	...
		Total	**20·99**	**108·32**	**3,406·45**	**4,082·59**	...	**1,141·87**	**3,873·59**	**1,237,675·58**	**1,027,221·69**	**19,224·48**

ULARRING DISTRICT.

Davyhurst ...	...	Voided leases	...	...	...	...	...	2·93	138·99	155,644·73	123,063·43	5,403·14
Do. ...	...	Sundry claims	...	...	...	...	...	...	30·12	5,999·15	3,219·41	...
Diemel's Find	...	Sundry claims	...	...	...	...	...	...	7·37	102·50	119·13	...

Mulline ...	(763U)	Young Australian	...	...	...	...	...	...	...	...	601·25	733·86	...
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	...	...	...	...	...	...	...	274·09	93,662·22	88,737·73	530·75
Do. ...	...	Sundry claims	...	...	...	...	...	...	...	43·27	7,122·60	5,060·95	·69
Mulwarrie ...	...	Voided leases	...	...	...	...	...	...	...	56·84	18,440·68	25,625·54	38·47
Do. ...	...	Sundry claims	...	...	...	...	...	...	...	21·45	2,099·07	1,888·49	...
Ularring ...	...	Voided leases	...	...	...	...	...	...	...	563·34	9,429·60	13,647·97	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	...	...	143·00	113·15	...
	From District generally :—												
	Sundry Parcels treated at :												
		Hannan's Central Battery, Kalgoorlie	...	...	...	...	...	...	...	...	18·40	4·66	...
		State Battery, Mulline	...	...	...	...	...	...	...	...	538·50	13,211·28	...
		State Battery, Mulwarrie	...	...	...	...	...	...	...	...	613·18	4,821·30	...
		Various Works	...	...	...	...	...	...	15·82	186·75	654·37	...
		Reported by Banks and Gold Dealers	...	...	...	...	...	19·24	·77	...	...	...
		Total	...	...	...	...	...	**22·17**	**1,152·06**	**298,568·88**	**290,274·41**	**5,973·05**

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 ...	980G	Cosmo	...	3·27	22·37	68·90	...	...	3·27	66·99	217·78	...
Do. ...	769G	(Two D's)	...	...	...	...	...	...	...	100·00	14·01	...
Do. ...	769G, (770G), (771G)	Two D's leases	...	...	...	...	...	...	...	950·00	590·26	...
Do. ...	...	Voided leases	...	...	...	...	...	...	264·29	734,280·94	388,565·03	5,375·97
Do. ...	...	Sundry claims	...	...	9·00	11·77	...	30·59	93·85	4,931·85	4,438·09	...
Niagara ...	...	Voided leases	...	...	...	...	...	...	104·54	84,472·50	51,887·97	...
Do. ...	...	Sundry claims	...	...	6·12	14·67	...	20·64	70·23	9,880·41	6,084·35	...
Tampa ...	(781G)	Hill 60	...	7·34	14·00	72·28	...	...	7·34	14·00	72·28	...
Do. ...	...	Voided leases	...	...	...	...	...	...	28·60	49,271·87	22,173·80	174·24
Do. ...	...	Sundry claims	10·60	...	...	...	...	28·21	244·17	3,212·00	1,894·48	...
	From District generally :—												
	Sundry Parcels treated at :												
		Grafter Battery	...	...	...	...	...	...	...	98·00	448·91	...
		Hainault Sulphide Plant, Kalgoorlie	...	...	...	...	...	...	...	...	9·03	...
		Lubra Queen G.M. Co., N.L., Works	...	...	...	...	...	...	...	...	153·47	...
		State Battery, Niagara	...	...	...	...	...	...	...	671·50	8,945·91	...
		Various Works	...	...	...	...	...	...	...	451·00	6,356·43	41·17
		Reported by Banks and Gold Dealers	...	...	...	...	...	1,435·20	787·38	...	...	...
		Total	**10·60**	**10·61**	**51·49**	**167·62**	...	**1,514·64**	**1,618·39**	**899,318·61**	**499,957·38**	**5,603·42**

TABLE IV.—*Production of Gold and Silver from all sources, etc.*—continued.

NORTH COOLGARDIE GOLDFIELD—continued.

YERILLA DISTRICT.

Mining Centre.	Number of Lease.	Registered Name of Company or Lease.	Total for 1925.					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.
Edjudina ...	1062R	Martin	...	...	21·75	20·68	...	...	...	121·25	98·66	...
Do. ...	1011R	Neta	...	...	...	...	...	...	...	156·75	102·56	...
Do. ...	1010R, 1011R ...	(Neta leases)	...	...	...	...	...	...	...	407·00	340·01	...
Do. ...	...	Voided leases	...	...	...	...	...	...	18·44	32,203·20	41,731·77	37·79
Do. ...	...	Sundry claims	...	...	70·25	78·14	...	...	21·26	3,753·58	3,157·54	...
Eucalyptus ...	...	Voided leases	...	...	...	...	...	...	2,864·77	1,351·35	3,020·68	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	367·50	362·50	381·82	...
Linden ...	1024R, [346F] ...	Great Carbine	...	...	...	...	...	...	...	67·75	20·30	...
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	553·16	17,179·60	22,098·74	...
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 ...	(1055R)	Redbrook G.M.	...	...	80·25	50·11	...	...	...	872·50	547·47	...
Do. ...	...	Voided leases	...	...	...	...	...	6·30	87·08	36,962·75	19,212·73	2·00
Do. ...	...	Sundry claims	...	...	...	...	...	·87	5·31	6,238·10	3,236·74	...
Yerilla ...	...	Voided leases	...	...	...	...	...	...	3,089·51	15,619·21	12,313·06	13·93
Do. ...	...	Sundry claims	...	...	...	...	...	19·30	15·88	2,401·00	1,338·07	...
Yilgangie ...	...	Voided leases	...	...	...	...	...	...	...	218·75	295·45	...
Do. ...	...	Sundry claims	...	...	...	...	...	121·67	29·83	40·50	65·53	...

Yundamindera	...	Voided leases	...	...	...	...	...	...	...	80·47	69,067·85	46,004·87	5·82
Do. ...	...	Sundry claims	...	...	...	...	...	...	...	85·22	3,151·25	2,740·75	...
	From District generally :—												
	Sundry Parcels treated at :												
	Battlesville Battery		...	...	...	...	...	...	...	...	...	621·83	...
	Fremantle Trading Co., Ltd., Works		...	...	...	...	...	...	...	...	...	4·92	...
	Neta Battery		...	...	...	...	...	...	...	...	...	325·69	...
	State Battery, Linden		...	...	...	...	...	...	...	...	72·00	4,030·90	...
	State Battery, Yarri		...	...	...	...	...	...	...	...	251·50	4,994·85	3·50
	State Battery, Yerilla		...	...	...	...	...	2·17	...	...	72·00	1,257·22	...
	Various Works		...	...	...	...	...	...	...	...	786·35	5,277·20	...
	Reported by Banks and Gold Dealers		...	...	...	...	...	1,011·56	154·74	...	...	...	...
	Total		...	...	**172·25**	**148·93**	...	**1,247·21**	**7,572·37**	**218,782·54**	**192,614·77**	**63·04**

Broad Arrow Goldfield.

Bardoc ...	1833w	Zoroastrian	...	...	...	...	...	...	...	23·25	22·45	106·77	...
Do. ...	...	Voided leases	...	...	...	...	...	...	...	1,863·68	73,236·55	51,823·64	203·60
Do. ...	...	Sundry claims	...	5·27	147·95	118·34	...	53·82	578·02	3,537·58	3,071·74	...	
Black Flag ...	...	Voided leases	...	...	...	...	...	27·81	373·99	40,332·13	24,451·48	...	
Do. ...	...	Sundry claims	...	...	...	...	...	710·99	180·49	2,181·08	2,063·02	...	
Broad Arrow	1938w	New Mexico	...	...	36·13	7·12	...	...	...	36·13	7·12	...	
Do. ...	1771w	North Duke	...	...	...	...	...	...	1,533·79	153·30	592·36	...	
Do. ...	1933w	Oversight Tara United ...	...	71·20	91·00	96·38	...	...	71·20	91·00	96·38	...	
Do. ...	(1799w)	Oversight	...	76·21	...	...	...	...	1,400·22	930·65	2,576·48	3·00	
Do. ...	(1735w)	Tara	...	...	...	...	...	...	3,174·28	586·25	1,659·76	...	
Do. ...	...	Voided leases	...	...	...	...	...	54·85	2,340·68	117,935·71	97,989·69	15·85	
Do. ...	...	Sundry claims	...	16·12	90·00	32·67	...	987·53	1,289·23	9,401·45	7,069·25	...	
Canegrass ...	...	Voided leases	...	...	...	...	...	...	...	89·10	133·13	...	
Do. ...	...	Sundry claims	...	...	12·00	77·86	...	...	201·58	26·00	122·09	...	
Carnage ...	...	Voided leases	...	...	...	...	...	...	...	138·00	251·97	...	
Do. ...	...	Sundry claims	...	...	7·50	18·88	...	...	...	81·00	57·26	...	
Paddington ...	...	Voided leases	...	...	...	...	...	5,557·72	257·75	175,109·58	82,198·30	18·96	
Do. ...	...	Sundry claims	...	...	67·00	11·11	...	1,714·16	2·13	10,480·68	6,688·29	...	
Siberia ...	1336w, 1399w ...	Associated Northern Blocks (W.A.), Ltd.	...	...	7,927·61	6,416·16	...	...	...	7,927·61	6,416·16	...	
Do. ...	1399w, (1424w), (1429w), (1442w) (1655w)	(Associated Northern Blocks (W.A.), Ltd.)	...	...	...	...	...	...	...	247,585·84	91,053·70	1,664·70	
Do. ...	1935w	Exchequer	...	...	85·50	133·51	...	...	...	85·50	133·51	...	
Do. ...	1371w	Gimblet South	...	...	...	...	...	...	...	72,401·22	12,191·04	...	
Do. ...	1399w	(Gimblet South Extended) ...	...	...	...	...	...	...	...	525·00	835·44	...	
Do. ...	1399w, (1424w), (1429w), (1442w)	(Gimblet South Extended leases)	...	...	...	...	...	...	...	215·00	39·98	...	
Do. ...	(1889w)	Hazel Gold Mine	...	...	...	...	...	...	...	29·00	2·29	...	
Do. ...	(1917w)	Hazelmere	...	...	...	...	...	...	...	227·50	52·38	...	
Do. ...	1289w	Lady Evelyn	...	...	...	...	...	...	...	902·00	1,577·19	...	
Do. ...	1289w, (1308w) ...	(Lady Evelyn leases)	...	...	...	...	...	...	25·26	5,376·25	5,267·70	...	
Do. ...	1929w	Mopoke	...	...	370·00	55·29	...	...	...	370·00	55·29	...	
Do. ...	1906w	Orinda	...	...	371·00	344·33	...	...	...	1,734·50	1,506·86	...	

TABLE IV.—*Production of Gold and Silver from all sources, etc.*—continued.

BROAD ARROW GOLDFIELD—*continued.*

Mining Centre.	Number of Lease.	Registered Name of Company or Lease.	Total for 1925.					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.
Siberia ...	1914w	Renown	...	...	42·00	56·69	...	...	506·50	114·50	255·84	...
Do. ...	1375w	(Siberia Consols)	...	...	...	...	...	...	41·58	1,013·50	3,136·03	...
Do. ...	1375w	Siberia Consols	...	...	...	...	...	...	46·30	609·75	1,303·59	...
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: Associated Northern Blocks (W.A.), Ltd.	...	...	...	...	...	...	...	6,897·00	2,528·10	...
Do. ...	1936w	Wentworth	...	...	323·00	148·60	...	...	...	323·00	148·60	...
Do. ...	1939w	Windstorm	...	...	22·50	15·74	...	...	...	22·50	15·74	...
Do. ...	...	Voided leases	...	...	...	...	...	...	789·17	24,764·92	14,591·55	...
Do. ...	...	Sundry claims	...	4·89	163·00	118·04	...	238·08	766·89	14,355·79	9,524·76	...
Smithfield ...	...	Voided leases	...	...	...	...	...	...	...	1,027·00	200·90	...
Do. ...	...	Sundry claims	...	...	12·50	6·52	...	...	23·79	82·00	185·24	...
	From Goldfield generally:—											
	Sundry Parcels treated at:											
	Brown Hill Consols Works, Kalgoorlie ...		...	...	...	...	...	...	...	38·00	15·32	...
	Fremantle Trading Co., Ltd., Works		...	...	...	...	...	...	...	...	80·10	...
	Hannans Central Works, Kalgoorlie		...	...	...	...	...	...	...	8·70	15·47	...
	Hainault Sulphide Plant, Kalgoorlie		...	...	...	...	...	...	...	...	9·57	...
	Pole Works		...	...	...	...	...	...	...	...	356·07	...
	Regan's Carnage Battery		...	...	...	...	...	...	...	27·00	598·81	...
	State Battery, Ora Banda		...	...	25·00	406·77	...	...	...	72·05	2,371·56	...
	State Battery, Siberia		...	...	...	...	...	...	...	40·00	1,102·96	...
	Zoroastrian Works		...	...	...	...	...	...	...	116·50	1,082·23	...
	Various Works		...	...	...	...	...	2,271·17	...	16,622·68	31,760·91	278·85
	Reported by Banks and Gold Dealers		4·68	...	...	...	...	7,841·24	...	...	...	...
	Total		**4·68**	**173·69**	**9,793·69**	**8,064·01**	...	**19,457·37**	**15,529·01**	**864,346·94**	**478,189·93**	**2,184·96**

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	...
Gindalbi ...	...	Voided leases	...	...	...	...	...	...	19·94	43,613·28	39,438·75	38·31
Do. ...	...	Sundry claims	...	...	...	...	...	...	674·82	1,051·27	1,230·42	...

Gordon ...	(1385x)	Pride of the Morning	...	...	268·90	439·43	...		14·39	5,820·93	2,204·97	...
Do. ...	...	Voided leases	...	...	...	...	...	...	268·25	40,607·30	11,425·99	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	54·65	630·50	577·80	...
Kanowna ...	(1460x)	Commonwealth of Kanowna ...	...	...	27·00	58·73	...	...	...	60·00	96·43	...
Do. ...	1389	Golden Valley	...	...	1,064·00	1,287·48	...	...	...	6,622·13	5,033·50	...
Do. ...	(1446x). ...	Golden Valley East	...	...	26·00	10·50	...		...	1,222·00	607·33	...
Do. ...	1019x	(Kanowna)	...	...	...	...	...	5·84	691·94	9,588·50	14,544·42	...
Do. ...	1299x	(Kanowna Consol)	...	...	...	...	...	...	...	713·50	129·30	...
Do. ...	1299x	(Kanowna Consol)	...	...	...	...	...	...	...	339·00	207·36	...
Do. ...	1299x, (1300x)	(Kanowna Consols leases) ...	...	...	...	...	...	...	6·76	312·00	261·31	...
Do. ...	1299x, 1379x ...	(Kanowna Consols leases) ...	...	...	...	...	...	...	...	4,584·00	2,096·11	...
Do. ...	1019x	Kanowna Red Hill G.M. Co., N.L.	...	...	4,900·00	3,768·06	...	...	...	12,695·00	10,348·20	...
Do. ...	12x, 13x, (14x), (15x), (18x), (19x), (72x), (855x), (974x), (1035x), (1103x), (1263x), (1278x), 1438x	North White Feather G.Ms., Ltd. ...	...	...	...	...	...	...	...	56,060·27	25,299·82	
Do. ...	1299x, 1379x, 1432x	Orion Gold Mines, Ltd.	...	...	180·00	60·50	...	...	...	180·00	60·50	...
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	...	...	...	...	...	8·47	3,701·82	432,700·59	223,135·86	806·56
Do. ...	...	Sundry claims	...	47·83	108·54	71·42	...	88·95	1,853·36	14,564·42	7,739·91	1·50
Mulgarrie ...	...	Voided leases	...	...	...	...	...	...	1,216·63	6,902·26	4,197·98	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	13·29	1,184·00	596·64	...
Six-mile ...	...	Voided leases	...	...	...	...	...	...	1,595·63	559·00	767·72	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	31·44	141·50	103·37	...
	From District generally :—											
	Sundry Parcels treated at :											
		Lady Pratt Works	...	...	...	...	...	...	...	31·00	281·01	...
		Old Cement Works (Martin's)	...	...	...	...	...	...	...	10,893·78	15,561·14	...
		Various Works	...	...	...	...	...	330·42	867·52	147,843·26	132,539·98	...
		Reported by Banks and Gold Dealers	3·36	...	...	...	...	104,034·11	·86	...	84·69	...
		Total	**3·36**	**47·83**	**6,574·44**	**5,696·12**	...	**104,492·49**	**11,316·42**	**960,387·80**	**597,573·82**	**2,522·12**

KURNALPI DISTRICT.

Jubilee ...	...	Voided leases	...	...	...	...	...	...	145·13	1,821·25	1,408·51	...
Do. ...	...	Sundry claims	...	...	...	...	...	25·57	...	46·00	28·91	...
Kurnalpi ...	...	Voided leases	...	...	...	...	...	371·18	3,100·64	2,925·01	2,778·07	6·27
Do. ...	...	Sundry claims	42·13	3·71	108·00	64·96	...	280·63	189·21	761·50	440·33	...

TABLE IV.—*Production of Gold and Silver from all sources, etc.*—continued.

NORTH-EAST COOLGARDIE GOLDFIELD—*continued.*

KURNALPI DISTRICT—*continued.*

Mining Centre.	Number of Lease.	Registered Name of Company or Lease.	Total for 1925.					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.
Mulgabbie ...	...	Voided leases	...	...	...	...	...	...	1,138·12	84·65	7,429·71	4·95
Do. ...	...	Sundry claims	...	6·00	...	...	...	6·50	1,528·51	139·50	955·10	...
	From District generally :—											
	Sundry Parcels treated at :											
	Success Battery		...	...	10·00	33·64	...	...	...	10·00	177·19	...
	Various Works		...	...	...	...	...	...	...	56·50	193·15	...
	Reported by Banks and Gold Dealers		...	...	...	...	...	11,375·71	19·62	...	...	...
		Total	**42·13**	**9·71**	**118·00**	**98·60**	...	**12,059·59**	**6,121·23**	**5,844·41**	**13,410·97**	**11·22**

East Coolgardie Goldfield.

EAST COOLGARDIE DISTRICT.

Binduli ...	...	Voided leases	...	...	...	...	...	...	...	334·10	224·30	...
Do. ...	...	Sundry claims	...	...	66·00	27·06	...	...	...	564·40	527·19	...
Boorara ...	5386E	Elsie May...	...	77·51	8·50	75·57	...	...	77·51	8·50	75·57	...
Do. ...	...	Voided leases	...	...	...	...	...	...	381·56	306,642·45	171,638·36	408·36
Do. ...	...	Sundry claims	...	...	15·10	59·44	...	·49	53·46	838·96	908·23	...
Boulder ...	392E	(Acrobat : Paringa Consolidated Mines Ltd.)	...	...	...	...	...	...	...	10·25	37·15	...
Do. ...	392E	(Acrobat : Paringa Mines (1909), Ltd.)	...	...	...	...	...	...	...	17,035·57	7,856·69	...
Do. ...	38E, 71E, 72E (101E)	Associated G.Ms. of W.A., Ltd. ...	...	...	60,343·13	26,889·34	783·00	...	8·49	2,204,190·28	1,159,144·86	35,284·05
Do. ...	49E (4211E) ...	Associated Northern Blocks (W.A.), Ltd.	...	...	2,195·86	1,818·69	...	...	538·31	423,557·18	510,534·14	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. ...	66E	Boulder Perseverance, Ltd.	...	...	49,222·38	37,135·51	9,095·51	...	...	95,154·83	82,265·77	18,917·63
Do. ...	281E	(Brookman Bros. : Boulder G.M. Co., Ltd.)	...	...	...	...	...	...	...	8,655·00	8,417·00	...
Do. ...	24E (888E), (949E)	Central and West Boulder G.Ms., Ltd.	...	...	32·76	18·54	...	...	...	70,895·31	36,261·65	...
Do. ...	352E	(Chaffers G.M. Co., Ltd.)	...	...	...	...	...	...	...	4,256·00	1,299·03	161·50
Do. ...	352E, 873E, 4334E	(Chaffers G.M. Co., Ltd.)	...	...	...	...	...	...	...	111,111·00	44,796·77	...
Do. ...	352E, 873E, 4334E	(Chaffers Gold Mining Co. (1913), Ltd.)	...	...	...	...	...	...	...	13,350·00	3,334·91	129·57
Do. ...	1621E	(Croesus Proprietary G.M. Co.) ...	...	...	...	...	...	...	...	79·00	45·87	...

Do.	...	(5347E)	Croesus South	...	...	33·03	5·86	...	...	...	601·28	231·47	...
Do.	...	5345E	Enterprise	...	...	1,182·21	572·26	...	...	...	1,957·50	902·26	...
Do.	...	35E	Eureka	...	...	605·88	373·13	...	...	107·98	6,762·93	5,934·19	...
Do.	...	351E, 1001E, 1002E, 1085E, 1113E, 1219E, 1326E, 1397E	Golden Horseshoe Estates Co., Ltd.	...	...	100,630·00	43,234·30	24,643·28	...	...	4,769,952·00	2,929,394·74	690,564·35
Do.	...	750E	(Golden Link 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.	...	750, 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.	...	66E	(Great Boulder Perseverance G.M., Ltd.)	...	...	...	...	...	...	...	3,306,942·88	1,841,159·00	203,821·43
Do.	...	16E, 51E, 61E, 102E, 280E, 1109E, (4361E)	Great Boulder Proprietary G.Ms., Ltd.	...	...	103,784·95	55,300·29	7,797·00	...	...	3,795,212·91	3,244,187·75	369,607·10
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)	...	...	...	...	...	...	4,847·57	128,727·26	63,546·75	...
Do.	...	4317E	Idaho	...	267·18	107·30	125·48	...	...	826·45	294·42	474·81	6·20
Do.	...	946E, (4370E), (4531E)	(Ironsides North leases) ...	...	...	...	...	...	...	...	71,677·81	128,290·00	...
Do.	...	946E	Ironsides North	...	...	...	3·90	...	...	...	4·95	342·73	...
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.) ...	...	...	...	...	...	...	...	4,296,179·00	2,571,681·86	447,123·80
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.	...	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 Gold Mines, Ltd.)	...	...	...	...	...	...	...	1,683,548·41	1,072,090·59	188·24

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 1925.					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 ...	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. ...	15E, 25E, 31E, 32E, 60E, 352E, 873E, 902E, 933E, 986E, 1116E, 1124E, 1196E, 1413E, 1507E, 2325E, 2326E, 4075E, 4334E, 4399E, 4445E, 4476E, 4493E	Lake View and Star, Ltd.	...	...	105,938·77	52,880·35	14,663·43	...	...	131,398·37	67,275·52	19,073·97
Do. ...	15E, 25E, 32E, 60E, 352E, 873E, 902E, 933E, 986E, 1116E, 1124E, 1196E, 2325E, 4075E, 4334E, (4432E), (4433E), (4434E), 4493E,	(Lake View and Star, Ltd.)	...	...	...	...	...	...	...	1,764,864·70	630,551·50	56,537·86
Do. ...	25E, 32E, 2325E, 2326E	(Lake View Consols, Ltd.)	...	...	...	...	...	...	...	1,179,303·55	1,016,875·27	38,491·89
Do. ...	5159E	Lake View South	...	...	462·43	276·98	...	...	...	1,265·82	716·76	...
Do. ...	5346E	Main Ore Channel	...	...	138·09	47·12	...	...	...	211·54	57·05	...
Do. ...	(33E), 35E, (975E),	(New North Boulder G.Ms., Ltd.) ...	...	...	...	...	...	...	...	23,438·78	14,750·03	...
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.) ...	...	...	906·35	1,006·52	...	...	...	36,157·13	19,211·37	...
Do. ...	5232E	Old Bank of England	...	...	51·27	23·02	...	...	...	1,082·68	972·85	...
Do. ...	73E, 410E, 448E, 532E, (578E), 698E, 944E, (1395E), (3031E), (4180E)	(Oroya Brownhill Co., Ltd.)	...	...	...	...	...	...	...	1,075,862·55	1,163,881·77	61,682·30
Do. ...	6E, 22E, 34E, 73E, 131E, 245E, 269E, (301E), 410E, 448E, 532E, (578E), 698E, 739E, 743E, 750E, (794E), 944E, 969E, 1004E, (1395E), 1621E, 3031E, (4180E)	Oroya Links, Ltd.	...	...	27,474·00	17,887·61	...	...	...	964,036·56	415,315·90	28,532·96

Do.	392E	Paringa Mining and Exploration Co., Ltd.			100·90	22·64				100·90	22·64	
Do.	392E	(Paringa Mines (1909), Ltd.)								26,890·74	12,599·54	
Do.	1208E, 3612E, 3643E	South Kalgurli Consolidated, Ltd.			83,606·29	46,705·35				1,036,907·29	414,482·59	15,071·52
Do.	1208E, 3612E	(South Kalgurli G.Ms., Ltd.								826,909·00	347,222·75	17,609·67
Do.	4537E	Union Jack			299·38	155·88				6,725·40	3,214·99	
Do.		Voided leases						109·90	5,780·86	241,661·31	158,009·51	
Do.		Sundry claims		5·80	106·40	42·19		24·58	5·80	2,470·12	1,442·71	
Feysville	Block 48	Hampton Gold Mining Areas, Ltd.								17·10	66·95	
		P.P.L. 40, Learhinan, D.			8·00	9·68				8·00	9·68	
		P.P.L. 23, McKay & Reid								120·70	120·73	
		P.P.L. 53—McKenzie & Party								17·24	31·63	
		P.P.L. 306—Excelsior			17·00	2·79				17·00	2·79	
		P.P.L. 63, 84, 86—Golden Hope G.Ms., N.L.			7,652·00	3,733·61				16,585·30	8,442·36	69·60
		P.P.L. 175—Jubilee Central								29·00	7·70	
		P.P.L. 207—Lancashire Lass								18·30	29·17	
		P.P.L. 264—Marion								16·29	25·52	
		P.P.L. 98—Red Indian								15·75	85·35	
		P.P.L. 37—Ring Neck							15·36	4·40	58·25	
		P.P.L. —Westralia								39·95	17·98	
		P.P.L. 1—White Hope: Hopeful Syndicate, Ltd.			5,869·00	2,206·66				20,932·03	8,437·75	
Do.		Sundry claims								20·53	22·06	
Do.	Block 48	(Hampton Plains Estate, Ltd.)						4,565·62	21·59	20,615·28	2,502·56	
Do.	Block 50	P.P.L. 17—McFarlane			57·40	28·34				67·40	33·40	
Do.	Block 50	(Hampton Plains Estate (1906), Ltd.								85·00	108·82	
Do.	Block 45	P.P.L. 252—Mount Martin								9,563·00	4,675·67	
Do.	Block 45	Hampton Properties, Ltd.							52·75	69·75	80·52	
Do.	Block 50	(Hampton Properties, Ltd.)							7·26	6,348·00	3,956·22	
Do.	Block 50	Hampton Properties, Ltd.							106·23	689·36	591·14	
Do.	Block 50	P.P.L. 138—Eva May Hampton								22·00	9·70	
Do.	Block 50	P.P.L. 9 and 274—Hampton Celebration (W.A.). Ltd.								22,111·00	9,156·99	
Do.	Block 50	P.P.L. 222—Hampton Jubilee			9·88	7·76				318·25	242·28	
Do.	Block 50	P.P.L. 183 and 184—Melvina leases								170·00	44·00	
Do.	Block 50	P.P.L. 23—Mutooroo Copper Corporation, N.L.			104·78	59·12				1,260·17	2,140·48	
Do.	Block 50	P.P.L. 10—Pernatty Central Copper Mining Co., N.L.			595·19	637·12				730·30	698·58	
Do.	Block 50	P.P.L. 29—Pernatty, East			11·27	3·43				11·27	3·43	
Do.	Block 50	P.P.L. 129—Triumph								20·56	42·82	
Do.	Block 50	P.P.L. 293—Union Jack								41·35	11·84	
Do.		Voided leases							110·74	561·30	394·24	
Do.		Sundry claims			9·75	25·72			12·13	405·74	322·94	
Kalgoorlie	5348E	Big Genuine			54·24	29·04				194·24	156·29	
Do.	(5279E)	Cassidy Hill			12·00	9·98				296·00	481·27	
Do.	(5251E)	Central								18,656·00	6,687·33	
Do.	(5359E)	Central, North								560·00	195·20	
Do.	5350E, 5351E	Great Boulder Proprietary G.Ms., Ltd.			4,085·84	3,036·87				5,884·71	4,317·39	
Do.	5370E	Hard Up			150·00	11·54				150·00	11·54	
Do.	4546E, 4547E, 4548E	Hannan's Hill leases			124·00	187·21				124·00	187·21	
Do.	4546E, 4547E 4548E, (4551E)	(Hannan's Reward, Ltd.)							5·72	33,378·00	9,005·69	
Do.	5379E	Hick's Gold Mine			80·00	22·17				101·37	46·11	
Do.	5358E	Invincible			13·23	17·64				37·94	33·73	

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 1925.					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.
Kalgoorlie ...	5375E	Lucell	...	...	148·21	160·44	...	...	...	296·81	394·48	...
Do. ...	4632E	North End	...	...	102·15	17·75	...	...	...	262·81	54·53	...
Do. ...	5333E	Paymaster	...	...	43·92	10·69	...	...	...	437·72	171·70	...
Do. ...	5368E	Rose of Diorite	...	...	548·00	480·10	...	...	1·73	1,271·00	1,049·60	...
Do. ...	5389E	Sons of Gwalia, Kalgoorlie ...	...	...	59·64	13·28	...	...	...	59·64	13·28	...
Do. ...	5193E	Surprise, North	...	...	2,203·00	3,151·40	...	...	...	2,812·93	4,037·27	...
Do. ...	(5376E)	Yorkshire Rose	...	...	157·61	39·02	...	...	...	502·96	1,490·72	...
Do. ...	...	Voided leases	...	...	...	...	...	242·48	9,478·81	915,986·07	367,713·28	44,017·12
Do. ...	...	Sundry claims	...	·50	1,943·62	1,075·04	...	207·69	434·26	44,810·73	18,243·71	...
Wombola ...	5391E	Caledonian	...	...	60·25	126·79	...	...	...	60·25	126·79	...
Do. ...	(4600E)	Daisy	...	...	...	...	...	...	...	423·05	1,902·01	...
Do. ...	5395E	Dinnie	...	...	45·00	28·69	...	...	...	45·00	28·69	...
Do. ...	4766E	Great Hope	...	...	713·00	1,901·93	...	...	86·61	2,790·38	10,150·88	...
Do. ...	4770E	Great Hope, North	...	...	460·00	424·30	...	...	...	2,791·24	3,425·72	...
Do. ...	...	Voided leases	...	...	...	...	...	...	1,867·91	6,060·04	7,312·22	...
Do. ...	...	Sundry claims	...	...	222·98	350·10	...	...	4·15	1,458·38	2,124·48	...
	From District generally :—											
	...	Sundry claims	...	3·23	40·93	233·95	...	10,907·93	435·18	5,382·25	2,090·14	...
	Sundry parcels treated at :											
		Adeline Works	...	...	...	...	...	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	...	...	...	...	...	...	...	780·38	45,161·54	...
		Dunstan & Cummings Works	...	...	...	...	...	...	...	...	9,244·56	1,644·00
		Fremantle Trading Co., Ltd., Works	...	...	...	...	...	...	...	...	12,860·37	8,028·22
		Great Boulder Perseverance Battery	...	...	...	...	...	...	...	...	7·18	...
		Hainault Sulphide Plant	...	...	...	339·08	142·89	...	...	35·66	5,525·63	870·95
		Hannans Central Lakeside Works (A.W.A. Slimes Plant)	...	...	...	...	...	...	...	58·06	4,788·43	...
		Hannans Central Works	...	...	...	90·90	...	...	...	172·80	65,332·79	67·17
		Hannans Reward Battery	...	...	...	811·50	...	...	...	...	1,223·65	...
		Kalgurli G.Ms., Ltd.	...	...	...	...	...	...	...	7·44	658·04	...
		Lone Hand Works	...	...	...	436·21	...	...	14·43	469·00	6,046·06	...
		North Kalgurli Battery	...	...	...	...	...	...	...	...	810·22	...
		Oroya Links Battery	...	...	...	...	...	...	...	32·34	453·58	...
		Various Works	...	...	...	75·50	...	341·72	15·15	38,756·72	75,984·27	1,968·67
	Reported by Banks and Gold Dealers		55·25	...	...	...	...	11,177·43	9,013·32	2·39	40·71	...
		Total	**55·25**	**354·22**	**562,912·87**	**304,482·38**	**57,125·11**	**27,664·47**	**34,346·44**	**30,925,345·45**	**19,439 ,737·42**	**2,075,180·59**

BULONG DISTRICT.

Balagundi ...	...	Voided leases	...	...	...	...	...	...	...	2,408·98	1,110·68	1,473·73	12·92
Do. ...	...	Sundry claims	...	1·80	...	...	...	...	...	122·14	269·76	222·19	...
Bulong ...	1191Y	Sweet Nell	...	...	262·00	547·16	...	...	...	...	384·84	878·79	...
Do. ...	...	Voided leases	...	...	...	...	...	107·54	8,433·70	99,635·96	82,526·49	...	
Do. ...	...	Sundry claims	...	...	77·26	150·81	...	1,648·60	1,109·85	6,993·31	15,038·66	...	
Hogan's Find	...	Voided leases	...	...	...	...	...	...	908·82	309·50	276·51	...	
Majestic ...	Block 41 ...	Hampton Gold Mining Areas Ltd. :— P.P.L. 275, Long Looked For	...	...	...	...	...	19·45	...	235·34	218·57	...	
Do. ...	do.	(Hampton Properties Ltd.)	...	...	...	...	...	...	...	41·00	22·66	...	
Do. ...	...	Voided leases	...	...	...	...	...	...	...	1,007·70	333·30	...	
Do. ...	...	Sundry claims	...	...	24·00	16·21	...	42·88	43·20	101·90	46·25	...	
Mt. Monger ...	...	Voided leases	...	...	...	...	...	...	1,862·57	1,128·35	979·59	...	
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 ...	1265Y	Golden Jumble	...	...	8·70	22·59	...	...	...	8·70	22·59	...	
Do. ...	...	Voided leases	...	...	...	...	...	2·06	3·70	1,688·90	868·75	...	
Do. ...	...	Sundry claims	...	47·56	26·50	91·13	...	112·69	47·56	302·50	502·04	...	
Trans\Find ...	1198Y	Transville	...	...	...	...	...	...	...	654·92	707·13	...	
Do. ...	...	Voided leases	...	...	...	...	...	...	...	4·50	31·63	...	
Woodline ...	...	Voided leases	...	...	...	...	...	...	...	792·75	610·57	...	
Do. ...	...	Sundry claims	...	...	...	...	...	...	...	39·33	61·57	...	
	From District Generally :—												
	Sundry claims		...	...	...	...	...	5·64	41·85	744·55	254·99	...	
	Sundry Parcels treated at :												
	Various Works		...	...	...	...	...	...	...	6,102·15	5,848·25	...	
	Reported by Banks and Gold Dealers		...	...	...	...	...	24,550·70	52·39	...	...	...	
		Total	...	**49·36**	**398·46**	**827·90**	...	**26,725·61**	**15,158·71**	**155,654·43**	**122,422·75**	**12·92**	

Coolgardie Goldfield.

COOLGARDIE DISTRICT.

Bonnievale ...	4600	Melva Maie	...	...	21·00	16·23	...	...	...	512·00	1,341·50	...	
Do. ...	...	Voided leases	...	...	...	...	...	...	25·00	350,852·84	188,088·12	...	
Do. ...	...	Sundry claims	...	14·12	107·65	290·13	...	...	106·20	2,234·83	2,549·95	...	
Bulla Bulling	...	Voided leases	...	...	...	...	...	...	...	776·81	668·19	...	
Do. ...	...	Sundry claims	...	...	...	...	...	...	12·82	375·56	263·64	...	
Burbanks ...	5188	Burbanks Oversight G.M. Co., N.L. ...	...	...	176·25	133·22	...	...	...	611·25	386·76	...	
Do. ...	5208	Main Lode South	...	...	18·00	11·82	...	...	...	18·00	11·82	...	
Do. ...	...	Voided leases	...	...	...	...	...	13·36	342·96	407,762·11	301,320·55	521·06	
Do. ...	...	Sundry claims	...	...	143·15	210·88	...	43·37	141·95	5,037·40	4,219·05	...	

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 1925.					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.
Cave Rocks ...	...	Voided leases	...	...	...	...	...	...	...	132·00	28·04	...
Coolgardie ...	5209	Benjamin George	...	...	35·50	26·01	...	...	...	35·50	26·01	...
Do. ...	(4559)	Cockshot	...	...	...	...	...	...	182·77	371·43	1,458·76	...
Do. ...	(5199)	Derry Ormonde	...	...	...	...	...	...	...	58·00	4·27	...
Do. ...	4555	(Dreadnought)	...	...	...	...	...	...	...	867·85	870·10	...
Do. ...	4555, 4561, (4563), (5065)	Dreadnought leases	...	...	...	...	...	...	...	962·18	1,028·24	...
Do. ...	(5147), (5148) ...	Garden Gully leases	...	...	...	...	...	...	...	102·00	10·69	...
Do. ...	4567	Griffith's Gold Mine	...	2·46	...	...	...	...	4·16	17,782·50	2,043·31	...
Do. ...	Block 59 ...	Hampton Gold Mining Areas, Ltd. ...	...	...	...	...	...	...	...	9·00	1·57	...
Do. ...	do.	P.P.L. 119, Golden Eagle ...	...	...	83·75	157·04	...	...	...	324·59	606·54	...
Do. ...	5197	Great Empress of Coolgardie ...	...	...	26·00	9·49	...	...	...	64·00	26·01	...
Do. ...	Block 49 ...	Hampton Plains Estates, Ltd. ...	...	...	...	...	...	...	10·94	150·00	157·31	...
Do. ...	Block 53 ...	(Hampton Plains Estates, Ltd.) ...	...	...	...	...	...	...	358·42	67·00	112·49	...
Do. ...	Block 49 ...	P.P.L. 384, A. W. Pane ...	...	...	...	...	...	...	...	25·75	9·09	...
Do. ...	Block 59 ...	(Hampton Plains Estates, Ltd.) ...	...	...	...	...	...	...	4·12	8,008·25	7,194·52	...
Do. ...	...	Voided leases	...	...	...	...	...	1,299·02	4,311·87	541,171·27	317,077·53	·96
Do. ...	...	Sundry claims	3·51	·53	435·25	425·46	...	135·50	2,082·15	38,382·06	15,603·29	...
Eundynie ...	...	Voided leases	...	...	...	...	...	...	...	29,812·50	14,966·76	1·75
Do. ...	...	Sundry claims	...	...	...	...	...	...	...	117·00	31·11	...
Gibraltar ...	4586	Carlton	...	...	178·00	273·40	...	...	15·28	1,236·00	1,023·57	...
Do. ...	4604	Limerick	...	...	...	...	...	...	...	192·75	72·80	...
Do. ...	4580	(Lloyd George)	...	...	...	...	...	...	...	341·75	289·27	...
Do. ...	4580, 4726, 4727	Lloyd George G.M. Co., N.L. ...	...	...	742·00	1,222·83	...	...	...	27,460·00	13,424·45	...
Do. ...	5200	Perserverance Gold Mine ...	...	...	36·87	69·57	...	...	...	73·87	112·18	...
Do. ...	(4603)	Reform	...	...	...	49·10	...	...	...	...	49·10	...
Do. ...	...	Voided leases	...	...	...	...	...	...	...	970·75	609·91	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	48·55	636·45	438·62	...
Gnarlbine ...	...	Voided leases	...	...	...	...	...	...	10·94	1,899·75	1,049·90	...
Do. ...	...	Sundry claims	...	...	38·35	71·35	...	...	1·31	228·10	170·61	...
Higginsville ...	...	Voided leases	...	...	...	...	...	...	287·26	32,578·00	14,938·44	134·79
Do. ...	...	Sundry claims	...	...	...	...	...	...	16·52	772·90	515·40	...
Londonderry	...	Voided leases	...	...	...	...	...	...	46·25	27,102·85	18,537·59	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	6·00	1,797·47	1,607·01	...

Mungari ...	...	Voided leases	...	...	...	...	...	...	...	17·71	735·00	331·78	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	...	107·82	346·51	204·90	...
Paris ...	...	Voided leases	...	...	...	...	...	...	...	4·30	...	...	...
Red Hill ...	...	Voided leases	...	...	...	...	...	...	...	1,541·48	40,797·40	31,070·65	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	...	34·62	160·42	287·90	...
Ryan's Find...	...	Voided leases	...	...	...	...	...	...	...	...	54·16	151·69	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	...	·44	87·69	226·64	...
St. Ives ...	4905	Brennan's Idough	...	25·85	501·50	321·12	...	...	...	38·03	2,091·50	1,537·17	...
Do. ...	5195	Clifton	...	...	332·25	119·22	...	...	...	...	538·15	179·89	...
Do. ...	(4669)	Coo-ee	...	...	24·75	30·58	...	...	...	...	328·75	805·24	...
Do. ...	4732	Ives Lake View Reward Junction	...	...	805·00	274·28	...	...	...	...	1,904·50	755·02	...
Do. ...	4720, 4721, 4722	Ives Reward Gold Mines, N.L. ...	...	...	10,251·39	2,888·17	...	...	...	...	10,297·64	2,910·16	...
Do. ...	5164	Just-in-Time	...	...	15·00	5·47	...	45·10	...	...	31·75	11·44	...
Do. ...	4720, 4721, 4722	(Lake View Reward Leases) ...	...	...	...	...	...	...	...	...	883·25	544·64	...
Do. ...	...	Voided leases	...	...	...	...	...	...	...	2·75	845·25	647·18	...
Do. ...	...	Sundry claims	...	...	108·89	61·89	...	49·05	...	...	918·56	332·19	...
Widgiemooltha	5207	Elgin	...	...	79·50	156·33	...	...	...	...	79·50	156·33	...
Do. ...	(4028)	Flinders	...	...	...	...	...	...	...	71·90	591·60	2,811·32	...
Do. ...	...	Voided leases	...	...	...	...	...	9·42	...	795·21	9,368·75	4,602·36	·17
Do. ...	...	Sundry claims	...	...	245·50	93·89	...	9·21	...	101·06	4,486·60	2,615·38	...
	From District Generally :—												
	Sundry Parcels treated at :												
	Burbanks Main Lode Works		...	...	...	...	...	2·77	...	...	557·50	1,261·60	114·17
	Fremantle Trading Co., Ltd. Works		...	...	...	...	...	...	...	...	...	20·08	...
	Highgate Battery		...	...	...	...	...	...	...	...	100·00	334·15	...
	Imperial Battery		...	...	...	...	...	...	...	...	26·00	10·59	...
	Lady Robinson Cyanide Works		...	...	...	...	...	...	...	...	70·00	348·28	...
	State Battery, Coolgardie		...	...	·99	495·80	...	...	...	...	688·49	12,825·27	9·65
	State Battery, St. Ives		...	...	...	...	...	...	...	...	...	452·42	...
	Various Works		...	...	...	...	...	4·98	...	...	3,083·61	15,618·12	108·89
	Reported by Banks and Gold Dealers ...		...	...	...	...	...	7,636·98	543·04	...	...	...	...
	Total		**3·51**	**42·96**	**14,406·54**	**7,413·28**	...	**9,248·76**	**11,273·83**	**1,580,986·90**	**993,996·46**	**891·44**	

KUNANALLING DISTRICT.

Balgarrie ...	...	Voided leases	...	...	...	...	...	10·94	75·48	5,142·25	4,825·96	1·38
Do. ...	...	Sundry claims	...	...	37·50	7·71	...	...	18·57	1,149·75	424·74	...
Carbine ...	33s	(Carbine)	...	...	...	...	...	...	10·85	2,401·00	1,164·53	...
Do. ...	33s, 710s, 711s, 807s, 863s, (890s)	Carbine leases	...	...	2,424·00	1,460·57	...	...	677·13	46,510·86	36,822·27	...
Do. ...	...	Voided leases	...	...	...	...	...	...	...	3,347·00	3,233·60	...
Do. ...	...	Sundry claims	...	...	12·00	69·43	...	...	...	85·00	125·12	...
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	...

TABLE IV.—*Production of Gold and Silver from all sources, etc.*—continued.

COOLGARDIE GOLDFIELD—*continued.*

KUNANALLING DISTRICT—*continued.*

Mining Centre.	Number of Lease.	Registered Name of Company or Lease	Total for 1925.					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.
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	...	...	16·00	19·90	...	·43	121·27	313·19	321·04	...
Jourdie Hills	...	Voided leases	...	...	...	...	...	...	18·00	28,009·74	19,401·09	28·45
Do. ...	...	Sundry claims	...	...	...	...	...	...	27·85	760·50	422·33	...
Kandana ...	...	Voided leases	...	...	...	...	...	...	...	465·00	68·12	...
Kintore ...	...	Voided leases	...	...	...	...	...	6·66	143·66	44,174·14	31,882·70	...
Do. ...	...	Sundry claims	...	...	...	...	...	100·30	·78	1,241·70	1,163·14	...
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	...	...	58·00	15·04	...	...	...	85·00	24·19	...
Do. ...	696s	(Blue Bell)	...	...	...	...	...	...	8·05	697·00	429·47	...
Do. ...	696s, (727s) ...	(Blue Bell leases)	...	...	...	...	...	...	...	1,693·00	1,647·99	...
Do. ...	892s	Brittania	...	...	23·50	91·10	...	...	871·06	34·50	234·63	...
Do. ...	(897s)	Nick of Time	...	...	87·50	135·65	...	...	68·35	171·25	273·82	...
Do. ...	(896s)	Premier	...	26·36	43·50	56·86	...	...	29·01	355·00	393·20	...
Do. ...	645s	Star of Fremantle	...	...	212·00	100·04	...	32·67	...	5,513·00	3,974·66	...
Do. ...	(895s)	Sydney Mint	...	...	8·00	8·59	...	...	7·34	8·00	9·37	...
Do. ...	847s	Turn of the Tide	...	...	94·00	252·44	...	...	2·72	4,653·98	5,232·34	...
Do. ...	...	Voided leases	...	...	...	...	...	...	685·98	91,842·74	72,498·86	18·84
Do. ...	...	Sundry claims	18·24	...	306·05	434·03	...	191·63	507·29	7,724·33	5,380·34	...
	From District Generally :—											
	Sundry Parcels treated at :											
	Blue Bell Battery		...	...	...	152·73	...	3·77	...	72·00	2,337·24	...
	Stanley Works		...	...	...	...	...	14·86	...	402·60	384·93	...
	Various Works		...	...	...	...	...	9·22	...	1,276·66	2,006·02	...
	Reported by Banks and Gold Dealers		...	...	...	...	...	264·19	1·10	...	...	...
		Total	**18·24**	**26·36**	**3,322·05**	**2,804·09**	...	**910·20**	**6,481·20**	**285,603·54**	**225,196·19**	**48·67**

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. ...	...	...	...	...	...	...	...	477,968·42	166,223·11	27,833·41
Do. ...	(914), (915), (916), (926), (928), (930), (942), (960)	(Bullfinch Proprietary (1919), Ltd.) ...	...	...	...	...	...	...	...	556·65	457·00	...
Do. ...	3282	Bullfinch Proprietary (1919), Ltd. ...	...	...	241·17	295·57	...	...	...	241·17	295·57	...
Do. ...	... ...	Voided leases	...	...	...	...	...	...	3·57	666·15	734·27	...
Do. ...	...	Sundry claims	...	...	96·75	82·81	...	...	...	356·80	283·48	...
Corinthian ...	...	Voided leases	...	...	...	...	...	...	...	134,508·09	29,324·83	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	...	104·59	77·35	...
Ennuin ...	...	Voided leases	...	...	...	...	...	...	...	134·56	361·34	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	...	117·00	72·12	...
Forrestonia ...	(2909)	Great Southern	...	...	...	...	...	...	...	915·09	214·16	...
Do. ...	...	Voided leases	...	...	...	...	...	...	...	270·00	83·99	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	...	327·00	114·95	...
Glenelg Hills	3280	Hollow & Heaton's Reward ...	...	9·33	...	...	...	...	9·33	...	...	...
Golden Valley	P.P.L. 4 ...	New Radio	...	...	25·00	50·75	...	...	...	25·00	50·75	...
Do. ...	3276	O.K.	...	...	140·25	71·48	...	...	...	168·00	90·84	...
Do. ...	2994	Radio	...	...	852·50	2,566·02	...	...	...	3,866·30	12,014·65	7·43
Do. ...	3248	Radio Deeps	...	...	223·00	659·85	...	...	...	388·00	903·39	...
Do. ...	3272	Radio North	...	...	9·00	6·62	...	...	...	52·00	96·85	...
Do. ...	3285	Sweet Alice	...	...	27·50	17·76	...	...	...	27·50	17·76	...
Do. ...	...	Voided leases	...	...	...	...	...	...	18·05	7,935·24	8,289·07	2·00
Do. ...	...	Sundry claims	...	...	46·50	70·53	...	...	2·75	2,318·72	2,178·36	...
Greenmount	550	Sunbeam	...	...	6·14	8·94	...	...	...	206·14	182·07	...
Do. ...	550	(Sunbeam)	...	...	...	...	...	14·00	...	4,472·00	1,427·25	...
Do. ...	550 (565) ...	(Sunbeam leases)	...	...	...	...	...	...	...	3,191·00	816·42	...
Do. ...	3264	Transvaal	...	...	997·00	222·00	...	...	...	997·00	252·18	...
Do. ...	...	Voided leases	...	...	...	...	...	31·99	21·62	115,937·50	28,849·48	944·50
Do. ...	...	Sundry claims	...	...	...	...	...	...	4·12	875·00	334·48	...
Hope's Hill ...	2544	Colleen Bawn	...	...	10·00	90·58	...	...	15·26	405·20	1,888·78	...
Do. ...	...	Voided leases	...	...	...	...	...	...	56·97	129,884·85	33,899·78	1·00
Do. ...	...	Sundry claims	...	...	...	...	...	...	25·38	1,622·50	506·06	...
Kennyville ...	3278	Great Leviathan	...	...	255·00	84·97	...	...	...	255·00	84·97	...
Do. ...	...	Voided leases	...	...	...	...	...	...	18·76	32,052·13	15,119·47	·59
Do. ...	...	Sundry claims	...	...	311·50	151·26	...	...	5·06	2,026·50	884·97	...
Koolyanobbing	...	Voided leases	...	...	...	...	...	...	...	308·00	116·74	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	...	55·00	11·24	...

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 1925.					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.
Marvel Loch	3069	(Banker)	...	...	...	...	...	...	...	1,043·00	926·75	...
Do.	3069	Banker: Golden Butterfly G.M. Co., N.L.	...	...	232·00	389·87	...	...	...	707·00	862·33	...
Do.	(923)	Bohemian	...	...	82·00	28·46	...	...	19·66	4,959·00	4,698·49	...
Do.	(3217), (3222)	Firelight leases	...	...	...	...	...	...	...	1,185·00	328·53	...
Do.	3069, (3151), (3152), (3157), (3213)	(Golden Butterfly G.M., Co., N.L.)	...	...	...	...	...	...	...	4,911·00	3,148·65	...
Do.	719	(Great Victoria)	...	...	...	...	...	...	...	1,356·00	281·53	...
Do.	719, 944, 945, 1227, 1228, 1606	Great Victoria G.Ms., N.L.	...	...	25,926·00	6,808·13	...	...	...	33,439·00	8,592·35	...
Do.	719, 944, 945, 1227, 1228, 1606	(Great Victoria leases)	...	...	...	...	...	...	...	132,664·26	17,869·89	...
Do.	852	May Queen	...	...	...	7·78	...	...	4·07	1,073·50	4,742·77	...
Do.	3307	Nevoria	...	...	302·00	101·54	...	...	...	302·00	101·54	...
Do.	3281	Resurection	...	...	11·00	31·32	...	...	...	11·00	31·32	...
Do.	3273	Salvation	...	...	322·00	499·83	...	...	...	769·00	1,247·29	...
Do.	...	Voided leases	...	...	...	...	...	...	84·73	243,494·00	85,666·81	771·03
Do.	...	Sundry claims	1·15	1·58	399·00	144·44	...	8·87	84·82	11,071·74	5,688·57	...
Mount Jackson	...	Voided leases	...	...	...	...	...	...	114·88	37,186·03	27,676·47	2,305·28
Do.	...	Sundry claims	...	3·10	...	...	...	4·42	30·46	1,689·25	1,131·60	·74
Mt. Rankin	...	Voided leases	...	...	...	...	...	3·84	5·20	496·00	122·17	...
Do.	...	Sundry claims	...	...	...	...	...	...	...	170·00	54·38	...
Parker's Range	2801	Scots Greys	...	...	110·00	31·51	...	...	...	1,406·00	511·60	...
Do.	724	(Spring Hill)	...	...	...	...	...	...	...	3,232·00	607·21	...
Do.	724, (760)	(Spring Hill leases)	...	...	...	...	...	...	...	8,910·00	2,215·59	...
Do.	724, 2633, (2793)	Spring Hill G.M. Co., N.L.	...	...	...	86·57	...	...	...	4,339·00	1,894·79	...
Do.	2951	White Horseshoe	...	...	373·00	291·41	...	...	...	3,946·50	3,336·92	...
Do.	...	Voided leases	...	...	...	...	...	...	105·14	13,686·25	10,013·04	...
Do.	...	Sundry claims	...	...	128·00	91·73	...	...	...	2,236·75	1,521·33	...
Southern Cross	(3284)	Fraser's	...	...	25·18	12·34	...	...	...	25·18	12·34	...
Do.	(3228), (3232)	Fraser's Central (1921) leases	...	...	...	...	...	...	...	900·50	398·04	...
Do.	...	Voided leases	...	...	...	...	...	2·13	211·22	443,180·20	211,598·08	364·41
Do.	...	Sundry claims	...	...	86·50	16·54	...	5·50	595·45	4,240·98	1,332·79	...
Westons	(3269)	Myrtle Central	...	...	25·00	49·98	...	...	...	245·00	295·89	...
Do.	(3270)	Recovery	...	...	...	...	...	...	...	54·00	26·68	...
Do.	3226	Royal Flush	...	...	100·00	79·91	...	...	...	699·00	529·05	...
Do.	...	Voided leases	...	...	...	...	...	...	4·06	421,524·99	298,668·61	21·78
Do.	...	Sundry claims	...	...	86·00	73·72	...	...	52·91	1,371·75	1,354·53	...

		From Goldfield generally:											
		Sundry Parcels treated at:											
		Glide Away Battery	...	...	...	...	...	...	...	...	...	237·60	...
		Great Victoria Cyanide Works	...	...	...	...	...	...	...	...	...	5,847·54	...
		Howlett's Battery	...	...	...	155·59	...	...	...	...	...	1,214·93	...
		Never Never Works	...	...	...	...	...	...	...	...	...	1,629·53	...
		Smith's Cyanide Works	...	...	...	...	...	...	...	...	...	26·16	...
		Spring Hill Works	...	...	...	...	...	...	...	...	...	854·27	...
		Sunbeam Battery	...	...	...	2·00	...	...	...	38·50		7,244·60	...
		Violet Works	...	...	...	...	...	...	...	...		998·34	...
		Various Works	...	...	...	...	...	...	...	118·28		26,087·03	36·54
		Reported by Banks and Gold Dealers	...	...	...	...	...	22·05	3·53	...		...	...
		Total	**1·15**	**14·01**	**31,448·99**	**13,281·81**	...	**92·80**	**1,497·00**	**2,302,225·51**		**1,059,185·91**	**32,288·71**

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 ...	(903), (1138), (1253)	Great Boulder Proprietary G.Ms., N.L.	...	...	504·83	668·61	...	...	...	6,663·69		10,890·82	...
Do. ...	(1306)	Gloaming	...	...	9·25	11·61	...	...	90·62	188·00		330·29	...
Do. ...	(1209)	Hoffman's Gold Mine	...	...	...	...	...	...	3·60	1,640·90		967·66	...
Do. ...	1288	Mararoa No. 3	...	...	99·50	378·28	...	...	...	476·25		1,068·45	...
Do. ...	1290	Mararoa No. 2	...	...	...	...	...	...	...	186·50		189·75	...
Do. ...	1291	Mararoa No. 1	...	...	...	...	...	...	...	766·96		985·79	...
Do. ...	1261	Mararoa South Extended	...	...	...	...	...	...	...	377·00		70·32	...
Do. ...	(1289)	New Valkyrie	...	...	10·25	7·37	...	...	...	99·25		55·10	...
Do. ...	(903)	(O.K.)	...	...	...	...	...	...	21·23	1,147·25		1,293·01	...
Do. ...	(903), (1138), (1253)	(O.K. leases)	...	...	...	...	...	...	...	2,364·00		3,455·06	...
Do. ...	1307	Recoup North	...	...	94·25	80·07	...	...	...	226·50		200·59	...
Do. ...	(1281)	Red, White & Blue Extended No. 2	...	...	...	...	...	...	...	2,756·75		986·28	...
Do. ...	990	Viking No. 1	...	42·44	193·00	564·35	...	...	42·44	670·50		1,536·98	...
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), (1181), (1194), (1235)	(Viking No. 1 leases)	...	...	...	...	...	...	...	48,452·00		44,457·70	242·83
Do. ...	...	Voided leases	...	...	...	...	...	4·23	10,300·49	806,002·93		507,958·04	34,600·73
Do. ...	...	Sundry claims	...	...	261·25	279·83	...	1,001·51	3,073·86	21,233·46		12,456·04	·59
Peninsula ...	...	Voided leases	...	...	...	...	...	...	17·61	7,807·14		4,833·88	...
		From Goldfields generally:											
		Sundry Parcels treated at:											
		Rawling's & Bullen's Works	...	...	...	...	...	...	...	57·39		4,266·10	...
		State Battery, Norseman	...	...	3·89	568·74	...	...	...	405·14		13,294·78	885·41
		Various Works	...	...	...	...	...	...	54·52	425·75		6,562·86	646·45
		Reported by Banks and Gold Dealers	...	...	...	...	...	1,026·29	...	...		1·04	...
		Total	...	**42·44**	**1,176·22**	**2,558·86**	...	**2,032·03**	**14,029·29**	**909,930·56**		**623,720·62**	**36,392·90**

TABLE IV.—*Production of Gold and Silver from all sources, etc.*—continued.

Phillips River Goldfield.

Mining Centre.	Number of Lease.	Registered Name of Company or Lease.	Total for 1925.					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.
Hatter Hill ...	...	Sundry claims...	...	...	33·00	7·53	...	...	...	33·00	7·53	...
Kundip ...	147, 179 ...	Fair Play leases	...	...	...	...	...	...	...	4,860·72	8,678·54	12·63
Do. ...	184	Gem	...	...	...	...	...	...	...	4,159·15	3,324·86	...
Do. ...	151	(Gem Consolidated)	...	...	...	...	...	...	...	777·50	616·30	...
Do. ...	151, 156 ...	Gem Consolidated leases ...	...	...	...	...	...	...	...	6,315·76	5,690·35	8·00
Do. ...	M.L. 52, M.L. 94	Harbour View Gold & Copper Co., Ltd.	...	...	...	...	...	...	...	1,602·89	1,836·05	360·11
Do. ...	M.L. 52, M.L. 94	(Harbour View leases)	...	...	...	...	...	...	379·86	3,619·25	1,560·86	61·41
Do. ...	M.L. 52, M.L. 94	(Harbour View leases)	...	...	...	...	...	...	...	3,403·50	2,227·62	1·88
Do. ...	·98	Hillsborough	...	...	...	...	...	...	...	3,295·51	6,018·84	118·03
Do. ...	M.L. 370 ...	North Harbour View	...	...	...	...	...	...	...	35·27	22·16	...
Do. ...	M.L. 52, M.L. 94	(Ravensthorpe G.M. Syndicate, N.L.)	...	...	...	...	...	...	...	1,124·00	433·94	164·98
Do. ...	...	Voided leases	...	...	...	...	...	113·28	176·31	37,704·03	25,448·75	3,070·20
Do. ...	...	Sundry claims	...	...	...	...	...	79·05	71·58	956·88	596·33	15·45
Mt. Desmond	...	Voided leases	...	...	...	...	...	...	1·40	9·00	3,905·46	6,891·59
Do. ...	...	Sundry claims	...	...	...	...	...	...	...	...	32·81	51·01
Mt. Purchas...	...	Voided leases	...	...	...	...	...	...	4·38	346·05	293·13	...
Do. ...	...	Sundry claims	...	...	...	...	...	...	...	4·75	4·68	...
Ravensthorpe	M.L. 16	(Marion Martin)	...	...	...	...	...	...	...	...	20·09	...
Do. ...	M.L. 16	Marion Martin	...	...	...	...	...	...	...	...	240·70	...
Do. ...	M.L. 16	(Marion Martin: Phillips River Gold & Copper Co., Ltd.)	...	...	...	...	...	...	...	...	275·33	205·97
Do. ...	201	Mount Doran	...	...	17·00	11·56	...	...	...	17·00	11·56	...
Do. ...	M.L. (15) ...	(Mt. Cattlin)	...	...	...	...	...	...	·49	200·00	85·50	...
Do. ...	M.L. (15) ...	Mt. Cattlin	...	...	...	...	...	...	...	...	789·34	...
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 & Copper Co., Ltd.)	...	...	...	...	...	...	...	...	387·33	...
Do. ...	M.L. (15) ...	(Mt. Cattlin: Phillips River Gold & Copper Co., Ltd.)	...	...	...	...	...	...	...	...	3,077·08	3,814·45
Do. ...	...	Voided leases	...	...	...	...	...	...	141·31	21,716·76	18,765·65	310·73
Do. ...	...	Sundry claims	...	...	12·00	8·11	...	157·82	6·60	2,258·18	1,420·01	20·65
West River ...	...	Voided leases	...	...	...	...	...	...	...	...	10·34	31·06
Do. ...	...	Sundry claims	...	...	...	...	...	...	...	...	3·29	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	...	...	...	...	...	122·48	...	...	...	...	...	...
		Total	...	...	**62·00**	**27·20**	...	**472·63**	**781·93**	**92,439·20**	**87,911·91**	**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.

Narra Tarra...	Loc. 833 ...	Narra Tarra : Fremantle Trading Co., Ltd.	...	...	...	...	...	...	...	...	...	91·51	20,718·76
Coobana Creek	...	Voided leases	...	...	...	...	...	...	53·66	...	...	...	...
		From State generally :—													
		Sundry Parcels treated at :													
		Fremantle Trading Co., Ltd., Works	...	...	...	104·72	60·02	...	...	...	3,232·91	9,675·43
		Hainault Sulphide Plant, Kalgoorlie	...	...	...	...	...	...	...	...	21·28	...
		State Smelter, Ravensthorpe	...	...	...	...	...	...	...	...	41·20	...
		Various Works	...	...	...	...	...	...	...	27·00	4,411·14	481·77
		Sundry Specimens	...	...	...	...	...	4·24	56·56	...	...	...
		Reported by Banks and Gold Dealers	3·61	...	...	...	...	141·78	183·87	...	...	...
		Total	**3·61**	...	...	**104·72**	**60·02**	**146·02**	**294·09**	**27·00**	**7,798·04**	**30,875·96**

TABLE V.

TOTAL OUTPUT OF GOLD BULLION ENTERED FOR EXPORT, AND RECEIVED AT THE PERTH BRANCH OF THE ROYAL MINT, FROM 1ST JANUARY, 1886, TO 31ST DECEMBER, 1925, SHOWING, IN FINE OUNCES, THE QUANTITY OBTAINED EACH YEAR FROM THE RESPECTIVE GOLDFIELDS, AND THE TOTAL ANNUAL VALUE.

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
1919		239·74	239·74		3,849·66	3,849·66		23·90	23·90		3·30	3·30
1920		131·53	131·53	9·42	5,295·85	5,305·27		114·20	114·20		2·96	2·96
1921		49·35	49·35		1,404·86	1,404·86		160·51	160·51		22·31	22·31
1922		5·01	5·01		3,732·13	3,732·13		95·88	95·88		13·57	13·57
1923		30·55	30·55		2,814·68	2,814·68		59·89	59·89		9·24	9·24
1924		12·77	12·77	6·58	2,209·05	2,215·63		70·49	70·49		3·18	3·18
1925		34·16	34·16		1,544·35	1,544·35					6·34	6·34
Total	22,422·06	6,951·38	29,373·44	147,302·43	151,105·70	298,408·13	4,351·11	26,449·99	30,801·10	4,104·96	2,168·07	6,273·03

Year.	*b* GASCOYNE.			*c* PEAK HILL.			*c* EAST MURCHISON.			MURCHISON.		
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		3 ·55	65·55	·56	446·00	446·56	268·57	52,926·34	53,194·91	8,669·79	96,610·36	105,280·15
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
1919					57·83	57·83		766·30	766·30		64,425·15	64,425·15
1920		3·19	3·19		18·78	18·78		98 82	98·82	835·05	56,338·49	57,173·54
1921		7·46	7·46		1·23	1·23	21·54	76·18	97·72	677·71	50,411·30	51,089·01
1922		1·52	1·52		5·12	5·12	556·07	614·95	1,171·02	238·39	40,724·62	40,963·01
1923					454·04	454·04	371·22	2,466·06	2,837·28	485·08	30,220·87	30,705·95
1924		2·46	2·46	2·98	1,669·92	1,672·90		4,490·78	4,490·78	613·28	22,414·52	23,027·80
1925		6·83	6·83		1,896·10	1,896·10		4,739·90	4,739·90	592·19	24,042·48	24,634·67
Total	304·55	659·55	964·10	41,102·62	171,897·22	212,999·84	230,563·56	1,406,816·47	1,637,380·03	1,446,766·85	1,975,136·31	3,421,903·16

a Prior to 1st May, 1898, included with Pilbara. *b* Prior to March, 1899, included with Ashburton. *c* From 1st August, 1897.

TABLE V.—*continued.*

Total Output of Gold Bullion entered for Export, and Received at the Perth Branch of the Royal Mint, etc.— continued.

Year.	*d* YALGOO.			*e* MT. MARGARET.			*f* NORTH COOLGARDIE.			*g* 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	1,389·24	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	...	2,837·97	2,837·97	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	638·99	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	...	878·62	878·02	...	95,186·67	95,186·67	...	30,273·00	30,273·00	...	2,493·63	2,493·63
1919	...	648·81	648·81	...	95,129·83	95,129·83	...	21,535·19	21,535·19	...	2,782·50	2,782·50
1920	...	243·26	243·26	...	82,976·60	82,976·60	...	11,221·31	11,221·31	...	5,642·42	5,642·42
1921	...	188·04	188·04	...	27,703·53	27,703·53	380·43	9,785·52	10,165·95	...	163·81	163·81
1922	...	11,669·19	11,669·19	215·69	30,878·39	31,094·08	180·55	11.236·64	11,417·19	...	...	...
1923	46·38	5,657·27	5,703·65	352·97	33,162·16	33,515·13	212·97	9,455·91	9,668·88	...	331·78	331·78
1924	73·79	5,924·03	5,997·82	330·17	40,750·48	41,080·65	202·60	9,145·96	9,348·56	...	1,616·40	1,616·40
1925	11·46	2,222·77	2,234·23	123·26	38,264·17	38,387·43	175·56	4,391·29	4,566·85	...	5,694·50	5,694·50
Total	11,478·21	86,756·13	98,234·34	607,310·81	2,620,482·36	3,227,793·17	261,636·81	1,712,614·20	1,974,251·01	121,540·42	210,471·30	332,011·72

Year.	*f* NORTH-EAST COOLGARDIE.			*f* EAST COOLGARDIE.			*h* COOLGARDIE.			YILGARN.		
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	3,788·03	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
1919	...	116·83	116·83	6,445·89	459,912·83	466,358·72	...	3,918·19	3,918·19	...	60,140·27	60,140·27
1920	...	350·26	350·26	2,186·57	402,861·25	405,047·82	...	4,031·16	4,031·16	2,230·09	35,930·17	38,160·26
1921	...	43·63	43·63	3,095·25	428,936·85	432,032·10	...	214·67	214·67	262·39	22,031·97	22,294·36
1922	...	...	...	2,631·78	415,979·06	418,610·84	...	518·97	518·97	1,437·76	13,267·24	14,705·00
1923	...	564·05	564·05	4,015·37	404,110·59	408,125·96	89·96	1,071·95	1,161·91	211·47	7,305·74	7,517·21
1924	61·74	1,322·28	1,384·02	1,071·69	375,211·10	376,282·79	126·97	6,721·06	6,848·03	75·22	8,644·23	8,719.45
1925	...	836·05	836·05	2,461·32	335,847·68	338,309·00	13·19	3,537·95	3,551·14	391·54	12,595·06	12,986·60
Total	234,809·81	434,381·69	669,191·50	6,792,670·88	14,040,588·66	20,833,259·54	661,362·03	849,935·05	1,511,297·08	215,873·72	940,725·34	1,156,599·06

d Prior to 1st April, 1897, included with Murchison. *e* From 1st August, 1897. *f* Prior to 1st May, 1896, included with Coolgardie.
g From 1st September, 1897. *h* Declared 5th April, 1894, to which date included with Yilgarn.

TABLE V.—*continued.*

Total Output of Gold Bullion entered for Export, and Received at the Perth Branch of the Royal Mint, etc.—continued.

Year.	‡ DUNDAS.			ƒ 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
1919	...	13,631·96	13,631·96	...	349·49	349·49	...	...	...	...	88·12	88·12
1920	...	7,156·82	7,156·82	...	34·62	34·62	...	...	...	...	129·31	129·31
1921	...	4,961·45	4,961·45	2,733·42	329·14	3,062·56	...	...	...	...	68·11	68·11
1922	...	3,799·37	3,799·37	...	317·13	317·13	...	...	...	59·92	67·33	127·25
1923	...	534·52	534·52	...	258·90	258·90	...	...	...	148·40	69·39	217·79
1924	1·38	2,126·14	2,127·52	...	67·72	67·72	...	...	...	18·80	47·21	66·01
1925	...	1,504·11	1,504·11	...	34·63	34·63	...	...	...	142·07	143·19	285·26
Total	113,896·47	598,206·47	712,102·94	39,035·37	42,268·53	81,503·90	282·21	557·53	839·74	17,855·76	18,124·10	35,979·86

‡ Prior to 1893 included with Yilgarn. ƒ Prior to 1902, included in State generally. ¶ Abolished 4th March, 1908.

Year.	GRAND TOTAL.			
	Export.	Mint.	Total.	Value.
	fine ozs.	fine ozs.	fine ozs.	£ s. d.
1886	270·17	...	270·17	1,147 12 2½
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	226,283 11 8
1893	99,202·50	...	99,202·50	421,385 8 8½
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 7½
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 7½
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 9¾
1912	83,577·12	1,199,080·87	1,282,657·99	5,448,384 16 5¾
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 2½
1918	15,644·12	860,867·03	876,511·15	3,723,182 14 9
1919	6,445·89	727,619 90	734,065·79	3,118,113 5 6½
1920	5,261·13	612,581·00	617,842·13	2,624,426 11 0
1921	7,170·74	546,559·92	553,730·66	2,352,098 6 8½
1922	5,320·16	532,926·12	538,246·28	2,286,324 17 5
1923	5,933·82	498,577·59	504,511·41	2,143,028 5 0½
1924	2,585·20	482,449·78	485,034·98	2,060,297 12 8½
1925	3,910·59	437,341·56	441,252·15	1,874,319 19 10¾
TOTAL	10,974,670·64	25,296,496·05	36,271,166·69	154,070,122 18 1¾

TABLE VI.

COMPARATIVE RETURN OF GOLD BULLION ENTERED FOR EXPORT AND RECEIVED AT THE PERTH BRANCH OF THE ROYAL MINT, DURING THE YEARS 1923, 1924, AND 1925, SHOWING IN FINE OUNCES THE QUANTITY RECORDED EACH MONTH, AND ITS VALUE.

MONTHS AND QUARTERS.	1923.				1924.				1925.			
	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	766·44	41,149·71	41,916·15	178,048 9 9	198·08	37,260·27	37,458·35	159,112 19 1¼	109·71	31,123·79	31,233·50	132,671 9 6
FEBRUARY	245·08	38,871·62	39,116·70	166,157 3 7¼	285·15	42,849·78	43,134·93	183,225 10 8½	395·63	32,087·86	32,483·49	137,981 1 10¾
MARCH	331·55	35,689·00	36,020·55	153,005 11 5	111·14	36,188·99	36,300·13	154,193 3 0¼	1,082·93	31,013·95	32,096·88	136,338 17 7¼
1st January to 31st March ...	**1,343·07**	**115,710·33**	**117,053·40**	**497,211 4 9¼**	**594·37**	**116,299·04**	**116,893·41**	**496,531 12 10¾**	**1,588·27**	**94,225·60**	**95,813·87**	**406,991 9 0**
APRIL	216·21	41,437·08	41,653·29	176,931 18 7	...	45,087·57	45,087·57	191,519 16 5¾	444·57	39,170·09	39,614·66	168,272 7 7¼
MAY	1,099·25	34,769·94	35,869·19	152,362 12 8¼	423·18	39,914·29	40,337·47	171,342 13 7½	305·96	34,468·49	34,774·45	147,712 9 5¾
JUNE	161·24	44,502·99	44,664·23	189,721 11 9½	87·10	47,083·23	47,170·33	200,366 16 6¼	228·90	39,274·09	39,502·99	167,798 0 8½
1st January to 30th June ...	**2,819·77**	**236,420·34**	**239,240·11**	**1,016,227 7 10**	**1,104·65**	**248,384·13**	**249,488·78**	**1,059,760 19 6¼**	**2,567·70**	**207,138·27**	**209,705·97**	**890,774 6 9½**
JULY	1,061·58	40,283·93	41,345·51	175,624 11 3¼	170·50	35,788·99	35,959·49	152,746 4 1	106·88	34,469·40	34,576·28	146,870 14 0½
AUGUST	651·49	47,807·11	48,458·60	205,839 0 11¾	...	41,581·96	41,581·96	176,628 18 9¼	124·72	44,007·26	44,131·98	187,460 14 8½
SEPTEMBER	...	46,272·38	46,272·38	196,552 11 6½	384·86	38,305·91	38,690·77	164,347 18 10¾	191·55	34,647·44	34,838·99	147,986 12 5½
1st January to 30th September ...	**4,532·84**	**370,783·76**	**375,316·60**	**1,594,243 11 7½**	**1,660·01**	**364,060·99**	**365,721·00**	**1,553,484 1 3¼**	**2,990·85**	**320,262·37**	**323,253·22**	**1,373,092 8 0**
OCTOBER	767·13	49,956·62	50,723·75	215,460 15 10¾	371·23	41,036·20	41,407·43	175,887 11 7¾	174·68	38,488·28	38,662·96	164,229 16 3½
NOVEMBER	222·89	32,481·05	32,703·94	138,917 10 1¾	167·50	33,151·29	33,318·79	141,529 4 5¾	289·22	34,809·58	35,098·80	149,090 4 6¼
DECEMBER	410·96	45,356·16	45,767·12	194,406 7 4½	386·46	44,201·30	44,587·76	189,396 15 3¾	455·84	43,781·33	44,237·17	187,907 11 1
Total	**5,933·82**	**498,577·59**	**504,511·41**	**2,143,028 5 0½**	**2,585·20**	**482,449·78**	**485,034·98**	**2,060,297 12 8½**	**3,910·59**	**437,341·56**	**441,252·15**	**1,874,319 19 10¾**

TABLE VII.

MONTHLY RETURN OF GOLD, CONTAINED IN BULLION, FURNACE PRODUCTS, AND ORE, ENTERED FOR EXPORT DURING 1925.

MONTH.	UNITED KINGDOM.			VICTORIA.			NEW SOUTH WALES.			SOUTH AUSTRALIA.			TOTALS.			Minted Gold Exported*
	Bullion.	Furnace Products.	Ore.	Bullion.	Furnace Products.	Ore.	Bullion.	Furnace Products.	Ore.	Bullion.	Furnace Products.	Ore.	Bullion.	Furnace Products.	Ore.	
1925.	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.	Fine ozs.
January	...	...	...	...	...	109·71	...	...	...	...	...	...	...	...	109·71	...
February	...	...	...	...	...	118·65	...	...	276·98	...	...	...	...	...	395·63	...
March	...	...	1,082·93	...	...	...	...	...	...	...	...	...	...	...	1,082·93	...
April	...	...	...	...	...	255·66	...	188·91	...	...	...	...	...	188·91	255·66	...
May	...	...	...	...	...	50·62	...	255·34	...	...	...	...	...	255·34	50·62	39·59
June	...	...	...	...	...	72·03	...	156·87	...	...	...	...	...	156·87	72·03	...
July	...	...	...	...	...	106·88	...	...	...	...	...	...	...	....	106·88	...
August	...	...	...	...	...	...	...	124·72	...	...	...	...	...	124·72	...	13·52
September	...	...	...	...	...	...	...	191·55	...	...	...	...	...	191·55	...	...
October	...	...	...	...	...	174·68	...	...	...	...	...	...	...	...	174·68	...
November	...	...	...	...	...	...	...	289·22	...	...	...	...	...	289·22	...	62·30
December	...	79·21	...	...	...	...	...	376·63	...	...	...	...	...	455·84	...	...
TOTALS	...	79·21	1,082·93	...	...	888·23	...	1,583·24	276·98	...	...	...	...	1,662·45	2,248·14	115·41

*When considering the total production of gold for this State, these amounts must be disregarded, having been already recorded in the total receipts of gold at the Mint.

TABLE VIII.—Return of Gold Bullion received at the Perth Branch of the ROYAL MINT from May, 1899, to the 31st December, 1925, 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.
	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.
Previous to 1901	952·47	8,023·68	137·33	756·06	171·75	34,293·08	35,807·81	73,215·76	14,041·57
1901	663·37	11,279·93	394·38	55·42	18·56	21,351·67	44,746·88	43,024·65	9,191·01
1902	439·93	10,706·03	3,284·37	...	124·86	32,637·17	62,357·98	47,628·18	5,116·94
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
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
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
1906	785·23	6,007·79	915·63	168·30	95·43	2,471·21	115,363·22	133,264·79	5,919·37
1907	431·72	4,924·97	396·22	49·89	10·06	7,057·22	140,382·15	137,713·43	3,815·06
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
1909	203·59	6,662·82	1,682·49	274·93	8·89	8,823·58	164,652·43	129,139·74	755·31
1910	586·44	7,094·46	1,670·20	208·31	31·67	3,679·72	165,123·37	134,098·94	873·58
1911	183·78	6,033·33	1,014·60	334·38	9·78	165·36	119,267·86	135,342·96	363·85
1912	361·11	7,674·55	912·60	47·77	8·09	237·96	110,585·25	128,679·43	1,410·49
1913	319·55	5,048·77	1,491·66	47·37	...	564·67	96,270·04	139,021·56	3,410·52
1914	238·83	6,750·56	1,538·31	56·09	5·00	104·45	79,785·02	135,990·48	1,705·85
1915	270·76	9,084·52	1,540·93	20·50	81·05	550·77	65,111·82	118,861·14	5,208·56
1916	306·92	8,265·75	692·68	38·34	74·07	190·21	37,169·30	95,071·24	5,320·33
1917	133·03	5,770·70	683·84	25·85	...	...	9,660·88	115,360·36	1,366·18
1918	144·31	3,643·49	339·36	7·87	...	...	949·78	93,501·94	1,090·10
1919	293·46	4,813·34	29·62	4·10	...	71·92	958·91	79,921·84	806·04
1920	164·07	6,589·24	137·59	3·79	4·03	22·62	121·47	70,428·05	307·48
1921	62·45	1,772·78	201·52	28·42	9·39	1·58	97·40	63,808·17	235·89
1922	6·36	4,694·01	123·65	17·41	1·89	6·40	789·30	51,649·85	14,819·53
1923	37·92	3,506·31	74·18	1·31	...	564·84	3,066·04	37,634·94	7,059·53
1924	16·21	2,760·69	86·49	4·00	3·02	2,128·28	5,707·71	28,211·09	7,449·97
1925	43·90	1,962·09	...	8·22	8·72	2,418·19	6,067·06	30,610·94	2,835·37
Total ...	8,251·38	181,310·45	31,692·72	2,549·22	778·98	200,690·10	1,687,907·21	2,392,903·71	106,230·54

Year.	Mt. Margaret.	North Coolgardie.	Broad Arrow.	North-East Coolgardie.	East Coolgardie.	Coolgardie.	Yilgarn.	Dundas.	*Phillips River.
	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.
Previous to 1901	84,659·99	133,467·52	22,879·60	57,204·02	172,896·93	79,218·50	37,719·21	32,056·83	...
1901	126,703·91	135,493·31	18,829·13	43,055·63	263,514·75	78,026·07	29,433·84	32,825·75	...
1902	144,663·12	182,543·06	15,903·42	53,901·58	636,536·52	94,134·17	25,873·68	31,088·91	5,146·80
1903	148,006·49	197,229·08	21,528·20	42,649·25	685,289·82	82,218·79	26,856·28	40,006·39	6,420·79
1904	143,453·51	166,939·82	24,721·53	39,799·55	699,475·35	73,076·66	35,854·87	37,508·11	2,450·03
1905	184,178·87	175,057·14	18,394·17	48,352·22	737,065·14	74,615·36	30,404·65	32,953·56	1,753·32
1906	166,097·63	130,784·60	20,415·43	37,509·91	742,525·99	73,307·24	30,996·76	24,484·65	1,744·38
1907	183,693·29	86,685·09	16,[illegible]8·85	30,285·39	766,846·83	73,532·99	27,795·35	27,222·21	1,806·30
1908	175,092·47	90,815·08	9,408·64	28,300·91	779,009·10	48,524·18	22,835·58	48,785·54	4,299·19
1909	163,781·55	80,293·29	5,860·66	29,603·84	747,856·04	43,756·68	25,255·30	43,254·22	4,345·04
1910	158,847·24	73,283·66	386·84	22,967·23	786,209·41	46,054·82	28,945·68	52,068·70	6,056·08
1911	162,319·77	74,536·34	346·78	22,917·38	848,725·06	41,861·54	18,190·20	59,831·49	5,242·16
1912	124,123·10	61,018·13	5·32	17,705·86	876,900·05	51,732·78	33,429·29	52,220·76	4,026·32
1913	107,391·67	73,160·41	10,814·52	13,452·90	867,887·30	42,738·63	76,581·73	47,535·02	4,221·40
1914	125,937·60	89,904·49	3,727·56	6,318·12	824,280·77	26,696·51	99,410·57	47,487·27	480·65
1915	132,819·64	69,318·34	17,810·14	10,808·78	872,406·66	21,593·44	111,539·75	42,283·16	324·48
1916	136,731·10	48,799·86	8,415·40	2,441·68	780,354·90	15,238·33	104,136·12	36,653·26	221·89
1917	136,343·74	34,650·24	11,300·38	936·97	737,833·22	7,968·62	91,168·91	34,685·39	238·50
1918	118,132·80	37,572·67	3,087·67	179·83	695,564·50	8,338·10	84,297·45	29,649·05	494·27
1919	117,763·53	26,692·84	3,455·12	144·34	569,081·41	4,866·10	74,493·69	20,346·85	434·47
1920	103,788·16	14,038·70	6,997·95	440·84	507,113·25	5,035·18	45,007·22	9,865·14	43·29
1921	35,134·85	12,492·59	206·82	54·75	543,397·61	273·77	27,844·76	6,259·31	413·29
1922	39,372·87	14,263·42	...	...	527,784·28	664·06	16,847·62	4,800·69	403·98
1923	41,206·42	11,757·92	423·44	703·32	502,783·94	1,334·06	9,085·08	674·62	325·25
1924	51,477·10	11,534·54	2,047·14	1,670·74	473,587·19	8,486·18	10,904·41	2,708·25	85·41
1925	49,010·57	5,619·91	7,246·05	1,062·56	427,548·64	4,524·68	16,016·10	1,909·16	43·83
Total ...	3,160,730·99	2,037,952·05	250,440·76	512,467·60	17,072,474·66	1,007,817·44	1,140,924·10	799,164·29	51,021·12

Year.	†Donny-brook.	State generally.	Total. Western Australia. Quantity.	Total. Western Australia. Actual Value.	Total. Other Countries. Quantity.	Total. Other Countries. Actual Value.	Grand Total. Quantity.	Grand Total. Actual Value.
	ozs.	ozs.	ozs.	£ s. d.	ozs.	£ s. d.	ozs.	£ s. d.
Previous to 1901	461·72	2,525·32	790,489·15	2,858,759 5 8	120·95	381 13 10	790,610·10	2,859,140 19 6
1901	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	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	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	...	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	...	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	...	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	...	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	...	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	...	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	...	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	...	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	...	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	...	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	...	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	...	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	...	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	...	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	...	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
1919	...	109·08	904,286·66	3,089,243 3 1	1,358·71	2,611 16 1	905,645·37	3,091,854 19 2
1920	...	161·46	770,269·53	2,595,167 17 9	1,375·73	1,531 18 5	771,645·26	2,596,699 16 2
1921	...	86·45	692,381·80	2,322,697 14 1	1,563·59	2,206 15 8	693,945·39	2,324,904 9 9
1922	...	85·44	676,330·76	2,264,069 17 11	3,319·49	2,130 17 2	679,650·25	2,266,200 15 1
1923	...	86·62	620,325·74	2,118,348 19 7	1,310·52	2,752 9 4	621,636·26	2,121,101 8 11
1924	...	58·91	608,927·33	2,049,636 8 9	1,006·53	1,814 18 4	609,933·86	2,051,451 7 1
1925	...	183·41	557,119·40	1,862,674 9 6	1,352·45	1,659 3 4	558,471·85	1,864,333 12 10
Total ...	630·96	21,131·66	30,667,069·94	106,664,266 10 9	25,613·08	42,008 1 0	30,692,683·02	106,706,274 11 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 1925, 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 1901 ...	...	520·82	520·82	35,205	...	2,303·27	2,303·27	117,294	...	2,824·09	2,824·09	152,499
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	29,928	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
1919	...	36·70	36·70	5,871	23 66	220·95	244·61	34,959	23·66	257·65	281·31	40,830
1920	...	41·50	41·50	7,616	10 25	179·84	190·09	31,249	10·25	221·34	231·59	38,865
1921	...	14·50	14·50	1,460	7·00	45·87	52 87	5,778	7·00	60·37	67·37	7,238
1922	...	25·35	25·35	2,446	·15	15·71	15·86	1,393	·15	41·06	41·21	3,839
1923	...	24·40	24·40	2,960	...	28·02	28·02	3,024	...	52·42	52·42	5,984
1924	...	28·55	28·55	4,048	·32	52·24	52·56	7,469	·32	80·79	81·11	11,517
1925	...	23·96	23·96	3,609	1·21	54·06	55·27	8,764	1·21	78·02	79·23	12,373
Total	372·62	5,335·93	5,708·55	518,798	348·82	10,533·83	10,882·65	934,526	721·44	15,874·63	16,596·07	1,453,699

* 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 1901 ...	...	...	...	...	...	...	...	...	...	...	...	...
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	...	...	...	...	...	...	...	...	...	...	...	...
1919	...	...	...	...	...	...	...	...	...	...	...	...
1920	...	...	...	...	...	...	...	...	...	...	...	...
1921	...	...	...	...	...	...	...	...	...	...	...	...
1922	...	...	...	...	...	...	...	...	...	...	...	...
1923	...	...	...	...	...	...	...	...	...	...	...	...
1924	...	...	...	...	...	...	...	...	...	...	...	...
1925	...	6·25	6·25	750	...	...	...	...	...	6·25	6·25	750
Total	2·25	102·55	104·80	14,214	...	3·19	3·19	1,804	2·25	105·74	107·99	16,018

Period.	PYRITIC ORE.		COPPER ORE.													
	Mt. Margaret G.F.		West Kimberley Goldfield		Pilbara Goldfield.				West Pilbara Gf.		Ashburton Gf.		Peak Hill Gf.		E. Murchison Gf.	
	Mt. Morgans D.				Marble Bar D		Nullagine D.								Lawlers D.	
	Quantity.	Value.	Q'ntity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	tons.	£	tons.	£	tons.	£	tons.	£	tons.	£	tons.	£	tons.	£	tons.	£
Previous to 1901 ...	...	...	...	...	...	...	...	...	11,178·00	96,887	...	...	...	...	...	...
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	38·50	426	...	...	...	...	7,764·18	40,607	...	...	112·70	2,409	...	...
1915 ...	6,557·62	2,368	67·55	1,247	...	...	...	...	314·75	3,546	146·00	3,744	237·58	7,618	10·93	147
1916 ...	4,409·22	2,263	3·47	36	...	...	...	...	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	9,688	75·00	1,523
1918 ...	2,251·81	1,629	...	...	...	...	...	...	1,844·19	28,961	...	...	76·28	2,480	82·44	1,314
1919 ...	4 135·99	4,919	...	...	...	...	...	...	1,030·78	15,807	...	...	14·39	353	...	...
1920 ...	6,019·98	7,276	...	...	...	...	9·00	360	1,700·50	32,059	...	...	35·39	1,401	...	...
1921 ...	6,116·66	7,871	...	...	...	...	...	...	1,055·00	18,955	...	...	...	...	...	...
1922 ...	3,441·15	4,203	...	...	...	...	...	...	164·00	2,481	...	...	...	...	...	...
1923 ...	...	...	...	...	...	...	...	...	221·00	3,500	...	...	...	...	...	...
1924 ...	...	...	...	...	...	...	...	...	79·00	1,012	...	...	...	...	...	...
1925 ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total ...	74,047·56	45,496	109·52	1,709	32·87	386	14·00	480	82,700·45	748,082	351·07	6,408	1,015·11	32,212	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 1901	...	...	5·15	91	...	...	98·00	1,715	38·00	407	4,812·00	35,056	...	...
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	...	...	...	...	...	...	...	...	...	...	...	...
1919	16·81	377	...	...	...	...	...	...	...	...	...	...	...	...
1920	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1921	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1922	...	...	...	...	...	...	998·66	13,435	...	...	...	...	...	...
1923	...	...	...	...	...	...	9,626·29	59,143	...	...	...	...	...	...
1924	...	...	...	...	...	...	10,672·00	34,955	...	...	...	...	...	...
1925	...	...	...	...	...	...	2,469·72	8,952	...	...	...	...	...	...
Total ...	968·46	10,714	55·56	522	38·40	413	23,903·17	118,477	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.		GYPSUM.	
	Menzies District.		E. Coolgardie D.								State generally.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	tons.	£	tons.	£	tons.	£	tons.	£	tons.	£	tons.	£
Previous to 1901	...	...	...	...	34·00	725	...	...	16,165·15	134,881	...	...
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	...	...	12,775·12	81,241	...	...
1915	...	...	...	...	3,681·03	24,093	2·03	16	4,498·56	40,998	...	...
1916	...	...	...	...	5,428·08	48,618	...	...	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	...	...
1919	...	...	...	...	215·02	4,993	...	...	1,277·00	21,530	...	...
1920	...	...	...	...	217·27	4,125	...	...	1,962·16	37,945	...	...
1921	...	...	...	...	95·34	1,207	...	...	1,150·34	20,162	664·50	622
1922	...	...	...	...	31·84	217	...	...	1,194·50	16,133	63·00	16
1923	...	...	...	...	26·01	541	...	...	9,873·30	68,184	...	...
1924	...	...	...	...	3·69	44	...	...	10,754·69	36,011	4,237·00	5,278
1925	...	...	...	...	...	...	...	...	2,469·72	8,952	3,059·95	4,118
Total ...	6·12	51	50·67	330	95,693·95	587,695	18·61	249	253,228·59	1,744,827	8,024·45	10,034

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 1901 ...	100·00	300	...	...	25,103·00	18,197	25,203·00	18,497	350·75	1,445	...	...	350·75	1,445
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	...	...	57·00	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	...	...	15,334·62	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
1919 ...	...	...	...	...	...	...	...	...	7,385·70	29,841	...	...	7,385·70	29,841
1920 ...	...	...	...	...	...	...	...	...	27,716·40	172,483	...	...	27,716·40	172,483
1921 ...	...	...	...	...	...	...	...	...	10,330·43	25,649	...	...	10,330·43	25,649
1922 ...	...	...	...	...	...	...	...	...	29,602·90	72,338	...	...	29,602·90	72,338
1923 ...	...	...	...	...	...	...	...	...	21,634·50	59,194	...	...	21,634·50	59,194
1924 ...	...	...	...	...	...	...	...	...	36,750·00	101,219	...	...	36,750·00	101,219
1925 ...	...	...	...	...	...	...	...	...	37,865·99	119,299	...	...	37,865·99	119,299
Total ...	100·00	300	450·00	247	57,280·00	36,148	57,830·00	36,695	377,244·47	1,175,257	106·57	1,529	377,351·04	1,176,786

† Iron ore from Koolan Island, Yampi Sound.

TABLE IX.—*Minerals other than Gold, etc.*—continued.

Period.	Silver Lead Ore.				Tungsten Ores.											
	Pilbara Goldfield.		Ashburton Gf.		Wolfram.		Scheelite.									
	Marble Bar District.				State generally.		North Coolgardie Gf. Menzies District.		Broad Arrow Goldfield.		Coolgardie Gf. Coolgardie District.		Dundas Goldfield.		Total.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Q'nty.	Value.	Quantity.	Value.	Q'nty.	Value	Q'nty.	Value.
	tons.	£	tons.	£	tons.	£	tons.	£	tons.	£	tons.	£	tons.	£	tons.	£
Previous to 1901 ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1901 ...	...	...	21·05	152	...	...	...	...	...	...	...	...	...	...	...	...
1902 ...	...	...	35·85	277	...	...	...	...	...	...	...	...	...	...	...	...
1903 ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1904 ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1905 ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1906 ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1907 ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1908 ...	...	...	727·25	6,914	...	...	...	...	...	...	...	...	...	...	...	...
1909 ...	...	...	440·00	3,520	*5·00	90	...	...	...	...	...	...	...	...	...	...
1910 ...	...	...	...	...	†42·00	115	...	...	...	...	...	...	...	...	...	...
1911 ...	...	...	...	...	‡194·00	877	...	...	...	...	...	...	...	...	...	...
1912 ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1913 ..	...	...	125·50	1,757	‡4·64	69	...	...	...	...	...	...	...	...	...	...
1914 ...	...	...	715·10	9,807	...	...	...	...	...	...	...	...	...	...	...	...
1915 ...	...	...	298·96	4,429	**·25	27	...	...	...	...	...	...	...	...	...	...
1916 ...	...	...	67·83	554	20·00	117	...	...	...	...	...	...	...	...	...	...
1917 ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1918 ...	...	...	237·48	3,461	...	...	...	...	...	...	...	...	...	...	...	...
1919 ...	...	...	214·76	3,116	...	...	273·06	829	...	...	45·71	101	...	...	318·77	930
1920 ...	...	...	...	...	...	...	134·25	113	3·35	175	40·00	54	·41	10	178·01	352
1921 ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1922 ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1923 ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1924 ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1925 ...	51·00	1,268	30·00	630	...	...	...	...	...	...	...	...	...	...	...	...
Total ...	51·00	1,268	2,913·78	34,617	265·89	1,295	407·31	942	3·35	175	85·71	155	·41	10	496·78	1,282

Period.	Coal.		Fireclay.		Gadolinite.		Asbestos.							
	Collie Mf.		Collie Mf.		Pilbara Gf. Marble Bar D.		Pilbara Gf. Marble Bar D.		Pilbara Gf. Nullagine D.		West Pilbara Goldfield.		Total.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Q'nty.	Value.	Quantity.	Value.
	tons.	£	tons.	£	tons.	£	tons.	£	tons.	£	tons.	£	tons.	£
Previous to 1901	176,254·10	82,547	...	...	...	...	...	...	...	...	...	...	...	...
1901	117,835·80	68,561	...	...	...	...	...	...	...	...	...	...	...	...
1902	140,883·90	86,188	...	...	...	...	...	...	...	...	...	...	...	...
1903	133,426·62	69,128	...	...	...	...	...	...	...	...	...	...	...	...
1904	138,550·04	67,174	...	...	...	...	...	...	...	...	...	...	...	...
1905	127,864·06	55,312	...	...	...	...	...	...	...	...	...	...	...	...
1906	149,755·27	57,998	...	...	...	...	...	...	...	...	...	...	...	...
1907	142,372·54	55,158	...	...	...	...	...	...	...	...	...	...	...	...
1908	175,247·92	75,694	...	...	...	...	40·00	1,600	...	...	...	...	40·00	1,600
1909	214,301·98	90,965	...	...	...	...	2·83	154	...	...	...	...	2·83	154
1910	262,166·06	113,699	...	...	...	...	...	...	...	...	...	...	...	...
1911	249,899·15	111,154	...	...	...	...	...	...	...	...	...	...	...	...
1912	295,078·91	135,857	...	...	...	...	...	...	...	...	...	...	...	...
1913	313,817·96	153,614	...	...	1·00	112	...	...	...	...	...	...	...	...
1914	319,210·32	148,684	...	...	...	...	...	...	...	...	...	...	...	...
1915	286,666 35	137,859	...	...	...	...	...	...	...	...	...	...	...	...
1916	301,525·97	147,823	...	...	...	...	...	...	...	...	...	...	...	...
1917	326,550·07	191,822	...	...	...	...	...	...	...	...	...	...	...	...
1918	337,039·24	204,319	...	...	...	...	...	...	...	...	...	...	...	...
1919	401,713·18	270,355	...	...	...	...	...	...	53·00	1,443	...	...	53·00	1,443
1920	462,020·78	350,346	...	...	...	...	32·00	1,900	124·50	5,386	...	...	156·50	7,286
1921	468,816·65	407,117	677·80	646	...	...	32·60	1,360	202·75	12,221	...	...	235·35	13,581
1922	438,442·78	381,555	...	...	...	...	2·50	250	179·18	7,350	...	...	181·68	7,600
1923	420,713·98	368,949	...	...	...	...	3·00	150	111·00	3,865	·85	17	114·85	4,032
1924	421,863·86	363,255	...	...	...	...	...	...	73·58	2,206	...	...	73·58	2,206
1925	437,461·20	363,203	...	...	...	...	...	...	50·00	1,619	·74	22	50·74	1,641
Total ...	7,258,978·69	4,558,336	677·80	646	1·00	112	112·93	5,414	794·01	34,090	1·59	39	908·53	39,543

Period.	Limestone.								Diamonds.		Magnesite.		Antimony.		Manganese.	
	Murchison Gf. Cue District.		Yilgarn Goldfield.		State generally.		Total.		Pilbara Gf. Nullagine District.		East Coolgardie Goldfield. Bulong District.		West Pilbara Goldfield.		Peak Hill Goldfield.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value
	tons.	£	tons.	£	tons.	£	tons.	£	carats.	£	tons.	£	tons.	£	tons.	£
Previous to 1901	...	...	269·85	273	33,250·00	6,159	33,519·85	6,432	§	24	...	...	...	...	...	...
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	...	...	...	...
1919	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1920	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1921	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1922	...	...	...	...	...	...	...	...	...	...	...	...	...	...	18·11	142
1923	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1924	...	...	...	...	...	...	...	...	...	...	...	...	...	...	58·63	294
1925	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
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	76·74	436

* Produced within the West Kimberley Goldfield. † 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 XXVIII., pages 74–79.

TABLE X.

QUANTITY AND VALUE OF BLACK TIN REPORTED TO THE MINES DEPARTMENT DURING 1925, AND TOTALS TO DATE.

LOCALITY.	NUMBER OF LEASE, CLAIM, OR AREA.	REGISTERED NAME OF COMPANY OR LEASE.	1925. Quantity. Lode.	1925. Quantity. Stream.	1925. Quantity. Total.	1925. 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.										
Cooglegong ...	...	Sundry claims	...	11·18	11·18	1,679	...	1,726·45	1,726·45	154,585
Mills Find ...	...	Sundry claims	...	...	...	...	...	85	85	69
Moolyella ...	...	Voided leases	...	...	...	...	...	330·53	330·53	21,340
Do. ...	...	Sundry claims	...	12·05	12·05	1,825	...	2,865·26	2,865·26	273,579
Old Shaw ...	...	Voided leases	...	...	...	...	...	6·75	6·75	424
Do. ...	...	Sundry claims	...	...	...	...	...	214·04	214·04	14,525
Tabba Tabba ...	...	Sundry claims	...	·73	·73	·105	...	117·30	117·30	13,203
Wodgina ...	M.Ls. 86, 87, 95	H.M. and Anchorite leases ...	...	...	...	...	...	5·00	5·00	500
Do. ...	M.L. 84 ...	(Mount Cassiterite)	...	...	...	...	133·52	13·85	147·37	14,184
Do. ...	M.Ls. 84, (93), (148)	Mount Cassiterite leases ...	...	...	...	...	195·50	1·60	197·10	16,913
Do. ...	...	Voided leases	...	...	...	...	37·82	6·10	43·92	4,414
Do. ...	...	Sundry claims	...	...	...	...	5·78	48·20	53·98	5,062
		Totals	...	23·96	23·96	3,609	372·62	5,335·93	5,708·55	518,798
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 ...	515	Kapanga	1·21	...	1·21	205	34·63	96	35·59	45,191
Do. ...	505 (519) 614...	Scotia leases	...	8·00	8·00	1,130	...	78·52	78·52	8,666
Do. ...	580	Southern Cross	...	...	...	...	7·95	...	7·95	1,086
Do. ...	Locs. 289, 290	Clarth and others	...	...	...	...	...	318·04	318·04	28,959
Do. ...	Loc. 290 ...	McKay & Struthers ...	...	...	...	...	...	5·39	5·39	762
Do. ...	...	Voided leases	...	...	...	...	235·14	3,471·20	3,706·34	367,163
Do. ...	...	Sundry claims	...	46·06	46·06	7,429	71·10	6,659·72	6,730·82	523,376
		Totals	1·21	54·06	55·27	8,764	348·82	10,533·83	10,882·65	934,526

TABLE XI.

QUANTITY AND VALUE OF TANTALITE REPORTED TO THE MINES DEPARTMENT DURING 1925, AND TOTALS TO DATE.

LOCALITY.	NUMBER OF LEASE, CLAIM, OR AREA.	REGISTERED NAME OF COMPANY OR LEASE.	1925. Quantity. Lode.	1925. Quantity. Stream.	1925. Quantity. Total.	1925. 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 ...	M.Ls. 86, 87, 95	H.M. and Anchorite leases ...	...	4·25	4·25	510	2·25	49·05	51·30	7,850
Do. ...	M.L. 293 ...	May Be	...	2·00	2·00	240	...	2·00	2·00	240
Do. ...	...	Sundry claims	...	...	...	...	...	51·50	51·50	6,124
		Totals	...	6·25	6·25	750	2·25	102·55	104·80	14,214
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 1925, AND TOTALS TO DATE.

LOCALITY.	NUMBER OF LEASE, CLAIM, OR AREA.	REGISTERED NAME OF COMPANY OR LEASE.	1925.		TOTAL TO DATE.	
			Quantity.	†Value.	Quantity.	†Value.
			tons.	£	tons.	£
MT. MARGARET GOLDFIELD.						
MT. MORGANS DISTRICT.						
Eulaminna ...	M.Ls. (4F), (5F), (11F), (12F)	West AustraNan Copper Co., Ltd.	...	...	61,687·98	38,818
Murrin Murrin...	M.L. (18F) ...	Nangeroo: Nangaroo Mines, Ltd.	...	...	12,359·58	6,678
		Totals	...	...	**74,047·56**	**45,496**

† Represents the value of the sulphur only, the copper contents not having been treated.

TABLE XIII.

QUANTITY AND VALUE OF COPPER ORE REPORTED TO THE MINES DEPARTMENT DURING 1925, AND TOTALS TO DATE.

LOCALITY.	NUMBER OF LEASE, CLAIM, OR AREA.	REGISTERED NAME OF COMPANY OR LEASE.	1925.			TOTAL TO DATE.		
			Quantity.		Value.	Quantity.		Value.
			Ore.	Metallic Copper.		Ore.	Metallic Copper.	
			tons.	tons.	£	tons.	tons.	£
WEST KIMBERLEY GOLDFIELD.								
Berylton ...	...	Voided leases	...	...	...	13·19	2·76	200
Yampi Sound ...	M.L. (1), [221H]	Yampi Sound Copper Mine	...	...	...	92·86	22·80	1,473
Do. ...	... ...	Sundry claims	...	...	...	3·47	·36	36
		Totals	...	...	...	**109·52**	**25·92**	**1,709**
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 Shaw ...	... ...	Voided leases	...	...	...	7·77	1·90	190
		Totals	...	...	...	**32·87**	**5·41**	**386**
NULLAGINE DISTRICT.								
Lionel	... ...	Sundry claims	...	...	...	9·00	4·75	360
McPhee's Creek	M.L. (14L) ...	Tambina	...	...	...	5·00	2·22	120
		Totals	...	...	...	**14·00**	**6·97**	**480**
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 Mine, Ltd.)	...	...	...	69·00	7·80	780
Do. ...	M.L. 174 ...	Good Fortune	...	...	...	56·77	8·58	904
Do. ...	M.Ls. 174, (175)	(Good Fortune leases)	...	...	...	63·40	9·58	1,011
Do. ...	M.L. 184 ...	Good Luck	...	...	...	5·21	1·01	111
Do. ...	M.L. 167 ...	(Quod Est.)	...	...	...	22·43	3·49	256
Do. ...	M.Ls. 167, 183	Roebourne Copper Mines, Ltd.	...	...	...	122·45	18·50	1,855
Do. ...	M.Ls. 144, (192), (193)	Yannery and Whundo Copper Mining Co., Ltd.	...	...	...	404·50	87·14	8,116
Do. ...	M.L. 144 ...	Yannery Hill Copper Mine	...	...	...	469·25	113·81	9,961
Do. ...	...	Voided leases	...	...	...	2,729·28	515·83	44,459
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 ...	Pilbarra Copper Fields, Ltd.	...	...	...	2,650·50	574·31	46,096
Do. ...	Loc. 71 ...	(Whim Well Copper Mines, Ltd.)	...	...	...	72,562·75	9,343·89	604,492
Do. ...	...	Voided leases	...	...	...	30·00	5·50	250
		Totals	...	...	...	**82,700·45**	**11,115·93**	**748,082**

TABLE XIII.—*Quantity and Value of COPPER ORE, etc.*—continued.

LOCALITY.	NUMBER OF LEASE, CLAIM, OR AREA.	REGISTERED NAME OF COMPANY OR LEASE.	1925.			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	...	Voided leases	...	...	...	169·25	62·49	4,188
		Totals	...	...	...	**351·07**	**97·13**	**6,408**
PEAK HILL GOLDFIELD.								
Peak Hill ...	M.L. (35P) ...	Burra Copper Mines, Ltd.	...	...	...	25·84	8·85	943
Do. ...	M.Ls. 37P, 38P	Sonia leases	...	...	...	135·04	47·26	4,807
Do. ...	M.L. 9P ...	Sons of Gwalia	...	...	...	458·49	169·89	15,680
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	...	...	...	153·91	43·02	3,885
Do. ...	... ...	Sundry claims	...	...	...	62·03	21·96	1,837
		Totals	...	...	...	**1,015·11**	**353·31**	**32,212**
EAST MURCHISON GOLDFIELD.								
LAWLERS DISTRICT.								
Kathleen Valley	M.L. (12) ...	Shepherd	...	...	...	6·77	1·32	69
Lawlers ...	M.L. (29) ...	Bungarra	...	...	...	157·44	23·85	2,837
Do. ...	...	Sundry claims	...	...	...	74·35	13·25	1,458
		Totals	...	...	...	**238·56**	**38·42**	**4,364**
MURCHISON GOLDFIELD.								
MEEKATHARRA DISTRICT.								
Gabanintha ...	...	Voided leases	...	...	...	920·56	119·84	9,381
Do. ...	...	Sundry claims	...	...	...	34·42	9·23	1,072
Holden's Find...	...	Sundry claims	...	...	...	6·72	1·11	111
Yaloginda ...	...	Sundry claims	...	...	...	6·76	1·41	150
		Totals	...	...	...	**968·46**	**131·59**	**10,714**
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 ...	M.L. (6) ...	Olive Queen	...	...	...	13·91	·98	91
		Totals	...	...	...	**38·40**	**5·57**	**413**
NORTHAMPTON MINERAL FIELD.								
Geraldine ...	M.Ls. (10), (11)	Geraldine leases	...	...	...	136·50	36·05	1,992
Narra Tarra ...	Loc. 833 ...	Narra Tarra: Fremantle Trading Co., Ltd.	2,469·72	138·49	8,952	23,766·67	1,784·64	116,485
		Totals	**2,469·72**	**138·49**	**8,952**	**23,903·17**	**1,820·69**	**118,477**
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 ases) ...	...	...	...	13,516·00	1,001·98	70,754
Do. ...	[10C, 11C], (4F), (5F)	(Mt. Malcolm Copper Mine leases) ...	...	...	...	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	80,19[illegible]
Mt. Margaret ...	G.M.L. (66F) ...	Mt. Morven	...	...	...	11·53	2·40	1[illegible]8
Murrin Murrin...	(18F)	Nangeroo: Nangaroo Mines, Ltd.	...	...	...	6·80	3·00	160
Do. ...	... ...	Voided leases	...	...	...	1,525·29	248·04	16,669
		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.	1925.			TOTALS TO DATE.		
			Quantity.		Value.	Quantity.		Value.
			Ore.	Metallic Copper.		Ore.	Metallic Copper.	
			tons.	tons.	£	tons.	tons.	£
MOUNT MARGARET GOLDFIELD—*continued*.								
MOUNT MARGARET DISTRICT.								
Burtville ...	M.L. (16T) ...	Dreadnought	...	...	...	2·85	·29	26
		Totals	...	...	...	2·85	·29	26
NORTH COOLGARDIE GOLDFIELD.								
MENZIES DISTRICT.								
Goongarrie ...	M.L. (13Z) ...	Providence Copper Mining Syndicate, Ltd.	...	...	...	4·70	·42	33
Do. ...	... ...	Sundry claims	...	...	...	1·42	·40	18
		Totals	...	...	...	6·12	·82	51
EAST COOLGARDIE GOLDFIELD.								
EAST COOLGARDIE DISTRICT.								
Boorara ...	M.L. (100E) ...	Premier Copper Mine	...	...	...	50·67	6·22	330
		Totals	...	...	...	50·67	6·22	330
PHILLIPS RIVER GOLDFIELD.								
Kundip ...	G.M.Ls. 147, 179	Fair Play leases	...	...	...	130·09	131·30	11,975
Do. ...	G.M.L. 184 ...	Gem	...	...	...	90·98	22·58	2,404
Do. ...	G.M.Ls. 151, 156	Gem Consolidated leases	...	...	...	48·00	76·75	8,327
Do. ...	M.Ls. 52, 94 ...	Harbour View Gold and Copper Co., Ltd. ...	...	...	...	1,209·93	90·14	8,236
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. 98 ...	Hillsborough	...	...	...	692·84	57·65	4,746
Do. ...	M.L. 370 ...	North Harbour View	...	...	...	15·72	99	124
Do. ...	M.Ls. 52, 94 ...	(Ravensthorpe G.M. Syndicate, N.L.) ...	...	...	...	132·56	24·36	1,382
Do. ...	... ...	Voided leases	...	...	...	3,430·67	319·32	22,398
Do. ...	... ...	Sundry claims	...	...	...	111·12	17·40	1,372
Mt. Desmond ...	... ...	Voided leases	...	...	...	46,952·31	4,107·47	279,054
Do. ...	... ...	Sundry claims	...	...	...	140·25	25·17	1,901
Ravensthorpe ...	M.L. 16 ...	Marion Martin	...	...	...	2,270·63	256·94	26,496
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. 15 ...	Mount Cattlin	...	...	...	2,178·01	142·64	15,296
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 & 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. ...	... ...	Voided leases	...	...	...	7,880·86	986·55	63,429
Do. ...	... ...	Sundry claims	...	...	...	1,157·36	133·24	11,482
West River ...	... ...	Voided leases	...	...	...	44·04	7·41	414
Do. ...	... ...	Sundry claims	...	...	...	150·69	25·84	2,061
		From Goldfield generally	...	...	...	1,637·88	128·64	9,760
		Totals	...	...	...	95,698·95	8,362·00	587,695
STATE GENERALLY.								
...	.. ..	Voided leases	...	...	...	5·11	1·54	56
...	... .	Sundry claims	...	...	...	13·50	2·27	193
		Totals	...	...	...	18·61	3·81	249

TABLE XIV.

QUANTITY AND VALUE OF IRONSTONE REPORTED TO THE MINES DEPARTMENT DURING 1925, AND TOTALS TO DATE.

LOCALITY.	NUMBER OF LEASE, CLAIM, OR AREA.	REGISTERED NAME OF COMPANY OR LEASE.	1925.		TOTALS TO DATE.	
			Quantity.	Value.	Quantity.	Value.
			tons.	£	tons.	£
WEST PILBARA GOLDFIELD.						
Whim Creek ...	(17), (18), (21)	Whim Well Copper Mines	...	...	100·00	300
		Totals	...	...	**100·00**	300
EAST COOLGARDIE GOLDFIELD.						
EAST COOLGARDIE DISTRICT.						
Boulder ...	(1490E) ...	**Mt. Ferrum**	...	...	450·00	247
		Totals	...	...	**450·00**	**247**
STATE GENERALLY.						
		Avon	...	...	22,223·00	16,241
		Clackline	...	...	18,253·50	8,789
		Coates' Paddock	...	...	4,712·00	3,277
		Greenbushes	...	...	7,481·00	4,629
		Koolan Island—Yampi Sound	...	...	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 1925, AND TOTALS TO DATE.

LOCALITY.	NUMBER OF LEASE, CLAIM, OR AREA.	REGISTERED NAME OF COMPANY OR LEASE.	1925.			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	...	...	...	774·59	257·13	5,139
Do. ...	M.L. 24PP. ...	Springvale	1,315·00	159·42	5,657	1,315·00	159·42	5,657
Do. ...	M.Ls. 148, 150, 154, 158, 20PP.	Surprise leases	19,606·00	1,669·59	59,296	88,804·53	12,541·11	377,861
Do. ...	M.L. 158 ...	(Surprise South)	...	...	...	14·00	5·41	170
Do. ...	M.L. 153 ...	Three Sisters: Ajana Lead Mines, Ltd.	5,585·00	562·54	20,093	5,585·00	562·54	20,093
Do. ...	M.L. 153 ...	(Three Sisters)	...	...	...	6·25	3·94	112
Do. ...	M.L. 197 ...	Two Boys	106·00	10·60	391	106·00	10·60	391
Do. ...	M.L. 23PP ...	Wheal Ina	210·00	11·00	412	398·00	56·46	1,259
Do. ...	Loc. 7 ...	Thring & Green	1,132·94	298·62	9,179	1,451·38	453·08	11,725
Do. ...	...	Voided leases	...	...	...	145·49	87·61	1,357
Do. ...	...	Sundry claims	...	...	...	327·04	175·65	3,408
Narra Tarra ...	Loc. 833 ...	Narra Tarra: Fremantle Trading Co., Ltd.	9,911·05	691·61	24,271	122,917·90	12,224·12	356,882
Do. ...	Locs. 118, 119	Lauder & Raven (Tributers) ...	...	...	...	106·21	60·02	1,345
Do. ...	...	Sundry claims	...	...	...	238·16	34·18	442
Northampton ...	Loc. 1472 ...	Baddera: Fremantle Trading Co., Ltd.	...	...	...	129,264·56	13,888·33	317,631
Do. ...	Loc. 436 ...	Fortune Exploration Co., N.L. ...	...	...	...	123·38	51·17	1,316
Do. ...	Loc. 1146 ...	Wheal Ellen: Fremantle Trading Co., Ltd.	...	...	...	22,033·28	1,818·71	52,456
Do. ...	Loc. 436 ...	(Wheal of Fortune Extended Syndicate)	...	...	...	125·82	43·13	793
Do. ...	...	Voided leases	...	...	...	3,266·76	723·13	14,329
Do. ...	...	Sundry claims	...	...	...	222·12	132·14	2,679
Victoria ...	...	Voided leases	...	...	...	19·00	12·54	212
		Totals	**37,865·99**	**3,403·38**	119,299	377,244·47	43,300·42	**1,175,257**
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 1925, AND TOTALS TO DATE.

LOCALITY.	NUMBER OF LEASE, CLAIM, OR AREA.	REGISTERED NAME OF COMPANY OR LEASE.	1925.		TOTALS TO DATE.	
			Quantity.	Value.	Quantity.	Value.
			tons.	£	tons.	£
		PILBARRA GOLDFIELD.				
		MARBLE BAR DISTRICT.				
Braeside ...	M.L. 289 ...	Federal South	1·50	35	1·50	35
Do.	M.L. 295 ...	Koongalin	24·00	600	24·00	600
Do.	M.L. 288 ...	Ragged Hill	6·00	150	6·00	150
		Sundry claims	19·50	483	19·50	483
		Totals	**51·00**	**1,268**	**51·00**	**1,268**
		ASHBURTON GOLDFIELD.				
Ashburton ...	M.L. (3) ...	Rainbow	...	...	56·90	429
Do.	... ...	Sundry claims	...	...	2·83	40
Do.	M.L. 102 ...	Silver Star	30·00	630	30·00	630
Uaroo	M.Ls. (43), (49), (84)	Uaroo Silver Lead Mines, Ltd.	...	...	2,824·05	33,518
		Totals	**30·00**	**630**	**2,913·78**	**34,617**

TABLE XVII.

QUANTITY AND VALUE OF COAL REPORTED TO THE MINES DEPARTMENT DURING 1925, AND TOTALS TO DATE.

LOCALITY.	NUMBER OF LEASE, CLAIM, OR AREA.	REGISTERED NAME OF COMPANY OR LEASE.	1925.		TOTALS TO DATE.	
			Quantity.	Value.	Quantity.	Value.
			tons.	£	tons.	£
		COLLIE MINERAL FIELD.				
Collie	197, etc. ...	Amalgamated Collieries of W.A., Ltd. (Cardiff Mine)	52,394·30	42,004	368,691·03	303,953
Do. ...	244, etc. ...	Amalgamated Collieries of W.A., Ltd. (Co-operative Mine) ...	120,509·96	97,361	627,006·31	532,388
Do. ...	85, etc. ...	Amalgamated Collieries of W.A., Ltd. (Proprietary Mine) ...	119,134·00	98,459	668,282·70	570,845
Do. ...	250, etc. ...	Amalgamated Collieries of W.A., Ltd. (Westralia Mine) ...	100,340·09	87,158	314,096·36	277,970
Do. ...	151, etc. ...	(Amalgamated Collieries of W.A., Ltd. (Scottish Leases) ...	...	...	380·00	251
Do. ...	197, etc. ...	(Cardiff Coal Mining Co., Ltd.)	...	...	976,824·78	471,417
Do. ...	151, etc. ...	(Collie Boulder Coal Mine Co., Ltd.)	...	...	71,512·70	26,139
Do. ...	244, etc. ...	(Collie Co-operative Collieries, Ltd.)	...	...	970,044·30	511,862
Do. ...	88 (part of) ...	(Collie Proprietary Coalfields of W.A., Ltd.)	...	...	477,781·55	242,918
Do. ...	85, etc. ...	(Collie Proprietary Coalfields of W.A., Ltd.)	...	...	580,392·15	289,246
Do. ...	260, etc. ...	Premier Coal Mining Co., Ltd.	45,082·85	38,221	419,663·81	306,355
Do. ...	151, etc. ...	(Scottish Collieries, Ltd.)	...	...	2,314·51	1,210
Do. ...	151, etc. ...	(Scottish Co-operative Collieries Co., Ltd.)	...	...	430,796·95	171,303
Do. ...	85, etc. ...	(The Proprietary Coal Mines of W.A., Ltd.)	...	...	693,045·34	413,755
Do. ...	88 (part of) ...	(The Proprietary Coal Mines of W.A., Ltd.)	...	...	109·00	54
Do. ...	250, etc. ...	(Westralian Coal Mining Co., Ltd.)	...	...	507,384·11	307,913
Do. ...	250, etc. ...	(Westralia Black Diamond Collieries, Ltd.)	...	...	125,083·24	117,827
Do. ...	... ...	Voided leases	...	...	25,569·85	12,930
		Totals	**437,461·20**	**363,203**	**7,258,978·69**	**4,558,336**

TABLE XVIII.

QUANTITY AND VALUE OF FIRECLAY REPORTED TO THE MINES DEPARTMENT DURING 1925, AND TOTALS TO DATE.

LOCALITY.	NUMBER OF LEASE, CLAIM, OR AREA.	REGISTERED NAME OF COMPANY OR LEASE.	1925.		TOTALS TO DATE.	
			Quantity.	Value.	Quantity.	Value.
		COLLIE MINERAL FIELD.	tons.	£	tons.	£
Collie	87	Amalgamated Collieries of W.A., Ltd. (Proprietary lease) ...	...	...	677·80	646
		Total	...	...	**677·80**	**646**

TABLE XIX.

QUANTITY AND VALUE OF LIMESTONE REPORTED TO THE MINES DEPARTMENT DURING 1925, AND TOTALS TO DATE.

LOCALITY.	NUMBER OF LEASE, CLAIM, OR AREA.	REGISTERED NAME OF COMPANY OR LEASE.	1925.		TOTALS TO DATE.	
			Quantity.	Value.	Quantity.	Value
			tons.	£	tons.	£
MURCHISON GOLDFIELD.						
CUE DISTRICT.						
Cuddingwarra ...	M.L. (3) ...	Linella	...	...	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 XX.

QUANTITY AND VALUE OF ASBESTOS REPORTED TO THE MINES DEPARTMENT DURING 1925, AND TOTALS TO DATE.

LOCALITY.	NUMBER OF LEASE, CLAIM, OR AREA.	REGISTERED NAME OF COMPANY OR LEASE.	1925.		TOTALS TO DATE.	
			Quantity.	Value.	Quantity.	Value.
			tons.	£	tons.	£
PILBARA GOLDFIELD.						
MARBLE BAR DISTRICT.						
Cooglegong ...	M.Ls. 274, 275	**Chrysotile No. 1 leases**	...	...	70·10	3,660
Soanesville ...	...	**Voided leases**	...	...	42·83	1,754
		Totals	...	...	112·93	5,414
NULLAGINE DISTRICT.						
Lionel	M.Ls. 32L, 33L	Bullswool No. 2 and Junction leases	...	...	6·15	330
Do.	M.L. 37L ...	Fibre Chief	2·50	70·00	2·50	70
Do.	... ...	Voided leases	...	...	564·78	26,665
Do.	... ...	Sundry claims	47·50	1,549	220·58	7,025
		Totals	50·00	1,619	794·01	34,090
WEST PILBARA GOLDFIELD.						
Roebourne ...	... ...	Sundry claims	...	...	·85	17
Sherlock ...	M.L. 215 ...	Greenhill Reward	·74	22	·74	22
		Totals	·74	22	1·59	39

TABLE XXI.

QUANTITY AND VALUE OF GADOLINITE REPORTED TO THE MINES DEPARTMENT DURING 1925, AND TOTALS TO DATE.

LOCALITY.	NUMBER OF LEASE, CLAIM, OR AREA.	REGISTERED NAME OF COMPANY OR LEASE.	1925.		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 XXII.

QUANTITY AND VALUE OF TUNGSTEN ORES REPORTED TO THE MINES DEPARTMENT DURING 1925, AND TOTALS TO DATE.

SCHEELITE.

LOCALITY.	NUMBER OF LEASE, CLAIM, OR AREA.	REGISTERED NAME OF COMPANY OR LEASE.	1925.			TOTALS TO DATE.		
			Ore.	Contents Tungstic Trioxide.	Value.	Ore.	Contents Tungstic Trioxide.	Value.
			tons.	units.	£	tons.	units.	£
NORTH COOLGARDIE GOLDFIELD.								
MENZIES DISTRICT.								
Comet Vale ...	G.M.L. 5410Z...	Lake View	...	...	...	380·84	338·39	818
Do. ...	... ...	Sundry claims	...	...	...	26·47	47·38	124
		Totals	...	...	...	407·31	385·77	942
BROAD ARROW GOLDFIELD.								
Ora Banda ...	... ...	Sundry claims	...	...	...	3·35	66·50	175
		Totals	...	...	...	3·35	66·50	175
COOLGARDIE GOLDFIELD.								
COOLGARDIE DISTRICT.								
Higginsville ...	... ...	Sundry claims	...	...	...	85·71	59·07	155
		Totals	...	...	...	85·71	59·07	155
DUNDAS GOLDFIELD.								
Norseman ...	... ...	Sundry claims	...	...	...	·41	3·98	10
		Totals	...	...	...	·41	3·98	10

WOLFRAM.

LOCALITY.	NUMBER OF LEASE, CLAIM, OR AREA.	REGISTERED NAME OF COMPANY OR LEASE.	1925.			TOTALS TO DATE.		
			Ore.	Metallic contents.	Value.	Ore.	Metallic contents.	Value.
			tons.	tons.	£	tons.	tons.	£
MURCHISON GOLDFIELD.								
CUE DISTRICT.								
Callie Spring ...	M.L. (11) ...	Socialist	...	...	...	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 XXIII.

QUANTITY AND VALUE OF MAGNESITE REPORTED TO THE MINES DEPARTMENT DURING 1925, AND TOTALS TO DATE.

LOCALITY.	NUMBER OF LEASE, CLAIM, OR AREA.	REGISTERED NAME OF COMPANY OR LEASE.	1925.		TOTALS TO DATE.	
			Quantity.	Value.	Quantity.	Value.
			tons.	£	tons.	£
EAST COOLGARDIE GOLDFIELD.						
BULONG DISTRICT.						
Bulong	... ...	Sundry claims	...	...	824·75	1,053
		Totals	...	...	824·75	1,053

TABLE XXIV.

QUANTITY AND VALUE OF ANTIMONY REPORTED TO THE MINES DEPARTMENT DURING 1925, AND TOTALS TO DATE.

LOCALITY.	NUMBER OF LEASE, CLAIM, OR AREA.	REGISTERED NAME OF COMPANY OR LEASE.	1925.			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 XXV.

QUANTITY AND VALUE OF GYPSUM REPORTED TO THE MINES DEPARTMENT DURING 1925, AND TOTALS TO DATE.

LOCALITY.	NUMBER OF LEASE, CLAIM, OR AREA.	REGISTERED NAME OF COMPANY OR LEASE.	1925.		TOTALS TO DATE.	
			Quantity.	Value.	Quantity.	Value.
			tons.	£	tons.	£
		STATE GENERALLY.				
Baandee ...	... ...	Sundry claims	542·20	813	899·20	1,170
Dukin ...	... ...	Sundry claims	...	...	487·00	561
Hines Hill ...	... ...	Sundry claims	1,034·50	1,035	1,675·50	1,357
Koorda ...	M.L. 280H ...	White Cross	444·00	652	2,405·50	2,969
Woolundra ...	... ...	Sundry claims	1,039·25	1,618	2,557·25	3,977
		Totals	3,059·95	4,118	8,024·45	10,034

TABLE XXVI.

QUANTITY AND VALUE OF DIAMONDS REPORTED TO THE MINES DEPARTMENT DURING 1925, AND TOTALS TO DATE.

LOCALITY.	NUMBER OF LEASE, CLAIM, OR AREA.	REGISTERED NAME OF COMPANY OR LEASE.	1925.		TOTALS TO DATE.	
			Quantity.	Value.	Quantity.	Value.
			carats.	£	carats.	£
		PILBARA GOLDFIELD.				
		NULLAGINE DISTRICT.				
Nullagine ...	M.R.C. (6L) ...	Morgans, A. E.	...	...	...	24
		Totals	...	...	...	24

XXVII.

QUANTITY AND VALUE OF MANGANESE REPORTED TO THE MINES DEPARTMENT DURING 1925, AND TOTALS TO DATE.

LOCALITY.	NUMBER OF LEASE, CLAIM, OR AREA.	REGISTERED NAME OF COMPANY OR LEASE.	1925.		TOTALS TO DATE.	
			Quantity.	Value.	Quantity.	Value.
			tons.	£	tons.	£
		PEAK HILL GOLDFIELD.				
Horseshoe ...	...	Voided leases	...	...	18·11	142
Do. ...	...	Sundry claims	...	...	58·63	294
		Totals	...	...	76·74	436

TABLE

RETURN OF ORE AND MINERALS 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
1 ...	...	...	...	...	...	...	9,825	33,709	9,825	33,709	828	44,409	78,118
2 ...	...	...	...	...	...	...	9,536	58,688	9,536	58,688	28	1,136	59,824
3 ...	...	...	...	...	...	...	4,339	136,472	4,339	136,472	82	5,891	142,363
4 ...	...	...	...	...	...	...	3,913	33,654	3,913	33,654	183	4,520	38,174
5 ...	...	...	...	...	...	...	737	13,768	737	13,768	946	77,401	91,169
6 ...	...	...	...	...	...	...	650	14,971	650	14,971	457	49,862	64,833
7 ...	...	...	...	...	...	...	966	20,878	966	20,878	535	64,860	85,738
8 ...	...	...	...	...	...	...	1,643	24,877	1,643	24,877	478	41,269	66,146
9 ...	...	...	...	...	...	...	455	9,740	455	9,740	4	365	10,105
1920 ...	...	...	...	...	...	...	1,511	22,467	1,511	22,467	137	2,698	25,165
1921 ...	...	...	...	...	...	...	1,040	16,153	1,040	16,153	206	8,448	24,601
1922 ...	...	...	...	...	...	...	352	5,519	352	5,519	660	14,860	20,379
1923 ...	...	...	...	...	...	...	3,394	48,907	3,394	48,907	1,057	16,193	65,100
1924 ...	...	...	...	...	...	...	2,795	40,676	2,795	40,676	...	...	40,676
1925 ...	...	...	...	...	...	...	1,201	18,200	1,201	18,200	...	...	18,200
Total ...	...	...	...	...	...	...	...	...	80,124	987,019	13,414	817,979	1,804,998

[1]†*See* Woodward's Mining Handbook, Perth: By Authority, 1895; page 123.

[2]† Weight not stated.

XXVIII.

ENTERED FOR EXPORT FROM 1850 TO 1925, INCLUSIVE.

TIN.											
BLACK TIN (Dressed Tin ore).								TIN INGOT.		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	1
...	...	...	...	651	79,738	651	79,738	...	...	79,738	2
...	...	...	...	484	72,142	484	72,142	...	...	72,142	3
...	...	...	...	363	35,649	363	35,649	...	...	35,649	4
...	...	...	...	429	41,391	429	41,391	...	...	41,391	5
...	...	...	...	463	49,101	463	49,101	...	...	49,101	6
...	...	...	...	383	45,288	383	45,288	...	...	45,288	7
...	...	...	...	415	76,952	415	76,952	...	...	76,952	8
...	...	...	...	318	47,269	318	47,269	...	...	47,269	9
...	...	...	...	243	49,449	243	49,449	...	...	49,449	1920
...	...	...	...	67	6,485	67	6,485	...	...	6,485	1921
...	...	...	...	110	10,930	110	10,930	...	...	10,930	1922
...	...	...	...	131	15,095	131	15,095	...	...	15,095	1923
...	...	...	...	87	12,008	87	12,008	...	...	12,008	1924
...	...	...	...	108	15,392	108	15,392	...	...	15,392	1925
...	...	...	...	...	...	14,893	1,420,252	867	117,214	1,537,466	Total

[2]†Weight not stated.

[3]†Probably the produce of Pilbara Goldfield and Greenbushes Mineral Field.

TABLE XXVIII.—*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
1	169,043	18,333	1,549	15,002	...	...	...	...	12	189
2	165,371	19,725	1,868	22,270	...	...	...	...	14	217
3	188,020	23,420	3,169	59,002	...	...	...	...	...	...
4	193,057	23,227	3,554	46,285	...	...	...	...	22	379
5	222,159	24,295	...	...	2,883	39,032	13	302	7	143
6	173,012	22,258	...	...	428	12,033	3,523	74,930	14	630
7	222,075	38,339	...	...	22	593	4,661	139,940	...	...
8	109,830	22,711	...	...	282	3,045	5,489	163,880	...	...
9	223,332	55,342	...	...	248	3,704	1,780	48,462	...	...
1920	130,692	36,605	...	...	3,427	84,743	1,930	69,136	...	...
1921	116,151	18,658	...	...	...	...	2,156	48,863	...	...
1922	118,696	18,164	...	...	...	...	2,796	69,528	...	...
1923	109,005	16,036	...	...	3,172	43,416	20	609	...	...
1924	89,146	13,409	...	...	4,854	83,095	...	...	...	...
1925	81,226	11,661	...	...	4,664	103,300	...	...	...	...
Total	4,403,620	611,345	44,032	508,748	20,920	381,032	23,052	628,956	184	5,437

[2]† Weight not stated. [4]† Estimated. ‡ Ore and Concentrates.

entered for EXPORT from 1850 to 1925, 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
...	...	...	...	...	...	...	...	1	6	...	...	2
...	...	...	...	...	...	...	...	...	...	...	...	3
...	...	...	...	...	...	...	...	...	...	...	...	4
...	...	...	...	...	...	18	5,729	...	...	...	...	5
...	...	...	...	...	...	...	...	...	...	...	...	6
...	...	4	140	...	...	...	...	...	...	...	...	7
...	...	...	...	...	...	[2]†	400	...	...	...	...	8
1	100	...	...	...	...	...	...	...	...	...	...	9
2	190	...	...	...	...	...	...	...	...	...	...	1910
9	826	...	...	...	...	...	...	...	...	...	...	1
...	...	...	...	...	...	...	...	...	...	...	...	2
1	86	...	...	...	...	...	...	...	...	...	...	3
½	40	...	...	...	...	...	...	7	40	...	...	4
½	25	...	...	...	...	...	...	...	...	688	1,196	5
1	128	3	438	11	19	47	9,375	21	284	12	47	6
...	...	½	42	57	707	17	2,513	18	158	42	50	7
½	31	5	720	679	2,564	...	...	5	75	62	225	8
½	15	6	772	...	...	¼	75	...	...	...	...	9
...	...	2½	395	1,765	4,260	...	...	13	130	...	...	1920
...	...	...	...	7	16	...	...	...	...	...	...	1921
...	...	...	...	1,075	1,784	...	...	...	3	...	...	1922
...	...	...	...	**	686	4½	688	...	...	2	8	1923
...	...	...	...	**	777	...	...	...	...	...	...	1924
...	...	...	...	**	1,045	5	1,010	...	...	...	...	1925
15	£1,441	21	2,507	...	11,858	...	19,790	...	696	806	1,526	Total

** Contained in Gold ore. [2]† Weight not stated.

TABLE XXVIII.—*Return of Ore and Minerals other than Gold*

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 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
Carried forward	...	...	...	..	...	...	...	...	508,968	

entered for EXPORT from 1850 to 1925, inclusive—continued.

Year.	Non-Metallic Minerals—*continued.*						Minerals not Elsewhere Included.		Total Value of Minerals other than Gold exported to Date.	Year.
	Asbestos. State generally.		Coal. Collie River Mf.		Mica. State generally.					
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.		
	tons.	£	tons	£	tons.	£	tons	£	£	
Brought forward	...	...	...	...	...	...	...	...	508,968	
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]† 2	41	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	200,106	1910
1	...	...	*40,063	29,344	...	...	[10]† 14	407	197,439	1
2	...	...	6 *42,602	6 30,721	...	...	[11]†	8	212,509	2
3	...	...	*54,228	39,125	...	...	5	17	336,155	3
4	...	...	*54,416	38,244	4	323	[12]† 9	635	182,996	4
5	...	...	1,667 *26,167	1,513 19,288	[2]†	26	[13]†	115	218,495	5
6	...	...	2,447 *37,590	1,857 28,387	[2]†	10	[14]†	713	265,043	6
7	...	...	*31,951	29,359	...	...	[15]†	440	343,167	7
8	...	1 25	*23,238	24,424	...	...	[16]† 5	97	360,895	8
9	...	36 752	*69,708	76,924	1	514	[17]†	116	244,050	9
1920	...	31 2,525	*78,788	104,665	[18]†	120	[19]†	223	377,416	1920
1921	...	141 6,205	*116,993	188,686	...	...	[20]†	257	293,771	1921
1922	...	143 5,746	*71,164	115,835	2	60	[21]†	1,083	243,512	1922
1923	...	71 3,830	5,313 *43,729	7,969 73,256	...	...	[22]†	303	226,996	1923
1924	...	32 1,586	*36,829	60,292	...	...	[23]† 20	160	212,003	1924
1925	...	23 687	66 *37,208	198 58,650	...	...	...	...	210,143	1925
Total	...	...	922,602	1,072,423	...	1,357	...	11,209	6,623,398	Total

* Bunker Coal. [2] † Weight not stated. [5] † 4 cwts. [6] † Cobalt ore.

[7] † Antimony ore. [12] † Bismuth. [16] †Molybdenite, [18] †7 cwts.

[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

[15] †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

[17] †Includes—

Bismuth, 1 cwt. ...	=	£15
Corundum, 1 ton ...	=	1
Molybdenite, 7 tons	=	100
Total ...		£116

[19] †Includes—

Antimony, 2½ tons	...	£45
Clay, 6 cwt.	...	6
Gadolinite, 1 ton ...	...	150
Iron Concentrates, 1 ton	...	17
Molybdenite, 10 cwt.	...	5
Total ...	...	£223

[20] †Includes—

Barytes, 2 cwt.	...	£18
Corundum, ¼cwt.	...	2
Felspar, 1 ton...	...	47
Jarosite, 12cwt.	...	5
Manganese, 16 tons	...	145
Pottery clay, 3½ tons....		40
Total ...	...	£257

[21] †Includes—

Barytes, 19 tons ...	...	£73
Felspar, 60 tons ...	...	485
Gypsum, 2 tons ...	...	4
Molybdenite, 51 tons	...	505
Pottery clay, 1 ton	...	16
Total ...		£1,083

[22] † Includes—

Clay, 34 tons ...	...	£94
Iron Ore, 2 tons ...	...	9
Manganese, 22 tons	...	200
Total ...	...	£303

[23] †Manganese.

PART III.—ALL MINES.

TABLE XXIX.

MILLING AND CYANIDING PLANTS ERECTED IN THE RESPECTIVE GOLDFIELDS, DISTRICTS, AND MINERAL FIELDS ON THE 31ST DECEMBER, 1925, 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.	
	PILBARRA GOLDFIELDS.													
	Marble Bar District.													
Bamboo Creek. G.M.L. 795	Bulletin	10	...	...	...	...	...	...	...	...	...	...	...	...
↑ *Lalla Rookh.* R.C. 112	State Battery, Bamboo Creek	5	...	...	...	...	...	...	...	1	5	...	...	...
	Lalla Rookh	10	...	...	...	...	...	...	...	...	5	...	...	...
Marble Bar. M.A. 37	Ironclad	10	...	...	...	...	...	...	...	...	...	...	...	...
G.M.L. 694	Jo Jo	5	...	...	...	1	...	...	...	1	...	...	...	...
↑ *North Shaw.* G.M.L. 820	State Battery, Marble Bar	5	...	...	...	...	...	...	...	1	...	...	...	...
	McLeod's Reward	5	...	...	...	...	...	...	...	...	...	...	...	...
	Total	**50**	...	...	...	**1**	...	...	...	**3**	**10**	...	...	**£13,630**
	NULLAGINE DISTRICT.													
Eastern Creek. M.A. 11L	Doherty's Reward	10	...	...	...	...	...	...	...	...	4	...	...	...
G.M.L. 219L	Shamrock	3	...	...	...	...	...	...	...	...	3	...	...	...
Middle Creek. G.M.L. 218L	Barton	10	...	...	...	...	...	...	...	1	6	...	...	...
20-*Mile Sandy.* ↑	State Battery, 20-Mile Sandy	5	...	...	...	...	...	...	...	...	...	...	...	...
	Total	**28**	...	...	...	...	...	...	...	**1**	**13**	...	...	**£2,692**
	WEST PILBARRA GOLDFIELD.													
Pilbara. L.C. 10	Black Prince	...	1	...	...	...	...	...	...	...	...	...	...	...
Station Peak. M.A. 14.	Pilgrim's Rest	10	...	...	...	...	...	...	...	...	...	...	...	...
	Total	**10**	**1**	...	...	...	...	...	...	...	...	...	...	**£2,090**
	PEAK HILL GOLDFIELD.													
Mt. Egerton. ↑	State Battery, Mt. Egerton	5	...	...	...	...	...	...	...	...	...	...	...	...
Peak Hill. T.A. 6P ↑	Wind Power Cyanide Works	...	...	...	...	...	...	...	...	...	6	...	...	...
	State Battery, Peak Hill	5	...	...	...	...	...	...	...	...	3	...	...	...
	Total	**10**	...	...	...	...	...	...	...	...	**9**	...	...	**£2,651**
	EAST MURCHISON GOLDFIELD.													
	LAWLERS DISTRICT.													
Kathleen Valley. G.M.L. 382	Yellow Aster	5	...	...	...	...	...	...	...	...	4	...	...	...
Lawlers. M.A. 32	Great Eastern	5	...	...	...	...	...	...	...	1	6	...	...	...
M.L. 11	Sands Retreatment Works	...	...	...	...	...	...	...	...	...	4	...	...	...
G.M.L. 1234	Vivien, Gem	5	...	...	...	...	...	1	...	...	...	...	...	...
58, etc.	Waroonga G.M. Co., Ltd.	10	...	...	...	...	...	1	...	1	4	...	...	...
Sir Samuel. ↑	State Battery, Sir Samuel	5	...	...	...	...	...	...	...	...	...	...	...	...
	Total	**30**	...	...	...	...	...	**2**	...	**2**	**18**	...	...	**£15,466**
	WILUNA DISTRICT.													
Corboy's Find. 358J	Toscana	3	...	...	...	...	...	...	...	...	...	...	...	...
Mt. Keith. ↑	State Battery, Mt. Keith	5	...	...	...	...	...	...	...	...	...	...	...	...
Wiluna. ↑	State Battery, Wiluna	10	...	...	...	...	...	...	...	...	6	...	...	...
	Total	**18**	...	...	...	...	...	...	...	...	**6**	...	...	**£15,964**
	BLACK RANGE DISTRICT.													
Maninga Marley. 203B	Havilah	10	...	...	...	...	...	...	...	...	...	...	...	...
Sandstone. ↑	State Battery, Sandstone	10	...	...	...	...	...	...	...	...	6	...	...	...
Youanmi. ↑	State Battery Youanmi	5	...	...	...	...	...	...	...	...	2	...	...	...
863B, etc.	Yuanmi Gold Mines, Ltd.	20	...	1	...	...	...	...	1	2	...	...	...	...
	Total	**45**		**1**	...	...	...	...	**1**	**2**	**8**	...	...	**£77,650**

TABLE XXIX.—*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. 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.	Value of all Mining Machinery
	MURCHISON GOLDFIELD.													
	CUE DISTRICT.													
Cuddingwarra. 1860	Big Bell	10	...	...	...	...	...	...	1	...	12	2	...	...
Cue. 203	Cue No. 1	20	...	...	...	...	...	...	...	1	...	...	...	...
↑	State Battery, Cue	5	...	...	...	...	...	...	...	...	5	...	...	...
Reedy's Find. 1977, etc.	Mararoa G.M. Co., N.L.	5	...	...	...	...	...	...	...	...	8	...	...	...
Tuckanarra. ↑	State Battery, Tuckanarra	10	...	...	...	...	...	...	...	...	...	...	...	...
	Total	**50**	...	...	...	...	...	...	**1**	**1**	**25**	**2**	...	**£23,588**
	MEEKATHARRA DISTRICT.													
Holden's Find. 1291N	Waterloo	5	...	...	...	...	...	...	...	...	...	...	...	...
Meekatharra. 533N	Bright's Cyanide Works	...	...	...	...	...	...	...	...	...	3	...	...	...
477N	Fenian	15	...	...	...	...	...	...	...	4	...	...	...	...
475N	Ingliston Consols Extended	15	...	...	...	...	...	...	...	3	...	...	...	...
1531N	Ingliston G.M. Co., N.L.	10	...	...	...	...	...	...	...	...	...	...	...	...
533N	Marmont	10	...	...	...	...	...	...	...	...	...	...	...	...
↑	State Battery, Meekatharra	5	...	...	...	...	...	...	...	...	5	...	...	...
Nannine. 166N	Nannine	10	...	...	...	...	...	...	...	2	3	...	...	...
	Total	**70**	...	...	...	...	...	...	...	**9**	**11**	...	...	**£40,826**
	DAY DAWN DISTRICT.													
Day Dawn. 1D, etc.	Great Fingall	...	...	...	...	...	...	...	...	...	22	...	...	...
Jasper Hill. M.A. 17D	Neptune	10	...	...	...	...	...	...	...	1	3	...	...	...
Lake Austin. 571D	Mainland Consols	3	...	...	...	...	...	...	...	...	...	...	...	...
	Toatl	**13**	...	...	...	...	...	...	...	**1**	**25**	...	...	**£2,900**
	MT MAGNET DISTRICT.													
Lennonville. 964M	Empress	5	...	...	...	...	...	...	...	1	3	...	...	...
1061M	Long Reef	...	...	...	...	...	...	...	...	...	3	...	3	...
Mt. Magnet. 1215M	Hill 60	5	...	...	...	...	...	...	...	...	...	...	...	...
1156M	Leap Year	5	...	...	...	...	...	...	...	1	...	...	...	...
1075M	New Havelock	5	...	...	...	...	...	...	...	...	3	...	...	...
↑	State Battery, Boogardie	5	...	...	...	...	...	...	...	...	5	...	...	...
	Total	**25**	...	...	...	...	...	...	...	**2**	**14**	...	**3**	**£6,549**
	YALGOO GOLDFIELD													
Field's Find. M.A. 23	Brown's Reward	5	...	...	...	...	...	...	...	...	6	...	...	...
Goodingnow. ↑	State Battery, Payne's Find	5	...	...	...	...	...	...	...	...	6	...	...	...
Noongal. 953	Revival	5	...	...	...	...	...	...	...	...	2		...	...
Messenger's Patch. 880	Brilliant G.M. Co., N.L.	10	...	...	...	...	...	1	...	2	...	...	...	...
Warda Warra. P.A. 66W	Austin & Stewart	...	1	...	...	...	...	...	...	...	...	...	...	...
Warriedar. ↑	State Battery, Warriedar	5	...	...	...	...	...	...	...	...	6	...	...	...
Yalgoo. P.A. 689	Moxon	...	1	...	...	...	...	...	...	...	...	...	...	...
	Total	**30**	**2**	...	...	...	...	**1**	...	**2**	**20**	...	...	**£23,646**
	MT. MARGARET GOLDFIELD.													
	MT. MORGANS DISTRICT.													
Linden. ↑	State Battery, Linden	10	...	...	...	...	...	...	...	...	6	...	...	...
341F	Torquay	5	...	...	...	...	...	...	...	...	4	2	...	...
Mt. Morgans. 5F	Westralia Mt. Morgans Mines, N.L. ...	10	...	...	...	...	...	...	...	3	...	3	1	...
Yundamindera. 357F	Big Stone	5	...	...	...	...	...	...	...	...	3	...	...	...
	Total	**30**	...	...	...	...	...	...	...	**3**	**13**	**5**	**1**	**£7,223**
	MT. MALCOLM DISTRICT.													
Lake Darlot. ↑	State Battery, Lake Darlot	10	...	...	...	...	...	...	...	...	...	...	...	...
Leonora. M.A. 10C	Gwalia Central G.Ms., Ltd.	5	...	...	...	...	...	...	...	...	...	...	...	...
263C	Trump: Gwalia Central G.Ms., Ltd. ...	5	...	...	...	...	...	...	...	...	...	...	...	...
190C, etc.	Sons of Gwalia, Ltd.	30	...	...	...	...	...	...	4	...	...	4	1	...
↑	State Battery, Leonora	10	...	...	...	...	...	...	...	...	5	...	...	...
Mt. Clifford. 1329C	Victory No. 1	5	...	...	...	...	...	...	...	...	2	...	...	...
Pig Well. 1547C	Starlight	10	...	...	...	...	...	...	...	...	...	...	...	...
	Total	**75**	...	...	...	...	...	...	4	...	7	4	1	£283,453

TABLE XXIX.—*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.	
	MT. MARGARET DISTRICT.													
Erlistoun.														
2113T	Baneygo North	5	...	...	...	...	...	...	...	1	...	...	...	...
2141T	King of Creation	5	...	...	...	...	...	...	...	...	...	...	...	...
Laverton.														
715T	Lancefield Treatment Synd.	...	...	...	...	...	...	...	...	...	8	...	...	...
1807T	Mary Mac G.M. Co., N.L.	10	...	...	...	...	...	...	...	4	3	1	...	...
⋀	State Battery, Laverton	10	...	...	...	...	...	...	...	...	5	...	...	...
	Total	**30**	...	...	...	...	...	...	...	**5**	**16**	**1**	...	**£6,317**
	NORTH COOLGARDIE GOLDFIELD.													
	MENZIES DISTRICT.													
Come Vale.														
5217	Gladsome	10	...	...	...	...	...	...	...	2	...	...	...	...
Menzies.														
M.A. 65Z	Lady Harriet	5	...	...	...	...	...	...	...	...	4	...	...	...
4931Z, etc.	Menzies Consolidated G.Ms., Ltd. ...	20	...	...	...	...	...	...	...	9	14	4	1	...
(3100Z), etc.	Menzies Mining & Exploration Corp., Ltd. ...	10	...	...	...	...	...	...	...	...	...	...	...	...
Mt. Ida.														
⋀	State Battery, Mt. Ida	5	...	...	...	...	...	...	...	...	...	...	...	...
5481Z	Unexpected South	5	...	...	...	...	...	...	...	1	...	...	...	...
	Total	**55**	...	...	...	...	...	...	...	**12**	**18**	**4**	**1**	**£14,918**
	ULARRING DISTRICT.													
Mulline.														
M.A. 11U	No 1 North Coolgardie Consols G.M., Ltd. ...	10	...	...	...	...	...	...	...	1	...	...	...	...
⋀	State Battery, Mulline	10	...	...	...	...	...	...	...	...	...	...	...	...
	Total	**20**	...	...	...	...	...	...	...	**1**	...	...	...	**£2,289**
	NIAGARA DISTRICT.													
Kookynie.														
769G	Two D's	...	...	1	...	...	...	...	...	2	...	...	...	...
Niagara.														
⋀	State Battery, Niagara	10	...	...	...	...	...	...	...	...	...	...	...	...
Tampa.														
M.A. 62G	Grafter	5	...	...	...	...	...	...	...	1	...	...	...	...
	Total	**15**	...	1	...	...	...	...	...	**3**	...	...	...	**£2,199**
	YERILLA DISTRICT.													
Edjudina.														
1011R	Neta	10	...	...	...	...	...	...	...	1	...	...	...	...
Yarri.														
⋀	State Battery, Yarri	10	...	...	...	...	...	...	...	...	5	...	...	...
	Total	**20**	...	...	...	...	...	...	...	**1**	**5**	...	...	**£4,350**
	BROAD ARROW GOLDFIELD.													
Bardoc.														
1833W	Zoroastrian	5	...	...	...	...	...	...	...	...	...	...	...	...
Siberia.														
1399W, etc.	Associated Northern Blocks (W.A.), Ltd. ...	...	...	1	...	2	3	...	...	10	...	7	2	...
1371W	Gimblet South	10	...	...	...	...	...	...	...	...	...	...	...	...
1289W	Lady Evelyn	5	...	...	...	...	...	...	...	...	4	...	...	...
(1736W)	Pole	5	...	...	...	...	...	...	...	...	...	...	...	...
⋀	State Battery, Ora Banda	5	...	...	...	...	...	...	...	...	5	...	...	...
⋀	State Battery, Siberia	5	...	...	...	...	...	...	...	...	...	...	...	...
	Total	**35**	...	1	...	2	3	...	...	10	9	7	2	**£63,968**
	NORTH-EAST COOLGARDIE GOLDFIELD.													
	KANOWNA DISTRICT.													
Gordon.														
1385X	Pride of the Morning	...	...	...	...	1	...	...	...	...	2	...	...	...
Kanowna.														
1389X	Golden Valley	5	...	...	...	...	...	...	...	...	...	...	...	...
M.A. 19X	Martin's Battery	15	...	...	...	...	...	...	...	...	...	...	...	...
12X, etc.	North White Feather G.Ms., Ltd.	20	...	...	...	...	...	...	...	...	...	...	...	...
1299X, etc.	Orion Mines, Ltd.	10	...	...	...	...	...	...	...	...	...	...	...	...
	Total	**50**	...	...	...	1	...	...	...	...	**2**	...	...	**£7,600**
	KURNALPI DISTRICT.													
Kurnalpi.														
M.A. 7K	Success Battery	5	...	...	...	...	...	...	...	...	2	...	...	...
Mulgabbie.														
M.A. 4K	Simmon's Battery	...	1	...	...	...	...	...	...	...	...	...	...	...
	Total	**5**	1	...	...	...	...	...	...	...	**2**	...	...	**£200**

TABLE XXIX.—*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. Batteries. Number of Heads of Stampers.	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.	Value of all Mining Machinery.
	EAST COOLGARDIE GOLDFIELD.													
	EAST COOLGARDIE DISTRICT.													
Boulder.														
38E, etc.	Associated Gold Mines of W.A., Ltd. ...	...	...	7	...	...	...	1	...	20	...	6	7	...
66E	Boulder Perseverance, Ltd.	...	...	8	...	...	...	1	2	17	...	24	13	...
351E	Golden Horseshoe Estates Co., Ltd. ...	100	...	1	...	...	3	6	15	5	20	22	14	...
M.A. 71E	Great Boulder No. 1, Ltd.	10	...	...	...	...	...	...	...	2	...	...	...	...
16E, etc.	Great Boulder Proprietary G.Ms., Ltd. ...	...	1	6	...	...	2	4	...	20	...	23	7	...
946E, etc.	Ironsides North	10	...	...	...	...	...	...	...	1	...	...	...	...
31E, etc.	Lake View & Star, Ltd.	10	...	6	...	...	...	...	3	3	15	26	4	...
281E, etc.	North Kalgurli (1912), Ltd.	20	...	...	...	...	...	2	...	1	4	...	...	...
410E, etc.	Oroya Links, Ltd.	50	...	11	...	...	1	3	3	17	...	7	1	...
1208E, etc.	South Kalgurli Consolidated, Ltd.	30	...	4	...	...	...	...	1	6	...	5	6	...
Hampton Plains														
Block 48, P.P.L. 86	Golden Hope G.Ms., N.L.	10	...	...	...	...	...	...	...	2	...	2	1	...
Block 50, P.P.L. 9	Celebration G.Ms., Ltd.	10	...	...	...	...	...	...	1	1	...	6	2	...
Block 45	Hampton Properties, Ltd.	10	...	...	...	...	...	...	...	...	6	2	1	...
Block 48, P.P.L. 1	White Hope Hopeful Syndicate, Ltd. ...	10	...	...	...	...	...	1	...	2	6	2	...	...
Kalgoorlie.														
3643E	Hainault Sulphide Plant	...	...	1	...	...	...	...	...	...	7	...	...	...
M.A. 7E	Hannans Central	20	...	...	...	...	...	...	...	...	8	4	...	...
4547E	Hannan's Reward	5	...	...	...	...	...	...	...	1	...	3	1	...
5370E	Hard-Up	...	...	...	...	1	...	...	...	...	...	...	...	...
L.C. 353E	Lone Hand	...	...	...	...	1	...	...	...	1	7	...	...	...
Wombala.														
4766E	Great Hope	...	...	...	...	1	...	1	...	1	...	...	...	...
4770E	Great Hope North	10	...	...	...	...	...	...	...	...	8	...	...	...
	Total	305	1	44	...	3	6	19	25	100	81	132	57	£692,737
	COOLGARDIE GOLDFIELD.													
	COOLGARDIE DISTRICT.													
Coolgardie.														
4567	Griffiths Gold Mine	10	...	...	...	...	...	...	...	...	6	...	...	...
M.A. 11	New Bayley's Mine, Ltd.	...	...	...	...	...	...	...	...	...	...	4	...	...
	State Battery, Coolgardie	10	...	...	...	...	...	...	...	...	6	...	...	...
Gibraltar.														
4580	Lloyd George Gold Mining Co., N.L. ...	10	...	...	...	...	...	...	...	2	18	...	...	...
4603	Reform	5	...	...	...	...	...	...	...	...	5	...	...	...
St. Ives.														
4720	Ives Reward Gold Mines, N.L.	10	...	...	...	...	...	...	...	2	...	...	...	...
4732	Ives Reward Junction	...	...	...	...	1	...	...	...	...	...	...	...	...
	State Battery, St. Ives	5	...	...	...	...	...	...	...	...	5	...	...	...
Widgiemooltha.														
M.A. 63	Highgate	3	...	...	...	...	...	...	...	1	...	...	...	...
M.A. 280H	Imperial	5	...	...	...	...	...	...	...	...	...	...	...	...
	Total	58	...	...	...	1	...	...	...	5	40	4	...	£30,095
	KUNANALLING DISTRICT.													
Carbine.														
338	Carbine	10	1	...	...	...	...	...	...	2	...	...	...	...
25-Mile.														
6968	Blue Bell	5	...	...	...	...	...	...	...	...	7	...	...	...
6458	Star of Fremantle	10	...	...	...	...	...	...	...	...	2	...	...	...
8978	Nick of Time	...	...	...	...	...	...	...	...	1	...	...	...	...
	Total	25	1	...	...	...	...	...	...	3	9	...	...	£6,750
	YILGARN GOLDFIELD.													
Bullfinch.														
914, etc.	Bullfinch Proprietary (1919), Ltd.	20	...	...	...	...	...	...	2	2	...	4	3	...
Forrestonia.														
2909	Great Southern	5	...	...	...	...	...	...	...	...	...	...	...	...
Golden Valley.														
3248	Manxman Battery	5	...	...	...	...	...	...	...	1	3	...	...	...
2994	Radio	5	...	...	...	...	...	...	...	...	3	...	...	...
Greenmount.														
M.A. 25	Transvaal	10	...	...	...	...	...	...	...	...	...	...	...	...
Kennyville.														
(911)	Edna May Battler G.M. Co., N.L.	10	...	...	...	...	...	...	...	2	5	...	...	...
(570)	Great Leviathan	5	...	...	...	...	...	...	...	...	...	...	...	...
Marvel Loch.														
3069	Banker: Golden Butterfly G.M. Co., N.L. ...	10	...	...	...	...	...	...	...	...	5	...	...	...
719	Great Victoria Gold Mines, N.L.	10	...	...	...	...	...	...	1	2	...	6	1	
M.A. 23	Howlett's Battery	5	...	...	...	...	...	...	...	...	4	...	...	...
3281	Resurrection	...	...	...	...	...	...	...	...	...	3	...	...	...
Mt. Jackson.														
(1933)	Butcher Bird No. 1	5	...	...	...	...	...	...	...	...	...	...	...	...
Parker's Range.														
2801	Scots Greys	5	...	...	...	...	...	...	...	...	...	...	...	...
724	Spring Hill G.M. Co., N.L.	10	...	...	...	...	...	...	...	1	4	...	...	...
Southern Cross.														
(3232)	Fraser's Central	...	...	...	...	1	...	...	...	...	...	...	...	...
Westonia.														
3269	Myrtle Central	10	...	...	...	...	...	...	...	...	6	...	...	...
3289	Recovery	5	...	...	...	...	...	...	...	1	...	...	...	...
	Total	120	...	...	...	1	...	...	3	9	33	10	4	£52,410

TABLE XXIX.—*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.	
	DUNDAS GOLDFIELD.													
Norseman.														
M.A. 18	Rawlings & Bullen	10	...	...	...	...	...	...	...	...	4	...	...	...
↑	State Battery, Norseman	5	...	...	...	...	...	...	...	...	6	...	...	...
	Total	**15**	...	...	...	...	...	...	...	...	**10**	...	...	**£2,823**
	PHILLIPS RIVER GOLDFIELD.													
Kundip.														
184	Gem	5	...	...	...	...	...	...	...	...	...	...	...	...
151	Gem Consolidated	5	...	...	...	...	...	...	...	...	...	...	...	...
M.L. 52	Harbour View Gold & Copper Co., Ltd. ...	10	...	...	...	...	...	...	...	...	...	...	...	...
T.A. 6	Two Boys	10	...	...	...	...	...	...	...	...	...	...	...	...
Ravensthorpe.														
201	Mt. Doran	5	...	...	...	...	...	...	...	...	1	...	...	...
	Total	**35**	...	...	...	...	...	...	...	...	**1**	...	...	**£2,365**
	STATE GENERALLY ...	...	...	1	...	...	...	1	...	...	...	...	...	...
	Total	...	...	**1**	...	...	...	**1**	...	...	...	...	...	**£30,100**

TABLE XXIX.—*Milling and Cyaniding Plants erected in the respective Goldfields, Districts, etc.*—continued.

GOLDFIELD	DISTRICT.	MILLING.									CYANIDING.			Total 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.	
	GOLD MINING.													
KIMBERLEY	... ...	...	...	...	...	...	...	...	...	...	...	...	...	...
PILBARRA ...	Marble Bar	50	...	...	...	1	...	...	...	3	10	...	...	13,630
	Nullagine	28	...	...	...	...	...	...	...	1	13	...	...	2,692
WEST PILBARA ...	... ...	10	1	...	...	...	...	...	...	...	...	...	...	2,090
ASHBURTON	... ...	...	...	...	...	...	...	...	...	...	...	...	...	...
GASCOYNE	... ...	...	...	...	...	...	...	...	...	...	...	...	...	...
PEAK HILL	... ...	10	...	...	...	...	...	...	...	...	9	...	...	2,651
EAST MURCHISON	Lawlers	30	...	...	...	...	...	2	...	2	18	...	...	15,466
	Wiluna	18	...	...	...	...	...	...	...	...	6	...	...	15,964
	Black Range	45	...	1	...	...	...	...	1	2	8	...	...	77,650
MURCHISON ...	Cue	50	...	...	...	...	...	...	1	1	25	2	...	23,588
	Meekatharra	70	...	...	...	...	...	...	...	9	11	...	...	40,826
	Day Dawn	13	...	...	...	...	...	...	...	1	25	...	...	2,900
	Mt. Magnet	25	...	...	...	...	...	...	...	2	14	...	3	6,549
YALGOO	... ...	30	2	...	...	...	...	1	...	2	20	...	...	23,646
MT. MARGARET	Mt. Morgans	30	...	...	...	...	...	...	...	3	13	5	1	7,223
	Mt. Malcolm	75	...	...	...	...	...	...	4	...	7	4	1	283,453
	Mt. Margaret	30	...	...	...	...	...	...	...	5	16	1	...	6,317
NORTH COOLGARDIE	Menzies	55	...	...	...	...	...	...	...	12	18	4	1	14,918
	Ularring	20	...	...	...	...	...	...	...	1	...	...	...	2,289
	Niagara	15	...	1	...	...	...	...	...	3	...	...	...	2,199
	Yerilla	20	...	...	...	...	...	...	...	1	5	...	...	4,350
BROAD ARROW	... ...	35	...	1	...	2	3	...	...	10	9	7	2	63,968
N.E. COOLGARDIE	Kanowna	50	...	...	...	1	...	...	...	...	2	...	...	7,600
	Kurnalpi	5	1	...	...	...	...	...	...	...	2	...	...	200
EAST COOLGARDIE	East Coolgardie	305	1	44	...	3	6	19	25	100	81	132	57	692,737
	Bulong	...	...	...	...	...	...	...	...	...	...	...	...	...
COOLGARDIE ...	Coolgardie	58	...	...	...	1	...	...	...	5	40	4	...	30,095
	Kunanalling	25	1	...	...	...	...	...	...	3	9	...	...	6,750
Yilgarn	... ...	120	...	...	...	1	...	...	3	9	33	10	4	52,410
DUNDAS	... ...	15	...	...	...	...	...	...	...	...	10	...	...	2,823
PHILLIPS RIVER ...	... ...	35	...	...	...	...	...	...	...	...	1	...	...	2,365
STATE GENERALLY ...	... ...	...	...	1	...	...	...	1	...	...	...	...	...	30,100
	Total, Gold Mining Machinery ...	**1,272**	**6**	**48**	**...**	**9**	**9**	**23**	**34**	**175**	**405**	**169**	**69**	**1,437,449**
	LEAD MINING.													
NORTHAMPTON, M.F. ...	... ...	...	...	...	...	...	...	10	...	...	...	...	...	54,075
	Total, Lead Mining Machinery ...	**...**	**...**	**...**	**...**	**...**	**...**	**10**	**...**	**...**	**...**	**...**	**...**	**54,075**
	TIN MINING.													
PILBARA	Marble Bar	...	...	...	...	...	...	2	...	...	...	...	...	2,650
GREENBUSHES TINFIELD	... ...	...	...	...	...	...	...	2	...	...	...	...	...	13,200
	Total, Tin Mining Machinery ...	**...**	**...**	**...**	**...**	**...**	**...**	**4**	**...**	**...**	**...**	**...**	**...**	**15,850**
	COPPER MINING.													
WEST PILBARA	... ...	...	...	...	...	...	...	5	2	1	...	...	...	60,000
PHILLIPS RIVER ...	... ...	...	...	5	...	...	...	10	2	...	...	3	1	79,850
	Total, Copper Mining Machinery ...	**...**	**...**	**5**	**...**	**...**	**...**	**15**	**4**	**1**	**...**	**3**	**1**	**139,850**
	COAL MINING.													
COLLIE COALFIELD ...	... ...	...	...	...	...	...	...	...	...	...	...	...	...	100,613
	Total, Coal Mining Machinery ...	**...**	**...**	**...**	**...**	**...**	**...**	**...**	**...**	**...**	**...**	**...**	**...**	**100,613**
	ASBESTOS MINING.													
PILBARA	Nullagine	...	...	...	...	...	...	1	...	...	...	...	...	2,750
	Total, Asbestos Mining Machinery	**...**	**...**	**...**	**...**	**...**	**...**	**1**	**...**	**...**	**...**	**...**	**...**	**2,750**
Total, Machinery other than Gold Mining		**...**	**...**	**5**	**...**	**...**	**...**	**30**	**4**	**1**	**...**	**3**	**1**	**313,138**
Total, all Mining Machinery		**1,272**	**6**	**53**	**...**	**9**	**9**	**53**	**38**	**176**	**405**	**172**	**70**	**£1,750,587**

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.

Arrangements can be made for the insurance of gold sent by post. Particulars upon application to the Mint.

A circular can be obtained from the Deputy Master of the Mint giving all necessary information for intending depositors, Coining Regulations, etc., etc.

Forms for use in connection with gold sent to the Mint by post 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 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.

RATES FOR CARRIAGE OF GOLD ON GOVERNMENT RAILWAYS.

	Distance not over—									
	10 miles	25 miles.	50 miles.	100 miles.	150 miles.	200 miles.	250 miles.	300 miles.	400 miles.	500 miles.
Bullion or unmanufactured Gold, per 100ozs.	s. d. 3 9	s. d. 4 6	s. d. 5 3	s. d. 6 9	s. d. 8 3	s. d. 9 9	s. d. 11 3	s. d. 12 9	s. d. 15 0	s. d. 17 3

1s. 6d. per 100ozs. for every additional 100 miles, or part thereof.

Consignments of Gold Bullion in lots exceeding in the aggregate 30,000 ozs. despatched on any one day will be allowed a reduction of 33⅓ per cent. with a minimum charge as for 30,000 ozs. Consignors may combine to make up the required quantity, but each consignment must be charged for separately.

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, at the mine.

By Authority : FRED. WM. SIMPSON, Government Printer, Perth.